State of Louisiana

The Honorable Kathleen Babineaux Blanco, Governor

Integrated Ecosystem Restoration and Hurricane Protection: Louisiana's Comprehensive Master Plan for a Sustainable Coast

CPRA

Coastal Protection and Restoration Authority of Louisiana

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LOUISIANA
JUSTICE
CONFIDENCE

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April 30, 2007

Dear Members of the Louisiana Legislature,

I am proud to submit for your consideration and approval, the state's coastal master plan, entitled Integrated Ecosystem Restoration and Hurricane Protection: Louisiana's Comprehensive Master Plan for a Sustainable Coast. The completion of this plan is an historic step in a journey which promises safer communities, a more sustainable coastal landscape, and a brighter future for Louisiana.

Based on years of coastal research and on lessons learned after the hurricanes of 2005, this Master Plan represents a bold vision for the complete integration of coastal protection and restoration. For the first time in Louisiana's history, state and local governments will be truly focused on the comprehensive, long term protection of our coastal communities and the sustainable restoration of our coastal landscape, working closely with the Congress to ensure a high level of federal coordination and support.

Over the past eighteen months, the Coastal Protection and Restoration Authority marshaled, through its integrated planning team, the best expertise available in developing this Master Plan. During almost five months of public review of the plan, they engaged members of the Louisiana Legislature, local governments, critical state and national stakeholders, and key leaders in the Congress and the federal Executive Branch of government. This plan embodies an open and credible process that will continue as it is implemented and adapted, using the best science and engineering here and throughout the world.

The death and devastation caused by hurricanes Rita and Katrina have strengthened our resolve to establish a lasting legacy of coastal protection and restoration for south Louisiana. The passage of this Master Plan is the first step in making that legacy a reality for our coastal communities today.

Sincerely,

Kathleen Babineaux Blanco

Kathleen Babineaux Blanco
Governor

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Executive Summary

Setting the Bar Higher

The Master Plan was developed to fulfill the mandates of Act 8, which was passed by the Louisiana Legislature in November 2005 and signed into law by Governor Blanco. The act created the Coastal Protection and Restoration Authority (CPRA) and charged it with coordinating the efforts of local, state, and federal agencies to achieve long-term and comprehensive coastal protection and restoration. In so doing, the CPRA must integrate what had previously been discrete areas of activity: flood control and wetland restoration. Act 8 also requires that the CPRA establish a clear set of priorities for making comprehensive coastal protection a reality in Louisiana.

The Master Plan is the principal means for achieving this goal. As such, the plan is informing several ongoing efforts, including the Louisiana Recovery Authority's Louisiana Speaks planning process and the development of the U.S. Army Corps of Engineers' Louisiana Coastal Protection and Restoration Report, which will be completed in December 2007.

The Master Plan presents a series of recommended hurricane protection and coastal restoration measures. Maps and explanations about the measures, as well as a management strategy for implementing them are also provided. Taken together, the Master Plan presents a conceptual vision of a sustainable coast based on the best available science and engineering.

The need for this comprehensive, integrated approach is acute. Since the 1930s, coastal Louisiana has lost over 1.2 million acres and is still losing land at the rate of 15,300 acres per year. This extreme rate of loss threatens a range of key national assets and locally important communities. Pipelines, navigation channels, and fisheries as well as centuries-old human settlements and priceless ecosystems are all at risk.

Hurricanes Katrina and Rita intensified the problem. Approximately 200 square miles of marsh were destroyed, over 200,000 homes were damaged, over 1,400 Louisianians died, and more than one million state residents were displaced by the storms. The hurricanes also disrupted the national economy, spiking fuel prices, lowering energy reserves, and slowing grain shipments to world markets. The hurricanes' effects highlighted the need to improve Louisiana's hurricane protection systems and restore the wetlands upon which so much of our national economy depends.

Goals of the Master Plan

- **Present a conceptual vision for a sustainable coast.**
- **Be a living document that changes over time as our understanding of the landscape improves and technical advances are made.**
- **Emphasize sustainability of ecosystems, flood protection, and communities.**
- **Integrate flood control projects and coastal restoration initiatives to help both human and natural communities thrive over the long-term.**
- **Be clear about what we don't know. In some areas, scientific and technical advancements will be needed before we can make definitive pronouncements as to what will happen.**

What Coastal Louisiana Provides

- **Energy infrastructure:** The wetlands protect critical oil and gas infrastructure from storm surge. This infrastructure produces or transports nearly one-third of the nation's oil and gas supply, and is tied to 50% of the nation's refining capacity (LA Department of Natural Resources, 2006).

- **Shipping:** Ten major navigation routes are located in south Louisiana. Five of the busiest ports in the U.S., ranked by total tons, are also located here. These facilities handle 19% of annual U.S. waterborne commerce (USACE, 2003).

- **Fisheries and wildlife habitat:** Louisiana provides 26% (by weight) of the commercial fish landings in the lower 48 states (US Department of Commerce, 2005). More than five million migratory waterfowl spend the winter in Louisiana's marshes (LA Department of Wildlife & Fisheries, 2000). The coastal landscape also provides stopover habitat for millions of neotropical migratory birds and 17 threatened or endangered species.

- **Water quality:** If river water flows through them, wetlands can filter nutrients that would otherwise flow directly into the Gulf of Mexico. Concentrations of these nutrients in the northern Gulf of Mexico contribute to the growing problem of hypoxia, or low oxygen conditions, in offshore coastal waters.

- **Culture:** The diverse peoples of south Louisiana have created a multi-faceted culture known throughout the world. Moreover, coastal Louisiana is home to two million residents, or over half of the state's population.

Assumptions and Technical Challenges

The planning team used several assumptions to guide their work.

1. This version of the Master Plan is a first cut at what will be a living document that changes over time.
2. A sustainable landscape is a prerequisite for both storm protection and ecological restoration.
3. Change is inevitable; the ecosystem is degrading now, and restoring sustainability will bring changes of its own.
4. Plans for hurricane protection must rely on multiple lines of defense.

Such assumptions lead to difficult choices, and the Master Plan enumerates several tradeoffs implicit in its proposals. For example, not every community will receive the same level of hurricane protection. The plan also discusses the shifts in fisheries and other traditional uses of the coast that are likely to occur when major river diversion projects are constructed.

Technical unknowns pose challenges as well. Questions remain about the ways in which climate change will affect the coast, as well as how to best balance the effects of diversions, levees, and restoring marshes using dredged sediments. Although we do not yet have all the answers, we do know that many of our existing protection and restoration techniques are effective.

We must begin creating a sustainable coast without delay, using methods that we know can work, while also field testing new concepts and learning as we go. Given the magnitude of the task at hand, a stepwise process based on sound science and engineering is the only way forward.

The Master Plan

An Integrated Planning Team made up of employees from the Department of Natural Resources and the Department of Transportation and Development took the lead in developing the Master Plan. The team, working in consultation with stakeholders, scientists, engineers, and the public, identified four objectives that define what the plan seeks to achieve:

- reduce risk to economic assets
- restore sustainability to the coastal ecosystem
- maintain a diverse array of habitats for fish and wildlife
- sustain Louisiana's unique heritage and culture

The full text of the objectives, as well as principles that guided the group's work, are presented in Appendix A.

Timeline: How the Master Plan was Developed

Act 8 Signed	Nov. 2005
Integrated Planning Team established	Feb. 2006
First plan formulation workshops held	May 2006
Plan formulation report completed	June 2006
Plan formulation report included in USACE report to Congress	July 2006
Six LA Recovery Authority Louisiana Speaks workshops held, providing input to Master Plan process	July-Aug. 2006
Over 50 stakeholder workshops and meetings held	July-Nov. 2006
Decision process workshop held with agency partners, science advisors, and NGOs	Sept. 2006
Second plan formulation workshops held	Oct. 2006
Preliminary Draft Master Plan presented for public review; 9 public meetings held	Nov.-Dec. 2006
Technical review panels meet and offer comments on Preliminary Draft Plan	Dec. 2006-Jan. 2007
Draft Master Plan presented for public review; 3 public hearings and 1 public meeting held	Feb.-March 2007
Technical review panels meet and offer comments on Draft Master Plan	March 2007
Final Master Plan submitted to legislature	April 2007

The measures contained in the plan can be broken down into three groups, based upon the broad outcomes they deliver:

- Restoring sustainability to the Mississippi River Delta
- Restoring sustainability to the Atchafalaya River Delta and Chenier Plain
- Hurricane protection—both structural and non-structural measures

Restoring Sustainability to the Mississippi River Delta

Creating a sustainable deltaic system requires that we reestablish the processes that originally created the landscape.

Reconnecting the Mississippi River to the wetlands through controlled diversions will restore flows of water through the wetlands so that the ecosystem can retain sediment and nutrients. We also need to act quickly to restore critical landforms before they are lost.

Land building diversions. Commonly referred to as the Mississippi River Delta Management plan, this concept involves building very large diversions that will use the majority of the river's sediment and fresh water to both create new delta lobes and nourish existing wetlands. We do not yet know where, how big, or how numerous these diversions will be, but some possible scenarios are presented in Figures 7 and 8. As this concept is studied further, we must consider not only how to sustain new wetlands but also how navigation and natural resource interests will be affected.

Land sustaining diversions. These diversions are not designed to build wetlands in large areas of open water, rather they are designed to reduce loss and restore the sustainability of existing wetlands. The proposed diversions are envisioned as parts of an interconnected system that will be operated as a whole; individual projects will not be operated in isolation. Along these lines, it is important to review the operation of Davis Pond, Caernarvon, and other land sustaining diversions already in place to ensure that these diversions are providing maximal ecosystem restoration benefits.

Marsh restoration with dredged material. Diversions distribute sediments to areas of need, rather than allowing the sediments to be channeled out of the coastal ecosystem into offshore waters. Another important tool for "getting the sediment right" is distributing these lost sediments through dredging and pipeline conveyance to restore wetlands. One way to

accelerate the benefits of diversions would be to mechanically restore lost marsh by pumping sediments via pipeline from the bed of the Mississippi River, offshore, or from navigation channels.

Navigation channels. The plan recommends using existing navigation channels, such as the Gulf Intracoastal Waterway and the Houma Navigation Canal, as "new distributaries" that could channel water to more remote areas of the coast.

Barrier shoreline restoration. Barrier shorelines are important habitat for many bird species as well as threatened and endangered animal species. They also serve as a first line of defense against storm surge. Barrier shoreline restoration is recommended in the Terrebonne and Barataria Basins because these ecologically important habitats are close enough to marsh and human settlements to diffuse wave energy and storm surge. In the Chandeleur Islands, the state will work with the Department of the Interior as it continues to develop a restoration and management plan to maintain the area as a national wildlife refuge.

Ridge habitat restoration. Ridges are natural elevated features that support woody vegetation and provide habitat for a variety of wildlife species, including migratory species crossing the Gulf. These features can also deflect storm surge, particularly during lower energy winter and tropical storms.

Shoreline stabilization. The plan recommends stabilizing selected shorelines near critical land masses as well as marsh fringes near flood protection works. This can be accomplished either by rock structures or by establishing living reefs. Securing shorelines will help preserve the boundaries of waterbodies and protect areas such as the Biloxi Marshes, the bay side of Grand Isle, and the Jefferson Parish levee system.

Closure of the Mississippi River Gulf Outlet. The plan calls for the immediate closure of the MRGO to deep draft navigation and for the construction of a closure dam at Bayou LaLoutre. The plan's intent is to restore the integrity of the Bayou LaLoutre ridge and use the remainder of the channel to convey fresh water from the Mississippi River to the Biloxi Marshes and other areas of St. Bernard Parish. The plan also includes restoration of wetlands and swamps in the Central Wetlands and Golden Triangle areas. Since this strategy will affect deep and shallow draft navigation industries, appropriate economic mitigation plans will be needed after the channel is closed. In this regard, the status of the Inner Harbor Navigation Canal lock must be resolved.

Restoring Sustainability to the Atchafalaya River Delta and Chenier Plain

The Atchafalaya River Delta is the only region of coastal Louisiana that is building land naturally, and the Master Plan seeks to take maximum advantage of this resource. Further west in the Chenier Plain, navigation channels and canals have allowed salt water to penetrate inland, destroying fragile marsh and impinging on freshwater lakes. The Chenier Plain Freshwater and Sediment Management and Reallocation Plan, recommended in the Master Plan, will help fine tune appropriate measures for the region.

Managing water and sediment. In order to reduce the impacts of periodic saltwater intrusion, the plan suggests managing river and surface fresh water supplies to ensure the availability of fresh water throughout the year. Such management will also permit the delivery of fresh water to areas that may be exposed to saltwater stress while also reducing reliance on groundwater resources.

- Navigation channels provide opportunities to distribute fresh water from the Atchafalaya River. For example, the GIWW could be used as a conduit to move the river's water to the west.

- The plan recommends that drainage be wisely managed in the Mermentau Basin. Such management would ensure that fresh water is available where needed for ecosystem and agriculture needs, but that communities are not placed at greater risk of flooding.

- The plan seeks to maintain the integrity of freshwater resources by shoring up the banks of selected navigation channels, fortifying and maintaining spoil banks along the GIWW and Freshwater Bayou Canal, raising and armoring critical sections of highways, and placing saltwater barriers at deep draft shipping channels to manage salinity levels.

Marsh restoration using dredged material. New land can be created by using dredged material from maintenance dredging of navigation channels. This is a particularly viable strategy in areas near the Calcasieu Ship Channel and the Atchafalaya River Navigation Channel. In other areas, material dredged and transported from offshore could be used to restore lost marsh.

Barrier shoreline restoration. Restoring the barrier shorelines of the Chenier Plain in areas of severe shoreline retreat will be accomplished using a combination of two methods: sand; placement and use of hard structures, such as offshore segmented breakwaters. These methods will help ensure that the shoreline maintains its integrity and protects interior marshes while continuing to allow tidal exchange.

Levees, or some other form of flood control structure, are recommended for high risk areas that must be protected in order to avoid severe consequences for the state and nation.

Lake shoreline stabilization. The plan recommends stabilizing key areas along the Chenier Plain's bay and lake shorelines that, if breached, would have catastrophic results for the landscape. By preventing lakes from growing in size, stabilization will also protect surrounding marsh, cheniers, and coastal prairie from wave induced erosion.

Hurricane Protection

If the state and nation are to continue enjoying the benefits provided by the communities of south Louisiana, new and upgraded hurricane protection systems are necessary. The level of protection provided will be proportional to the assets at risk. There is concern that levees built across swamp and marsh would stop the flow of water, leading to further wetland loss and creating impoundments that flood communities. These concerns must be addressed as projects are developed.

Consider the entire system. Water, sediment and nutrients must be delivered to the wetlands, and overall hydrology must be improved by minimizing impediments to water flow. Protection and restoration actions must be designed to work together to ensure that they do not induce flooding in low-lying communities, and that flood water is not trapped within the system.

Hurricane protection structures must be built and maintained so that the ecosystem remains dynamic and functional.

Use non-structural measures to reduce risk. Given that levees and restored wetlands cannot eliminate all damage from flooding and storms, non-structural solutions offer tools that communities can use now to reduce their risks. In this regard, keeping wet areas wet is important, both for safety and flood control reasons. Approved evacuation plans must be followed, and evacuation routes must be properly maintained and armored as necessary. Communities must also follow FEMA-approved hazard mitigation plans and consider compartmentalization plans.

Non-Structural Solutions: Tools Citizens Can Use

- **Flood insurance**. Because of its low lying topography, Louisiana has the highest rate of repetitive flood losses in the nation. Given the base risk, all residents of coastal Louisiana should purchase flood insurance.

- **Elevating and retrofitting structures.** Residents of south Louisiana can improve their homes in ways that reduce the risk of storm damage. Hazard mitigation funds are available to citizens for this purpose.

- **Building codes.** The 2007 Louisiana State Uniform Construction Code is designed to ensure that new construction can better withstand hurricane force winds. Citizens must comply with the provisions of this code.

Focused structural solutions. Restoration and non-structural measures can reduce the risk from storm surge. But in most areas of coastal Louisiana, the number of people and assets at risk warrants higher degrees of protection. The Master Plan recommends building hurricane protection systems in the following areas.

- *Lake Pontchartrain Barrier Plan.* To increase protection in metro New Orleans, including areas such as the North Shore of Lake Pontchartrain that have no protection today, an outer barrier must be built. This barrier should raise protection over the level needed to withstand a storm that has a 1% chance of occurring in

any given year. Figures 13-15 show some concepts being considered for this project, but additional planning and design is needed in order to select the appropriate alignment.

- *Barataria Basin and West Bank.* Additional hurricane protection structures must be built to increase protection to the West Bank of metro New Orleans and to provide protection to central and western Barataria Basin communities that have no protection today. The upgraded hurricane protection system would work with projects already underway to provide the West Bank with protection over the level needed to withstand a storm that has a 1% chance of occurring in any given year. In addition, the project would provide protection to Lafourche Parish and the communities in the central Barataria Basin sufficient to withstand a storm with a 1% chance of occurring in any given year.

  The state is awaiting the results of further modeling to refine alternative alignments for this project (see Figures 16-18 for some possibilities now under consideration). In addition, new engineering options are needed in order to design flood control structures that will work in conjunction with diversions north of the alignment. Together, these structures should be planned and designed to maximize sustainability while providing needed hurricane protection. All of these issues will be explored in depth as feasibility studies for the project are conducted.

- *Plaquemines Parish.* The plan recommends a multi-faceted protection plan for Plaquemines Parish. All sections of levees intended to provide hurricane protection would become federal levees under this plan. Levees south to Oakville would be raised to provide a greater than 100 year level of protection, meaning protection over the level needed to withstand a storm that has a 1% chance of occurring in any given year. Levees between Oakville and Myrtle Grove on the west bank and between Caernarvon and White Ditch on the east bank would be improved to improve to withstand a storm that has a 1% chance of occurring in any given year. As stated above, these stretches of levees would be made part of the federal hurricane protection system.

The drainage levee south of Myrtle Grove would also be federalized and brought to the same elevation as the current federal hurricane protection levees in southern Plaquemines Parish. South of St. Jude on the west bank and south of Phoenix on the east bank, the levees would be maintained at their currently authorized heights. This plan would protect concentrations of industry and populations, while respecting the limitations imposed by the unique geography of Plaquemines Parish.

- *Terrebonne Parish and Atchafalaya Delta.* The plan recommends construction of the existing alignment for the Morganza to the Gulf project, which has been approved after more than 15 years of study by citizens, scientists, and federal agencies. The project will protect the Houma/Thibodaux area, which has a growing population of over 200,000 residents and is currently unprotected. An inner barrier to provide a second line of defense south of Houma may also be needed, pending further study. Regardless, the Morganza to the Gulf project must proceed without delay.

- *LA 1 Highway Corridor.* Louisiana's southernmost port is Port Fourchon, strategically located in the central Gulf region where it serves as a focal point for deepwater oil and gas activities. However, the only roadway connecting the port to the rest of the nation is the vulnerable, two-lane LA 1 highway. Efforts are underway to upgrade and raise on concrete structure the sections of LA 1 that are outside of the existing levee system. To protect the portion of this federally recognized energy corridor that lies within the levee system, the levee between LaRose and Golden Meadow should be raised significantly to provide a 1% level of protection. This means that the protection would be sufficient to withstand a storm with a 1% chance of occurring in any given year. Completion of the Morganza to the Gulf and Donaldsonville to the Gulf projects, together with restoration activities, would further increase levels of protection to this highway. If ongoing modeling and analysis show that risks to assets in this area remain unacceptably high, the Master Plan recommendations will be modified accordingly.

- *Acadiana.* In this region, the highest concentrations of assets are found in Lafayette, New Iberia, and Abbeville. The plan recommends that these areas receive a greater than 100 year level of protection, meaning protection over the level needed to withstand a storm that has a 1% chance of occurring in any given year. Areas between New Iberia and Berwick/Patterson should be protected to withstand a storm with a 1% chance of occurring in any given year. However, much planning and analysis remain to be done before deciding how best to protect this region.

- *Chenier Plain.* The plan recommends that the Lake Charles/ Sulphur area receive a greater than 100 year level of protection. This may be achieved with a ring levee that surrounds population centers as well as critical oil and gas infrastructure. Much planning and analysis remain to be done before deciding how best to protect this region.

  Areas between Abbeville and Lake Charles, where the human population is large but dispersed, would initially be protected by fortifying spoil banks and raising highways in critical locations. If the highway is located on or at the base of a chenier, raising it further is likely unnecessary. The plan recommends improving protection to homes and properties located on cheniers by armoring highway embankments in certain vulnerable locations. In selected low spots, such as along the eastern edge of Highway 82 south of Forked Island, the highway will need to be raised in order to protect the Mermentau Freshwater Basin. If further analysis shows that these measures will not provide enough protection, a levee would be considered along the GIWW. This analysis is ongoing.

Next Steps: Implementing the Master Plan

Some of the measures described above must be implemented before others for a variety of reasons, including: funding constraints, institutional barriers, technical unknowns, and the requirements of individual projects. The state's *Annual Plan: Ecosystem Restoration and Hurricane Protection in Coastal Louisiana* will be the vehicle for presenting yearly scheduling and cost information about projects. The Annual Plan will also offer yearly updates on progress, strategies, technical challenges, and priorities.

An adaptive management strategy underlies every aspect of what the program will accomplish in the coming years. This strategy uses a science and performance based process for assessing how the plan and its projects need to change over time so that the best available practices are consistently used. The use of adaptive management also presupposes strong engagement from citizens and other affected constituencies. Such engagement involves enhanced dialogue with a range of stakeholders, including landowners, fishers, and the navigation community, as well as scientific, engineering, and other technical experts.

We must also resolve important challenges, from scientific and technical uncertainties to institutional constraints. For example, we need better models so that we may better assess how to balance the many interests involved as we build flood protection systems, create marsh, and use multiple river diversions in the same estuarine basin. Changes in laws and policies are also needed to ensure successful implementation of the plan.

Plan Recommendations for Removing Institutional Constraints

- **Increase awareness and use of non-structural protection measures**
- **Improve land use planning, zoning, and permitting**
- **Develop fair and equitable processes for acquiring surface land rights**
- **Foster the sustainability of coastal forests**
- **Obtain dedicated funding for coastal protection and restoration**
- **Address challenges at the federal level**

We are living in a historic moment, one that presents us with a stark choice: either make the bold and difficult decisions that will preserve our state's future, or cling to the status quo and allow coastal Louisiana and its communities to wash away before our eyes.

As the coastal program moves ahead, the plan recommends that a Coastal Assessment Group be made part of the state's management structure, along with an Applied Coastal Engineering and Science Program. These groups would be responsible for making sure that advancements in science and technology are integrated into the state's program.

Stringent inspections of hurricane protection systems, assessments of the effects of restoration and protection actions, and regular updates of the Master Plan are also important tools for keeping the program on track.

These recommendations assume as their point of departure that saving coastal Louisiana and the critical services it provides requires the same basic commitment from all concerned: the resolve to achieve and maintain an unprecedented level of excellence in our stewardship of coastal Louisiana. This commitment does not seek to elevate one set of needs over another, but rather to balance the many interests—cultural, economic, and ecological—that together make America's Wetland one of the most unique and vital coastal regions in the world.

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Preface: A New Resolve

Act 8 Sets the Bar Higher

What had been a crisis has now turned into a bona fide emergency: extreme rates of land loss compounded with inadequate hurricane protection measures threaten the viability of south Louisiana's communities and infrastructure. Scientists, engineers and policy makers have long worked to improve wetland restoration and hurricane protection in the region, even as the wetlands converted to water at a rapid rate. However, Hurricanes Katrina and Rita intensified these urgent needs. Not only did the storms destroy huge swaths of wetlands outright, but the resulting destruction and human misery revealed the inadequacy of the state's hurricane protection systems. Over 1,400 Louisiana residents died, 200,000 homes sustained major damage, and approximately 440,000 Louisiana citizens were still displaced from their homes one year after the storms.

To correct the root causes of these problems, Louisiana is accelerating efforts to create a sustainable coast. As Hurricanes Katrina and Rita made clear, we cannot meet this goal unless we return the wetlands to health, change the way we manage and live in this dynamic landscape, and improve our hurricane protection systems. Furthermore, we have learned that levees and wetland restoration projects can no longer be constructed in separate spheres. Instead, flood control and wetland restoration projects must be designed, built, and operated in coordination, taking into account how individual projects interact with each other. Recognizing the importance of this integrated strategy, the state enacted legislation to coordinate what had been discrete areas of activity: hurricane protection and coastal restoration.

The vehicle for articulating these policy changes was Senate Bill 71, which was adopted by the Louisiana Legislature during the First Extraordinary Session in

ENROLLED

First Extraordinary Session, 2005 ACT No. 8

SENATE BILL NO. 71 (Duplicate of House Bill No. 141)

BY SENATOR DUPRE AND REPRESENTATIVE ALARIO AND COAUTHORED BY SENATORS AMEDEE, BAJOIE, CAIN, CHAISSON, CHEEK, B. GAUTREAUX, N. GAUTREAUX, FONTENOT, HOLLIS, JONES, LENTINI, MOUNT, MURRAY,

November 2005 and signed by Governor Blanco as Act 8. This legislation created the Coastal Protection and Restoration Authority (CPRA) and charged it with coordinating the efforts of local, state, and federal agencies to achieve long-term, comprehensive coastal restoration and hurricane protection. One of the central tenets of this legislation is that state agencies must move beyond jurisdictional boundaries and ensure ongoing integration of hurricane protection and coastal wetland restoration activities. Act 8 seeks to integrate hurricane protection and coastal restoration activities to provide for a safe and sustainable Louisiana.

Act 8 directs the CPRA to supply "aggressive state leadership and direction" as new policies, plans, and programs for the coast are developed. Emphasizing coordination in this way and giving the CPRA the power to enforce it are both groundbreaking aspects of Act 8. In addition, the act requires that the CPRA use its leverage to resolve conflicts in the fine print—those policy, institutional, and legislative constraints that, if not dealt with, could hamstring effective action.

The Master Plan

Act 8 stipulates that the CPRA establish a clear set of priorities for making comprehensive coastal restoration and protection a reality in Louisiana. To this end, the act charged the CPRA with developing a Master Plan that presents a conceptual vision of a sustainable coast based on the best available science and engineering.

The Master Plan takes a comprehensive view as it describes which actions will sustain Louisiana's coastal ecosystem, safeguard coastal populations,

Courtesy Scott Russell Photography

City of New Orleans from St. Bernard Parish marshes.

and protect vital economic and cultural resources. In the past, individual programs and projects may have been carried out for single purposes that did not relate to a larger vision. The Master Plan, by contrast, provides a vehicle for focusing funding and projects toward a common goal. The state will use new programs as well as existing programs such as the Coastal Wetlands Planning, Protection and Restoration Act Program (CWPPRA), the Louisiana Coastal Area Program (LCA), and the Coastal Impact Assistance Program (CIAP) to implement the Master Plan. In addition to shaping how restoration and protection funds are spent, the Master Plan provides a context within which to evaluate other activities in the coastal zone, including: transportation, navigation, and port projects; oil and gas development; groundwater management; and land use planning.

Recognizing that the Master Plan will play a critical role in Louisiana's future, the plan's development has been closely coordinated with other related efforts. The Louisiana Recovery Authority has used iterations of the Master Plan as it considered redevelopment options for south Louisiana through its Louisiana Speaks Initiative, a planning process that will guide the region's recovery and long-term growth. The U.S. Congress has directed the U.S. Army Corps of Engineers (Corps) to develop its own Louisiana Coastal Protection and Restoration (LACPR) report by December 2007. While the Corps's plan does not deal with many of the policy and legislative issues contained in the Master Plan, the state and the Corps are working to ensure that both plans are congruent and complementary.

The Master Plan was drafted by an Integrated Planning Team (IPT) made up of senior staff from the Department of Natural Resources (DNR) and the Department of Transportation and Development (DOTD). The Corps of Engineers New Orleans District also assigned a senior staff person to serve as a liaison to the team. The IPT members were chosen because their diverse backgrounds and multiple areas of expertise help address the many economic, cultural, and technical issues that must be woven into the plan. This planning effort was supported by a multi-disciplinary consultant team including Shaw Coastal; Brown, Cunningham and Gannuch, Inc.; and Halcrow, Inc. After the plan has been approved by the Legislature, Act 8 stipulates that DNR has responsibility for implementing projects related to coastal wetlands, and DOTD has responsibility for implementing projects related to hurricane protection.

This document describes why the coast must be protected and restored, discusses the underlying rationales behind the Master Plan, provides maps and explanations about what the plan contains, and outlines a long-term management strategy for implementation. More details about the information discussed in this report can be found in technical appendices, available at www.louisianacoastalplanning.org.

The plan could not have been created without the thousands of coastal residents, stakeholders, scientists, and engineers who provided ideas and in-depth comments at each stage of the plan's development. The planning team sincerely thanks these contributors for their involvement. Appendices C-1 and C-2 offer copies of the 2,000 pages of public comments and notes received from December 2006 to March 2007. Appendices B and H present stakeholder comments received as part of early plan formulation workshops.

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Flock of roseate spoonbills in South Louisiana wetlands.

What America's Wetland Provides

Because it supplies so many benefits to the nation, south Louisiana's coast is known as "America's Wetland."

STORM PROTECTION

Wetlands and barrier islands reduce storm surge for inland communities and protect critical shipping and energy infrastructure.

FISHERIES AND HABITAT

The coast provides shelter and spawning grounds for thousands of fish and wildlife species.

CULTURE

The coast is home to unique human communities.

Chapter 1: What Is At Stake?

America's Wetland—A Working Coast

South Louisiana encompasses internationally significant ecosystems, culturally unique communities, nationally significant fisheries, and world centers of shipping and industry. Though renowned for its beauty and natural resources, the landscape is not a wilderness. The homes and businesses of half of Louisiana's citizens, along with major ports and industrial facilities, are all located within this one of a kind region.

Louisiana's coastal landscape provides a host of benefits, including protection from flooding. Barrier islands, healthy marshes, natural ridges adjacent to bayous, and cypress swamps provide a natural buffer during storms by slowing down and reducing incoming surges of water. This function, combined with man-made levees and other flood control measures, have allowed Louisiana's working coast to thrive in a flood-prone area.

The Congressional Budget Office estimated that losses of physical capital from Hurricanes Katrina and Rita totaled between $70 and $130 billion.

How much storm surge and wave energy can barrier islands and wetlands deflect? Recent modeling sheds light on this issue. One numerical model that examined forecasts of barrier island loss from the 1990s through 2020 found dramatic increases in bay wave energy with time even under mild weather conditions (Stone, 2004). The study's models found that in some cases, water conditions behind diminished barrier islands resembled those found in the open sea. Another model examined a different hypothetical situation: what if the wetlands east of the Mississippi River Gulf Outlet, the Gulf Intracoastal Waterway, and Lake Borgne turned into open water eight feet deep? The model found that Hurricane Katrina's storm surge would have been three to six feet higher in St. Bernard Parish and New Orleans East (Working Group for Post-Hurricane Planning for the Louisiana Coast, 2006). In Louisiana's flat, low-lying coastal areas, the incremental reductions in storm surge and wave energy provided by coastal landscape features, working in concert with hurricane protection structures, can mean the difference between an area that survives a storm and one that suffers catastrophic damage.

Lessons from the Storms

Hurricanes Katrina and Rita showed just how much these degrees of flood protection can mean. In New Orleans after the levees failed, just one or two feet of extra elevation were enough to keep some homes dry, while lower homes a few blocks away filled with water. But even though some fared better than others, for most residents of coastal Louisiana the loss of life and property remain devastating realities. Statewide, over 200,000 homes sustained major or severe damage, and approximately 440,000 Louisiana citizens were still displaced from their homes one year after the storms (Louisiana Recovery Authority, Aug. 2006). Hundreds of schools, hospitals, and churches were also damaged or destroyed.

In addition to human impacts, the storms had dramatic effects on south Louisiana's wetlands themselves. A study by the U.S. Geological Survey (USGS) reports that the storms converted approximately 217 square miles of marsh to water. Of this total, 98 square miles of land were lost in southwestern Louisiana, and 119 square miles were lost in southeastern Louisiana. Analyses of future growing seasons will indicate how much of this damage is permanent. Marsh plants may rebound in some spots and not in others. Regardless of the final outcome, the storms have aggravated an already dire land loss emergency.

National Resources

Energy infrastructure. The oil and gas industry has established a concentration of coastal and offshore infrastructure and refining capacity in and near south Louisiana. Nearly 9,300 miles of pipelines cross the marshes of coastal Louisiana (USACE, 2004). The Henry Hub in Erath, Louisiana, is the pricing point for natural gas throughout North America, and Port Fourchon provides a port and supply point for hundreds of offshore drilling operations in the Gulf of Mexico. The network of energy facilities located in and around the wetlands produces or transports nearly one-third of the nation's oil and gas supply and is tied to 50% of the nation's refining capacity (LA Department of Natural Resources, 2006). Barrier islands and wetlands help buffer this infrastructure from storm damages.

The network of energy facilities located in and around the wetlands produces or transports nearly one-third of the nation's oil and gas supply, and is tied to 50% of the nation's refining capacity.

The Storms' Effects Went Far Beyond the State's Borders

The storms' national impacts revealed just how much U.S. citizens depend on the resources and infrastructure found in south Louisiana.

Loss of crude oil and natural gas production in the Gulf of Mexico, along with significant disruptions to 20% of U.S. refining capacity, significantly increased gasoline and heating oil prices for households throughout the nation (Congressional Budget Office, 2005).

Disruptions in offshore oil and gas production reduced supply and forced withdrawals from the Strategic Petroleum Reserve.

The temporary closure of the Port of New Orleans slowed grain shipments from the Midwest, which had ripple effects on world agricultural markets.

Courtesy Donn Young/Port of New Orleans

Container and breakbulk ships line the wharves at the Nashville Avenue Complex and Napoleon Avenue Container Terminal at the Port of New Orleans.

National and international commerce. Ten major navigation routes are located in south Louisiana. Five of the busiest ports in the U.S., ranked by total tons, are also located in this region, handling approximately 469 million tons of waterborne cargo each year. This represents 19% of annual U.S. waterborne commerce (USACE, 2003). Without barrier islands and wetlands, all of this infrastructure would be at greater risk when storms come ashore.

Fisheries and wildlife habitat. Coastal Louisiana has the largest expanse of coastal wetlands in the lower 48 states. This ecosystem is the nation's largest shrimp, oyster, and blue crab producer and provides 26% (by weight) of the commercial fish landings in the lower 48 states (US Department of Commerce 2005). In fact, Louisiana is second only to Alaska in annual volume of seafood landings, and three of the nation's top seafood

Each year, the Port of South Louisiana and the Port of New Orleans together account for $150 billion and 20% of the U.S. import/export cargo traffic. (Dept. of Commerce Service Assessment, 2005).

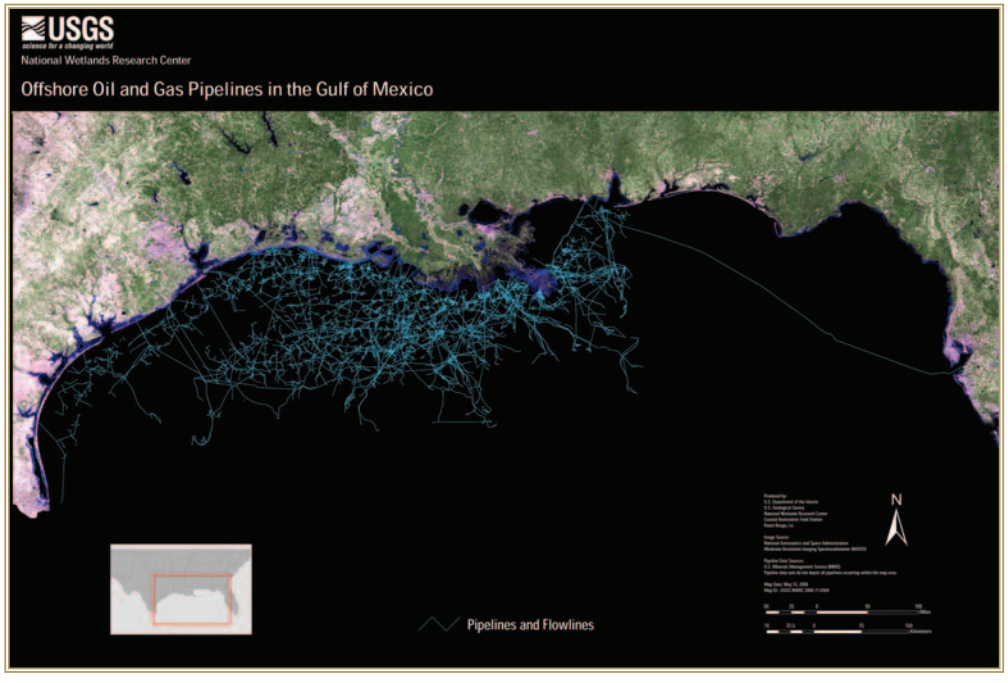


Figure 1. Map of offshore oil and gas pipelines in the Gulf of Mexico (courtesy of USGS).

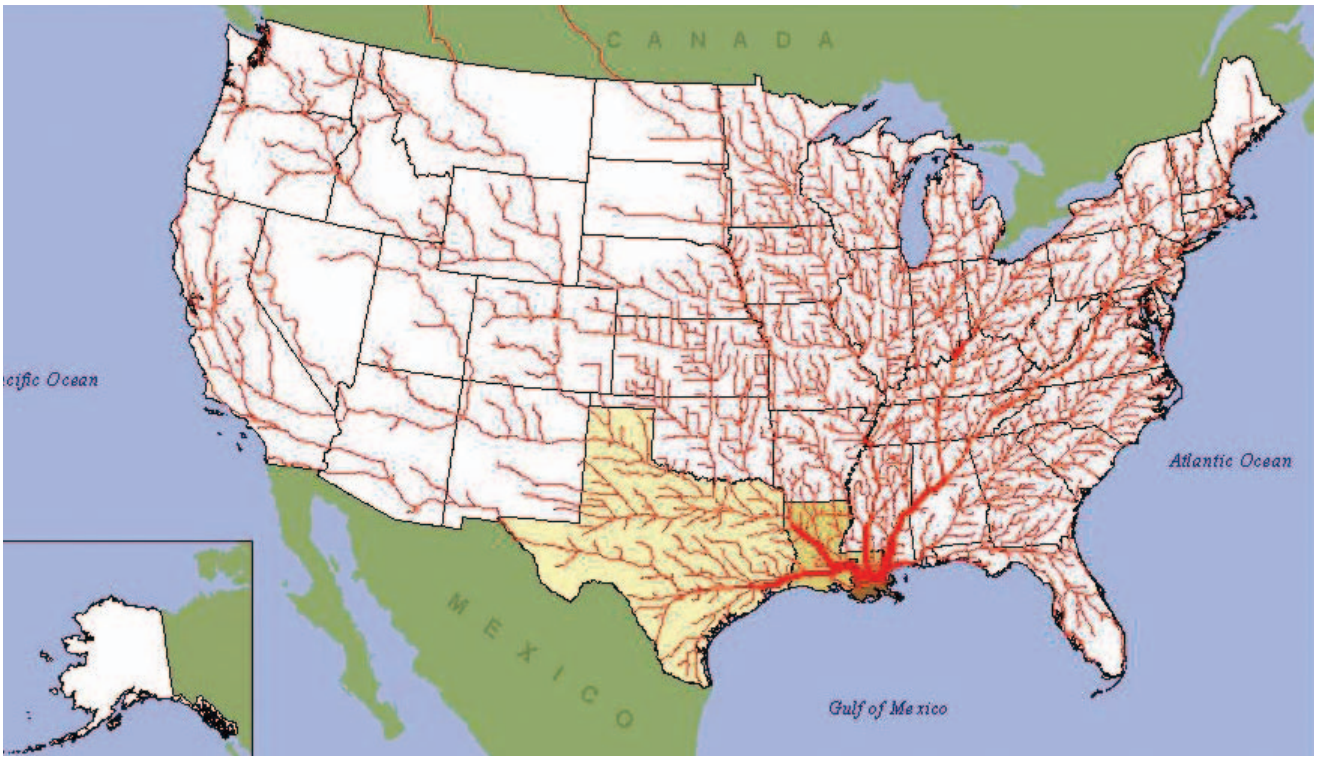


Figure 2: Louisiana's Mississippi River Ports – Inland movement of maritime cargo by truck. (courtesy FHWA)

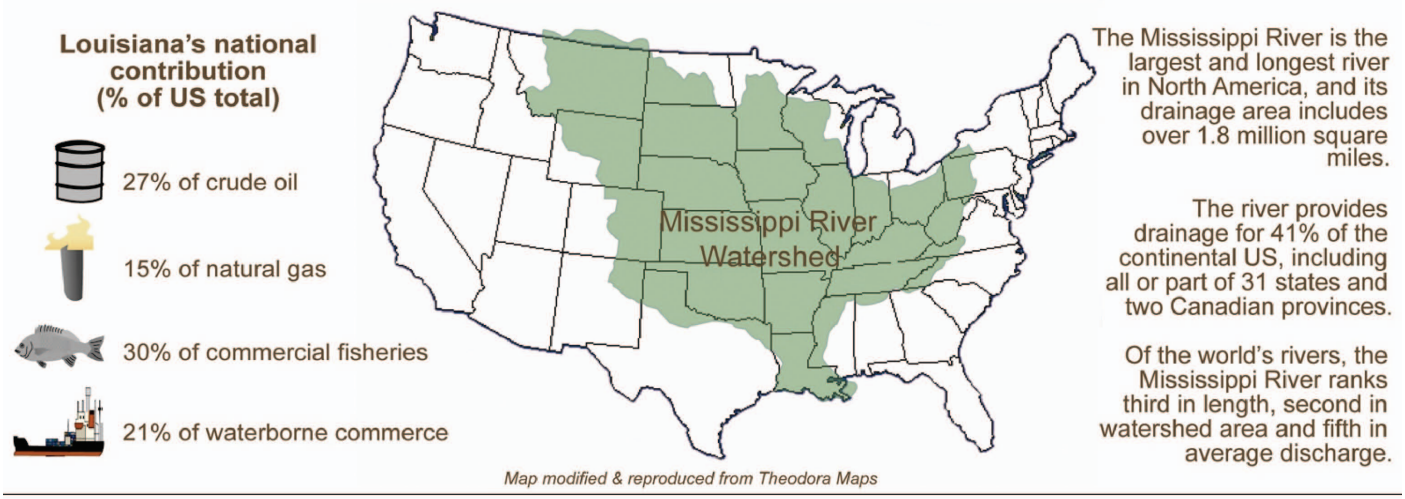


Figure 3: Louisiana's national and international significance.

Louisiana Black Bear crossing stream in South Louisiana.

ports by volume are in Louisiana (US Department of Commerce 2004, 2005). These resources are processed and shipped throughout the world, providing jobs for almost 30,000 Louisiana citizens as well as jobs in other states (LA Department of Wildlife and Fisheries, 2005).

The North American Flyway passes directly over south Louisiana, and more than five million migratory waterfowl spend the winter in Louisiana's marshes (LA Department of Wildlife and Fisheries, 2000). In addition, the coastal landscape provides stopover habitat for millions of neotropical migratory birds on their journeys across the Gulf of Mexico. Hundreds of fish and wildlife species, as well as the jobs and recreational opportunities associated with birding, hunting, fishing, and eco-tourism, all depend on the barrier islands and wetlands found in south Louisiana.

Shrimp boats docked after coming in from the Gulf.

Seventeen endangered or threatened species are found in south Louisiana, including the bald eagle, Gulf sturgeon, Louisiana black bear, and several species of sea turtles (USACE, 2004).

Water quality. When river water flows through them, wetlands filter nutrients from the water that would otherwise flow directly into the Gulf of Mexico. High concentrations of these nutrients in the northern Gulf of Mexico contribute to the growing problem of hypoxia, or low oxygen conditions, in offshore coastal waters. As increasing amounts of river water are diverted into marshes as part of restoration projects, these nutrients will help sustain wetland plants or be processed in the soil, rather than contributing to a nationally significant water quality problem (see Chapter 2).

Courtesy Bruce Schultz, LSU AgCenter

Cattle ranching has been a part of Vermilion Parish's history since the early 1800's.

Culture. People have lived in south Louisiana for over 12,000 years, using the abundance of the rivers and coast to extract resources and facilitate trade. When New Orleans was founded 300 years ago, it quickly became a center of international commerce, attracting people from around the world. These diverse peoples lived in proximity while retaining their own identities, a trend that defied typical melting pot dynamics and created a multi-faceted culture that endures today.

The Chitimacha people have lived on Louisiana's coast for at least 2,500 years and state as part of their beliefs, "We have always been here." The regard of land and family expressed by this sentiment is one that many residents of south Louisiana share. In fact, according to the 2000 Census, Louisiana has the highest percentage of native born residents (79.4%) of any state in the nation.

Port Fourchon currently services over 75% of the Gulf of Mexico deepwater oil production.

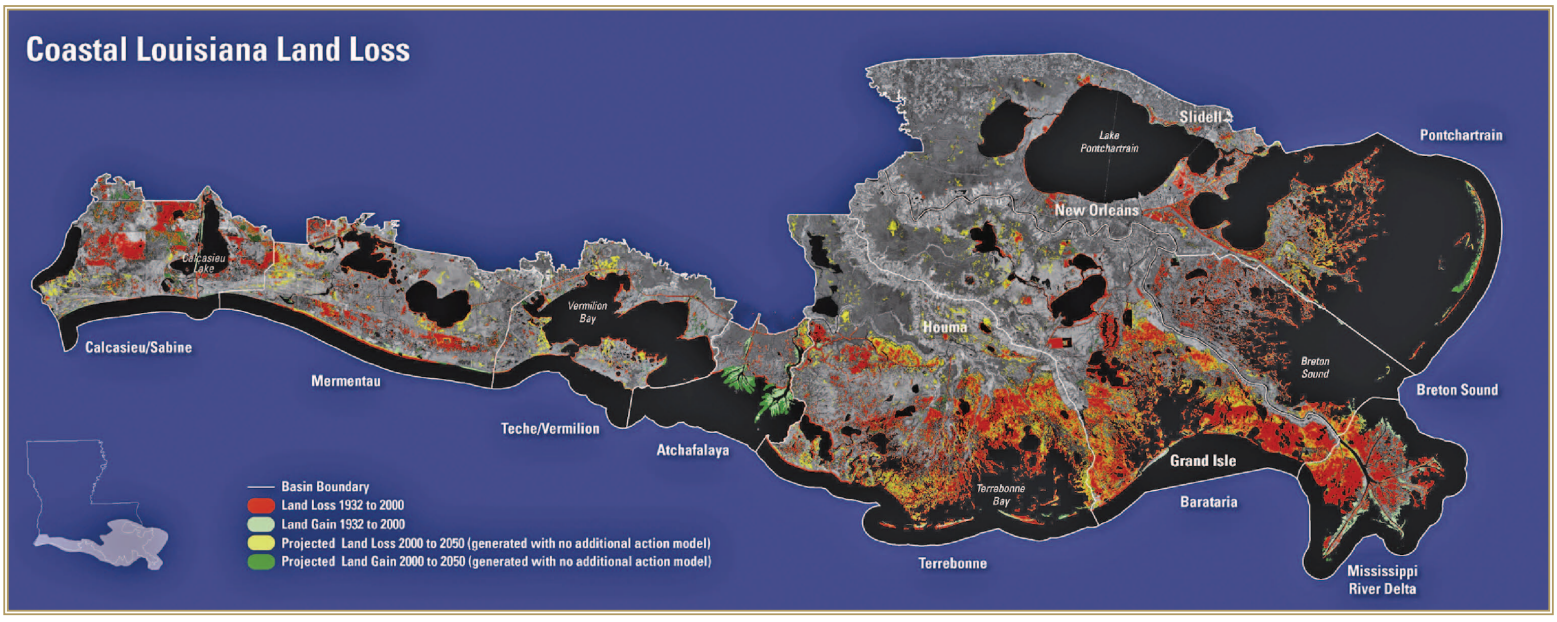
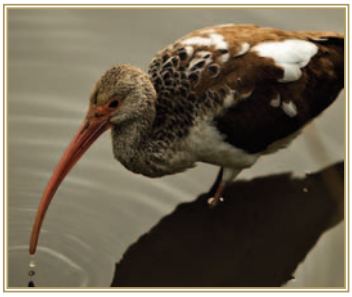


Figure 4: Land change in coastal Louisiana. Red and yellow indicate past and projected land loss; greens indicate past and projected land gain. Barras et al. 2003

Between 1932 & 2000, coastal Louisiana lost over 1,875 square miles of land, and scientists estimate that the state will lose an additional 513 square miles by 2050. Approximately 24 square miles of Louisiana land turn into open water each year, enough to endanger human communities and essential habitat (Barras et al., 2003).



Courtesy Scott Russell Photography

Whether or not these citizens are able to maintain their connection to the region depends on how quickly the state can find ways to rebuild wetlands and provide adequate storm protection.

Louisiana's working coast, America's Wetland, supports vital ecosystems, national energy security, a unique culture, and thousands of jobs. However, the region is changing before our eyes, threatening benefits we have relied upon for decades.

Losing Ground

Humans have altered Louisiana's coastal ecosystem for centuries, and these changes have allowed our communities and the nation to prosper. However, the unintended effects of these changes have now reached a critical mass that threatens not just the health of the natural systems but life in south Louisiana as we know it. Our challenge: to promote a sustainable coast that allows both human and natural communities to thrive over the long-term.

Until the late 19th Century, the Mississippi River's floods regularly spread water and sediment across southeast Louisiana, helping to expand the Delta Plain, replenishing swamps and marshes, and creating an ecosystem that endured for thousands of years. But in the last century, the river has been contained within channels. The river's water, sediment, and nutrients, all vital land building resources, are now funneled into the Gulf of Mexico. Because the wetlands do not receive the materials that allow them to regenerate, they become waterlogged, sink, and turn into open water. Rising sea level, regional subsidence, saltwater intrusion from man-made channels, and a host of other factors all increase stress upon an already burdened ecosystem.

The Chenier Plain in southwest Louisiana was built by the waxing and waning of the Mississippi River's influence in the area. Ridges composed of shells and sand lie along the Gulf shoreline and support maritime forests. The predominance of oak trees on these ridges gave the region its name; "chene" is the French word for oak. The Chenier Plain has its own set of unique land loss challenges, many of which have not been explored as fully as those in the Delta Plain. The Chenier Plain is also used differently than the delta; the population is dispersed throughout the inland area, and most of the land north of the coastal zone is used for agriculture. For these reasons, freshwater allocation among agriculture, municipal, industrial, and ecosystem demands is a major concern. Some citizens recall that after Hurricane Audrey's storm surge came inland in 1957, it was 10 years before farm production returned to pre-storm levels. Residents are now wondering how many years will pass before the soil has recovered from Hurricane Rita's surge.

Change	Benefits	Tradeoffs
Levees and other structures built to control the Mississippi River.	Provided flood protection as well as navigation, and expanded the land available for development in areas such as New Orleans.	Reduced the flow of water and sediment into deltaic wetlands and the Chenier Plain; thereby destabilizing coastal landscapes.
Canals and navigation channels dredged; rivers in the Chenier Plain straightened and deepened.	Allowed shipping as well as oil and gas production to flourish; provided for greater flood control; further established south Louisiana as an international center for trade and industry.	Changed the way water flows in the region, increasing saltwater intrusion, reducing retention of fresh water in the Chenier Plain, and accelerating land loss.
Forced drainage of wetlands.	Increased land available for development.	Promoted rapid sinking of land, and increased the number of people and assets at risk.

Courtesy Bruce Schultz / LSU AgCenter

Longshoremen loading rice onto a ship at the Port of Lake Charles.

Implications

If sustainability is not restored to the coastal ecosystem, land will continue to be lost at a rapid rate, and critical infrastructure will be damaged or destroyed. Pipelines, offshore support centers, and other facilities constructed for inland conditions will be subject to the open water of the Gulf of Mexico. Should these trends continue, the nation can expect disruptions in the delivery and pricing of crude oil and gas. As we saw after Hurricanes Katrina and Rita, these conditions may destabilize the nation's economy.

Shipping will be similarly affected. As wetlands become waterlogged and disappear, storm surges will batter south Louisiana's waterways and ports. Maintenance costs will increase, as will disruptions in commerce.

Natural resources will suffer as well. Fisheries and wildlife stocks, including threatened and endangered species, will decline as spawning, breeding, and foraging grounds are lost to the Gulf. Not only will consumers encounter rising prices and shortages of resources that are readily available today, but the nation will lose priceless habitat whose intrinsic value is recognized the world over.

The gradual loss of south Louisiana communities presents other costs. As repeated flooding makes living near the coast more difficult and people migrate inland, historic villages and towns that were originally located on high ground will be abandoned. Louisiana has already lived through the catastrophic scenario in which hurricanes claim over 1,400 lives and tens of billions of dollars worth of property. The everyday catastrophe of continued land loss further threatens the viability of coastal communities throughout south Louisiana.

When one considers the human cost, the risks to infrastructure, and the danger to wildlife and landscape, it is clear that we must take bold action. Significant upgrades to our hurricane protection systems are clearly in order, but levees alone cannot do the job. A sustainable coastal ecosystem will help storm protection projects diffuse flooding while safeguarding the infrastructure, fisheries, and communities that are integral to our state and national security. In addition, wiser land use practices must govern the way we live in this dynamic landscape if we are to create safe communities that thrive over the long-term.

Implementing this comprehensive solution will require one of the largest public works programs our nation has ever undertaken. And while Louisiana is willing to pay its fair share of the cost, federal funds will also be needed. Such assistance is not a handout, but rather an acknowledgement that south Louisiana's coast was altered so that it could better serve national energy and navigation interests. It only makes sense, therefore, that having benefited from Louisiana's geography and resources for over 200 years, the nation will invest in restoring the ecosystem and protecting the coast's defenses.

Dredged sediments being placed in open water to restore marsh that has been lost.

Chapter 2: Assumptions, Tradeoffs, and Challenges

Assumptions of the Master Plan

- The Master Plan is a living document that must be continually updated as we learn more about how to protect and restore Louisiana's coast.
- A healthy landscape is essential to achieving both a sustainable ecosystem and reliable flood protection.
- Change is inevitable whether or not we take action. Therefore, we must embrace actions that allow us to create a sustainable future.
- A "multiple lines of defense" strategy should guide flood protection decisions.

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Head of Passes – Looking south to the Gulf of Mexico from the mouth of the Mississippi River.

Plans that will affect the lives of millions of people, as this one will, are not designed in a vacuum. Not only have citizens and stakeholders taken part in all aspects of developing this document (see Chapter 3), but a variety of external mandates and constraints have also shaped the plan's development. For example, Act 8 requires that the Master Plan be comprehensive in scope—not simply tweaking existing ways of protecting, restoring, and managing the coast, but recommending large-scale solutions to problems that have not been solved by smaller, localized efforts. Other factors involve hard choices related to land use and fisheries. In addition, climate change and other technical issues pose complex challenges as we proceed. Because these external factors exert a strong influence, we must be clear about what they are and how they are affecting the direction and scope of the plan.

Basic Assumptions

As the Integrated Planning Team and its partners sought to balance the many factors involved, they relied upon four assumptions to guide their work.

First, the Master Plan only offers a snapshot of the current thinking about coastal protection and restoration. The planning team based its recommendations on ideas that have been widely circulated and discussed as part of Louisiana Coastal Area activities, previous hurricane protection initiatives, and other efforts. In this sense, the planning team did not start from scratch, but rather attempted to take well-established ideas about flood control and coastal restoration to a new level. At the same time, the planning team attempted to think outside of the box and identify areas, such as new levee technology, where innovation is needed. In these cases, the intent was to highlight key uncertainties and encourage engineers and scientists

to advance the state of the art. Because it is constrained by what we know today, this plan must be revised as we learn more. In other words, this version of the Master Plan is a first cut at what will be a living document that changes over time.

Second, a sustainable landscape is a prerequisite for storm protection and ecological restoration. This does not mean that we attempt to freeze south Louisiana into one configuration forever, which would be impossible given the inherently dynamic nature of the coast. It does mean that we stop the severe wetland loss that is changing our communities and ravaging the landscape. Without a sustainable landscape, it will be extremely difficult to maintain human communities, much less provide sustainable hurricane protection into the future.

A third assumption involves the inevitability of change. The system is changing now, changing so quickly in fact, that unless we take action soon the nation will lose one of its most ecologically productive and economically vital regions. At the same time, everything we do to fix the problem will also alter the ecosystem. The way water flows, the salinity of the water, how much sediment it contains—all of these characteristics will shift as we take action. Given that seemingly small alterations can have big long-term effects, those working on the coastal program must understand the impacts of proposed actions and make sure that all changes are accounted for and used to maximum advantage. Equally essential will be rigorous monitoring and assessment in order to integrate lessons learned into the program.

Fourth, plans for hurricane protection must rely on multiple lines of defense. This involves using natural features such as barrier islands, marshes, cheniers, and forested ridges to complement man-made structures such as highways, levees, and raised homes. Such an approach avoids reliance on single protection measures, which, if compromised, would leave vulnerable areas without recourse. Residents of coastal Louisiana have used a multiple lines of defense strategy for thousands of years, building homes and settlements on high ground that was protected by natural ridges, barrier islands, and more recently by levees. Using this strategy as part of a comprehensive protection and restoration program thus expands the scale of what is already a regional tradition. With this expanded scale come issues of coordination, given that protection and restoration measures must work in concert with each other and with local land use and zoning regulations.

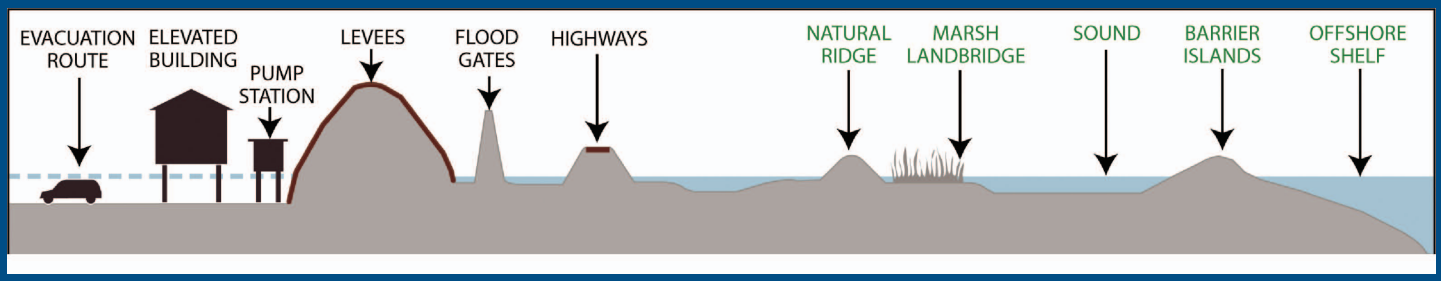


Figure 5: Multiple lines of defense concept (adapted from graphic produced by the Lake Pontchartrain Basin Foundation).

Citizens participated in the LRA Louisiana Speaks workshops held across coastal Louisiana. Input on alternative coastal plans helped shape the master plan's preliminary draft issued in November 2006.

Using the multiple lines of defense approach also requires that large tracts of coastal landscape remain sustainable. As a result, this approach presupposes a strong emphasis on ecosystem restoration and on the restoration of entire basins.

These concerns may sound relevant only to planners, scientists, or citizens living near the Gulf. But over time, changes made to the coast will affect all residents of Louisiana and the nation. Where seafood can be caught, where land can be developed, how high homes must be built, the cost of storm recovery, and the need for and availability of insurance—all of these factors and more will shift as we take action. In other words, protecting and restoring our coast is not a job reserved for specialists. This underscores the need for partnerships among all levels of government—federal, state, and local—as well as the public. Because everyone will be affected, everyone has a stake in helping to shape the program and put it into practice. This communal responsibility is most evident when we consider the hard decisions that must be made as we seek to create a sustainable coast.

Implications

Recognizing that changes are unavoidable if we want to continue living in south Louisiana, a spirit of common purpose is imperative. We are living in an historic moment, one that presents us with a stark choice: either make the bold and difficult decisions that will preserve our state's future, or cling to the status quo and allow coastal Louisiana and its communities to wash away before our eyes. There is no longer any time to waste. We must act now or forfeit the possibility that our children and grandchildren will be able to share the life, culture, and resources that are so precious to us and so important to the nation.

At the same time, we cannot simply expect hard working residents of the coast to make costly sacrifices without support. We must work together to manage the coming changes. Actions such as adjusting zoning laws to support flood control and land building, providing information well in advance of possible impacts, and exploring avenues for fair compensation to those who will be directly impacted are all ways to help our communities adjust to the new future we are creating for our state. The examples below offer more details about the issues at stake.

Fisheries. Because the Mississippi River is contained in levees and no longer overtops its banks in regular floods, the wetlands throughout the Deltaic Plain do not receive the sediment and water they need to regenerate. As a result, areas that were land are fast becoming open water. Reconnecting the river to the wetlands using large-scale river diversions will help the wetlands rebuild and reduce rates of land loss.

As sediment rich fresh water enters the system, areas that are suitable habitat for resources such as oysters and shrimp will shift. On the other hand, if we do nothing, land in southeast Louisiana will continue to fragment and sink, claiming habitats and increasing flood risks in inland areas. In the coming decades, and possibly within just 25 years, the habitat may deteriorate to the point that important fisheries are no longer viable. In a very real sense therefore, we must accept that fishing locations will need to change in order to provide a sustainable landscape over the long-term.

Protection Levels

Category 5? 100 Year Storm? 1% Annual Chance of Occurrence?

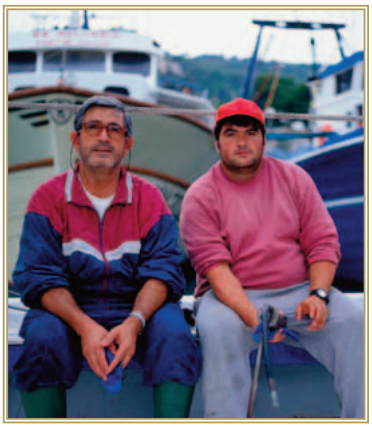
How are all these concepts related, and how can they be used to define expected levels of protection? "Category 5" is the highest level of the Saffir-Simpson hurricane index and indicates a hurricane with maximum sustained winds above 155 miles per hour. Since it is indexed solely to wind speeds, this does not accurately reflect the true nature and source of the primary threat to coastal Louisiana—the storm surge. The magnitude of the storm surge is not only related to wind speed, as any witness of the damage caused by Hurricane Katrina may attest. Hurricane Katrina, a Category 3 storm at landfall, had a much larger storm surge than Hurricane Camille, a Category 5 storm at landfall.

For this reason, we define levels of protection in this document in terms of the annual probability that a given storm surge will be experienced. Just as there is a 50% chance of getting "heads" each time a coin is flipped, a 1% storm surge actually refers to the probability of the surge occurring in any given year. Likewise, just as it is possible to flip "heads" several times in a row, it is possible to have a "1% storm surge" in consecutive years, or even more than once within the same year. However, over thousands of years, a "1% storm surge" should occur, on average, once in 100 years.

For example, analyses by the Corps of Engineers have concluded that a surge of the same magnitude as Hurricane Katrina's has a 0.25% chance of occurring in any given year, or an average of once in 400 years, in New Orleans. Similarly, a surge of the same magnitude as Hurricane Rita's has a 1.1% chance of occurring in any given year, or an average of once in 90 years, in New Orleans. Probabilities have not yet been computed for the extreme surges that Cameron Parish and other areas in western Louisiana experienced during Hurricane Rita.

Levees. Not every south Louisiana community that wants levee protection from the largest of storms will get it. In some areas of the coast it would be difficult if not impossible to build and maintain these types of structural protection systems. In addition, there are simply not enough federal or state dollars available to make this solution feasible. As a result, communities with dense concentrations of assets at risk, such as New Orleans, Houma, Lafayette, and Lake Charles, will receive a greater level of structural protection than will other communities. Wherever we build levees, we must make sure that the landward wetlands remain healthy and connected parts of the overall coastal ecosystem. This will require innovative engineering as well as constant monitoring and assessment. In addition, levees do not protect against wind damage, so south Louisiana residents will always need to take additional precautions to protect life and property.

Even though they will not all receive higher levees, other south Louisiana communities will not be left to fend for themselves. An analysis of the areas and assets at greatest risk has led the state to target, as a baseline, a coast-wide level of protection that would withstand a storm surge with a 1% chance of occurring in any given year. However, this goal will not be met immediately and not all of the needed protection will be provided by levees. Some will be provided by land building projects working in conjunction with storm protection measures, including improved evacuation routes that double as storm surge barriers, raising homes, and other non-structural construction methods. Certain aspects of this non-structural protection will be accomplished as citizens elevate homes and businesses and take other steps to protect their property. In all cases, the state's aim is to tailor the measures adopted to the specific needs of individual communities while basing all of our actions on sound science and engineering.



Land use. The centuries old tradition in south Louisiana was to live on high ground and leave wet areas wet. In recent decades, this tradition held less sway, as people began filling in and developing low-lying areas. We now know that allowing development in low-lying areas within hurricane protection systems not only increases a community's exposure to damage in the event of a levee failure, but also removes temporary water storage areas that would otherwise be able to accommodate water from rainfall. Such water storage areas can also limit damage if water overtops a levee. Maintaining this important buffer zone through smart growth is critical (see Chapter 3, "Minimizing Risk").

As these examples show, we must make important shifts in the way we use the coast, while at the same time reducing dislocation and economic hardship for south Louisiana citizens. These changes, as difficult as some of them will inevitably be, also present us with new opportunities—opportunities to fashion a coast that allows both human and natural systems to thrive over the long-term.

Climate Change

The most recent report of the Intergovernmental Panel on Climate Change (IPCC) makes clear that scientists are in all but unanimous agreement about the reality of global warming. There is, however, still debate about how the new trends are manifesting. Recent assessments show a significant increase in North Atlantic hurricane frequency since 1995 (Webster et al., 2005). This analysis also indicates an increase in the number and proportion of strongest category 4 and 5 hurricanes in the late 20th Century.

Sea level trends are more certain. Since the beginning of high-accuracy satellite altimetry in the early 1990s, tide gauges and altimeters have shown global mean sea level to be rising at a rate of just above 3 mm/year, compared to a rate of slightly less than 2 mm/year over the previous century (IPCC, 2007). The IPCC's 2007 report further estimates that in the next century, future sea level rise rates may be anywhere from 2 to 6 mm/year higher than present rates.

We are living in a historic moment, one that presents us with a stark choice: either make the bold and difficult decisions that will preserve our state's future, or cling to the status quo and allow coastal Louisiana and its communities to wash away before our eyes.

Coastal Louisiana will be among the first places in North America to feel the effects of global warming. Its low-lying coast will be directly impacted by rising sea level and more frequent hurricanes. Longer dry periods and more intense storms linked to global climate change would further stress some of the more highly managed wetland areas of coastal Louisiana. Larger storms will drive more salt water into fresh systems that are unable to flush it back out because of the lack of drainage, rainfall, and fresh water input from rivers. And the longer salt water remains in the wetland system, the harder it will be for the vegetation to recover after a storm surge.

Other changes, such as shifts in river flows, may be more subtle. Because the Mississippi River drains 40% of the continental U.S., climate changes upriver in the Mississippi Basin could change the timing and delivery of water and sediment to the Deltaic Plain. The link between Louisiana and the larger Mississippi Basin complicates predictions of the effects climate change will have on Louisiana's coastal zone.

Relative sea-level rise is the term used to express the combined effect of both subsidence and sea level rise. In Louisiana the problem of rising sea levels is compounded by the gradual sinking, or subsiding, of our coastal lands. When land surface in south Louisiana subsides, more sediment is needed to build and maintain wetlands and barrier islands to the original, higher elevation. And as the land surface moves down, so do the elevations of levees and flood protection structures, requiring more maintenance to keep them at their design heights. Fortunately, most projections of relative sea level rise show that this trend is within the wetlands' abilities to cope, especially if actions are taken to re-establish natural land-building processes (Day et al., 2007; Day et al., 1995; Reed, 2002; Scavia et al., 2002; Twilley et al., 2001).

Courtesy Scott Russell Photography

However, in the Chenier Plain, the climate change trends of rising sea level and higher temperatures are compounded by projected changes in rainfall that could lead to longer dry periods. These trends would exacerbate the region's already serious lack of freshwater resources. These kinds of yearly changes in the availability of fresh water and sediment, as well as other long-term trends that may be associated with climate change, reinforce the need for the Master Plan to explore aggressive ecosystem restoration measures. In addition, the actions of this comprehensive restoration and protection program must be effective under a range of climate change scenarios.

Other Technical Challenges

Years of research, modeling, and project construction have identified the fundamental protection and restoration options available, and it is now time to accelerate efforts to put this knowledge into practice. As we move closer to building larger and more comprehensive projects, our need for detailed information will increase. At the same time, Louisiana's coast is changing constantly, and data quickly become outdated as conditions shift, both because of factors intrinsic to coastal processes and because of the effects of global warming.

We will have to proceed in stages, field testing new concepts and learning as we go. There will inevitably be failures and course corrections, but experience gained will help us improve subsequent efforts. Restoring a dynamic landscape of this size has never before been attempted. Given the magnitude of the task at hand, a stepwise process based on sound science and engineering is the only way forward.

For example, rates of subsidence throughout south Louisiana vary, even within the same general areas, and the state and its federal partners are working now to gain a more accurate picture of regional subsidence rates. The causes of subsidence are also under study, as are the interrelationships between subsidence and sea level rise. Such complexities encourage scientific exploration, but they also make it difficult to issue hard and fast predictions about how a given area will be affected by protection and restoration measures.

All of these factors together create enormous science and engineering uncertainties that need to be resolved. Some of the immediate technical challenges facing the state are summarized below.

When hurricane protection systems are placed across estuarine basins, they change the way surface water flows.

What does the science and engineering tell us? When hurricane protection structures were placed across estuarine basins in the past, they altered patterns of marsh flooding. By keeping water from moving inland, such structures reduce high water levels. This in turn reduces the frequency with which new sediment and nutrients spread across the marsh surface. Placing appropriately sized river diversions landward of the hurricane protection structures may compensate for some of these effects. But hurricane protection structures may also hold water in, and so another challenge involves making sure that introduced water does not excessively flood inland wetlands or harm communities. If structures are overtopped with salt water, as occurred in the Chenier Plain during Hurricane Rita, the water must be removed quickly so that the wetlands can recover.

Urgent Call to Action: Develop Next Generation Hurricane Protection Systems

Future hurricane protection systems must rely on new technologies that bear little resemblance to traditional earthen levee embankments. Levees must be built with innovative designs, since we now recognize the importance of tidal exchange and natural hydrology in sustaining wetland ecosystems. The challenge is significant; some have equated it with rewriting the engineering textbooks for flood control. But this challenge must be met if over two million people are to continue living and working along Louisiana's coast. As researchers and planners explore new options, they should keep these principles in mind:

- Use innovative technology to build hurricane protection systems that minimize disruptions to tidal regimes and hydrology.
- Keep entire basin systems functional and sustainable by integrating landward diversions, drainage structures, and other environmental projects into hurricane protection systems.
- Ensure that strict land use controls are enforced. Wet areas must stay wet, and community growth must be managed to minimize impacts on wetlands and risks to life and property.

What questions remain? We need to know more about how diversions and levees can be designed to sustain the coastal landscape of Louisiana. How can we size and operate diversions to achieve sheet flow over the marsh? Can drainage structures placed in levees help move water out so that it is not held too long or at too high a level? If the levees are overtopped during a storm, will salt water have a long-term destructive impact?

What is the state doing to answer these questions? The state is working with federal partners to monitor the long-term recovery of wetland systems affected by Hurricanes Katrina and Rita. The data collected will offer valuable real-world information about the storms' effects.

The state is also working to improve existing models so it can more accurately assess how water moves throughout the region. Different regions of the coast have different modeling needs, and improving models for each is a long-term proposition. However, the state is funding research in partnership with the Corps and others to fill this need as quickly as possible. The state also needs to construct demonstration projects that

serve as clinical trials of large-scale measures to protect and restore the coast. With improved models in hand, along with the results of demonstration projects, we will be able to better evaluate the effects of various alternatives. As we learn more about how our concepts will work in practice, we will fine tune our restoration and protection plans.

Multiple river diversions operating simultaneously will freshen estuarine basins.

What does the science and engineering tell us? We know that more sediment is available in the Mississippi River at certain times of year, and that diversions can be turned on when sediment is plentiful and turned off when it is not. Using a diversion in this way is called pulsing. Coordinated pulsing of several diversions at once should allow us to take maximal advantage of available sediment, while moderating effects on habitat diversity. Although this technique helps protect and sustain existing wetlands, it could take decades for new land to be built with new diversions alone.

What questions remain? We need to know more about the effects of coordinated use of diversions. How much sediment can be moved? What effects will this have on habitat? Will we take too much water out of the Mississippi River and make it difficult to meet flood control, navigation, and water supply needs? Twenty-five years from now, after climate change has affected factors such as sea level rise, what kinds of diversions will we need to meet the sediment and water resource needs of the coast?

Courtesy Donn Young / Port of New Orleans

Stevedores offload containers from the MSC Carolina at the Port of New Orleans in 2007.

Wetland biologist retrieving data from an environmental water monitoring station.

What is the state doing to answer these questions? Improved modeling and observation of demonstration projects can help us plan for the best outcome. Existing river diversions, such as Caernarvon, are already giving us valuable insights into these issues. The state is also working to improve analytical tools, such as the CLEAR models that link water flow with ecosystem function. Although fisheries will change as diversions are brought on line, those affected will be a part of the planning process. National needs for flood control, navigation, and water supply will serve as constraints on planning. Any system we implement will be designed to make sure all needs are balanced.

We need sediment from rivers, navigation channels, and offshore sources to achieve our restoration goals.

What does the science and engineering tell us? Pumping sediments into an open water area can build marsh quickly. This may be a good option in areas like Lafourche and Terrebonne Parishes, which are further from the Mississipppi and Atchafalaya Rivers. However, wetlands that are built via pipeline may not function in the same ways as wetlands built through natural processes. In addition, the technique requires periodic mechanical renourishment or coupling with river diversions to assure sustainability. Finally, pumping in sediment is expensive, and doing it on a large-scale will require that the state make long-term investments in infrastructure.

What questions remain? How much sediment is available in and around the coast? How renewable are these sediments? Where exactly does it make sense to employ this kind of marsh restoration? How can we ensure that wetlands created using artificial means are sustainable?

Coastal Louisiana Ecosystem Assessment and Restoration (CLEAR) program personnel at Louisiana State University utilizing map application to analyze output from the landscape change module.

Department of Natural Resources training personnel in data collection protocols for the Coast-wide Reference Monitoring System (CRMS).

What is the state doing to answer these questions? The state is conducting an inventory of available sand resources. The Master Plan recommends that an inventory be conducted for all sediment resources, including the Mississippi River system. Such an inventory should determine just what is available and how renewable the sediment sources are. The state is also conducting pilot projects to compare the results when marsh is restored with dredged material and sustained with river diversions versus marsh restoration efforts that are built without diversions. The results of such experiments would help the state carefully select priority areas for action and improve the effectiveness of future projects.

High nutrient concentrations in the Mississippi River contribute to water quality problems in the Gulf of Mexico.

What does the science and engineering tell us? Diverting river water into coastal wetlands is one of the main tools for restoring the health of south Louisiana's deltaic wetlands. Such reintroductions could be designed and managed to mimic the spring floods that occurred naturally in such systems, providing a seasonal pulse of fresh water, sediments, and nutrients. Diversions could also be run during other times of the year to re-freshen the system. However, nitrogen loading from the Mississippi River watershed is a driver for the spread of hypoxia or low-oxygen levels in coastal waters. These nutrient levels threaten Louisiana's productive coastal fisheries and overall water quality.

Louisiana is a signatory to the Action Plan for Reducing, Controlling, and Mitigating Hypoxia in the Northern Gulf of Mexico (2001). The action plan stated that a 30% reduction of nitrate loading from the mouth of the river into the Gulf was necessary to reverse the growth of hypoxia in Louisiana's coastal waters. These reductions can be achieved through a wide suite of actions, including agricultural management practices, municipal and industrial source reductions, and watershed and wetland restoration.

What questions remain? We need to know more about the effects of diverting nutrient-laden river water into coastal wetlands, and we need to better understand the potential to overload these systems or generate negative conditions such as harmful algal blooms.

What is the state doing to answer these questions? The data from studies of the Caernarvon Diversion and a number of municipal wastewater to wetland projects indicate that we must avoid exceeding the nutrient assimilation rate of particular kinds of wetlands. Under optimum conditions, these case studies show that significant uptake of nitrogen can be achieved, especially in cypress swamps. There are many sources of nutrients in a drainage basin as large as that of the Mississippi River. Therefore, the solution to the problem must not be limited to coastal Louisiana. Reducing nutrient levels both within Louisiana and throughout the Mississippi River watershed can help alleviate concerns about the negative effects of potential nutrient overloading of coastal wetlands and also protect Louisiana's coastal fisheries by reducing hypoxia in the northern Gulf.

These and other issues will continue to be studied as the planning process moves forward. As we learn more, the plan will change to reflect new knowledge gained. The next chapter outlines a conceptual vision for creating a safe and sustainable south Louisiana.

© Bevil Knapp

Sand and silt mixed with water shoot onto the surface of Timbalier Island, a Terrebonne Parish barrier island, as bulldozers spread out the new material.

Chapter 3: The Master Plan

Principles Underlying the Plan

The planning team, working with citizens, scientists, engineers, and government partners, developed a set of overall program principles to guide their work. These principles deal with five major topics:

- integrating coastal protection and restoration to maximize sustainable, cost effective benefits
- involving all affected citizens and stakeholders in developing and implementing the plan
- regularly updating the plan to ensure that it continues to reflect conditions on the ground as well as the best available science and engineering
- handling constraints appropriately so that limits are respected while removing obstacles to progress
- ensuring a good fit between future land use decisions and the plan's recommendations

The full text of these principles is contained in Appendix A of the Master Plan, available online at www.louisianacoastalplanning.org.

This chapter presents the state's vision of the projects that must be undertaken to protect and restore Louisiana's coast. The projects themselves are briefly described, along with the context within which the state made its determinations.

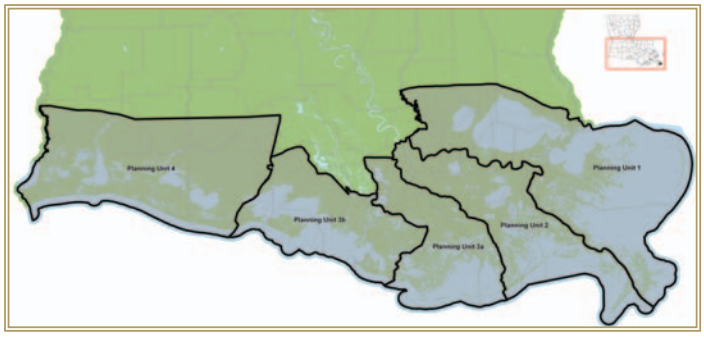
Framework of the Master Plan

The term "Louisiana coast" might sound like a reference to a homogeneous ecosystem. In reality, Louisiana's coastal region contains diverse landscapes, including forested wetlands, barrier islands, marsh, and ridges where humans have lived for centuries. In recognition of this diversity and building on analyses found in the Coast 2050 and Louisiana Coastal Area (LCA) studies, the planning team divided the coast into five distinct planning units. Within each planning unit, the plan offers a strategy for hurricane protection and coastal restoration.

The planning team used a 100-year horizon when assessing the coastal assets at risk as well as options for coastal protection and restoration. This was done to ensure that the plan and its projects would function as intended into the future, providing a sustainable coast for future generations.

The planning team was charged with developing a comprehensive plan that is as cost-effective as possible.

Figure 6: The Five Planning Units (Map)
Five separate planning units were considered for the Master Plan, each representing a distinct hydrologic area.



However, the team was not given a financial ceiling within which all of their recommended projects had to fit. As the plan is implemented in the coming years, the need for swift and effective action must be balanced against fiscal constraints.

Planning objectives. The planning team and its partners developed Coast-wide Planning Objectives that define what the Master Plan seeks to achieve as a whole.

Objective #1: Reduce economic losses from storm based flooding to residential, public, industrial, and commercial infrastructure, assuring that assets are protected, at a minimum, from a storm surge that has a 1% chance of occurring in any given year.

Courtesy Bruce Schultz, LSU AgCenter

Student participating in LSU AgCenter 4-H program to learn about the benefits of the coastal marsh and its ecosystem.

- This may be achieved by implementing plans, projects, policies, and programs intended to provide for hurricane protection and coastal conservation and restoration, including constructing levee and floodgate systems, enhancing natural landscape elements, and by elevating, flood proofing or relocating structures.

- Protection of resources of national and statewide significance will be a priority; including major oil and gas facilities and refineries, deep draft ports and waterways, military and military support facilities, the Gulf Intracoastal Waterway, interstate and other major highways, and historic sites.

- This objective explicitly deals with protection of assets. Effective evacuation procedures must be implemented.

Objective #2: Promote a sustainable coastal ecosystem by harnessing the processes of the natural system.

- A sustainable system is one characterized by high levels of productivity and resilience (the ability of a system to withstand naturally variable conditions and/or recover from disturbances).

- This may be achieved by providing for daily, seasonal, and episodic fluctuations in water levels and salinities, and/or reestablishing natural pathways of sediment movement and nutrient uptake.

- Appreciation of the dynamic nature of the coastal system must be integral to the planning and selection of preferred alternatives.

- Design, construction, and operation of new flood and storm protection measures should avoid or minimize effects that would reduce ecosystem resilience. Where practicable, disrupted hydrologic systems should be rehabilitated to re-establish sustainable processes.

- Project design should promote conditions that route riverine waters through estuarine basins and promote sheet flow over wetlands in order to maximize nutrient assimilation.

Objective #3: Provide habitats suitable to support an array of commercial and recreational activities coast-wide.

- As Louisiana's coastal ecosystem degrades, critical habitat that supports fish and wildlife species continues to be lost. Therefore, the plan will seek to increase the magnitude of suitable fish and wildlife habitats coast-wide.

- The plan will seek to ensure a continued diversity of fish and wildlife habitats coast-wide.

Objective #4: Sustain, to the extent practicable, the unique heritage of coastal Louisiana by protecting historic properties and traditional living cultures and their ties and relationships to the natural environment.

- Louisiana coastal communities are valuable. They are living stewards of the culture, history, land, and environmental resources of the coast for themselves, for the state, and for the nation.

- Sensitivity and fairness must be shown to those in the coastal communities whose homes, lands, livelihoods, and ways of life may be adversely affected by the implementation of any selected alternatives.

- Displacement and dislocation of resources, infrastructure, and possibly communities may be unavoidable under some scenarios. Because of the negative near-term effects some restoration projects may have on the sustainability of existing cultures, careful consideration of mitigation efforts on human disruption must be undertaken.

Process used to develop the plan. Over the last several decades, scientists and planners have done a great deal of work to advance our knowledge about hurricane protection and coastal restoration. The Master Plan planning process sought to integrate all of these efforts into a single vision for creating a sustainable coast, refining techniques, adding new concepts and eliminating outdated ideas as needed. In pursuit of this goal, the following six steps were used to develop the Master Plan. (For a discussion of the complete process, see Appendices B and H.)

Step 1: Specify problems and opportunities. The planning team and its partners outlined what we know about the problems facing coastal Louisiana and what we can do to address them. In order to articulate the plan's objectives, the team built on previous planning studies, research, and the principles and objectives of ongoing programs. Stakeholders were instrumental in outlining these foundation pieces of the Master Plan.

Step 2: Inventory and forecast conditions. The planning team assessed the levels of risk being experienced in coastal Louisiana's communities as well as the current state of the ecosystem.

In addition, the team and its partners projected how these risk levels would change in the future if we take no further action to correct the problems. This analysis provided a sound basis for articulating what the state and nation stand to lose if aggressive action is not taken.

Step 3: Formulate alternative plans. To accomplish this step, the planning team developed two alternative plans. This was done by combining the most promising project concepts into two different approaches for coastal protection and restoration. These alternative plans highlighted the tradeoffs inherent in varying courses of action. For example, the team was able to examine the differences in plans that provided maximum protection for everyone versus more strategic protection. The team also evaluated the difference in plans that relied on continued human intervention in building and sustaining the landscape (by, for example, marsh restoration using dredged sediment) versus a greater reliance on naturally sustaining the coast (by, for example, river diversions).

Step 4: Evaluate effects of alternative plans. The two plans were analyzed for their potential effects on communities and the ecosystem. In addition, the planning team discussed the plans in individual meetings with many stakeholders and in regional meetings convened by the Louisiana Recovery Authority's "Louisiana Speaks" initiative (see below).

Step 5: Compare alternative plans. When combined with stakeholder discussions of the advantages and disadvantages of each alternative plan, the technical analyses quickly pointed to the need to protect communities in proportion to the assets at risk, and to balance rapid land building through with long-term ecosystem sustainability. Plans that rely solely on either restoration or protection activities are not viable, as they do not adequately balance the four objectives.

Meeting of the Federal and State resource agencies and the Scientific and Engineering Review Team held October 2006. Shown is a breakout session focused on the Chenier Plain.

Step 6: Select a recommended plan. Using the analyses described above, the planning team compiled a Master Plan that recommends measures for protecting and restoring coastal Louisiana. The plan presents projects in varying degrees of detail, depending on the current level of knowledge. Some projects, such as the Lake Pontchartrain Barrier Plan and the Mississippi River Delta Management Plan, are conceptual at this point; much more planning and design must be performed before we build these projects. In such instances, the plan offers a menu of representative options now under consideration—with the understanding that the designs will continue to change as they are examined further. Other projects, such as Morganza to the Gulf, have been extensively studied and are ready for construction. In such cases, the plan is able to present more information. However, the plan remains a conceptual document whose contents will change over time as improved technical information is gathered.

Cattlemen join, rice, crawfish and alligator farmers to meet with the CPRA Integrated Planning Team members at a stakeholder meeting open to the public in Abbeville in August 2006.

Timeline: How the Master Plan was Developed

Act 8 Signed	Nov. 2005
Integrated Planning Team established	Feb. 2006
First plan formulation workshops held	May 2006
Plan formulation report completed	June 2006
Plan formulation report included in USACE report to Congress	July 2006
Six LA Recovery Authority Louisiana Speaks workshops held, providing input to Master Plan process	July-Aug. 2006
Over 50 stakeholder workshops and meetings held	July-Nov. 2006
Decision process workshop held with agency partners, science advisors, and NGOs	Sept. 2006
Second plan formulation workshops held	Oct. 2006
Preliminary Draft Master Plan presented for public review; 9 public meetings held	Nov.-Dec. 2006
Technical review panels meet and offer comments on Preliminary Draft Plan	Dec. 2006-Jan. 2007
Draft Master Plan presented for public review; 3 public hearings and 1 public meeting held	Feb.-March 2007
Technical review panels meet and offer comments on Draft Master Plan	March 2007
Final Master Plan submitted to legislature	April 2007

Engaging citizens, stakeholders, agency partners, and technical specialists. The planning team assembled an Interdisciplinary Technical Team made up of representatives from coastal parishes, levee districts, state and federal agencies (including the Corps of Engineers), nongovernmental organizations, and academia. This group reviewed the planning team's work and provided guidance and ideas during workshops held in May and October 2006. Between July 2006 and November 2006, the planning team also held dozens of meetings with stakeholder groups in order to learn which coastal protection measures and approaches were preferred. Details of these workshops and meetings can be found in Appendices B and H of this report available at: www.louisianacoastalplanning.org.

CPRA Integrated Planning Team members answer questions on coastal ecosystem restoration and hurricane protection issues at one of six LRA Louisiana Speaks workshops held in the summer of 2006.

In addition, members of the planning team along with the Coastal Louisiana Ecosystem Assessment and Restoration (CLEAR) Program provided the basic restoration and protection scenarios used by the Louisiana Recovery Authority's "Louisiana Speaks" workshops held in July and August 2006. These workshops helped citizens begin defining long-term sustainable visions for the communities of south Louisiana. Ideas shared at the workshops were factored into the planning team's deliberations in the fall of 2006.

A Preliminary Draft Master Plan was created in November 2006, and this draft was shared with the public at nine public meetings held coast-wide in November and December. The planning team also presented the Preliminary Draft Master Plan to two teams of scientists for review. One such team, the Science and Engineering Review Team (SERT), was convened specifically to provide comments on the planning effort. As a result of these outreach activities, the planning team received detailed comments from Louisiana residents, national environmental groups, local and state leaders, engineers, and scientists. Details of these meetings and comments received can be found in Appendix C of this report available at: www.louisianacoastalplanning.org.

All of these comments were integrated into a Draft Master Plan. This iteration of the plan was also presented to the public and scientific panels for review. Three public hearings and one public meeting were held in February and March 2007, and hundreds of citizens again provided feedback. A science and engineering review meeting was held in March 2007. The final Master Plan was produced based on comments received.

Technical Oversight Provided by Two Scientific Panels

A Science and Engineering Review Team made up of internationally known experts in coastal science and engineering reviewed the Master Plan drafts and provided extensive comments. Some members of this panel also attended early plan formulation workshops in the spring and fall of 2006. Membership on this team has expanded in response to new challenges, but as of March 2007, the team's members were as follows:

Gerry Galloway, University of Maryland
Robert Gilbert, University of Texas
Patrick Hesp, Louisiana State University
Shirley Laska, University of New Orleans
Doug Meffert, Tulane University
Irv Mendelssohn, Louisiana State University
Ehab Meselhe, University of Louisiana at Lafayette
Denise Reed, University of New Orleans
Harry Roberts, Louisiana State University
Lawrence Rozas, NOAA, National Marine Fisheries Service
Charles Simenstad, University of Washington
Fred Sklar, South Florida Water Management District
Robert Twilley, Louisiana State University

The Louisiana Coastal Area's Science Board also reviewed the draft Master Plans and process. The board's members include:

Don Boesch, University of Maryland
Conner Bailey, Auburn University
C. Ronnie Best, USGS
Stephen Brandt, NOAA
Robert Dean, University of Florida
William Dietrich, UC Berkeley
Joseph Fernando, Arizona State University
Peter Goodwin, University of Idaho
George Tanner, University of Florida
John Teal, Woods Hole Oceanographic Institution
John Wells, Virginia Institute of Marine Science

Analyses undertaken for this planning effort have shown that the measures outlined below can go a long way toward addressing Louisiana's coastal crisis. Recent modeling results indicate that if all of the Master Plan's restoration projects were aggressively implemented, Louisiana would be able to increase sustainability in significant portions of the coastal zone. These models also show that if the recommended hurricane protection projects were implemented, we may be able to reduce by 90% the potential coast-wide damages from storm surges with a 1% chance of occurring in any given year. Potential coast-wide damages from storm surges with a 0.2% annual chance of occurrence may be reduced by over 80% (see Appendices F and G). Ongoing analyses will help refine the levels of risk facing the coast, as well as recommended levels of protection.

The following sections present the plan's recommendations. Some projects can be constructed while the uncertainties outlined in Chapter 2 are being resolved. As that chapter made clear, we have much to learn about several of the projects proposed in the plan, especially those involving innovative technology. Policy and legislative issues will also influence what can be done. Chapter 4 offers recommendations for handling those uncertainties. To ensure that the plan stays current, the list of projects below will be reviewed and modified regularly in the coming years.

Robert Twilley, Ph.D., Louisiana State University, facilitates discussion at a Science and Engineering Review Team (SERT) meeting as Ehab Meselhe, Ph.D., P.E., University of Louisiana at Lafayette, examines mapping.

Restoring Sustainability to the Mississippi River Delta

As many scientists and policy makers have noted, creating a sustainable deltaic system requires that we reestablish the processes that originally created the landscape. We must reconnect the Mississippi River to the wetlands through diversions and restore flows of water through the wetlands so that the ecosystem can retain sediment and nutrients. Key landscape features, such as barrier shorelines and land bridges, may also need to be restored. Taken as a whole, the measures outlined below offer a framework for achieving these objectives.

Land building diversions. Historically in Louisiana, we managed the Mississippi River for navigation and flood control without understanding the consequences for the ecosystem. The approach outlined in this plan is intended to better balance all of the needs of the region. In order to create new land, science tells us that we must turn the river loose and let it resume doing what it did for thousands of years: spread water and sediment into fragmented marsh and shallow water to create new delta lobes and nourish existing wetlands. Commonly referred to as the Mississippi River Delta Management Plan, this concept involves building very large land-building diversions that will use the majority of the river's sediment and fresh water. This approach is the only way to sustain large areas of southeastern Louisiana.

We do not yet know the best way to accomplish such a major re-engineering of one of the world's great rivers. As a result, this concept must be planned in much greater detail before exact construction recommendations can be made. Some conceptual scenarios for these large diversions are depicted in lower Plaquemines Parish (see Figures 7 and 8). One scenario would place the diversions in the vicinity of Myrtle Grove on the west bank and Phoenix on the east bank. This was proposed by a Technical Group made up of 35 scientists from around the world who participated in the "Envisioning the Future of the Gulf Coast" Symposium in June 2006. Other scenarios have been proposed by stakeholders, including one that places the diversion further downriver in the vicinity of Boothville and Venice. Each option has different advantages and disadvantages, but the issues that must be weighed when determining the final locations include:

- maintaining reliable and safe deep-draft navigation of the river
- ensuring that large diversions do not undermine adjacent river levee sections or flood communities
- placing the diversion so that it builds and sustains the maximum amount of land within the estuarine basins
- taking stock of salinity shifts within basins and how they will affect fisheries and the people who rely on them

How these trade-offs are ultimately resolved will have huge implications for the people who live and work in this region. The good news is that we will be able to anticipate these effects and be proactive in managing them.

Mississippi River Delta Management: Issues to Consider

What does the project accomplish? This project will spur major wetland building in the Barataria-Breton Sound region, which will benefit the ecosystem and provide a degree of storm protection to nearby communities. In addition, introduced sediments and nutrients will increase the sustainability of existing wetlands. This area is important for a host of reasons, including its ability to protect the river communities and the greater New Orleans area from storm surge.

What are the issues involved? There has been much speculation about how the delta management plan would work in practice, but at this juncture, the state does not yet know where the diversions will be, how large they will be, how they will be operated, or how many there will be. Two possible alternative scenarios are shown in Figures 7 and 8, but these are only concepts, and they will undoubtedly change as further research and planning are conducted. We do know that such diversions will change the entire ecosystem and hydrology of the area. As a result, land building, salinities, commercial and recreational fisheries, flood control, and navigation will all need to be factored in to the overall delta management plan.

How can the issues be addressed? Because the delta management strategy is so conceptual at this point, trade-offs and the mechanisms to balance those trade-offs are difficult to define. The state must work with scientists, engineers, stakeholders, and the public to address these complex issues and ensure that our plans are based on the best possible information. Public participation in the planning effort can ensure that the necessary accommodations are made ahead of time to help affected citizens adjust.

What happens if we keep the status quo? Wetlands in the Barataria and Breton Sound Basins are already rapidly converting to water, and this process will continue, increasing the vulnerability of the river communities and the greater New Orleans area to storm damage. The navigation channel of the Mississippi River will also grow more difficult to maintain.

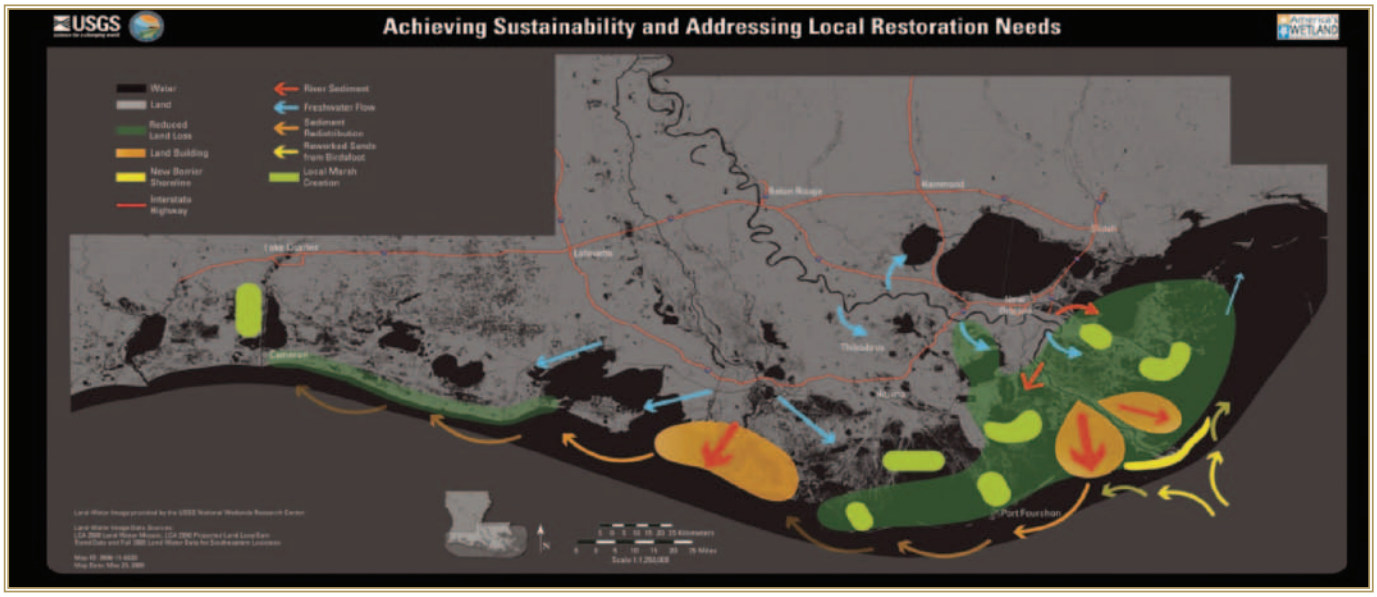


Figure 7: Mississippi River Delta Management—Concept #1
Vicinity of Myrtle Grove on the west bank and Phoenix on the east bank (Technical Group, 2006).

These locations would keep more sediment within the estuarine basins than Concept #2, thereby maximizing the land building capacity of the river. This location would also provide the greatest opportunity for nutrient assimilation by wetland plants, which could help reduce the hypoxia problem in Gulf waters. However, this scenario would create the greatest shift in salinities and would thus change the location of commercially important species. This would affect citizens whose incomes depend upon harvesting saltwater fisheries. There is also concern among residents that this scenario would effectively lead to the abandonment of the towns and commercially important facilities in the lower portion of Plaquemines Parish.

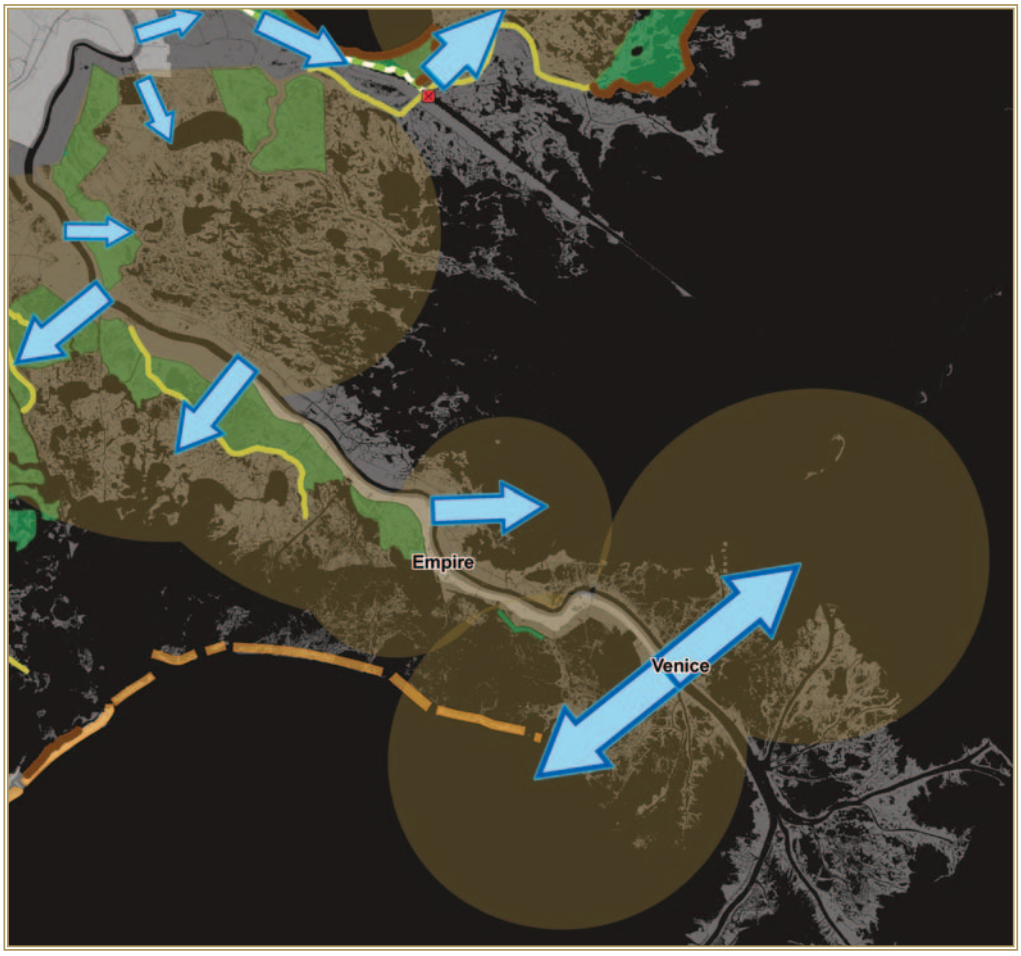


Figure 8: Mississippi River Delta Management—Concept #2, Diversions downriver.

Mississippi River Diversion	- Mississippi River Diversion at Violet - Modify Authorization of Caernarvon Diversion - Mississippi River Diversion at White Ditch - Mississippi River Diversion at Bayou Lamoque - Mississippi River Delta Management - Mississippi River Diversion at Myrtle Grove with Dedicated Dredging - Mississippi River Diversion at West Point a la Hache with Dedicated Dredging
Closure	- Close Mississippi River Gulf Outlet (MRGO) at Bayou La Loutre Ridge
Barrier Shoreline Restoration	- Barrier Shoreline Restoration: Barataria Basin
Marsh Restoration using Dredged Material	- Maintain and Restore the Breton Sound Marshes - Maintain and Restore Biloxi Landbridge and Barrier Reefs - Mississippi River Diversion at Myrtle Grove with Dedicated Dredging - Mississippi River Diversion at West Point a la Hache with Dedicated Dredging - Marsh Restoration using Dredged Material in Barataria Basin - Beneficial Use of Dredged Material
Shoreline Stabilization in Strategic Areas	- Maintain and Restore Biloxi Landbridge and Barrier Reefs - Maintain MRGO-Lake Borgne Landbridge - Grand Isle and Vicinity Shoreline Protection
Navigable Waterway Stabilization	- Mississippi River Gulf Outlet (MRGO) Shoreline Stabilization
Ridge Habitat Restoration	- Restore Bayou LaLoutre Ridge - Ridge Habitat Restoration in Barataria Basin

This scenario, which has been proposed by several stakeholders, would situate diversions near Boothville and Venice. These locations could minimize changes in basin salinities and fisheries. However, the tradeoff may be that sediments are not retained within the Barataria and Breton Sound Basins, which would diminish the land building capacity of the diversions. Further modeling will better describe the potential for this alternative to retain sediments within basins and increase sediment in the longshore current. Further analyses are also required to determine the potential impacts that this scenario would have on salinities and locations of commercially important species.

Notes on Land Sustaining Diversions

- We must ensure that existing diversions, such as Davis Pond and Caernarvon, are used to maximum extent practicable.
- We must operate all diversions as an interconnected system, not project by project.
- Land sustaining diversions are not designed to build land in large open water areas, but to maintain existing land.
- "CFS" stands for "cubic feet per second." This volume refers to the possible flow of water when the river is high; daily flows will fluctuate and may be much lower than this figure.

Land sustaining diversions. River diversions into existing wetland systems can prevent further land loss in targeted areas. The proposed diversions are envisioned as parts of an interconnected system that will be operated as a whole; individual projects will not be operated in isolation. Along these lines, it is important to review the operation of Davis Pond, Caernarvon, and other land sustaining diversions in the Delta Plain. It is a state priority to ensure that these diversions are providing maximal ecosystem restoration results in conjunction with other restoration measures.

One other important note about diversions: the amount of water that can flow through a diversion varies throughout the year, depending on how high the river level is. More water passes through the diversion when the river stage is high, and less water flows through when the river level is low. Diversions can also be controlled to balance the need to sustain land and the need to maximize the diversity of habitats in the landscape (see Chapter 2).

Diversions distribute sediments to areas of need, rather than allowing the sediments to be channeled out of the coastal ecosystem into offshore waters. Another important tool for "getting the sediment right" is distributing these lost sediments through dredging and pipeline conveyance to restore wetlands.

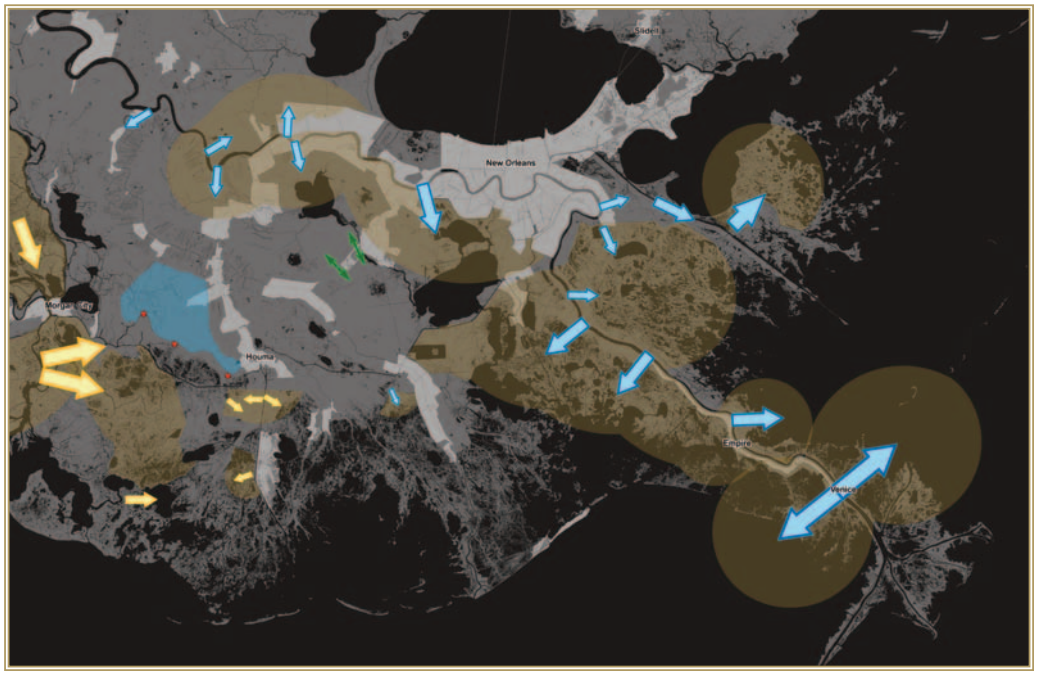
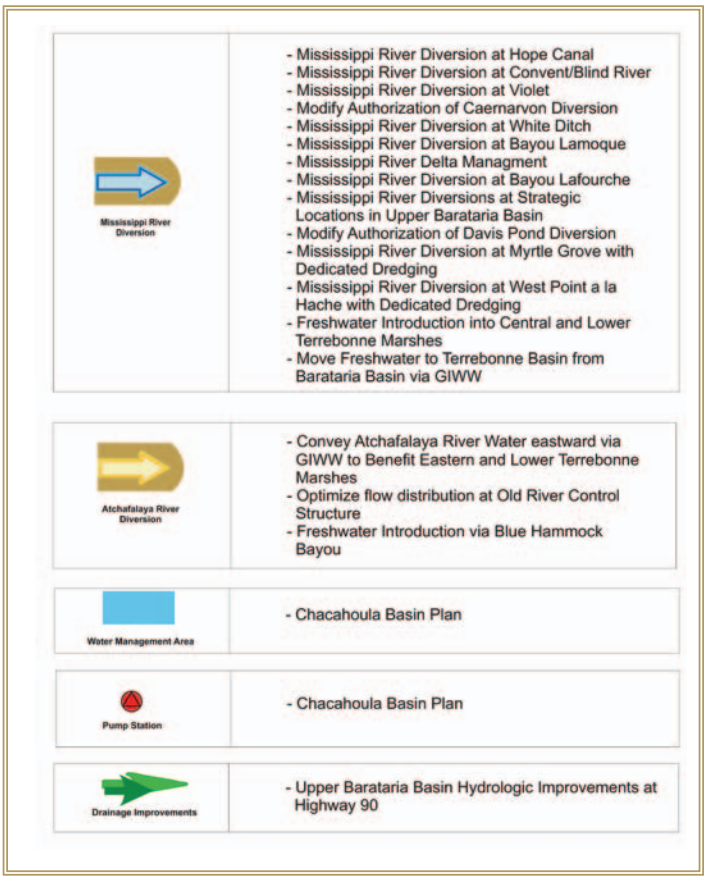


Figure 9: Restoring natural processes in the Delta Plain.

Marsh restoration using dredged material. One way to accelerate the benefits of diversions would be to mechanically restore lost marsh by pumping sediments via pipeline from the bed of the Mississippi River, offshore, or from navigation channels. Combining land sustaining diversions and this type of mechanical marsh restoration could rapidly convert open water to wetlands and help the restored marsh remain viable. Pipeline conveyance of sediment is seen as a particularly good option for areas like Myrtle Grove and West Point a la Hache, where the Master Plan recommends situating land sustaining diversions. Together, diversions and pipeline conveyance of sediment could rebuild marsh quickly in areas where land loss has reached crisis levels.

The Master Plan also proposes marsh restoration projects that are not directly associated with river diversions. Such projects are recommended in Lafourche and Terrebonne Parishes where it is difficult to access river water and sediment for natural land building. In areas like these, using dredged material may be the most viable technique for restoring lost wetlands. If the restored marsh cannot be sustained with river water, the areas will need periodic renourishment, and continued investment in pipeline infrastructure will be necessary.



"…management for sediment accumulation in wetlands is essential to their sustainability. This includes sediment delivered by tidal and meteorological processes as well as by river diversions and pipelines that retain sediments in the coastal system rather than discharging them into deep waters. 'Getting the sediment right' should be a central design principle of the plan."

Review comment by the LCA Science Board, March 2007

Navigation channels. Land sustaining diversions introduce river water and sediment directly into nearby wetlands. But large areas of Louisiana's coast that need water and sediment are not adjacent to major rivers. Theoretically, one way to reach these areas with river water is to reactivate old distributary channels such as Bayou Lafourche and Bayou Terrebonne. Practically speaking, however, dense development along these historic channels makes this option difficult, as it would compromise the integrity of adjacent communities. Another alternative would be to use existing navigation channels as "new distributaries" that could channel water to more remote areas of the coast.

For example, the Gulf Intracoastal Waterway and the Houma Navigation Canal could be used to move fresh water from the Atchafalaya River to marshes in Terrebonne Parish, where there are no other readily available sources of fresh water. Such use of navigation channels increases the potential influence of diversions. To take full advantage of this capacity, the Master Plan suggests stabilizing the banks of navigation channels to prevent them from enlarging further and merging with larger waterbodies. The plan's recommendations for the Mississippi River Gulf Outlet reflect both this stabilization component and the use of the channel to direct fresh water and sediment into nearby marshes (see below).

Barrier shoreline restoration. Barrier shoreline restoration is recommended in the Terrebonne and Barataria Basins because these ecologically important habitats are close enough to marsh and human settlements to diffuse wave energy and storm surge. These areas also provide habitat for migratory birds and threatened and endangered species.

The Chandeleur Islands are a separate case. Analyses indicate that these islands are too far from the mainland to provide significant storm protection function for Louisiana. However, the Chandeleurs represent valuable habitat. The U.S. Department of Interior is evaluating the restoration needs of the Breton Sound National Wildlife Refuge, which includes the Chandeleur Islands. The state will help to define this plan and will evaluate how best to implement the plan once it has been completed.

Ridge habitat restoration. Ridges are natural elevated features that were created by bayous or former distributaries of the Mississippi River. Ridges support woody vegetation that cannot survive at the lower elevations of surrounding wetlands. Such vegetation provides habitat for a variety of

wildlife species, including many threatened neotropical migrant birds. Ridges can also deflect storm surge, particularly during lower energy winter and tropical storms.

Shoreline stabilization. The plan recommends the stabilization of selected shorelines near critical land masses and marsh fringes near flood protection works. Typical stabilization measures include rip-rap or some combination of marsh restoration and rip-rap. In areas with relatively firm soils and low wave energy, marsh terracing projects offer a more natural buffer for eroding shorelines. Other innovative possibilities could involve constructing a living oyster reef that would reduce wave energy in front of a shoreline. Securing these areas will help preserve the boundaries of waterbodies and protect areas such as the Biloxi Marshes, the bay side of Grand Isle, and the Jefferson Parish levee system.

A dredge sprays sediment onto the marsh surface nourishing vegetation.

The Mississippi River Gulf Outlet

The Mississippi River Gulf Outlet (MRGO) was constructed to provide a shorter deep-draft maritime traffic route from the Gulf of Mexico to the Port of New Orleans. However, even before the channel was opened in 1965, citizens and scientists raised concerns about its potential to harm the ecosystem and increase storm damages. The Master Plan calls for the immediate closure of the MRGO to deep draft navigation. Components of the plan include:

- Immediately construct a closure dam at Bayou LaLoutre that will restore the integrity of the Bayou LaLoutre ridge. This will affect both the shallow-draft and deep-draft navigation industries, and a comprehensive closure plan should include mechanisms to mitigate the economic consequences for users that rely on the channel. However, these considerations should not in any way delay the channel's immediate closure. In addition, actions must be taken to avoid increased erosion in nearby waterways should shallow draft and recreational traffic circumvent the closure structure.

- Ensure that the channel remains isolated from Lake Borgne so that the channel may convey fresh water from the Mississippi River to the Biloxi Marshes and other areas of St. Bernard Parish. Without such a freshwater conduit, these marshes will not receive wetland building fresh water and sediment.

- Restore wetlands and swamps in the Central Wetlands and Golden Triangle areas.

- Integrate this MRGO closure plan with overall hurricane protection plans for the New Orleans metropolitan area.

Courtesy U.S. Army Corps of Engineers

The MRGO Closure Plan: Issues to Consider

What does the project accomplish? It will form a barrier that slows incoming storm surge and halts saltwater intrusion. It will also provide a channel for distributing badly needed fresh water and sediment into nearby marshes.

What are the issues involved? When the closure dam is in place, the channel will no longer be used for deep draft navigation, and an alternate route for the Gulf Intracoastal Waterway will be lost. The public is concerned that navigation considerations may slow down closure of the channel.

How can the issues be addressed? The first priority must be to close the MRGO with an appropriately designed closure dam. At the same time, the maritime industry is an economic driver in coastal Louisiana, and the effects of the channel's closure must be mitigated. Buy-outs and relocations of affected deep-draft industries may be useful, and the Inner Harbor Navigation Canal (IHNC) lock should be replaced, as this aging structure is a vital component of the Gulf Intracoastal Waterway. However, local residents and others are concerned that the construction and maintenance of the IHNC project will harm communities already hit hard by the hurricanes of 2005. The Corps is currently reevaluating the IHNC replacement project's environmental impact statement to determine how to better address citizen concerns. Regardless of how the lock issue is resolved, the MRGO should be closed immediately.

What happens if we keep the status quo? The MRGO channel will continue to widen, and the area's wetlands will continue to deteriorate. Loss of wetlands also increases the storm surge risk for nearby communities.

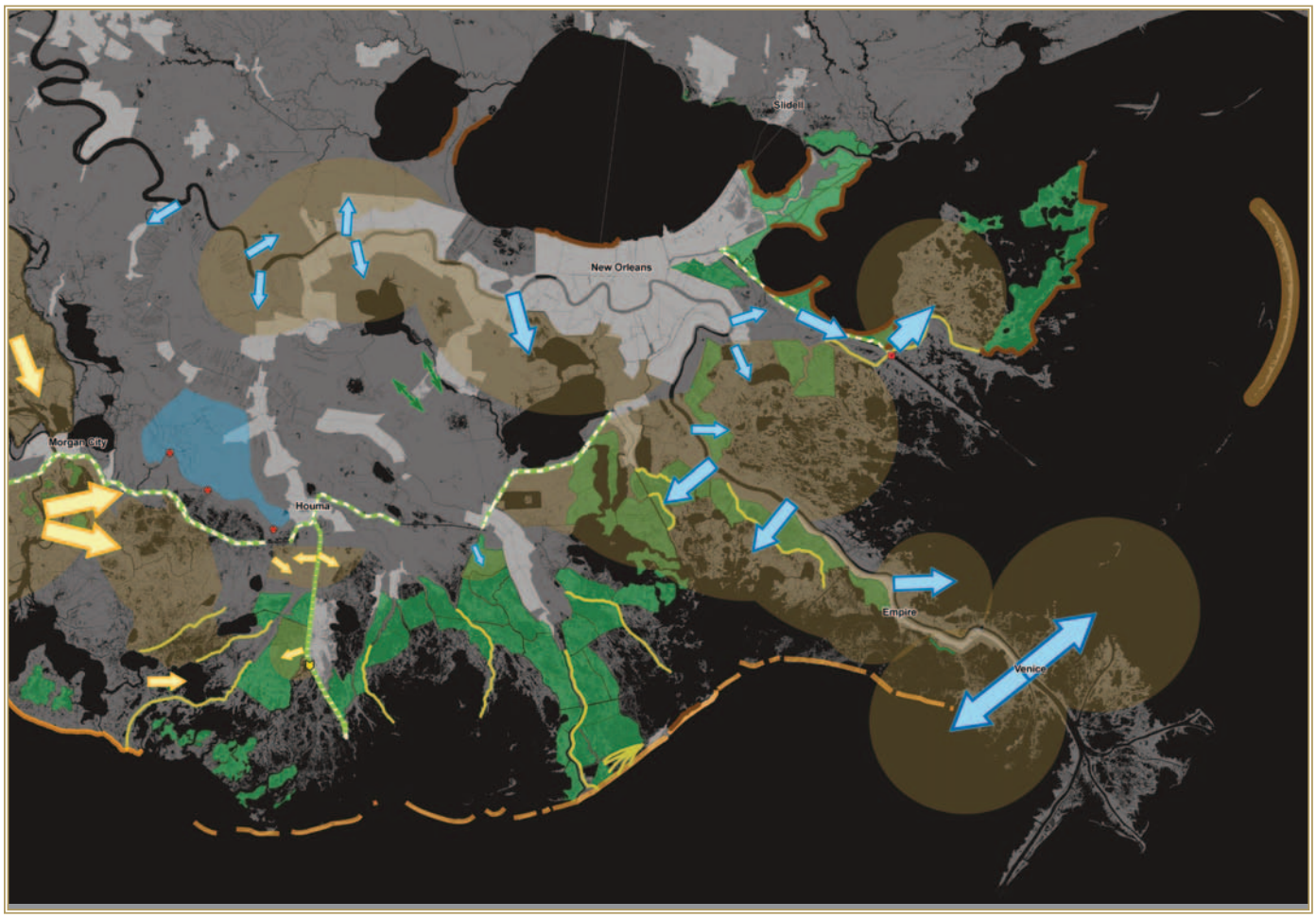


Figure 10: Restoring and maintaining critical landscape features.

Pump Station	- Chacahoula Basin Plan
Closure	- Close Mississippi River Gulf Outlet (MRGO) at Bayou La Loutre Ridge
Drainage Improvements	- Upper Barataria Basin Hydrologic Improvements at Highway 90
Barrier Shoreline Restoration	- Barrier Shoreline Restoration: Chandeleur Islands - Barrier Shoreline Restoration: Barataria Basin - Barrier Shoreline Restoration: Terrebonne Basin - Barrier Shoreline Restoration: Point Au Fer Island
Marsh Restoration using Dredged Material	- Maintain and Restore the Breton Sound Marshes - Maintain and Restore Biloxi Landbridge and Barrier Reefs - St. Tammany Marsh Restoration - Central Wetlands Restoration - Marsh Restoration using Dredged Material at Golden Triangle - East Orleans Landbridge Restoration - Marsh Restoration using Dredged Material in Barataria Basin - Mississippi River Diversion at Myrtle Grove with Dedicated Dredging - Mississippi River Diversion at Point a la Hache with Dedicated Dredging - Marsh Restoration in Terrebonne Basin - Marsh Restoration at Point Au Fer Island - Maintain Landbridge between Caillou Lake and Gulf of Mexico - Beneficial use of Dredged Material
Shoreline Stabilization in Strategic Areas	- East Orleans Landbridge Restoration - Shoreline Protection on South Shore of Lake Pontchartrain - Maintain and Restore Biloxi Landbridge and Barrier Reefs - Maintain MRGO-Lake Borgne Landbridge - Shoreline Stabilization on Maurepas Landbridge - Grand Isle and Vicinity Protection and Shoreline Stabilization
Navigable Waterway Stabilization	- Mississippi River Gulf Outlet (MRGO) Shoreline Stabilization - Bankline Protection for Gulf Intracoastal Waterway (GIWW) - Bankline Protection for Houma Navigation Canal (HNC)
Ridge Habitat Restoration	- Restore Bayou LaLoutre Ridge - Ridge Habitat Restoration in Barataria Basin - Ridge Habitat Restoration in the Terrebonne Basin

Restoring Sustainability to the Atchafalaya River Delta and Chenier Plain

The Atchafalaya River Delta is the only region of coastal Louisiana that is building land naturally, and the Master Plan seeks to take maximum advantage of this resource. Further west in the Chenier Plain, navigation channels and canals have allowed salt water to penetrate inland. This salt water is destroying fragile marsh and impinging on freshwater lakes. Fresh water needed for agriculture is increasingly compromised, a trend that endangers the region's tradition of rice, cattle, and crawfish farming. Groundwater supplies are also being affected as aquifers become saltier. These surface and groundwater resources may cease to provide adequate water for drinking and farming if action is not taken to correct the problem.

In order to fine tune the measures proposed for the Chenier Plain, we must augment our knowledge of how water and sediment enters and flows through the region. Much of this information will be provided by the Chenier Plain Freshwater and Sediment Management and Reallocation planning effort, which is being conducted through the Louisiana Coastal Area Ecosystem Restoration Program.

Managing water and sediment. In order to reduce the impacts of periodic saltwater intrusion, the plan suggests managing river and surface freshwater supplies to allow better maintenance of water sources throughout the year. Such management will also permit the delivery of fresh water to areas that may be exposed to saltwater stress.

Navigation channels. As in the Mississippi River Delta, navigation channels provide opportunities to distribute fresh water from the Atchafalaya River. For example, the GIWW could be used as a conduit to move the river's water to the west where it is badly needed.

Manage inflow of water from uplands. The plan recommends that drainage be wisely managed in the Mermentau Basin. Such management would ensure that fresh water is available for ecosystem and agriculture needs, but that communities are not placed at greater risk of flooding.

Courtesy Bruce Schultz/LSU AgCenter (Hurricane Rita 2005)

Along the coast between Abbeville and the Texas state line, residents' livelihoods are centered on oil and gas, fishing, ecotourism, rice and crawfish farming, and cattle ranching.

Maintain basin integrity of freshwater reservoirs. Inland lakes and freshwater marshes are at continued risk from encroaching salt water. Part of the challenge involves stopping the flow of salt water from Vermilion Bay into inland navigation and irrigation canals. To address this problem, the Master Plan suggests that the banks of selected navigation channels may need to be shored up. This will help prevent further wetland losses and will maintain the channels' capacities to move fresh water and sediment into the system. The plan also recommends fortifying and maintaining spoil banks along the GIWW and Freshwater Bayou Canal to provide another line of storm surge protection.

A second step will involve raising and maintaining critical highways in selected locations so that they can provide three functions: serve as reliable roads before and after emergencies, help maintain the integrity of the Mermentau Lakes Freshwater Basin, and reduce storm surges into interior wetlands. Based on the results of current surge modeling, the plan recommends that sections of LA Highways 82 and 27 be armored and maintained to a height of at least 10 feet where needed (see below "Raising Highways in the Chenier Plain: Issues to Consider.") Highways located on or at the base of cheniers already meet the intent of this criterion and will not need to be raised.

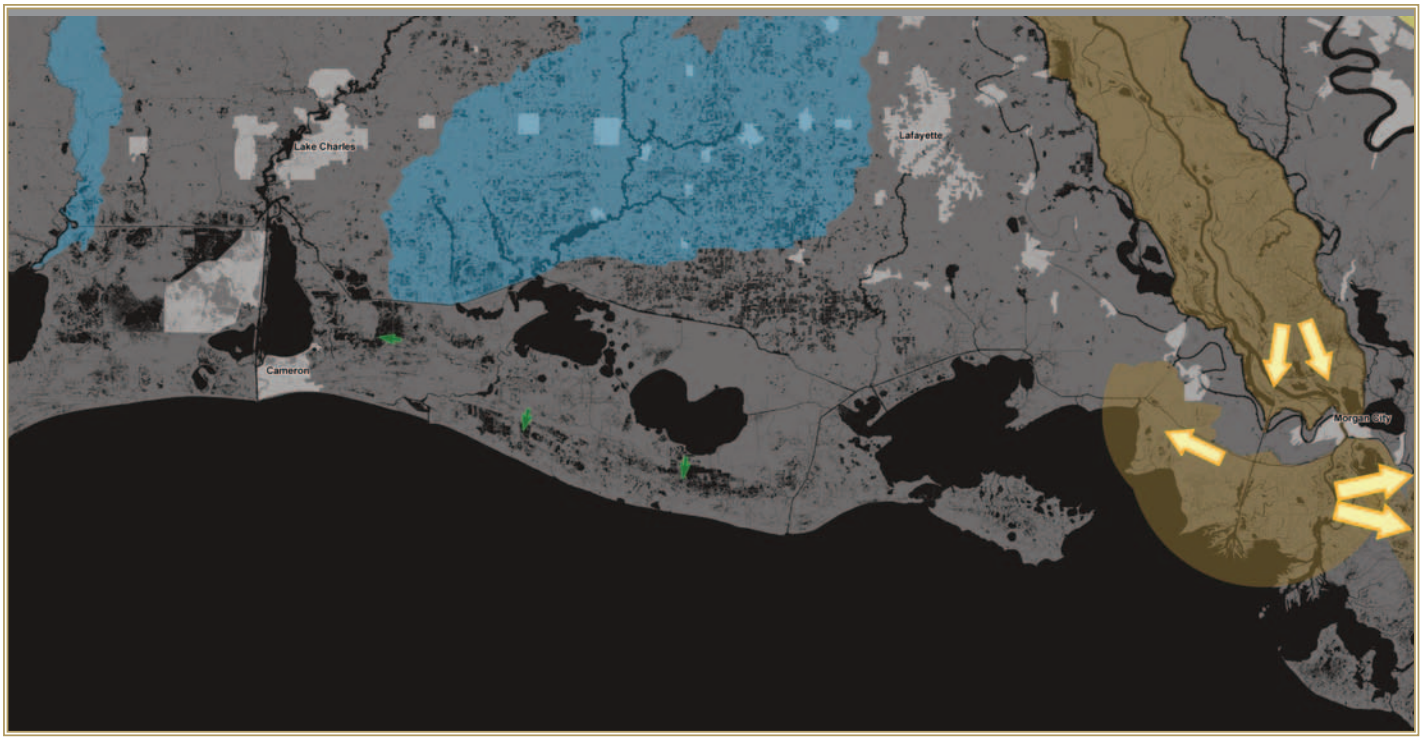


Figure 11: Restoring natural processes in the Atchafalaya River Delta and Chenier Plain.

Atchafalaya River Diversion	- Convey Atchafalaya River Water Eastward via GIWW to benefit Eastern and Lower Terrebonne Marshes - Convey Atchafalaya River Water Westward via GIWW - Freshwater Introduction into Central and Lower Terrebonne Marshes - Increase Sediment Transport Down Wax Lake Outlet - Optimize Flow Distribution at Old River Control Structure
Water Management Area	- Chenier Plain Freshwater and Sediment Managment and Reallocation - Mermentau Basin Watershed Management Plan to Retain Freshwater Resources - Sabine Basin Watershed Managment:
Drainage Improvements	- Hydrologic Improvements in Mermentau Basin at Highways 82 and 27

Courtesy Bruce Schultz/LSU AgCenter

Planting marsh grass to stabilize ICWW shoreline

Managing Freshwater in the Mermentau Basin: Issues to Consider

What does the project accomplish? It will allow continued management of the system and keep fresh water available for users, such as rice, cattle, and crawfish farmers.

What are the issues involved? Managing the basin will require cooperation among the many residents involved. This is particularly true north of the basin where reservoirs for freshwater storage may need to be created, and where the paths of some river channels may need to be restored to more meandering configurations. These options may slow the speed with which water drains from northern communities. At the same time, climate change-induced shifts in rainfall patterns may intensify the problem of salinization and make resolution of these water management challenges more crucial than ever.

How can the issues be addressed? All affected citizens need fresh water and therefore have a direct incentive to use their resources wisely for the advantage of the entire region. There are many tools available for achieving this goal. For example, initiatives such as the Wetlands Reserve Program offer options for compensating landowners who opt to convert farmland to wetlands. Farmers may also take advantage of newly designed and more efficient irrigation systems that reduce water use.

What happens if we keep the status quo? The basin will become saltier, and saltwater intrusion will contaminate soil. Irrigation water from surface systems will become saltier and unusable for agriculture. Increased reliance on groundwater may in turn increase subsidence and salinization of aquifers.

Salinity control in deep draft navigation channels. It is also necessary to control salt water at its source by placing salinity barriers at deep draft shipping channels. Safe and efficient navigation must be maintained when implementing these projects. The barriers would be operated periodically to manage saltwater intrusion events. They may also provide additional storm protection benefits. For example, a saltwater intrusion barrier in the Calcasieu Ship Channel at Cameron could work in conjunction with raised highways to restore the integrity of the chenier systems. Today in the Calcasieu-Sabine Basin, landowners intensively manage and partition their holdings to address salinity problems. The proposed barriers in navigation channels would give these landowners the opportunity to work within a regional framework, instead of having to rely solely on their own individual efforts. Increasing the connectedness of the system in this way will also promote a more productive and resilient ecosystem and should increase fisheries' yields.

Marsh restoration using dredged material. There are no major rivers in the Chenier Plain that can be diverted to create substantial areas of new land. In many cases, therefore, beneficial use of material from maintenance dredging of existing navigation channels represents the best way to restore lost wetlands. This is a particularly viable strategy in areas near the Calcasieu Ship Channel and the Atchafalaya River Navigation Channel. In other areas, material dredged and transported from offshore could be used to recreate lost marsh.

Barrier shoreline restoration. Restoring the barrier shorelines of the Chenier Plain in areas of severe shoreline retreat will be accomplished using a combination of two methods: sand placement and use of hard structures, such as offshore segmented breakwaters. Properly combining these two techniques can slow shoreline retreat rates and allow for tidal exchange between the Gulf of Mexico and the interior marsh. These methods will help ensure that the shoreline maintains its integrity and continues buffering wave energy to protect interior marshes.

Shoreline stabilization. The plan recommends stabilizing key areas along the Chenier Plain's bay and lake shorelines that, if breached, would have catastrophic results for the landscape. By preventing enlargement of lakes and bays, stabilization will also protect surrounding marsh, cheniers, and coastal prairie from wave induced erosion.

Restoring the barrier shorelines of the Chenier Plain in areas of severe shoreline retreat will be accomplished using a combination of two methods: sand placement and use of hard structures, such as offshore segmented breakwaters.

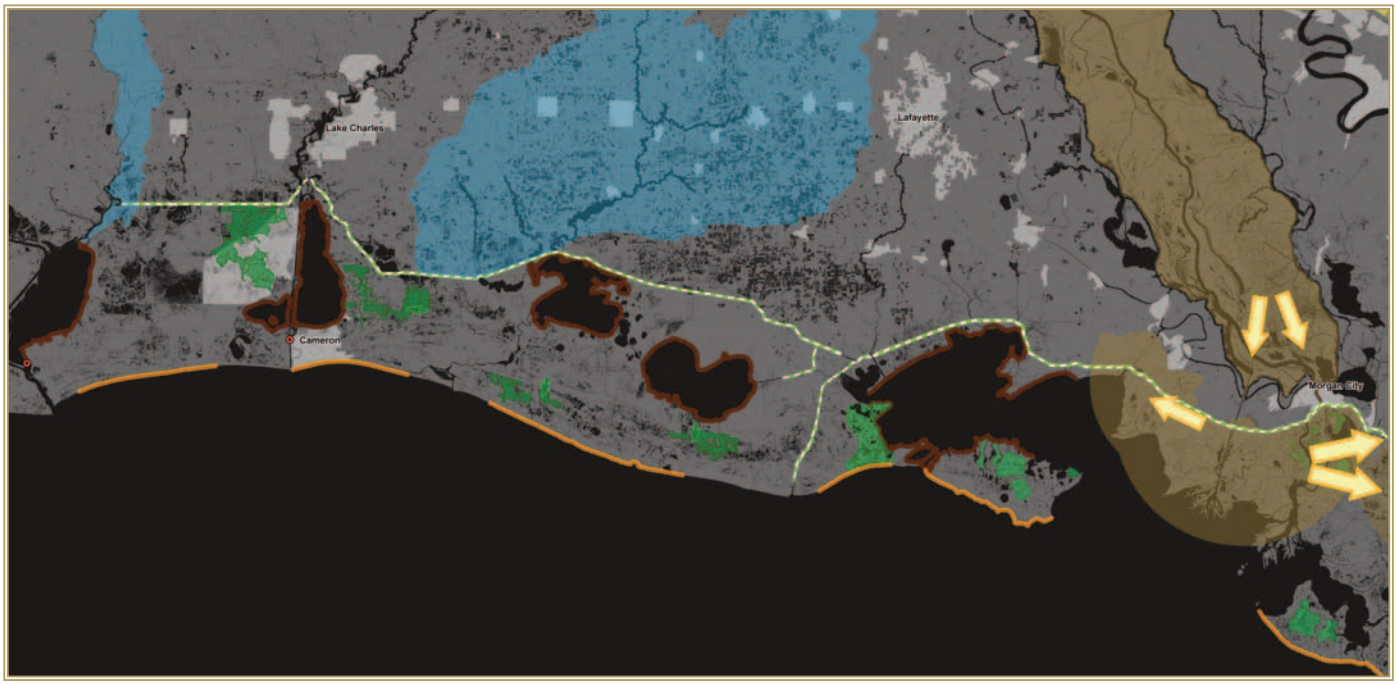


Figure 12: Restoring and maintaining critical landscape features.

Atchafalaya River Diversion	- Convey Atchafalaya River Water Eastward via GIWW to Benefit Eastern and Lower Terrebonne Marshes - Convey Atchafalaya River Water Westward via GIWW - Freshwater Introduction into Central and Lower Terrebonne Marshes - Increase Sediment Transport Down Wax Lake Outlet - Optimize Flow Distribution at Old River Control Structure
Water Management Area	- Chenier Plain Freshwater and Sediment Managment and Reallocation - Mermentau Basin Watershed Management Plan to Retain Freshwater Resources - Sabine Basin Watershed Managment
Salinity Control Structure	- Salinity Control Structure at Calcasieu Pass - Salinity Control Structure at Sabine Pass
Drainage Improvements	- Hydrologic Improvements in Mermentau Basin at Highways 82 and 27
Barrier Shoreline Restoration	- Barrier Shoreline Restoration: Point au Fer Island - Barrier Shoreline Restoration: Freshwater Bayou to South Point/Marsh Island - Barrier Shoreline Restoration: Sabine River to Calcasieu River - Barrier Shoreline Restoration: Calcasieu River to Freshwater Bayou
Marsh Restoration using Dredged Material	- Marsh Restoration using Dredged Material at Point au Fer - Marsh Restoration using Dredged Material at Marsh Island - Marsh Restoration using Dredged Material at Weeks Bay - Raynie Marsh Restoration - Marsh Restoration using Dredged Material South of Highway 82 - Beneficial Use of Dredged Material from Calcasieu Ship Channel - Beneficial Use of Dredged Material
Shoreline Stabilization in Strategic Areas	- Southwest Pass Shoreline Stabilization - Stabilize Shoreline of Vermilion, East and West Cote Blanche Bays - Stabilize Grand Lake Shoreline - Stabilize White Lake Shoreline - Stabilize Calcasieu Lake Shoreline - Stabilize Sabine Lake Shoreline
Navigable Waterway Stabilization	- Bankline Stabilization of Freshwater Bayou from Belle Isle Bayou to Freshwater Bayou Canal Lock - Fortify Spoil Banks of GIWW and Freshwater Bayou - Bankline Protection for Gulf Intracoastal Waterway (GIWW) - Bankline Stabilization of Freshwater Bayou - Fortify Spoil Banks of GIWW and Freshwater Bayou

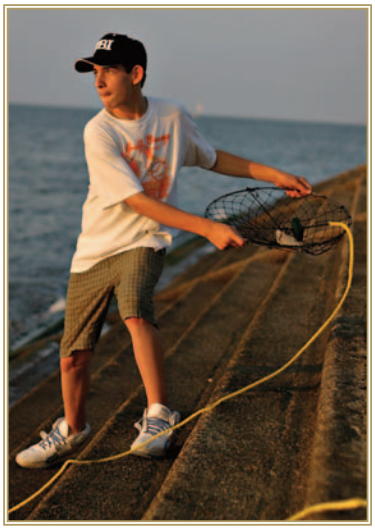
Hurricane Protection

As Hurricanes Katrina and Rita taught us, the residents of south Louisiana need storm protection. Storm surge and economic appraisals have determined that the areas in south Louisiana at risk from a storm surge with a 1% chance of occurring in any given year include 430,000 residences. Possible economic consequences for this level of flooding could top $34 billion. Areas at risk from a storm surge with a greater than 0.2% chance of occurring in any given year include over 870,000 residences. Possible economic consequences for this level of flooding could top $157 billion (see Appendix F).

These figures reflect south Louisiana's geography. Communities situated in the delta plain of the Mississippi, one of the world's major rivers, are at greater risk from flooding than most other places in the U.S. But many of these communities are also integral to the delivery of essential services to the nation, and some, like New Orleans, are unique cultural centers known the world over. These communities could not exist without levees. In recognition of the need for structural protection, hurricane protection structures are recommended in high risk areas that must be protected in order to avoid severe consequences for the state and nation.

However, there is concern that building levees across swamp and marsh can stop the flow of water, leading to further wetland loss and creating impoundments that flood communities. Finding the right mix of options requires that we keep the needs of the entire system in mind.

Consider the entire system. Hurricane protection systems must be built and maintained so that the ecosystem remains dynamic and functional. Water, sediment, and nutrients must be delivered to the wetlands, and overall hydrology must be improved by minimizing impediments to water flow. We must also ensure that protection and restoration actions do not induce flooding in low-lying communities. For example, once a hurricane protection system is built, water flow through wetlands that are landward of these structures must be maintained, and even enhanced where necessary, to maintain water and sediment exchange.



Courtesy Scott Russell Photography

How Communities Can Minimize Their Flooding Risk

- Use smart growth; prohibit development in wetland areas and require buffer zones near levees.
- Communities should strictly enforce National Flood Insurance Program regulations and use appropriate building regulations.
- Consider compartmentalization plans (the Dutch "compartmentation" concept) to contain flooding if levees fail.

In addition, such protection structures should be sited so that they are not exposed to open Gulf conditions. Hurricane protection systems built landward of wetlands are more resilient than stand alone structures because the adjacent marsh and swamp help buffer storm surge and wave energy. An aggressive restoration program, therefore, will protect hurricane protection structures and enhance the protection they offer.

Use non-structural solutions to minimize risks. Hurricane protection systems and restored wetlands cannot eliminate all flooding risks, whether from storm surges, rivers, or rainfall. In addition, wind damage is always a risk for hurricane-prone regions. For these reasons, storm related risks will remain facts of life in south Louisiana, regardless of how many protection structures are built and wetlands are restored. The non-structural solutions described below offer tools that communities can use now to reduce these risks. These solutions should be implemented in all areas of south Louisiana, regardless of whether protection systems are planned or in place.

Smart growth. Wetland areas inside the hurricane protection system need to remain intact and undeveloped. The most state of the art hurricane protection system can actually increase the assets at risk if it encourages development in wetlands or areas near the levee footprint. Such action would not only be risky from a safety and economic standpoint, but it would also degrade wetlands and eliminate interior flood storage capacity. Once a national and state commitment to building a levee is made, local governments must enforce appropriate land use and zoning regulations to ensure that the system, once built, contributes to the long-term sustainability of the region.

Flood insurance. According to FEMA, a home has a 26% chance of being damaged by a flood during the course of a 30 year mortgage, compared to a 9% chance of damage from fire (www.floodsmart.gov/floodsmart/pages/statistics). And because of its low lying topography, Louisiana has the highest rate of repetitive flood losses in the nation. Given the base risk, all residents of coastal Louisiana should purchase flood insurance, even if they live inside a hurricane protection system. Public education about flood risks and the need for insurance is available through the Community Rating System Program.

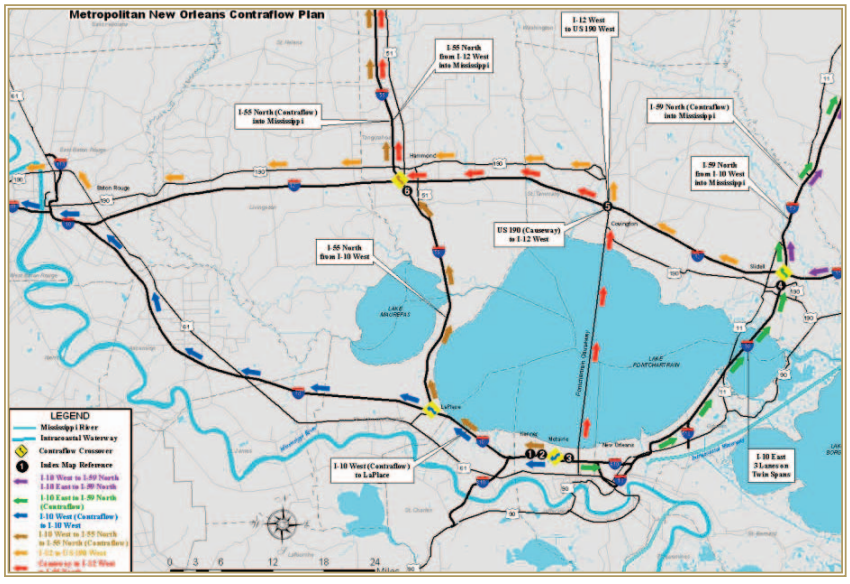
Besides helping residents of coastal Louisiana stay out of harm's way, non-structural measures can reduce insurance costs. For example, the National Flood Insurance Program's Community Rating System lowers flood insurance premiums up to 45% for residents of communities that adopt flood preparedness measures, from floodplain management and buy-out programs to drainage system maintenance. The Community Rating System gives a substantial incentive to communities that zone floodplains with low density uses (Activity 430LZ Low Density Zoning, CRS Coordinator's Manual).

Elevating and retrofitting structures. Residents of south Louisiana must now meet improved building standards to protect against wind damage, and FEMA is formulating guidelines regarding the heights to which homes must be raised in order to avoid damage from storm surge. Hazard mitigation funds are available to citizens through their local parish Emergency Preparedness Offices. These funds can be used to elevate, retrofit, or buy out homes that have suffered damage from flooding (see www.FEMA.gov/fima/hmgp). Adoption of these kinds of measures has the added benefit of lowering flood insurance premiums for homeowners as well as reducing storm damages (FEMA Louisiana Floodplain Management Desk Reference, p. 17-2).

Building codes. In 2007 the state enacted the Louisiana State Uniform Construction Code. This new building code adopted provisions from national and international codes and was designed to ensure that new construction could better withstand hurricane winds. When used in concert with structural elevation, the code will result in substantially safer buildings. The law applies state-wide, with special provisions for areas at particular risk from high winds. All communities must stringently enforce the new code.

FEMA-approved hazard mitigation plans. All 64 Louisiana parishes plus an additional 14 communities received funds from FEMA to develop hazard mitigation plans. Sixty-nine plans have been completed to date. Hurricanes and storms were the main hazards addressed in the plans, which made recommendations for retrofitting critical facilities to make them more disaster resistant. These plans augment the state's own hazard mitigation plan, authorized in April 2005, which spells out priorities for safeguarding critical facilities. The state's plan also emphasizes non-structural measures such as buy-out and elevation recommendations.

Evacuation routes. We need to make sure that evacuation routes are raised where necessary and adequately armored so that residents may safely evacuate and return after a storm passes. The Department of Transportation and Development is working with the Louisiana State Police and the Governor's Office of Homeland Security and Emergency Preparedness to continually improve emergency plans for hurricane evacuation.



Compartmentalization. The plan recommends that metropolitan areas consider a compartmentalization system, similar to the one described for New Orleans by the Bring New Orleans Back Commission. This idea, which is based on the Dutch "compartmentation" concept, goes one step beyond establishing primary lines of defense against storm surge by creating contingencies in the event that some element of the flood protection system is compromised. Just as water-tight compartments enable cruise ships to stay afloat if the outer hull is breached, creating inner protection zones that are hydrologically disconnected from each other can stop a levee failure from inundating an entire metropolitan area. Such a plan must be developed in conjunction with local drainage and land use plans.

Focused structural solutions. Restoration and non-structural measures can reduce the risk from storm surge. But in most areas, the risk of storm surge flooding will remain unacceptably high, even after restoration and non-structural measures are factored in. To more fully protect these high risk areas, hurricane protection structures are recommended in order to provide more protection.

The planning team evaluated several factors as they defined targeted hurricane protection levels for the Master Plan. Population concentrations; the number of strategic assets such as ports, refineries, military installations and others; and the expected costs for disaster response and recovery in specific areas were all considered. The landscape's elevation in relation to the height of potential storm surges was used to compute potential damages that could result from two scenarios: a storm surge that has a 1% chance of occurring in any given year and a storm surge that has a 0.2% chance of occurring in any given year. These storm scenarios were used when the Master Plan was prepared because they incorporated the best and most up-to-date data available. Ongoing storm surge, economic, environmental, and engineering analyses will ultimately define the standard of protection that is achievable for all of Louisiana's coastal communities.

From these analyses, the major urban areas of the coast—the New Orleans, Houma, Lafayette, and Lake Charles regions—were identified

as needing very high levels of protection. Scaling the level of protection to the population and infrastructure at risk is the best way to build a case for the major federal appropriations that will be needed to get the job done. Smaller communities will not necessarily receive this higher level of protection. In many of these smaller communities, non-structural solutions (see above) will reduce risks more quickly than will massive building projects that take years to be constructed.

After decades of building hurricane protection systems, we have learned many things about the best ways to proceed. Among these considerations are the following:

- Barriers redirect but do not eliminate storm surges, so the system must build in room for storm surge water to move.
- Controlled overtopping can be acceptable if there is sufficient space for temporary water storage within the protection system. All structures must be designed so that they do not breach if over topped.
- Hurricane protection systems must be designed to ensure that interior flooding will not occur from extreme rainfall events. Drainage structures, pumps, and adequate internal water storage capacity are necessary.
- Longer, more complex protection systems must include more structures to accommodate drainage, pipelines, railroad crossings, and other features. This increases the potential locations of structural failures.
- By changing the way water flows, structures can help divert water and sediment to critically stressed wetland areas.
- Unarmored earthen levees are not appropriate in all environments. Innovative technologies are needed if hurricane protection structures are placed in high energy environments or in areas with extremely soft soils. This will increase reliability and reduce maintenance requirements.

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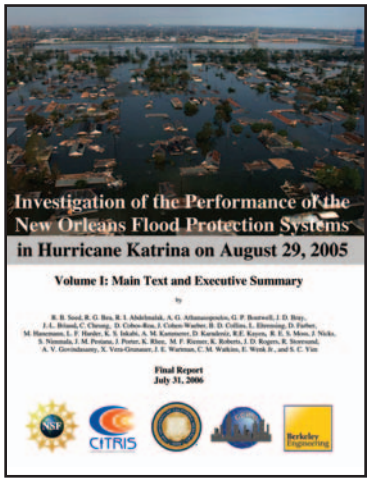
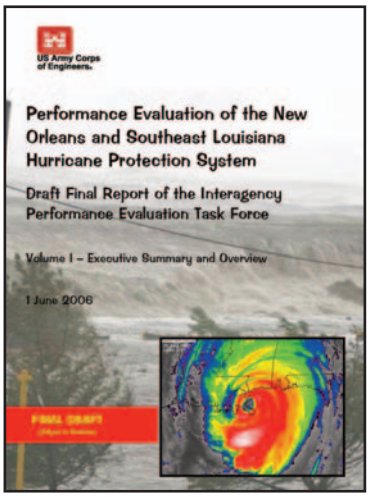


- We must get the movement of water and sediment right. At risk are the health of wetlands, the viability of a diverse ecosystem, and the safety of communities.

- Unwise development in flood-prone areas must be strictly discouraged through enforcement of land use regulations.

- All hurricane protection structures must be designed to provide adequate and reliable protection to communities; complement ecosystem restoration measures; minimize disruptions to tides and water flow; and, if overtopped, remain functional and allow quick drainage of water from the system.



Recent reviews of the performance of the New Orleans hurricane protection system by the American Society of Civil Engineers, Team Louisiana, and the Interagency Performance Evaluation Task Force have also made detailed recommendations for improving future designs. The state will continue to work with the Corps of Engineers, levee districts, and parishes to make sure that the construction of hurricane protection structures is compatible with wetland restoration.

Because these issues are still under study, the exact placements of many hurricane protection structures are not final, and will be determined as feasibility studies are completed. The maps in the following sections explain some of the issues in play.

New Orleans metropolitan area. When complete, repairs to the area's hurricane protection projects will not provide enough protection to the New Orleans metropolitan area, and they cannot be retrofitted to substantially increase protection beyond the 100 year level without major impacts to the community. In addition, the North Shore of Lake Pontchartrain and other areas surrounding the lakes have no protection from storm surges entering from the Gulf. To address these deficiencies, an outer barrier must be built to work in tandem with projects already on the ground or being planned. For the purposes of this plan, we used the Corps' projection that it would complete all authorized and funded hurricane protection system upgrades in metropolitan New Orleans by 2010.

What is the "funnel effect?"

A funnel effect is created when two levees come together at an angle. At these junctions, storm surge is magnified, and forces acting upon the levees are increased. Under certain circumstances, as occurred at the junction of the MRGO with the GIWW during Hurricane Katrina, a funnel effect can overwhelm flood protection systems. Although it is best to engineer the flood protection systems to minimize the funnel effect, levees can be raised and strengthened to accommodate an anticipated increase in flood heights. There are also opportunities to use the funnel effect to our advantage, directing water to engineered spillways that will allow overtopping into storm surge reservoirs. This advantage can best be utilized when constructing outer barriers near areas that can store significant amounts of water, such as Lake Pontchartrain.

Different alignments for this project will have different effects (see three possible concepts next page), but overall, the project will be designed to minimize impacts to both the habitat of important species and hydrology in and around Lakes Pontchartrain and Borgne. If not designed to work with existing hurricane protection systems, the project's design may worsen flooding from hurricanes in nearby areas such as St. Bernard Parish and Mississippi. For these reasons, the state must continue modeling efforts to determine the optimal alignment. Such an alignment will provide the necessary hurricane protection while balancing all four of the Master Plan's objectives. If the results of this research show that higher surge levels will be created for some areas, existing levee systems will need to be raised or strengthened.

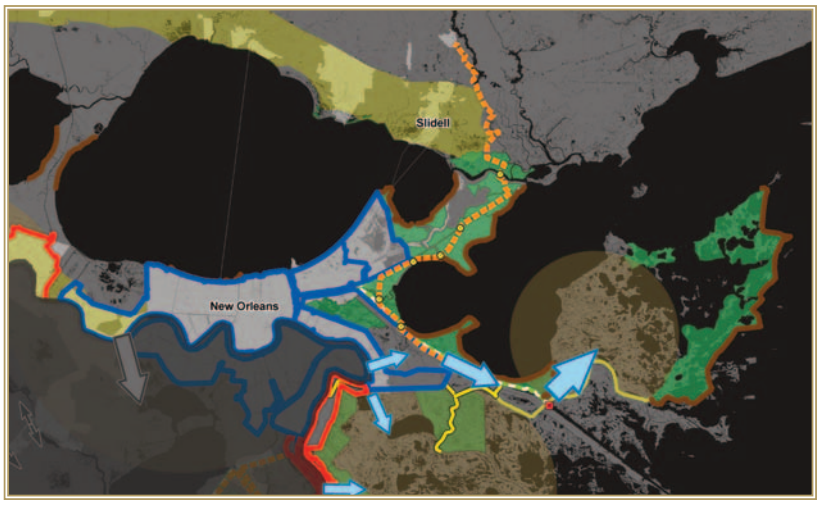


Figure 13. Lake Pontchartrain Barrier Alignment: #1-Interior at Golden Triangle.

Alignments #1 and #2 are fairly similar, although #1 would not enclose the Golden Triangle and would thus have the least direct ecosystem impact. However, without proper design Alignment #1 could change water flow and restrict animal and boat access through major channels. Of the three conceptual alignments, this one does the least to address the existing funnel effect and provides no water storage landward of the levee.

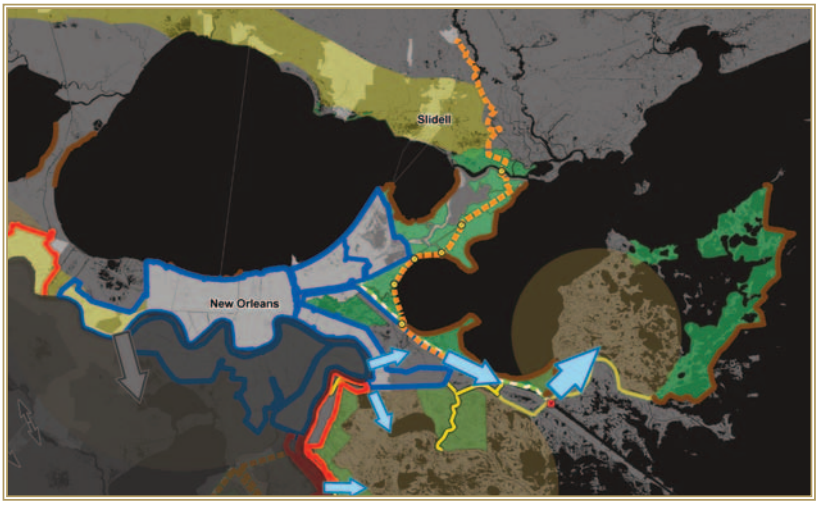


Figure 14. Lake Pontchartrain Barrier Alignment: #2-Rim of Lake Borgne.

Unlike Alignment #1, this alignment would enclose the Golden Triangle, and would thus have a greater ecosystem impact. In addition, without proper design, Alignment #2 could change water flow and restrict animal and boat access through major channels. Impacts to the habitat of the Gulf Sturgeon, a threatened species, would also need to be addressed. Alignment #2 would reduce the funnel effect; further modeling will reveal the extent of this reduction.

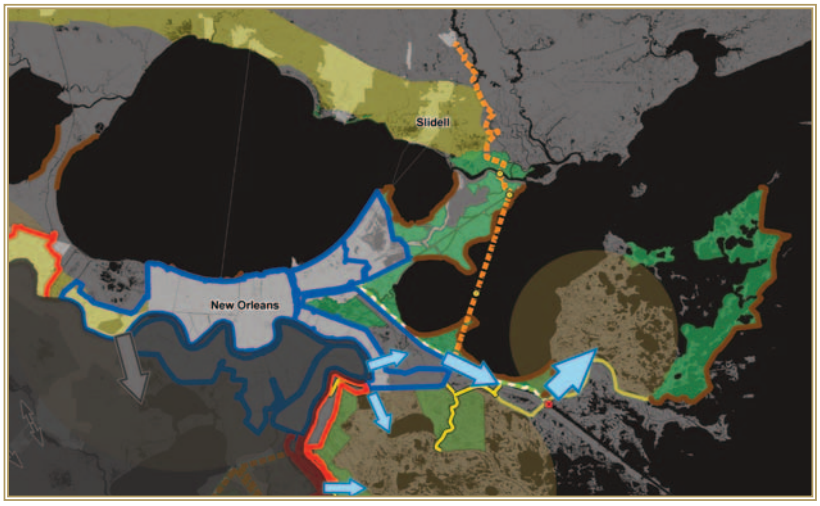
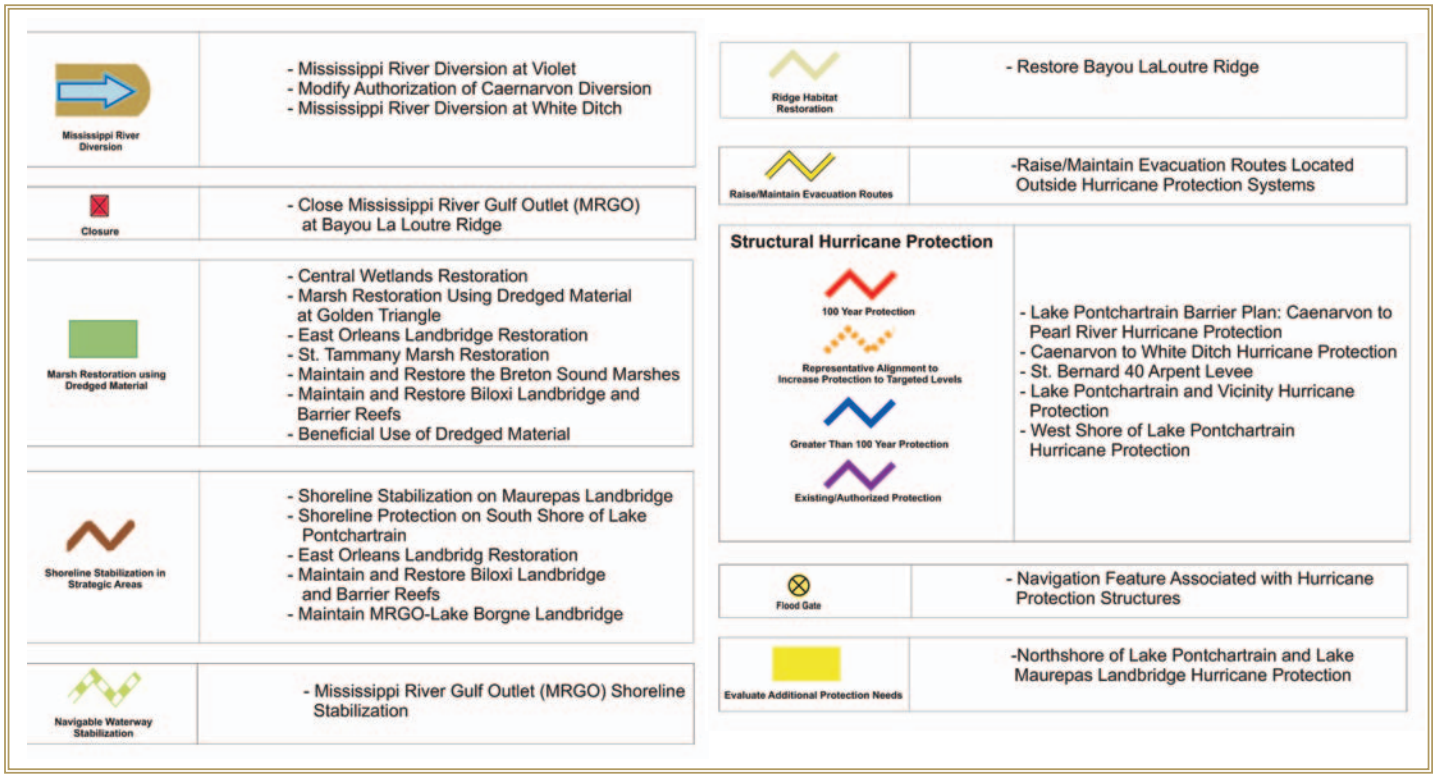


Figure 15. Lake Pontchartrain Barrier Alignment: #3-Lake Borgne.

This alignment may provide the most reliable protection against storm surge because it eliminates the funnel effect and provides water storage to accommodate overtopping. However, it could be the most challenging of the three alignments to build because it would be situated in the open water of Lake Borgne. This alignment would also pose the greatest challenges for maintaining ecosystem function, including maintaining adequate water exchange and animal movement. Issues related to the Gulf Sturgeon, a threatened species, would also need to be addressed. Innovative storm barrier concepts, such as pile-supported concrete structures, could be used to increase the feasibility of this alignment.



The following actions are needed in order for the New Orleans metro area to achieve more than a 1% level of protection, meaning protection over the level needed to withstand a storm with a 1% chance of occurring in any given year: (1) raise existing levees to the 1% level of protection through ongoing work by the Corps of Engineers, and (2) build an outer barrier (see alternatives).

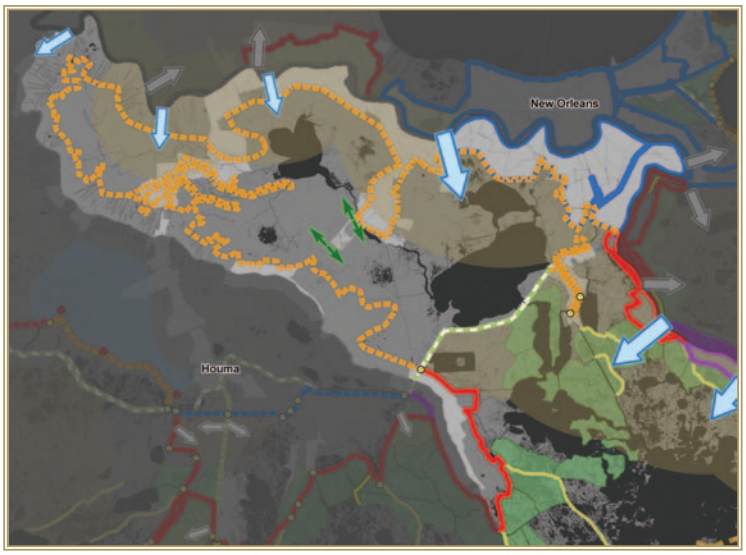


Figure 16. Donaldsonville to the Gulf Alignment: #1- Swamp.

This alignment follows the upland margin of the Barataria Basin wetlands. If a traditional earthen levee were used, this alignment would minimize further disruptions to the basin hydrology. However, the length of this alignment would increase construction, operation, and maintenance costs, as well as the number of structures needed for drainage, pipeline, and water channel crossings. As a result, this alignment includes more potential locations for structural failure. In addition, this alignment provides no water storage landward of the levee. If the structure were overtopped, water would flow into populated areas. The West Bank and Vicinity project levees would also need to be raised beyond the level provided by the Corps's ongoing work, in order to achieve a greater than 1% level of protection for the West Bank of metro New Orleans. There are questions as to how feasible it would be to raise these levees—both technically and economically. Ring levees would need to be added around central basin communities, including Chackbay, Kraemer, Crown Point, Jean Lafitte, and Lafitte to provide a 1% level of protection for these communities.

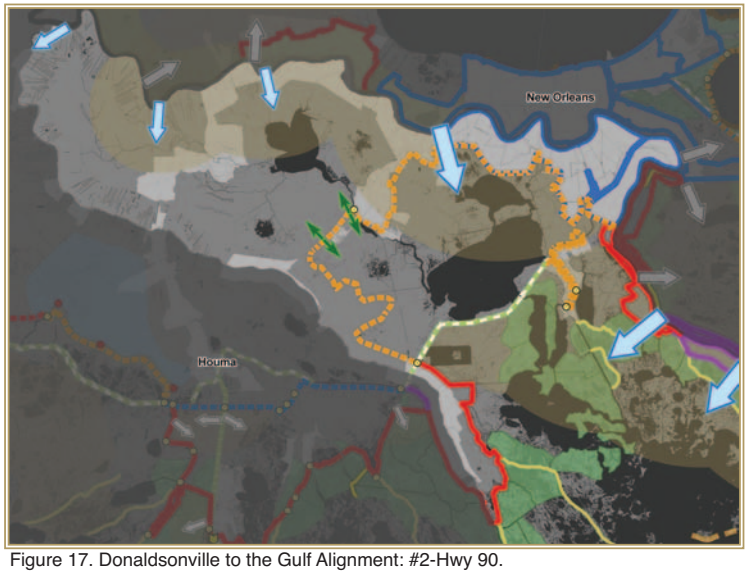


Figure 17. Donaldsonville to the Gulf Alignment: #2-Hwy 90.

Because it would be built near Highway 90, an existing hydrologic barrier in the basin, this alignment would minimize further disruptions to water flow patterns. In fact, when coupled with needed drainage improvements under Highway 90, this alignment could improve water exchange throughout the basin. Its shorter length would reduce construction, operations, and maintenance costs, and it would require fewer water channel, pipeline, drainage and other ancillary structures. As a result, this alignment would have fewer potential locations for structural failure. However, this alignment would still have direct impacts on wetlands. In addition, if this alignment were built, the West Bank and Vicinity project levees would need to be raised beyond the level provided by the Corps's ongoing work, in order to achieve a greater than 1% level of protection for the West Bank of metro New Orleans. There are questions as to how feasible it would be to raise these levees—both technically and economically. A ring levee would also have to be built around Crown Point, Jean Lafitte, and Lafitte to provide a 1% level of protection to these communities.

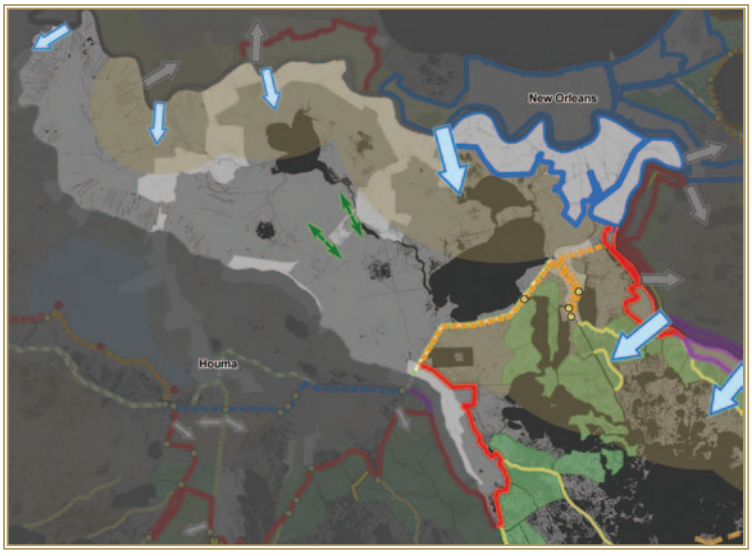
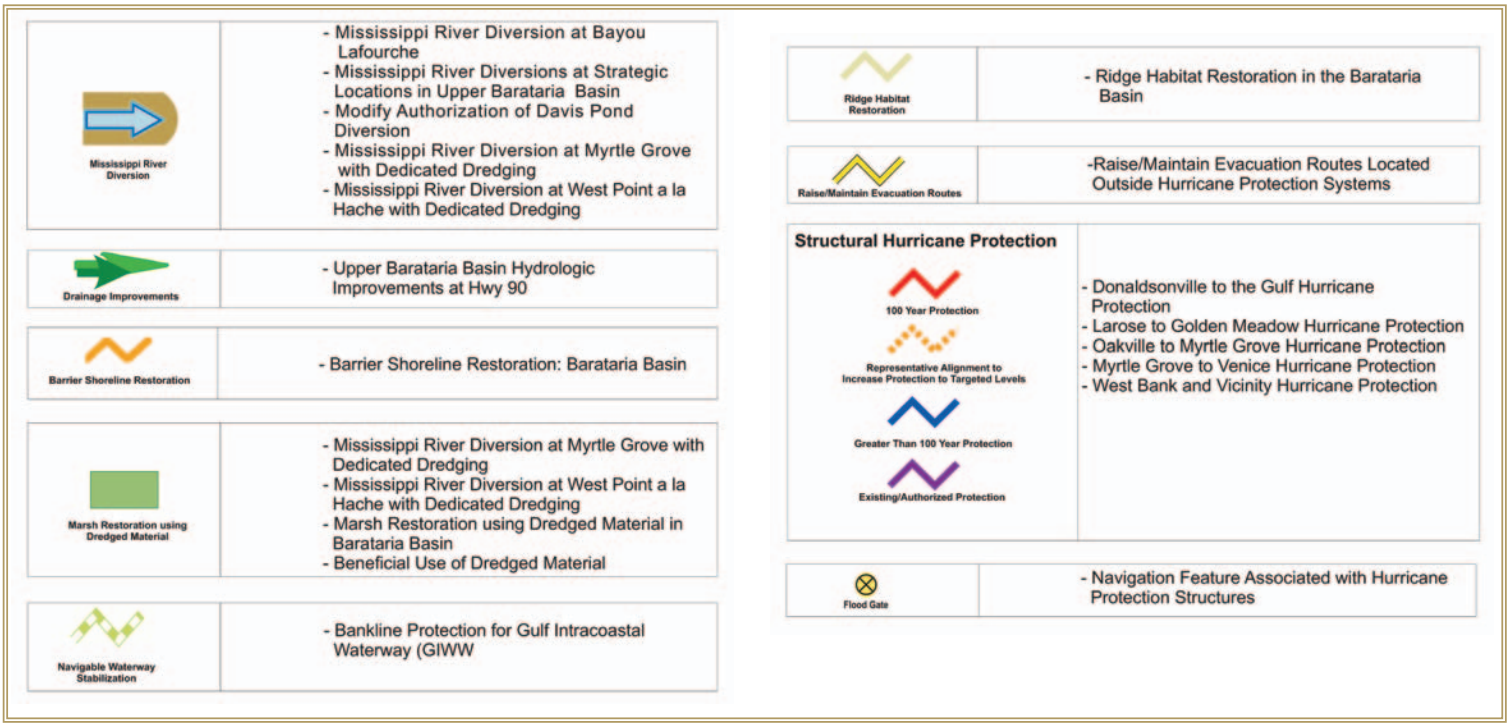


Figure 18. Donaldsonville to the Gulf Alignment: #3-GIWW.

This alignment would follow the Gulf Intracoastal Water Way roughly between Oakville in Plaquemines Parish and LaRose in Lafourche Parish. It would provide space for temporary water storage should overtopping occur, and it could be designed to help direct water to areas such as eastern Terrebonne Parish, which would otherwise be difficult to reach using river diversions. It would also protect central Basin communities, including Crown Point, Jean Lafitte, and Lafitte. However, if it were not properly designed to increase wetland sustainability in conjunction with necessary restoration projects, this alignment would further stress ecosystems that support commercially and recreationally important fish and wildlife species in Barataria Basin. Innovative designs and technologies will need to be used to ensure the sustainability of the basin's wetlands, improve reliability of the protection structure, and reduce maintenance costs.

Barataria Basin and West Bank. Lafourche Parish communities north of LaRose as well as central Barataria Basin communities are unprotected from storm surges. In addition, when an authorized protection project entitled "West Bank and Vicinity" is completed, the West Bank of New Orleans will still remain unacceptably vulnerable to surge from very large storms. The Master Plan recommends that protection be provided to Lafourche and central basin communities, such as Lafitte, at the level that could withstand a storm with a 1% chance of occurring in any given year. The Master Plan further recommends that the West Bank's protection be improved over this level. Further analyses must be performed to define the exact placement and height of this protection. In all instances it is important to improve drainage through the Highway 90 roadway embankment to help restore upper basin swamps. All of these issues are being evaluated as part of the Corps of Engineers' Donaldsonville to the Gulf feasibility study. Figures 16-18 present options now under study.



The following actions are needed in order for West Bank and Vicinity of metro New Orleans to achieve more than a 1% level of protection, meaning protection over the level needed to withstand a storm with a 1% chance of occurring in any given year: (1) raise existing levees to the 1% level of protection through ongoing work by the Corps of Engineers, and either (2) raise the West Bank and Vicinity levees further, or (3) build an outer barrier (see alternative 3).

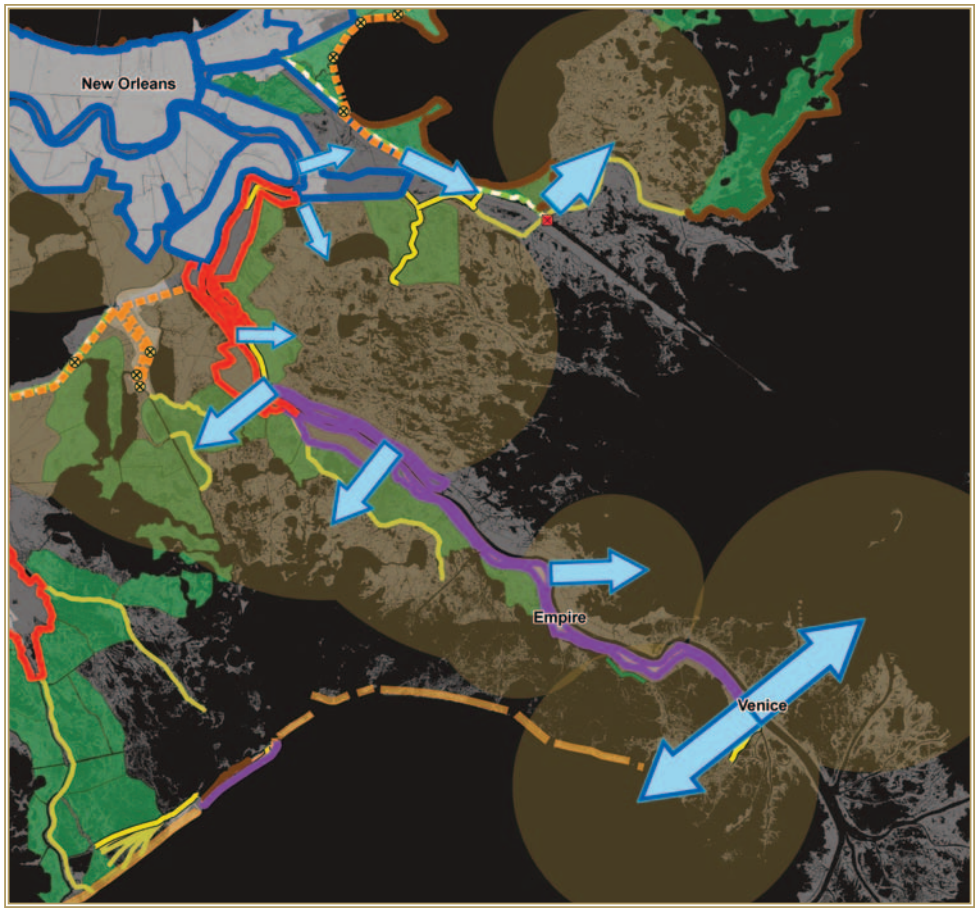
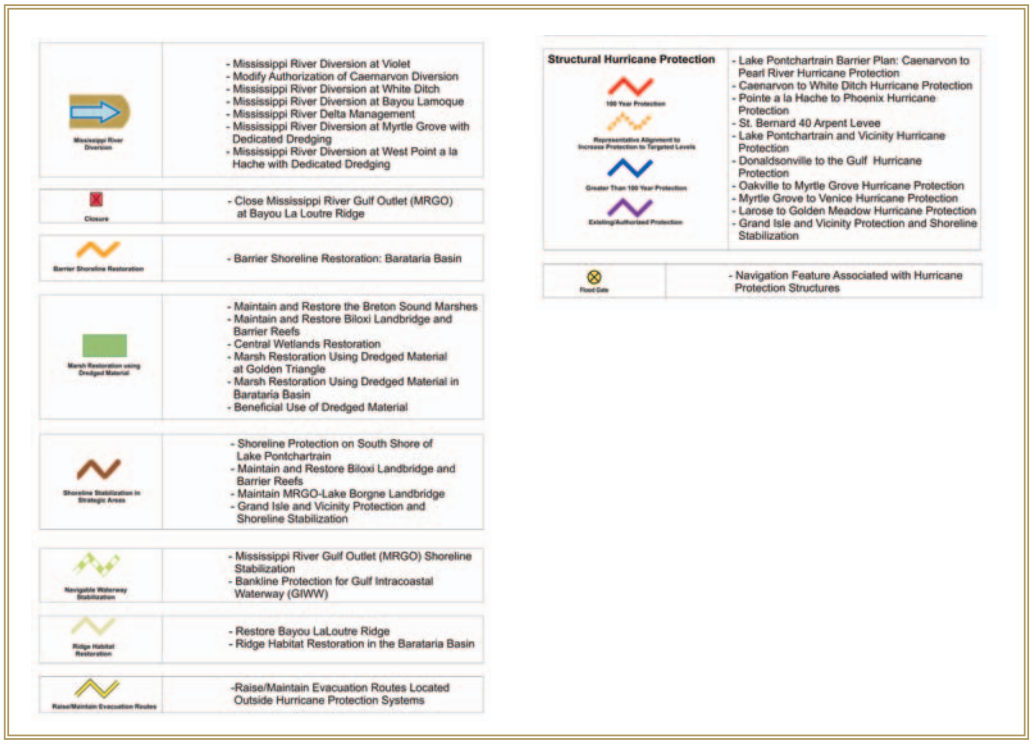


Figure 19. Proposed hurricane protection in Plaquemines Parish.



Plaquemines Parish. The plan recommends a multi-faceted protection plan for Plaquemines Parish.

1. From the upper portions of the parish down to Oakville on the west bank of the Mississippi River, the plan recommends a hurricane protection system that would provide a greater than 100 year level of protection, meaning protection over the level needed to withstand a storm that has a 1% chance of occurring in any given year.

2. From Oakville to Myrtle Grove on the west bank and from Caernarvon to White Ditch on the east bank (areas that include the ConocoPhillips refinery at Alliance), the plan recommends improving the current levee to provide a level of protection that would protect against a storm with a 1% chance of occurring in any given year. These stretches of levee should be raised and be made a part of the federal hurricane protection system.

3. The drainage levee south of Myrtle Grove should be federalized and brought to the same elevation as the current federal hurricane protection levees in southern Plaquemines Parish.

4. South of St. Jude on the west bank and south of Phoenix on the east bank, the levees would be maintained at their currently authorized heights.

5. Maximize use of non-structural measures.

This decision reflects several constraints. The levee system in lower Plaquemines Parish is very long, and the entire region is steadily subsiding. Because it is surrounded by deep Gulf waters, this levee system is also subject to relatively high wave energy and storm surge levels. For these reasons, it would be very challenging to increase levee heights in lower Plaquemines Parish, to fortify them so they remain functional if overtopped, and to maintain them at their authorized elevations.

ConocoPhillips refinery at Alliance in Plaquemines Parish seen from across the Mississippi River.

Hurricane Protection in Plaquemines Parish: Issues to Consider

What does the project accomplish? The proposed hurricane protection system would upgrade levels of protection and protect key assets of the parish. Non-structural solutions would work in conjunction with the levees to reduce risk.

What are the issues involved? While it would retain the level of hurricane protection it has now, lower Plaquemines Parish south of St. Jude and Phoenix would not receive enhanced structural hurricane protection. There is concern that this strategy would isolate lower Plaquemines Parish, prevent residents and business owners from obtaining affordable insurance, and undermine the parish's economy.

How can the issues be addressed? The Coastal Protection and Restoration Authority, including the Departments of Insurance and Economic Development, will work with Plaquemines Parish government to address these concerns, recognizing the unique constraints and opportunities in this coastal region. The Master Plan's proposed barrier island restoration measures and the Mississippi River Delta Management plan will, over time, increase protection to citizens of Plaquemines Parish. In the lower regions of the parish, hurricane protection will have to encompass a range of strategies, including raising homes and other non-structural improvements made by individual homeowners. In keeping with this approach, residents of lower Plaquemines Parish, along with other south Louisiana residents who live in vulnerable areas, are advised not to rebuild their homes at grade on slabs.

What happens if we keep the status quo? Plaquemines Parish will be unacceptably vulnerable to storm surge without the proposed improvements to the hurricane protection system and the adoption of other non-structural solutions.

Courtesy Scott Russell Photography

Terrebonne Parish and Atchafalaya Delta. Terrebonne Parish is experiencing the highest rate of land loss in coastal Louisiana, and communities in the lower parish are often flooded from extreme high tides and small storms. This means that the Houma/Thibodaux metro area's 200,000 residents are currently unprotected. Wetland restoration alone cannot do the job; storm surge barriers are also needed. For this reason, the plan recommends that the existing alignment for the Morganza to the Gulf project be constructed. This project has been vetted and approved after more than 15 years of review by citizens at public meetings and by scientists and engineers who have conducted numerous feasibility studies. The project has also been reviewed through the National Environmental Policy Act (NEPA) process, which assesses the environmental impact of major federal projects.

© Bevil Knapp

The oil and gas drilling platforms and the legs that will hold them up above the water's surface are fabricated inland and then floated out to deepwater sites and placed into position.

Having passed muster in all of these arenas, the project has been awaiting authorization for the past six years as part of a federal Water Resources Development Act. Because this project is so critical to the future of Houma and surrounding communities, the Terrebonne Levee and Conservation District is using local funds to construct portions of the levee.

There are concerns that if land use practices are not changed to require buffer zones near the levee and prohibit development in wetlands, the levee could encourage new development in low-lying areas and increase the assets at risk. These consequences would run counter to the Master Plan's objectives of sustaining wetlands and reducing risks to coastal communities.

The project's alignment follows spoil banks and canals in order to minimize effects on wetlands. Environmental structures are incorporated into this alignment to restore connections of impounded wetlands to the estuary. Certain portions of the alignment will have to be carefully designed to take advantage of lessons learned during Hurricane Katrina regarding the best way to handle storm surge. This presents an opportunity to explore new technology and innovative concepts. Figures 20 and 21 show alternatives being considered for the design phase of this aspect of the project.

If we do not build Morganza to the Gulf, residents in Dulac, Chauvin, and Montegut will be forced to move inland. Houma, one of the region's centers of oil and gas industry, will remain at unacceptable risk from even small hurricanes. Wetlands near the proposed project that are already impounded from spoil banks and canals will continue to deteriorate unless environmental structures are built to restore connections to the estuary.

In addition to the Morganza to the Gulf project, an interior levee system may also be needed in order to provide adequate levels of protection to the Houma/Thibodaux area. The need for this additional barrier will be assessed as the Morganza project moves toward completion, but it must not slow progress toward construction of the existing alignment.

LA 1 Highway Corridor. Louisiana's southernmost port is Port Fourchon, strategically located in the central Gulf region where it serves as a focal point for deepwater oil and gas activities. However, the only roadway connecting the port to the rest of the nation is the vulnerable, two-lane LA 1 highway. Efforts are underway to upgrade and raise on concrete structure the sections of LA 1 that are outside of the existing levee system. To protect the portion of this federally recognized energy corridor that lies within the levee system, the levee between LaRose and Golden Meadow should be raised significantly to provide a 1% level of protection. This means that the protection would be sufficient to withstand a storm with a 1% chance of occurring in any given year. Completion of the Morganza to the Gulf and Donaldsonville to the Gulf projects, together with restoration activities, would further increase levels of protection to this highway. If further modeling and analysis show that risks to assets in this area remain unacceptably high, the Master Plan recommendations will be modified accordingly.

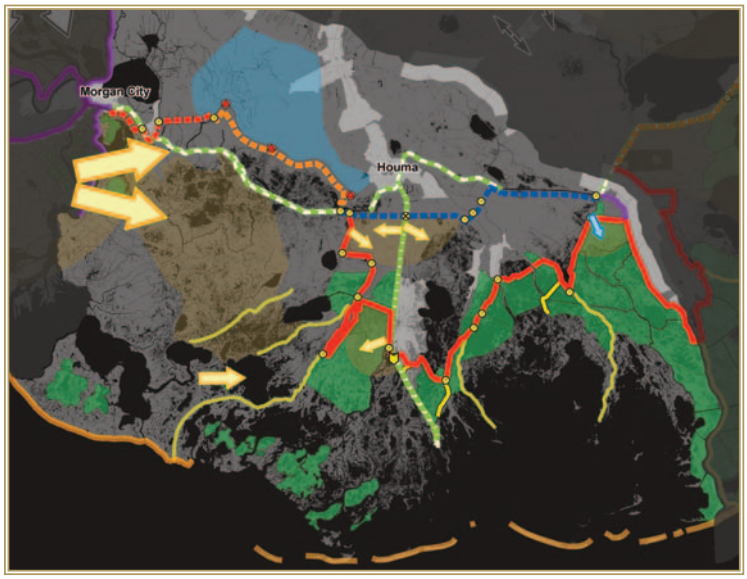


Figure 20. Morganza to the Gulf Alignment: Project Awaiting Authorization.

This alignment follows existing ridges wherever possible and incorporates floodgates and water control structures to mimic natural water flow patterns. The need to maximize protection to coastal communities was balanced with the need to make allowances for sediment and water flow. In many cases, these measures could improve water exchange through wetlands. Throughout the 15 years that this project has been developed, there has been active stakeholder and public input.

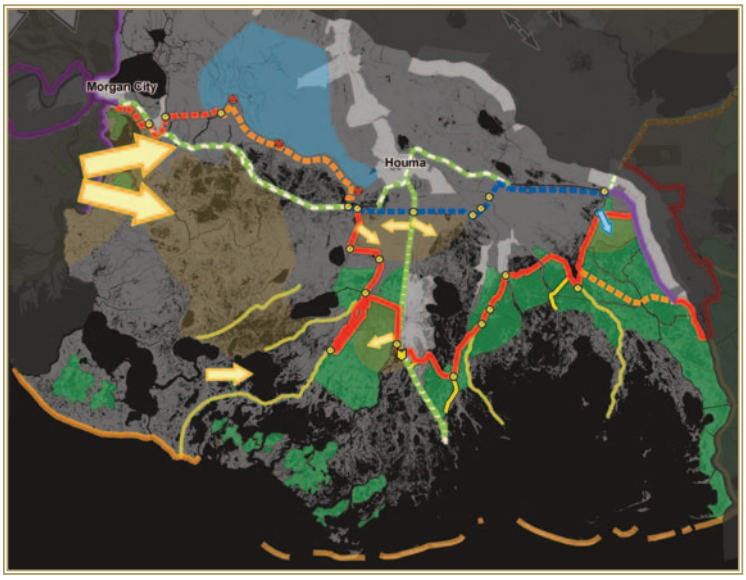


Figure 21. Morganza to the Gulf Alignment Addition: Pointe au Chien to Golden Meadow.

This additional alignment would extend from Pointe au Chien to Golden Meadow and would reduce the funnel effect created where the proposed Morganza to the Gulf Alignment meets the LaRose to Golden Meadow levee. The additional alignment would also increase protection to lower Lafourche communities. However, if not properly designed to allow for adequate water movement, this addition could further stress the area's fragile wetlands. As a result, this addition would have to incorporate floodgates and work in tandem with water and sediment diversions to ensure that water exchange contributes to wetlands sustainability. Resolution of these issues must not delay the implementation of the current Morganza to the Gulf Alignment, which is being considered for federal authorization.

The current Morganza to the Gulf alignment should be constructed to provide a 1% level of protection to communities such as Dulac, Montegut, and Chauvin, as well as larger communities to the north. To provide the Houma/Thibodaux area with a greater than 1% level of protection, meaning protection over the level needed to withstand a storm with a 1% chance of occurring in any given year, the following actions are needed: (1) either raise the Morganza to the Gulf levee further, or (2) build an inner barrrier.

Mississippi River Diversion	- Move Freshwater to Terrebonne Basin from Barataria Basin via GIWW
Atchafalaya River Diversion	- Freshwater Introduction via Blue Hammock Bayou - Convey Atchafalaya River Water Eastward via GIWW to Benefit Eastern and Lower Terrebonne Marshes - Freshwater Introduction to Central and Lower Terrebonne Marshes
Water Management Area	-Chacahoula Basin Plan
Pump Station	- Chacahoula Basin Plan
Lock	-Multipurpose Operation of the Houma Navigation Canal (HNC) Lock
Barrier Shoreline Restoration	- Barrier Shoreline Restoration: Terrebonne Basin - Barrier Shoreline Restoration: Point Au Fer Island
Marsh Restoration using Dredged Material	- Marsh Restoration Using Dredged Material in Terrebonne Basin - Maintain Landbridge between Caillou Lake and Gulf of Mexico - Marsh Restoration Using Dredged Material at Point Au Fer - Beneficial Use of Dredged Material
Navigable Waterway Stabilization	- Bankline Protection for Houma Navigation Canal - Bankline Protection for Gulf Intracoastal Waterway (GIWW)
Ridge Habitat Restoration	- Ridge Habitat Restoration in the Terrebonne Basin
Raise/Maintain Evacuation Routes	-Raise/Maintain Evacuation Routes Located Outside Hurricane Protection Systems
Structural Hurricane Protection 100 Year Protection Representative Alignment to Increase Protection to Targeted Levels Greater Than 100 Year Protection Existing/Authorized Protection	- Morganza to the Gulf Hurricane Protection - Houma and Vicinity Hurricane Protection - Morgan City to Gibson Hurricane Protection -Gibson to Houma Hurricane Protection - LaRose to Golden Meadow Hurricane Protection
Flood Gate	- Navigation Feature Associated with Hurricane Protection Structures

Acadiana. In this region, the highest concentrations of assets are found in Lafayette, New Iberia, and Abbeville. The plan recommends that these areas receive a greater than 100 year level of protection, meaning protection over the level needed to withstand a storm that has a 1% chance of occurring in any given year. Areas between New Iberia and Berwick/Patterson should receive a 100 year level of protection. However, more modeling and analysis need to be done to determine appropriate protection measures for this area.

Chenier Plain. The plan recommends that the Lake Charles/Sulphur area receive a greater than 100 year level of protection, meaning protection over the level needed to withstand a storm that has a 1% chance of occurring in any given year. This could be achieved with a ring levee that surrounds the population centers as well as critical oil and gas infrastructure. More modeling and analysis need to be done to properly evaluate the vulnerability of this area and to define the needed flood protection alignments.

Areas between Abbeville and Lake Charles, where the human population is large but dispersed, would initially be protected by the raised highways and fortified spoil banks previously described. If further modeling and analysis show that these measures will not provide protection from a storm that has a 1% chance of occurring in any given year, a levee would be considered along the GIWW. This analysis is still ongoing.

Courtesy Bruce Schultz/LSU AgCenter

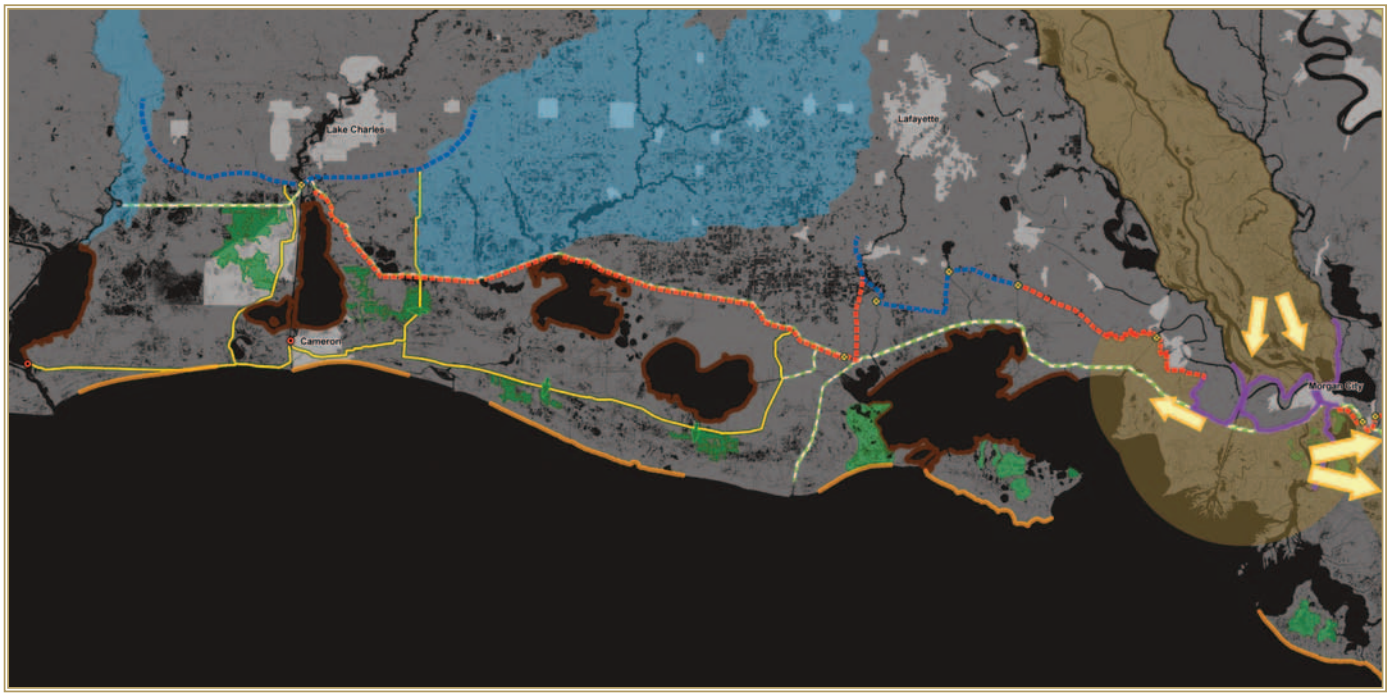


Figure 22: Hurricane protection west of the Atchafalaya River.

Atchafalaya River Diversion	- Convey Atchafalaya River Water Eastward via GIWW to Benefit Eastern and Lower Terrebonne Marshes - Convey Atchafalaya River Water Westward via GIWW - Freshwater Introduction into Central and Lower Terrebonne Marshes - Increase Sediment Transport Down Wax Lake Outlet - Optimize Flow Distribution at Old River Control Structure
Water Management Area	- Chenier Plain Freshwater and Sediment Managment and Reallocation - Mermentau Basin Watershed Management Plan to Retain Freshwater Resources - Sabine Basin Watershed Managment
Salinity Control Structure	- Salinity Control Structure at Calcasieu Pass - Salinity Control Structure at Sabine Pass
Drainage Improvements	- Hydrologic Improvements in Mermentau Basin at Highways 82 and 27
Barrier Shoreline Restoration	- Barrier Shoreline Restoration: Point au Fer Island - Barrier Shoreline Restoration: Freshwater Bayou to South Point/Marsh Island - Barrier Shoreline Restoration: Sabine River to Calcasieu River - Barrier Shoreline Restoration: Calcasieu River to Freshwater Bayou
Marsh Restoration using Dredged Material	- Marsh Restoration using Dredged Material at Point au Fer - Marsh Restoration using Dredged Material at Marsh Island - Marsh Restoration using Dredged Material at Weeks Bay - Raynie Marsh Restoration - Marsh Restoration using Dredged Material South of Highway 82 - Beneficial Uses of Dredged Material from Calcasieu Ship Channel - Beneficial Use of Dredged Material
Shoreline Stabilization in Strategic Areas	- Southwest Pass Shoreline Stabilization - Stabilize Shoreline of Vermilion, East and West Cote Blanche Bays - Stabilize Grand Lake Shoreline - Stabilize White Lake Shoreline - Stabilize Calcasieu Lake Shoreline - Stabilize Sabine Lake Shoreline
Navigable Waterway Stabilization	- Bankline Stabilization of Freshwater Bayou from Belle Isle Bayou to Freshwater Bayou Canal Lock - Fortify Spoil Banks of GIWW and Freshwater Bayou - Bankline Protection for Gulf Intracoastal Waterway (GIWW) - Bankline Stabilization of Freshwater Bayou - Fortify Spoil Banks of GIWW and Freshwater Bayou
Raise/Maintain Evacuation Routes	-Raise/Maintain Evacuation Routes Located Outside Hurricane Protection Systems - Raise and Maintain Highways 82 and 27
Structural Hurricane Protection 100 Year Protection Representative Alignment to Increase Protection to Targeted Levels Greater Than 100 Year Protection Existing/Authorized Protection	- Maintain Existing Levee Protection for Morgan City and Berwick - Wax Lake Outlet to New Iberia Hurricane Protection - Abbeville to Lake Charles Hurricane Protection - Lafayette and Vicinity Hurricane Protection - Lake Charles and Vicinity Hurricane Protection
Flood Gate	- Navigation Feature Associated with Hurricane Protection Structures

Raising Highways in the Chenier Plain: Issues to Consider

What does the project accomplish? It would reduce surge impacts in the Mermentau Basin and provide an enhanced level of protection for southwest Louisiana communities.

What are the issues involved? Some residents of southwest Louisiana are concerned that the state is planning to raise and widen Highway 82 along its entire length in the Chenier Plain. In so doing, residents worry, the state will expropriate privately owned homes and land, forcing relocation of whole communities. Raised highways may also exacerbate drainage problems should storm surge overtop them.

How can the issues be addressed? If the highway is located on a chenier, the road is already on a landscape feature at or above the targeted elevation, and raising it further is unnecessary. Thus, the plan does not recommend raising the highway on cheniers. Instead, the plan recommends improving protection to homes and properties located on cheniers by armoring highway embankments in certain vulnerable locations. This will ensure that the road can be used safely after storms. In selected low spots, such as south of White Lake or along the eastern edge of Highway 82 south of Forked Island, the highway will need to be raised in order to protect the Mermentau Freshwater Basin. However, there are few human settlements in such areas, and impacts on landowners are expected to be minimal. Structures will be built into the raised highways to improve drainage.

What happens if we maintain the status quo? Storm surge will continue to encroach into marshes and southwest Louisiana communities, endangering fresh water supplies.

Hurricane Protection in the Chenier Plain: Issues to Consider

What does the project accomplish? Building targeted barrier shoreline restoration projects, including offshore segmented breakwaters, and raising and fortifying selected portions of LA Highways 82 and 27 (see above) will provide first and second lines of defense against storm surge for communities such as Cameron, Holly Beach, and Pecan Island. Communities further inland will have more protection based on the concentration of assets at risk.

What are the issues involved? Shoreline communities south of the GIWW will not have levee protection under this proposed plan.

How can the issues be addressed? Citizens who live in this area will need to meet certain building code and height requirements in order to obtain insurance.

What happens if we keep the status quo? Major metropolitan areas and strategic oil and gas infrastructure will remain at unacceptable risk from storm surge.

Chapter 4: Master Plan Implementation
A Plan for Delivering Results

Assumptions Driving Master Plan Implementation

1. Work cannot begin on every project at once. Plan elements must be prioritized.

2. Funding constraints, institutional barriers, and technical unknowns will influence which measures can be implemented first.

3. Upon approval of the Master Plan, the state's Annual Plan, a separate document, will present project priorities, scheduling, and cost information.

4. Projects presented in the Annual Plan must balance the four coast-wide objectives.

Working within constraints. The planning team identified the measures described in Chapter 3 using the working assumptions that each measure was critically important and would be implemented as soon as possible to achieve the objectives of the Master Plan. However, building and maintaining these measures will cost tens of billions of dollars. As a matter of practicality, therefore, it is not feasible for all of the measures in the Master Plan to be constructed at the same time.

In order to take the process to the next level, the following constraints must be considered:

- Funding, materials, and other resources are limited and will restrict both what can be done and how quickly projects can be completed. Certain projects must be constructed before others in order to achieve intended outcomes.
- Some existing laws, policies, and other administrative procedures must be updated if the Master Plan is to be implemented as envisioned.
- Several concepts require further planning before they can be designed or constructed.
- Some of the proposed projects will take many years to plan, design, and construct.

While recognizing the limitations that these constraints impose, the state cannot wait until these challenges are resolved before it begins planning, designing, and constructing projects. The state will proceed on the strong foundation built through years of protection and restoration work while leaving room to adapt the plan as conditions change and lessons are learned.

As the program evolves, the state will regularly review the need to add new projects, delete certain projects, and change the location, size, or capacities of other projects.

The state's *Annual Plan: Ecosystem Restoration and Hurricane Protection in Coastal Louisiana* is published each spring before the state's legislative session begins. As its name implies, the Annual Plan must identify hurricane protection and coastal restoration projects, as well as other actions, which will be undertaken in that fiscal year. Cost estimates for actions to be taken are provided in the Annual Plan as well. The state is also expanding the format of the Annual Plan to include a "report card" of progress made and a forecasted sequence of project priorities for up to three years. Of course, such forecasts are not written in stone. If conditions on the ground change, if funding levels change, or if technical issues are resolved more quickly than anticipated, then project schedules will be modified. This use of the Annual Plan will allow the state to present what it plans to achieve in the near-term without scheduling action steps so far in advance that the quality of the assumptions used would be questionable.

The Annual Plan will outline the actions that will be undertaken in the next fiscal year to protect and restore communities and natural resources. Other projects listed in the Annual Plan will advance the knowledge needed to make progress over time. In this way, the plan will seek to deliver results while also laying the groundwork for new measures. When the state assesses how the overall coastal protection and restoration program can best be adapted to changing conditions and new information gained, it will include this information in the next Annual Plan. In this way, the plan will offer yearly updates on progress, strategies, technical challenges, and priorities.

Courtesy Scott Russell Photography

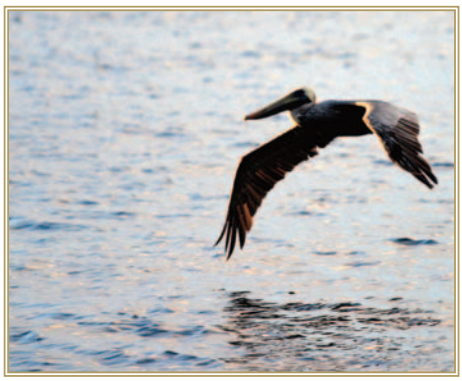
Flock of white pelicans in St. Bernard Parish marshes.

The Annual Plan's provisions, in aggregate and over time, must achieve the four coast-wide objectives that have guided work on the Master Plan (see Chapter 3 for full text of objectives). Each of these objectives —reduce risk to economic resources, restore sustainability to the coastal ecosystem, maintain a diverse array of fish and wildlife habitat, sustain heritage and culture—is integral to the continued vitality of south Louisiana.

Selecting the Annual Plan's projects. The first step is to identify which activities must move forward on a faster track—the so-called "Urgent Early Actions." Although this term implies a focus on emergency measures only, "Urgent Early Actions" include any measure that aggressively pursues high priority activities, regardless of how long it will take to plan, design, or construct. Measures selected for inclusion in the Annual Plan as Urgent Early Actions must meet at least one of six criteria. These criteria reflect the need to build projects now while also laying the groundwork for large-scale, conceptual measures. The criteria are listed below.

- Measures that will reduce key uncertainties and thereby help speed the construction of other projects described in the Master Plan. Mississippi River Delta Management could be seen as such a measure, because it will illuminate options for constructing major diversions. These diversions will, in turn, support the long-term sustainability of wetlands surrounding the Mississippi River while also maintaining navigation and other vital economic activities in the region.

- Projects that do not involve major new construction but are simply modifications of existing structures' operations. Modifying the ways that the Davis Pond and Caernarvon Diversion projects operate could be seen as Urgent Early Actions under this criterion, because the projects will have relatively low costs compared to the ecosystem benefits that can be derived. We may need changes in federal laws to authorize these kinds of changes.



Courtesy Scott Russell Photography

Brown pelican over lake in South Louisiana.

- Projects that protect concentrated and strategic assets that were identified in the Master Plan as needing a greater than 100 year level of protection, meaning protection over the level needed to withstand a storm that has a 1% chance of occurring in any given year. Beginning planning and design of the Lake Pontchartrain Barrier Plan to increase the effectiveness of New Orleans's hurricane protection system could be identified as an Urgent Early Action under this criterion.

- Projects that maintain or reestablish a landscape feature that is a linchpin for restoring or sustaining the flow of water in a given area. The closure of the MRGO at Bayou La Loutre as well as barrier island restoration could be seen as Urgent Early Actions under this criterion.

- Projects that restore natural processes in an area of high projected land loss. The proposed Mississippi River diversions in the Master Plan would allow river water and sediment to sustain basin wetlands. Such diversions could be included as Urgent Early Actions under this criterion.

- Projects that sustain processes that are key to the social and economic viability of an existing community. Projects such as the Mississippi River Diversion at Bayou Lafourche could be considered Urgent Early Actions under this criterion.

It is also necessary to consider the remaining measures in the Master Plan to determine which are essential to the success of the Urgent Early Actions. For example, the MRGO/Lake Borgne land bridge must be maintained if the Violet Diversion is to be viable. A list of such supporting measures for each Urgent Early Action will be compiled.

The next step involves sorting the list of Urgent Early Actions and their supporting measures into one of the following categories:

- Planning: the concept is currently being evaluated or needs to be evaluated before engineering and design can begin.

- Engineering and Design: planning is complete, and the measure was found to be feasible. The project is either ready to be designed, or engineering and design are already underway.

- Awaiting Construction: planning and design of the measure is complete; the project is awaiting or has received authorization, and construction is ready to begin.

- Modification: the measure has already been built and requires modifications either to the structure or to its operations.

Understanding the implementation status of each Urgent Early Action can help clarify certainties about the projects' viabilities, potential costs, and schedules.

Together, the selection of Urgent Early Actions, the identification of supporting measures, and the definition of each action's status provide the basis for deciding which new projects to begin in any given year. For a more detailed description of how these decisions are being made, see Chapter 5 in Appendix A of the Master Plan. See Chapter 3 of the Fiscal Year 2008 (FY 08) Annual Plan for discussion of the Urgent Early Actions. All appendices and the FY 08 Annual Plan are available at www.louisianacoastalplanning.org.

Adaptive Management

Chapter 3 and Appendix A of the Master Plan provide a list of projects and promising concepts that are expected to meet the plan's coast-wide objectives. However, putting these measures into practice may require decades. Meanwhile, changes in social, political, and environmental conditions will influence the contents of the plan as well as how the plan is implemented. In addition, science and engineering will continue to improve as the coastal protection and restoration program moves forward. Given the dynamic nature of the coast, the degree to which human communities are entwined with the natural system, and the rapid pace of advancements in science and technology, the coastal protection and restoration program must be managed in a way that allows for adaptation. Learning from action taken and making improvements based on knowledge gained will keep the plan relevant into the future.

An adaptive management strategy is crucial for making sure that the program remains true to its basic objectives while also integrating valuable new information and allowing necessary shifts in priorities. By using a science and performance based process for assessing how the plan and its projects need to change over time, we can ensure that the best available practices are consistently used. The use of adaptive management also presupposes strong engagement from citizens and other affected constituencies. This includes enhanced dialogue with a range of stakeholders, including landowners, fishers, and the navigation community, as well as scientific, engineering, and other technical experts.

Adaptive management acknowledges that we cannot predict with absolute certainty what will happen as we undertake to change a large and complicated natural system, that understanding these complexities requires experts and stakeholders from many disciplines, and that we must continually monitor and assess the results of our actions in order to make sure that we are learning from experience. Adaptive management is thus a way to use science and public participation to resolve the challenges described in Chapter 2 as expeditiously and fairly as possible.

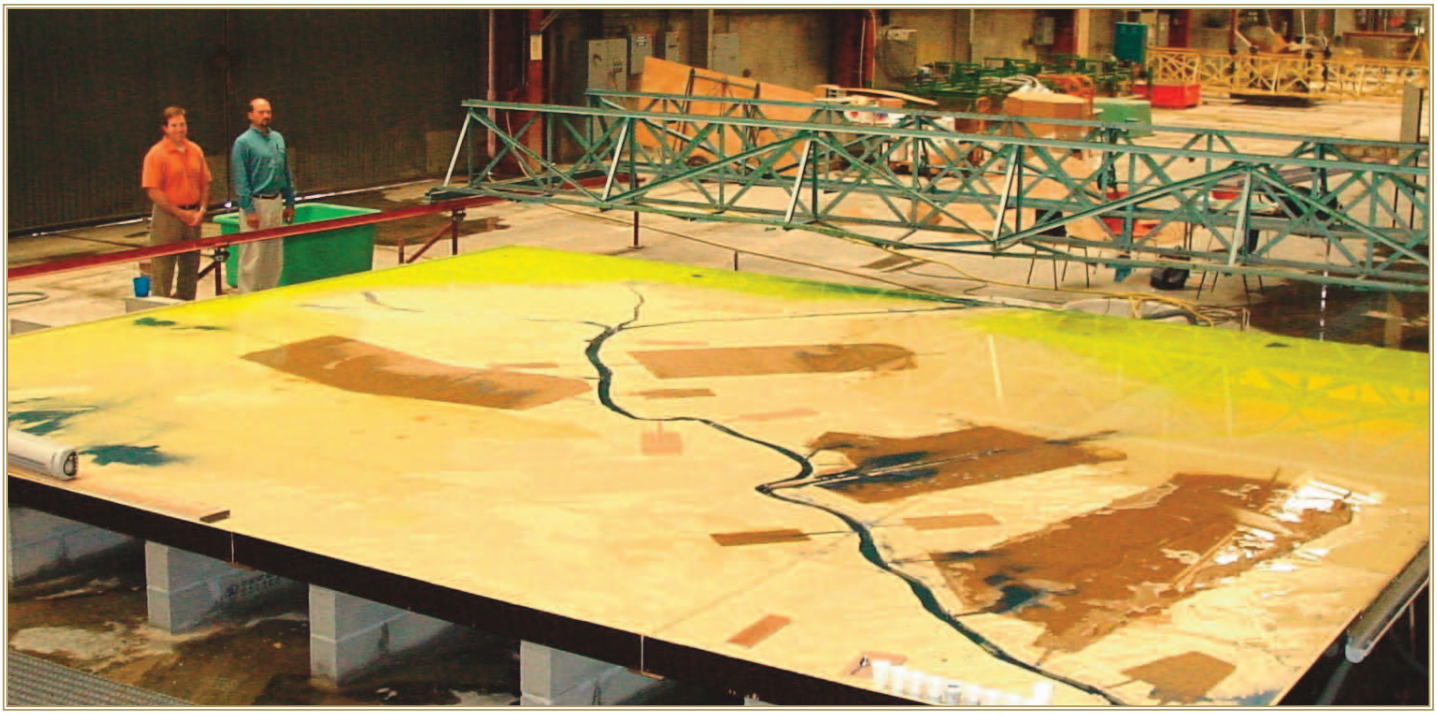
One crucial area that the state's adaptive management program must investigate is how storm risks will change over time. Following the lead of the Dutch, the state will take a two-pronged approach: (1) examine how storm trends are changing, and update our understanding of how frequently a surge of a given height will occur; and (2) investigate the condition of our flood control structures, and if flaws are found, retrofit all related structures to be sure the problem is corrected throughout the entire levee system. These reassessments should be conducted regularly to keep up with ongoing changes in modeling results, improved data collection, and shifts in environmental conditions due to climate change and other factors. Such reassessments will help the state tailor its responses to the actual risk. The adaptive management approach envisioned for Louisiana's coastal restoration and hurricane protection program will affect all levels of activity, from the establishment of overall priorities, to policy and legislation, to research initiatives, to project construction, and the development of tools for accomplishing specific tasks.

Reducing Scientific and Technical Uncertainties

To support this adaptive management strategy, the Master Plan identifies actions that will help address scientific uncertainties, promote technical advancements, and improve the data used at all levels of decision making. The state has been and will continue to pursue all of these objectives.

Improve and expand modeling capabilities. Models are among the state's primary planning and design tools for evaluating protection and restoration options. Good models help assess the potential effects of projects, uncover potentially hidden consequences, and allow relatively rapid comparison of alternative concepts so that the most effective projects can be built more quickly. For example, modeling can provide insight into the different effects of a 5,000 cfs diversion versus a 15,000 cfs diversion; one may build land more quickly but cause more drastic shifts in habitat. Up-front analysis of these tradeoffs allows planners and the public to make more informed decisions. In addition, models help evaluate how high levees must be to provide targeted levels of protection. These results allow planners to identify and correct potential problems with projects at the design stage, thereby saving both time and money. Lastly, models project the paths and strengths of oncoming storms, which can allow the timely activation of evacuation and emergency response plans. Given the importance of modeling to the overall coastal protection and restoration program, the state must improve the scope and quality of these capabilities.

Conceptual models. A conceptual model is a visual or narrative summary that describes the important components of a system and the interactions among them. Establishing the basic assumptions behind system function is the goal of conceptual modeling. These assumptions must be reevaluated regularly, since conceptual models are often the basis for analytical modeling.



The state's small scale physical model shows potential effects of a land building diversion scenario. Blue indicates sediment deposition and land gain over a simulated 100 year period.

Physical models. Physical models are tangible representations of hydrologic processes in a given area. As such, the models can provide insights into how the system functions overall. Louisiana has a small-scale physical model of a portion of the Mississippi River's Deltaic Plain. The model has helped researchers better understand how major river diversions proposed for the area would spur land building.

Photo of analytical model output , CLEAR model

Analytical models. Analytical models use the functional relationships described in conceptual models to predict a system's response to specific measures or combinations of projects. A variety of powerful analytical models have been used to prepare the Master Plan. However, these models must be continually improved in order to support the Master Plan's integrated mission.

For example, storm surge models predict how storm waters may move inland. In order for this capability to more accurately reflect the conditions in play, storm surge models need to better quantify how barrier islands, marshes, coastal forests, ridges, and other landscape features interact with storm surges. Improvements also need to be made to ecosystem response models such as the Coastal Louisiana Ecosystem Assessment and Restoration (CLEAR) model. Finally, we need improved socioeconomic models that link human and economic value to biological and physical processes. These models have not been developed to the same degree as other analytical models. This deficiency must be addressed if the state is to have all the tools needed to fully evaluate management decisions against the four Master Plan objectives.

Support a strong data collection and information management program. Models are only as good as the data and assumptions used to calibrate them. To make sure that all data and assumptions are of the highest possible quality, the following actions are recommended.

Improve collection and management of basic data. The Louisiana coast is changing so rapidly that some information about it quickly becomes outdated. The state needs a system for acquiring and regularly updating data about landscape characteristics such as: how high the land is, how deep the inland and offshore waters are, and the net effect of sea level rise coupled with subsidence. We also need improved data about the coast's human and natural communities, such as population totals and economic inventories, as well as habitat distributions and fisheries dynamics. Much of this information is being collected, but it needs to be catalogued and made more accessible so that it can be incorporated into models.

Complete a regional sediment inventory. We need to know how much sand and sediment are available for restoration and protection projects. To meet this need, an inventory of available sediment in riverine, navigation channel, and offshore sources should be completed. Compiling existing sediment related data is another important step, as is developing a regional sediment budget model that would identify sources of renewable sediment. As part of this effort, the state should refine its understanding of the availability, particle size, accretion and consolidation rates, and other characteristics of sediments that could be used for restoration and protection projects.

CRMS program collects data about wetland change using a network of sites that evaluate the combined effects of individual projects on the ecosystem.

Expand the Coast-wide Reference Monitoring System. In recent years, the state and its federal partners have begun a new ecosystem monitoring program called the Coast-wide Reference Monitoring System (CRMS)-Wetlands. The program collects data about wetland change using a network of sites that evaluate the combined effects of individual projects on the ecosystem. As the expanded CRMS and its sister program for barrier islands and shorelines, the Barrier Island Comprehensive Monitoring Program, continue to gather data over the next several years, the state will be able to discern natural ecosystem variability from the effects of restoration and protection projects. Such information will allow the state to more fully assess the Master Plan's performance. Data collected through coast-wide monitoring will also be used to improve the quality of models. To complete the suite of baseline data being collected in coastal Louisiana, the Master Plan recommends that this program add a component to assess conditions in coastal waters.

Support focused research and demonstration projects. Research and demonstration projects offer the opportunity to test new concepts on a small scale, with relatively small investments of time, money, and materials. The results of demonstration projects can reduce the unknowns associated with cutting edge concepts, thereby helping the state focus its resources wisely. Examples of topics needing focused research and/or demonstration projects include an investigation of how climate change could affect Louisiana, and research to improve our understanding of how wetlands and other coastal features affect storm surge and wave patterns. Other projects could help define guidelines for using pipeline delivery of sediments to create sustainable marsh, as well as technologies that may build stronger hurricane protection structures than traditional methods allow.

LOUISIANA
COASTAL PROTECTION & RESTORATION AUTHORITY
INTEGRATED PLANNING TEAM

September 2006
Volume 3

IPT Solicits Comments from Stakeholders

Starting in mid-August, the Coastal Protection and Restoration Authority's Integrated Planning Team (the IPT) began meeting with stakeholder groups informing them of the methodology and process by which the Louisiana Coastal Protection Master Plan is being prepared. The objective of these meetings has been to provide information to stakeholders and to receive direct input.

By mid-September, presentations had been made to the following groups: Parishes Against Coastal Erosion (PACE), floodplain managers, regional planning districts, environmental interest groups, and the parishes of Calcasieu, St. Mary, and Vermilion. The IPT has also made presentations as guests at the board meetings of the Louisiana Landowners Association, ten levee boards, and at the Barataria-Terrebonne National Estuary Program Management Conference.

The IPT requires that feedback from these and other stakeholders is addressed and incorporated into the planning process. Inquiries and input from stakeholders will be received, reviewed, and assessed continuously as part of the planning process throughout the project analysis phase of plan preparation prior to publication of the draft in November 2007.

Issues brought up by stakeholders during meetings to date have reflected concerns ranging from future development in the coastal region to levee alignment. Attendees offered a number of recommendations for consideration by the IPT team related to maximizing marsh restoration, restoring marsh using all sediment sources especially those from the Mississippi and Atchafalaya Rivers, and using non-structural restoration in combination with linear and ring levees. Several comments suggested maximum protection including structural solutions across all of Louisiana's

Presentation at the Calcasieu Parish Police Jury Committee Meeting in Lake Charles, LA

LOUISIANA
COASTAL PROTECTION & RESTORATION AUTHORITY
INTEGRATED PLANNING TEAM

November 2006
Volume 4

IPT Interagency/SERT Alternative Plans Review Workshop

On October 24 and 25th, 2006, the Integrated Planning Team (IPT) hosted an interagency workshop. Approximately 38 technical experts, including the Science and Engineering Review Team (SERT) gathered to assist the IPT in evaluating technical analyses, stakeholder comments, and addressing unresolved issues associated with the two alternative plans. Included were representatives from federal, state, and local agencies, parishes, levee districts, universities, and specialized nongovernmental organizations (NGOs). Through workshop discussions, the participants sought to define specific areas lacking consensus and to aid in IPT formulation of the Preliminary Draft Master Plan.

In the workshop introduction, the IPT outlined the meeting goals and described the decision making process, objectives of the program, and review materials used in alternative plan analysis and scoring. Attendees divided into working groups based on five coastal planning units described in the plan. During these breakout sessions, one room was devoted to the Deltaic Plain (planning units 1, 2, and 3a), while the second focused on the Chenier Plain (planning units 3b and 4). Each group was tasked with assessing results of alternative plan analysis and beginning to outline the preliminary draft Louisiana Comprehensive Coastal Preliminary Master Plan.

Overall, the groups sought outcomes that best balance the following four planning objectives:

1) Reduce economic losses from storm based flooding
2) Promote a sustainable coastal ecosystem
3) Provide habitats suitable to support an array of commercial and recreational activities countwide
4) Sustain, to the extent practicable, the unique cultural heritage of coastal Louisiana.

At the end of the workshop, each group presented its proposals for protection and restoration of the coastal areas in the respective regions. These determinations were used as inputs for further analysis at the ITT Plan Refinement workshop held October 31st.

IPT Interagency/SERT Alternative Plan Review Workshop

LOUISIANA
COASTAL PROTECTION & RESTORATION AUTHORITY
INTEGRATED PLANNING TEAM

January 2007
Volume 5

Preliminary Draft Plan Goes Public

On November 29 and 30, 2006, the Coastal Protection and Restoration Authority (CPRA) released a preliminary draft of the Louisiana's Comprehensive Coastal Protection Master Plan. The draft plan was made available to the public on the internet and at presentations held in New Orleans, Houma, and Lake Charles. Local officials, residents, and other stakeholders gathered to review and comment on the state's first plan to restore and protect the coast. The draft plan can be downloaded from louisianacoastalplanning.org, the website of the CPRA-Integrated Planning Team (CPRA-IPT).

Besides releasing the preliminary draft of the comprehensive master plan, the meeting also provided an opportunity for the CPRA to listen to comments and concerns from the public. Members of the Authority, including the Steering Committee, attended each meeting to answer questions and accept public comment. Public officials, stakeholders, and interested Louisiana residents gathered to review and comment on the plan.

CPRA-IPT members stressed that the Comprehensive Coastal Protection Master Plan for Louisiana Preliminary Draft is still conceptual and not yet a complete plan as comments and statements from the public must be evaluated and, where appropriate, incorporated into the plan. The preliminary draft and its appendices describe (a) the planning process used in the plan's development, (b) the plan objectives used in determining alignments and other plan features, (c) public comments from earlier stakeholder meetings, and (d) an outline of the steps necessary for plan implementation and maintenance. Yet to be incorporated in the plan are the priority, sequence, and costs of the plan's individual projects. Comments received during the public comment period, from the end of November until January 5, 2007, will assist the CPRA-IPT in developing the sequence of projects to be included in the final draft plan due to be released in February 2007.

Attendees line up to offer comments to members of the CPRA board in Houma

Improve the tools available for assessing the program. To be effective, the program must constantly assess the quality of what it has accomplished. In this regard, every project constructed should include "as built" designs as part of the contractor deliverable. Design, operations and maintenance, and assessment protocol manuals should also be developed to maintain institutional knowledge. Incorporation of peer reviewed comments from both technical and public stakeholders is another measure that managers must employ to improve the technical quality and scope of management decisions. Using these tools, a regular report on progress made should be developed. This report will allow managers, stakeholders, and the public to understand what has been accomplished. These reviewers can then suggest timely adjustments to projects and the Master Plan.

Expand efforts to engage stakeholders and the public. Establishing an effective and on-going stakeholder and public communication strategy is an essential part of implementing the Master Plan. Citizens provide important ideas about what has already been done, and they can help planners avoid future problems by voicing concerns about trends and impacts in their communities. Dialogue among scientists, engineers, planners, and the public also helps ensure that everyone clearly understands which options are technically feasible.

In formulating this first *Comprehensive Master Plan for a Sustainable Coast,* the planning team held more than 50 stakeholder, science and engineering, and public meetings. The information gained at these meetings helped shape both the overall scope and the detailed discussions in the Master Plan (see Chapter 3). As implementation and refinement of the plan continues, this level of interaction with the public and stakeholders must continue, and even increase, to ensure long-term success. The plan recommends expanding outreach to the public and the media so that the urgent needs of our coast are well communicated in print, radio, and TV coverage. The Interdisciplinary Technical Team should continue to be involved so that information about changing public needs as well as advances in science and engineering can be more easily shared.

Removing Institutional Constraints

Protecting and restoring the coast is not just a matter of building large-scale, high profile projects. Institutional challenges to progress must also be resolved to avoid costly delays and ensure that all projects deliver maximal benefits.

Increase awareness and use of non-structural protection measures. The state must encourage citizens and local governments to take greater advantage of the many non-structural measures available for reducing risk from storm surge. Such measures can help residents and businesses make their homes safer while also reducing flood insurance premiums.

- *Mandatory disclosure laws*. Require that purchasers be notified if their future properties are located in either a 100 year or a 500 year floodplain. This notification should be made before financing for the purchase is approved.

- *Floodplain management training.* Require mandatory training in floodplain regulations for certified building officials responsible for enforcing the new statewide building codes. The training would help these officials be informed about flood elevation requirements as they conduct their day to day responsibilities as inspectors. Such training should also be extended to real estate agents and lenders.

- *Begin a statewide education/outreach campaign.* The campaign's goal should be to inform citizens about the Community Rating System and the many ways in which citizens can reduce their flood insurance premiums. This campaign should be conducted by professional media consultants and use public service and/or paid announcements on television, radio, and print media.

Improve land use planning, zoning, and permitting. During the planning and public comment periods for this document, several people expressed the concern that constructing new hurricane protection systems must not encourage unwise development into high risk areas. Indeed, development has expanded into low-lying areas in the past, serving to increase overall levels of risk and diminishing the effectiveness of the protection structures themselves. Such an outcome would be counter to the Master Plan's objectives of sustaining wetland ecosystems and reducing the flooding risks borne by coastal communities.

Appropriate land use planning and zoning can help achieve these objectives. To this end, the Louisiana Coastal Resources Program and the Louisiana Coastal Zone Management Plan should be strengthened. Zoning actions by local governments, though not popular in Louisiana, are another means of protecting coastal wetlands. State legislation as well as departmental policies should provide incentives that spur local governing bodies to enact region-wide land use zoning. These efforts could follow the lead of Lafayette, Louisiana which has already made great strides in land use planning.

The Louisiana Sea Grant Program and the Coalition to Restore Coastal Louisiana are working on a review of land use planning tools in Louisiana. Their objectives are: to assess state land use planning authority and practices, to provide planners with information on legal and policy tools, to identify gaps in planning authority, to provide information on planner needs to lawmakers, and to facilitate better planning for public safety in the coastal zone. The Coastal Protection and Restoration Authority will convene a working group, including members of parish governments, legislators, landowners, and agency personnel, to examine this report and develop a strategy for implementing required actions. This strategy will guide smart growth that is consistent with the objectives of the Master Plan.

Address processes to acquire land rights. Approximately 80% of coastal Louisiana is privately owned, and the rights of these landowners, including mineral rights, must be honored as components of the Master Plan are constructed and operated. Through many years of working on projects in coastal Louisiana, the state Departments of Natural Resources (DNR) and Transportation and Development (DOTD) have built strong working relationships with most of the coast's major landowners. In order to complete the Master Plan's measures in a timely fashion, these relationships must be fostered and strengthened.

Land ownership has many faces in coastal Louisiana. Often, large tracts of land are owned by a single entity. In other cases, single parcels of property may be owned by hundreds of individuals that are either difficult to contact or, in some cases, unknown. This is particularly true when land has been passed down through generations. Situations will also arise in which multiple parcels of land are needed to implement very large projects. If many parcels of land are needed for a given project, or if the state needs a parcel of land for a project but the parcel is owned by multiple parties, a single landowner's desire not to participate can delay or even terminate the project.

Multiple options must be available to reach equitable solutions for building projects on private lands. The simplest option is to acquire the necessary easements to construct the project. Another option would be to allow for separation of surface rights from mineral rights. The state could then purchase the surface rights to the land, while the original landowner would retain all subsurface and mineral rights.

In cases where such an agreement cannot be reached on a project that is in the best interest of the public, expropriation is a possibility. Both DNR and DOTD can expropriate land under Title 19 of the Louisiana Revised Statutes. However, expropriating involves filing a lawsuit, and the lawsuit must be resolved before the project can begin. This long and contentious process is clearly not a desirable outcome.

Another choice for acquiring the necessary land rights to construct projects that are in the best interest of the public is an authority known as "quick take." When a negotiated settlement cannot be reached after good faith negotiations between the implementing agency and the landowner, and if delays in land acquisition will delay project construction, quick take authority allows the agency to place the offered compensation in the court registry and file a lawsuit against the landowner. Progress toward project construction is not hindered by that action or the suit, and whatever compensation the landowner will ultimately receive is settled at a later date. DOTD has this authority for roadway construction, and levee districts have this authority for levee projects.

To date, DNR has never entertained the idea of using either form of condemnation and considers both to be options of last resort. However, in order to ensure that large-scale projects are built on time, these options must be available, particularly in cases where property would be damaged or destroyed in order to build project features. Thus, although it is the state's clear preference to work in partnership with landowners to achieve the objectives of the Master Plan, passage of legislation to provide DNR and DOTD with "quick-take" authority for the implementation of this plan, similar to that already provided to DOTD for highways, is necessary at this juncture.

Foster the sustainability of coastal forests. Louisiana's coastal wetland forests are of tremendous economic, ecological, cultural, and recreational value to residents of Louisiana, the people of the United States, and the world. But the same stressors that are affecting coastal marshes are also degrading coastal forests and causing outright loss of this habitat.

Louisiana has had best management practices for coastal wetlands since 2000 (Louisiana Department of Agriculture and Forestry, Environmental Protection Agency, and Louisiana Department of Environmental Quality 2000). However, these practices do not address coastal forests or forested wetlands as distinct ecosystems. Governor Blanco activated a Science Working Group to provide information and guidelines on creating sustainable coastal forests, from both environmental and economic perspectives. The group's findings, including specific objectives, were compiled and submitted in a report entitled "Conservation, Protection and Utilization of Louisiana's Coastal Wetland Forests" (Coastal Wetland Forest Conservation and Use Science Working Group, 2005, www.coastalforestswg.lsu.edu).

The group then recommended that its function be split; the Science Working Group itself would deal with science questions, and a separate Advisory Panel would define stakeholder issues. The Advisory Panel would also make policy recommendations for sustainable management of coastal forests in Louisiana based upon the Science Working Group's 2005 report. The Advisory Panel consists of stakeholders, non-government organizations, and state and federal agencies.

This division of responsibility was enacted, and the Advisory Panel's recommendations were released in March 2007 (see Appendix A). The CPRA is now reviewing these recommendations in order to define the state's policies on managing coastal forests. These policies should be implemented as expeditiously as possible in order to provide for the long-term sustainability of threatened coastal forest resources.

Obtain dedicated funding sources. Louisiana cannot implement the Master Plan unless it obtains larger and more reliable funding streams. The state's Coastal Protection and Restoration Fund receives $25 million in state funds annually to address coastal protection and restoration issues, and the federal government dedicates approximately $50 million per year through the Coastal Wetlands Planning, Protection, and Restoration Act (CWPPRA) Program. Funding for hurricane protection projects and other coastal restoration activities comes through annual federal and state appropriations processes, and as such, the dollars allocated are determined by fluctuating fiscal priorities. As a whole, this level of funding is less than what will be required to build the projects presented in the Master Plan.

The Energy Policy Act of 2005 created the Coastal Impact Assistance Program, which will provide approximately $523 million through 2010 to Louisiana and its coastal parishes. The funding is designed to support coastal restoration and infrastructure projects that mitigate the impacts of offshore oil and gas activities. The program will be an important asset as Louisiana ramps up its coastal restoration effort. However, the nation's most successful civil works programs, such as construction of the Interstate Highway System, were supported by a more stable long-term funding commitment. A similar national commitment, buttressed by strict standards of accountability, must be made in order to save Louisiana's coast.

In December 2006, the U.S. Congress passed legislation regarding the sharing of outer continental shelf revenues. This will provide the state and coastal parishes approximately $20 million per year until 2016. In subsequent years, the amount Louisiana receives will increase to between $300 and $500 million per year. Similar commitments of federal funds will need to be applied to this effort.

Address implementation challenges at the federal level. The federal government's traditional method for building hurricane protection and coastal restoration projects works well for endeavors that are localized and relatively narrow in scope. However, the coast-wide, comprehensive program presented in the Master Plan cannot be accommodated using this traditional framework.

The Congressional authorization and appropriations processes present large challenges. For example, the Water Resource Development Act is the primary vehicle used to obtain authorization for restoration projects, but as this document goes to print, Congress has not reauthorized this act in seven years. In addition, before a project can move from planning to design to construction, the Executive Branch must give its approval and Congressional action is needed. At each juncture, a project can meet with delays lasting months or even years. Such restrictions will effectively hamstring Louisiana's coastal restoration and hurricane protection program before it can deliver results.

Program Management

Create a structure to support implementation of the Master Plan. The Integrated Planning Team, which compiled this Master Plan, was created to begin coordinating the efforts of the Department of Natural Resources and the Department of Transportation and Development, as stipulated in Act 8 (see Preface). However, the Integrated Planning Team was seen as a temporary entity that would disband after the first Master Plan was completed. The state must now develop a program structure that can support implementation of the Master Plan over the coming years.

An independent working group of scientists and engineers also recognized this need in their report entitled "A New Framework for Planning the Future of Coastal Louisiana after the Hurricanes Of 2005" (Working Group for Post-Hurricane Planning for the Louisiana Coast, 2006). The Master Plan recommends adopting recommendations from this group, particularly the suggestion that a Coastal Assessment Group be made a permanent entity within the state's management structure. The Coastal Assessment Group should use the talents of scientists and other technical experts who can reach out to the international research community to supplement their understanding of specific issues. The group would be responsible for:

- reporting on progress made toward implementing the Master Plan's measures;
- making revisions to the Master Plan as laid out in the adaptive management strategy;
- preparing the *Annual Plan: Ecosystem Restoration and Hurricane Protection in Coastal Louisiana* (Annual Plan), and ensuring that the Annual Plan's contents, including the activities of the Applied Coastal Science and Engineering Program discussed below, are consistent with the priorities set out in the Master Plan;
- helping to resolve policy, legislative, and institutional issues that may hinder progress;
- fostering greater consistency between the Master Plan and activities taking place in south Louisiana that may affect coastal protection and restoration.

The Master Plan also recommends that an Applied Coastal Engineering and Science Program be established to resolve data and knowledge gaps and to facilitate scientific, engineering, and technical advancements. This program would consult with and be supported by existing programs, such as the Louisiana Coastal Area Science and Technology Program, which focuses mainly on ecological and restoration issues. By contrast, the proposed Applied Coastal Engineering and Science Program would focus on research associated with both restoration initiatives and flood protection projects.

Provide an effective structure for federal partnerships. The federal government should act quickly to develop mechanisms for focusing federal involvement in an effective, problem-solving partnership with the state. This should include a process to align the many diverse federal agency missions related to the protection and restoration of coastal Louisiana.

Ensure monitoring and inspection of the hurricane protection system. After the disastrous hurricanes of 2005, the state took steps to enhance the levee inspection program (La.RS:38:241 and 38:247). The Coastal Protection and Restoration Authority is now responsible for ensuring that hurricane protection levees are well planned, constructed, and maintained. In support of this goal, the Department of Transportation and Development (DOTD) has implemented a mandatory levee inspection program requiring that each levee district perform quarterly inspections, correct any deficiencies found, and submit detailed inspection and remediation reports. DOTD has developed a levee inspector training and certification program to supplement its long-standing training program for directors and staff of levee boards. DOTD is also planning a program to provide oversight and quality assurance inspection of all Corps of Engineers levee construction projects.

Ensure regular reviews of the Master Plan. The Master Plan is designed to be a living document that will evolve over time to reflect our improved understanding of the coast. As a result, the full Master Plan should be reviewed and updated initially after five years, and then again at regular intervals of five to ten years as conditions warrant. In addition to these regular reviews, unforeseen circumstances—such as a major hurricane or a significant change in funding for the plan—should prompt an earlier review.

Conclusion

At the heart of all of these recommendations is the recognition that coastal Louisiana connects the nation's heartland to the rest of the world, transporting agricultural and industrial commodities and meeting the nation's energy demands while at the same time supporting amazingly productive ecosystems and culturally vibrant communities.

Ensuring the sustainability of this region requires the same basic commitment from all concerned: the resolve to achieve and maintain an unprecedented level of excellence in our plans for and care of coastal Louisiana. This commitment does not seek to elevate one set of needs over another, but rather to balance the many interests—cultural, economic, and ecological—that together make America's Wetland one of the most unique and vital coastal regions in the world.

Courtesy Donn Young / Port of New Orleans

Norwegian Cruise Lines' Norwegian Sun berths at the Port of New Orleans. The Norwegian Sun was the first cruise ship to return to New Orleans following Hurricane Katrina.

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Coastal Protection and Restoration Authority of Louisiana

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Integrated Ecosystem Restoration and Hurricane Protection: Louisiana's Comprehensive Master Plan for a Sustainable Coast

Appendix A:
Final Plan and Implementation

Coastal Protection and Restoration Authority of Louisiana

April 2007

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1.0 Introduction

This appendix describes the Master Plan in full together with the process for its implementation and future review. The first step in development of this Master Plan was the definition of the principles and objectives that provide the vision and direction for creation of the Plan. These are set out in full in Chapter 3, and provide the foundation for the entire decision making process (as reported in Appendices B and H).

The plan was defined through application of the decision making process and consultation upon the November 2006 Preliminary Draft and February 2007 Draft of the Master Plan. The complete set of measures, studies and programs that constitute the Master Plan are described in Chapter 4 of this Appendix.

Chapter 5 then sets out the process to be followed in implementation of this first iteration of the Master Plan. It should be noted that the priorities and sequence of implementation for this first iteration of the Master Plan is reported in the 'Fiscal Year 2008 Annual Plan: Ecosystem Restoration and Hurricane Protection in Coastal Louisiana' (Annual Plan) in order that it can be regularly reviewed and updated. Implementation recommendations include several critical components for the success of the Master Plan, beyond the sequencing of implementation of the individual measure and study recommendations. Included within this 'Program Implementation Strategy' are recommendations for the following actions.

- Establish a 'Coastal Assessment Group' to oversee and facilitate implementation of the Master Plan.
- Establish an Applied Coastal Engineering and Science Program to resolve areas of scientific uncertainty and promote technological advancements that will advance program implementation.
- Make necessary changes to policy and legislative issues such as land use planning, the need for dedicated funding sources and review of the Congressional authorization and appropriations process.
- Formulate and implement an adaptive plan management process, to include monitoring of measure and program performance, knowledge management, focused research, feedback mechanisms, reporting of progress and ongoing stakeholder engagement.

This Annual Plan will reflect the priorities and dependencies identified through the sequencing process.

The final chapter of this appendix then looks beyond the implementation of this version of the Master Plan to consider future iterations of the plan. The Master Plan is intended to be a 'living document' that will be reviewed periodically to reflect the new knowledge arising from plan implementation and changes to the physical, environmental, social or political setting. It is anticipated that the first review of the plan will occur within a relatively short timeframe (within 5 years) as the framework and understanding are anticipated to develop relatively rapidly following this initial plan. Thereafter, a regular cycle of plan review will be recommended together with unscheduled reviews as required when circumstances unexpectedly change. Chapter 6 also includes details of the process that should be adopted when undertaking a review of the Master Plan, from review of the objectives through to identification of the preferred plan.

2.0 Coastal Louisiana

2.1 Critical Need

Coastal Louisiana is a complex ecosystem composed of bottomland hardwood forests, swamps, marshes, cheniers (forested coastal ridges), prairies, bayous, bays, and barrier islands. Threaded through the eastern portion of the landscape are a series of ridges along former distributaries of the Mississippi River, upon which the majority of communities settled. In the west, the prairie and cheniers were the focus of settlement. The coastal Louisiana ecosystem contains 30 percent of the coastal marsh in the contiguous United States, yet it suffers 90 percent of the total coastal marsh loss. The alarming rate of land loss in coastal Louisiana has been well documented. Since the 1930s, coastal Louisiana has lost over 1.2 million acres (1,875 mi^2), an area nearly the size of Delaware (Barras et al., 2003; and Dunbar et al., 1992). At present, the rate of loss is approximately 15,300 acres per year (23.9 mi^2/yr), but estimates indicate that coastal Louisiana could experience a net loss of an additional 328,000 acres (513 mi^2/yr) by the year 2050 (Figure 2.1; Barras et al., 2003).

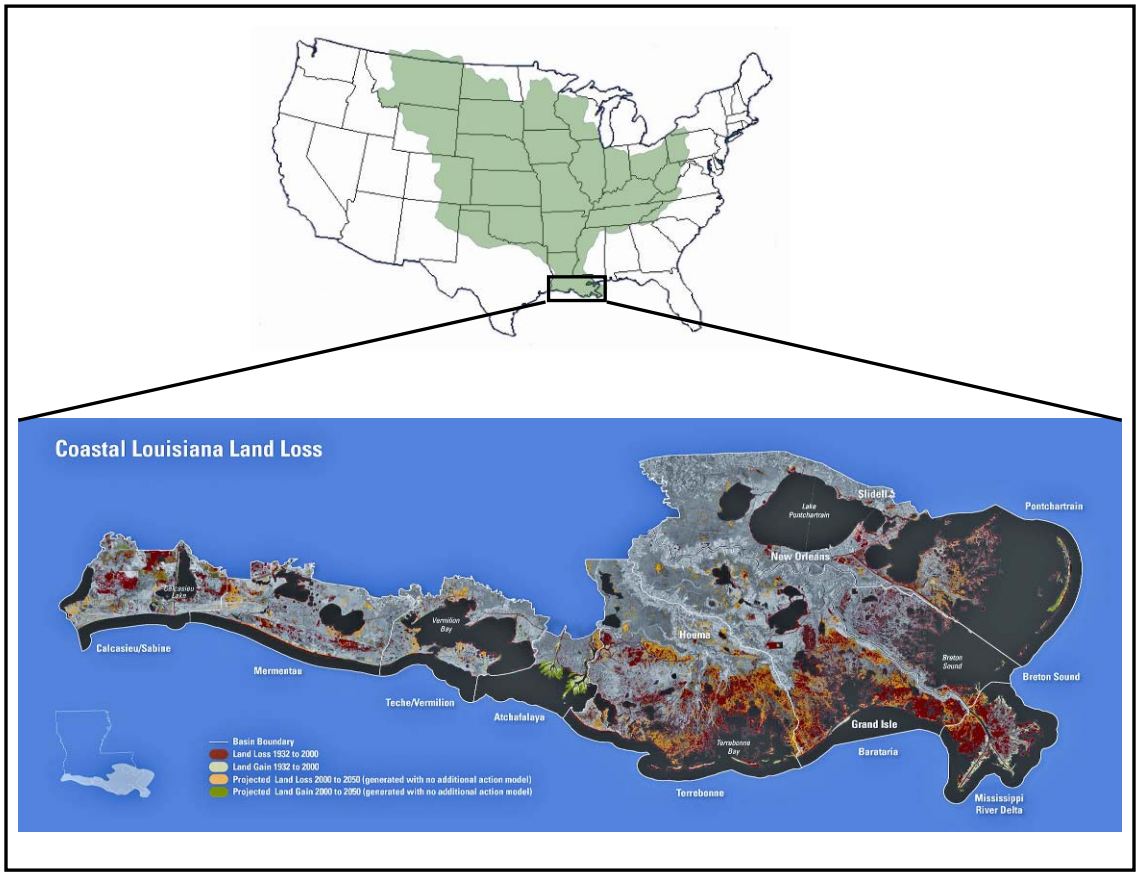


Figure 2.1: Mississippi River water shed and close-up of coastal Louisiana. Watershed map modified from Theodora Maps. Colors in Louisiana land loss map: red indicates land lost between 1932 and 2000; yellow indicates projected land loss from 2000 to 2050 if no additional action is taken to offset this trend (Barras et al. 2003).

In addition to this predicted trend, a study by the U.S. Geological Survey (USGS) has reported that the storms of 2005 converted approximately 138,880 acres (217 mi^2) of marsh to water (Barras 2006). Of this total, 98 square miles of land were lost in southwestern Louisiana, and 119 square miles were lost in southeastern Louisiana. Analyses of future growing seasons will indicate how much of this damage is permanent, as marsh plants may rebound in some spots and not in others. Regardless of the final outcome, the storms have aggravated an already dire land loss emergency. The storms of 2005 called out another extreme vulnerability to the long-term viability of coastal Louisiana – that of the inadequacy of hurricane protection measures in this fragile region. Hurricanes Katrina and Rita caused severe damage to over 200,000 homes, and one year after the storm approximately 440,000 Louisiana citizens were still displaced from their homes. The Congressional Budget Office estimated that losses of physical capital totaled between $70 and $130 billion. Approximately 45% of these losses involved business structures or equipment, including resources owned by national concerns.

The past and continual degradation of Louisiana's coastal landscape will have significant ecological, societal, and economic impacts on the region and the Nation as tremendous resources supported by the coastal zone are put at risk. According to the 2000 census two million people, or over 65 percent of the population of Louisiana, live within 50 miles of the coast. Based on 2001 census estimates, the total population for the seventeen coastal parishes and the nine adjacent parishes that "connect economically to the coastal parishes" was almost three million (Richardson et al., 2004). Louisiana's economy is concentrated in the southern region of the state. This includes 73.5 percent of total state employment, almost 60 percent of oil and gas employment, 77 percent of pre-Katrina/Rita construction employment, and 67 percent of all manufacturing employment in the state (Richardson et al., 2004). Nationally important industries directly tied to locations on the coast and major waterways include not only the production of oil and gas, but offshore oil and gas exploration, development and transport; shipbuilding and other manufacturing of transportation equipment; petroleum and chemical refining; and water-borne transportation, as well as seafood production and harvest.

Nearly 9,300 miles of oil and gas pipelines cross the wetlands of coastal Louisiana (USACE 2004). The network of associated energy facilities produces or transports nearly one-third of the nation's oil and gas supply, and is tied to 50% of the nation's refining capacity (DNR 2006). Additionally, 80% of the nation's offshore domestic oil and gas supply is transported through coastal Louisiana. Coastal Louisiana also supports intermodal transportation that is critical to the viability of the nation. Five of the busiest cargo ports in the United States, ranked by total tons, are located here, handling approximately 19% of the annual U.S. waterborne commerce (USACE 2003). Louisiana is known as "Sportsman's Paradise" for the diverse habitats found along its coast, which in turn support a vast diversity of fish and wildlife species. Louisiana is by far the nation's largest shrimp, oyster, and blue crab producer and provides 26% (by weight) of the commercial fish landings in the lower 48 states. In fact, Louisiana is second only to Alaska in annual volume of seafood landings. According to National Oceanography and Atmospheric Administration reports (US Department of Commerce 2004; US Department of Commerce 2005), three of the nation's top seafood ports by volume are in Louisiana. Coastal Louisiana's wetlands also provide stopover habitat for millions of threatened and endangered neotropical migratory birds, and more than five million migratory waterfowl. These natural resources provide the state with vital jobs to support the commercial and recreational industries, and the nation with valued seafood. The richness of Louisiana's culture, a richness in part driven by the history that is present throughout the state, is also a tremendous attraction to the Nation and the world. It is this indefinable richness that has made tourism such an important contributor to Louisiana's economy, whether this richness comes from historic architecture, food, music, language or culture. According to the Louisiana Department of Culture, Recreation & Tourism over $4.4 billion of visitor spending in Louisiana in 2004 was from New Orleans and Lake Charles. Where coastal Louisianans live, work, and play, is part of their identity. Sustaining Louisiana's coastal culture is dependant on sustaining Louisiana's coast.

Without barrier islands, wetlands and the protection of infrastructure and communities that supply the workforce for these industries, these nationally important resources would be at much greater risk to storm damage and supply disruptions. For these reasons and more, this region must be sustained for the well being of the state and the nation.

2.2 The CPRA – A New Approach

The Louisiana Legislature, through Act 8 of the First Extraordinary Session of the 2005 Louisiana Legislature, established the Coastal Protection and Restoration Authority (CPRA) to develop, implement, make reports on, and provide oversight for a comprehensive coastal protection master plan (Master Plan) and annual coastal protection plans, working in conjunction with state agencies, political subdivisions, including levee districts, and federal agencies. The Master Plan, as described herein, portrays the State's desires and needs relative to hurricane protection and coastal restoration, integrating these efforts in order to achieve long-term and comprehensive coastal sustainability.

The Master Plan builds on past efforts and existing programs to provide this comprehensive vision, and serves to unite the work of on-going programs including the Coastal Wetlands, Planning, Protection, and Restoration Act (CWPPRA); the Louisiana Coastal Area (LCA) Ecosystem Restoration plan; the Coastal Impact Assistance Program (CIAP); hurricane protection proposals; and the US Army Corps of Engineers (USACE) Louisiana Coastal Protection and Restoration (LACPR) Study. The CWPPRA, which is overseen by five Federal agencies and the State, has provided Louisiana and its Federal Partners with a dedicated funding source for coastal restoration projects. The CWPRPA Program has developed: an Annual Priority Project List Report since 1991; the Louisiana Coastal Wetlands Restoration Plan with its 10 appendices in 1993; a Quality Management Plan and Monitoring Program; the Coast 2050 Plan with its 6 appendices in 1998 (LCWCRTF and WCRA); and a Revised Coast 2050 Plan in 2001 (LCWCRTF and WCRA). Since 1991, the CWPPRA Program has constructed 67 projects, with another 72 projects either in engineering and design or currently under construction.

The LCA report, with its 12 appendices, was completed by the USACE and the State of Louisiana in 2005. The LCA Plan was developed with input from all resource agencies, stakeholders, and the public at large. Although not a comprehensive solution to the challenges facing coastal Louisiana, it lays the groundwork for a system-scale coastal restoration effort. Numerous studies, interagency and agency engineer manuals and handbooks, and technical reports by the USACE, Natural Resources Conservation Service, U. S. Geological Survey, and U. S. Fish and Wildlife Service have also been compiled over the past 30 years that include data on the Mississippi River and other rivers pertinent to Louisiana's sediment sources, and Coastal Louisiana data as they relate to problems on the Louisiana coast (listed in Appendix K, Bibliography).

The Master Plan has also been developed in close coordination with the Coastal Impact Assistance Program (CIAP) plan that was released in February 2007. These two plans are complementary, and in fact the CIAP plan serves as an early opportunity for substantial progress toward implementation of the Master Plan.

At the same time, other nations have been faced with similar problems with their shorelines, wetlands, and river deltas, such as the Netherlands, the United Kingdom (UK), Germany, France and Italy. All efforts provide important insights into the technologies that may be used to provide coastal protection in Louisiana. In particular, the technologies and lessons learned by the Dutch are of relevance to issues we face in coastal Louisiana today. However, for the purposes of developing a strategic planning approach, the approach used in the United Kingdom was identified as the most suitable. This approach has been developed over the past 15 years by the UK Department of Environment, Food, and Rural Affairs (formerly the Ministry of Agriculture, Fisheries, and Food).

3.0 Master Plan Principles and Objectives

Central to the definition of a long-term and comprehensive coastal protection and restoration plan is the concept of sustainability. Put simply, sustainability seeks to ensure that actions taken today, to address present day issues, avoid to the extent possible tying future generations into inflexible and unacceptably expensive approaches. There are many aspects to sustainability to consider in a comprehensive plan that is seeking to address the long-term management of both coastal protection and restoration. The Master Plan sets a path toward the achievement of sustainable long-term management of coastal Louisiana.

The process of defining the Comprehensive Coastal Protection Master Plan began with identification of principles to provide fundamental guidance for that plan. Concepts related to sustainable management of the coast (described in detail in Appendix D), were translated into a series of principles and objectives to direct definition of the Master Plan. In addition to these concepts, the State directive, in identifying broader plan requirements, provided a further basis for the principles.

These principles identify the range of value-based considerations applied in developing the comprehensive plan, and in doing so, they build on legislative directives. Many of the principles defining environmental-related considerations are derived directly from those developed for the Louisiana Coastal Area (LCA) Ecosystem Restoration Study. Additional principles are included that define the considerations associated with risk reduction of coastal economic and environmental assets and the ability to balance and sustain current uses with improved risk reduction.

These principles define a broader set of subcomponents of those common fundamental objectives found in the State and Federal directives. They also aid in the identification of assets and risks in the landscape and support the definition of planning objectives that indicate levels of success.

3.1 Master Plan Purpose

For the benefit and protection of the state as a whole, its citizens and its localities, hurricane protection and ecosystem restoration are vital to survival. It is without question that the viability of residential communities; agricultural, energy, fish and wildlife production; and commercial and industrial development in coastal Louisiana is dependent on a sustainable coastal ecosystem. The State and Nation must therefore act to provide protection to coastal Louisiana through the use of a holistic, comprehensive plan integrating ecosystem restoration with structural and non-structural measures for storm damage reduction.

3.2 Program Principles

Program principles identify the critical manners in which implemented plans and measures may ultimately interrelate with and alter the activities and assets within the coastal landscape. They describe the range of critical considerations required to develop appropriate and effective plans and plan components. These principles, set out below, represent the *rules* by which the program implementation, including the plan formulation process, is conducted.

- In order to achieve a sustainable long-term solution for comprehensive hurricane protection and coastal restoration, projects and plans will be integrated and evaluated on a 100 year planning horizon to understand future implications of current actions.

- The comprehensive hurricane protection and coastal restoration plan will provide a basis for follow-on decisions regarding redevelopment of south Louisiana and effective evacuation planning.
- The plan will identify the frequency and severity of future flooding and erosion risks so informed decisions can be made regarding future development and land use in coastal Louisiana, to reduce inundation of coastal communities, and to ensure sustainable and productive coastal habitation.
- The Master Plan will be developed and implemented with the participation and input of the numerous and diverse interests that live, work, and play in coastal Louisiana, along with national interests who depend upon coastal Louisiana's continued health and existence.
- An integrated, standardized procedure and scoring system will be developed and followed that will allow reasonable and informed decisions between and within planning units.
- The protection and restoration of coastal Louisiana will be an ongoing and evolving process. The selected plan will include an effective monitoring and evaluation process that reduces scientific and engineering uncertainty, assesses the success of the plan, and supports adaptive management of plan implementation.
- The level of detail provided for a measure may only be as great as the level of understanding of the problems, needs, and opportunities for a region or the proposed solutions. Promising concepts must be evaluated expeditiously and implemented if shown to be appropriate.
- The plan will be reviewed on a regularly scheduled basis and after exceptional events, and will be reformulated as necessary to respond to changing economic, social, and environmental conditions.
- Limited sediment availability is one of the constraints on system rehabilitation. Therefore, plan elements including mechanical sediment retrieval and placement may be considered where landscape objectives cannot be met using natural processes. Because sediment mining can contribute to ecosystem degradation in the source area, such alternatives should, to the extent practicable, maximize use of sediment sources outside the wetland ecosystems, such as from rivers or from the Gulf of Mexico.
- Constraints on coastal protection and restoration will be identified in plan formulation. Such constraints may include resource limitations (e.g., sediment availability, freshwater sources, funding), scientific or technical uncertainties (e.g., subsidence and sea level rise rates, effectiveness of certain restoration techniques, modeling uncertainty), and socio-economic considerations (public acceptability of proposed actions; preferred land uses such as agricultural, residential, industrial, fisheries).
- Projects will be designed and implemented in the most cost efficient manner using adaptive management and appropriate engineering, economic, and scientific criteria.
- Synergies between traditional flood and storm protection measures and coastal restoration opportunities will be encouraged, and cost-effective solutions will be sought.
- Protection and restoration alternatives that minimize long-term operation and maintenance costs will be preferred. For example, restoration measures should always be considered in conjunction with levees in order to minimize exposure of hard structures to open Gulf conditions. Further, restoration alternatives that rely on natural cycles and processes for ecosystem sustainability, rather than external energy subsidies, will be preferred.
- Allowing development of low-lying areas within protection systems not only increases exposure to damages in the event of a system failure, but also diminishes effectiveness of the protection works themselves by removing water storage areas from the system. This program will support and promote close coordination among all jurisdictional authorities to encourage strict enforcement of laws and regulations. Appropriate easements will be obtained in wetlands landward of hurricane protection systems to maintain these important natural buffer zones.

- Recognizing that disturbed and degraded ecosystems can be vulnerable to invasive species, implementation of the plan needs to be coordinated with other State and Federal programs addressing such invasions. Project designs will promote conditions conducive to native species by incorporating appropriate features to protect against invasion to the extent possible without diminishing project effectiveness.
- Program implementation, including development of the plan, will comply with all applicable state and federal laws and regulations. It is understood that a component of program implementation is to seek revisions to laws and regulations, if appropriate, to ensure timely implementation of the master plan.

3.3 Coastwide Planning Objectives and Plan Formulation Principles

The 'Coastwide Planning Objectives' provide a broad set of overall aspirations, which the Master Plan seeks to deliver. These objectives provide the basis for determining the relative success of all potential plans or individual plan components.

By establishing a full and diverse range of values, these objectives ensure that the Master Plan is gauged and selected to meet both State and Federal directives, while delivering a sustainable long-term Master Plan. The coastwide planning objectives, which represent the desired attributes of any plan, are listed below.

Plan formulation principles identify the necessary considerations for identifying potential measures and the comprehensive coastal protection plan. They address the definition of potential measures, potential constraints for development of plans, possible limitations in application of types of measures, and provide guidance on how these factors should be addressed. These principles, as set out below for each of the objectives, serve as the guidelines that cannot be violated during plan formulation.

Objective 1. Reduce economic losses from storm based flooding to residential, public, industrial, and commercial infrastructure, assuring that assets are protected, at a minimum, from a storm surge that has a 1% chance of occurring in any given year.

- This may be achieved by implementing plans, projects, policies, and programs intended to provide for hurricane protection and coastal conservation and restoration, including constructing levee and floodgate systems, enhancing natural landscape elements, and elevating, flood-proofing or relocating structures.
- Protection of resources of national and statewide significance will be a priority; including major oil and gas facilities and refineries, deep draft ports and waterways, military and military-support facilities, the Gulf Intracoastal Waterway, interstate and other major highways, and historic sites.
- This objective explicitly deals with protection of assets. Effective evacuation procedures must be implemented.

Objective 2. Promote a sustainable coastal ecosystem by harnessing the processes of the natural system.

- A sustainable system is one characterized by high levels of productivity and resilience (the ability of a system to withstand naturally variable conditions and/or recover from disturbances).
- This may be achieved by providing for daily, seasonal and episodic fluctuations in water levels and salinities, and/or reestablishing natural pathways of sediment movement and nutrient uptake.
- Appreciation of the dynamic nature of the coastal system must be integral to the planning and selection of preferred alternatives.

- Design, construction, and operation of new flood and storm protection measures should avoid or minimize effects that would reduce ecosystem resilience. Where practicable, disrupted hydrologic systems should be rehabilitated to re-establish sustainable processes.
- Project design should promote conditions that route riverine waters through estuarine basins and promote sheet flow over wetlands in order to maximize nutrient assimilation.

Objective 3. Provide habitats suitable to support an array of commercial and recreational activities coastwide.

- As Louisiana's coastal ecosystem degrades, critical habitat that supports fish and wildlife species continues to be lost. Therefore, the plan will seek to increase the magnitude of suitable fish and wildlife habitats coastwide.
- The plan will seek to ensure a continued diversity of fish and wildlife habitats coastwide.

Objective 4. Sustain, to the extent practicable, the unique heritage of coastal Louisiana by protecting historic properties and traditional living cultures and their ties and relationships to the natural environment.

- Louisiana coastal communities are valuable. They are living stewards of the culture, history, land and environmental resources of the coast for themselves, for the state, and for the nation.
- Sensitivity and fairness must be shown to those in the coastal communities whose homes, lands, livelihoods, and ways of life may be adversely affected by the implementation of any selected alternatives.
- Displacement and dislocation of resources, infrastructure, and possibly communities may be unavoidable under some scenarios. Because of the negative near-term effects some restoration projects may have on the sustainability of existing cultures, careful consideration of mitigation efforts on human disruption must be undertaken.

4.0 The Full Plan

4.1 Background

The long-term Master Plan is a detailed vision that provides guidance for the future of Coastal Louisiana. This plan represents the State's first approximation of the comprehensive, integrated solution for ecosystem restoration and hurricane protection. It builds upon previous planning, research, and lessons learned. The Master Plan is also an integrated approach meant to balance objectives in a comprehensive manner while allowing implementation in a feasible, cost-effective way to provide for all the resources and citizens of Louisiana. This plan represents a point of departure from how planning of activities along coastal Louisiana has been done in the past. As such, it does not represent an end product, but instead a new direction and a new philosophy for how we live in, and manage the resources of, coastal Louisiana.

Many adjustments will need to be made in the first few years of implementation, including revisions to existing management practices, policies, and legislation. Additionally, although the Master Plan builds upon decades of experience, implementation of this program and some of the measures which comprise the plan will require much further analysis including modeling, engineering & design, and environmental study. Therefore, mechanisms for change – not only early in plan implementation, but throughout the life of its implementation – will be required to meet the needs of the Master Plan. Such activities are discussed further in Chapter 5 of this appendix. This chapter, describing the plan, lays out the "constructable" components of the Master Plan, including those large-scale planning, and coastwide programmatic, measures that will support construction of measures. Order of presentation does not indicate order of priority; for further discussion of the process for identification of urgent early actions, refer to Chapter 5.2.

4.1.1 Plan Formulation

A decision making process (described in Appendix B) was developed in order to provide a consistent framework to consider the relative merits of any potential management options to achieve the principles and objectives (Chapter 2). The process was supported by technical analyses (see appendices E, F, and G) and applied to evaluate the outputs from appraisal of two alternative plans which had been developed as an aid to the process of defining the Master Plan (see Appendix H). The outputs from evaluation of these alternative plans, together with the assessments of the certainty of these evaluations, were used to generate the Preliminary Draft Master Plan, also presented in Appendix B. The IPT sought public comments on the Preliminary Draft Master Plan, which was released for public review on November 29, 2006, through a series of nine public meetings, meetings with the LCA Science Board and the CPRA Science and Engineering Review Team, and a public comment period that ended on January 5, 2007. Based upon comments (see Appendix C-2) and further analyses of the Preliminary Draft Master Plan, the Draft Master Plan was prepared and released for public review on February 6, 2007. The IPT sought public comments on the Draft Master Plan through a series of three public hearings, two public meetings, a joint meeting with the LCA Science Board and the CPRA Science and Engineering Review Team, and a public comment period that ended on April 2, 2007. Based upon comments (see Appendix C-1) Final Master Plan was revised and is presented below. This plan was approved by the CPRA on April 12, 2007.

4.1.2 Measure Definition

Measure descriptions contained in this chapter were used to generate cost estimates for planning purposes. In many cases, there is extensive planning and design that will be necessary, including more detailed analyses of alternatives, before finalizing alignments, features, costs, and operational schemes. For example, we have identified areas of Louisiana's coast that require hurricane protection through construction of hurricane protection

structures. It is recommended that certain areas of the coast are protected from storm surges that have a 1% chance of occurring in any given year. Other areas are recommended for protection from larger storm surges, but given the status of ongoing data collection and storm surge, engineering, and economic analyses, it is difficult to say with certainty how high the level of protection may be. For the purposes of this report, these areas have been analyzed as being provided protection from storm surges with a 0.2% chance of occurring in any given year because planning data indicate risks that require substantially greater protection measures than the baseline level (1%). Completion of additional analyses, such as those progressing within the Corps of Engineers' *Louisiana Coastal Protection and Restoration Project*, will inform and ultimately define the technically feasible level of protection. In any case, the goal is to provide protection to these areas proportional to the total economic consequences that may be incurred when larger storm surges impact the coast.

4.2 Coastwide Benefits of the Plan

The appraisals undertaken to support development of this plan clearly demonstrated that without significant action the coastal landscape of Louisiana will continue to degrade, reducing the sustainability and productivity of the coast, while also increasing the flooding risk to built assets. With no further action, it has been previously estimated that 513 square miles of land may be lost by 2050 (Barras, 2003). Analyses undertaken for this study (see Appendix G) indicate that as much as 762 square miles of land could be lost by 2050.

The economic consequences from storm surge flooding include direct damages to property and infrastructure, emergency costs, evacuation and subsistence costs, and reoccupation and clean up costs. The storm surge and economic appraisals have demonstrated that, under existing conditions, the areas vulnerable to flooding with a 1 percent annual probability includes over 430,000 residencies, with potential economic consequences of over $34 billion coastwide. The 0.2% probability risk area includes over 871,000 residencies, with potential economic consequences of over $157 billion coastwide.

Although the above represent total coastwide risk, any individual storm of these magnitudes would also result in tremendous losses to the economy of the entire Nation by increasing the costs of goods because of disruptions to navigation and by increasing the costs of natural gas and oil products. Additionally, tremendous burdens are placed on other areas in the region by the large number of evacuees that must be provided for in the wake of hurricanes. In summary, hurricane protection for south Louisiana can be considered of critical importance to the local citizens, the Region, and the Nation. The Master Plan sets out an integrated combination of measures representing a significant reduction in these potential negative future impacts.

The proposed protection measures provide for the avoidance of the large majority of potential damages to built assets under the two storm surge levels analyzed. If aggressively implemented the plan is capable of reducing total potential damages to areas vulnerable to flooding with a 1 percent annual probability by 90 percent to less than $4 billion, and reduces the number of residences at risk by 96 percent. The 0.2% annual probability risk damages may be reduced by 84 percent to less than $25 billion and the number of residences at risk is reduced by 80 percent. Additional to these benefits is the avoidance of many of the National economic impacts identified above. These figures represent strong economic case for the storm surge protection measures set out in this preliminary draft plan.

Analyses performed to forecast the nature of changes to the coastal wetland system under the Master Plan indicate that if all of the Master Plan's restoration projects were aggressively implemented, Louisiana will be able to increase sustainability in significant portions of the coastal zone. It should be noted, however, that this analysis did not account for effects of some of the larger restoration measures, such as the Mississippi River Delta

Management plan because of their conceptual nature (see description of large-scale planning efforts, chapter 4.4 of this appendix). Therefore, the Master Plan holds the possibility that past and continued land loss could be substantially slowed or even reversed if all measures were fully implemented. Possibly more important than the reversion of land loss trends will be the creation of a more sustainable system whereby freshwater and tidal flows naturally maintain coastal landscapes and their associated ecosystems. The plan will also provide for a continued diversity of habitats in coastal Louisiana that support recreational and commercial activities on the coast. This improved coastal landscape will also increase storm surge protection to many built coastal assets and buffer levee systems from open water conditions. In combination, these hurricane protection and ecosystem restoration improvements provide coastal communities an understood degree of risk reduction that will allow them to make informed decisions for shaping their future.

4.3 Measures Maps

Figures 4.1 through 4.6 contain conceptual representations of all measures. Note that these should not be viewed as definite footprints of proposed measures. Further planning, engineering, and design; as well as scientific, engineering, stakeholder, and public input is required to determine exact specifications for construction. Descriptions of measures may be found in sections 4.4 through 4.10.

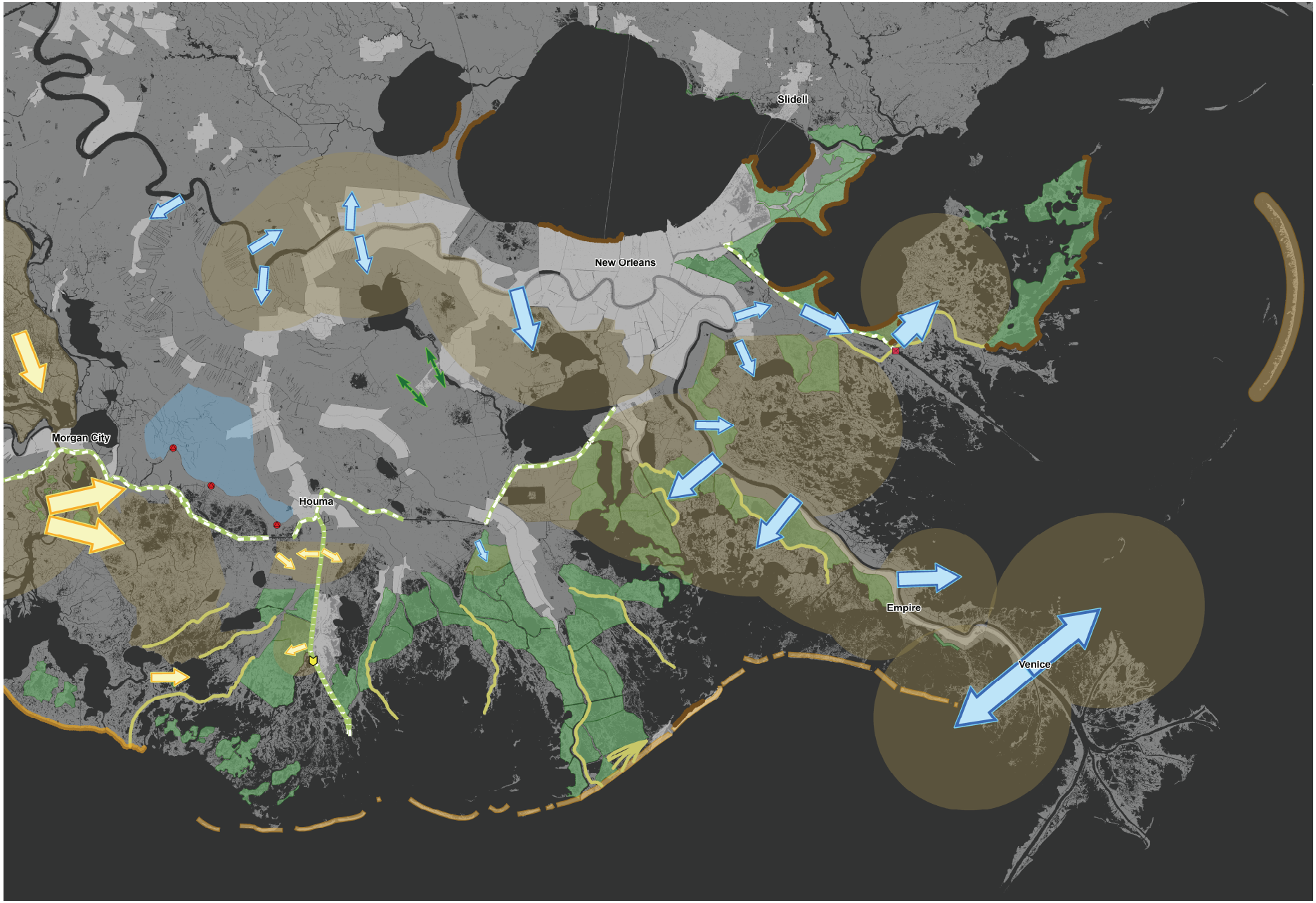
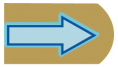


Figure 4.1: Ecosystem Restoration in the Mississippi River Delta Plain (legend follows on page 13).

LEGEND FOR FIGURE 4.1: Ecosystem Restoration in the Mississippi River Delta.

 Mississippi River Diversion	- Mississippi River Diversion at Hope Canal - Mississippi River Diversion at Convent/Blind River - Mississippi River Diversion at Violet - Modify Authorization of Caernarvon Diversion - Mississippi River Diversion at White Ditch - Mississippi River Diversion at Bayou Lamoque - Mississippi River Delta Managment - Mississippi River Diversion at Bayou Lafourche - Mississippi River Diversions at Strategic Locations in Upper Barataria Basin - Modify Authorization of Davis Pond Diversion - Mississippi River Diversion at Myrtle Grove with Dedicated Dredging - Mississippi River Diversion at West Point a la Hache with Dedicated Dredging - Move Freshwater to Terrebonne Basin from Barataria Basin via GIWW
Atchafalaya River Diversion	- Convey Atchafalaya River Water eastward via GIWW to benefit Eastern and Lower Terrebonne Marshes - Optimize Flow Distribution at Old River Control Structure - Freshwater Introduction via Blue Hammock Bayou - Freshwater Introduction into Central and Lower Terrebonne Marshes
Water Management Area	- Chacahoula Basin Plan
Pump Station	- Chacahoula Basin Plan
Closure	- Close Mississippi River Gulf Outlet (MRGO) at Bayou La Loutre Ridge
Drainage Improvements	- Upper Barataria Basin Hydrologic Improvements at Highway 90

Barrier Shoreline Restoration	- Barrier Shoreline Restoration: Chandeleur Islands - Barrier Shoreline Restoration: Barataria Basin - Barrier Shoreline Restoration: Terrebonne Basin - Barrier Shoreline Restoration: Point Au Fer Island
Marsh Restoration using Dredged Material	- Maintain and Restore the Breton Sound Marshes - Maintain and Restore Biloxi Landbridge and Barrier Reefs - St. Tammany Marsh Restoration - Central Wetlands Restoration - Marsh Restoration using Dredged Material at Golden Triangle - East Orleans Landbridge Restoration - Marsh Restoration using Dredged Material in Barataria Basin - Mississippi River Diversion at Myrtle Grove with Dedicated Dredging - Mississippi River Diversion at Point a la Hache with Dedicated Dredging - Marsh Restoration in Terrebonne Basin - Marsh Restoration at Point Au Fer Island - Maintain Landbridge between Caillou Lake and Gulf of Mexico - Beneficial use of Dredged Material
Shoreline Stabilization in Strategic Areas	- East Orleans Landbridge Restoration - Shoreline Protection on South Shore of Lake Pontchartrain - Maintain and Restore Biloxi Landbridge and Barrier Reefs - Maintain MRGO-Lake Borgne Landbridge - Shoreline Stabilization on Maurepas Landbridge - Grand Isle and Vicinity Protection and Shoreline Stabilization
Navigable Waterway Stabilization	- Mississippi River Gulf Outlet (MRGO) Shoreline Stabilization - Bankline Protection for Gulf Intracoastal Waterway (GIWW) - Bankline Protection for Houma Navigation Canal (HNC)
Ridge Habitat Restoration	- Restore Bayou LaLoutre Ridge - Ridge Habitat Restoration in Barataria Basin - Ridge Habitat Restoration in the Terrebonne Basin

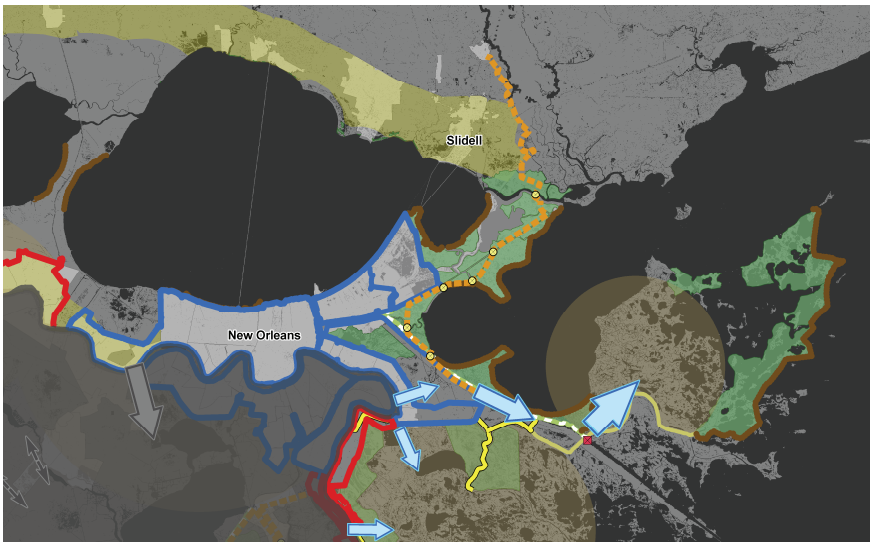


Figure 4.2a: Hurricane Protection for the New Orleans Metropolitan area and surrounding communities, showing Lake Pontchartrain Barrier Alternative 1 – Interior of Golden Triangle (legend follows on page 15).

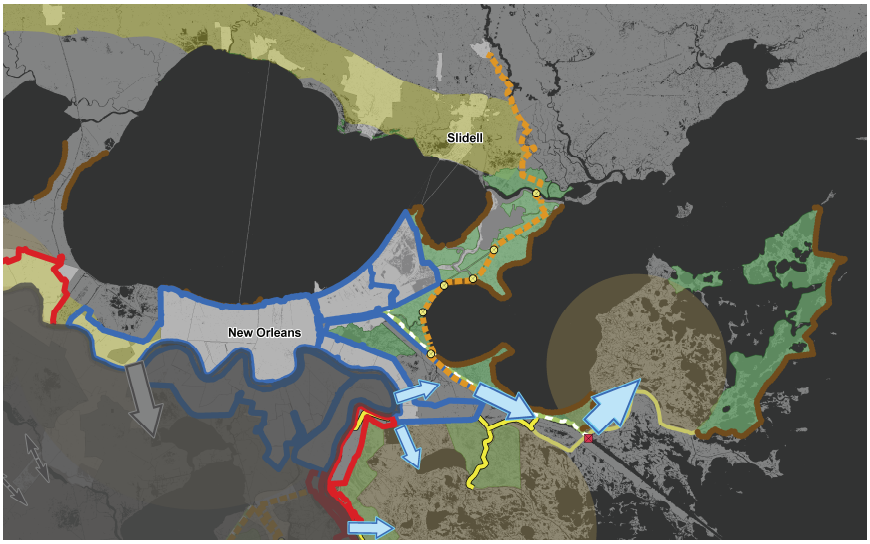


Figure 4.2b: Hurricane Protection for the New Orleans Metropolitan area and surrounding communities, showing Lake Pontchartrain Barrier Alternative 2 – Rim of Lake Borgne (legend follows on page 15).

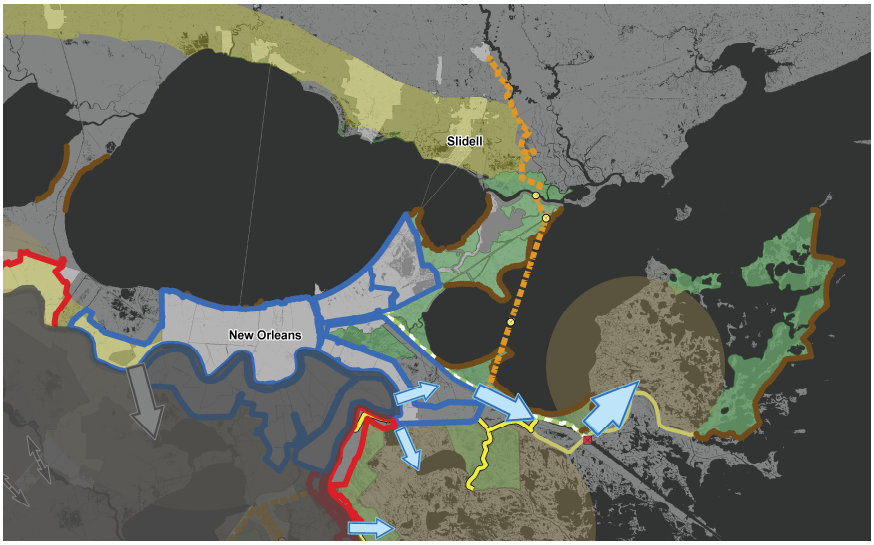
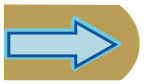


Figure 4.2c: Hurricane Protection for the New Orleans Metropolitan area and surrounding communities, showing Lake Pontchartrain Barrier Alternative 3 – Lake Borgne (legend follows on page 15).

LEGEND FOR FIGURES 4.2a-4.2c: Hurricane Protection for the New Orleans Metropolitan area and surrounding communities, Alternatives 1-3

 Mississippi River Diversion	- Mississippi River Diversion at Violet - Modify Authorization of Caernarvon Diversion - Mississippi River Diversion at White Ditch
Closure	- Close Mississippi River Gulf Outlet (MRGO) at Bayou La Loutre Ridge
Marsh Restoration using Dredged Material	- Central Wetlands Restoration - Marsh Restoration Using Dredged Material at Golden Triangle - East Orleans Landbridge Restoration - St. Tammany Marsh Restoration - Maintain and Restore the Breton Sound Marshes - Maintain and Restore Biloxi Landbridge and Barrier Reefs - Beneficial Use of Dredged Material
Shoreline Stabilization in Strategic Areas	- Shoreline Stabilization on Maurepas Landbridge - Shoreline Protection on South Shore of Lake Pontchartrain - East Orleans Landbridg Restoration - Maintain and Restore Biloxi Landbridge and Barrier Reefs - Maintain MRGO-Lake Borgne Landbridge
Navigable Waterway Stabilization	- Mississippi River Gulf Outlet (MRGO) Shoreline Stabilization

Ridge Habitat Restoration	- Restore Bayou LaLoutre Ridge
Raise/Maintain Evacuation Routes	-Raise/Maintain Evacuation Routes Located Outside Hurricane Protection Systems
Structural Hurricane Protection 100 Year Protection Representative Alignment to Increase Protection to Targeted Levels Greater Than 100 Year Protection Existing/Authorized Protection	- Lake Pontchartrain Barrier Plan: Caenarvon to Pearl River Hurricane Protection - Caenarvon to White Ditch Hurricane Protection - St. Bernard 40 Arpent Levee - Lake Pontchartrain and Vicinity Hurricane Protection - West Shore of Lake Pontchartrain Hurricane Protection
Flood Gate	- Navigation Feature Associated with Hurricane Protection Structures
Evaluate Additional Protection Needs	-Northshore of Lake Pontchartrain and Lake Maurepas Landbridge Hurricane Protection

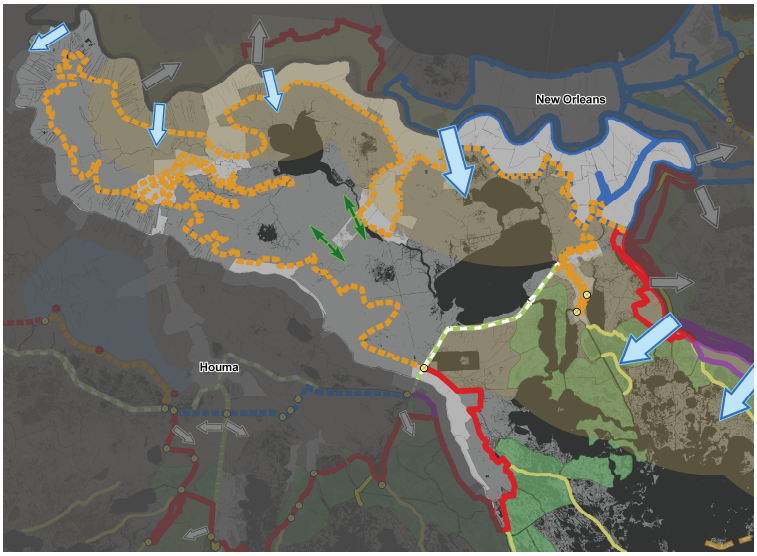


Figure 4.3a: Hurricane Protection for New Orleans West Bank, Lafourche Parish, and Barataria Basin Communities, showing Donaldsonville to the Gulf Alternative 1 – Swamp (legend follows on page 17).

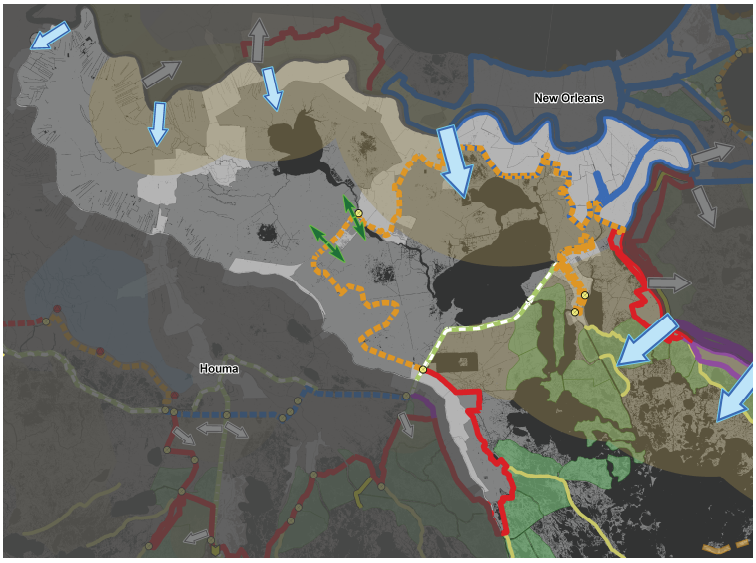


Figure 4.3b: Hurricane Protection for New Orleans West Bank, Lafourche Parish, and Barataria Basin Communities, showing Donaldsonville to the Gulf Alternative 2 – Highway 90 (legend follows on page 17).

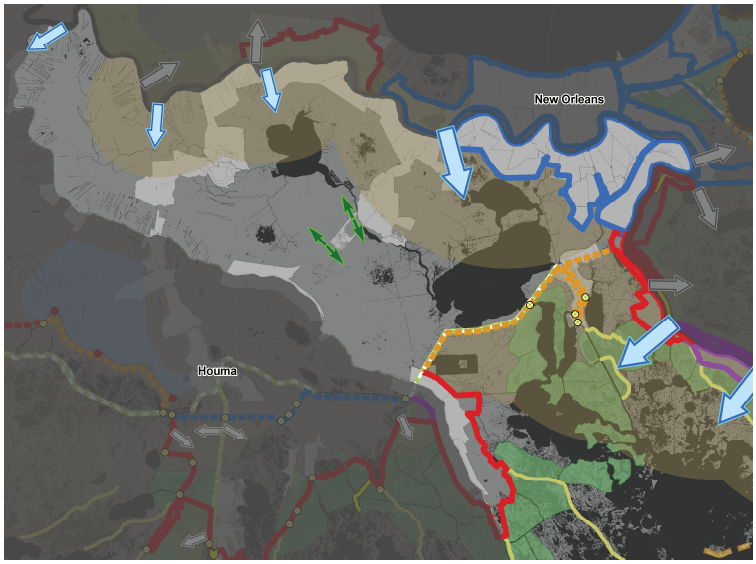


Figure 4.3c: Hurricane Protection for New Orleans West Bank, Lafourche Parish, and Barataria Basin Communities, showing Donaldsonville to the Gulf Alternative 3 – GIWW (legend follows on page 17).

LEGEND FOR FIGURES 4.3a-4.3c: Hurricane Protection for New Orleans West Bank, Lafourche Parish, and Barataria Basin Communities, Alternatives 1-3

Mississippi River Diversion	- Mississippi River Diversion at Bayou Lafourche - Mississippi River Diversions at Strategic Locations in Upper Barataria Basin - Modify Authorization of Davis Pond Diversion - Mississippi River Diversion at Myrtle Grove with Dedicated Dredging - Mississippi River Diversion at West Point a la Hache with Dedicated Dredging
Drainage Improvements	- Upper Barataria Basin Hydrologic Improvements at Hwy 90
Barrier Shoreline Restoration	- Barrier Shoreline Restoration: Barataria Basin
Marsh Restoration using Dredged Material	- Mississippi River Diversion at Myrtle Grove with Dedicated Dredging - Mississippi River Diversion at West Point a la Hache with Dedicated Dredging - Marsh Restoration using Dredged Material in Barataria Basin - Beneficial Use of Dredged Material
Navigable Waterway Stabilization	- Bankline Protection for Gulf Intracoastal Waterway (GIWW

Ridge Habitat Restoration	- Ridge Habitat Restoration in the Barataria Basin
Raise/Maintain Evacuation Routes	-Raise/Maintain Evacuation Routes Located Outside Hurricane Protection Systems
Structural Hurricane Protection 100 Year Protection Representative Alignment to Increase Protection to Targeted Levels Greater Than 100 Year Protection Existing/Authorized Protection	- Donaldsonville to the Gulf Hurricane Protection - Larose to Golden Meadow Hurricane Protection - Oakville to Myrtle Grove Hurricane Protection - Myrtle Grove to Venice Hurricane Protection - West Bank and Vicinity Hurricane Protection
Flood Gate	- Navigation Feature Associated with Hurricane Protection Structures

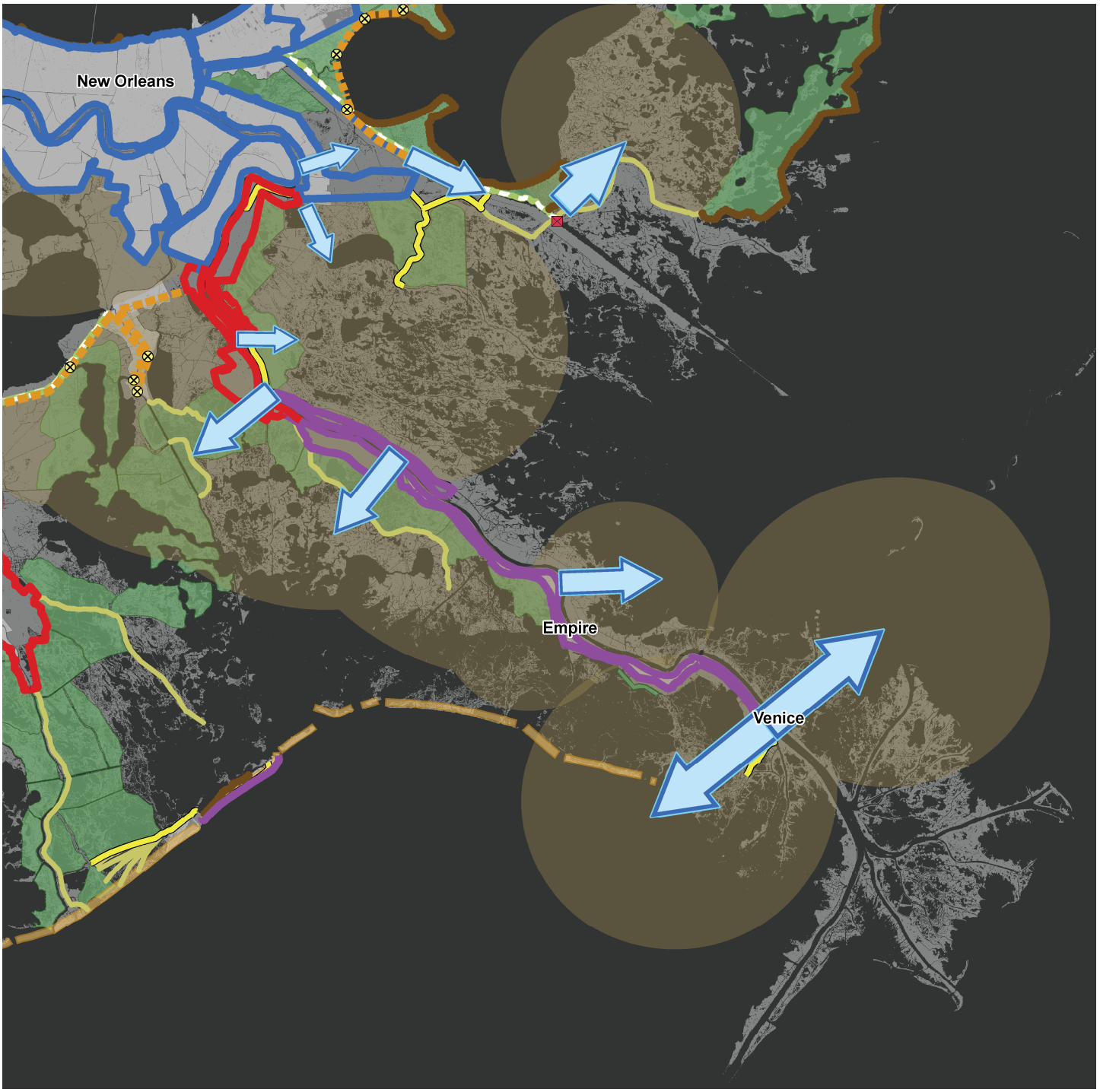


Figure 4.4: Hurricane Protection for Plaquemines Parish and Grand Isle (legend follows on page 19).

LEGEND FOR FIGURE 4.4: Plaquemines Parish and Grand Isle Hurricane Protection

Mississippi River Diversion	- Mississippi River Diversion at Violet - Modify Authorization of Caernarvon Diversion - Mississippi River Diversion at White Ditch - Mississippi River Diversion at Bayou Lamoque - Mississippi River Delta Management - Mississippi River Diversion at Myrtle Grove with Dedicated Dredging - Mississippi River Diversion at West Point a la Hache with Dedicated Dredging
Closure	- Close Mississippi River Gulf Outlet (MRGO) at Bayou La Loutre Ridge
Barrier Shoreline Restoration	- Barrier Shoreline Restoration: Barataria Basin
Marsh Restoration using Dredged Material	- Maintain and Restore the Breton Sound Marshes - Maintain and Restore Biloxi Landbridge and Barrier Reefs - Central Wetlands Restoration - Marsh Restoration Using Dredged Material at Golden Triangle - Marsh Restoration Using Dredged Material in Barataria Basin - Beneficial Use of Dredged Material
Shoreline Stabilization in Strategic Areas	- Shoreline Protection on South Shore of Lake Pontchartrain - Maintain and Restore Biloxi Landbridge and Barrier Reefs - Maintain MRGO-Lake Borgne Landbridge - Grand Isle and Vicinity Protection and Shoreline Stabilization

Navigable Waterway Stabilization	- Mississippi River Gulf Outlet (MRGO) Shoreline Stabilization - Bankline Protection for Gulf Intracoastal Waterway (GIWW)
Ridge Habitat Restoration	- Restore Bayou LaLoutre Ridge - Ridge Habitat Restoration in the Barataria Basin
Raise/Maintain Evacuation Routes	-Raise/Maintain Evacuation Routes Located Outside Hurricane Protection Systems
Structural Hurricane Protection 100 Year Protection Representative Alignment to Increase Protection to Targeted Levels Greater Than 100 Year Protection Existing/Authorized Protection	- Lake Pontchartrain Barrier Plan: Caenarvon to Pearl River Hurricane Protection - Caenarvon to White Ditch Hurricane Protection - Pointe a la Hache to Phoenix Hurricane Protection - St. Bernard 40 Arpent Levee - Lake Pontchartrain and Vicinity Hurricane Protection - Donaldsonville to the Gulf Hurricane Protection - Oakville to Myrtle Grove Hurricane Protection - Myrtle Grove to Venice Hurricane Protection - Larose to Golden Meadow Hurricane Protection - Grand Isle and Vicinity Protection and Shoreline Stabilization
Flood Gate	- Navigation Feature Associated with Hurricane Protection Structures

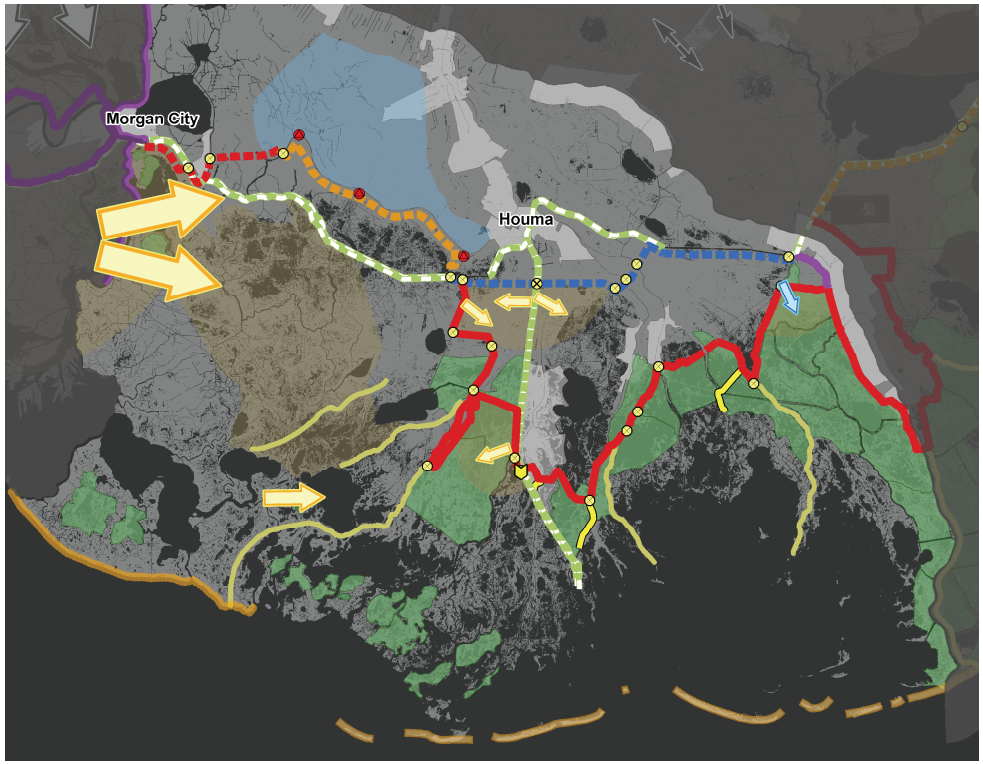


Figure 4.5a: Hurricane Protection for Terrebonne and Lafourche parishes, showing Morganza to the Gulf Alignment – Project Awaiting Authorization (legend follows on page 21).

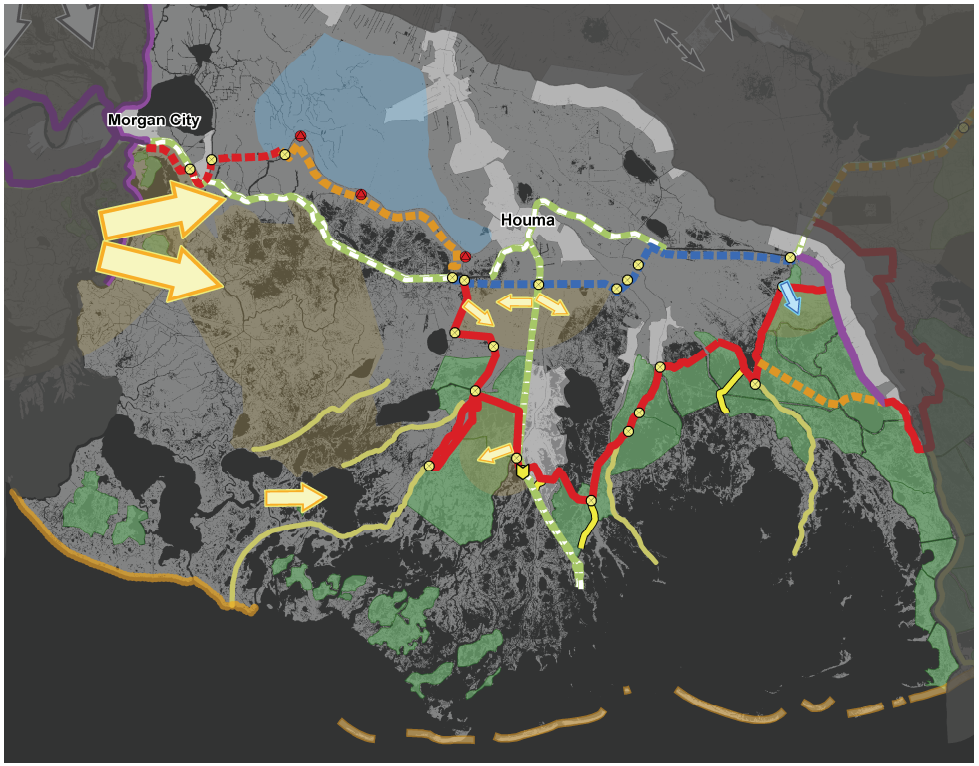
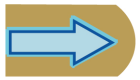


Figure 4.5b: Hurricane Protection for Terrebonne and Lafourche parishes, showing Morganza to the Gulf Alignment addition – Pointe au Chien to Golden Meadow (legend follows on page 21).

LEGEND FOR FIGURES 4.5a and 4.5b: Terrebonne and Lafourche Hurricane Protection Alternatives 1 and 2

 Mississippi River Diversion	- Move Freshwater to Terrebonne Basin from Barataria Basin via GIWW
Atchafalaya River Diversion	- Freshwater Introduction via Blue Hammock Bayou - Convey Atchafalaya River Water Eastward via GIWW to Benefit Eastern and Lower Terrebonne Marshes - Freshwater Introduction to Central and Lower Terrebonne Marshes
Water Management Area	-Chacahoula Basin Plan
Pump Station	- Chacahoula Basin Plan
Lock	-Multipurpose Operation of the Houma Navigation Canal (HNC) Lock
Barrier Shoreline Restoration	- Barrier Shoreline Restoration: Terrebonne Basin - Barrier Shoreline Restoration: Point Au Fer Island
Marsh Restoration using Dredged Material	- Marsh Restoration Using Dredged Material in Terrebonne Basin - Maintain Landbridge between Caillou Lake and Gulf of Mexico - Marsh Restoration Using Dredged Material at Point Au Fer - Beneficial Use of Dredged Material

Navigable Waterway Stabilization	- Bankline Protection for Houma Navigation Canal - Bankline Protection for Gulf Intracoastal Waterway (GIWW)
Ridge Habitat Restoration	- Ridge Habitat Restoration in the Terrebonne Basin
Raise/Maintain Evacuation Routes	-Raise/Maintain Evacuation Routes Located Outside Hurricane Protection Systems
Structural Hurricane Protection 100 Year Protection Representative Alignment to Increase Protection to Targeted Levels Greater Than 100 Year Protection Existing/Authorized Protection	- Morganza to the Gulf Hurricane Protection - Houma and Vicinity Hurricane Protection - Morgan City to Gibson Hurricane Protection -Gibson to Houma Hurricane Protection - LaRose to Golden Meadow Hurricane Protection
Flood Gate	- Navigation Feature Associated with Hurricane Protection Structures

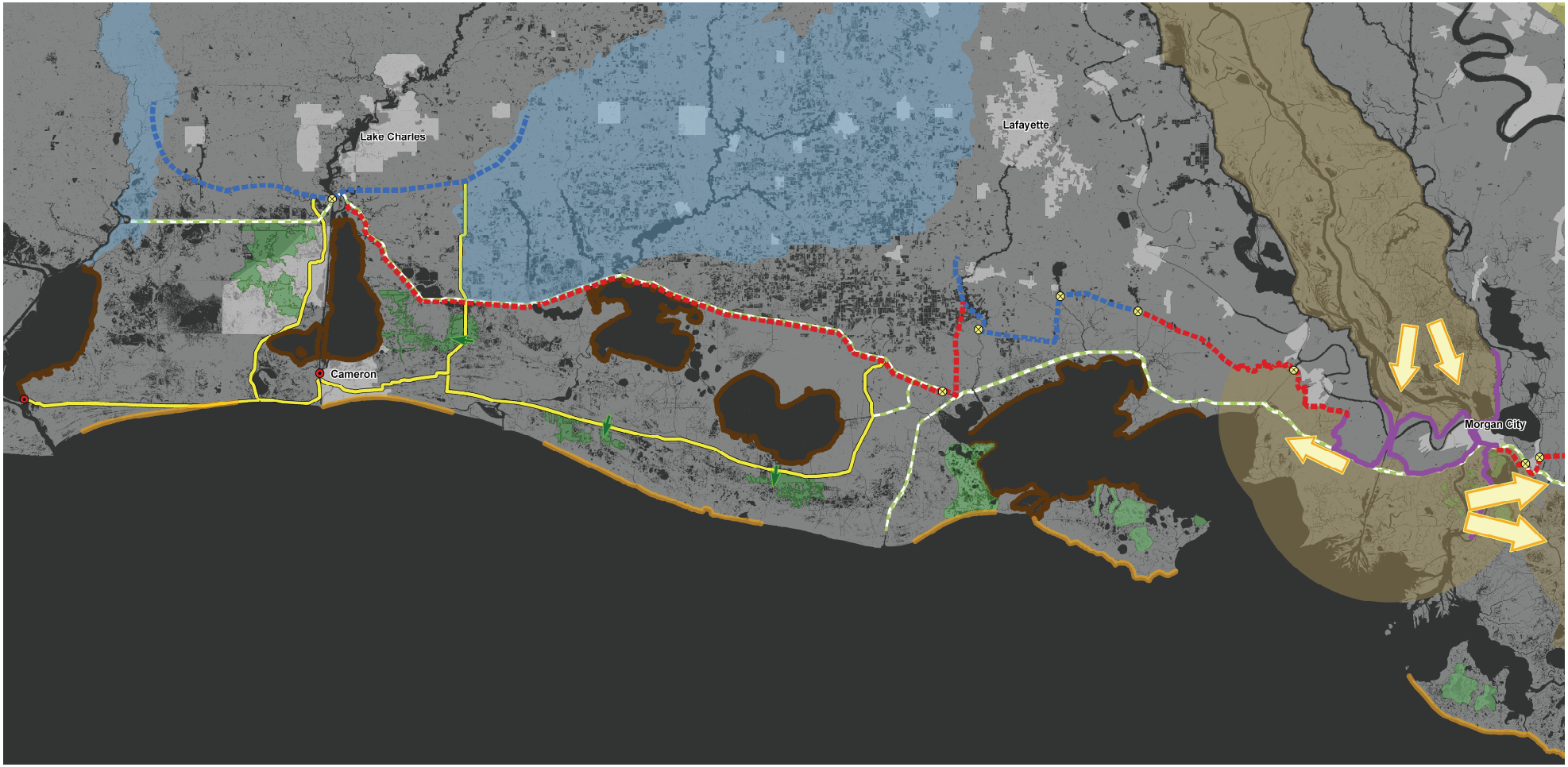


Figure 4.6: Ecosystem Restoration and Hurricane Protection for Atchafalaya River Delta, Acadiana, and the Chenier Plain (legend follows on page 23).

LEGEND FOR FIGURE 4.6: Ecosystem Restoration and Hurricane Protection for Atchafalaya River Delta, Acadiana, and the Chenier Plain

Atchafalaya River Diversion	- Convey Atchafalaya River Water Eastward via GIWW to Benefit Eastern and Lower Terrebonne Marshes - Convey Atchafalaya River Water Westward via GIWW - Freshwater Introduction into Central and Lower Terrebonne Marshes - Increase Sediment Transport Down Wax Lake Outlet - Optimize Flow Distribution at Old River Control Structure
Water Management Area	- Chenier Plain Freshwater and Sediment Managment and Reallocation - Mermentau Basin Watershed Management Plan to Retain Freshwater Resources - Sabine Basin Watershed Managment
Salinity Control Structure	- Salinity Control Structure at Calcasieu Pass - Salinity Control Structure at Sabine Pass
Drainage Improvements	- Hydrologic Improvements in Mermentau Basin at Highways 82 and 27
Barrier Shoreline Restoration	- Barrier Shoreline Restoration: Point au Fer Island - Barrier Shoreline Restoration: Freshwater Bayou to South Point/Marsh Island - Barrier Shoreline Restoration: Sabine River to Calcasieu River - Barrier Shoreline Restoration: Calcasieu River to Freshwater Bayou
Marsh Restoration using Dredged Material	- Marsh Restoration using Dredged Material at Point au Fer - Marsh Restoration using Dredged Material at Marsh Island - Marsh Restoration using Dredged Material at Weeks Bay - Raynie Marsh Restoration - Marsh Restoration using Dredged Material South of Highway 82 - Beneficial Uses of Dredged Material from Calcasieu Ship Channel - Beneficial Use of Dredged Material

Shoreline Stabilization in Strategic Areas	- Southwest Pass Shoreline Stabilization - Stabilize Shoreline of Vermilion, East and West Cote Blanche Bays - Stabilize Grand Lake Shoreline - Stabilize White Lake Shoreline - Stabilize Calcasieu Lake Shoreline - Stabilize Sabine Lake Shoreline
Navigable Waterway Stabilization	- Bankline Stabilization of Freshwater Bayou from Belle Isle Bayou to Freshwater Bayou Canal Lock - Fortify Spoil Banks of GIWW and Freshwater Bayou - Bankline Protection for Gulf Intracoastal Waterway (GIWW) - Bankline Stabilization of Freshwater Bayou - Fortify Spoil Banks of GIWW and Freshwater Bayou
Raise/Maintain Evacuation Routes	-Raise/Maintain Evacuation Routes Located Outside Hurricane Protection Systems - Raise and Maintain Highways 82 and 27
Structural Hurricane Protection 100 Year Protection Representative Alignment to Increase Protection to Targeted Levels Greater Than 100 Year Protection Existing/Authorized Protection	- Maintain Existing Levee Protection for Morgan City and Berwick - Wax Lake Outlet to New Iberia Hurricane Protection - Abbeville to Lake Charles Hurricane Protection - Lafayette and Vicinity Hurricane Protection - Lake Charles and Vicinity Hurricane Protection
Flood Gate	- Navigation Feature Associated with Hurricane Protection Structures

4.4 Large-Scale Planning

LSP-1. Mississippi River Delta Management

This measure will identify and evaluate features that would greatly increase the deposition of Mississippi River sediment in shallow coastal areas and restore deltaic growth in the Mississippi River Delta Plain. Two types of projects, large diversions (greater than 50,000 cfs) from the Mississippi River and alternative navigation channel alignments will be investigated. The large-scale river diversions could potentially maximize the river's sediment and freshwater resources available for ecosystem maintenance. Diversion sites, capacities, and outfall management measures would also be assessed to help optimize diversion plans while accommodating navigation, water supply, and flood control needs.

LSP-2. Optimize Flow Distribution at Old River Control Structure

This measure will conduct a comprehensive study to identify and analyze operational changes from the mandated 70/30 percent flow distribution between the Mississippi and Atchafalaya Rivers at Old River Complex. The focus of the study will be to determine whether distributions may be altered to increase freshwater and sediment availability in the Atchafalaya Basin and the central Louisiana coast without adversely impacting the long term flood carrying capacity of the Mississippi River, stability of the navigation channels, municipal freshwater supplies, and ecosystem restoration in the Pontchartrain and Barataria-Terrebonne Basins, and the coastal zone of the Lower Mississippi River.

LSP-3. Backfill and/or Plug Non-Essential Oil and Gas Canals

This measure will close non-essential oil and gas canals coast wide to restore natural hydrology to wetland areas that have been adversely impacted by canal construction. Abandoned location canals, and other canals that can be eliminated without adversely impacting ongoing production operations, will be identified for restoration to mitigate the adverse effects of unchecked tidal exchanges. Restoration operations could include permanent plugs, spoil bank degradation and marsh creation by backfilling through dedicated dredging projects. Canals identified through this effort would be restored through marsh creation measures included in the individual planning units.

LSP-4. Chenier Plain Freshwater and Sediment Management and Reallocation

This measure will formulate a comprehensive hydrologic and sediment management plan that will maximize environmental restoration benefits and support agriculture, commercial activities, navigation, and recreation in the region. The study will examine structural and nonstructural alternatives that most effectively utilize the freshwater and sediment resources in the study area. A phased but comprehensive planning approach will be used. This approach will use traditional as well as innovative tools, including application of models to assess hydrology, salinity and sediments resulting from current, future without, and future with project conditions.

LSP-5. Sediment Inventory and Allocation

This measure will provide for a full inventory of available sediment from sources to include material dredged from navigation channels, off shore from the Gulf of Mexico, and rivers. Policy, procedure, and priorities will also be developed for using dredged material to create marsh across the state. The sediment inventory and allocation will provide information needed in prioritization and the design and construction of marsh creation, ridge restoration and barrier shoreline restoration measures throughout the coast. For planning and costing purposes, the measure has been divided into two sub-measures:

(a) Beneficial Use of Dredged Material

This sub-measure proposes to formulate and implement a course of action that maximizes beneficial use of material dredged from navigation channels as a tool to attain the Master Plan objectives. The

Louisiana Coastal Area (LCA) Beneficial Use of Dredged Material Program will strive to identify disposal sites and complete site preparation (including environmental clearances and real estate acquisition) in advance of the USACE O&M navigation maintenance program disposal needs. Funds for the beneficial use program would be used for the incremental costs of restoration activities above and beyond the base plan, or Federal Standard, selected by the USACE O&M Program, if beneficial use is not part of that O&M plan. In the current authorizing language, the LCA Beneficial Use Program is recommended for authorization at $100 million over ten years.

(b) Dedicated Dredging from Rivers and Offshore

This sub-measure proposes to complete a sediment inventory of riverine, navigation channel, and offshore sources of sediment. As stated in one of the plan formulation principles, it is the preference to maximize use of sediment sources from outside of the wetland ecosystem. To this extent, the primary focus of this measure will be to inventory and utilize sediment sources from riverine and offshore locations. However, sediment mining from inland water bodies on an individual-case basis will be evaluated in this measure for its benefits and impacts to the system. Also included in this work would be refining understanding of the availability, particle size, accretion and consolidation rates and other characteristics of sediments that could be used for restoration and protection projects. A regional sediment budget model is also recommended, and will require data compilation and numerical modeling of the Mississippi River. This model can identify sources and sinks of sediment along the coast as well as inland, which will be an invaluable tool to support Master Plan implementation. It is anticipated that this work would be consistent with the USACE National Regional Sediment Management Program. Construction and operations and maintenance costs for this measure are related to specific measures, including but not limited to marsh creation and barrier shoreline restoration, in all planning units.

4.5 Programmatic Measures

PM-1. Applied Coastal Engineering and Science Program

This measure will provide state allocated funds to reduce key uncertainties and to promote advances in the science and technology fields critical to implementation of the Master Plan. Over the life of Master Plan implementation, there will be a need for strategic data collection and management, improved forecasting tools, focused research and development, and assessment of program and project effectiveness. These needs may be related to the science, modeling, socio-economic impacts and changes, implementation, technical methodology, resource constraints, or effectiveness of measures. They may also be related to development and refinement of forecasting tools. These advances in the state of science and technology must be addressed in order to achieve full and balanced integration of protection and restoration objectives. Utilization of existing programs, such as the Louisiana Coastal Area Science and Technology Program will be maximized and extended as a portion of this measure.

PM-2. Coordination with Hazard Mitigation Programs

This measure will provide state allocated funds for the coordination of local, state, and federal entities responsible for planning and implementing of non-structural plan measures such as hazard mitigation grants; hurricane evacuation plans; relocation assistance; local compliance with the FEMA National Flood Insurance Program (NFIP) regulations, including elevating structures; parish, levee district, and state emergency action plan coordination; inhibit development in low lying areas (zoning); and other programs as may be deemed appropriate for this measure.

PM-3. CPRA Management and Capacity Building

There are many issues that will have to be addressed in the first few years to remove existing constraints to implementation of the Master Plan. These include policy, legislative, and institutional issues associated with effective execution of projects and the plan. Examples include the need to develop federal partnerships to establish dedicated funding streams and cost sharing agreements. This will include the need to obtain Congressional authority and appropriations. Another major issue for early resolution includes passing necessary land use planning policies and legislation required for responsible growth in coastal Louisiana. Oversight and coordination of all efforts by both state and federal agencies will require staff and contractor support.

4.6 Planning Unit 1: East of the Mississippi River

1-1. Lake Pontchartrain Barrier Plan: Caernarvon to Pearl River Hurricane Protection

This measure will provide hurricane protection to concentrated, distributed and strategic assets located in the upper and central Pontchartrain Basin. This storm barrier will work in conjunction with the existing levee systems in order to increase the level of hurricane protection. For the purposes of this report, we have analyzed these areas as being protected from storm surges with a 0.2% chance of occurring in any given year. Completion of additional analyses, such as those progressing within the Corps of Engineers' *Louisiana Coastal Protection and Restoration Project*, will inform and ultimately define the technically feasible level of protection. The measure will create a "Barrier Levee" from Caernarvon to I-59 at Pearl River to provide a first line of defense for Metropolitan New Orleans and vicinity.. It should be noted that further study will finalize the alignments and any flood gates required to maintain existing levels of tidal exchange. The design of the selected alternative must include guidance in balancing the overall water resources needs of the basin, including integrating river flood protection, Mississippi River diversions, hurricane surge protection, tidal flows and hydrologic exchanges to maintain a stable and healthy landscape.

Alternative Alignment 1— Interior at Golden Triangle: Alignments #1 and #2 are similar, although Alignment #1 would not enclose the Golden Triangle and would thus have the least direct ecosystem impact. However, without proper design, Alignment #1 could change water flow and restrict animal and boat access through major channels. Of the three conceptual alignments, this one does the least to address the existing funnel at the Inner Harbor Area and provides no water storage landward of the protection structure.

Alternative Alignment #2—Rim of Lake Borgne: Unlike alignment #1, this alignment would enclose the Golden Triangle, and would thus have greater ecosystem impact. In addition, without proper design, Alignment #2 could change water flow and restrict anima and boat access through major channels. Impacts to the habitat of the Gulf Sturgeon, a threatened species, would also need to be addressed. Alignment #2 would reduce the funnel at the Inner Harbor Area, although further modeling is needed to assess effects on adjacent levees systems.

Alternative Alignment #3—Lake Borgne: This alignment may provide the most reliable protection against storm surge because it eliminates the funnel at the Inner Harbor Area and provides for waster storage to accommodate overtopping. However, it could be the most challenging of the three alignments to build because it would be situated in the open water of Lake Borgne. This alignment would also pose the greatest challenge for maintaining ecosystem function, including maintaining adequate water exchange and animal movement. Issues related to the Gulf sturgeon, a threatened species, would also need to be addressed. Innovative storm barrier concepts, such as pile-supported concrete structures, could be used to increase the feasibility of this alignment.

1-2. Caernarvon to White Ditch Hurricane Protection

This measure will improve existing levees, and new levees will be constructed where no levees exist, to protect concentrated and strategic assets located between Caernarvon and White Ditch in Plaquemines Parish from storm surges with a 1% chance of occurrence in any given year. This levee must be incorporated into the federal hurricane protection system. If required, the measure will include raising the height of the Mississippi River Levee to achieve the targeted level of protection. The back levee alignment is approximately 35 miles long. Communities protected include Braithwaite, St. Clair, Scarsdale, Stella, Dalcour, Betrandville, Wills Point and Belair.

1-3. Pointe a la Hache to Phoenix Hurricane Protection

This measure will maintain existing levees, including the Mississippi River Levee, in Plaquemines Parish on the east bank of the Mississippi River from south of Pointe a la Hache to Phoenix to provide storm protection for concentrated and strategic assets in the communities of Phoenix, Harlem, Bellevue, Nero, Davant, Pointe a la Hache, Beshel, and Bohemia. The existing back levee is a component of the Federal New Orleans to Venice Hurricane Protection Project and is approximately 24 miles in length.

1-4. St. Bernard 40 Arpent Levee

This measure will increase the height of the 40 Arpent Levee in St. Bernard in conjunction with the Lake Pontchartrain Barrier Plan in order to reduce the risk to targeted assets from storm surges originating in Lake Borgne. It will provide a second line of defense from storm surges originating in Lake Borgne for concentrated and strategic assets in Metropolitan New Orleans and upper St. Bernard Parish. The 40 Arpent Levee is approximately 20 miles long and separates the urban areas of St. Bernard Parish from the Central Wetlands and extends from the Intracoastal Canal on the west to Caernarvon-Verret on the east, where it will tie into the Lake Pontchartrain Barrier Plan levee.

1-5. West Shore of Lake Pontchartrain Hurricane Protection

This measure will construct a levee approximately 28 miles long located southwest of Lake Pontchartrain. This new levee will connect to the Lake Pontchartrain and Vicinity Hurricane Protection Project to provide increased hurricane storm surge protection for concentrated and strategic assets in St. Charles, St. John the Baptist and St. James Parishes.

1-6. Lake Pontchartrain and Vicinity Hurricane Protection

This measure will re-evaluate approximately 56 miles of levee along the south shore of Lake Pontchartrain from the Bonnet Carre Spillway to Highway 11, to identify and implement structural improvements required to work in conjunction with the Lake Pontchartrain Barrier plan in order to reduce the risk of targeted assets. For the purposes of this report, we have analyzed these areas as being protected from storm surges with a 0.2% chance of occurring in any given year. Completion of additional analyses, such as those progressing within the Corps of Engineers' *Louisiana Coastal Protection and Restoration Project*, will inform and ultimately define the technically feasible level of protection. The measure will also include an evaluation of compartmentalization opportunities to contain flood water in the event of overtopping.

1-7. North Shore of Lake Pontchartrain and Lake Maurepas Hurricane Protection

This measure will evaluate the storm surge risks expected to remain after implementing the Lake Pontchartrain Barrier Plan and evaluate the vulnerability of communities surrounding Lake Maurepas and Lake Pontchartrain. Results of the evaluation will be used to develop and recommend structural and/or non-structural protection approaches and planning needed to reduce the risk to those communities.

1-8. Raise/Maintain Evacuation Routes Located Outside the Hurricane Protection Systems

This measure will raise/maintain evacuation routes outside of hurricane protection structures that are at risk of being damaged by storm surge. Vulnerable routes will be identified and appropriate actions will be recommended to assure the ability to safely and surely evacuate in advance of a storm and rising water and to have a functional road for safe return and recovery after a storm has passed. In many cases this may be accomplished by armoring of the roadway embankment to prevent the roadway embankment from being eroded.

1-9. Mississippi River Diversion at Hope Canal

This measure will divert freshwater, nutrients and sediment from the Mississippi River into the Maurepas Swamp via Hope Canal. Hope Canal is on the east bank of the Mississippi River near Garyville. The diversion will be sized to divert approximately 2,000 cfs.

1-10. Mississippi River Diversion at Convent/Blind River

This measure will divert freshwater, nutrients and sediment from the Mississippi River into the Maurepas Swamp via Blind River. Blind River is located approximately 20 miles south of Lake Maurepas on the east bank of the Mississippi River near Convent. The diversion will be sized to divert up to 5,000 cfs.

1-11. Shoreline Stabilization on Maurepas Landbridge

This measure will stabilize approximate 7.5 miles of shoreline along the Maurepas Landbridge to protect interior marsh on this critical coastal landscape feature located between Lake Maurepas and Lake Pontchartrain.

1-12. St. Tammany Marsh Restoration

This measure will utilize dedicated dredging and vegetation plantings to fortify the lake rim and restore marshes along the north shoreline of Lake Pontchartrain. Approximately 11.7 miles of shoreline will be fortified and approximately 326 acres of marsh will be created.

1-13. Shoreline Protection on South Shore of Lake Pontchartrain

This measure will stabilize approximate 11.4 miles of shoreline along the south shore of Lake Pontchartrain. A 300’ wide marsh buffer will be created at strategic locations to protect the interior shoreline, and appropriate breakwaters will be constructed to maintain this critical shoreline.

1-14. East Orleans Landbridge Restoration

This measure will restore and maintain the East Orleans Landbridge, a critical coastal landscape feature located between the western shoreline of Lake Borgne and the eastern shoreline of Lake Pontchartrain. Restoration features will include dedicated dredging for marsh and ridge restoration and shoreline stabilization at critical areas, particularly the in the area near Lake Catherine and the Rigolets. The area targeted for restoration includes the eastern portion of the Bayou Sauvage National Wildlife Refuge. Approximately 38,000 acres of marsh will be restored or enhanced and approximately 145 miles of shoreline and ridges will be protected or restored. The adaptive management program will assess the measure’s effectiveness and refine elements of future phases.

1-15. Close Mississippi River Gulf Outlet (MRGO) at Bayou La Loutre Ridge

This measure will close the MRGO at the Bayou La Loutre Ridge with an earthen plug. The MRGO begins at the confluence of the Gulf Intracoastal Waterway (GIWW) and the Inner Harbor Navigation Canal (IHNC) and extends southeastward through the Breton/Chandeleur Sound to the Gulf of Mexico. Appropriate economic mitigation plans must be implemented to address impacts to deep-draft and shallow-draft navigation facilities and industries. In addition, actions must be taken to avoid increased erosion in nearby waterways should shallow draft and recreational traffic circumvent the closure structure. If at any time after the channel is closed with an earthen

plug it is decided to restore limited navigation capacity, any new navigation structure to be constructed would be closed under normal conditions in order to maintain the integrity of the Bayou la Loutre Ridge. The lock structure would be operated only under emergency situations and only for shallow-draft traffic.

1-16. Mississippi River Gulf Outlet (MRGO) Shoreline Stabilization

This measure will provide bank stabilization at strategic locations along approximately 26 miles of the MRGO between the closure structure south of Bayou La Loutre (1-15) and the intersection of the GIWW and Michoud Canal to the north. This measure does not include the most critical portions of the channel, which are included in measure 1-20: Maintain MRGO-Lake Borgne Landbridge.

1-17. Central Wetlands Restoration

This measure will restore and sustain wetlands via pipeline conveyance of sediments dredged from the Mississippi River to sites across the Central Wetlands. Hydraulic management and vegetation planting will also be used to re-establish and sustain cypress swamps in the project area. The Central Wetlands are located between the St. Bernard 40 Arpent Levee and the Mississippi River Gulf Outlet (MRGO), south of the Gulf Intracoastal Waterway (GIWW). Approximately 9,000 acres of marsh will be restored or enhanced. The New Orleans Sewerage and Water Board has expressed interest in using this area for assimilation of nutrients from treated effluent, and this partnering opportunity will be included as a portion of this measure.

1-18. Marsh Restoration Using Dredged Material at Golden Triangle

This measure will restore and sustain approximately 7,000 acres of marsh via pipeline conveyance of sediments dredged from the Mississippi River to the Golden Triangle Area, located between the west lobe of Lake Borgne, the north bank of the Mississippi River Gulf Outlet (MRGO), and the south bank of the Gulf Intracoastal Waterway (GIWW).

1-19. Mississippi River Diversion at Violet

This measure will divert freshwater, nutrients and sediment from the Mississippi River via the Mississippi River Gulf Outlet into the Biloxi Marshes and other areas of St. Bernard Parish. A portion of the diverted water will also benefit the Central Wetlands. The diversion will be constructed on the east bank of the Mississippi River near Violet, and will divert up to a maximum of 50,000 cfs as needed to achieve objectives.

1-20. Maintain MRGO – Lake Borgne Landbridge

This measure will restore and sustain approximately 14,000 acres of wetlands utilizing dedicated dredging, and includes bankline stabilization at strategic locations along the Lake Borgne shoreline. The Lake Borgne Landbridge is a critical coastal landscape feature located between Lake Borgne and the north bank of the MRGO and is a vital feature facilitating the intended operation of the Violet Diversion.

1-21. Modify Authorization of Caernarvon Diversion

This measure will identify and seek approval for operational changes that will increase the ability of the Caernarvon Freshwater Diversion to sustain wetlands in Plaquemines and St. Bernard parishes. The Caernarvon structure is located on the east bank of the Mississippi River about 15 miles downstream from New Orleans, near the St. Bernard-Plaquemines Parish line. The diversion is currently authorized to maintain specific salinity targets. Operational flexibility is needed to maximize sediment diversion and also to modify operations of this single diversion to operate in a coordinated fashion with other projects in the basin as they are constructed.

1-22. Maintain and Restore the Breton Sound Marshes

This measure will utilize dedicated dredging to restore and sustain approximately 38,000 acres of marsh at critical areas of the Breton Sound. The Breton Sound Marshes are located between the east bank of the Mississippi River and the south bank of the Mississippi River Gulf Outlet (MRGO).

1-23. Mississippi River Diversion at White Ditch

This measure will divert freshwater, nutrients and sediments from the Mississippi River through a new control structure at White Ditch to restore and sustain wetlands on the east bank of the Mississippi River. White Ditch is located north of Carlisle in Plaquemines Parish. The diversion will be capable of diverting up to 10,000 cfs.

1-24. Maintain and Restore the Biloxi Landbridge and Barrier Reefs

This measure will utilize sediment dredged from offshore sources to restore and maintain the Biloxi Land Bridge. Features include restoration of approximately 25,000 acres of marsh and approximately 75 miles of shoreline stabilization/barrier reefs. The Biloxi Landbridge is a brackish marsh / oyster reef system which separates Lake Borgne and Chandeleur Sound.

1-25. Restore Bayou La Loutre Ridge

This measure includes increasing the ridge elevation and width with dredged material, and includes planting of woody vegetation and native wetland plants, to restore approximately 25 miles of the natural Bayou La Loutre Ridge. The ridge restoration will extend from the east bank of the Mississippi River Gulf Outlet (MRGO) south of Old Shell Beach eastward along the south boundary of the Biloxi Wildlife Management Area.

1-26. Mississippi River Diversion at Bayou Lamoque

This measure will remove the existing operable gates and associated equipment from the Bayou Lamoque freshwater diversion structures to allow for a free-flowing river diversion. The structure is capable of diverting approximately 12,000 cfs from the Mississippi River to Plaquemine Parish marshes. Since the original structure was built for salinity control in Breton Sound (in order to provide for optimal oyster habitat), some modifications of the outfall channel may be necessary to direct the diverted water into the marshes. Any resulting dredged material will be used to create marsh. Bayou Lamoque is located on the east bank of the Mississippi north of Empire in Plaquemines Parish.

1-27. Barrier Shoreline Restoration: Chandeleur Islands

This measure recommends collaboration with the Department of the Interior, and other state and federal resource agencies, as a habitat management plan for continued maintenance of the island chain, the Breton National Wildlife Refuge, is developed. The state will help to define this plan to ensure that it considers the full range of barrier shoreline habitats typically found in coastal Louisiana and will evaluate how best to help implement the plan once it has been completed.

4.7 Planning Unit 2: Mississippi River to Bayou Lafourche

2-1. Donaldsonville to the Gulf Hurricane Protection

This measure will provide increased hurricane protection to concentrated, distributed, and strategic assets located in the upper and central Barataria Basin. This hurricane protection measure will work in conjunction with the existing West Bank and Vicinity Hurricane Protection project to further reduce the risk of targeted assets in West Bank of New Orleans. For the purposes of this report, we have analyzed these areas as being protected from storm surges with a 0.2% chance of occurring in any given year. Completion of additional analyses, such as those progressing within the Corps of Engineers' *Louisiana Coastal Protection and Restoration Project*, will inform and ultimately define the technically feasible level of protection. The alignment will protect the remainder of the

Upper Barataria Basin, including communities along Bayou Lafourche, Lafitte, and Barataria from storm surges with a 1% annual chance of occurrence. The design of the selected alternative must include guidance in balancing the overall water resources needs of the basin, including integrating river flood protection, Mississippi River diversions, hurricane surge protection, tidal flows and hydrologic exchanges to maintain a stable and healthy landscape.

Alternative Alignment #1—Swamp: This alignment follows the upland margin of the Barataria basin wetlands. If a traditional earthen levee were used, this alignment would minimize further disruption to the basin hydrology. However, the length of this alignment would increase construction, operation, and maintenance costs, as well as the number of structures needed for drainage, pipeline, and water channel crossings. As a result, this alignment includes more potential locations for structural failure. In addition, this alignment provides no water storage landward of the levee. If the structure were overtopped, water would flow into populated areas. The West Bank and Vicinity project would also need to be raised beyond the level provided by the Corps' ongoing work, in order to achieve a greater than 1% level of protection for the West bank of Metro New Orleans. There are technical and economic questions as to how feasible it would be to raise this protection system. Ring levees would need to be added around central basin communities, including Chackbay, Kreamer, Crown Point, Jean Lafittte, and Lafitte to provide a 1% level of protection for these communities.

Alternative Alignment #2—Highway 90: Because it would be built near Highway 90, an existing hydrologic barrier in the basin, this alignment would minimize further disruptions to water flow patterns. When coupled with the Upper Barataria Basin Hydrologic Improvements at Highway 90 measure, this alignment could improve water exchange throughout the basin. Its shorter overall length would reduce construction, operation, and maintenance costs, and it would require fewer structures for drainage, pipeline, and water channel crossings. As a result, this alignment would have fewer potential locations for structural failure. However this alignment would still have direct impacts on wetlands. In addition, if this alignment were built the West Bank and Vicinity project would also need to be raised beyond the level provided by the Corps' ongoing work, in order to achieve a greater than 1% level of protection for the West bank of Metro New Orleans. There are technical and economic questions as to how feasible it would be to raise this protection system. Ring levees would need to be added around central basin communities, including Crown Point, Jean Lafittte, and Lafitte to provide a 1% level of protection for these communities.

Alternative Alignment #3—GIWW: This alignment would follow the Gulf Intracoastal Waterway between Oaklville in Plaquemines Parish and Larose in Lafourche Parish. It would provide space for temporary water storage should overtopping occur, and it could be designed to help direct water to areas such as eastern Terrebonne Parish, which would otherwise be difficult to reach using river diversions. It would also protect central basin communities, such as Crown Point, Jean Lafitte, and Lafitte. However, if it were not properly designed to increase wetland sustainability in conjunction with necessary restoration projects, this alignment would further stress ecosystems that support commercially and recreationally important fish and wildlife species in Barataria basin. Innovative designs and technologies will need to be used to ensure the sustainability of the basin's wetlands, improve reliability of the protection structure, and reduce maintenance costs.

2-2. West Bank and Vicinity Hurricane Protection

This measure will complete the West Bank hurricane protection protect Metropolitan New Orleans on the West Bank of the Mississippi River from west of Avondale to Oakville from storm surges with a 1% probability of occurring in any given year. The completed hurricane protection system will include 65 miles of levee, floodwalls, and floodgates, and protect over 250,000 citizens. The West Bank hurricane protection project is intended to work in conjunction with measure 2-1, Donaldsonville to the Gulf Hurricane Protection to provide the 0.2% level of protection. The project is located in portions of Orleans, Jefferson and Plaquemines parishes.

2-3. Larose to Golden Meadow Hurricane Protection

This measure will raise the height of the existing Larose to Golden Meadow Hurricane Protection Levee to protect concentrated and strategic assets on both the east and west side of Bayou Lafourche from storm surges with a 1% probability of occurring in any given year. Approximately 24 miles of levees and floodwalls will be raised on the southern reaches, below the Gulf Intracoastal Waterway. The potential for increased surge heights from the adjacent Donaldsonville to the Gulf and Morganza to the Gulf levee systems will be evaluated, and if necessary the Larose to Golden Meadow levees system will be raised accordingly.

2-4. Oakville to Myrtle Grove Hurricane Protection

This measure will improve existing levees, and construct new levees where no levees exist, to protect concentrated and strategic assets located between Oakville and Myrtle Grove along the Mississippi River in Plaquemines Parish from a storm surge with a 1% probability of occurring in any given year. This levee must be incorporated into the federal hurricane protection system. This will include raising the height of the Mississippi River Levee, if required, to achieve the targeted level of protection. The back levee alignment is approximately 21 miles in length. The Conoco Phillips refinery at Alliance is contained within this levee alignment.

2-5. Myrtle Grove to Venice Hurricane Protection

This drainage levee south of Myrtle Grove would be federalized and brought to the same elevation as the current hurricane protection levees in southern Plaquemines Parish. The existing federal hurricane protection levee, a component of the New Orleans to Venice Hurricane Protection Project, would be maintained at its currently authorized height. This measure would provide storm protection to concentrated and strategic assets located between Myrtle Grove and Venice along the Mississippi River in Plaquemines Parish.

2-6. Grand Isle and Vicinity Protection and Shoreline Stabilization

This measure combines coastal restoration and structural improvements to provide hurricane protection to concentrated and strategic assets located on Louisiana's only inhabited barrier island. Project features consist of maintaining the height of the existing levee/dune on the gulf side; constructing segmented breakwaters on the north side of the island; extending the rock dike at the eastern edge of Fifi Island to reduce wave energy on the northeast end of the island; and repairing the breach on Elmer's Island to protect Cheniere Caminada.

2-7. Raise/Maintain Evacuation Routes Located Outside the Hurricane Protection Systems

This measure will raise/maintain evacuation routes outside of hurricane protection structures that are at risk of being damaged by storm surge. Vulnerable routes will be identified and appropriate actions will be recommended to assure the ability to safely and surely evacuate in advance of a storm and rising water and to have a functional road for safe return and recovery after a storm has passed. In many cases this may be accomplished by armoring of the roadway embankment to prevent the roadway embankment from being eroded. In addition to other highways, elevating an approximately 20 mile section of LA 1 from Golden Meadow to Port Fourchon is of particular importance since it is subject to frequent inundation and is vital for re-entry to Port Fourchon to initiate post-storm recovery activities.

2-8. Upper Barataria Basin Hydrologic Improvements at Highway 90

This measure consists of drainage infrastructure, strategically located along that segment of U.S. Highway 90 between Boutte and Raceland, to improve hydrology in the upper Barataria Basin for flood control and wetlands sustainability.

2-9. Move Freshwater to Terrebonne Basin from Barataria Basin via GIWW

This measure will utilize dedicated dredging and hard shoreline stabilization materials in order to increase freshwater flow in the GIWW to the west to sustain marsh in the eastern Terrebonne Basin.

2-10. Mississippi River Diversion at Bayou Lafourche

This measure will be located in the upper Barataria Basin near Donaldsonville on the West Bank of the Mississippi River. The diversion will be implemented in accordance with the Louisiana Department of Natural Resources' *Mississippi River Water Reintroduction into Bayou Lafourche, Final Phase 2 Design Report*, dated March 2006. Diversion capacity will be a minimum of 1,000 cfs.

2-11. Mississippi River Diversions at Strategic Locations in Upper Barataria Basin

This restoration measure will divert freshwater, nutrients, and sediment from the Mississippi River into the upper Barataria Basin swamps. For planning purposes, two locations in the area south of Donaldsonville and north of Highway 90, between the Mississippi River and Bayou Lafourche, were analyzed to divert 1,000 cfs each.

2-12. Modify Authorization of Davis Pond Diversion

This measure will identify, and seek approval for, operational changes that will increase wetland restoration outputs from the David Pond Freshwater Diversion located on the west bank of the Mississippi River, in the vicinity of a historic crevasse near Luling. The Davis Pond Diversion is capable of diverting approximately 10,000 cfs, but is currently managed to maintain specific salinity targets. Operational flexibility is needed to maximize sediment diversion and also to modify operations of this single diversion to operate in a coordinated fashion with other projects in the basin as they are constructed.

2-13. Mississippi River Diversion at Myrtle Grove with Dedicated Dredging

This measure includes a Mississippi River diversion of approximately 2,500 to 15,000 cfs to increase sediment and freshwater input to the area. In order to accelerate the wetland building function of this measure and moderate effects on habitat diversity within the Barataria Basin, the measure includes dedicated dredging of river sediments for the restoration of approximately 21,000 acres of wetlands in the outfall area of the diversion. Myrtle Grove is located on the west bank of the Mississippi River between Ironton and Deer Range.

2-14. Mississippi River Diversion at West Pointe a la Hache with Dedicated Dredging

This measure will replace the current 2,000 cfs West Pointe a la Hache siphon with a diversion of approximately 2,500 to 15,000 cfs, thus increasing sediment and freshwater input to the area. In order to accelerate the wetland building function of this project and moderate effects on habitat diversity within the Barataria Basin, the measure also includes dedicated dredging of river sediments for the restoration of approximately 16,500 acres of wetlands in the outfall area of the diversion. West Pointe a la Hache is located on the west bank of the Mississippi River in Plaquemines Parish, Louisiana.

2-15. Marsh Restoration Using Dredged Material in Barataria Basin

This measure will create approximately 148,000 acres of marsh using sediments mined from the Mississippi River and other sources and delivered, via slurry pipelines with pumps and outlet units, to sites across the Barataria Basin as identified in the Louisiana Department of Natural Resources' *Phase 2 Reconnaissance-Level Evaluation of The Third Delta Conveyance Channel Project – Final Report*, prepared by CH2MHill, dated October 2006. The adaptive management program will assess the measures effectiveness and refine elements of future phases. This measure would be implemented in conjunction with measure LSP-5, Sediment Inventory and Allocation.

2-16. Ridge Habitat Restoration in Barataria Basin

This measure includes restoring approximately 23 miles of natural ridge habitat by increasing ridge elevation and width with dredged material, and would also include planting of woody vegetation and native wetland plants. Natural ridges support maritime forests, which are a critically imperiled habitat in coastal Louisiana. Ridges in the Barataria Basin targeted for restoration include: Bayou Lafourche ridge, Bayou L'Ours ridge, Bayou Grande Cheniere ridge, Caminada Chenier ridges, Bayou Dupont ridge, and Bayou Barataria ridge.

2-17. Barrier Shoreline Restoration: Barataria Basin

This measure will utilize sediment dredged from offshore sources or the Mississippi River to reestablish sustainable barrier islands and barrier headlands. The Barataria Barrier Shoreline consists of a barrier island chain which separates Barataria Basin from the Gulf of Mexico. The barrier shoreline is approximately 47 miles in length, extending from Sandy Point in the east to Bayou Lafourche in the west, and includes several barrier islands and the Caminada Headland between Belle Pass and Caminada Pass.

2-18. Bankline Protection for Gulf Intracoastal Waterway (GIWW)

This measure will utilize hard bank line stabilization materials to restore and protect approximately 188 miles of strategic channel banks along both sides of the GIWW between the Mississippi River and Delta Farms. Additional benefits will be protection of critical marsh areas between the GIWW and Lake Salvador and the creation of approximately 20 acres of marsh.

4.8 Planning Unit 3a: Bayou Lafourche to Bayou de West

3a-1. Morganza to the Gulf Hurricane Protection

This measure will construct the Morganza to the Gulf Hurricane Protection Project to protect concentrated, distributed, and strategic assets in Houma, Thibodaux and coastal communities in southern Terrebonne and western Lafourche parishes from storm surges with a 1% probability of occurring in any given year. The Morganza to Gulf Alignment is approximately 72 miles long and is bounded on the west by Miners Canal and on the east by the Bayou Lafourche ridge. An alternative alignment should be considered in the design phase for the eastern most reach to ensure that the junction with the Larose to Golden Meadow Hurricane Protection Project is adequately designed. The alternative alignment follows the Twin Pipeline from Pointe Au Chien to Golden Meadow. The design of the project must include guidance in balancing the overall water resources needs of the basin, including integrating drainage, hurricane surge protection, tidal flows and hydrologic exchanges to maintain a stable and healthy landscape.

Alternative Alignment #1—Project Awaiting Authorization: This alignment follows existing ridges whenever possible and incorporates floodgates and water control structures to mimic natural water flow patterns. The nee to maximize protection to coastal communities was balanced with the need to make allowances for sediment and water flow. In many cases, these measures could improve water exchange through wetlands. Throughout the 15 years that this project has been developed, there has been active stakeholder and public input.

Alternative Alignment #2—Pointe au Chien to Golden Meadow: This additional alignment would extend from Pointe au Chien to Golden Meadow and reduce the funnel created where the proposed Morganza to the Gulf alignment meets the Larose to Golden Meadow levee. The additional alignment would also increase protection to Lafourche communities. However, if not properly designed to allow for adequate water movement, this addition could further stress the area's fragile wetlands. As a result, this addition would have to incorporate floodgates and work in tandem with water and sediment diversions to ensure that water exchange contributes to wetland sustainability. Resolution of these issues must not delay the implementation of the current Morganza to the Gulf alignment, which is being considered for federal authorization.

3a-2. Gibson to Houma Hurricane Protection

This measure will provide hurricane protection to concentrated, distributed, and strategic assets from Gibson to Miners Canal, a distance of approximately 17 miles. The levee alignment will connect the Federal Lower Atchafalaya River (LAR) levee alignment at Gibson with the Morganza to the Gulf levee alignment near Houma. The alignment will follow the State Barrier Plan, which is currently designed to alleviate Atchafalaya River backwater flooding, and will incorporate hurricane protection features.

3a-3. Morgan City to Gibson Hurricane Protection

This measure will provide hurricane protection to concentrated, distributed, and strategic assets from Morgan City to Gibson, a distance of approximately 19 miles. The alignment will follow the Federal Lower Atchafalaya River (LAR) Barrier Plan, which is currently designed to alleviate Atchafalaya River backwater flooding, and will incorporate hurricane protection features.

3a-4. Houma and Vicinity Hurricane Protection

This measure will provide hurricane protection to concentrated, distributed, and strategic assets located in the Houma/Thibodaux metropolitan areas. The alignment will work in conjunction with the Morganza to the Gulf Hurricane Protection measure to increase protection in these areas. For the purposes of this report, we have analyzed these areas as being protected from storm surges with a 0.2% chance of occurring in any given year. Completion of additional analyses, such as those progressing within the Corps of Engineers' *Louisiana Coastal Protection and Restoration Project*, will inform and ultimately define the technically feasible level of protection. The alignment begins at Miners Canal, crosses the Houma Navigation Canal (HNC) south of the major industrial facilities on that channel, proceeds along the wetland/upland interface southeast of Bourg to Larose, a distance of approximately 30 miles. The hurricane protection system may include floodgates in the GIWW, HNC, Bayou Petite Caillou, and Bayou Terrebonne.

2-3. Larose to Golden Meadow Hurricane Protection

This measure will raise the height of the existing Larose to Golden Meadow Hurricane Protection Levee to protect concentrated and strategic assets on both the east and west side of Bayou Lafourche from storm surges with a 1% probability of occurring in any given year. Approximately 24 miles of levees and floodwalls will be raised on the southern reaches, below the Gulf Intracoastal Waterway. The potential for increased surge heights from the adjacent Donaldsonville to the Gulf and Morganza to the Gulf levee systems will be evaluated, and if necessary the Larose to Golden Meadow levees system will be raised accordingly.

3a-5. Raise/Maintain Evacuation Routes Located Outside the Hurricane Protection Systems

This measure will raise/maintain evacuation routes outside of hurricane protection structures that are at risk of being damaged by storm surge. Vulnerable routes will be identified and appropriate actions will be recommended to assure the ability to safely and surely evacuate in advance of a storm and rising water and to have a functional road for safe return and recovery after a storm has passed. In many cases this may be accomplished by armoring of the roadway embankment to prevent the roadway embankment from being eroded.

3a-6. Bankline Protection for Houma Navigation Canal (HNC)

This measure will utilize hard bankline stabilization materials to restore and protect approximately 54 miles of strategic channel banks along both sides of the HNC from its confluence with the GIWW to Terrebonne Bay.

3a-7. Multipurpose Operation of the Houma Navigation Canal (HNC) Lock

The measure will develop and implement a multi-purpose operational plan for the HNC Lock that will allow the lock to be utilized for coastal restoration purposes. The lock may be used to optimize Atchafalaya River water and sediment flow to sustain wetlands in the Lake Boudreaux, Lake Mechant, and Grand Bayou areas. The lock will be located on the HNC, 1.75 miles south of the Bayou Sale intersection. Planning, Engineering, and construction costs are included in measure 3a-1: Morganza to the Gulf Hurricane Protection.

3a-8. Bankline Protection for Gulf Intracoastal Waterway (GIWW)

This measure will utilize hard bankline stabilization materials to restore and protect approximately 80 miles of strategic channel banks along both sides of the GIWW between Morgan City and Larose.

3a-9. Marsh Restoration Using Dredged Material in Terrebonne Basin

This measure will create approximately 11,400 acres of marsh using sediments, mined from the Mississippi River, Atchafalaya River and/or offshore sources, delivered via slurry pipelines with pumps and outlet units, to Terrebonne wetlands located between the west bank of Bayou Lafourche, the south bank of the GIWW, and east of Bay Junop as identified in the Louisiana Department of Natural Resources' *Phase 2 Reconnaissance-Level Evaluation of The Third Delta Conveyance Channel Project – Final Report*, prepared by CH2MHill, dated October 2006.. The adaptive management program will assess the measures effectiveness and refine elements of future phases. This measure would be implemented in conjunction with measure LSP-5, Sediment Inventory and Allocation.

3a-10. Chacahoula Basin Plan

This measure will implement the Chacahoula Basin Plan, developed by the Terrebonne Levee and Conservation District, to alleviate inundation issues in the Verret sub-basin. The Chacahoula Basin comprises approximately 107,200 acres bounded to the north by Louisiana Highway 1, to the south by Highway 182, to the west by Highway 662 and Highway 398, and to the east by Highway 311.

3a-11. Freshwater Introduction via Blue Hammock Bayou

This measure will increase the Atchafalaya River influence in lower Terrebonne Parish wetlands by increasing the hydraulic cross-section of Blue Hammock Bayou. The project will enhance and sustain marsh in an area between Four League Bay and Bayou du Large, including the areas encompassing Lake Mechant and marshes north to Bayou Decade. Approximately 230 acres of marsh will also be created using dredged material from the channel during project implementation.

3a-12. Ridge Habitat Restoration in Terrebonne Basin

This measure includes restoring and maintaining approximately 65 miles of natural ridge habitat by increasing ridge elevation and width with dredged material. Natural ridges support maritime forests, which are a critically imperiled habitat in coastal Louisiana. This measure also includes planting of woody vegetation and native wetland plants at several degraded natural ridge sites throughout the Terrebonne Basin.

3a-13. Maintain Landbridge Between Caillou Lake and Gulf of Mexico

This measure will use rock revetment and dedicated dredging for marsh creation and nourishment to restore and maintain the landbridge located between Caillou Lake and the Gulf of Mexico. This critical landscape feature, bordered on the west by Bay Junop and on the east by Lake Pelto, is vital to maintain the hydrologic regime. Approximately 1,400 acres of marsh will be restored.

3a-14. Barrier Shoreline Restoration: Terrebonne Basin

This measure will utilize sediment dredged from offshore sources to reestablish sustainable barrier islands and barrier headlands. The Terrebonne Barrier Shoreline consists of a barrier island chain which separates Timbalier Bay, Terrebonne Bay and Lake Pelto from the Gulf of Mexico. The barrier shoreline extends from Bayou Lafourche west to Raccoon Island, and includes the Caminada Headland west of Belle Pass.

2-9. Move Freshwater to Terrebonne Basin from Barataria Basin via GIWW

This measure will utilize dedicated dredging and hard shoreline stabilization materials in order to increase freshwater flow in the GIWW to the west to sustain marsh in the eastern Terrebonne Basin.

3b-6. Convey Atchafalaya River Water Eastward via GIWW to Benefit Eastern and Lower Terrebonne Marshes

This measure will increase Atchafalaya River water influence into eastern and southern Terrebonne marshes via the GIWW. This will be accomplished in conjunction with Bankline Protection for Gulf Intracoastal Waterway (3b-11) and Convey Atchafalaya River Water Westward via GIWW (3b-13) to work in tandem to manage and convey freshwater and nutrients using Atchafalaya River waters to reduce saltwater intrusion and enhance/sustain marshes in the southern Terrebonne basin. Bank stabilization of the GIWW will be performed to provide an effective conveyance channel that insures protection of adjacent thin-mat floating marsh. The landowner is concerned that the planned increased flow through the GIWW and into connected channels will degrade fragile floating marshes in northern Terrebonne Basin. The planned increase in water movement eastward via GIWW will require bank and water controls at canal, pipeline, and bayou connections.

4.9 Planning Unit 3b: Bayou de West to Freshwater Bayou Canal

3b-1. Lafayette and Vicinity Hurricane Protection

This measure will provide protection for concentrated and strategic assets for Metropolitan Lafayette and vicinity, including the Abbeville and New Iberia communities. The proposed alignment begins west of Abbeville and ends east of New Iberia. Further study is required, including refinement of economic and surge analysis to determine the level of risk to the area, in order to finalize design of a hurricane protection system that would achieve project objectives in a balanced manner. For the purposes of this report, we have analyzed these areas as being protected from storm surges with a 0.2% chance of occurring in any given year. Completion of additional analyses, such as those progressing within the Corps of Engineers' Louisiana Coastal Protection and Restoration Project, will inform and ultimately define the technically feasible level of protection.

3b-2. Wax Lake Outlet to New Iberia Hurricane Protection

This measure will protect concentrated and strategic assets located between Wax Lake Outlet and New Iberia from storm surges with 1% probability of occurring in any given year. Evaluation is needed, including refinement of economic and surge analysis to determine the level of risk to the area, in order to finalize design of a hurricane protection system that would achieve project objectives in a balanced manner.

3b-3. Maintain Existing Levee Protection for Morgan City and Berwick

This measure will sustain the current level of flood protection from the Morgan City to the Wax Lake Outlet by maintaining existing Mississippi River and Tributaries levees at authorized protection levels.

3b-4. Raise/Maintain Evacuation Routes Located Outside the Hurricane Protection Systems

This measure will raise/maintain evacuation routes outside of hurricane protection structures that are at risk of being damaged by storm surge. Vulnerable routes will be identified and appropriate actions will be recommended

to assure the ability to safely and surely evacuate in advance of a storm and rising water and to have a functional road for safe return and recovery after a storm has passed. In many cases this may be accomplished by armoring of the roadway embankment to prevent the roadway embankment from being eroded.

3b-5. Barrier Shoreline Restoration: Point Au Fer Island

This measure will restore approximately 21 miles of the gulf shoreline along Point Au Fer Island using a combination of sediment dredged from offshore sources and offshore segmented breakwaters. Design should maintain tidal processes and connectivity to interior marshes to maximize wetland sustainability. Point Au Fer Island is located south-southeast of the mouth of the Atchafalaya River.

3b-6. Convey Atchafalaya River Water Eastward via GIWW to Benefit Eastern and Lower Terrebonne Marshes

This measure will increase Atchafalaya River water influence into eastern and southern Terrebonne marshes via the GIWW. This will be accomplished in conjunction with Bankline Protection for Gulf Intracoastal Waterway (3b-11) and Convey Atchafalaya River Water Westward via GIWW (3b-13) to work in tandem to manage and convey freshwater and nutrients using Atchafalaya River waters to reduce saltwater intrusion and enhance/sustain marshes in the southern Terrebonne basin. Bank stabilization of the GIWW will be performed to provide an effective conveyance channel that insures protection of adjacent thin-mat floating marsh. The landowner is concerned that the planned increased flow through the GIWW and into connected channels will degrade fragile floating marshes in northern Terrebonne Basin. The planned increase in water movement eastward via GIWW will require bank and water controls at canal, pipeline, and bayou connections.

3b-7. Bankline Stabilization of Freshwater Bayou from Belle Isle Bayou to Freshwater Bayou Canal Lock

This measure will stabilize approximately 8 miles of bankline located on the eastern side of Freshwater Bayou Canal between the Freshwater Bayou Lock and Belle Isle Bayou in Vermilion Parish. This measure will also provide increased protection to the interior marsh by reducing erosion from wake energy created by vessel traffic.

3b-8. Increase Sediment Transport Down Wax Lake Outlet

This measure will realign the upstream segment of the inflow channel of the Wax Lake Outlet at its intersection with the Atchafalaya River to increase the sediment load per unit of discharge to enhance and restore approximately 260 acres of marsh. The Wax Lake Outlet is located in west St. Mary Parish and discharges into Atchafalaya Bay.

3b-9. Southwest Pass Shoreline Stabilization

This measure will stabilize approximately 5 miles of shoreline along Southwest Pass to prevent further widening of the tidal pass. Rock revetment will be placed at either end of the tidal pass to reduce the volume of salt water entering Vermillion Bay. Southwest pass connects the Gulf of Mexico and Vermillion Bay on the western side of Marsh Island, in Iberia and Vermillion Parishes and is located between two Louisiana wildlife refuges.

3b-10. Barrier Shoreline Restoration: Freshwater Bayou to South Point/Marsh Island

This measure will restore the gulf shoreline between Freshwater Bayou and South Point, Marsh Island using a combination of sediment dredged from offshore sources and offshore segmented breakwaters. Design should maintain tidal processes and connectivity to interior marshes to maximize wetland sustainability. Further analysis is needed to determine the most appropriate mechanism to accomplish this goal.

3b-11. Bankline Protection for Gulf Intracoastal Waterway (GIWW)

This measure will utilize hard bankline stabilization materials to protect critical areas along the north and south banks of the GIWW in strategic locations from the Vermillion River to the Atchafalaya River and in addition will stabilize the east bank of Freshwater Bayou from its intersection with the GIWW, southward to the Freshwater Bayou Canal Lock. This bank stabilization will reduce erosion from wake energy from vessel traffic and protect interior marshes.

3b-12. Raynie Marsh Restoration

This measure will utilize dredged sediments from offshore sources for shoreline restoration and to nourish and restore wetlands in the Raynie Marsh area where wetland loss rates are projected to be high. Tidal processes and connectivity to the interior marshes will be maintained to maximize wetland sustainability in the Raynie Marshes.

3b-13. Convey Atchafalaya River Water Westward via GIWW

This measure will stabilize approximately 85 miles of bankline at strategic locations along the GIWW to increase the movement of freshwater and sediment from the Atchafalaya River via the GIWW westward to enhance and sustain marsh in the Tech/Vermilion and Mermentau basins. Bank stabilization of the GIWW will be performed to provide an effective conveyance channel that does not adversely affect the existing landscape.

3b-14. Marsh Restoration Using Dredged Material at Weeks Bay

This measure will utilize sediments dredged from offshore sources to restore and nourish approximately 300 acres of marsh between Weeks Bay and the GIWW in Iberia Parish.

3b-15. Marsh Restoration Using Dredged Material at Marsh Island

This measure will utilize sediments dredged from offshore sources to restore and nourish approximately 430 acres of marsh on Marsh Island.

3b-16. Marsh Restoration using Dredged Material at Point Au Fer

This measure will utilize sediments dredged from offshore sources to restore and nourish approximately 900 acres of marsh on Point Au Fer Island.

3b-17. Stabilize Shoreline of Vermilion, East and West Cote Blanche Bays

This measure will stabilize approximately 42 miles of shoreline at strategic locations in Vermilion Bay, West Cote Blanche Bay, and East Cote Blanche Bay. Restoration of these shorelines will maintain tidal processes and connectivity to interior marshes to maximize wetland sustainability.

3b- 18. Freshwater Introduction into Central and Lower Terrbonne Marshes

This measure will manage freshwater from the Atchafalaya River through the operation of numerous existing small water distribution structures such as weirs, culverts etc., and through new distribution structures as needed, to benefit wetlands on the east side of the Atchafalaya Bay. This must be accomplished without adverse impacts in the fresh marshes of northern Terrebonne Basin.

3b-19. Fortify Spoil Banks of GIWW and Freshwater Bayou

This measure will beneficially utilize material dredged from the Acadiana Gulf of Mexico Access Channel project to create and nourish marsh and spoil banks along the GIWW from the Vermilion River Cutoff Channel to Commercial Canal, and along Freshwater Bayou from the GIWW to the Freshwater Bayou Lock, and will include armoring as needed.

4.10 Planning Unit 4: Freshwater Bayou Canal to Sabine River

4-1. Lake Charles and Vicinity Hurricane Protection

This measure will work in conjunction with other measures, such as Raise and Maintain Highways 82 and 27 (4-3) and Salinity Control Structure at Calcasieu Pass (4-9), to provide hurricane protection for concentrated and strategic assets in the Lake Charles metropolitan area, which includes Vinton, Sulphur, Lake Charles and Iowa. Further study is required, including refinement of economic and surge analysis to determine the level of risk to the area, in order to finalize design of a hurricane protection system that would achieve project objectives in a balanced manner. For the purposes of this report, we have analyzed these areas as being protected from storm surges with a 0.2% chance of occurring in any given year. Completion of additional analyses, such as those progressing within the Corps of Engineers' *Louisiana Coastal Protection and Restoration Project*, will inform and ultimately define the technically feasible level of protection.

4-2. Abbeville to Lake Charles Hurricane Protection

This measure will protect distributed and strategic assets located between the Lake Charles metropolitan area and the Lafayette/Abbeville metropolitan areas, which includes the communities of Kaplan, Gueyden, Lake Arthur, and Holmwood from a storm surge with a 1% probability of occurring in any given year. Levees will be constructed where necessary to work in conjunction with other lines of defense such as shoreline measures, navigation channel bank improvements, raising of highways, etc. The proposed protection system is approximately 150 miles in length and begins at the Calcasieu Lock, and extends eastward along the south bank of the GIWW to the Leland Bowman Lock then north across the GIWW then east-northeast to the Lafayette and Vicinity Hurricane Protection System. Further study is required, including refinement of economic and surge analysis to determine the level of risk to the area, in order to finalize design of a hurricane protection system that would achieve project objectives in a balanced manner.

4-3. Raise and Maintain Highways 82 and 27

This measure will elevate and maintain sections of Highways 82 and 27 to provide hydrologic control for maintaining the Mermentau and Calcasieu basins as freshwater ecosystems. If the highway is located on a chenier, the road is already on a landscape feature at or above the targeted elevation, and raising it further is unnecessary. Thus, the plan does not recommend raising the highway on the cheniers. Instead, the plan recommends improving protection to homes and properties located on cheniers by armoring highway embankments in certain vulnerable locations. This will ensure that the road can be used safely after storms. In selected low spots, such as south of White Lake or along the eastern edge of Highway 82 south of Forked Island, the highway will need to be raised in order to protect the Mermentau Freshwater Basin. However, there are few human settlements in such areas, and impacts on landowners are expected to be minimal. In addition to environmental benefits, this measure will provide a level of surge protection benefits for communities in the Chenier Plain, especially the communities north of the eastern portion of Highway 82. This measure will be considered as a line of storm surge defense during the analysis of the level of protection for the Lake Charles and Vicinity Hurricane Protection Measure (4-1) and Abbeville to Lake Charles Hurricane Protection Measure (4-2).

4-4. Bankline Protection for Gulf Intracoastal Waterway (GIWW)

This measure will utilize hard bankline stabilization materials to protect critical areas along the north and south banks of the GIWW in strategic locations from the Sabine River to the Vermilion River to reduce erosion from vessel traffic wake energy and protect interior marshes.

4-5. Restore the Mermentau Lakes Basin Integrity

This measure will utilize earthen embankments, in conjunction with the existing Schooner Bayou salinity control structure and Leland Bowman Lock, to restore the integrity of the Mermentau Lakes Basin. Two earthen embankments, totaling 7 miles in length, will be reconstructed and connected to the existing control structure to close potential avenues for saltwater intrusion. When complete, this measure will provide a salt water barrier from Highway 82 to the Schooner Bayou salinity control structure to the Leland Bowman Lock at the GIWW.

4-6. Stabilize Grand Lake Shoreline

This measure will utilize hard structures, in conjunction with dredged material, to stabilize critical locations of the Grand Lake shoreline in order to reduce shoreline erosion and protect interior marshes. Additionally, connectivity to the interior marshes will be maintained to maximize wetland sustainability in the area. Grand Lake is located east of Calcasieu Lake in Cameron Parish.

4-7. Stabilize White Lake Shoreline

This measure will utilize hard structures, in conjunction with dredged material, to stabilize critical locations of the White Lake shoreline to reduce shoreline erosion and protect interior marshes. Additionally, connectivity to the interior marshes will be maintained to maximize wetland sustainability in the area. White Lake is located southwest of Abbeville, south of the GIWW in Vermilion Parish.

4-8. Bankline Stabilization of Freshwater Bayou

This measure will utilize hard bankline stabilization materials to complete the continuous armoring of the west bank of Freshwater Bayou from the intersection of the GIWW to the Freshwater Bayou Lock. Previous projects constructed under the Coastal Wetlands Planning Protection and Restoration Act (CWPPRA) provided bankline stabilization in all but two reaches. These two reaches extend from the GIWW to Six Mile Canal and from Humble Canal to the Freshwater Bayou Canal Lock.

4-9. Salinity Control Structure at Calcasieu Pass

This measure will reduce the Calcasieu Ship Channel cross section at Calcasieu Pass to 400’ width and 40’ depth in the vicinity of Cameron and will evaluate other structures to reduce saltwater intrusion and storm surge from the Calcasieu River Channel into Calcasieu Lake. Completion of additional analyses will inform and ultimately define the structural measures required to achieve project goals.

4-10. Barrier Shoreline Restoration: Sabine River to Calcasieu River

This measure will restore portions of the gulf shoreline from the Sabine River to the Calcasieu River using a combination of sediment dredged from offshore sources and offshore segmented breakwaters. Additionally, tidal processes and connectivity to the interior marshes will be maintained to maximize wetland sustainability in the area.

4-11. Barrier Shoreline Restoration: Calcasieu River to Freshwater Bayou

This measure will restore portions of the gulf shoreline from the Calcasieu River to Freshwater Bayou using a combination of sediment dredged from offshore sources and offshore segmented breakwaters. The portion of this shoreline in front of the Rockefeller Wildlife Refuge has the highest rate of shoreline erosion in the Chenier Plain. Additionally, tidal processes and connectivity to the interior marshes will be maintained to maximize wetland sustainability in the area.

4-12. Marsh Restoration Using Dredged Material South of Highway 82

This measure includes using dredged sediment from the Gulf of Mexico to nourish and restore approximately 3,000 acres of marsh areas south of Highway 82, east and west of the Calcasieu Ship Channel.

4-13. Beneficial Uses of Dredged Material from Calcasieu Ship Channel

This measure will implement and extend the ongoing LCA beneficial use program for the Calcasieu Ship Channel, including incorporation of measures defined by the Port of Lake Charles. Approximately 37,600 acres of marsh at five sites within the Sabine National Wildlife Refuge may be restored and nourished through beneficial use of dredged material from the Calcasieu River Ship Channel.

4-14. Salinity Control Structure at Sabine Pass

This measure will establish a salinity control structure at the south end of Sabine Lake near the Gulf of Mexico. The ability to control salinity gradients will enhance the ability to maintain large areas of fresh and intermediate marsh in the area.

4-15. Fortify Spoil Banks of GIWW and Freshwater Bayou

This measure will beneficially utilize material dredged from the Acadiana Gulf of Mexico Access Channel project to create and nourish marsh and spoil banks along the GIWW from Freshwater Bayou to the Vermilion River Cutoff Channel, and along Freshwater Bayou from the GIWW to the Freshwater Bayou Lock, and will include armoring as needed.

4-16. Stabilize Calcasieu Lake Shoreline

This measure will utilize hard structures, in conjunction with dredged material, to stabilize critical locations of the Calcasieu Lake shoreline to reduce shoreline erosion and protect interior marshes. Additionally, tidal processes and connectivity to the interior marshes will be maintained to maximize wetland sustainability in the area. Calcasieu Lake is located south of Lake Charles in Cameron Parish.

4-17. Stabilize Sabine Lake Shoreline

This measure will utilize hard structures, in conjunction with dredged material, to stabilize critical locations of the Sabine Lake shoreline to reduce shoreline erosion and protect interior marshes. Additionally, tidal processes and connectivity to the interior marshes will be maintained to maximize wetland sustainability in the area. Sabine Lake is located on the Texas/Louisiana border and a portion of the eastern shoreline encompasses the Sabine National Wildlife Refuge.

4-18. Mermentau Basin Watershed Management Plan to Retain Freshwater Resources

This measure is to develop a comprehensive watershed management plan for freshwater resources in the Mermentau Basin to provide for wetland restoration and to support continued agriculture and navigation in the region. Existing stage and flow data from locks, reservoirs, the GIWW, the Red River and other sources of freshwater will be used to establish water availability and determine allocation needs.

4-19. Sabine Basin Watershed Management

The measure will conduct detailed investigations to develop a comprehensive management plan to increase Sabine River flow via the GIWW so that a reduced salinity regime may be established within the Calcasieu sub-basin for wetlands restoration and sustainability. The strategy includes a hydrologic assessment to identify the impacts of inflow redistribution on coastal areas and the Sabine River/Toledo Bend Reservoir system and to develop measures to mitigate adverse impacts.

4-20. Hydrologic Improvements in Mermentau Basin at Highways 82 and 27

Environmental structures to pass freshwater from north to south across Highway 82 and from east to west across Highway 27 are needed to optimize fresh water distribution. In addition, should these roadways be overtopped by storm surges and the fresh marshes of the Mermentau Lakes Sub-basin are impacted by salt water, these structures would facilitate drainage and may foster a more rapid recovery of these areas.

5.0 Program Implementation Strategy

5.1 Introduction

Both hurricane protection and ecosystem restoration have been on-going for decades in coastal Louisiana; however, integration of these missions and the increasing level of effort raises many new questions regarding how best to balance achievement of all objectives. The Master Plan represents the State's first approximation of the comprehensive solution for coastal protection and restoration. It builds upon previous planning, research, and lessons learned, yet many uncertainties remain regarding program & project impacts and the ability to balance objectives in the face of changing conditions.

This plan represents a point of departure from how planning of activities along coastal Louisiana has been done in the past. As such, it does not represent an end product, but instead a new direction and a new philosophy for how we live in, and manage the resources of, coastal Louisiana. Many adjustments will need to be made in the first few years of implementation, including revisions to existing management practices, policies, and legislation. Although a multitude of local, State and Federal agencies; policies; and legislation already exist which influence the planning, funding, and implementation of the Master Plan, all were created prior to the integration of planning and implementation of coastal protection and restoration. Additionally, although the Master Plan builds upon decades of experience, implementation of this program and some of the measures which comprise the plan will require further analyses including modeling, engineering & design, and environmental study. Therefore, mechanisms for change – not only early in plan implementation, but throughout the life of its implementation – will be required to meet the needs of the Master Plan.

This Chapter sets out the full framework to be utilized in progressing implementation of this first iteration of the Master Plan. The following section presents the process for identifying the first actions to be undertaken. Subsequent sections then present the recommended framework for long-term program management, the policy and legislative issues requiring resolution, and the adaptive management framework that must be established in order that implementation of the plan evolves over time.

5.2 Urgent Early Actions and Implementation Sequencing

5.2.1 Background

The Master Plan sets out a wide range of measures and studies to be implemented in coastal Louisiana, at a cost of tens of billions of dollars over the coming decades. In the evaluations undertaken to define the plan it was necessary to assume that all measures are started in the first year of plan implementation. This is clearly not a realistic assumption as there are many constraints which prevent this from being possible. These constraints include the following.

- Funding, materials, and other resources are limited and will restrict both what can be done and how quickly projects can be completed.
- Certain projects must be constructed before others in order to achieve intended outcomes.
- Some existing laws, policies, and other administrative procedures must be updated if the Master Plan is to be implemented as envisioned.
- Several concepts require further planning before they can be designed or constructed.
- Some of the proposed projects will take many years to plan, design, and construct.

Given these constraints, it is important to define a mechanism to decide which measures are progressed first. The procedure developed is based upon the premise that all measures called for in the Master Plan are critical, but accepts that constraints prevent the full plan from being implemented at once. Thus, the most urgent early actions will be identified and sequenced according to funding availability. Funds from all potential sources will be managed to progress the Master Plan urgent early activities. This includes the Coastal Impact Assistance Program, the Coastal Wetlands Planning, Protection, and Restoration Act Program, Outer Continental Shelf Revenue Sharing, cost-sharing opportunities with Federal Agencies—e.g., Corps of Engineers, Federal Emergency Management Agency, and Water Resources Development Act projects such as Louisiana Coastal Area and Morganza to the Gulf—, the Statewide Flood Control Program, the State Capital Outlay Bond Program, State general funds, local funds, and others. Even with all the above programs, Louisiana cannot complete the Master Plan utilizing only state funds. Given that total costs are estimated to be in the tens of billions of dollars, Louisiana and the nation must work together for the Master Plan to be successful. This will require that many federal and state agencies work together in unprecedented ways for a plan of this scope to be successful.

The process set out below does not attempt to sequence the full set of recommendations presented in the Master Plan, nor does it seek to imply priorities with respect to other actions that may be taken in the coastal zone that are beyond the scope of this plan. It is recognized that there will be changes over time, both near and long term, in priorities and needs in the coastal landscape. Adaptive management is a concept that is embraced in many large-scale ecosystem restoration and flood control programs, and is the approach that will be utilized to manage the implementation of the Master Plan. This approach links all phases of program implementation from concept through project operations and even changes in the plan itself. It is thus dependent upon collaboration, flexibility and continued improvement.

To lay out the actions that will be taken in a timeframe longer than approximately 5 years would require making potentially unfounded assumptions on how existing constraints (including policies, legislation, funding, scientific and technical uncertainties), the physical landscape, and human use of that landscape will change into the future. Thus, just as the components of the entire plan should be managed adaptively, so should the implementation of the plan. As funding opportunities change during implementation, the sequencing will need to be modified as appropriate.

To this end, the reporting and update of the implementation priorities and sequence will be provided via the Annual Plan process, rather than within the Master Plan. This will provide for the review and update of the implementation plan on an annual basis to ensure the program accurately reflects funding availability and the status of individual actions. The process for definition of this Annual Plan will be an elaboration of the existing Annual Planning process, focused directly on implementation of the Master Plan.

The process defined in the following sections only considers sequencing of the measures and studies defined in the Master Plan. It does not provide solutions to the administrative and framework changes that may be necessary to successfully implement the Master Plan. Regardless of the sequence of implementation of measures and studies, it is imperative that immediate action be taken to resolve the legislative, institutional, and policy issues in order that the Master Plan can be effectively and efficiently implemented. A more detailed discussion of early actions needed for administrative and program management is presented in Chapters 5.3 to 5.5.

5.2.2 Process

The following sections set out the criteria and procedures by which urgent early actions and sequencing of those actions will be determined. The process builds on approaches followed for previous planning initiatives, but necessarily is more comprehensive than previous approaches to include the broader objectives of this plan. An overview of the process is presented in Figure 5.1.

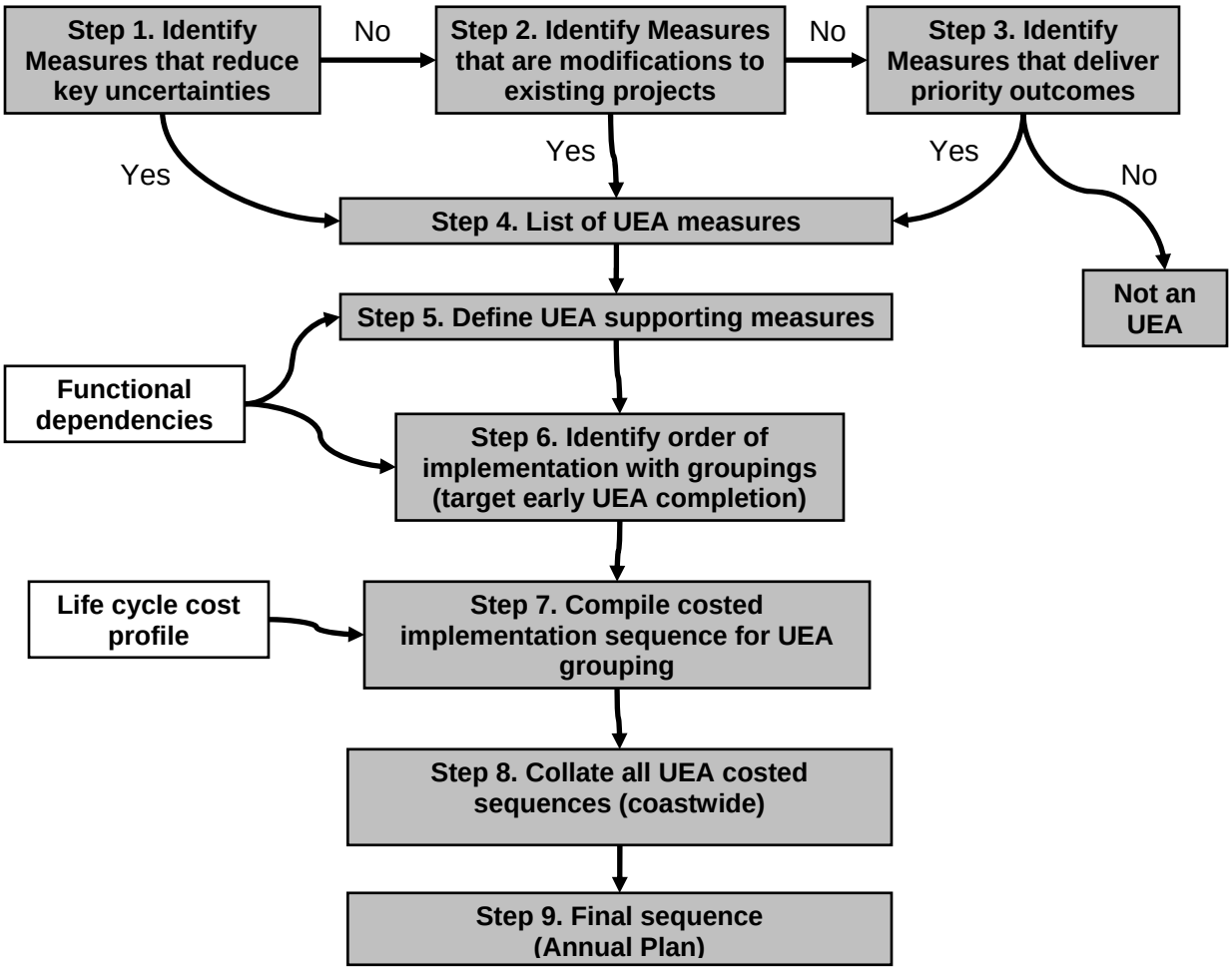


Figure 5.1: Steps in Determining Urgent Early Actions and Sequencing

5.2.3 Identifying the Urgent Early Actions

The plan is expected to achieve positive outcomes that are sequenced based upon the most critical needs both within a region and across the coast. Assumptions were made that all measures in the plan are critical needs, but decisions must be made on what measures are initiated first in order that utilization of our finite resources can be planned. The process set out below seeks to sequence the Urgent Early Actions (UEA's) that will be taken to efficiently implement the Master Plan. Actions will be sequenced in a way that best balances the four coastwide

objectives, and includes those uncertainties, policy, legislative, and funding issues that need to be resolved in order to implement the entire plan. The four coastwide objectives, found in chapter 3, and are summarized as:

- reduce risk to economic assets;
- restore sustainability to the coastal ecosystem;
- maintain a diverse array of habitats for fish and wildlife; and
- sustain Louisiana's unique heritage and culture.

A great deal of information was considered to generate the plan, including the following parameters:

- economic inventories (assets) and population;
- storm surge maps (combined with economics to gauge risk);
- current levels of protection to assets;
- past and future land loss estimates;
- projected changes in habitat suitability for representative species; and
- stakeholder and public input.

This information will also be used as supporting data in the sequencing process.

Urgent Early Action Criteria

In order to determine which of the measures identified in the Master Plan will be elevated for early action, Urgent Early Action criteria will be applied. There are three sets of criteria (Steps 1 to 3 of the sequencing process, Figure 5.1). The first set relates to those measures that must be implemented early as their outcome/design/performance will be used to reduce key uncertainties in future plan implementation. The second set identifies those measures which primarily involve non-construction actions to deliver rapid improvements. The third set relates to those measures that deliver the highest priority outcomes.

Completion of Steps 1 to 3 of the process will result in the identification of a complete list of *urgent early actions* for the Master Plan (Step 4). These steps and the criteria are described further below.

Step 1: Reducing Uncertainties

Measures that will result in the reduction of key uncertainties, and hence improve the future definition and implementation of the remainder of the Master Plan will be identified as *urgent early actions*. The main report sets out the major assumptions and uncertainties associated with this first iteration of the Master Plan. A range of studies and measures are proposed as part of the Plan in order to reduce these uncertainties into the future. It is necessary to ensure early action on these measures such that the information they yield can feed back into the plan process as soon as possible.

The following definitions will be used in the identification of these urgent early actions:

- measures which facilitate the planning or design of other existing or planned projects; and
- large scale planning of promising concepts or projects that reduce key uncertainties related to plan implementation will be started at the earliest opportunity, as they will have implications for future implementation of the Master Plan.

An example of this would be the Mississippi River Delta Management Study to review options for major diversions on the lower Mississippi River.

Step 2: Modifications of Existing Projects

Modifications of existing structures, or their operations, will be defined as an urgent early actions where they can be achieved with minimal capital cost implications. These measures are likely to represent the quickest opportunities to deliver improvements to the Louisiana coastal area and as such their implementation will be prioritized. An example would be modifying the existing authorizations to enable greater flows through the Carneravon and Davis Pond Freshwater Diversion Structures.

Step 3: Priority Outcomes

The following sections identify the attributes of a measure that would define a priority outcome. A measure that meets one of these criteria will be considered an Urgent Early Action.

Hurricane Protection

For Concentrated and Strategic Assets, where there is a high standard of protection targeted in the Master Plan this will be an UEA. The locations with a high target standard of protection are, by definition, those with the greatest levels of risk (flood threat multiplied by vulnerable assets) and hence provide a rational basis for targeting early actions.

These protection urgent early action outcomes will be defined by the following standard:

- Projects that protect concentrated and strategic assets that were identified in the Master Plan as needing a greater than 100 year level of protection, meaning protection over the level needed to withstand a storm that has a 1% chance of occurring in any given year..

Beginning planning and design of the Lake Pontchartrain Barrier Plan to increase the effectiveness of New Orleans's hurricane protection system could be identified as an UEA under this criterion.

Ecosystem Restoration

Measures associated with reestablishing critical ecosystem structure or function, will be defined as an urgent early action. This rationale seeks to ensure early progress on those elements of the coastal landscape that are critical to providing a system that is able to sustain itself.

These restoration UEA outcomes will be defined as those that meet one (or more) of the following criteria:

- Maintains or reestablishes a feature critical to sustaining or restoring the hydrologic regime. This criteria will be used to identify those features of the landscape that facilitate the functioning of the must vulnerable wetland areas by providing the physical setting within which the hydrologic processes operate. Examples of such measures would be restoration of barrier islands and crucial land bridges.
- Restores natural processes in an area of high projected loss. This will be used to ensure that measures which provide for the restoration of land-sustaining or land-building processes in highly vulnerable areas of the coastal ecosystem, are identified for early implementation. Measures that serve to reestablish riverine influence in fragile wetlands would meet this criterion.

- Sustains or improves processes critical to the socio-economic viability of an existing community. This will include those measures that provide for the continuation or improvement of conditions that are essential to the continued viability of human use of natural resources. An example of measures that would meet this criterion includes those that stabilize municipal fresh water supplies.

The priority areas for consideration under the above criteria will be identified using the land change projections, on both 10 and 50 year horizons, provided by the CLEAR analysis (see Appendix G) undertaken to support definition of this plan.

Step 4: List of Urgent Early Action Measures

Resultant from steps 1 to 3 will be a list of all UEA's identified through application of the above process.

5.2.4 Sequencing of Urgent Early Action Measures

Aims

This process will sort the UEA measures into an implementation sequence which will ensure that objectives are achieved as quickly as possible within the overall constraints governing ecosystem restoration and hurricane protection. The actual timescales for implementation will be dependant upon resource availability, the most critical of which is likely to be funding. This process will be used to generate the implementation plan.

Measure Status

The measures identified in the above process as the urgent early actions will be at various stages of development, in terms of their progress towards implementation, and their associated certainty of implementation and performance. Each measure will be identified as being at one of the following stages of implementation:

- ***Planning*** – concept is currently under evaluation or needs to be evaluated before engineering & design can be undertaken. This phase includes compliance with the National Environmental Policy Act (NEPA).
- ***Engineering & Design*** – planning is complete, and the measure was found to be feasible. The project is either ready to be designed or engineering and design are already underway.
- ***Construction*** – planning and design of the measure is complete; the project is awaiting or has received authorization, and construction is ready to begin.
- ***Modification*** – the measure has already been built and requires modifications either to the structure or to its operations.

It is important to understand the status of each measure when developing a sequence of implementation as this is indicative of timescale to construction, and the current understanding of the level of certainty in the measure's ability to achieve the desired performance.

Sequencing Process Parameters

The decision process of sequencing measures will consider the following data and information (parameters):

- schedules, considering estimated time to begin construction and estimated construction duration, as well as desired schedule to meet the measure's objectives;
- Cost data, including total cost and cost profile (planning – design – construction – operation and maintenance);
- authorization and funding status (including cost sharing opportunities); and
- functional dependencies on other projects.

Sequencing Considerations

There will be four steps involved in the process of sequencing the implementation of urgent early action measures, as follow:

- identify the dependencies on other 'supporting' measures (Step 5);
- identify the implementation sequence within groupings (Step 6);
- apply the cost data for the measures, presented as a cost profile (to include planning, design and construction) (Steps 7 & 8); and
- adjust schedule to match funding constraints (Steps 9 & 10).

The following sections set out the process for each of these steps.

Step 5: Dependencies

The process for definition of the UEA measures produces a list of individual measures that are considered to deliver or facilitate important outcomes. However, the successful implementation of these individual measures may be dependant upon their integration with other measures which support them.

For each UEA the supporting measures will be identified using the following criteria:

- measures which facilitate the functioning or sustainability of a UEA (e.g. the Maintain MRGO – Lake Borgne Landbridge is needed for the Mississippi River Diversion at Violet to influence target areas);
- measures where it is necessary to rebuild a particular landscape feature so that a UEA functions as intended (e.g. Shell Island needs to be rebuilt for the integrity of the Barataria Barrier Islands, which is critical to freshwater and sediment retention within the coastal system and for flood protection);
- measures required to achieve balanced implementation of protection and restoration (this will follow the mitigation process which is defined separately).

Based upon these criteria, the measures supporting each UEA will be identified.

Step 6: Implementation Order

Within the individual groupings (a grouping includes the UEA measures plus supporting measures) it is likely that there will be a necessary, or preferable, order to the implementation of individual measures. Factors that will influence the order of implementation within these groupings will include the following:

- based upon the schedules defined for each measure, some will be able to be progressed to construction earlier than others;
- certain measures within a group may deliver the majority of the benefits towards achievement of the UEA outcome; these measures should be built first;
- within a grouping it may be necessary to construct a particular measure(s) first to facilitate the implementation of other measures within the group.

The output from this step will be an order of implementation for the individual measures in each grouping.

Steps 7 & 8: Initial Sequence

The next step is to populate the implementation orders with the individual measure schedules and life cycle costs and compile all the measure groupings to give a comprehensive sequence and cost profile for all measures associated with delivery of the urgent early actions. The consideration of project costs in the implementation order should highlight potential differences in uncertainty of the cost estimate, which reflects the current status of

the measure. The process may delay measures, or may allow implementation of only early phases of a measure. Some situations that may cause this include: budgets are insufficient to promote the measure in full during the initial sequence; the measure's effectiveness may include uncertainties or require technological advancements that warrant refinements to the measure prior to construction. These adjustments will also seek to ensure that plan implementation balances the delivery of protection and restoration outcomes.

Step 9: Final Sequence and Annual Plan

The final results of the above process include a sequence of the implementation plan for the Master Plan UEA's and dependent measures. As identified above, the outputs from the sequencing process are not reported as part of the Master Plan, but will be included as part of the Annual Plan. This provides for the ongoing review of the implementation sequence and incorporation of new understanding arising from implementation and the adaptive management process (see Section 5.5). The implementation sequence presented in the Annual Plan must reflect the dependencies identified through the process set out above. Included in the Annual Plan will be work of on-going programs that support implementation of the Master Plan, such as CWPPRA, LCA, CIAP, and hurricane protection projects.

5.3 Program Management

The Master Plan articulates a comprehensive vision of actions necessary to sustain Louisiana's coastal ecosystem and safeguard coastal populations and vital socioeconomic resources. Whereas, in the past, individual programs and projects for coastal protection and restoration may have been carried out for single purposes which may not have been a functional portion of a larger vision, the Master Plan provides an opportunity to focus available funding toward a common goal. Programs such as the Coastal Wetlands Planning Protection and Restoration Act (CWPPRA), Louisiana Coastal Area (LCA), and the Coastal Impact Assistance Program (CIAP) may now all be used in a coordinated fashion to implement the Master Plan. In addition to guiding expenditures of protection and restoration funds, the Master Plan provides a context within which to evaluate other types of activities occurring in the coastal zone, including: transportation, navigation, and port projects; oil and gas development; groundwater management; and land use planning.

The CPRA was charged by Act No. 8 of the 2005 1st Extraordinary Special Session of the Louisiana Legislature in November 2005 to develop, coordinate, make reports on, and provide oversight for a comprehensive coastal protection and restoration master plan, and annual coastal protection and restoration plans. The Executive Assistant to the Governor for Coastal Activities, chairperson of the CPRA, has been given broad powers to coordinate activities of state agencies responsible for carrying out coastal protection and restoration activities, and also for coordinating state policies on activities that would significantly affect these activities. Although the primary responsibility for carrying out the coastal restoration elements of the plan lies within the Department of Natural Resources and the primary responsibility for carrying out the hurricane protection elements of the plan lies within the Department of Transportation and Development, the CPRA must coordinate the activities of both departments to ensure available funding is allocated to areas of greatest need. The Integrated Planning Team, responsible for compiling this Master Plan, was an interim response to facilitate coordination of the activities of the two departments, but a critical need exists to provide a long-term mechanism to maintain focus, effectiveness, and integration of Master Plan implementation.

This need was recognized by an independent working group of scientists and engineers who prepared a report titled "A New Framework for Planning the Future of Coastal Louisiana after the Hurricanes of 2005" (Working Group for Post-Hurricane Planning for the Louisiana Coast, 2006). This report recommended establishing a Coastal Assessment Group and vesting them with the responsibility for executing integrated assessments to assure

that proposed projects are integral portions of a larger plan, and evaluate to what extent different economic, social, and environmental objectives are served. A second function of the Coastal Assessment Group would be to direct a Coastal Engineering and Science Program and to coordinate with related on-going initiatives (see chapter 5.5.2) to support adaptive management, participatory decision making, and rigorous independent peer review.

Although the CPRA has been empowered by State law to articulate the State's priorities and provide focus for coastal protection and restoration activities, no comparable body exists within the federal government. Although the LCA Program envisions a task force (including limited participation by the State) to coordinate restoration activities under the direction of the U.S. Army Corps of Engineers, it is unclear how this group would interact with the CPRA to resolve any differences that may arise. In addition, as is the case with the CWPPRA Task Force, it is likely that the State's role on such a federal task force will be limited, specifically with respect to discussions regarding obligations of federal funds. Since it is likely that overall implementation of the Master Plan will require a significant partnership with the federal government for both funding and legislative compliance, these deficiencies must be rectified to avoid significant delays in project implementation.

The following specific actions are recommended to facilitate long-term program management of Master Plan implementation:

1. A Coastal Assessment Group should be formalized and made a permanent group within the State's program management structure. This group should use the talents of scientists and other technical experts who can reach out to the international research community to supplement their understanding of specific issues. This group should specifically be charged with the following duties.
    a. Report on the progress toward implementation of the Master Plan.

    b. Make revisions to the Master Plan, as necessary. This process is set out in Chapter 6 of this Appendix.

    c. Prepare future iterations of the Annual Plan: Ecosystem Restoration and Hurricane Protection in Coastal Louisiana (Annual Plan), ensuring that activities of the implementing agencies and the Coastal Engineering and Science Program are consistent with the priorities set out in the Master Plan.

    d. Facilitate resolution of policy, legislative, and institutional issues that may hinder the implementation of the Master Plan, as identified by the CPRA.

    e. Foster communication between CPRA member agencies, federal and local governments, and the public to ensure activities which may affect coastal protection and restoration are consistent with the Master Plan.

2. An Applied Coastal Engineering and Science Program should be established as a vehicle to resolve decision-relevant data and knowledge gaps, and facilitate engineering and technical advancements that support Master Plan implementation. This program should make maximum use of existing programs, such as the LCA Science and Technology Program, supplementing and integrating these programs as needed to ensure that scientific and technical needs relevant to decision making are addressed.
3. The federal government should act quickly to develop mechanisms for focusing federal involvement in an effective, problem-solving, partnership with the State. This should include a process to align the many diverse federal agency missions related to the protection and restoration of coastal Louisiana.

5.4 Policy and Legislative Issues for Early Resolution

Many needs for policy, legislative, and institutional changes have already been identified, and are discussed briefly below. This is by no means an exhaustive list; however, it is imperative that these issues be resolved early in the implementation of the Master Plan to avoid delays in construction of measures or unintended consequences of projects because of ineffective regulations to ensure that measures do not induce inappropriate activities.

5.4.1 Increase Awareness and Use of Non-Structural Protection Measures.

The state must encourage citizens and local governments to take greater advantage of the many non-structural measures available for reducing risk from storm surge. Such measures can help residents and businesses make their homes safer while also reducing flood insurance premiums.

- Mandatory disclosure laws. Require that purchasers be notified if their future property is located in either a 100-year or a 500-year floodplain. This notification should be made before financing for the purchase is approved.
- Floodplain management training. Require mandatory training in floodplain regulations for certified building officials responsible for enforcing the new statewide building codes. The training would help these officials integrate flood elevation requirements with the responsibilities of their jobs as inspectors. Such training should also be extended to real estate agents and lenders.
- Begin a statewide education/outreach campaign. The campaign's goal should be to inform citizens about the Community Rating System and the many ways in which citizens can reduce their flood insurance premiums. This campaign should be conducted by professional media consultants and use public service and/or paid announcements on television, radio, and print media.

5.4.2 Land Use Planning/Zoning/Permitting

During the planning and public comment period, the concern was raised many times that construction of new hurricane protection systems must not have the unintended consequence of inducing unwise development into high risk areas. Indeed, development has expanded into low-lying wetland areas in the past, serving to increase overall levels of risk and increasing the potential consequences if hurricane protection systems overtop or fail. However, this would be counter to our objectives of sustaining wetland ecosystems and reducing risk of coastal communities to storm-related damages. Such an unintended consequence of providing protection to populated areas must be avoided during implementation of the Master Plan.

In very straightforward terms, it is the goal to ensure that wetlands in coastal Louisiana remain sustainable into the future. Louisiana citizens agree that wetlands, both coastal marshes and interior forested wetlands, should be protected from residential and commercial development whether or not a levee is planned for the area. It is an essential component to conserve coastal wetlands and to reduce risk to low lying communities.

Land use planning and zoning are therefore urgent policy/legislative actions that need to be addressed in order to successfully achieve the intended outcomes of the Master Plan. Land use actions by the state must balance individual property rights with the need to maintain our coastal wetlands. While the coastal population of Louisiana requires protection, unwise development should be strongly discouraged in high risk coastal areas. Prudent planning supports examining the need to strengthen the Louisiana Coastal Resources Program and the Louisiana Coastal Zone Management Plan. Zoning actions by local governments, though not popular in

Louisiana, are another means of designating non-development areas in coastal wetlands. State legislation, as well as departmental policies, should endorse this initiative and look for ways to provide incentives to local governing bodies to enact and enforce region-wide land use zoning. Assurances that hurricane protection and coastal restoration measures do not result in wetland losses or increasing the assets at risk in coastal regions are imperative in the successful implementation of the Master Plan.

Louisiana Sea Grant and the Coalition to Restore Coastal Louisiana are currently working on a review of land use planning tools in Louisiana. Their objectives are to assess state land use planning authority and practices, to provide information on legal and policy tools to planners, to identify gaps in planning authority, to provide information on needs of planners' to lawmakers, and to facilitate better planning for public safety in the coastal zone. The CPRA will convene a working group, including parish governments, legislators, landowners, and agency personnel, to examine this report and develop a strategy for implementing required actions to guide smart growth consistent with the objectives of the Master Plan.

5.4.3 Land Owner Concerns/Partnership

Approximately 80% of coastal Louisiana is privately owned and the rights of these landowners, including mineral rights, must be honored as components of the Master Plan are constructed and operated. Through many years of working on projects in coastal Louisiana, DNR and DOTD have built strong working relationships with most of the major landowners to construct projects in a manner that achieves the goals but is also fair and equitable to the landowners. These relationships must be fostered during the implementation of the Master Plan to allow for timely completion of measures.

Land ownership has many faces in coastal Louisiana. In many cases, large tracts of land are owned by a single entity. In other cases, single parcels of property may be owned by hundreds of individuals that are either difficult to contact or, in some cases, unknown. This is particularly the case when land has been passed down through generations. Situations will also arise where multiple parcels of land will be needed to implement very large projects such as those proposed in the Master Plan. In any of these cases, a single landowner's desire not to participate in project implementation can result in a project being delayed indefinitely or even terminated.

Multiple options must be available to reach fair and equitable solutions for building projects on private lands. The first course of action would be to acquire the necessary easements to construct the project. Another option would be to work to allow for separation of surface rights from mineral rights. The state could then purchase the surface rights to the land, while the original landowner would retain all subsurface (including mineral) rights.

In cases where such an agreement cannot be reached expropriation is an option. Both DNR and DOTD have the capability to expropriate under Title 19 of the Revised Statues. However, expropriating involves filing a law suit, which must be resolved prior to initiating project activities. This is a long and contentious process, and is clearly not a desirable option.

Another choice for acquiring the necessary land rights to construct projects that are in the best interest of the public is an authority known as "quick take". When a negotiated settlement cannot be reached after good faith negotiations between the implementing agency and the landowner, and if delays in land acquisition will delay project construction, quick take authority allows the agency to place the offered compensation in the court registry and file a law suit against the landowner. Progress toward project construction is not hindered by that action, and the suit, and whatever compensation the landowner will ultimately receive, is settled at a later date. The DOTD has this authority for roadway construction, and levee districts have this authority for levee projects. DNR only

has quick-take authority to acquire lands for coastal restoration projects on barrier islands if a settlement cannot be reached, granted to it through an amendment in 2001. No further quick-take authority legislation has been passed for coastal restoration projects because of legislator and landowner opposition and because of technical complications caused by land reclamation issues.

To date, DNR has never entertained the idea of using either form of condemnation and considers both to be options of last resort. However, in order to ensure that these large-scale projects may be built in a timely fashion, these options must be available to both implementing agencies, particularly in cases where property would be damaged or destroyed in order to build project features. Thus, although it is the clear preference to work in partnership with landowners to achieve the objectives of the Master Plan, passage of the needed legislation to provide DNR and DOTD with "quick-take" authority, similar to that already provided to DOTD for highway construction, is a necessary early action in the implementation of the Master Plan.

5.4.4 Coastal Forestry

Louisiana's coastal wetland forests are of tremendous economic, ecological, cultural, and recreational value to residents of Louisiana, the people of the United States, and the world. Large-scale and localized alterations of processes affecting coastal wetlands have caused the complete loss of some coastal wetland forests and reduced the productivity and vigor of remaining areas. This loss and degradation threatens ecosystem functions and the services they provide.

Best management practices for coastal wetlands were reported in the Louisiana Department of Agriculture and Forestry, Environmental Protection Agency, and Louisiana Department of Environmental Quality report (2000). However, no such recommendations exist for the specific ecosystems of coastal forested wetlands. In response to the public's concerns for continuing loss of Louisiana's coastal wetland forests, Governor Foster, before leaving office, commissioned the formation of a task force to address these concerns. Immediately upon taking office, Governor Kathleen Blanco followed through with this response by activating the task force, which later became known as the Coastal Wetland Forest Conservation and Use Science Working Group (hereafter referred to as SWG). The mission of the SWG was to provide information and guidelines for the long-term utilization, conservation, and protection of Louisiana's coastal wetland forest ecosystem, from both environmental and economic perspectives. Their findings were compiled and submitted in a report entitled "Conservation, Protection and Utilization of Louisiana's Coastal Wetland Forests" (Coastal Wetland Forest Conservation and Use Science Working Group, 2005).

To accomplish this mission the following objectives were developed:

- Gather and synthesize scientific information available on regeneration, growth, and potential harvesting effects on coastal wetland forests.
- Gather and summarize field information on general characteristics of previously harvested bald cypress and tupelo forest stands to evaluate their potential to regenerate, become established, and remain vigorous.
- Review existing laws, regulations, policy, and guidelines affecting coastal forestry activities (and current forest conditions).
- Develop science-based, interim guidelines for the conservation and utilization of coastal wetland forests.
- Identify critical areas of priority research needed to refine these interim guidelines.

Additionally, the Governor's Office has commissioned the Advisory Panel to define stakeholder issues and make associated policy recommendations for sustainable management of coastal forests in Louisiana based upon the SWG 2005 report. The Advisory Panel, consisting of stakeholders, non-government organizations, and state and federal agencies, have recommended several options for immediate implementation and developing a framework to support long-term planning for sustainability. Major recommendations are summarized below:

1. Develop better data collection, management, and dissemination procedures to identify and assess health of coastal forests and provide necessary information for management decisions.
2. Continue development of forest management guidelines that support sustainable forestry practices in coastal wetland forests as a supplement to the State's forestry best management practices..
3. Create an interagency team to define goals, develop a process and procedure, and create a methodology (through appropriate incentive programs) to manage coastal wetland forests for their ecosystem values, and to protect, conserve, and restore these areas in an economically and environmentally sustainable manner.
4. Develop state programs for restoration of existing coastal wetland forests or creation of new coastal wetland forests on agricultural or other suitable open lands, and ensure these programs work in concert with relevant federal programs.
5. Develop a long-term coordination mechanism for interested stakeholders, including landowners, environmental groups, state and federal resource and regulatory agencies, and scientists and engineers in order to foster information exchange and education, and to coordinate efforts for the protection, conservation, and restoration of coastal wetland forests.

For the full text, please see the Advisory panel's recommendations, available at www.lacpra.org. The CPRA has accepted the recommendations of the Advisory Panel and moved to create a working group under the direction of the Governor's Advisory Commission on Coastal Protection, Restoration, and Conservation. The purpose of this group will be to establish a long term dialogue for this important issue and recommend immediate actionable policies for CPRA approval.

5.4.5 Dedicated Funding Source

Reliable funding streams must be obtained for both the Federal and non-Federal shares of program costs. To date, the State's Coastal Protection and Restoration Fund receives scheduled inputs of $25 million annually to address coastal protection and restoration issues. Without a significant change in cost sharing requirements for federal projects, this level of funding is not adequate to address the problem. Similarly, the federal government dedicates approximately $50 million per year to the restoration program through the Coastal Wetlands Planning, Protection, and Restoration Act (CWPPRA) program. Funding for hurricane protection projects and other coastal restoration activities comes through annual Federal and State appropriations process, and as such, it is subject to fluctuations due to changing priorities. This may slow the pace of critical projects. The State has been fortunate to receive two installments of funding from outer continental shelf oil and gas funds through the first two phases of the Coastal Impact Assistance Program. These two installments total approximately $565 million, but the unpredictable nature of the timing (separated by five years) and magnitude ($25 million vs. $540 million) make it difficult to plan for long-term implementation.

Successful national civil works programs, such as the construction of the interstate highway system and the Mississippi River and Tributaries (MR&T) project, are useful examples of programs that were made national priorities and provided with significant and regular funding to implement more certain aspects of the programs

even as uncertainties were being reduced in the overall program. Coordinated Federal and State legislation, and other innovative solutions, will be necessary to define and implement a program that will be capable of responding to the protection and restoration problems of coastal Louisiana in a timely manner and at appropriate scales. Provision of a reliable source of funds, with strict accountability standards, is necessary to ensure sustainability of program implementation.

5.4.6 Implementation Process

The current framework under which the federal government engages in activities related to the Master Plan can be traced back to the Water Resources Council's *Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies,* the Water Resources Development Act of 1986 and subsequent re-enactments, and attendant administrative policies and Corps of Engineers regulations. This implementation framework can be useful in implementing less-complex water resources projects. However, it is increasingly apparent that large multipurpose programs, such as that laid out in the Master Plan, cannot be effectively implemented on timescales appropriate for the urgency of the need under existing processes. Specific recommendations for improvement of intergovernmental coordination are included in Chapter 5.3 of this appendix, but additional improvements to the Federal water resources implementation framework are required. Several recent National Research Council reports (NRC 2004a; NRC 2004b; NRC 2004c) all make specific recommendations for adapting Federal water resources planning and implementation frameworks to better address the unique challenges of large, multi-purpose programs.

Of specific concern to the CPRA is the relative unpredictability of the Congressional authorization and appropriations processes. Although efforts are made to enact a Water Resources Development Act— the primary vehicle used to obtain project authorization— every two years, this schedule is more often missed than met. The requirement for Executive Branch approval and Congressional action to move from planning to design and then to construction for each project can introduce years of delay in project implementation. Legislative authorizations are typically restrictive and prevent rapid adaptation in project construction or operations. In addition, appropriations decisions are made on an annual basis, resulting in funding instability for long-term, large-scale projects. Increasing reliance on Continuing Resolutions in the early parts of each Federal Fiscal Year exacerbates this problem and contributes to delays in project initiation and completion. The CPRA understands the need for safeguards to ensure that funds are allocated and expended efficiently and appropriately, but authorization and appropriations processes must be put in place to reduce delays and stabilize funding levels so that program implementation is not delayed by political considerations.

5.5 Adaptive Management Framework for Decision Support

It is understood that large programs such as the Master Plan require years to implement. Recognizing the dynamic and interrelated character of natural and socio-economic systems, as well as the rapid pace of advances in science and technology, the coastal protection and restoration program and the associated projects must be managed in a way that allows for adaptation in response to these changes.

As discussed above, long-term sustainability is the underlying goal of Louisiana's Master Plan. To evaluate the progress of Master Plan implementation and whether the coast of Louisiana is on a trajectory towards sustainability, the State must employ a strategy which is responsive to improvements in technology and lessons learned during implementation and management. Adaptive management is a concept that has been embraced in many large-scale ecosystem restoration and flood control programs, and is the approach that will be utilized to manage the long-term implementation of the Master Plan. This approach links all phases of program

implementation from concept through project operations and even changes in the plan itself. It is thus dependent upon collaboration, flexibility and continued improvement.

Adaptive management simply acknowledges that uncertainty exists in the anticipated outcomes of manipulating large complicated systems, that understanding the complexity of systems requires the knowledge or expertise of many disciplines, and that we must continually monitor the results of our actions in order to adapt as necessary. It is also a vehicle to allow the existing body of best practices to be used, while reaching out to all stakeholders to understand the best technically sound and socially acceptable way to proceed.

The adaptive management approach seeks to ensure that all implemented projects contribute to larger-scale benefits. This essentially creates a two-tiered approach: project-level and system-level planning and assessment (figure 5.2).

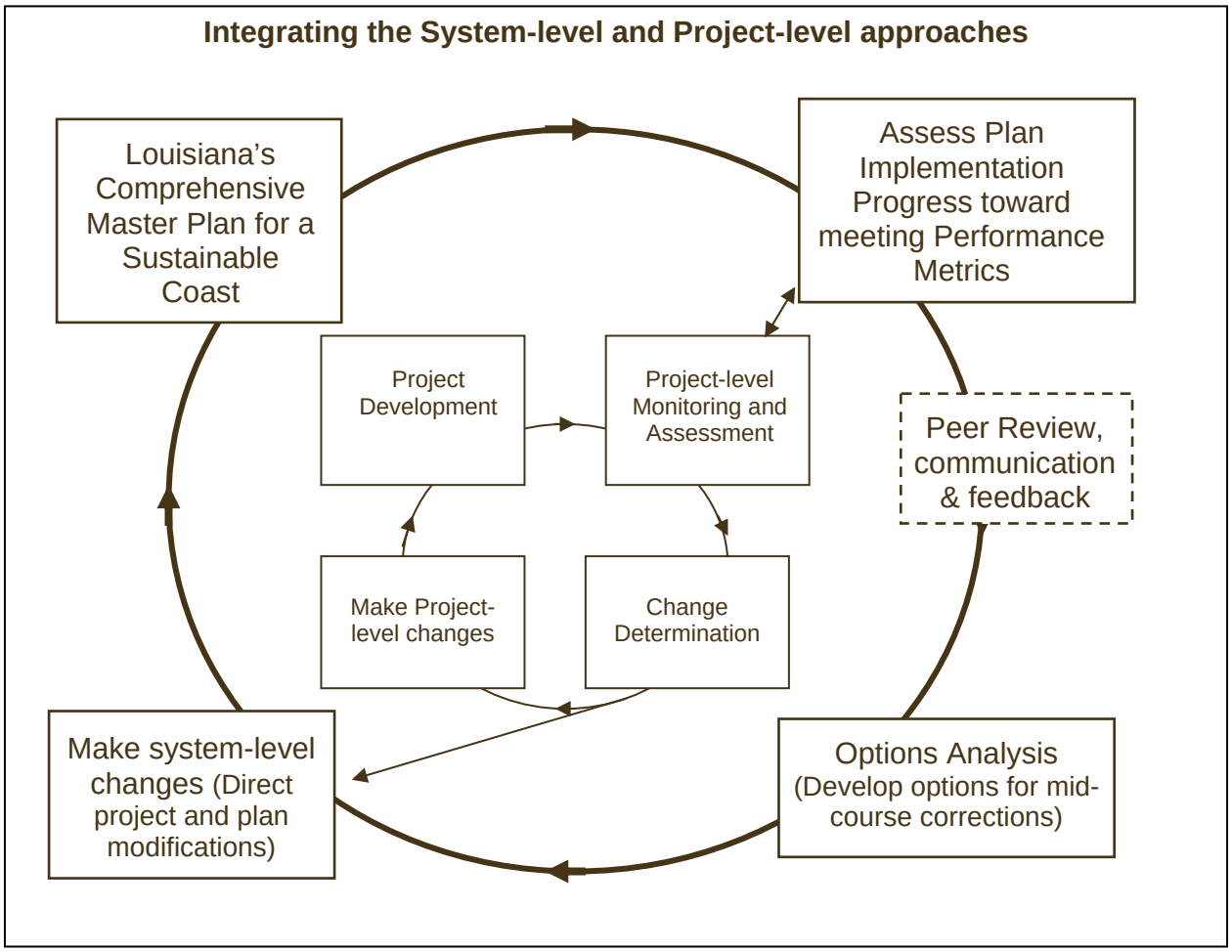


Figure 5.2: A two-tiered approach to adaptive management illustrating the coordination and interdependence of the project- and system-level approaches. The project-level approach (inner loop) is independent of funding authority and falls under the umbrella of the system-wide restoration and protection program (outer loop).

The system-level approach focuses on regional and ecosystem-scale resource management. The project-level approach focuses on more localized impacts and responses. It is essential that these two levels of management are coordinated, are complementary, and contribute to achievement of common principles and objectives which

govern Louisiana's coastal protection and restoration efforts. In addition to hurricane protection and ecosystem functions and values, human functions need to be considered and evaluated in relation to expected outcomes of ecological services and structure and functions.

Learning and adaptation are elements that close the feedback loop and initialize the next cycle of iterative management actions. Information from monitoring, results of experimental manipulations, model forecasts, and supporting research are combined to yield either confirmations of existing beliefs or new explanations of the factors that control the system. This vital information should be readily available so that all stakeholders, from managers to the general public, may reach the most technically sound and socially acceptable solutions.

The following section describes the necessary actions to manage long term implementation of the protection and restoration program. It does not necessarily seek to charge groups within implementing agencies with tasks, but rather to identify all of the major components that must work together to track the intended effects of actions, projects, and programs to determine whether the benefits materialize as predicted, and use that information to adjust projects, or even the overall plan, as appropriate. A specific organizational structure will need to be created, and funds dedicated, to ensure that all of the necessary components of adaptive management are implemented as part of the long term management of the Master Plan.

5.5.1 Master Plan Management – Adaptive Implementation

There are three basic components of plan management: program definition, implementation actions, and adaptation. Implementation actions include not only construction of projects but also policy and legislation changes, tool development and advancing knowledge, which inform and facilitate plan adaptation (Figure 5.3).

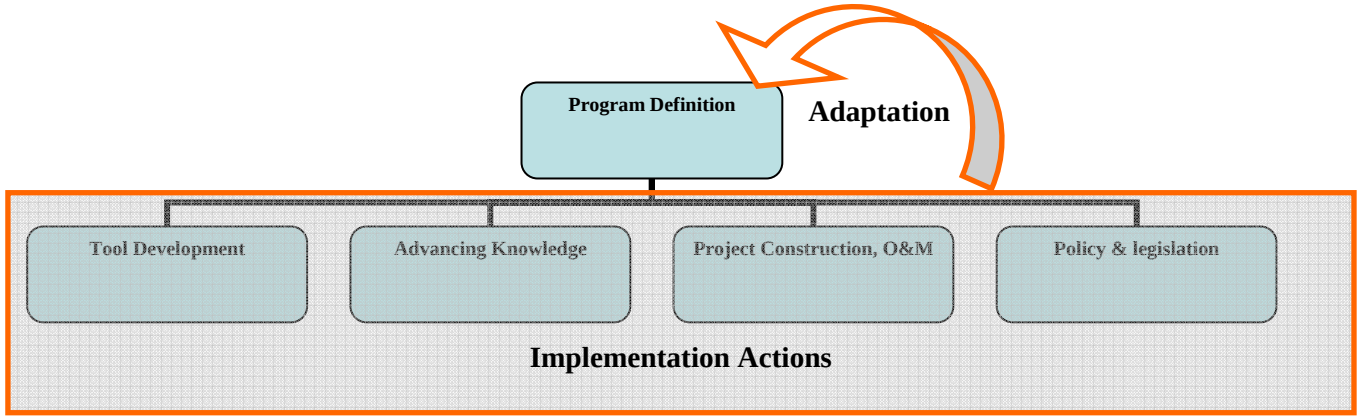


Figure 5.3: Basic components of plan management and their relationships

5.5.1.1 Program Definition

Program definition is the intent of this report. The Master Plan defines the coastwide objectives and provides a list of measures (projects and promising concepts) that are expected to deliver results that will meet the objectives. However, this list of measures was generated based upon existing understanding of ecosystem function, existing protection systems, and human land use patterns. It is fully anticipated that this list of measures, and possibly even the program objectives, will change in the future based on changed conditions and advances in knowledge and continued public input.

5.5.1.2 Implementation Actions

All activities should support implementation and advancement of Master Plan objectives. Actions are related not only to project construction and operations and maintenance (as described in Chapter 4), but also to recommendations for policy and legislative changes (see Section 5.4) and monitoring, modeling, assessment, and adaptation (discussed below). In order to maintain a common vision and to ensure institutional memory, design and operations & maintenance manuals that serve as 'living documents' to aid planners and engineers, and regular reporting on implementation performance are also necessary actions. All actions are unified toward common goals with an effective and on-going stakeholder & public communication strategy.

Tool Development

Tools must be developed that will improve forecasting and assessment capabilities. This applies not only to those tools needed to design and evaluate projects but also to those needed to evaluate overall program success.

At the system scale, performance metrics must be established against which program implementation success is measured. These performance metrics should stem from coastwide objectives and be based upon the current understanding of system function as described in conceptual models. Some examples of performance metrics may include land:water ratio; habitat change; salinity (isohalines); marsh surface elevation/accretion; subsidence/sea level rise; social and economic metrics; and protection metrics. Program-scale analytical forecasting and assessment models must also be developed and maintained that build upon conceptual models to provide planners with the most current understanding of system function, needs, and response to actions as plans are developed, implemented, and modified.

Project goals and modeling tools must also be established and updated regularly as new information becomes available. These tools are necessarily more detailed, accounting for biological and physical processes at a higher resolution than those used for program-level modeling.

Advancing Knowledge

Modeling, monitoring, and assessment of program implementation must be linked in order to effectively and efficiently advance the program. Existing data collection efforts and modeling capabilities must be reviewed and additional needs identified and addressed in order to resolve program implementation or assessment uncertainties. These needs may be related to the science, engineering, modeling, socio-economic impacts and changes, implementation, technical methodology, resource constraints, or effectiveness of measures. They may also be related to development and refinement of forecasting tools. These advances in the state of science and technology must be addressed in order to achieve full and balanced integration of protection and restoration objectives.

Each need will require a different resolution strategy, including focused demonstration or research projects, and monitoring of existing projects or natural conditions. At the system scale, coastwide monitoring and baseline data collection are essential to support the advancement of conceptual and analytical models that will inform planners as they review program performance in order to make recommendations for change. Planners will also require more detailed understanding of individual projects' contribution to program objectives. Demonstrations of new technologies, such as those to advance engineering of protection measures, would also be very useful for increasing understanding of project level impacts.

Project Construction, Operations & Maintenance

Recommendations for changes in construction or operation and maintenance of individual projects could stem from either underperformance in contributing to coastwide objectives, as described above, or from underperformance from an engineering perspective. Thus, individual projects also need to be assessed for their engineering performance and their long-term sustainability (operation & maintenance cost and feasibility).

Policy & Legislation

Policy and legislation are more difficult to manage adaptively. Once promulgated, changes or modifications are slow to enact. However, recommendations for changes in current policy and legislation may be necessary to protect Louisiana's citizens from future vulnerability and harm. Some key areas may include land use and development restrictions or guidelines, insurability, social services and infrastructure support. Different areas of the coast will have different levels and measures of protection, depending on technical feasibility of construction and long-term sustainability. Revising policy and legislation will protect citizens from unanticipated future risk.

5.5.1.3 Adaptation

Learning from the actions taken and making project or even plan modifications based on the increased knowledge is perhaps the most challenging of all the steps of plan management. In fact, the most commonly identified barrier to adaptive implementation of a program is the lack of a structured framework for "closing the loop" on learning, communicating, and applying lessons at all phases of implementation. As outlined above (Figure 5.2), a management framework must incorporate program and project evaluation (modeling) of anticipated performance, and utilize performance assessment against overall program goals and objectives (monitoring) to guide decisions for changes to projects or even to the Master Plan (Parsons and PBS&J 2003).

Plan implementation requires modeling, data collection, and analyses at appropriate scales to ensure that actions are achieving their intended outcomes at both project and program scales. This requires a systematic review and analysis of project monitoring data against anticipated performance, to assess whether the project is delivering anticipated benefits to coastwide objectives. From these activities come recommendations on the actions that are needed to improve performance against program objectives.

Future decisions on projects and their operations must be informed by an integrated assessment of contributions of these actions to the multiple program principles and objectives. Any engineering, scientific, or technical advancements that are deemed necessary for successful implementation of measures or integration of program objectives must be identified and resolved expeditiously. Thus, work must focus on pursuing answers to questions that are critical to the decisions being made.

Under the existing management framework, the Department of Transportation and Development (DOTD) and the Department of Natural Resources (DNR) are responsible for all aspects of project implementation, including planning; design; construction; and operation, maintenance and monitoring of protection and restoration projects.

Each agency already operates under a management structure that allows for effective implementation of projects, including mechanisms for performance assessment of the engineered effectiveness of projects.

At the program level, continued planning, performance assessment, and plan management must be maintained. Performance metrics against which plan implementation is reviewed must be established, and projects or even the plan must be updated as needed to improve program effectiveness. Program effectiveness must be appraised in an integrated manner to ensure that each project, as well as the overall program, takes advantage of synergies and avoids or mitigates conflicts among coastwide objectives.

Because this is in effect a new program which integrates and focuses activities of two distinct departments of state government, a mechanism for managing the overarching responsibilities for program planning, implementation, monitoring, assessment, and revisions must be identified and implemented. Specific recommendations for this may be found in section 5.3 of this chapter.

5.5.2 Scientific & Technical Needs – Early Actions

5.5.2.1 Background

The State of Louisiana, in cooperation with local and federal government entities, the academic community, and the affected public, has been working for decades on advancing the science and technology related to ecosystem restoration and hurricane protection. Hurricane Betsy in 1965 served as the impetus for change in how Louisiana's vulnerability to flooding was perceived. After this storm, the USACE was given the authority to begin work on levee systems that would protect the extremely vulnerable low-lying regions of coastal Louisiana not only from river flooding but also hurricane surge flooding events. Since that time, the State and USACE have worked to improve hurricane protection and the technologies for providing such protection in this vulnerable landscape. Alterations to the natural landscape were first documented in the 1920's (Viosca 1927), and by 1978 the crisis had become so severe that the State passed the Louisiana State and Local Coastal Resources Management Act. Since that time, the state and federal governments have evolved their management and technical approaches to addressing the land loss crisis in response to increased scientific understanding of the problems and ecosystem response to restoration technology.

Today, the DNR Office of Coastal Restoration and Management (OCRM) works to ensure that the best available scientific and engineering knowledge is applied to the planning, construction, operation, and maintenance of restoration projects through a variety of efforts. Recently the decision was made to transition from small-scale, project level monitoring to an ambitious coastwide monitoring program. Currently, two components are being implemented and are known as the Coastwide Reference Monitoring System (CRMS) - Wetlands and the Barrier Island Comprehensive Monitoring (BICM) program. Other components that have been proposed should also be implemented to ensure that ecosystem monitoring parameters needed to inform models and managers are collected (Steyer et al. 2003). Through the Louisiana Coastal Area Science and Technology Program (see Appendix A, USACE 2004), DNR is working with USACE to reduce key uncertainties related to ecosystem restoration. This program includes a management organization designed to ensure that the modeling, monitoring, research, and technology development that are supported by this program are directly tied to the needs of the restoration program. It also includes a structure for stakeholder and peer participation and review. Through the Coastal Louisiana Ecosystem Assessment and Restoration (CLEAR) Program, administered by faculty at Louisiana State University (sponsored by the Department of Natural Resources), the state has also been building its own capacity to readily address such uncertainties. These initiatives, in addition to other on-going monitoring, modeling, research, database management, and assessment work throughout the state, will allow the restoration program to continue to meet the challenges of implementing such a large-scale restoration effort.

Levee construction, inspection, and maintenance have also evolved through the decades since many of the levee boards and districts were established. The federal government first began work on levee and flood control as a national response to the Mississippi River flood of 1927. The Mississippi River and Tributaries Act of 1928, required local non-federal sponsorship of levee construction projects as well as local operation and maintenance of the completed structures. After the disastrous hurricanes of 2005, the state took steps to enhance the levee inspection program (La.RS:38:241 and 38:247). The Coastal Protection and Restoration Authority is now responsible for ensuring that hurricane protection levees are well planned, constructed, and maintained. In support of this goal, The Department of Transportation and Development (DOTD) has implemented a mandatory levee inspection program for hurricane levees and is in the process of obtaining an elevation survey of the existing hurricane levee protection system. Inspections are the responsibility of the individual levee districts. To ensure consistency in quality and documentation of the inspections, DOTD developed a levee inspector training and certification program in addition to its training program for directors and staff of levee boards that has been in effect for many years. The Department of Transportation and Development is also designing a program to provide oversight and quality assurance inspection of all USACE levee construction projects. As required by state legislation, each levee district also has maintained operational and emergency plans for many years.

In addition, the Governor's Office of Homeland Security and Emergency Preparedness, Louisiana State Police, and DOTD work together to maintain and improve an emergency operation plan for hurricane evacuation. In 2004, DOTD and Louisiana State Police, in cooperation with the New Orleans and Baton Rouge American Red Cross chapters as well as Mississippi transportation officials, began developing a new evacuation plan because of performance deficiencies that were discovered during the Hurricane Ivan evacuation. The new plan was released on June 1, 2005, and was put to the test August 27, 2005 as Hurricane Katrina approached. The contra-flow implemented provided greatly increased evacuation efficiency in southeast Louisiana. In a May 28, 2006 article, The Times-Picayune stated that the "…evacuation in the two days before the hurricane struck was no less than a triumph." In 2006, the National Partnership for Highway Quality (NPHQ), a group of government and private industry transportation leaders, presented DOTD with the Gold Award for its collaborative evacuation operations that helped more than 1 million people leave the New Orleans area before Hurricane Katrina struck. In announcing the award the NPHQ noted:

- Evacuation by contra-flow during Hurricane Katrina was faster and more efficient than the Hurricane Ivan evacuation. A two-thirds increase in traffic volume on the road was achieved – 20,000 vehicles per hour versus 12,000 during Hurricane Ivan.
- Real-time traffic information was provided through the Traffic Control Center every 30 minutes to the media and to other gulf states.
- During the 25 hours that contra-flow operated, more than 1 million people were evacuated.

DOTD continues to work on evacuation operations improvement, using the most recent experiences from Hurricane Rita to improve the plan and adapt for unforeseen consequences. DOTD also considers hurricane evacuation in the planning of all transportation improvements throughout the State's roadway network.

Also recognized is the direct impact that storms can have on the infrastructure itself. Many at-grade coastal roads are subject to storm surge and need protection from the scouring action of surge waters, both when rising and retreating. In furthering ongoing efforts, a strong emphasis has been placed on new technology, such as Intelligent Transportation Systems, including such elements as dynamic message signs with real time information displays. In addition, to assure that needed research is conducted on important transportation issues, including improved hurricane evacuation, as well as the timely investigation and implementation of cutting edge

technology, DOTD works closely with the Louisiana Transportation Research Center (LTRC). Created in 1986, and sponsored jointly by DOTD and LSU, LTRC has grown to national prominence. The center conducts short-term and long-term research and provides technology assistance, engineering training and continuing education, technology transfer, and problem-solving services to DOTD and others in the transportation community. The center is largely supported by funding authorized by the Federal Highway Administration. LTRC's goal is to merge the resources of state government and universities to identify, develop, and implement new technology to improve the state's transportation system. LTRC combines the efforts of DOTD and the state's universities to find innovative solutions to Louisiana's wide ranging transportation problems. Examples of titles of recent reports include "Development of Geotechnical Information Database-Computer Program to Expedite Soil Subgrade Survey Data to Designers" and "Louisiana Offshore Terminal Authority (LOTA) Environmental Monitoring: Marine/Estuarine".

In 2005, hurricanes Katrina and Rita prompted another paradigm shift in how the State approaches these issues that are so crucial to the long term sustainability of our coastal zone. The passage of Act 8 also challenges the science and engineering community to work to further advance the scientific understanding and technological tools in ways that will allow us to meet seemingly conflicting objectives within the coastal zone: provide for increased levels of hurricane protection while improving the sustainability of the natural landscape. These advances will come by building upon past and ongoing work in these disciplines.

5.5.2.2 Recommendations

An Applied Coastal Engineering and Science Program (measure PM-1) is recommended to provide a dedicated funding stream using state resources to reduce key uncertainties and to promote advances in the science and technology fields critical to implementation of the Master Plan. Some early specific needs have been identified as discussed below. Many have been initiated by programs such as those discussed above, while others will need to be expanded in scope or level of effort utilizing this measure (PM-1) in order to meet the broader needs of the Master Plan.

Improve and integrate forecasting and design tools required to assess plan and project effectiveness in meeting objectives

Models are mathematical or conceptual approximations of systems. They simulate essential processes, functions, and structure of systems. They are useful in identifying attributes that provide a measure of the behavior of a broad suite of properties and predict the outcome of alternative courses of action. Used as a template on which knowledge about system processes and functions are systematically organized, integrated, and updated, models become the dynamic archive for knowledge about system response to variability in driving forces including management actions.

There are myriad models available to assist with plan forecasting and project design including conceptual, hydrodynamic, storm surge, and ecosystem impacts at various geographic scales. Many models have been utilized in coastal Louisiana to guide distinct hurricane protection and ecosystem restoration decisions. However, further development and integration is required to aid in the planning and analysis of the newly integrated objectives of the Master Plan in order to provide more robust analyses and more defensible results. Two types of improvements are envisioned. One type of improvement is to link ecological model components (e.g. habitat switching and suitability models) with physics-based models (e.g. hydrodynamic and storm surge models). The other type of improvement resides in improving the ecological modeling components, including land change, water quality, habitat switching, and habitat suitability – including fisheries dynamics. In addition, socioeconomic models which link human and economic value to biological

and physical processes have not been given equal attention and must also be advanced if we are to have all the tools needed to fully evaluate management decisions against all four Master Plan objectives.

Support a robust data collection and information management program

Models are only as reliable as the input data quality and the assumptions by which the models are calibrated and validated. Monitoring provides the data, and focused research and demonstration projects inform the assumptions used in model development. Monitoring parameters and data collection frequency must also supply information appropriate to assess program implementation performance. Program performance metrics against which program implementation progress is measured must also be generated early, and used to guide expansion of the monitoring program.

Basic data collection is a necessary component of calibrating and advancing predictive models. Some examples of the types of basic data that should be collected, archived, and updated as conditions warrant include: bathymetry; topography; geotechnical information; surveys; regional subsidence/ relative sea level change rates, including investigations of fault zones; settlement rates of stacked material (levees, marsh creation, etc); flow at critical hydraulic exchange points; community population statistics; and economic inventories. Additionally the coastwide ecosystem monitoring efforts described above should be expanded to include a broader array of biological, physical, and societal parameters in order to fully assess success of plan implementation in meeting the Master Plan objectives.

Data sets are most useful when they are organized and integrated into forms that are universally accessible and useable. The data collection effort described above will require that the database management and repository capacities be increased in order to ensure that all pertinent data and research findings are readily available for plan forecasting and evaluation. Thus, it is recommended that existing spatial and temporal data management systems be reviewed and expanded to ensure that all scientific and engineering information needed to aid in design and review of performance of projects and the program is maintained appropriately and may be readily accessible to various agencies, academia, and the public.

Regional Sediment Management

There is a substantial amount of marsh creation outlined in this document. One of the most significant uncertainties surrounding this effort involves whether sufficient sediment resources exist within the Mississippi River and the Louisiana coastal zone to facilitate the amount of marsh construction outlined in this document. Specifically, at present we do not have a reliable inventory of how much sediment will be available in both the near-term and long-term future from the river, offshore, and via beneficial use and dedicated dredging efforts, to support coast-wide marsh creation efforts. The LCA Science and Technology Program has recently initiated efforts with the State of Louisiana and the US Army Corps of Engineers to develop a coast-wide Regional Sediment Management Program, which will provide the information that we need to determine how much marsh creation we can realistically expect to do under present circumstances.

Support focused research and demonstration projects to reduce uncertainties or test new technologies associated with plan implementation

Many questions may be answered through modeling supported by focused data collection. Others require that theories or new technologies be tested under field conditions or through utilization of other experimental techniques. Such research that focuses on advancing the state of knowledge or technology available to support management decisions must be supported. Some examples of such topics include: investigate and describe potential impacts of climate change on program recommendations; increase understanding of the influence of wetlands and other coastal features on storm surge and wave patterns may facilitate balanced

achievement of Master Plan objectives. These are but a few of the potential topics that would benefit from focused research initiatives.

Ensure adequate program performance assessment and feedback mechanisms

One of the early actions of Master Plan implementation will include the generation of performance metrics against which program implementation progress will be measured. This will not only provide a benchmark against which planners gauge implementation progress, but will also inform decisions regarding which specific data parameters, models, and research should be pursued to support decisions.

In order to assist managers with this task, every project constructed should also include 'as built' designs as part of the contractor deliverable. Other "living" documents, such as design, operations & maintenance, and assessment protocol manuals should also be developed to maintain institutional knowledge of projects and the program in general. Peer review, to include both technical and public stakeholders, is another crucial tool that managers must employ to improve the technical quality and scope of the on-going management decisions that will be made. Using these tools, a regular implementation performance reporting mechanism must be established to allow managers, stakeholders, and the public to understand program progress and to make timely adjustments to projects or the plan. A framework to integrate hydrodynamic, hydraulic and ecological models into the decision-making process would aid in this effort. The framework should include a decision-making protocol. One example of this is Multiple Criteria Decision Analysis (MCDA), which is well-suited for addressing problems where multiple stakeholders are balancing multiple alternatives to achieve numerous objectives.

Increase stakeholder and public participation

Establishing an effective and on-going stakeholder & public communication policy must also be an early action in order to ensure successful implementation of the Master Plan. In formulating this first approximation of the comprehensive solution for coastal hurricane protection and ecosystem restoration, the Integrated Planning Team hosted upwards of 4 dozen stakeholder, science and engineering, and public meetings. All of this information was invaluable in the development of the Master Plan. As implementation and refinement of the plan continues, it is imperative that this sort of interaction continue, and even increase, to ensure the long-term success of the program.

6.0 Future Plan Review & Modification

6.1 The need for review

The process described below will be used to consider future iterations of the plan. The first iteration of Louisiana's Comprehensive Master Plan for a Sustainable Coast has been prepared utilizing the best information and analytical tools available to the CPRA Integrated Planning Team. This has provided a sound basis upon which to define the long term management strategy; however the uncertainties in this plan, indeed in any plan based upon predictions of future conditions, require that the Master Plan be regularly revisited to ensure it remains appropriate for the prevailing conditions.

The Master Plan is designed to be a 'living document' that will evolve over time to reflect our improving understanding of the coast and its management, and as external factors change. This evolution will occur in two primary ways:

- Firstly, the operation and implementation of individual measures within the program will be regularly assessed to determine the need for adaptation either because of engineering performance relative to objectives or to reflect changing societal or environmental circumstances or improved scientific understanding of how to deliver specific outcomes.
- Secondly, the full Master Plan will be periodically reviewed to assess the need for modifications; new information will be incorporated at this time to ensure that the plan remains appropriate to deliver the defined objectives.

Central to these processes will be the monitoring and science and technology programs described above. The operation and maintenance of individual measures, and the process for modifying operation based upon programmatic learning, are set out in the proceeding sections of this chapter.

The process for future review of the full Master Plan will be established to ensure the plan is consistent with:

- improved technical understanding arising from plan implementation (e.g. design and performance of measures, coastwide physical processes, habitat development);
- scientific developments (e.g. understanding of climate change);
- changes in regulatory or administrative arrangements;
- significant changes to the form of the coast (built or natural) which alter the context of the plan.

The following sections set out the process by which the Master Plan will be reviewed into the future.

6.1.1 Scheduled review

The early stages of implementation of this first iteration of Louisiana's Comprehensive Master Plan for a Sustainable Coast, in particular the large-scale planning measures and Applied coastal Engineering and Science Program will provide for significant improvements in our understanding of key aspects of this coast. This, together with the resolution of the program management framework, make it possible that there will be a need to revisit the plan within a relatively short timescale to use this improved understanding to make revisions.

It is not possible, or necessary, at this time to define an exact timetable for this review, however it is anticipated that the review will take place within five years of starting the implementation of the plan.

Beyond the first review of the Master Plan, it will be necessary to regularly review the plan into the future. It is considered likely that a 5 to 10 year period will be appropriate for these future reviews, however, changes in understanding of the coast or the management framework will be monitored to determine (within that 5 to 10 year period) when the Master Plan measures become sufficiently out of date as to warrant a full review of the Plan. This will be a judgment made by the CPRA. Regardless of other developments, it is considered that a review should be undertaken every 10 years (if not before) in order to ensure the recommendations remain appropriate.

6.1.2 Unscheduled Review

In addition to these regular reviews it is possible that circumstances could unexpectedly change sufficiently to warrant an early review of the Master Plan. By definition it is not possible to predict what such events may be; however, possible scenarios would include:

- a major storm event which changes the feasibility of the plan measures;
- a significant change in the funding streams available for the Master Plan; and
- findings that may make major assumptions regarding constraints to plan implementation invalid.

These reviews would be triggered by the CPRA, based upon their judgment of the implications of the change for plan implementation.

6.2 Master Plan Review Process

The process for future review of the Master Plan will follow a risk-based process, similar to that taken in development of this first version of the Plan (set out in Appendices B and H). This process is defined to address the requirements of long-term planning for the Louisiana coast, and builds on the experiences from existing sustainable coastal planning approaches, in particular the Shoreline Management planning process being followed in the United Kingdom (Defra, 2006).

A review of the Master Plan will involve consideration of all aspects of the existing plan, from the principles and objectives through to the individual measures. It will be important to involve stakeholders in all stages of this process. This will be facilitated through the definition and execution of a clear and inclusive stakeholder engagement strategy. The flow chart below provides a description of the steps involved in this process (Figure 6.1), and the following sections elaborate on this process.

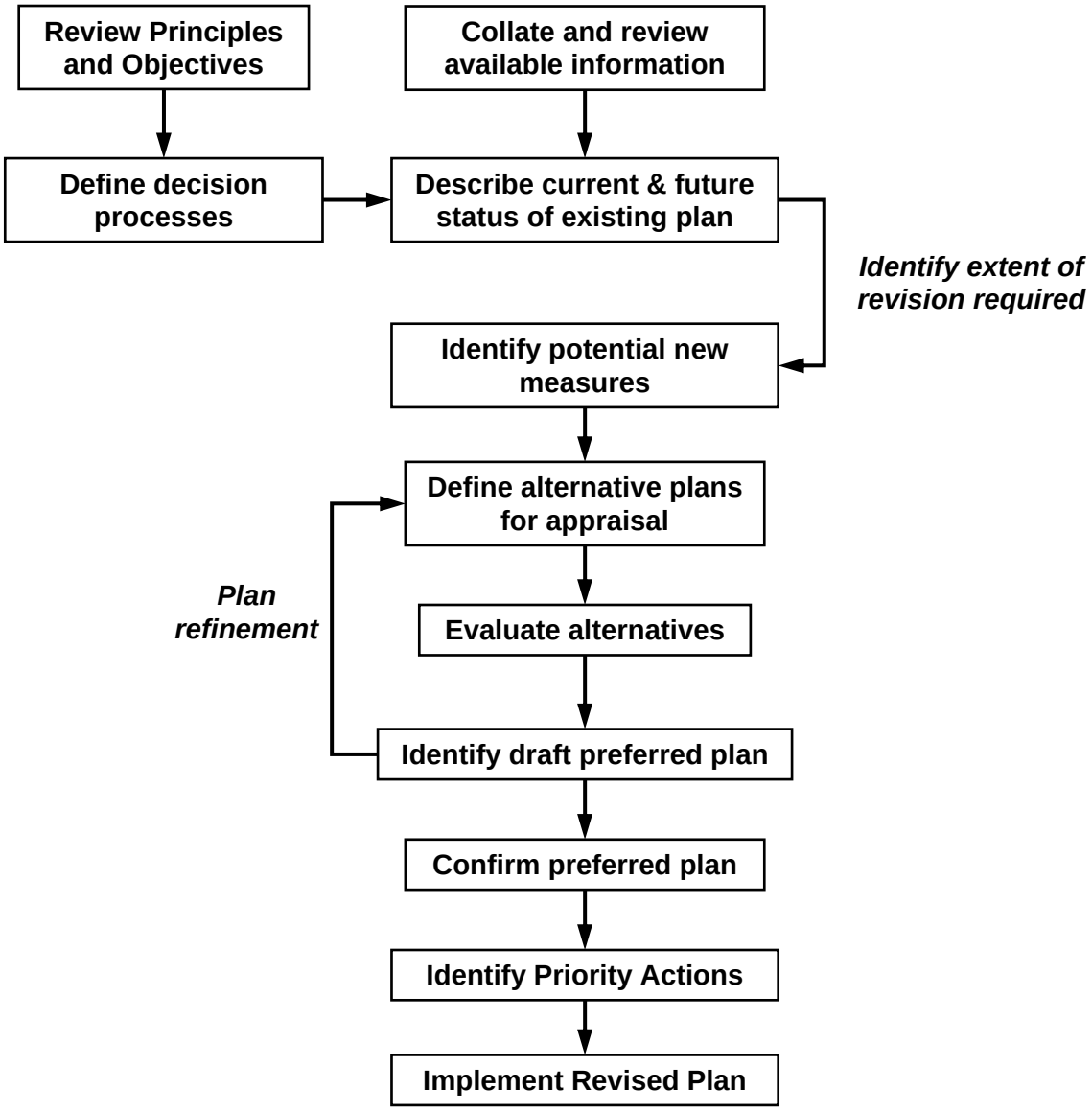


Figure 6.1: Process for future review and modification of the Master Plan.

The extent of review required will be assessed during the initial stages of the review process. This will not reduce the number of steps to be followed, but may change the effort required for each step.

It is recommended that at each scheduled review a complete reevaluation of the existing plan is undertaken, rather than a simple (non-appraisal based) consideration of whether the plan is satisfactory. It will be important to reappraise the existing plan in light of the lessons learned from the adaptive management process and incorporate any changes within the coastal environment that have occurred since the plan was originally defined. It is possible that there might come a time where evaluation tools are sufficiently accurate, and the plan has limited uncertainty, such that after initial reevaluation of the existing plan the CPRA is able to confirm that the plan remains as good as can be achieved. However, developments in our understanding and ability to predict outcomes of proposed actions will be required for this situation to be reached. Thus, it is unlikely to be viable for the next iteration of the Master Plan.

However, a scaling of the review effort should be undertaken. Following the existing plan appraisal against objectives it will be possible to identify the extent of possible improvements or alternative approaches that should be considered. The extent of these potential changes will dictate the extent to which new alternative plans will need to be defined for appraisal. The process of alternative plan definition and appraisal could reconfirm that the existing plan is still the most appropriate, or lead to modifications.

6.2.1 Review of Principles and Objectives

The first task to be undertaken in a review of the Master Plan will be to revisit the principles and objectives. The principles and objectives defined for this first iteration of the plan are considered likely to remain applicable over the long-term as they represent good practices and valid aims for coastal Louisiana. However, it is recommended that once it has been identified that the Master Plan is to be reviewed then its aims should also be reviewed. This must be undertaken in association with key stakeholders as considered to be necessary to ensure the principles and objectives appropriately reflect societal values and needs from the coast, and the have widespread support amongst those who will be affected by the plan recommendations.

When undertaking this review it is important to remember that the principles and objectives provide the basis upon which potential plans are appraised, so must clearly articulate the characteristics that the Master Plan should seek to deliver, and provide for the definition of a quantifiable assessment of objective achievement. To assist in the process of applying these objectives to the decision making process, the relative importance of each should be identified.

6.2.2 Define the Decision Process

The appendices to this plan set out the process followed in the development of the plan. This has followed an analytical process, linked with inputs from stakeholders; however, the process has been constrained by the datasets available at this time. As such, while this process is likely to remain largely applicable for future revisions of the plan, there will need to be a review of the detail in light of the objectives and data available at the time of plan review.

A key aspect of the process that will need to be revised will be the approach to appraising achievement of objectives. This will require the definition of datasets to be used, metrics and appraisal processes. It is important that a clear and consistent process is used, in order to limit the subjectivity in the process of plan appraisal. Review of the existing objective appraisal process (Appendix B) will provide the starting point for this process.

It will also be important to set out the process through which the objective achievement outputs for each alternative plan will be compared in order that the preferred plan can be identified. This process should involve the generation of comparable outputs for each alternative appraised and may take account of the relative importance of the objectives.

6.2.3 Collate and Review Available Information

The comprehensive monitoring program, and targeted research and large-scale planning that will be promoted through this first Master Plan will provide an improved information base upon which to undertake future reviews. The Adaptive Management program (see Section 5.5) should provide for the ongoing analyses of new data to consider the potential implications for implementation of the Master Plan, and these data should be combined with the existing data in this first version of the plan to provide the complete set of baseline data to be appraised for the review.

Key datasets include the following:

- Storm surge flooding risks;
- Distributions of people, property and infrastructure;
- Human use of the coast, including the economics of commercial and recreational activity;
- Coastal landscape change, rates of loss/gain;
- Habitat types and distribution;
- Species types and distribution; and
- Coastal heritage features.

This compiled dataset will be appraised to present a review of the uncertainties in understanding. This will consider both uncertainties related to the current form and function of the coast, and uncertainties in our ability to predict future evolution. These uncertainties will be addressed through the use of scenarios when appraising future plan performance.

In addition to data compilation, it will also be important to identify the analytical tools to be used during plan evaluation. This first Master Plan is looking to establish a program whereby the existing tool can be continually improved and updated to represent the best understanding of the form and function of the Louisiana coast. Tools to appraise storm flood risk and wetland ecological functioning will be central to the appraisal process.

6.2.4 Current and Future Status

The comprehensive dataset should be analyzed to define the current status of the Louisiana coast, in particular identifying the levels of risk to human assets and the status of the wetlands, considering land area, habitats and species. This will focus on identifying the progress toward achievement of the Master Plan objectives, considering the newly defined objectives (where they have been revised). The reporting will explicitly identify notable changes in the coastal landscape, to include:

- alterations to the physical environment; this will include the construction/results of hurricane protection projects, restoration projects such as diversions and marsh restoration with dredged material, and natural changes to the landscape;
- changes to habitat or species composition or distribution; and
- changes to development patterns or the human use of the wetlands, such as navigation or fishing;

Further analyses will then consider the likely future physical evolution of the coast over the next 100 years, both without any further action and with continued implementation of the existing program of measures. These analyses will apply appropriate analytical tools (e.g. numerical models) to define the likely future landscape changes and their implications for risk to people and built assets, and for changes to coastal habitats and species.

It is important that these analyses reflect the identified uncertainties in order that the range of potential outcomes can be considered. This is likely to be best achieved through the consideration of a number of scenarios which explicitly capture the uncertainties. For example, analyses of plan performance may be run with different values for factors such as relative sea level rise rates or river sediment loads. The outcomes from these analyses will then provide an indication of the likely range of possible outcomes under a single course of action, and provide for better informed decision making.

The 'no action' scenario will be used to identify the potential implications for the plan objectives of no further investment in coastal protection or restoration, and as such provide the justification for future actions. The analysis of the existing plan measures will identify the extent to which this represents a satisfactory plan to achieve the defined objectives. Using the process defined through the previous steps (section 6.2.2), achievement of objectives will be identified and reported, and aspects where there is scope to improve upon plan performance will be identified.

6.2.5 Assess Extent of Revision Necessary

Having identified the areas where the existing plan could be improved to better deliver the (new) plan objectives, it will be possible to identify the likely extent of plan revision necessary.

If the existing plan appears generally satisfactory, then it may only be necessary to consider adjustments, or the inclusion/modification of a few measures, to test whether future plan performance could be improved. In this scenario the extent of effort in subsequent tasks (6.2.6 to 6.2.12) may be relatively small.

However, it is likely that the improved understanding that will be available for plan development (based upon the outputs from the adaptive management program) will provide many potential opportunities to improve upon plan performance and hence full appraisal of a number of alternative approaches may be valid, in order to consider differing trade-offs. In this case a more significant effort will be required and appropriate time and resources should be allocated to the process.

6.2.6 Public and Stakeholder Engagement

Stakeholder Engagement will be an important element of the decision process for the plan, so it will be important to define how and when stakeholders will be involved. The approach to, and extent of, stakeholder involvement should be defined in light of the extent of revision required (section 6.2.5).

A more extensive involvement program will offer greater benefits, and potentially, wider acceptance of the outcomes. The engagement strategy will include the process for integration and liaison with other governing bodies such as Federal, State, Parish and Local Authorities. This involvement will be an extension of stakeholder and public involvement throughout implementation of the Master Plan program since definition of the previous iteration of the plan.

6.2.7 Identify Potential New Measures

Having identified the likely long term performance of the existing plan under a range of scenarios, in particular the areas of potential weakness in achievement of objectives, it will be possible to identify new measures, or modifications to existing ones, that might improve plan performance.

This identification of measures will be informed by the following:

- outcomes from project and program monitoring;
- studies of promising concepts;
- research initiatives; and
- measures identified by stakeholders.

The process of selecting or amending measures to improve the existing plan will be informed by the understanding of potential measure performance, mapped against the areas of plan weakness.

Using the same information sources, this process should also seek to identify any measures within the existing plan that may not be contributing to achievement of the objectives, or possibly having a negative impact on plan performance. Consideration should be given to removing these measures from the revised plan.

It may be appropriate to involve the public and other stakeholders in this process of reviewing the existing plan appraisal outputs and identifying potential changes to the plan to improve performance.

6.2.8 Define Alternative Plans for Appraisal

Having identified the measures, or modifications to measures, that might be considered for the revised plan, together with those existing measures that might be removed, it will be necessary to define complete alternative plans for appraisal. In the process of development of this first version of the Master Plan two alternative plan rationales were used to define the alternatives for appraisal (see Appendix H). It may be appropriate to repeat this exercise if a wide range of possible new measures are being considered, otherwise a more intuitive process of defining plans may be sufficient. There is no set number of alternatives that should be defined, but clearly the more alternatives the more effort that will be required to appraise them, but also the more performance data they will generate.

Unless the existing plan is shown to be wholly inadequate, based upon the appraisal of future status, it is likely that each of the alternatives will represent a modified version of the existing plan. The alternatives for appraisal should be defined to represent differing approaches to improving plan performance in order that outputs from their appraisal will clearly identify the better performing approaches.

6.2.9 Alternative Plan Evaluation

The alternative plans identified will each be evaluated using the same tools as were used to appraise the no action scenario and existing plan. Again, a number of scenarios will be considered to capture the key uncertainties in understanding, in order that the range of potential outcomes can be identified. In addition, the use of scenarios will enable the identification of any plans which are highly vulnerable to certain scenarios.

The outputs from these appraisals will be used to identify the performance of each alternative plan against the Master Plan objectives, under each of the scenarios considered. These outputs may be presented graphically (such as the Radar Diagrams used in Appendix B) to aid their review. A summary table explaining the objective scores should also be produced for each plan.

6.2.10 Define Draft Preferred Plan

This step will involve the interpretation of the objective testing outputs to identify the plan that performs best by providing the most gains (and the fewest losses) against the objectives across the range of scenarios tested. This process will also include review of the performance of the existing plan, as it is possible that it may still offer a strong performance.

If a single plan is clearly offering the strongest performance and improvements across the range of objectives, then this should be taken forward as the basis for the preferred plan. Where no single plan delivers improvements against all areas of weakness in the existing plan, then it will be necessary to identify the strong elements of each

and attempt to compile a composite plan that is likely to deliver a strong performance across objectives, under a range of future scenarios

This process may be assisted by considering the objectives in their order of priority, such that a strong performance against the higher priority objectives is considered more important than against the lower priority ones. Tabulation and reporting of these appraisals is necessary to ensure transparency in this process.

When a preferred plan has been identified the potential for adding, removing or amending individual measures to potentially improve plan performance should be considered. In undertaking any such modification of the plans it is very important to that any changes do not detrimentally impact other measures or reduce effectiveness against other criteria.

This process should be undertaken with some level of stakeholder involvement. This may involve the definition of a preferred plan which stakeholders then critically review, or including stakeholders in the review of appraisal outputs and definition of the preferred plan. These inputs must be defined through the Stakeholder Engagement Strategy.

Based upon these appraisals a single complete preferred plan for the whole coast should be defined. Once the complete plan is set out it is important that it is reviewed for consistency, for example to ensure that protection measures provide for consistent levels of protection to discrete areas of population.

6.2.11 Confirm Preferred Plan

Having defined the draft preferred plan analyses, such as those developed through the S&T Program, should be undertaken to confirm it delivers an improved performance against the existing plan and the alternatives appraised. A public review of the proposals, and the results of analyses of the plan, will also serve to confirm the plan. Full and open discussion of the proposed plan and its performance is required to ensure that it represents the best possible solution and that it is widely understood.

The analyses will be a repeat of the process used for the alternative plans and will output analyses of performance against the objectives. If these analyses suggest that there are still areas of poor performance, then it may be possible to incorporate additional measures or modifications. Alternatively it may be considered impossible to address that weakness without unacceptably compromising performance against another objective. In such a situation, that weakness would be accepted as part of the plan and reported as a know limitation in our ability to deliver against the range of plan objectives. Once the preferred plan has been analyzed and consulted upon it should be finalized and its costs and anticipated benefits reported.

6.2.12 Identify Implementation Plan

Having defined the revised Master Plan it will be necessary to set out a plan for its implementation. The process adopted for this first iteration of the Master Plan is set out in Chapter 5 of this appendix. A similar process could be followed for future iterations of the plan. Alternatively, it may be considered necessary or desirable to set out a plan for implementation beyond the ‘near term’, if it is deemed advantageous to include a schedule and cost estimate for implementation of all planned measures.

Regardless, the process of defining an implementation sequence is likely to start with the identification of areas of greatest need and promoting those measures that address those needs. The existing status of measures—such as their funding status, likely timescales to implementation, and level of certainty in the proposed measure—will also be important factors in this process.

The actual process to be applied will need to be developed at the time of undertaking the review as it will depend upon the objectives appraised and the aims of the implementation plan.

6.2.13 Plan Dissemination and Implementation

Having finalized the plan and its implementation process it is important that the recommendations are publicized and taken forward for formal adoption as necessary. This will follow the appropriate process for ratification of the plan and approval of budgets for implementation. It is likely that this implementation will be a continuation of the ongoing implementation effort, modified as appropriate to take account of changes to the plan.

7.0 Acknowledgements

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Integrated Ecosystem Restoration and Hurricane Protection: Louisiana's Comprehensive Master Plan for a Sustainable Coast

Appendix B: Preliminary Draft Plan Formulation Process (November 2006)

Coastal Protection and Restoration Authority of Louisiana

April 2007

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1.0 Introduction

This appendix sets out the decision making process that was followed in the development of the November 2006 Preliminary Draft Master Plan which was consulted upon during the period November 2006 to January 2007. The process (described in Chapter 2) was developed in order to consider the relative merits of any potential management options to achieve the principles and objectives of the Plan (see Main Report).

The process was applied to evaluate the outputs from appraisal of two alternative plans which had been developed as an aid to the process of defining the Master Plan (see Appendix I). The outputs from evaluation of these alternative plans, together with the assessments of the certainty of these evaluations, are presented in Chapter 3. The full set of measures comprising the Preliminary Draft Master Plan is presented in Chapter 4, with a brief description of the form of each of the measures included. Chapter 5 is a detailed description of the plan. Chapter 6 provides a summary of the Stakeholder engagement activities undertaken in the process leading to the publication of the Preliminary Draft Master Plan. The input provided through these activities is summarized within the body of the chapter with fuller notes provided in a series of supporting Annexes.

2.0 Decision Making Process

The process used to delineate two alternative plans for analysis and stakeholder discussion is detailed in Appendix H. Discrete storm surges, economic and environmental appraisals of the two alternatives were undertaken (see Appendices E, F and G respectively). The remainder of this appendix will detail the decision process that was established to provide a systematic process to use the results of analytical methods and stakeholder discussions to identify a preferred plan. Section 2.1 identifies the metrics and scoring process used to evaluate comprehensiveness and achievement of the coastwide objectives. Section 2.2 describes the approach to considering the operational certainty of the protection and restoration measures in a plan. Section 2.3 sets out the steps of the decision making process from the identification and definition of base conditions through to defining the best combination of protection and restoration measures for the preferred plan.

2.1 Objectives Scoring

The following sections set out the processes that were used for scoring achievement of the four objectives, based upon the defined metrics. A five-point scoring system was developed for each objective to compare the effectiveness of each alternative plan in achieving the coastwide planning objectives.

2.1.1 Objective 1

Reduce storm damages from flooding to residential, public, industrial, and commercial infrastructure, providing a level and form of protection commensurate with the assets at risk, with a minimum level of protection equivalent to a storm surge with 1 percent annual chance of recurrence.

Frame of Reference for assessment of alternatives: protection from storm surge conditions equivalent to a 1 percent annual chance of recurrence and provide appropriate standard of protection for national and state resources.

2.1.1.1 Input

- Inventory of national and statewide strategic resources
- Inventory of existing built assets and population, including mapping of concentrated asset areas.
- Current landscape (including existing levees) surge flood depths for 100 year (1 percent annual chance) and 500 year (0.2 percent annual chance) events.
- Alternative plan protection measure position/alignment.

2.1.1.2 Methodology

- Identify national and statewide strategic resources.
- Identify the extent of protection provided to Concentrated and Distributed Asset areas by proposed protection measures.
  - Identify the standard of protection afforded (note, surge depths are only available for the 1 percent and 0.2 percent annual probability events, so standards will be defined in relation to these).
- Identify those national and statewide strategic resources for which it is necessary to provide structural protection in order to maintain operation.
  - Identify the standard of protection afforded to these resources by proposed protection measures.

- Identify the number of buildings within Concentrated Asset areas.
  - This will include residencies, commercial, industrial, public and agricultural buildings.

Note. These datasets all relate to structural protection afforded to build assets. The scoring system outlined below builds on this, and appraises plan performance based upon the extent of structural protection afforded. The protection afforded by wetlands would be considered implicit within the standards of protection considered to be afforded by structures (i.e. the structures would be designed to take account of any benefits provided by fronting landscape). Non-structural measures (raising properties, etc) are not considered in this scoring, as it is assumed that a program for non-structural protection will be put in place to build towards providing 1 percent annual probability flood protection state-wide, regardless of structural protection.

2.1.1.3 Objective 1 Scoring Table

Table 2.1.1.3: Objective 1 Scoring

Score	Concentrated Asset Areas (CA)	Distributed Asset Areas (DA)	Strategic Resources
++	All CA with >5000 buildings protected by 500-yr levee; and All CA with >1000 buildings protected by 100-yr levee; and Some CA areas with <1000 buildings protected.	Some full DA areas protected by 100-yr levee.	All protected by 500-yr levee.
+	All CA with >1000 buildings protected by 100-yr levee; and Some CA areas with <1000 buildings protected.		All protected by 100-yr levee.
=	All CA with >5000 buildings protected by 100-yr levee; and Most CA with >1000 buildings protected by 100-yr levee; and Some CA areas with <1000 buildings protected.	No DA areas protected by 100-yr levee.	Most protected by 100-yr levee.
-	Some CA with >1000 buildings protected by 100-yr levee; and No CA areas with <1000 buildings protected.		Some protected by 100-yr levee.
--	No added protection to any CA.		No added protection.

Note. This scoring is based on numbers of structures in Consolidated Asset areas. Analysis showed that this metric is proportional to expected damages.

2.1.1.4 Application to Preferred Plan Development

The application of this scoring was undertaken at the planning unit scale to provide a mechanism to define the overall levels of protection provided and for the comparison of alternative approaches. Having appraised plans at this scale, subsequent steps in the decision process will be used to refine the location and level of protection to discrete concentrations of built assets.

2.1.2 Objective 2

Promote a sustainable coastal ecosystem by harnessing the processes of the natural system.

Frame of reference for assessment of alternatives: Maximize resilience and continuing productivity.

2.1.2.1 Input

- 50 year spatially explicit predictions of wetland productivity Alt. 1, Alt 2 and No Action, at 10 year increments.
- Characteristics of restoration and protection measures.

2.1.2.2 Methodology

- Determine changes in productivity associated with each alternative, including no action, using CLEAR model output:
  - Calculate the rate of change in productivity for years 0-10 and years 40-50 for each planning unit
  Evaluate restoration and protection measures comprising each alternative at the planning unit scale:
    - Identify nature of existing impediments to natural fluctuations in water levels and salinities or to sediment transport pathways; and
    - Identify measures or approaches which improve natural fluctuations or sediment transport pathways; and
    - Identify measures or approaches which impair existing fluctuations in water level and salinity, or impact sediment transport pathways.

2.1.2.3 Objective 2 Scoring Table

Table 2.1.2.3: Objective 2 Scoring

Score	Ecosystem Productivity	Process Exchanges
++	Rate of change of productivity is positive.	Natural process exchanges are greater than current conditions.
+	Rate of change of productivity is positive.	Natural process exchanges are similar to current conditions.
=	Rate of change of productivity minimal.	Natural process exchanges are similar to current conditions.
-	Rate of change of productivity is minimal.	Natural process exchanges are less than current conditions.
--	Rate of change of productivity is negative.	Natural process exchanges are less than current conditions.

Note: In recognition that supporting analyses contain some uncertainty in accuracy and precision, change is defined by an increase or decrease of greater than 5 percent from no action case.

2.1.2.4 Application to Preferred Plan Development

Productivity

The analysis and scoring described above was conducted at the planning unit scale. The metrics/scoring were also applied to the whole coast for the assessment of the preferred alternative.

For the purposes of reformulation, the effect of measures in achieving sustainable levels of productivity was inferred at the ecosystem unit (EU) scale, or greater depending upon the scale of the measure. The utility of those measures (note: effect can be toward ++ or --) in attaining a ++ plan should then be considered in the development of the preferred plan.

Resilience

The effect of measures in achieving changes in resilience and the process regime was inferred for the entire planning unit. The utility of those measures in maximizing objective achievement for an alternative plan were considered in the development of the preferred plan.

2.1.3 Objective 3

Provide fish and wildlife habitats that support an array of commercial and recreational activities coastwide.

Frame of Reference for assessment of alternatives: increase magnitude of fish and wildlife habitat resources, especially those for commercial and recreational species, coastwide. The value of the coastal ecosystem in supporting a variety of species of both commercial and recreational interest has long been recognized. This objective seeks to provide a similar array of opportunities across the coast in the future, recognizing that some change in the net suitability of habitat for some species is inevitable both under no action and restoration alternatives.

2.1.3.1 Input

- 10 and 50 year spatially explicit predictions of habitat suitability for 11 species for Alt. 1, Alt 2 and No Action;
- Current distribution of habitat suitability for 11 species; and
- 10 and 50 year spatially explicit predictions of wetland types for 5 habitats modeled by CLEAR; outputs for Alt. 1, Alt 2, and No Action.

2.1.3.2 Methodology

- Determine the future effects of the alternatives on habitat suitability:
  - Calculate the total habitat suitability units for each species (11 total) coastwide for:
    - 0, 10, 50 year no-action
    - 0, 10, 50 year Alt 1
    - 0, 10, 50 year Alt 2
- For year 10 and year 50 determine the percentage change in HSUs compared to Year 0 for each alternative and each species coastwide
  - Change $HSU_{speciesx}$ = Alternativex $HSU_{speciesx}$ – Yr 0 $HSU_{speciesx}$
- Determine the future effects of the alternatives on habitats
  - Calculate the total area for each wetland type coastwide for:

- 0, 10, 50 year no-action
- 0, 10, 50 year Alt 1
- 0, 10, 50 year Alt 2

- For year 10 and year 50 determine percentage change in area compared to Year 0 for each alternative for each wetland type coastwide

  - Change $Area_{wetland\ typex}$ = Alternativex $Area_{wetland\ typex}$ – Yr 0 $Area_{wetland\ typex}$

The Method uses habitats that can currently be distinguished in model output. Barrier Island, ridge and Chenier habitats cannot be distinguished at this time; their area is reflected in the area of the adjacent or surrounding wetland or as upland.

2.1.3.3 Scoring Table

Table 2.1.3.3: Objective 3 Scoring

Score	Habitat Suitability	Habitat Area
++	% change in HSUs for ≥ 7 species increase coast wide; and zero decrease.	% change in area of ≥ 3 wetland types increases coast wide; and zero decrease.
+	% change in HSUs for ≥ 5 species increase coast wide; and ≤ 2 decrease.	% change in area of ≥ 2 wetland types increases coast wide; and ≤ 1 decrease.
=	% change in HSUs for ≥ 4 species increase coast wide; and ≤ 4 decrease.	% change in area of ≥ 2 wetland types increases coast wide; and ≤ 1 decrease.
-	% change in HSUs for ≥ 4 species decreases coast wide.	% change in area of ≥ 2 wetland types decreases coast wide.
--	% change in HSUs for ≥ 7 species decreases coast wide.	% change in area of ≥ 3 wetland types decreases coast wide.

Note: In recognition that supporting analyses contain some uncertainty in accuracy and precision, change is defined by an increase or decrease of > 5 percent from Year 0.

2.1.3.4 Application to Preferred Plan Development

The analysis and scaling described above is conducted at the coastwide scale to assess the outcomes associated with the alternatives. The metrics/scaling should also be applied to the whole coast for the assessment of the preferred alternative.

However, examination of the data at the planning unit (PU) scale will be necessary to inform the development of the preferred plan. Having developed data for each planning unit for the alternatives and no action (as above):

- Consider whether changes in magnitude are even amongst planning units and identify any PUs which seem to ‘pull’ the coastwide data towards ++ or --.
- Consider role of individual measures in driving the changes and the utility of those measures (note: effect can be toward ++ or --) in attaining a ++ plan for all metrics in the scoring table, and use them (or not) in the preferred plan as appropriate.

- Consider the role of measures included to meet objective 3 relative to wetland productivity and resilience outcomes reflected in Objective 2.

2.1.4 Objective 4

Sustain, to the extent practicable, the unique heritage of coastal Louisiana by protecting historic properties and traditional living cultures and their ties and relationship to the natural environment.

Requirements for coastal community continuity include: limited unexpected risk; sustainable (appropriate) livelihoods; opportunity to retain extended family and friendship networks; local basic services; ability to retain continuity of traditions and knowledge and connection to place; appreciation and utilization of critical local ecological knowledge in partnership with science and engineering to address coastal restoration

2.1.4.1 Input

(Note: Social scientists who study communities utilize descriptive, qualitative data as well as quantitative data for community assessment. Descriptive data will include resident beliefs, assessments of community resiliency/threat, degrees of attachment to place and renewable resources, as well as systematic analysis of historic and current information about the communities. Some of these data cannot be modeled quantitatively but serves no less an important role in the scientific analysis of project impacts and viable adjustments than does the quantitative modeling.)

- Locations of commercial fishing license holders, vessels, and processors (Louisiana Department of Wildlife and Fisheries, 2006).
- Description of coastal communities: population, social/political/economic institutions and the infrastructure which supports them.
- Storm protection information, from Objective 1 appraisals.
- Identification of unique 'traditional' communities.
- Historic sites database.
- Habitat Suitability Units for species important to traditional communities.

2.1.4.2 Methodology

- Identify the coastal communities whose protection is being considered or against whom there might be an adverse impact from a restoration project.
- Identify the base line information.
- Assess the necessary social/political/economic infrastructure for sustainability.
- Review the appraisals undertaken for objective 1 to identify the method of storm protection to be provided for the 1 percent annual probability storm to determine/assess
  - Communities are likely to remain in situ or need to relocate.
- Determine future flood and/or erosion risks to historic sites under the base plan
  - Determine changes to these risks under the alternative plans.
- Determine species habitats important to traditional communities based on commercial fishing license database.

- Determine baseline magnitude of habitats to support species important to traditional communities, using Habitat Suitability Units (HSUs) (see section 2.3, Objective 3 method).
  - Determine future changes in HSUs for the alternative plans for EUs adjacent to communities.

Based upon the above information determine scores for each of the following three criteria:

- **Communities:** Score based upon whether the plan allows the community to survive (more, same or less protection).
- **Natural Resources**: Score based on how plan affects the resource (decline, n/a, increase); two types of Natural Resources are considered, Wildlife/Fisheries and Agriculture.
- **Sustainable Balance**: This is the interaction between communities and the Natural Resources. This is scored based on: enhanced; same; or, less/harder, access to natural resources.

2.1.4.3 Scoring Table

Table 2.1.4.3: Objective 4 Scoring

Score	Coastal Heritage	Natural Resources	Sustainable Balance
++	Improve protection including structural protection.	Increased	Increased
+	Improve protection.		
=	No change from current protection condition.	Neutral	Neutral
-	Reduce protection.	Decreased	Decreased
--	Communities not viable.		

2.1.4.4 Application to Preferred Plan Development

This analysis needed to consider the various components that contribute to the 'cultural' impacts at their appropriate scales. The risk exposure of the communities was based upon the analysis arising from Objective 1, whereas the Habitat Suitability Units were reported at an ecosystem unit scale. The outputs from this analysis were presented at the planning unit scale.

2.2 Operational Certainty

The level of understanding regarding the implementation and operation of the component projects was assessed while comparing alternative plans. The assessment of uncertainty was subjective; however, it was based upon industry-wide experience in the application of project technologies to coastal environments similar to those prevailing in the proposed project area.

Given the very different requirements and technologies for wetland restoration and asset protection projects, it was considered necessary to have an 'operational certainty' score for each of these aspects (i.e. there will be two 'certainty' scores for each plan, 'restoration' and 'protection').

The scores reflect the following aspects of the proposed plan:

- Construction – the certainty over construction methodology and the size/scope of the measure necessary to deliver the intended benefits. This also included knowledge of local conditions influencing implementation (e.g. geotechnical conditions).
- Cost – linked to construction, the certainty over the cost estimates generated for a measure.
- Performance - the certainty regarding the benefits to be provided by the plan, assuming forcing conditions remain as anticipated (i.e. not considering uncertainty in future conditions, such as sea level rise). This included measures where it is difficult to predict performance, or where there is not consensus between available predictions (e.g. from modeling, expert judgment, analogous projects).

The scoring was based upon the following rationale.

Table 2.2: Operational Certainty Scoring

Score	Operational Certainty
+	Project construction, costs and performance all well understood and have been applied in a similar area.
=	Project construction/costs or performance is uncertain (due to technology or environmental uncertainties).
-	Project construction/costs and performance are uncertain (due to technology and environmental uncertainties).

Application to Preferred Plan Development

Two 'certainty' scores were generated for each of the five planning units, one related to the protection measures and the other to restoration measures. These scores were presented alongside the objective achievement scoring, to give an indication of the relative certainty attached to the defined objective scores.

A brief written explanation of these certainty scores was generated to identify why the score has been given, in particular it will identify any measures with low levels of certainty.

2.3 Decision Process Steps

This section gives the approach used to identify a preferred alternative with feasible measures that can be accomplished in a timely manner: short-term, intermediate, and long-term applications. The preferred alternative plan to achieve compliance with the coastwide objectives, and to achieve the benchmarks set for each objective, was defined based on this interactive, interdisciplinary, logical approach. A summary of the process is presented in the flow diagram below.

The approach placed the first priority on establishing the nature of protection to be afforded to Concentrated Assets (i.e. objective 1), followed by the identification and means by which the other objectives are to be achieved. Achievement of the 'other' objectives may modify the way in which protection is afforded, but will not reduce the level of protection afforded.

Although studies and models have been conducted from Year 1 through Year 50, with intentions to extrapolate into Year 100 using reasoned science and engineering methodologies, the process used the time steps of 10 and 50 years in evaluating and presenting the preferred plan. This process is built upon the appraisal of two alternative plans which were developed and detailed as described in Appendices B and C. The report and its appendices contain complete details of steps 1 through 10, and provide the basis for the remaining steps which will be accomplished between November 2006 and April 2007*. *(*Some steps illustrated in this flowchart have been modified to reflect the current availability of data that was initially outlined in the November 2006 Preliminary Draft Plan).*

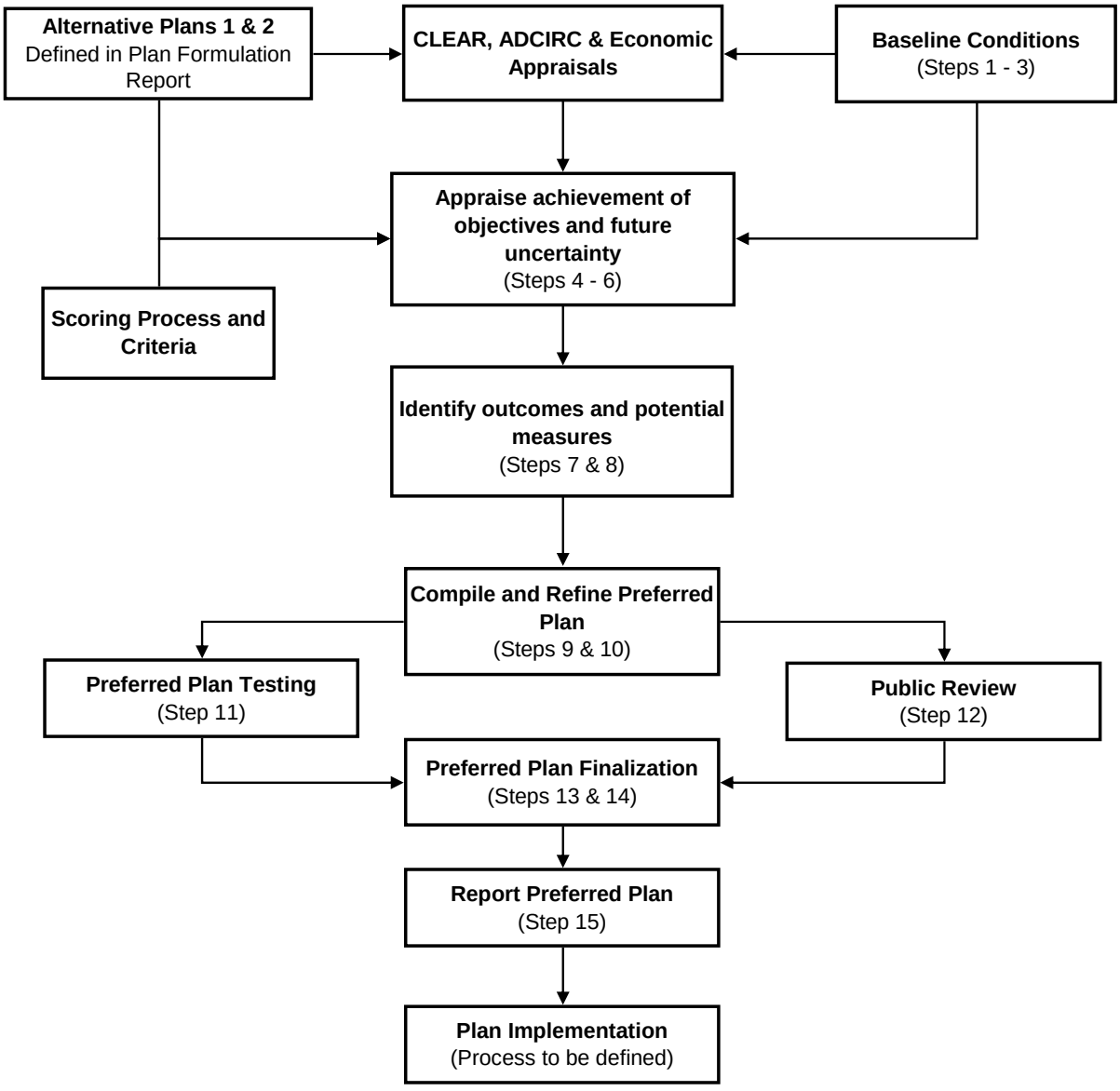

Figure 2.3: Decision Process Flowchart

Table 2.3: Decision Process Steps

Step		Method
1	Define Baseline conditions	▪ Run CLEAR model to establish 50 year wetland land area, also reporting for year 10. ▪ Prepare maps of landscape change, to years 10 and 50, compared to present day landscape; produce mapping to illustrate landscape change. ▪ Report changes in habitat parameters (suitability, productivity, etc).
2	Define Baseline Hazards	▪ Identify storm surge flood depths for 1% and 0.2% annual probability storms under current conditions. ▪ Interpret how the flood hazard is likely to change into the future based on wetland morphology changes (10 and 50 years). This will consider the impacts of landscape changes and projected relative sea level change.
3	Define Baseline Risk	▪ Define risks to Concentrated and Distributed Assets under the 1% and 0.2% annual probability storms. To include damage value, and number and nature of assets at risk. ▪ For each planning unit describe changes in risk into future based upon step 2 outputs. This will be descriptive, and will be of detail to inform decisions on whether a particular form of protection will remain effective into the future.
4	Appraise alternative plan achievement of objectives	▪ Define scores for each alternative plan based upon the scoring processes for Objectives 1-4. Scores should be defined for years 10 and 50.
5	Appraise level of certainty associated with alternative plan.	▪ The 'operational certainty' scores for each alternative will be identified.
6	Presentation of appraisal/scoring outputs	▪ For each PU, prepare a 'Radar Diagram' presenting the scores for each alternative plan. For comparative purposes, both plans will be represented on each diagram. There will be two diagrams to represent the two time steps. ▪ For each PU prepare a Summary Table to describe the performance of measures in that area, as support to the scoring presented in the diagrams, and as a means of recording important assumptions/ uncertainties or other comments.
7	Initial review of outcomes	▪ Review the outcomes of the two alternative plans that have been analyzed, considering their achievement of the defined coastwide objectives. ▪ Use this information to identify the specific positive and negative aspects of the outcomes for each plan, as relates to

Step		Method
		objective achievement. ▪ Compile a composite set of geographically specific outcomes that best achieve the coastwide plan objectives. (These may include benefits not delivered by either analyzed plan, but considered to be achievable.) ▪ Consider any conflicts within these outcomes, and modify accordingly. ▪ Produce map of 'outcomes'.
8	Identify potential measures to deliver outcomes	▪ Review the measures within the analyzed plans and identify those contributing toward the defined outcomes, ensuring synergistic relationships are identified. ▪ Identify other measures considered necessary to deliver the complete suite of outcomes. ▪ Compile a set of potential measures. This will include duplicates where a specific outcome may be achieved in more than one way.
9	Select measures	▪ Review the 'certainty' and cost information to: compare the 'duplicate' measures and identify whether one approach is clearly preferable; and, review the characteristics of all measures to ensure they are reasonable. ▪ Compile a full list of the measures considered necessary to deliver the defined outcomes (including unresolved choices). ▪ Produce map of measures.
10	Definition of draft preferred plan	▪ The combination of measures identified through steps 7 to 9 should be compiled into a single coastwide plan. ▪ Check that proposed levee alignments provide continuity of protection, and that there are not discrepancies in standards provided for adjoining risk areas. ▪ To ensure that the preferred plan represents the best solution, the radar diagrams from the alternative plans should be reviewed to ensure all areas of weak performance have been addressed to the extent possible. If weaknesses are identified, the contributing measures should be reviewed. ▪ Define the complete draft plan.
11	Full plan testing	▪ Prepare inputs for modeling of full plan. ▪ Undertake CLEAR modeling of plan. ▪ Extend modeling outputs to 100 year time horizon.

Step		Method
12	Full plan public review	▪ Public consultation of the plan to provide review of proposals.
13	Full plan appraisal	▪ Repeat step 4 for the full plan (appraisal against objectives and future uncertainty). ▪ Review these outputs to ensure the performance of the plan provides the anticipated benefits. Any areas where poor performance is identified should be considered and the contributing measures modified accordingly.
14	Full plan scenario testing and finalization	▪ For the full coastwide plan repeat step 5 to consider the performance of the plan under the defined future scenarios. ▪ These considerations will be expert judgment based. ▪ This should consider the full coastwide plan, and may identify areas of potential weakness not previous identified under the previous appraisals of the individual parts of the plan. Where any weaknesses are identified, the appropriate measures should be reviewed and modified or replaced if improved performance is likely.
15	Report full plan	▪ Define the plan in full. ▪ Clearly identify the residual risks (both to human assets and ecosystems) arising from implementation of the plan. ▪ This process will be informed by the sensitivity testing described above.

3.0 Alternative Plan Evaluation

3.1 Overview

Having defined the two alternative plans for appraisal (Appendix I), the analyses set out in Appendices E, F and G were undertaken to describe their storm surge reduction, economic and environmental performance. Using the outputs from the Alternative Plan appraisals, steps 1 to 6 of the decision making process were undertaken to consider the achievement of objectives and the certainty associated with the appraisals.

The outputs from these steps are presented, by planning unit, in the following sections. The objective scoring and operational certainty information is tabulated for each planning unit. In addition to the tables, 'Radar Diagrams' are provided which illustrate the relative performance of each alternative against the four objectives at each time step. These provide a visualization of plan performance, which is useful for comparison in definition of the preferred plan.

No attempt was made to score a No Action Alternative because at the beginning of the Master Plan effort it was decided that No Action was an unacceptable solution for the State of Louisiana. Alongside these appraisals the alternatives have continued to be refined with input from state and federal agencies, interested organizations, and other stakeholders. A series of stakeholder meetings were held across the Coast over the summer (2006) months to inform key stakeholders and gather their input. The full outputs from these ongoing stakeholder meetings are presented in Chapter 5.

3.2 Planning Unit 1

3.2.1 Planning Unit 1 - Alternative 1 - Year 10 - Objective Scoring Table

Table 3.2.1: Planning Unit 1 - Alternative 1 - Year 10 - Objective Scoring

Objective	Scoring Criteria	Qualitative description of impacts	Criteria Score	Comments	Score
Reduce economic losses from storm based flooding	Concentrated Assets	▪ All CA with >5,000 buildings are protected to a 500 year storm event level. ▪ All CA with >1,000 buildings are protected to a 100 year storm event level. ▪ No CA with <1,000 buildings exists.	++	▪ There is only one strategic oil facility (DYNEGY/VENICE) in the Mississippi River Delta – East Bank that is not protected. The facility was constructed in accordance with its fragile environment and it would not feasible to protect with a levee. ▪ Due to the fact that all three scoring criteria were ++ the overall score for this alternative is ++.	++
	Distributed Assets	Most DAs are protected to a 100 year storm event level.	++		
	Strategic Resources	All strategic assets are protected to a 500 year storm event level.	++		
Promote a sustainable coastal ecosystem	Productivity	Positive from Output (15% increase from yr 0).	+	Scoring table indicates this is ++.	++
	Process Exchanges	Positive: includes large diversion and Pontchartrain Barrier not considered to substantially increase hydrologic barrier.	+		
Provide habitats for commercial and recreational activities	Species	4 increase (mink, otter, alligator, duck); 5 decrease (croaker, trout, menhaden, br shrimp, oyster).	-	Category for this combination doesn't exist: assume equivalent to '=' based on 4 spp increasing, with '=' habitat score.	=
	Habitats	2 increase (fresh, salt marsh); 1 decreases (brackish marsh).	=		

Continued…

Objective	Scoring Criteria	Qualitative description of impacts	Criteria Score	Comments	Score
Sustain, to the extent practicable, the unique heritage of coastal Louisiana	Communities	More physical protection due to pass closures/Restoration provides more protection. (++).	++		=
	Natural Resources	W&F-Decline, Agriculture-N/A (Minimal Agriculture in Planning Unit.	-		
	Sustainable Balance	Decreased resource accessibility.	-		

3.2.2 Planning Unit 1 – Alternative 1 – Year 50 - Objective Scoring Table

Table 3.2.2: Planning Unit 1 - Alternative 1 - Year 50 - Objective Scoring

Objective	Scoring Criteria	Qualitative description of impacts	Criteria Score	Comments	Score
Reduce economic losses from storm based flooding	Concentrated Assets	▪ All CA with >5,000 buildings are protected to a 500 year storm event level. ▪ All CA with >1,000 buildings are protected to a 100 year storm event level. ▪ No CA with <1,000 buildings exists.	++	▪ There is only one strategic oil facility (DYNEGY/VENICE) in the Mississippi River Delta – East Bank that is not protected. The facility was constructed in accordance with its fragile environment and it would not feasible to protect with a levee. ▪ Due to all the fact that all three scoring criteria were ++ the overall score for this alternative is ++.	++
	Distributed Assets	Most DA are protected to a 100-yr storm event level.	++		
	Strategic Resources	All strategic assets are protected to a 500 year storm event level.	++		
Promote a sustainable coastal ecosystem	Productivity	Negative from output (6% decrease from yr 40).	--	Category for this combination doesn't exist: assume equivalent to '=' based on productivity being almost minimal (requirement: 5% or less difference).	=
	Process Exchanges	Positive: large diversion and Pontchartrain Barrier not considered to substantially increase hydrologic barrier.	+		
Provide habitats for commercial and recreational activities	Species	2 increase (alligator, duck); 6 decrease (trout, menhaden, br shrimp, oysters, otter, muskrats).	-	Category for this combination doesn't exist: assume equivalent to '--' based on 6 spp decreasing coastwide (7 needed to score '--').	--
	Habitats	1 increases (fresh marsh); 3 decrease (brackish, intermediate, salt marsh).	--		

Continued…

Objective	Scoring Criteria	Qualitative description of impacts	Criteria Score	Comments	Score
Sustain, to the extent practicable, the unique heritage of coastal Louisiana	Communities	More physical protection due to pass closures/Sustained protection based upon maintenance every 20 years for mechanically created marsh.	++		=
	Natural Resources	W&F-Decline, Agriculture-N/A (Minimal Agriculture in Planning Unit.	-		
	Sustainable Balance	Decreased resource accessibility.	-		

3.2.3 Planning Unit 1 - Alternative 1 - Operational Certainty Scoring Table

Table 3.2.3: Planning Unit 1 - Alternative 1 - Operational Certainty Scoring

Measures	Operational Certainty		Score
	Construction/Cost	**Performance**	
Protection Certainty	▪ Project construction and costs are well understood and have been applied in similar areas within the planning unit. ▪ Building a flood protection to an elevation of + 40ft will be the challenge for the section between Caernarvon and Slidell but can certainly be done. ▪ The section along the Golden Triangle will include a construction/cost challenge because of the foundation conditions (water/deteriorated marsh), but modern engineering offers solutions to adapt to these conditions.	▪ The performance of project features (earthen levees, floodwalls, floodgates and environmental structures) are all well understood and have been applied in similar areas within the planning unit. ▪ There are environmental concerns regarding the impacts to hydrology within the basin, but the inclusion of environmental structures and flood control structures, which will generally be open, will allow for the needed hydrology.	+
Restoration Certainty	▪ Source material was constrained to the river; should consider other sources. ▪ Costs and constructability of potential actions resulting from recommended studies are not considered and may replace or require changes to proposed measures.	▪ Large controlled diversion into existing wetland complex is new application of technology. ▪ Exact sizing, locations, and operation of diversions required for sustainability of wetland ecosystems is still uncertain. ▪ Constructed wetlands may not have same level of ecological function as naturally created wetlands. ▪ Modeling outputs were best available; however, coarse resolution of model supported by limited data sets leaves uncertainty in outputs. Outputs are indicative of large-scale trends rather than detailed impacts. ▪ Impacts of potential actions resulting from recommended studies are not considered and may replace or require changes to proposed measures. ▪ Uncertainty associated with combined effects of restoration	-

Measures	Operational Certainty		Score
	Construction/Cost	**Performance**	
		and protection actions on hydrology.	

3.2.4 Planning Unit 1 - Alternative 2 - Year 10 - Objective Scoring Table

Table 3.2.4: Planning Unit 1 - Alternative 2 - Year 10 - Objective Scoring

Objective	Scoring Criteria	Qualitative description of impacts	Criteria Score	Comments	Score
Reduce economic losses from storm based flooding	Concentrated Assets	▪ Some CA with >1,000 buildings are protected to a 100 year storm event level. ▪ No CA with <1,000 buildings exists.	-	▪ Most of the strategic assets are protected to a 100 year storm event level. ▪ Overall the Alternative scores '–' due to its negative performance in protecting CA's and DA's.	-
	Distributed Assets	No DA are protected to a 100 year storm event level.	-		
	Strategic Resources	Most strategic assets are protected to a 100 year storm event level.	=		
Promote a sustainable coastal ecosystem	Productivity	Positive from output (increase 21% from yr 0).	+	Scoring table indicates this is '++'.	++
	Process Exchanges	Positive: large diversion and Pontchartrain Barrier not considered to substantially increase hydrologic barrier.	+		
Provide habitats for commercial and recreational activities	Species	4 increase (mink, otter, alligator, duck); 5 decrease (croaker, trout, menhaden, br shrimp, oyster).	-	Category for this combination doesn't exist: assume equivalent to '=' based on 4 spp increasing, with '+' habitat score.	=
	Habitats	3 increase (fresh, intermediate, salt marsh); 1 decreases (brackish).	+		
Sustain, to the extent practicable, the unique heritage of coastal Louisiana	Communities	Less protection than Alt 1.due to pass openings/less protection from restoration.	+		-
	Natural Resources	W&F-Decline, Agriculture-N/A (Minimal Agriculture I Planning Unit.	-		
	Sustainable Balance	Decreased resource accessibility.	-		

3.2.5 Planning Unit 1 – Alternative 2 – Year 50 - Objective Scoring Table

Table 3.2.5: Planning Unit 1 - Alternative 2 - Year 50 - Objective Scoring

Objective	Scoring Criteria	Qualitative description of impacts	Criteria Score	Comments	Score
Reduce economic losses from storm based flooding	Concentrated Assets	▪ Some CA with >1,000 buildings are protected to a 100 year storm event level. ▪ No CA with <1,000 buildings exists.	-	▪ Most of the strategic assets are protected to a 100 year storm event level. ▪ Overall the Alternative scores – due to its negative performance in protecting CA's and DA's.	-
	Distributed Assets	No DA are protected to a 100 year storm event level.	-		
	Strategic Resources	Most strategic assets are protected to a 100 year storm event level.	=		
Promote a sustainable coastal ecosystem	Productivity	Negative from output (10% decrease from yr 40).	--	Category for this combination doesn't exist: assume equivalent to '-'. High decrease in productivity especially in Biloxi marsh.	-
	Process Exchanges	Positive: large diversion and PB not considered to substantially impact exchange.	+		
Provide habitats for commercial and recreational activities	Species	2 increase (alligator, duck); 3 decrease (trout, menhaden, otter).	-	Category for this combination doesn't exist: assume equivalent to '-' based on need to have 4 spp increase to warrant '='.	-
	Habitats	2 increases (fresh, salt marsh); 1 decreases (brackish marsh).	=		
Sustain, to the extent practicable, the unique heritage of coastal Louisiana	Communities	Less protection than Alt 1.due to pass openings/less protection from restoration.	+		-
	Natural Resources	W&F-Decline, Agriculture-N/A (Minimal Agriculture I Planning Unit.	-		
	Sustainable Balance	Decreased resource accessibility.	-		

3.2.6 Planning Unit 1 - Alternative 2 - Operational Certainty Scoring Table

Table 3.2.6: Planning Unit 1 - Alternative 2 - Operational Certainty Scoring

Measures	Operational Certainty		Score
	Construction/Cost	**Performance**	
Protection Certainty	▪ Project construction and costs are well understood and have been applied in similar areas within the Planning Unit. ▪ Building a flood protection to an elevation of + 40ft will be the challenge for the section between Caernarvon and Slidell but can certainly be done. ▪ The section along the Golden Triangle will include a construction/cost challenge because of the foundation conditions (water/deteriorated marsh), but modern engineering offers solutions to adapt to these conditions.	▪ The performance of project features (earthen levees, floodwalls, floodgates and environmental structures) are all well understood and have been applied in similar areas within the Planning Unit. ▪ There are environmental concerns regarding the impacts to hydrology within the basin, but the inclusion of environmental structures and the fact that no structures are included at Chef Pass and Rigolets Pass, will allow for the needed hydrology.	+
Restoration Certainty	▪ Source material was constrained to the river; should consider other sources. ▪ Costs and constructability of potential actions resulting from recommended studies are not considered and may replace or require changes to proposed measures.	▪ Large controlled diversion into existing wetland complex is new application of technology. ▪ Exact sizing, locations, and operation of diversions required for sustainability of wetland ecosystems is still uncertain. ▪ Constructed wetlands may not have same level of ecological function as naturally created wetlands. ▪ Modeling outputs were best available; however, coarse resolution of model supported by limited data sets leaves uncertainty in outputs. Outputs are indicative of large-scale trends rather than detailed impacts. ▪ Impacts of potential actions resulting from recommended studies are not considered and may replace or require changes to proposed measures. ▪ Uncertainty associated with combined effects of restoration and protection actions on hydrology.	-

3.2.7 Planning Unit 1 - Year 10 - Objective Scoring Diagram

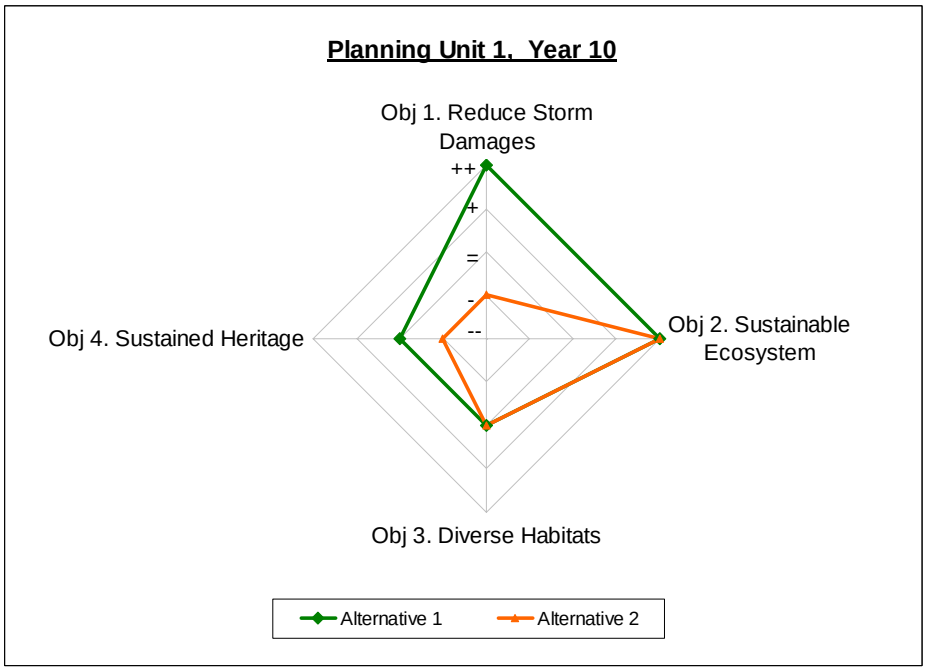

Figure 3.2.7: Planning Unit 1 - Year 10 - Objective Scoring Diagram

3.2.8 Planning Unit 1 - Year 50 - Objective Scoring Diagram

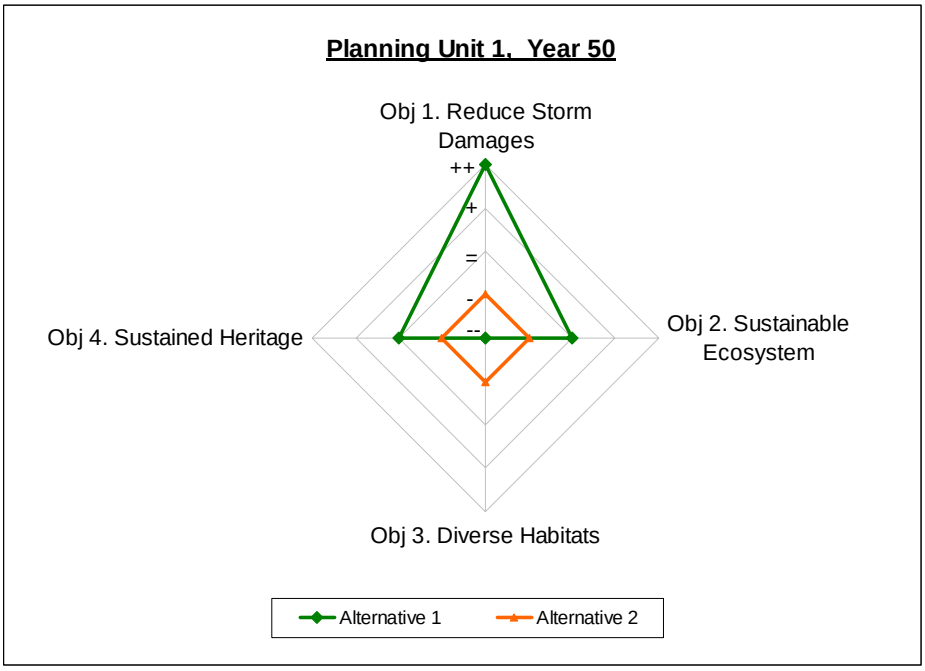

Figure 3.2.8: Planning Unit 1 - Year 50 - Objective Scoring Diagram

3.3 Planning Unit 2

3.3.1 Planning Unit 2 - Alternative 1 - Year 10 - Objective Scoring Table

Table 3.3.1: Planning Unit 2 - Alternative 1 - Year 10 - Objective Scoring

Objective	Scoring Criteria	Qualitative description of impacts	Criteria Score	Comments	Score
Reduce economic losses from storm based flooding	Concentrated Assets	▪ All CA with >5,000 buildings are protected to a 500-year storm event level. ▪ All CA with >1,000 buildings are protected to a 100-year storm event level. ▪ CA with <1,000 buildings are protected to a 100-year storm event level.	++	▪ The levee alignment and levee height will be protective against a 500-year storm event, and resulting storm surge at the coastline for the majority of CA; other CA are protected against a 100-year storm surge event. ▪ DA outside the proposed alignment do not include highways or residential communities. ▪ Most strategic resources are within the levee alignment that is protective against a 500-year storm event. Strategic Resources that can be protected by a levee system are either within a 500-year or 100-year protective levee system.	++
	Distributed Assets	Some DA are protected to 100-year storm event level.	++		
	Strategic Resources	All strategic resources are within the levee alignment that is protective against a 100-year storm event.	+		
Promote a sustainable coastal ecosystem	Productivity	Positive from output (34% increase from yr 0).	+	Positive productivity. Driven by marsh creation. Category for this combination doesn't exist: assume equivalent to '='.	=
	Process Exchanges	Less than current: few minor diversions and increased hydrologic barrier at GIWW.	-		

Continued…

Objective	Scoring Criteria	Qualitative description of impacts	Criteria Score	Comments	Score
Provide habitats for commercial and recreational activities	Species	4 increase (mink, otter, alligator, duck); 5 decrease (croaker, trout, menhaden, br shrimp, oyster).	-	Category for this combination doesn't exist: assume equivalent to '=' based on 4 spp increasing, with '=' habitat score.	=
	Habitats	2 increase (fresh, salt marsh); 1 decreases (brackish marsh).	=		
Sustain, to the extent practicable, the unique heritage of coastal Louisiana	Communities	Improved structural protection, some protection from restoration.	++		+
	Natural Resources	W&F-Decline, Agriculture same.	-		
	Sustainable Balance	Access not hindered, alligators enhanced.	+		

3.3.2 Planning Unit 2 – Alternative 1 – Year 50 - Objective Scoring Table

Table 3.3.2: Planning Unit 2 - Alternative 1 - Year 50 - Objective Scoring

Objective	Scoring Criteria	Qualitative description of impacts	Criteria Score	Comments	Score
Reduce economic losses from storm based flooding	Concentrated Assets	▪ All CA with >5,000 buildings are protected to a 500-year storm event level. ▪ All CA with >1,000 buildings are protected to a 100-year storm event level. ▪ CA with <1,000 buildings are protected to a 100-year storm event level.	++	▪ The levee alignment and levee height will be protective against a 500-year storm event, and resulting storm surge at the coastline for the majority of CA; other CA are protected against a 100-year storm surge event. ▪ DA outside the proposed alignment do not include highways or residential communities. ▪ Most strategic resources are within the levee alignment that is protective against a 500-year storm event. Strategic Resources that can be protected by a levee system are either within a 500-year or 100-year protective levee system.	++
	Distributed Assets	Some DA are protected to 100-year storm event level.	++		
	Strategic Resources	All strategic resources are within the levee alignment that is protective against a 100-year storm event.	+		
Promote a sustainable coastal ecosystem	Productivity	Minimal from output (4% decrease from yr 40).	=	Scoring table indicates a score of '-'.	-
	Process Exchanges	Less than current: few minor diversions and increased hydrologic barrier at GIWW.	-		

Continued…

Objective	Scoring Criteria	Qualitative description of impacts	Criteria Score	Comments	Score
Provide habitats for commercial and recreational activities	Species	2 increase (alligator, duck); 6 decrease (trout, menhaden, br shrimp, oysters, otter, muskrats.	-	Category for this combination doesn't exist: assume equivalent to '--' based on 6 spp decreasing coastwide (7 needed to score '--').	--
	Habitats	1 increases (fresh marsh); 3 decrease (brackish, intermediate, salt marsh).	--		
Sustain, to the extent practicable, the unique heritage of coastal Louisiana	Communities	Improved structural protection, some protection from restoration.	++		+
	Natural Resources	W&F-Decline, Agriculture same.	-		
	Sustainable Balance	Access not hindered, alligators enhanced	–		

3.3.3 Planning Unit 2 - Alternative 1 - Operational Certainty Scoring Table

Table 3.3.3: Planning Unit 2 - Alternative 1 - Operational Certainty Scoring

Measures	Operational Certainty		Score
	Construction/Cost	**Performance**	
Protection Certainty	▪ Project construction and costs are well understood and have been applied in similar areas within the Planning Unit. ▪ The proposed alignment is included in the Donaldsonville to the Gulf feasibility study, which increases the understanding of construction techniques and costs.	▪ The performance of project features (earthen levees, floodwalls, floodgates and environmental structures) are all well understood and have been applied in similar areas within the Planning Unit. ▪ There are environmental concerns regarding the impacts to hydrology within the basin, but the inclusion of environmental structures will allow for adaptive management to address environmental factors that may arise. ▪ The proposed alignment is included in the Donaldsonville to the Gulf feasibility study, which increases the operational certainty.	+
Restoration Certainty	▪ Source material was constrained to the river; should consider other sources. ▪ Costs and constructability of potential actions resulting from recommended studies are not considered and may replace or require changes to proposed measures.	▪ Constructed wetlands may not have same level of ecological function as naturally created wetlands. ▪ Exact sizing, locations, and operation of diversions required for sustainability of wetland ecosystems is still uncertain. ▪ Modeling outputs were best available; however, coarse resolution of model supported by limited data sets leaves uncertainty in outputs. Outputs are indicative of large-scale trends rather than detailed impacts. ▪ Impacts of potential actions resulting from recommended studies are not considered and may replace or require changes to proposed measures. ▪ Uncertainty associated with combined effects of restoration and protection actions on hydrology.	-

3.3.4 Planning Unit 2 - Alternative 2 - Year 10 - Objective Scoring Table

Table 3.3.4: Planning Unit 2 - Alternative 1 - Year 10 - Objective Scoring

Objective	Scoring Criteria	Qualitative description of impacts	Criteria Score	Comments	Score
Reduce economic losses from storm based flooding	Concentrated Assets	▪ All CA with >5,000 buildings are protected to a 500-year storm event level. ▪ All CA with >1,000 buildings are protected to a 100-year storm event level, with the exception of Grand Isle. ▪ CA with <1,000 buildings are protected to a 100-year storm event level.	+	▪ The levee alignment and levee height will be protective against a 500-year storm event, and resulting storm surge at the coastline for the Greater New Orleans Metropolitan Area on the West Bank; most CA are protected against a 100-year storm surge event, with the exception Grand Isle. ▪ DA outside the proposed alignment do not include highways or residential communities. ▪ Most strategic resources are within the levee alignment that is protective against a 500-year storm event. Strategic Resources that can be protected by a levee system are either within a 500-year or 100-year protective levee system.	+
	Distributed Assets	Some DA are protected to 100-year storm event level.	++		
	Strategic Resources	All strategic resources are within the levee alignment that is protective against a 100-year storm event.	+		
Promote a sustainable coastal ecosystem	Productivity	Positive from output (47% increase from yr 0).	+	Diversions offset obstruction to exchange by protection levees; scoring table indicates '+' score.	+
	Process Exchanges	Similar to current: several 5,000 cfs diversions and increased hydrologic barrier at Hwy 90.	=		

Continued…

Objective	Scoring Criteria	Qualitative description of impacts	Criteria Score	Comments	Score
Provide habitats for commercial and recreational activities	Species	4 increase (mink, otter, alligator, duck); 5 decrease (croaker, trout, menhaden, br shrimp, oyster).	-	Category for this combination doesn't exist: assume equivalent to '=' based on 4 spp increasing, with '+' habitat score.	=
	Habitats	3 increase (fresh, intermediate, salt marsh); 1 decreases (intermediate).	+		
Sustain, to the extent practicable, the unique heritage of coastal Louisiana	Communities	Current level of structural protection, some protection from restoration.	+		=
	Natural Resources	W&F-Decline, Agriculture same.	-		
	Sustainable Balance	Access not hindered, alligators enhanced.	=		

3.3.5 Planning Unit 2 – Alternative 2 – Year 50 - Objective Scoring Table

Table 3.3.5: Planning Unit 2 - Alternative 2 - Year 50 - Objective Scoring

Objective	Scoring Criteria	Qualitative description of impacts	Criteria Score	Comments	Score
Reduce economic losses from storm based flooding	Concentrated Assets	▪ All CA with >5,000 buildings are protected to a 500-year storm event level. ▪ All CA with >1,000 buildings are protected to a 100-year storm event level, with the exception of Grand Isle. ▪ CA with <1,000 buildings are protected to a 100-year storm event level.	+	▪ The levee alignment and levee height will be protective against a 500-year storm event, and resulting storm surge at the coastline for the Greater New Orleans Metropolitan Area on the West Bank; most CA are protected against a 100-year storm surge event, with the exception Grand Isle. ▪ DA outside the proposed alignment do not include highways or residential communities. ▪ Most strategic resources are within the levee alignment that is protective against a 500-year storm event. Strategic Resources that can be protected by a levee system are either within a 500-year or 100-year protective levee system.	+
	Distributed Assets	Some DA are protected to 100-year storm event level.	++		
	Strategic Resources	All strategic resources are within the levee alignment that is protective against a 100-year storm event.	+		

Continued…

Objective	Scoring Criteria	Qualitative description of impacts	Criteria Score	Comments	Score
Promote a sustainable coastal ecosystem	Productivity	Minimal from output (4% decrease from yr 40).	=	Diversions offset obstruction to exchange by protection levees; scoring table indicates '='.	=
	Process Exchanges	Similar to current: several 5,000 cfs diversions, but increased hydrologic barrier at Hwy 90.	=		
Provide habitats for commercial and recreational activities	Species	2 increase (alligator, duck); 3 decrease (trout, menhaden, otter).	-	Category for this combination doesn't exist: assume equivalent to '-' based on need to have 4 spp increase to warrant '='.	-
	Habitats	1 increases (fresh); 1 decreases (brackish); 3 remain similar to year 0.	=		
Sustain, to the extent practicable, the unique heritage of coastal Louisiana	Communities	Current level of structural protection, some protection from restoration.	+		=
	Natural Resources	W&F-Decline, Agriculture same.	-		
	Sustainable Balance	Access not hindered, alligators enhanced.	=		

3.3.6 Planning Unit 2 - Alternative 2 - Operational Certainty Scoring Table

Table 3.3.6: Planning Unit 2 - Alternative 2 - Operational Certainty Scoring

Measures	Operational Certainty		Score
	Construction/Cost	**Performance**	
Protection Certainty	▪ Project construction and costs are well understood and have been applied in similar areas within the Planning Unit. ▪ The proposed alignment is included in the Donaldsonville to the Gulf feasibility study, which increases the understanding of construction techniques and costs.	▪ The performance of project features (earthen levees, floodwalls, floodgates and environmental structures) are all well understood and have been applied in similar areas within the Planning Unit. ▪ There are environmental concerns regarding the impacts to hydrology within the basin, but the inclusion of environmental structures will allow for adaptive management. ▪ The proposed alignment is included in the Donaldsonville to the Gulf feasibility study, which increases the operational certainty. ▪ Performance would be improved by including the measure to provide 100-yr protection for Grand Isle.	+
Restoration Certainty	▪ Source material was constrained to the river; should consider other sources. ▪ Costs and constructability of potential actions resulting from recommended studies are not considered and may replace or require changes to proposed measures.	▪ Constructed wetlands may not have same level of ecological function as naturally created wetlands. ▪ Exact sizing, locations, and operation of diversions required for sustainability of wetland ecosystems is still uncertain. ▪ Modeling outputs were best available; however, coarse resolution of model supported by limited data sets leaves uncertainty in outputs. Outputs are indicative of large-scale trends rather than detailed impacts. ▪ Impacts of potential actions resulting from recommended studies are not considered and may replace or require changes to proposed measures. ▪ Uncertain of performance of small diversions (5,000 cfs each) into upper basin because of restricted flow at Hwy 90 and potential further restrictions to flow with proposed levee alignment. ▪ Uncertainty associated with combined effects of restoration and protection actions on hydrology.	-

3.3.7 Planning Unit 2 - Year 10 - Objective Scoring Diagram

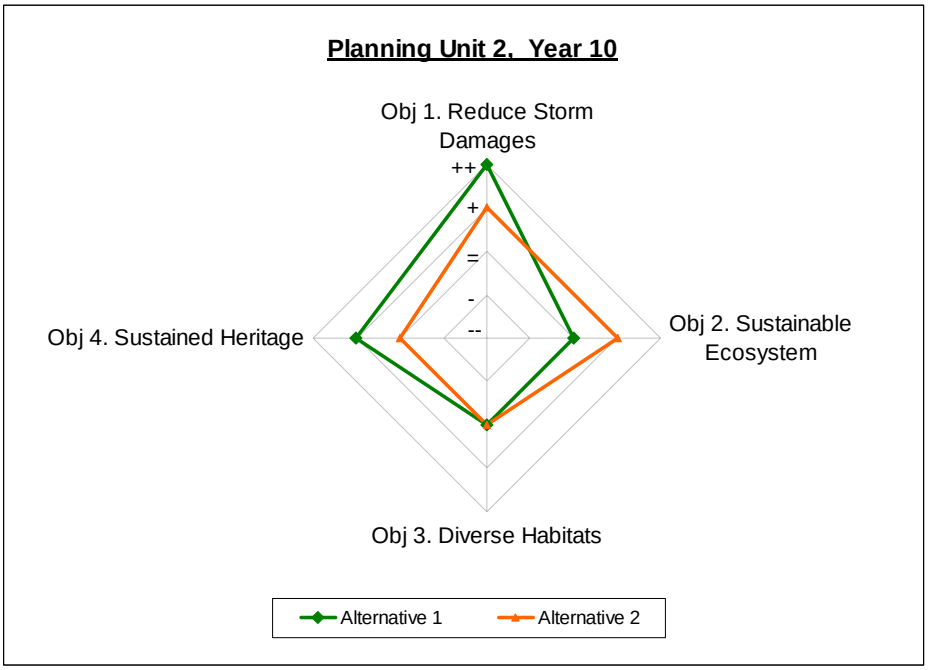

Figure 3.3.7: Planning Unit 2 - Year 10 - Objective Scoring Diagram

3.3.8 Planning Unit 2 - Year 50 - Objective Scoring Diagram

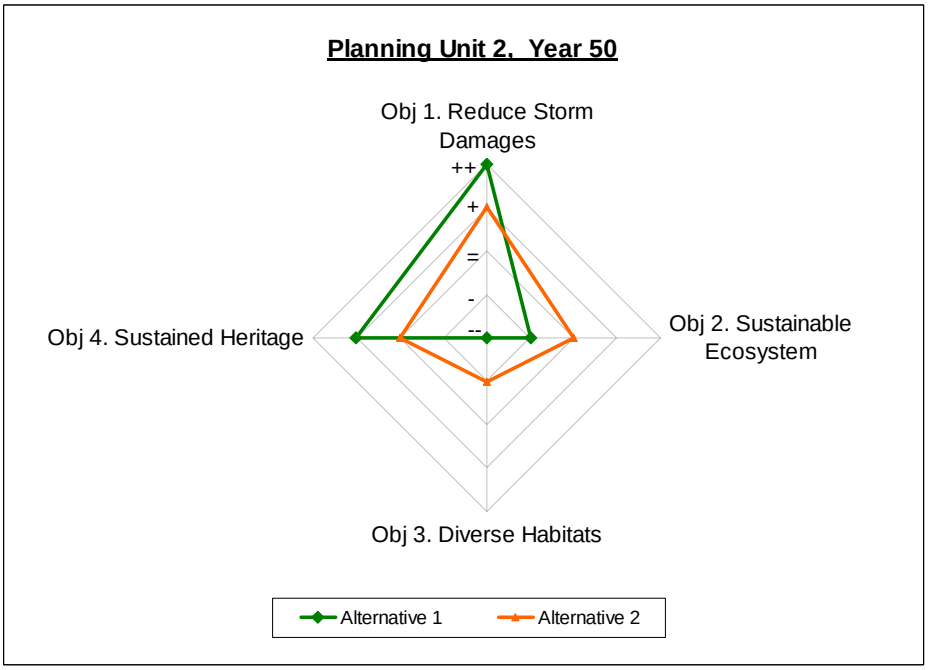

Figure 3.3.8: Planning Unit 2 - Year 50 - Objective Scoring Diagram

3.4 Planning Unit 3a

3.4.1 Planning Unit 3a - Alternative 1 - Year 10 - Objective Scoring Table

Table 3.4.1: Planning Unit 3a - Alternative 1 - Year 10 - Objective Scoring

Objective	Scoring Criteria	Qualitative description of impacts	Criteria Score	Comments	Score
Reduce economic losses from storm based flooding	Concentrated Assets	All concentrated assets are within the levee alignment that is protective against a 500-year storm event.	++	The levee alignment and levee height will be protective against a 500-year storm event, and resulting storm surge at the coastline within Planning Unit 3a.	++
	Distributed Assets	All distributed assets are within the levee alignment that is protective against a 500-year storm event.	++		
	Strategic Resources	All strategic resources are within the levee alignment that is protective against a 500-year storm event.	++		
Promote a sustainable coastal ecosystem	Productivity	Positive from output (20% increase from yr 0).	+	Assume as in Morganza study inclusion of environmental structures; scoring table indicates '+'.	+
	Process Exchanges	Net similar exchange; small improvement in flows, Morganza is a leaky levee.	=		
Provide habitats for commercial and recreational activities	Species	4 increase (mink, otter, alligator, duck); 5 decrease (croaker, trout, menhaden, brown shrimp, oyster).	-	Category for this combination doesn't exist: assume equivalent to '=' based on 4 spp increasing, with '=' habitat score.	=
	Habitats	2 increase (fresh, salt marsh); 1 decreases (brackish marsh).	=		

Continued…

Objective	Scoring Criteria	Qualitative description of impacts	Criteria Score	Comments	Score
Sustain, to the extent practicable, the unique heritage of coastal Louisiana	Communities	Improved structural protection to majority of communities, overall no increased protection from restoration.	++		++
	Natural Resources	W & F increase, agriculture same.	+		
	Sustainable Balance	Overall access not hindered (net balance).	=		

3.4.2 Planning Unit 3a – Alternative 1 – Year 50 - Objective Scoring Table

Table 3.4.2: Planning Unit 3a - Alternative 1 - Year 50 - Objective Scoring

Objective	Scoring Criteria	Qualitative description of impacts	Criteria Score	Comments	Score
Reduce economic losses from storm based flooding	Concentrated Assets	All concentrated assets are within the levee alignment that is protective against a 500-year storm event.	++	The levee alignment and levee height will be protective against a 500-year storm event, and resulting storm surge at the coastline within Planning Unit 3a.	++
	Distributed Assets	All distributed assets are within the levee alignment that is protective against a 500-year storm event.	++		
	Strategic Resources	All strategic resources are within the levee alignment that is protective against a 500-year storm event.	++		
Promote a sustainable coastal ecosystem	Productivity	Negative from output (10 % decrease from yr 40).	-	Category for this combination doesn't exist: assume equivalent to '-' as negative productivity trend moderate.	-
	Process Exchanges	Net similar exchange; small improvement in flows, Morganza is a leaky levee.	=		
Provide habitats for commercial and recreational activities	Species	2 increase (alligator, duck); 6 decrease (trout, menhaden, br shrimp, oysters, otter, muskrats).	-	Category for this combination doesn't exist: assume equivalent to '--' based on 6 spp decreasing coastwide (7 needed to score '--').	--
	Habitats	1 increases (fresh marsh); 3 decrease (brackish, intermediate, salt marsh).	--		
Sustain, to the extent practicable, the unique heritage of coastal Louisiana	Communities	Improved structural protection to majority of communities, coastal restoration enhances protection.	++		++
	Natural Resources	W & F increase, agriculture same.	+		
	Sustainable Balance	Overall access not hindered (net balance).	=		

3.4.3 Planning Unit 3a - Alternative 1 - Operational Certainty Scoring Table

Table 3.4.3: Planning Unit 3a - Alternative 1 - Operational Certainty Scoring

Measures	Operational Certainty		Score
	Construction/Cost	**Performance**	
Protection Certainty	▪ Project construction and costs are well understood and have been applied in similar areas within the Planning Unit. ▪ The proposed alignment is included in the Morganza to the Gulf feasibility study, which increases the understanding of construction techniques and costs.	▪ The performance of project features (earthen levees, floodwalls, floodgates and environmental structures) are all well understood and have been applied in similar areas within the Planning Unit. ▪ There are environmental concerns regarding the impacts to hydrology within the basin, but the inclusion of environmental structures will allow for adaptive management to address environmental factors that may arise. ▪ The proposed alignment is included in the Morganza to the Gulf feasibility study, which increases the operational certainty.	+
Restoration Certainty	▪ Source material was constrained; should consider other sources. ▪ Costs and constructability of potential actions resulting from recommended studies are not considered and may replace or require changes to proposed measures.	▪ Constructed wetlands may not have same level of ecological function as naturally created wetlands. ▪ Modeling outputs were best available; however, coarse resolution of model supported by limited data sets leaves uncertainty in outputs. Outputs are indicative of large-scale trends rather than detailed impacts. ▪ Impacts of potential actions resulting from recommended studies are not considered and may replace or require changes to proposed measures. ▪ Uncertainty associated with combined effects of restoration and protection actions on hydrology.	-

3.4.4 Planning Unit 3a - Alternative 2 - Year 10 - Objective Scoring Table

Table 3.4.4: Planning Unit 3a - Alternative 2 - Year 10 - Objective Scoring

Objective	Scoring Criteria	Qualitative description of impacts	Criteria Score	Comments	Score
Reduce economic losses from storm based flooding	Concentrated Assets	All concentrated asset areas with greater than 1,000 or 5,000 buildings are within the levee alignment that is protective against a 500-year storm event.	++	The internal levee alignment and levee height will be protective against a 500-year storm event; the external levee alignment will be protective against a 100-year storm event. The combination of these levee protection levels encompasses all concentrated and distributed assets; most of the strategic resources are protected with very few that are outside of any levee protection at all.	+
	Distributed Assets	All distributed assets are within the levee alignment that is protective against a 500-year storm event.	++		
	Strategic Resources	All to most of the strategic resources are within the levee alignment that is protective against a 100-year storm event.	+		
Promote a sustainable coastal ecosystem	Productivity	Positive from output (41% increase from yr 0).	+	Inner levee below Houma little impact on exchange; Ridge improvement along existing bayou features; scoring table indicates '+'.	+
	Process Exchanges	Net similar exchange; small improvement in flows, Morganza is a leaky levee.	=		
Provide habitats for commercial and recreational activities	Species	2 increase (mink, otter); 7 decrease (croaker, trout, menhaden, br shrimp, oyster, alligator, duck).	-	Category for this combination doesn't exist: assume equivalent to '=' based on 4 spp increasing, with '+' habitat score.	=
	Habitats	3 increase (fresh, intermediate, salt marsh); 1 decreases (intermediate).	+		

Continued…

Objective	Scoring Criteria	Qualitative description of impacts	Criteria Score	Comments	Score
Sustain, to the extent practicable, the unique heritage of coastal Louisiana	Communities	Improved structural protection to majority of communities, coastal restoration enhances protection.	++		+
	Natural Resources	W & F decrease, agriculture same.	-		
	Sustainable Balance	Overall access not hindered (net balance).	=		

3.4.5 Planning Unit 3a – Alternative 2 – Year 50 - Objective Scoring Table

Table 3.4.5: Planning Unit 3a – Alternative 2 – Year 50 - Objective Scoring

Objective	Scoring Criteria	Qualitative description of impacts	Criteria Score	Comments	Score
Reduce economic losses from storm based flooding	Concentrated Assets	All concentrated asset areas with greater than 1,000 or 5,000 buildings are within the levee alignment that is protective against a 500-year storm event.	++	The internal levee alignment and levee height will be protective against a 500-year storm event, the external levee alignment will be protective against a 100-year storm event. The combination of these levee protection levels encompasses all concentrated and distributed assets; most of the strategic resources are protected with very few that are outside of any levee protection at all.	+
	Distributed Assets	All distributed assets are within the levee alignment that is protective against a 500-year storm event.	++		
	Strategic Resources	All to most of the strategic resources are within the levee alignment that is protective against a 100-year storm event.	+		
Promote a sustainable coastal ecosystem	Productivity	Minimal from output (4% decrease from yr 40).	=	Inner levee below Houma little impact on exchange Ridge improvement along existing bayou features; scoring table indicate '='.	=
	Process Exchanges	Net similar exchange; small improvement in flows, Morganza is a leaky levee.	=		
Provide habitats for commercial and recreational activities	Species	2 increase (alligator, duck); 3 decrease (trout, menhaden, otter).	-	Category for this combination doesn't exist: assume equivalent to '-' based on need to have 4 spp increase to warrant '='.	-
	Habitats	1 increases (fresh); 1 decreases (brackish); 3 remain similar to year 0.	=		

Continued…

Objective	Scoring Criteria	Qualitative description of impacts	Criteria Score	Comments	Score
Sustain, to the extent practicable, the unique heritage of coastal Louisiana	Communities	Improved structural protection to majority of communities, coastal restoration enhances protection.	++		+
	Natural Resources	W & F decrease, agriculture same.	-		
	Sustainable Balance	Overall access not hindered (net balance).	=		

3.4.6 Planning Unit 3a - Alternative 2 - Operational Certainty Scoring Table

Table 3.4.6: Planning Unit 3a - Alternative 2 - Operational Certainty Scoring

Measures	Operational Certainty		Score
	Construction/Cost	**Performance**	
Protection Certainty	▪ Project construction and costs are well understood and have been applied in similar areas within the Planning Unit. ▪ The proposed alignment is included in the Morganza to the Gulf feasibility study, which increases the understanding of construction techniques and costs.	▪ The performance of project features (earthen levees, floodwalls, floodgates and environmental structures) are all well understood and have been applied in similar areas within the Planning Unit. ▪ There are environmental concerns regarding the impacts to hydrology within the basin, but the inclusion of environmental structures will allow for adaptive management to address environmental factors that may arise. ▪ The proposed alignment is included in the Morganza to the Gulf feasibility study, which increases the operational certainty.	+
Restoration Certainty	▪ Source material was constrained; should consider other sources. ▪ Costs and constructability of potential actions resulting from recommended studies are not considered and may replace or require changes to proposed measures.	▪ Constructed wetlands may not have same level of ecological function as naturally created wetlands. ▪ Modeling outputs were best available; however, coarse resolution of model supported by limited data sets leaves uncertainty in outputs. Outputs are indicative of large-scale trends rather than detailed impacts. ▪ Impacts of potential actions resulting from recommended studies are not considered and may replace or require changes to proposed measures. ▪ Uncertainty associated with combined effects of restoration and protection actions on hydrology.	-

3.4.7 Planning Unit 3A - Year 10 - Objective Scoring Diagram

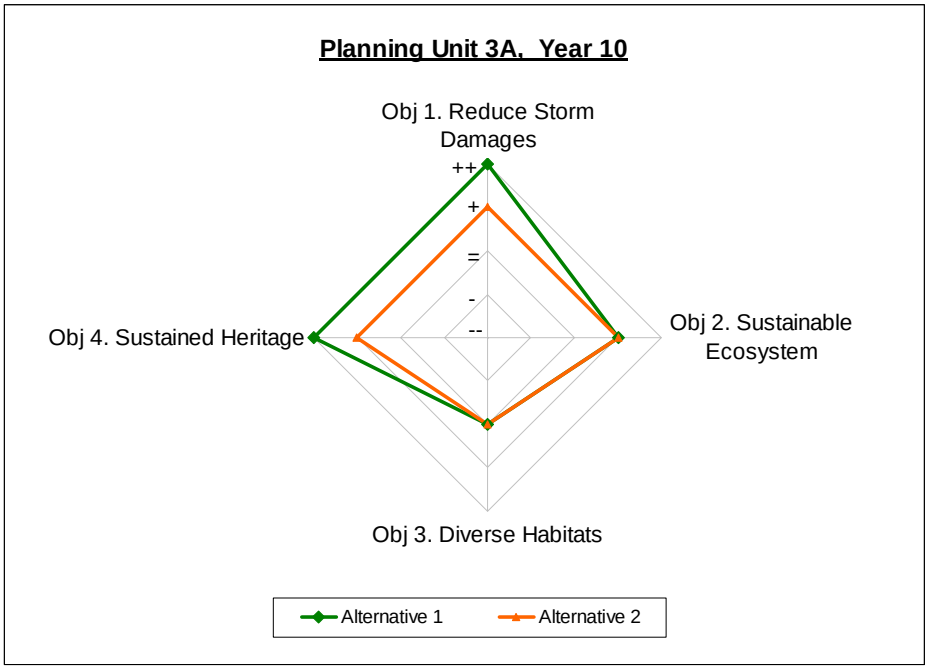

Figure 3.4.7: Planning Unit 3a - Year 10 - Objective Scoring Diagram

3.4.8 Planning Unit 3A - Year 50 - Objective Scoring Diagram

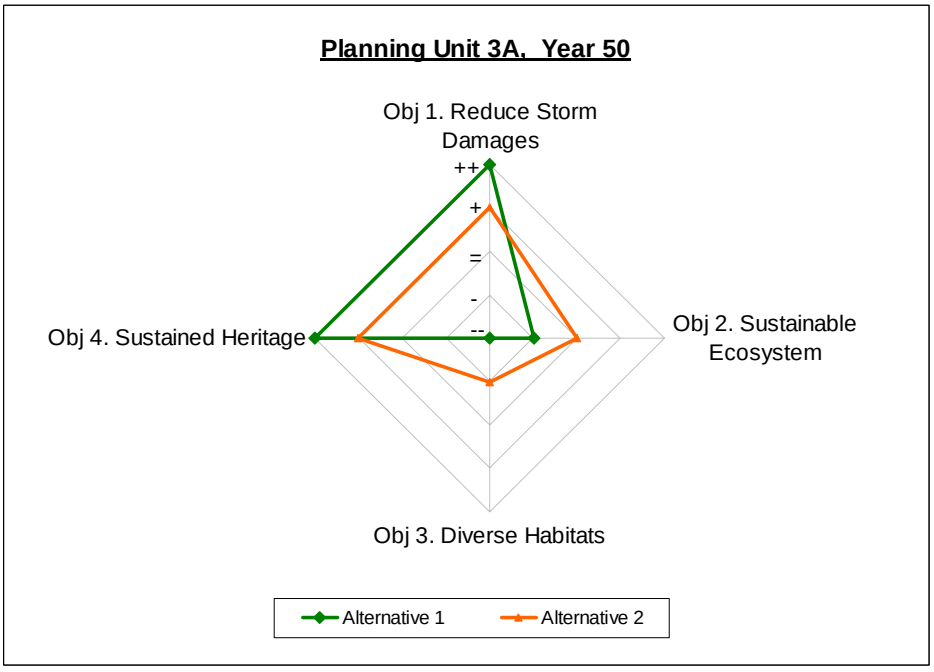

Figure 3.4.8: Planning Unit 3a - Year 50 - Objective Scoring Diagram

3.5 Planning Unit 3b

3.5.1 Planning Unit 3b - Alternative 1 - Year 10 - Objective Scoring Table

Table 3.5.1: Planning Unit 3b - Alternative 1 - Year 10 - Objective Scoring

Objective	Scoring Criteria	Qualitative description of impacts	Criteria Score	Comments	Score
Reduce economic losses from storm based flooding	Concentrated Assets	▪ All CA with >5,000 buildings are protected to a 500-year storm event level. ▪ All CA with >1,000 buildings are protected to a 100-year storm event level. ▪ CA with <1,000 buildings are protected to a 100-year storm event level.	++	▪ The levee alignment and levee height will be protective against a 500-year storm event and the resulting storm surge at the coastline for all of the Concentrated Areas. Avery Island is outside the protection. ▪ DA outside the proposed alignment includes a portion of Louisiana highways 317 and 83 and several small farming communities along Bayou Cypremort. A small levee exists along Bayou Sale giving some protection to 6 small farming communities. Weeks community is outside the protection. ▪ Most strategic resources are within the levee alignment that is protective against a 500-year storm event. Most Strategic Resources that can be protected by a levee system are within a 500-year protective levee system or are higher than the storm surges.	=
	Distributed Assets	The majority of DA are protected to 500 year storm event level.	++		
	Strategic Resources	All but two (2) strategic resources are within the levee alignment that is protective against a 500-year storm event.	++		

Continued…

Objective	Scoring Criteria	Qualitative description of impacts	Criteria Score	Comments	Score
Promote a sustainable coastal ecosystem	Productivity	Minimal from output (5% increase from yr 0).	=	Scoring table indicates '-'.	-
	Process Exchanges	▪ Some improvement in flows into E. Terrebonne from Atchafalaya, protection levee impacting wetlands above GIWW. ▪ => Net exchange less than current.	-		
Provide habitats for commercial and recreational activities	Species	4 increase (mink, otter, alligator, duck); 5 decrease (croaker, trout, menhaden, brown shrimp, oyster).	-	Category for this combination doesn't exist: assume equivalent to '=' based on 4 spp increasing, with '=' habitat score.	=
	Habitats	2 increase (fresh, salt marsh); 1 decreases (brackish marsh).	=		
Sustain, to the extent practicable, the unique heritage of coastal Louisiana	Communities	Improved structural protection to majority of communities, overall no increased protection from restoration.	++		++
	Natural Resources	W & F increase, agriculture increase.	+		
	Sustainable Balance	Overall access not hindered.	=		

3.5.2 Planning Unit 3b – Alternative 1 – Year 50 - Objective Scoring Table

Table 3.5.2: Planning Unit 3b - Alternative 1 - Year 50 - Objective Scoring

Objective	Scoring Criteria	Qualitative description of impacts	Criteria Score	Comments	Score
Reduce economic losses from storm based flooding	Concentrated Assets	▪ All CA with >5,000 buildings are protected to a 500-year storm event level. ▪ All CA with >1,000 buildings are protected to a 100-year storm event level. ▪ CA with <1,000 buildings are protected to a 100-year storm event level.	++	▪ The levee alignment and levee height will be protective against a 500-year storm event, and resulting storm surge at the coastline for the majority of CA; other CA are protected against a 100-year storm surge event. ▪ DA are protected to the 500-year storm event level of protection. ▪ All strategic resources are within the levee alignment that is protective against a 500-year storm event.	++
	Distributed Assets	The majority of DA are protected to 500 year storm event level.	++		
	Strategic Resources	All but two (2) strategic resources are within the levee alignment that is protective against a 500-year storm event.	++		
Promote a sustainable coastal ecosystem	Productivity	Minimal from output (4% decrease from yr 40).	=	Losses east of Atchafalaya River cause overall minimal productivity change rate within PU; scoring table indicates '-'.	-
	Process Exchanges	▪ Small improvement in flows into E. Terrebonne from Atchafalaya, protection levee impacting wetlands above GIWW. ▪ Net exchange less than current.	-		
Provide habitats for commercial and recreational activities	Species	2 increase (alligator, duck); 6 decrease (trout, menhaden, br shrimp, oysters, otter, and muskrats.	-	Category for this combination doesn't exist: assume equivalent to '--' based on 6 spp decreasing coastwide (7 needed to score '--').	--
	Habitats	1 increases (fresh marsh); 3 decrease (brackish, intermediate, salt marsh).	--		

Continued…

Objective	Scoring Criteria	Qualitative description of impacts	Criteria Score	Comments	Score
Sustain, to the extent practicable, the unique heritage of coastal Louisiana	Communities	Increased structural protection to majority of communities, overall no increased protection from restoration.	++		++
	Natural Resources	W & F increase, agriculture increase.	+		
	Sustainable Balance	Overall access not hindered.	=		

3.5.3 Planning Unit 3b - Alternative 1 - Operational Certainty Scoring Table

Table 3.5.3: Planning Unit 3b - Alternative 1 - Operational Certainty Scoring

Measures	Operational Certainty		Score
	Construction/Cost	**Performance**	
Protection Certainty	▪ Project construction and costs are well understood and have been applied in similar areas in Louisiana.	▪ Based on the 500-year storm surge maps (USACE, 2006) the levee alignment and dimensions proposed for Alternative 1 will protect all concentrated, distributed, and strategic assets within Planning Unit (PU) 3b to the maximum extent practicable.	+
Restoration Certainty	▪ Source material was constrained; should consider other sources. ▪ Costs and constructability of potential actions resulting from recommended studies are not considered and may replace or require changes to proposed measures.	▪ Constructed wetlands may not have same level of ecological function as naturally created wetlands. ▪ Modeling outputs were best available; however, coarse resolution of model supported by limited data sets leaves uncertainty in outputs. Outputs are indicative of large-scale trends rather than detailed impacts. ▪ Impacts of potential actions resulting from recommended studies are not considered and may replace or require changes to proposed measures. ▪ Uncertainty associated with combined effects of restoration and protection actions on hydrology. ▪ Ecological function of measure to rebuild of historic reefs is questionable in the face of a major river delta.	-

3.5.4 Planning Unit 3b - Alternative 2 - Year 10 - Objective Scoring Table

Table 3.5.4: Planning Unit 3b - Alternative 2 - Year 10 - Objective Scoring

Objective	Scoring Criteria	Qualitative description of impacts	Criteria Score	Comments	Score
Reduce economic losses from storm based flooding	Concentrated Assets	▪ All CA with >5,000 buildings are protected to a 500-year storm event level. ▪ All CA with >1,000 buildings are protected to a 100-year storm event level, with the exception of Grand Isle. ▪ CA with <1,000 buildings are protected to a 100-year storm event level.	++	▪ The levee alignment and levee height will be protective against a 500-year storm event and the resulting storm surge at the coastline for all of the Concentrated Areas. Avery Island is outside the protection. ▪ DA outside the proposed alignment includes a portion of Louisiana highways 317 and 83 and several small farming communities (9) along Bayou Cypremort (15). A small levee exists along Bayou Sale giving some protection to 6 small farming communities. Weeks community is outside the protection. ▪ Most strategic resources are within the levee alignment that is protective against a 500-year storm event. Most Strategic Resources that can be protected by a levee system are within a 500-year protective levee system or are higher than the storm surges.	=
	Distributed Assets	Some DA are protected to 500-year storm event level.	++		
	Strategic Resources	All strategic resources are within the levee alignment that is protective against a 500-year storm event.	++		

Continued…

Objective	Scoring Criteria	Qualitative description of impacts	Criteria Score	Comments	Score
Promote a sustainable coastal ecosystem	Productivity	Positive from output (10% increase from yr 0).	+	Losses east of Atchafalaya River continue at higher rate than rest of PU; scoring table indicates '+'.	+
	Process Exchanges	Some improvement in flows into E. Terrebonne (Penchant) from Atchafalaya, little disruption from protection levees => similar exchanges.	=		
Provide habitats for commercial and recreational activities	Species	4 increase (mink, otter, alligator, duck); 5 decrease (croaker, trout, menhaden, br shrimp, oyster).	-	Category for this combination doesn't exist: assume equivalent to '=' based on 4 spp increasing, with '+' habitat score.	=
	Habitats	3 increase (fresh, intermediate, salt marsh); 1 decreases (intermediate).	+		
Sustain, to the extent practicable, the unique heritage of coastal Louisiana	Communities	Increased structural protection, some communities left out; overall no increased protection from restoration.	++		++
	Natural Resources	W & F increase, agriculture increase.	+		
	Sustainable Balance	Overall access not hindered.	=		

3.5.5 Planning Unit 3b – Alternative 2 – Year 50 - Objective Scoring Table

Table 3.5.5: Planning Unit 3b – Alternative 2 – Year 50 - Objective Scoring

Objective	Scoring Criteria	Qualitative description of impacts	Criteria Score	Comments	Score
Reduce economic losses from storm based flooding	Concentrated Assets	▪ All CA with >5,000 buildings are protected to a 500-year storm event level. ▪ All CA with >1,000 buildings are protected to a 100-year storm event level. ▪ CA with <1,000 buildings are protected to a 100-year storm event level.	++	▪ The levee alignment and levee height will be protective against a 500-year storm event and the resulting storm surge at the coastline for all of the Concentrated Areas. Avery Island is outside the protection. ▪ DA outside the proposed alignment includes a portion of Louisiana highways 317 and 83 and several small farming communities along Bayou Cypremort. A small levee exists along Bayou Sale giving some protection to 6 small farming communities. Weeks community is outside the protection. ▪ Most strategic resources are within the levee alignment that is protective against a 500-year storm event. Most Strategic Resources that can be protected by a levee system are within a 500-year protective levee system or are higher than the storm surges.	=
	Distributed Assets	Some DA are protected to 500-year storm event level.	++		
	Strategic Resources	All strategic resources are within the levee alignment that is protective against a 500-year storm event.	++		

Continued…

Objective	Scoring Criteria	Qualitative description of impacts	Criteria Score	Comments	Score
Promote a sustainable coastal ecosystem	Productivity	Minimal from output (3% decrease from yr 40).	=	Losses east of Atchafalaya River because overall minimal productivity change rate for entire PU.	=
	Process Exchanges	Some improvement in flows into E. Terrebonne (Penchant) from Atchafalaya, little disruption from protection levees => similar exchanges.	=		
Provide habitats for commercial and recreational activities	Species	2 increase (alligator, duck); 3 decrease (trout, menhaden, otter).	-	Category for this combination doesn't exist: assume equivalent to '-' based on need to have 4 spp increase to warrant '='.	-
	Habitats	1 increases (fresh); 1 decreases (brackish); 3 remain similar to year 0.	+		
Sustain, to the extent practicable, the unique heritage of coastal Louisiana	Communities	Increased structural protection, some communities left out; overall no increased protection from restoration.	++		++
	Natural Resources	W & F increase, agriculture increase.	+		
	Sustainable Balance	Overall access not hindered.	=		

3.5.6 Planning Unit 3b - Alternative 2 - Operational Certainty Scoring Table

Table 3.5.6: Planning Unit 3b - Alternative 2 - Operational Certainty Scoring

Measures	Operational Certainty		Score
	Construction/Cost	**Performance**	
Protection Certainty	▪ Project construction and costs are well understood and have been applied in similar areas in Louisiana.	Based on the 100-year and the 500-year storm surge maps (USACE, 2006) the levee alignments and dimensions proposed for Alternative 2 will protect most of the concentrated assets, most of the distributed assets and all of the strategic assets within (PU) 3-b.	+
Restoration Certainty	▪ Source material was constrained; should consider other sources. ▪ Costs and constructability of potential actions resulting from recommended studies are not considered and may replace or require changes to proposed measures.	▪ Constructed wetlands may not have same level of ecological function as naturally created wetlands. ▪ Modeling outputs were best available; however, coarse resolution of model supported by limited data sets leaves uncertainty in outputs. Outputs are indicative of large-scale trends rather than detailed impacts. ▪ Impacts of potential actions resulting from recommended studies are not considered and may replace or require changes to proposed measures. ▪ Uncertainty associated with combined effects of restoration and protection actions on hydrology. ▪ Uncertainty associated with unintended consequences of increasing sediment load down Wax Lake Outlet on surrounding areas, including Terrebonne marshes.	-

3.5.7 Planning Unit 3B - Year 10 - Objective Scoring Diagram

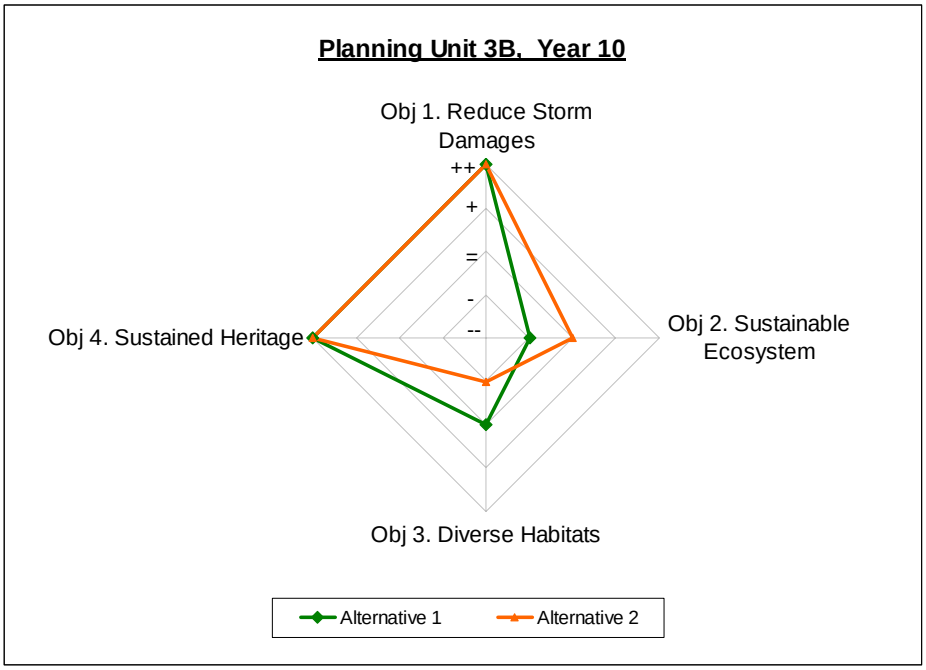

Figure 3.5.7: Planning Unit 3b - Year 10 - Objective Scoring Diagram

3.5.8 Planning Unit 3B - Year 50 - Objective Scoring Diagram

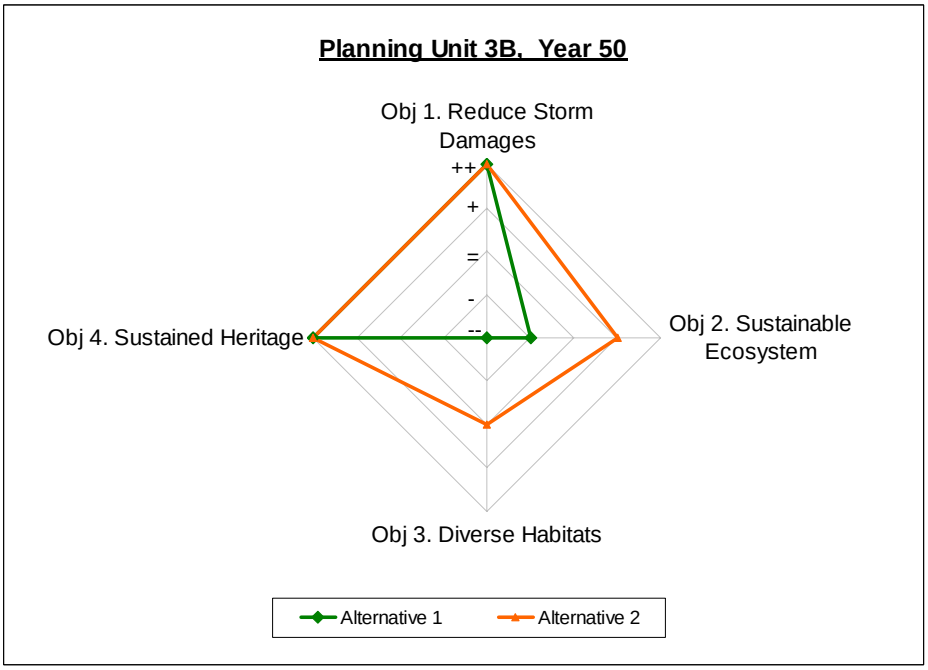

Figure 3.5.8: Planning Unit 3b - Year 50 - Objective Scoring Diagram

3.6 Planning Unit 4

3.6.1 Planning Unit 4 - Alternative 1 - Year 10 - Objective Scoring Table

Table 3.6.1: Planning Unit 4 - Alternative 1 - Year 10 - Objective Scoring

Objective	Scoring Criteria	Qualitative description of impacts	Criteria Score	Comments	Score
Reduce economic losses from storm based flooding	Concentrated Assets	▪ All CA with >5,000 buildings are protected to a 500-year storm event level. ▪ All CA with >1,000 buildings are protected to a 100-year storm event level. ▪ CA with <1,000 buildings are protected to a 100-year storm event level.	++	▪ The levee alignment and levee height will be protective against a 500-year storm event, and resulting storm surge at the coastline for the majority of CA; other CA are protected against a 100-year storm surge event. ▪ DA outside the proposed alignment do include highways or very small residential communities. ▪ Most strategic resources are within the levee alignment that is protective against a 500-year storm event. There are two LNG facilities located south of the levee line of protection.	+
	Distributed Assets	The majority of DA are protected to 500-year storm event level.	++		
	Strategic Resources	All but two (2) strategic resources are within the levee alignment that is protective against a 100-year storm event.	=		
Promote a sustainable coastal ecosystem	Productivity	Positive from output (18% increase from yr 0).	+	Category for this combination doesn't exist: assume equivalent to '='.	=
	Process Exchanges	Minor changes in FW flow. Increased isolation of wetlands north of GIWW. Salinity control structure reduces exchange.	-		

Continued…

Objective	Scoring Criteria	Qualitative description of impacts	Criteria Score	Comments	Score
Provide habitats for commercial and recreational activities	Species	4 increase (mink, otter, alligator, duck); 5 decrease (croaker, trout, menhaden, br shrimp, oyster).	-	Category for this combination doesn't exist: assume equivalent to '=' based on 4 spp increasing, with '=' habitat score.	=
	Habitats	2 increase (fresh, salt marsh); 1 decreases (brackish marsh).	=		
Sustain, to the extent practicable, the unique heritage of coastal Louisiana	Communities	Increased protection for most communities due to structural protection (levees and Hwy 82).	++		++
	Natural Resources	W&F overall increase; Calcasieu Ship Canal Saline Plug causes significant decrease in Speckled Trout. Agricultural increase.	+		
	Sustainable Balance	Overall increase (especially for ducks); localized decrease in trout in Calcasieu Lake.	+		

3.6.2 Planning Unit 4 – Alternative 1 – Year 50 - Objective Scoring Table

Table 3.6.2: Planning Unit 4 - Alternative 1 - Year 50 - Objective Scoring

Objective	Scoring Criteria	Qualitative description of impacts	Criteria Score	Comments	Score
Reduce economic losses from storm based flooding	Concentrated Assets	▪ All CA with >5,000 buildings are protected to a 500-year storm event level. ▪ All CA with >1,000 buildings are protected to a 100-year storm event level. ▪ CA with <1,000 buildings are protected to a 100-year storm event level.	++	▪ The levee alignment and levee height will be protective against a 500-year storm event, and resulting storm surge at the coastline for the majority of CA; other CA are protected against a 100-year storm surge event. ▪ DA outside the proposed alignment do include highways or very small residential communities. ▪ Most strategic resources are within the levee alignment that is protective against a 500-year storm event. There are two LNG facilities located south of the levee line of protection.	+
	Distributed Assets	The majority of DA are protected to 500-year storm event level.	++		
	Strategic Resources	All but two (2) strategic resources are within the levee alignment that is protective against a 100-year storm event.	=		
Promote a sustainable coastal ecosystem	Productivity	Minimal from output (5% decrease from yr 40).	=	Scoring table indicates '-'.	-
	Process Exchanges	Minor changes in FW flow. Increased isolation of wetlands north of GIWW. Salinity control => reduced exchange).	-		

Continued…

Objective	Scoring Criteria	Qualitative description of impacts	Criteria Score	Comments	Score
Provide habitats for commercial and recreational activities	Species	2 increase (alligator, duck); 6 decrease (trout, menhaden, br shrimp, oysters, otter, and muskrats).	-	Category for this combination doesn't exist: assume equivalent to '--' based on 6 spp decreasing coastwide (7 needed to score '--').	--
	Habitats	1 increases (fresh marsh); 3 decrease (brackish, intermediate, salt marsh).	--		
Sustain, to the extent practicable, the unique heritage of coastal Louisiana	Communities	Increased protection for most communities due to structural protection (levees and Hwy 82).	++		++
	Natural Resources	W&F overall increase; Calcasieu Ship Canal Saline Plug causes significant decrease in Speckled Trout. Agricultural increase.	+		
	Sustainable Balance	Overall increase (especially for ducks); localized decrease in trout in Calcasieu Lake.	+		

3.6.3 Planning Unit 4 - Alternative 1 - Operational Certainty Scoring Table

Table 3.6.3: Planning Unit 4 - Alternative 1 - Operational Certainty Scoring

Measures	Operational Certainty		Score
	Construction/Cost	**Performance**	
Protection Certainty	Project construction and costs are well understood and have been applied in similar areas in Louisiana.	Based on the 500-year storm surge maps (USACE, 2006) the levee alignment and dimensions proposed for Alternative 1 will protect all concentrated, distributed, and strategic assets within Planning Unit (PU) 4 to the maximum extent practicable. Two exceptions: Cameron and other small coastal communities and two LNG facilities.	+
Restoration Certainty	▪ Source material was constrained to navigation channels; should consider other sources. ▪ Costs and constructability of potential actions resulting from recommended studies are not considered and may replace or require changes to proposed measures.	▪ Constructed wetlands may not have same level of ecological function as naturally created wetlands. ▪ Modeling outputs were best available; however, coarse resolution of model supported by limited data sets leaves uncertainty in outputs. Outputs are indicative of large-scale trends rather than detailed impacts. ▪ Impacts of potential actions resulting from recommended studies are not considered and may replace or require changes to proposed measures. ▪ Uncertainty associated with combined effects of restoration and protection actions on hydrology. ▪ Existing hydrologic barriers in PU are pervasive and smaller scale than existing ecosystem model can resolve. ▪ Uncertainty associated with measures required to allow Calcasieu/Sabine Basin to convert to saline conditions. ▪ Measures required to ensure that Mermentau Basin remains fresh enough for agriculture are uncertain.	-

3.6.4 Planning Unit 4 - Alternative 2 - Year 10 - Objective Scoring Table

Table 3.6.4: Planning Unit 4 - Alternative 2 - Objective Scoring

Objective	Scoring Criteria	Qualitative description of impacts	Criteria Score	Comments	Score
Reduce economic losses from storm based flooding	Concentrated Assets	▪ All CA with >5,000 buildings are protected to a 500-year storm event level. ▪ All CA with >1,000 buildings are protected to a 100-year storm event level. ▪ CA with <1,000 buildings are protected to a 100-year storm event level.	+	▪ The levee alignment and levee height will be protective against a 500-year storm event. Most of the CA are either protected against a 100-year storm surge event or are higher than the Storm surge with the exception of Cameron and Hackberry. ▪ DA outside the proposed alignment do include Louisiana highways 82 and 27 and many residential communities. ▪ Most strategic resources are within the levee alignment that is protective against a 500-year storm event. Most Strategic Resources that can be protected by a levee system are either within a 500-year or 100-year protective levee system or are higher than the storm surges.	=
	Distributed Assets	Some DA are protected to 100-year storm event level.	=		
	Strategic Resources	All strategic resources are within the levee alignment that is protective against a 100-year storm event.	=		
Promote a sustainable coastal ecosystem	Productivity	Positive from output (16% increase from yr 0).	+	Only minor changes in FW flow, greater salinity incursion allowed; scoring table indicates '+'.	+
	Process Exchanges	Similar exchanges.	=		

Continued…

Objective	Scoring Criteria	Qualitative description of impacts	Criteria Score	Comments	Score
Provide habitats for commercial and recreational activities	Species	4 increase (mink, otter, alligator, duck); 5 decrease (croaker, trout, menhaden, br shrimp, oyster).	-	Category for this combination doesn't exist: assume equivalent to '=' based on 4 spp increasing, with '+' habitat score.	=
	Habitats	3 increase (fresh, intermediate, salt marsh); 1 decreases (intermediate).	+		
Sustain, to the extent practicable, the unique heritage of coastal Louisiana	Communities	Some increased protection above existing (Hwy 82 raised).	+		+
	Natural Resources	F&W overall increase; slight increase in agriculture due to elevating Hwy 82.	+		
	Sustainable Balance	Significant increase in ducks and trout.	+		

3.6.5 Planning Unit 4 – Alternative 2 – Year 50 - Objective Scoring Table

Table 3.6.5: Planning Unit 4 – Alternative 2 – Year 50 - Objective Scoring

Objective	Scoring Criteria	Qualitative description of impacts	Criteria Score	Comments	Score
Reduce economic losses from storm based flooding	Concentrated Assets	▪ All CA with >5,000 buildings are protected to a 500-year storm event level. ▪ All CA with >1,000 buildings are protected to a 100-year storm event level. ▪ CA with <1,000 buildings are protected to a 100-year storm event level.	+	▪ The levee alignment and levee height will be protective against a 500-year storm event. Most of the CA are either protected against a 100-year storm surge event or are higher than the Storm surge with the exception of Cameron and Hackberry. ▪ DA outside the proposed alignment do include highways 82 and 27 and many residential communities. ▪ Most strategic resources are within the levee alignment that is protective against a 500-year storm event. Most Strategic Resources that can be protected by a levee system are either within a 500-year or 100-year protective levee system or are higher than the storm surges.	=
	Distributed Assets	Some DA are protected to 100-year storm event level.	=		
	Strategic Resources	All strategic resources are within the levee alignment that is protective against a 100-year storm event.	=		
Promote a sustainable coastal ecosystem	Productivity	Minimal from output (5% decrease from yr 40).	=	Only minor changes in FW flow, greater salinity incursion allowed.	=
	Process Exchanges	Similar exchanges.	=		

Continued…

Objective	Scoring Criteria	Qualitative description of impacts	Criteria Score	Comments	Score
Provide habitats for commercial and recreational activities	Species	2 increase (alligator, duck); 3 decrease (trout, menhaden, otter).	-	Category for this combination doesn't exist: assume equivalent to '-' based on need to have 4 spp increase to warrant '='.	-
	Habitats	1 increases (fresh); 1 decreases (brackish); 3 remain similar to year 0.	=		
Sustain, to the extent practicable, the unique heritage of coastal Louisiana	Communities	Some increased protection above existing (Hwy 82 raised).	+		+
	Natural Resources	F&W overall increase; slight increase in agriculture due to elevating Hwy 82.	+		
	Sustainable Balance	Significant increase in ducks and trout.	+		

3.6.6 Planning Unit 4 - Alternative 2 - Operational Certainty Scoring Table

Table 3.6.6: Planning Unit 4 - Alternative 2 - Operational Certainty Scoring

Measures	Operational Certainty		Score
	Construction/Cost	**Performance**	
Protection Certainty	Project construction and costs are well understood and have been applied in similar areas in Louisiana.	Based on the 100-year and the 500-year storm surge maps (USACE, 2006) the ring levee alignments and dimensions proposed for Alternative 2 will protect most of the concentrated assets, some of the distributed assets and most of the strategic assets within PU 4.	+
Restoration Certainty	▪ Source material was constrained to navigation channels; should consider other sources. ▪ Costs and constructability of potential actions resulting from recommended studies are not considered and may replace or require changes to proposed measures.	▪ Constructed wetlands may not have same level of ecological function as naturally created wetlands. ▪ Modeling outputs were best available; however, coarse resolution of model supported by limited data sets leaves uncertainty in outputs. Outputs are indicative of large-scale trends rather than detailed impacts. ▪ Impacts of potential actions resulting from recommended studies are not considered and may replace or require changes to proposed measures. ▪ Uncertainty associated with combined effects of restoration and protection actions on hydrology. ▪ Existing hydrologic barriers in PU are pervasive and smaller scale than existing ecosystem model can resolve. ▪ Uncertainty associated with measures required to allow Calcasieu/Sabine Basin to convert to saline conditions. ▪ Measures required to ensure that Mermentau Basin remains fresh enough for agriculture are uncertain.	-

3.6.7 Planning Unit 4 - Year 10 - Objective Scoring Diagram

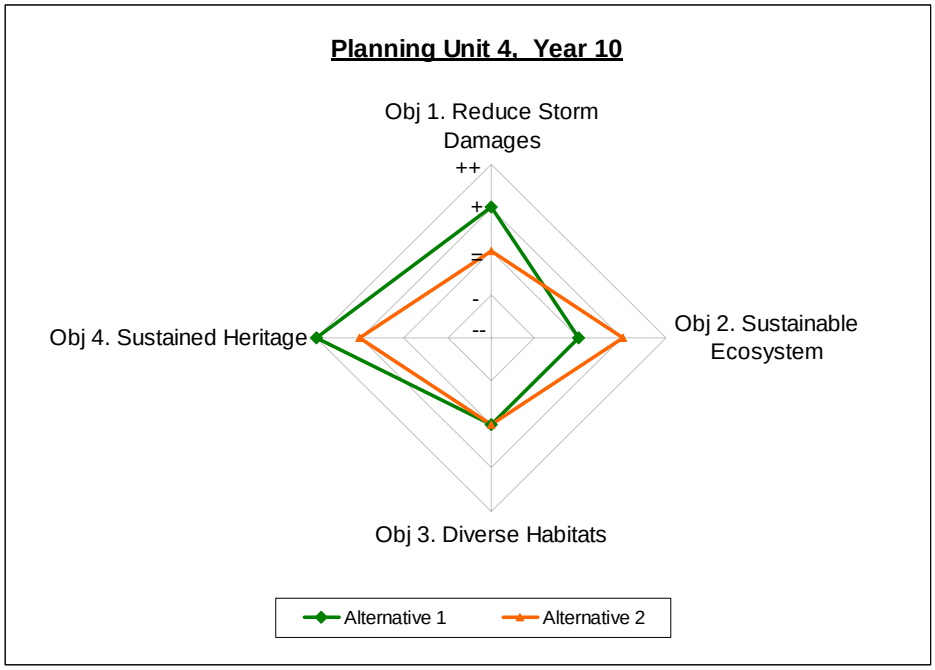

Figure 3.6.7: Planning Unit 4 - Year 10 - Objective Scoring Diagram

3.6.8 Planning Unit 4 - Year 50 - Objective Scoring Diagram

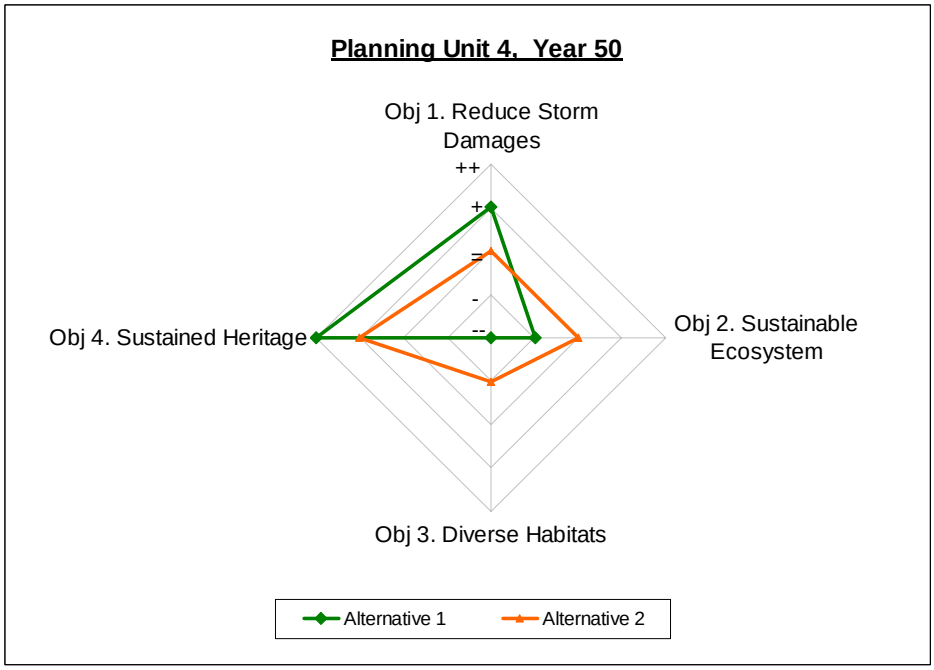

Figure 3.6.8: Planning Unit 4 - Year 50 - Objective Scoring Diagram

4.0 The Preliminary Draft Long-Term Plan

4.1 Plan Definition

The outputs from plan appraisal and objective scoring were used as the basis for two decision making workshops in October 2006. The first of these workshops involved members of the SERT and State and Federal Agencies, and the second was the ITT. These workshops iteratively performed Steps 7 to 10 of the decision making process, through to the definition of a draft complete plan. The detailed outputs from these workshops are presented in Chapter 5, together with summarized conclusions. The outputs from these workshops were refined by the IPT to create a single comprehensive plan for the coast of Louisiana, with some areas of uncertainty remaining. This preliminary draft of the plan was then presented to the CPRA Master Plan Steering Committee on 1 November 2006, where further refinements to the plan were made. The plan was then presented to the full CPRA on 8 November 2006, who then approved the plan to go forward for public review.

An important step in the process of defining the November 2006 Preliminary Draft Master Plan, was the identification of preferred 'outcomes' (Step 7 of the decision process, see Section 2.3). Outcomes maps were produced during the two workshops to depict a set of geographically specific outcomes that best achieve the coastwide plan objectives, and were used as the first step in defining the complete plan. These outcomes formed the basis for the identification of measures, and as such provide the overall composite vision that the plan is aiming to deliver in the long term. The preferred outcomes are depicted on two maps, one showing the Delta Plain (Figure 4.1) and the other the Chenier Plain (Figure 4.2).

Sections 5.1 to 5.5 present a list of the measures included in the Preliminary Draft Plan, derived from the decision process, scoring systems, models, maps, tables, figures, diagrams, stakeholder and technical inputs, and other evaluation techniques, as outlined in the preceding sections of this Appendix. In addition, Section 5.6 contains a list of proposed large scale studies of promising concepts for future management of the Louisiana coastal area. The descriptions contained in these sections will serve as the basis for cost estimating and analysis to be carried out during December 2006 and January 2007.

The descriptions provided in Sections 5.1 to 5.5 are simply brief details of the individual measures proposed, focusing on the form of that measure. These sections do not elaborate upon the issues addressed by these measures, the synergies between measures and the anticipated benefits of the measures.

The full plan is also illustrated on two maps identifying the locations of all measures. These are divided by the major geomorphic areas of the coast, in order to illustrate the strong synergies between measures in those areas. Figure 4.3 shows the Delta Plain (Planning Units 1, 2 and 3a) and Figure 4.4 the Chenier Plain (3b and 4).

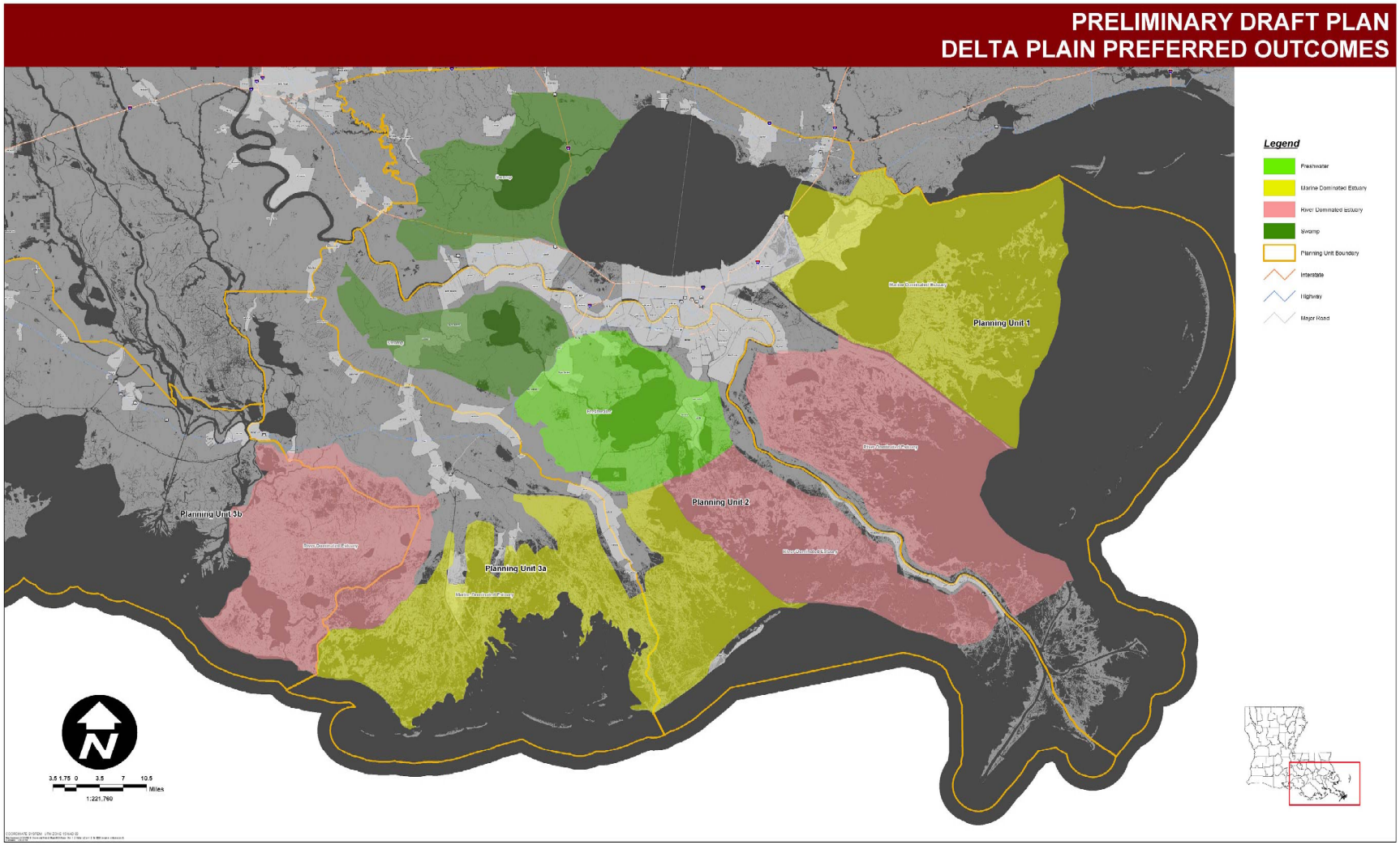

Figure 4.1: Delta Plain Preferred Outcomes

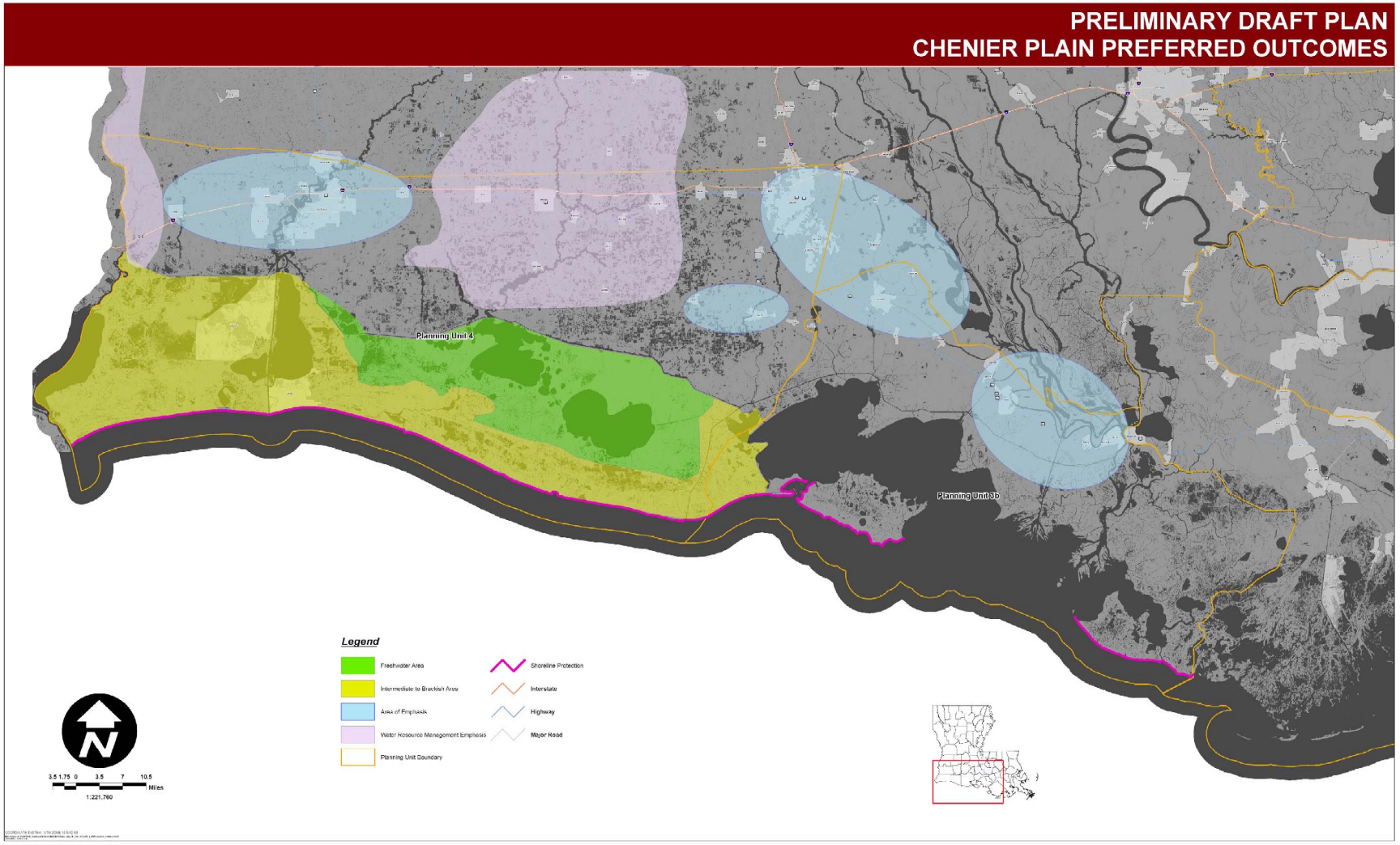

Figure 4.2: Chenier Plain Preferred Outcomes

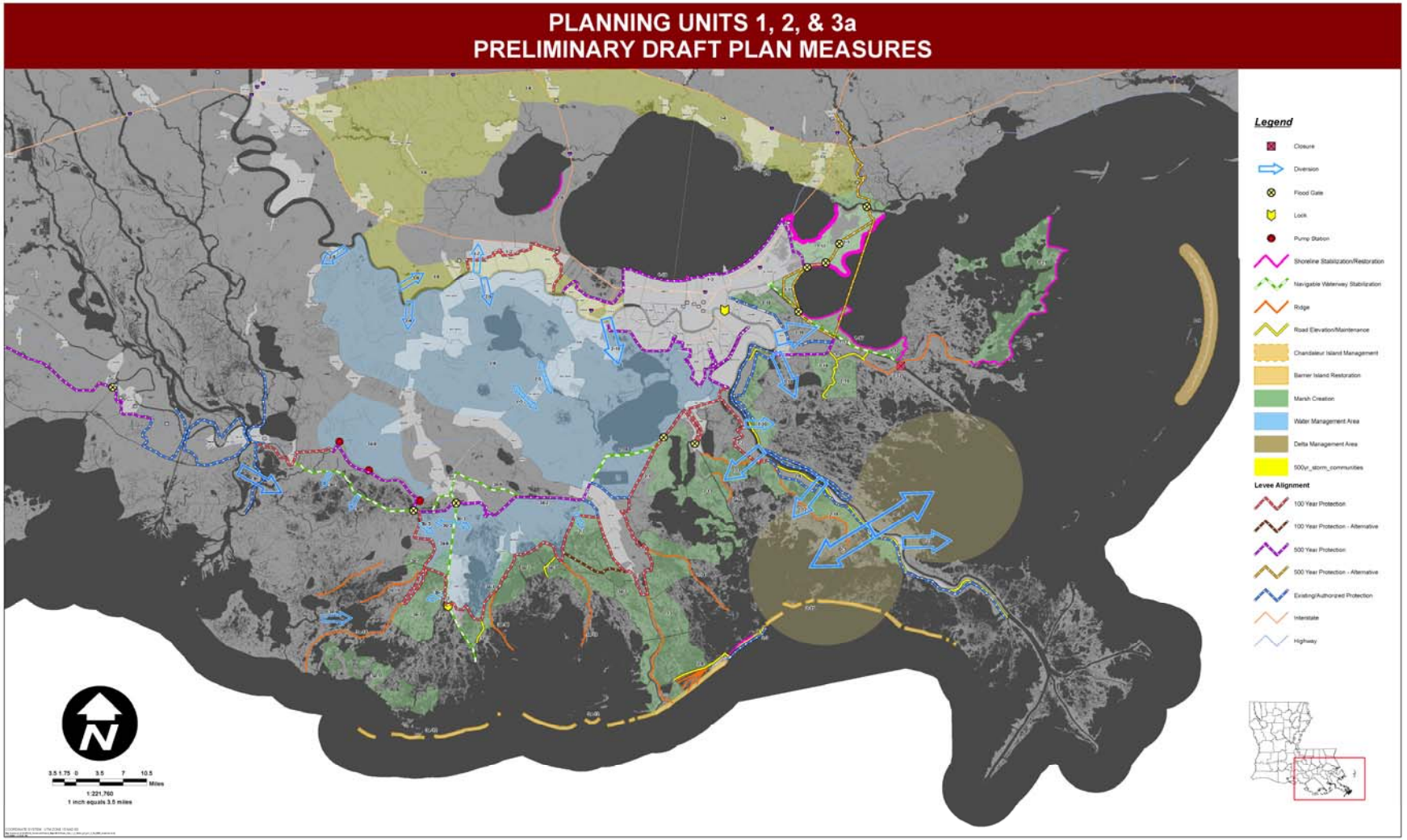

Figure 4.3: Delta Plain Planning Units 1, 2, and 3a

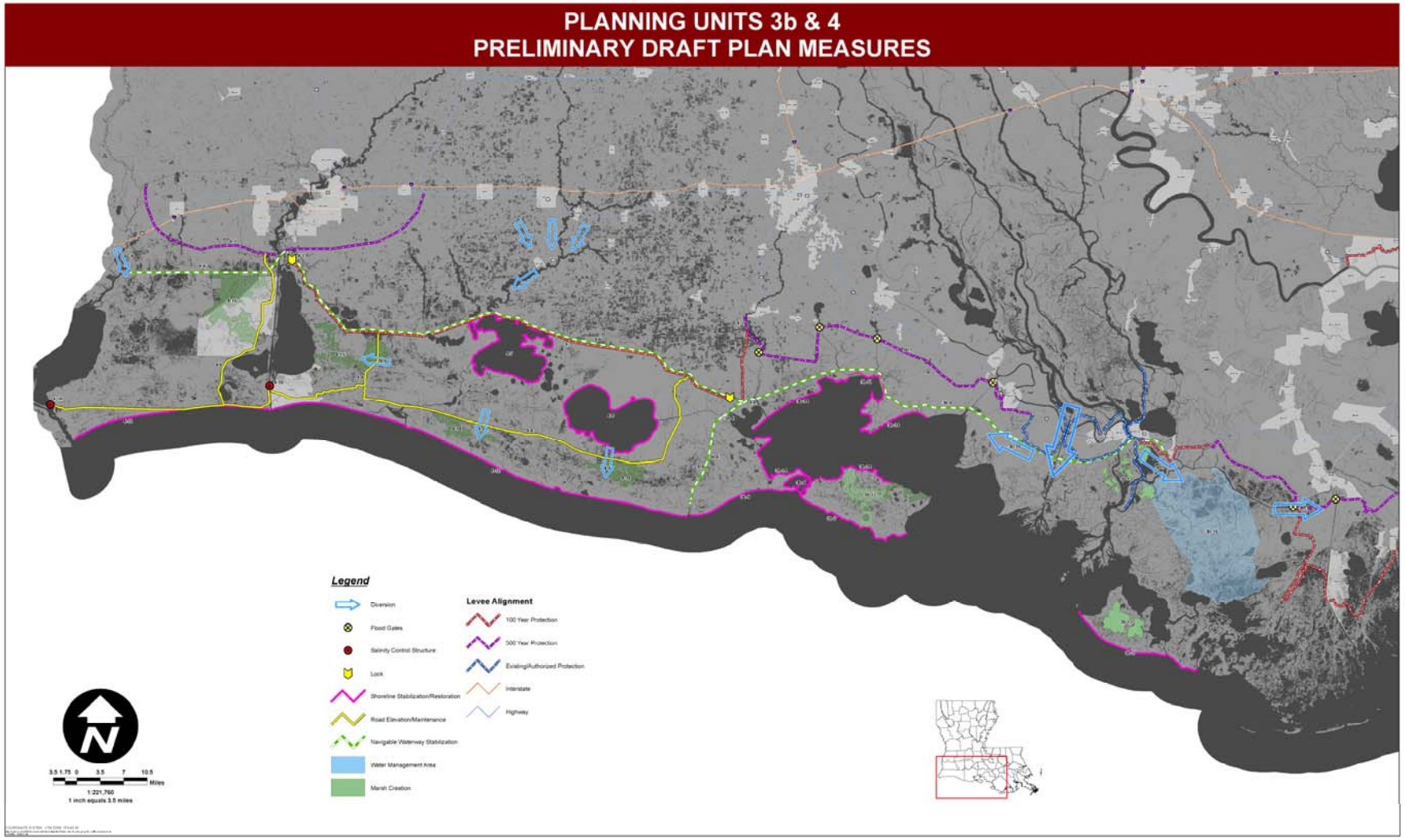

Figure 4.4: Chenier Plain Planning Units 3b and 4

5.0 Plan Overview

The long-term Master Plan is a detailed vision that provides guidance for the future of Coastal Louisiana. The Plan is also an integrated approach meant to meet objectives in a comprehensive manner while allowing implementation in a feasible, cost-effective way. It is meant to balance objectives to provide for all the resources and citizens of Louisiana. It is also subject to revision as the decision process and evaluations continue, and input is received from stakeholders, agencies, and the public. Scientists and engineers agree that Louisiana's erosion, subsidence, and land change problems cannot be reversed if the system is not changed. Stakeholders have asked that the first line of protective defense not be the last line of defense; i.e. they want to have a layered system of protection coupled with restoration. The measures listed in this Chapter represent a comprehensive and integrated plan that reflects these views.

The long-term Master Plan will also factor in such cooperative thinking as land use planning and zoning, landowner concerns, adaptive management, federal and state partnerships, coastal consistencies, and determining priorities for Louisiana's coastline. These issues have not yet been fully resolved.

The appraisals undertaken to support development of this plan clearly demonstrated that without significant action the coastal landscape of Louisiana will continue to degrade (see Appendix G), reducing the sustainability and productivity of the coast, while also increasing the flooding risk to built assets. The economic consequences from storm surge flooding include direct damages to property and infrastructure, emergency costs, evacuation and subsistence costs, and reoccupation and clean up costs. The storm surge and economic appraisals (Appendices E and F) have demonstrated that, under existing conditions, the areas vulnerable to flooding with a 1 percent annual probability includes over 430,000 residencies, with potential economic consequences (damages) of over $34 billion coastwide. The 0.2% probability risk area includes over 871,000 residencies, with potential economic consequences (damages) of over $157 billion coastwide.

Although the above represent total coastwide risk, any individual storm of these magnitudes would also result in tremendous losses to the economy of the entire Nation by increasing the costs of goods because of disruptions to navigation and by increasing the costs of natural gas and oil products. Additionally, tremendous burdens are placed on other areas in the region such as Dallas, Houston, Baton Rouge, Shreveport, Monroe, and others by the tremendous number of evacuees that must be provided for because of the need to flee these hurricanes. In summary, Hurricane protection for south Louisiana can be considered of critical importance to the local citizens, the Region, and the Nation.

The preliminary draft plan sets out an integrated combination of measures representing a significant reduction in these potential negative future impacts.

The proposed protection measures provide for the avoidance of the large majority of potential damages to built assets under the two storm surge levels analyzed. The plan reduces damages to areas vulnerable to flooding with a 1 percent annual probability by 90 percent to less than $4 billion, and reduces the number of residences at risk by 96 percent. The 0.2% probability risk damages are reduced by 84 percent to less than $25 billion, and the number of residences at risk is reduced by 80 percent. Additional to these benefits is the avoidance of many of the National economic impacts identified above.

These figures represent very clearly the strong economic case for the storm surge protection measures set out in this preliminary draft plan.

Analyses have not yet been performed to forecast the nature of changes to the coastal wetland system under the preferred plan, but the range of measures proposed are intended to provide for the stabilization and building of many areas that are currently experiencing ongoing loss. Possibly more important than the reversal of land loss trends will be the creation of a more sustainable system whereby freshwater and tidal flows naturally maintain coastal landscapes and their associated ecosystems. The plan will also provide for a continued diversity of habitats in coastal Louisiana that support recreational and commercial activities on the coast. This improved coastal landscape will also increase storm surge protection to many built coastal assets and buffer levee systems from open water conditions.

5.1 Planning Unit 1: East of the Mississippi River

PD 1-1. Levee from Pearl River to Braithwaite (0.2% annual probability) and from Braithwaite to Belair (1.0% annual probability). Maintain existing levees from Phoenix to Bohemia.

This levee alignment will be constructed from Interstate 59 at Pearl River to Braithwaite in Plaquemines Parish to protect concentrated, distributed and strategic assets in the greater New Orleans metropolitan area from 0.2 percent annual probability storm surge (operates in conjunction with measure PD 1-3); three alternative routes are being considered. The levee system would include 110' wide sector gates a both Chef Pass and the Rigolets, along with five 65' x 50' tainter gates at Chef Pass and sixteen 65' x 50' tainter gates at the Rigolets. Additionally, ring levees will be improved on the east bank of the Mississippi River from Braithwaite to Belair to provide 1 percent annual probability level of protection for concentrated and strategic assets in those areas of Plaquemines Parish.

PD 1-1a. Raise St. Bernard 40 Arpent Levee System to 17.5 ft and Connect Through Verret

This measure will increase the height of the 40 Arpent Levee to provide a second line of defense for concentrated and strategic assets in metropolitan New Orleans and upper St. Bernard Parish. The 40 Arpent Levee separates the urban areas of St. Bernard Parish from the Central Wetlands and extends from the Intracoastal Canal to Caernarvon-Verret on the east, where it will tie into measure PD 1-1.

PD 1-2. West Shore of Lake Pontchartrain Levee

This levee alignment will be constructed southwest of Lake Pontchartrain and will extend the Lake Pontchartrain and Vicinity Hurricane Protection Project to provide increased hurricane storm surge protection for concentrated and strategic assets in St. Charles, St. John the Baptist and St. James Parishes. The alignment of this levee is the subject of an ongoing USACE Feasibility Study.

PD 1-3. Re-evaluate Raising Levee Protection at Southshore of Lake Pontchartrain to Function With Measure PD1-1 to Provide Protection Equivalent to 0.2% Annual Probability

This measure will re-evaluate Levee Protection along the south shore of Lake Pontchartrain from the LaBranche Wetlands to Highway 11, to identify and implement structural improvements required to provide Metropolitan New Orleans on the East Bank with 0.2 percent annual probability storm surge protection. This measure includes evaluation of improvements needed on the Lake Pontchartrain Sewall in Orleans Parish.

PD 1-4. Evaluate the Impact of a 0.2% Annual Probability Storm on the Communities Surrounding Lake Pontchartrain and Lake Maurepas with Measure PD1-1 in Place and Provide Structural Protection Where Needed or Elevate/Relocate Assets at Risk

This measure will use USACE ADCIRC modeling outputs (that incorporate a 0.2 percent annual probability storm surge protection levee from Measure PD 1-1 to evaluate the vulnerability of communities surrounding Lake Maurepas and Lake Pontchartrain to storm surge of 0.2 percent annual probability. Results of the evaluation will

be used to develop and implement structural and/or non-structural protection as needed to provide a 0.2 percent annual probability level of protection to assets at risk in those communities.

PD 1-5. Raise/Maintain Emergency Evacuation Routes Located Outside the Hurricane Protection Plans
This measure applies to all evacuation roadways that are not protected by a hurricane levee or levees. These routes will be raised and armored as needed to provide adequate evacuation capability and return access for recovery after passage of storms.

PD 1-6. Small Diversion at Hope Canal

This measure will divert freshwater, nutrients and sediment from the Mississippi River into the Maurepas Swamp via Hope Canal, which is located on the east bank of the Mississippi River near Garyville.

PD 1-7. Small Diversion at Convent/Blind River
This measure will divert freshwater, nutrients and sediment from the Mississippi River into the upper basin swamps via Blind River, which is located approximately 20 miles south of Lake Maurepas on the east bank of the Mississippi River near Convent.

PD 1-8. Bankline Stabilization along Maurepas Landbridge (Lake Maurepas & Lake Pontchartrain)
This shoreline protection measure will stabilize the bankline of the Maurepas Landbridge, and protect interior marsh on this critical coastal landscape feature located between Lake Maurepas and Lake Pontchartrain. It is important to preserve this landbridge to prevent increased fetch that would result if lakes Maurepas and Pontchartrain coalesce.

PD 1-9. St. Tammany Marsh Restoration and Shoreline Protection with Dredge Material and Vegetation Planting
This restoration measure will provide shoreline protection and marsh creation along the north shoreline of Lake Pontchartrain.

PD 1-10. Shoreline Protection on South Shore of Lake Pontchartrain at Jefferson Parish
This measure will establish shoreline protection and a 300’ wide marsh buffer at strategic locations along the south shore of Lake Pontchartrain.

PD 1-11. Maintain Critical Marsh Shorelines and Ridges of the East Orleans Landbridge
This restoration measure will restore and maintain the East Orleans Landbridge, a critical coastal landscape feature located between the western shoreline of Lake Borgne and the eastern shoreline of Lake Pontchartrain. Restoration features include dedicated dredging for marsh and ridge restoration and shoreline stabilization at critical areas. The area targeted for restoration includes the eastern portion of the Bayou Sauvage National Wildlife Sanctuary.

PD 1-12. Close Mississippi River Gulf Outlet (MRGO)at Bayou La Loutre Ridge
This measure will close the MRGO to deep draft navigation at the Bayou LaLoutre Ridge. This location will allow restoration of the integrity of the Bayou LaLoutre Ridge and facilitate distribution of water from the Violet Diversion (Measure PD 1-16).

PD 1-13. Mississippi River Gulf Outlet (MRGO) Shoreline Stabilization
This measure will provide bank stabilization at strategic locations along the MRGO between the closure structure at the Bayou LaLoutre Ridge (PD 1-12) and the intersection of the GIWW and Michoud Canal to the north.

PD 1-14. Sediment Delivery by Pipeline at Central Wetlands and Establishment of Cypress Swamp through Hydraulic Management

This measure will restore and sustain wetlands using sediments mined from the Mississippi River and delivered, via slurry pipelines with pumps and outlet units, to sites across the Central Wetlands. Hydraulic management and vegetation planting will also be used to re-establish and sustain cypress swamps in the project area. The Central Wetlands are located between the St. Bernard 40 Arpent Levee and the Mississippi River Gulf Outlet (MRGO), south of the Gulf Intracoastal Waterway (GIWW).

PD 1-15. Sediment Delivery by Pipeline at Golden Triangle

This measure will restore and sustain marsh using sediments mined from the Mississippi River and delivered, via slurry pipelines with pumps and outlet units, to the Golden Triangle Area, located between the west lobe of Lake Borgne, the north bank of the Mississippi River Gulf Outlet (MRGO), and the south bank of the Gulf Intracoastal Waterway (GIWW).

PD 1-16. Construct Large Violet Diversion to Sustain Biloxi Marshes

This measure will divert freshwater, nutrients and sediment from the Mississippi River via the Mississippi River Gulf Outlet into the Biloxi Marshes. The diversion would be constructed on the east bank of the Mississippi River near Violet.

PD 1-17. Maintain MRGO – Lake Borgne Landbridge Including Landbridge Shoreline Protection This measure will utilize dedicated dredging to restore and sustain wetlands, and includes bankline stabilization at strategic locations along the Lake Borgne shoreline. The Lake Borgne Landbridge is a critical coastal landscape feature located between Lake Borgne and the north bank of the MRGO.

PD 1-18. Modify Authorization of Caernarvon Diversion

This measure would identify, and seek approval for, operational changes that would increase wetland restoration outputs from the Caernarvon Freshwater Diversion, located on the east bank of the Mississippi River approximately 15 miles downstream from New Orleans, near the St. Bernard-Plaquemines Parish line.

PD 1-19. Maintain and Restore the Breton Sound Marshes

This measure will utilize dedicated dredging to restore and sustain approximately 38,000 acres of marsh at critical areas of the Breton Sound Basin. The Breton Sound Basin is located between the east bank of the Mississippi River and the south bank of the Mississippi River Gulf Outlet (MRGO).

PD 1-20. Medium Diversion at White Ditch

This restoration measure will divert freshwater, nutrients and sediments from the Mississippi River through a new control structure at White Ditch to restore and sustain wetlands on the east bank of the Mississippi River. White Ditch is located north of Carlisle in Plaquemines Parish.

PD 1-21. Maintain and Restore the Biloxi Landbridge and Barrier Reefs

This measure will utilize sediment mined from offshore sources to restore and maintain the Biloxi Land Bridge. Features include restoration of approximate 58,000 acres of marsh and approximately 37 miles of shoreline stabilization. The Biloxi Landbridge is a brackish marsh / oyster reef system that is located between the Orleans Landbridge and the Chandeleur Islands.

PD 1-22. Restore Bayou LaLoutre Ridge

This restoration measure includes increasing ridge elevation and width with dredged material, and would also include planting of woody vegetation and native wetland plants, to restore the natural Bayou LaLoutre Ridge

which extends from the east bank of the Mississippi River Gulf Outlet (MRGO) south of Old Shell Beach eastward along the south boundary of the Biloxi Wildlife Management Area.

PD 1-23. Medium Diversion at Bayou Lamoque
This measure will remove the existing gates and their mechanical operating system from the Bayou Lamoque freshwater diversion structures to allow a free-flowing diversion that will increase sediment, nutrient and freshwater input from the Mississippi River to Plaquemine Parish marshes. Bayou Lamoque is located on the east bank of the Mississippi north of Empire in Plaquemines Parish.

PD 1-24. Complete Construction of the Inner Harbor Navigation Lock
This measure includes the construction of a deep-draft lock, 110 feet wide by 1,200 feet long by 36 feet of draft on the Industrial Canal at the Mississippi River.

5.2 Planning Unit 2: Mississippi River to Bayou Lafourche

PD 2-1. Levee Along GIWW Alignment from Golden Meadow to Oakville, including Lafitte and Barataria (Protection from 1% Annual Probability Surge in Lafourche and Central Basin; Protection from 0.2% Annual Probability surge in West Bank))
This levee alignment will be constructed to serve as a first line of defense to protect concentrated, distributed and strategic assets in Lafourche and the Central Basin to the 1 percent annual probability level of protection, and in combination with the West Bank and Vicinity Hurricane Protection Levee, would provide Metropolitan New Orleans on the West Bank protection from 0.2 percent annual probability storm surge.

PD 2-2. Levee from Oakville to Myrtle Grove (1% annual probability)
This levee alignment will improve existing levees, and where no levees exist, new levees will be constructed, to provide 1 percent annual probability storm surge protection to concentrated and strategic assets located between Oakville and Myrtle Grove along the Mississippi River in Plaquemines Parish.

PD 2-2a. Maintain Existing Levees from Myrtle Grove to Venice
This measure would maintain existing levees to provide storm surge protection to concentrated and strategic assets located between Myrtle Grove and Venice along the Mississippi River in lower Plaquemines Parish.

PD 2-3. Grand Isle and Vicinity Project
This measure combines coastal restoration and structural improvements to provide hurricane protection to concentrated and strategic assets located on Louisiana's only inhabited barrier island. Project features consist of maintaining the authorized protection levee/dune on the gulf side; construction of segmented breakwaters on the north side of the island and extension of the rock dike at the eastern edge of Fifi Island to reduce wave energy on the bay side of Grand Isle; and repairing the breach on Elmer's Island to protect Cheniere Caminada.

PD 2-4. Raise/Maintain Evacuation Routes Outside the Hurricane Protection Plans
This measure applies to all evacuation roadways that are not protected by a hurricane levee or levees. These routes will be raised and armored as needed to provide adequate evacuation capability and return access for recovery after passage of storms.

PD 2-5. Upper Barataria Hydrologic Improvements at Highway 90
This measure consists of drainage infrastructure, strategically located along that segment of U.S. Highway 90 and the railroad embankment between Boutte and Raceland, to improve hydrology in the upper Barataria Basin for flood control and wetlands sustainability.

PD 2-6. Develop a Watershed Management Plan for Upper Barataria Basin to Improve Storm Water Drainage/ Hydrology North of Highway 90 and Redirect Freshwater, Sediment, Storm Water, and Treated Sewage Water to Sustain Upper Basin Swamps and Middle Basin Freshwater Marsh

This study will develop a flexible framework for managing water resource quality and quantity within watersheds in the Upper Basin swamps and Middle Basin freshwater marsh ecosystem units within the Barataria Basin.

PD 2-7. Move Freshwater to Terrebonne Basin from Barataria Basin via the Gulf Intracoastal Waterway (GIWW)

This measure will restore and protect critical lengths of deteriorated channel banks in the vicinity of Delta Farms using hard shoreline stabilization materials, and will increase freshwater flow to the west to sustain marsh in the Terrebonne Basin.

PD 2-8. Small Diversion at Bayou Lafourche

This diversion will be located in the upper Barataria Basin near Donaldsonville on the West Bank of the Mississippi River, and be implemented in accordance with the Louisiana Department of Natural Resources' ongoing design efforts.

PD 2-9. Small Diversions at Strategic Locations in Upper Basin

This restoration measure will divert freshwater, nutrients, and sediment from the Mississippi River into the Upper Basin swamps at two locations in the area south of Donaldsonville and north of Highway 90, between the Mississippi River and Bayou Lafourche.

PD 2-10. Modify Authorization of Davis Pond Diversion

This measure will identify, and seek approval for, operational changes that would increase wetland restoration outputs from the David Pond Freshwater Diversion located on the west bank of the Mississippi River, between Luling and Ama, in the vicinity of a historic crevasse.

PD 2-11. Medium Diversion with Dedicated Dredging at Myrtle Grove

This restoration measure includes a freshwater diversion coupled with dedicated dredging of river sediments for the restoration of approximately 20,000 acres of wetlands. Myrtle Grove is located on the west bank of the Mississippi River in Plaquemine Parish, between Ironton and Deer Range and directly across from Phoenix.

PD 2-12. Medium Diversion at West Point a la Hache

This measure will replace the current 2,000 cfs West Point a la Hache siphon with a medium sized diversion, thus increasing sediment and freshwater input to the area. West Point a la Hache is located on the west bank of the Mississippi River in Plaquemines Parish, Louisiana.

PD 2-13. Pipeline Conveyance of Sediment to Create Strategic Marsh Platforms in Fringing Marsh and Middle Basin Marsh Areas

This measure will create marsh using sediments mined from the Mississippi River and delivered, via slurry pipelines with pumps and outlet units, to sites across the Barataria Basin as identified in the Louisiana Department of Natural Resources, Phase 2 Reconnaissance-Level Evaluation of The Third Delta Conveyance Channel Project – Draft Report, prepared by CH2MHill, 2006.

PD 2-14. Ridge Restoration in the Barataria Basin

This restoration measure includes increasing ridge elevation and width with dredged material, and would also include planting of woody vegetation and native wetland plants. Ridges in the Barataria Basin under consideration

for restoration include: Bayou Lafourche ridge, Bayou L'Ours ridge, Bayou Grande Cheniere ridge, Caminada Chenier ridges, Bayou Dupont ridge and, Bayou Barataria ridge.

PD 2-15. Barataria Basin Barrier Shoreline Restoration Caminada Headland to Sandy Point
This restoration feature will utilize sediment mined from offshore sources or the Mississippi River to reestablish sustainable barrier islands and barrier headlines. The Barataria Barrier Shoreline consists of a barrier island chain which separates Barataria Bay from the Gulf of Mexico and stretches from Sandy Point in the east to Bayou Lafourche in the west.

PD 2-16. Bankline Protection for Gulf Intracoastal Waterway (GIWW)
This measure will utilize hard shoreline stabilization materials to restore and protect approximately 30 miles of strategic channel banks along both sides of the GIWW between the Mississippi River and Bayou Lafourche.

5.3 Planning Unit 3a: Bayou Lafourche to Bayou de West

PD 3a-1. Morganza to the Gulf Hurricane Protection and Lower Atchafalaya River (LAR) Barrier Plan Alignment (1% annual probability)
This levee alignment is a combination of the Morganza to the Gulf and the Lower Atchafalaya River Barrier Plan and would provide protection from 1 percent annual probability storm surge to concentrated, distributed and strategic assets within the Houma, Thibodaux, and Morgan City area. The alignment is 113.5 miles in length and is bounded on the west by the Bayou Boeuf Lock, on the east by the Larose to Golden Meadow Hurricane Protection Levee. An alternative levee alignment is being considered along the "Twin Pipeline" from Pointe Au Chien to Golden Meadow to eliminate the "funnel effect" between these two levee systems.

PD 3a-2. Internal Hurricane Levee Alignment (0.2 % annual probability)
This levee alignment is 52 miles in length and begins in Gibson, follows the Terrebonne Levee and Conservation District Barrier Plan to Minors Canal, crosses the Houma Navigation Canal just south of the Terrebonne Port and then proceeds to the Gulf Intracoastal Waterway below Bourg to Larose. This segment would protect concentrated and strategic assets in the Houma/Thibodeaux area from 0.2 percent annual probability storm surge.

PD 3a-3. Raise/Maintain Evacuation Routes Located Outside the Hurricane Protection Plans
This measure applies to all evacuation roadways that are not protected by a hurricane levee or levees. These routes will be raised and armored as needed to provide adequate evacuation capability and return access for recovery after passage of storms.

PD 3a-4. Bankline Protection for the Houma Navigation Canal (HNC)
This measure will utilize hard shoreline stabilization materials to restore and protect strategic channel banks along both sides of the HNC from its confluence with the GIWW, south to Terrebonne Bay.

PD 3a-5. Multi-Purpose Operation of the Houma Navigation Canal Lock
The measure would include development and implementation of a multi-purpose operational plan for the Houma Navigation Canal Lock that would allow the lock to be utilized for coastal restoration purposes by making more efficient use of Atchafalaya River water and sediment flow and maintaining salinity regimes favorable for wetlands in the Lake Boudreaux, Lake Mechant and Grand Bayou areas. The lock would be located on the Houma Navigation Canal, 1.75 miles south of the Bayou Sale intersection.

PD 3a-6. Bankline Protection for the Gulf Intracoastal Waterway (GIWW)
This measure will utilize hard shoreline stabilization materials to restore and protect strategic channel banks along both sides of the GIWW between Morgan City and Larose.

PD 3a-7. Pipeline Conveyance of Sediment to Create Strategic Marsh Platforms
This measure will create marsh in Terrebonne wetlands located between the west bank of Bayou Lafourche, the south bank of the GIWW, and east of Blue Hammock Bayou.

PD 3a-8. Implement Chacahoula Basin Plan and Other Projects to Alleviate Inundation Issues in the Verret Sub-Basin
The measure will implement the Chacahoula Basin Plan, developed by the Terrebonne Levee and Conservation District, and other projects to alleviate inundation issues in the Verret sub-basin. The Chacahoula Basin comprises approximately 107,179 acres and is bounded to the north by Louisiana Highway 1, to the south by Highway 182, to the west by Highway 662 and Highway 398, and to the east by Highway 311.

PD 3a-9. Freshwater Introduction via Blue Hammock Bayou
This measure will introduce freshwater to enhance and sustain marsh in an area between Four League Bay and Bayou du Large, and encompassing Lake Mechant and marsh areas north to Bayou Decade..

PD 3a-10. Protect and Maintain Ridges
This restoration measure includes increasing ridge elevation and width with dredged material, and would also include planting of woody vegetation and native wetland plants at multiple degraded natural ridges sites throughout the Terrebonne Basin.

PD 3a-11. Maintain Landbridge between Caillou Lake and the Gulf of Mexico
This measure would restore and maintain the landbridge located between Caillou Lake and the Gulf of Mexico, and bordered on the west by Bay Junop and on the east by Lake Pelto.

PD 3a-12. Terrebonne Basin Barrier Shoreline Protection
This restoration feature will utilize sediment mined from offshore sources to reestablish sustainable barrier islands and barrier headlines. The Terrebonne Barrier Shoreline consists of a barrier island chain which separates Terrebonne Bay and Lake Pelto from the Gulf of Mexico and stretches from Bayou Lafourche west to Raccoon Point.

PD 3a-13. Develop a Watershed Management Plan for Upper Terrebonne Basin to Improve Storm Water Drainage/ Hydrology and Redirect Freshwater, Sediment, Storm Water, and Treated Sewage Water to Sustain Upper Basin Swamps and Middle Basin Freshwater Marsh
This study will develop a flexible framework for managing water resource quality and quantity within watersheds in the Upper Basin swamps and Middle Basin freshwater marsh ecosystem units within the Terrebonne Basin.

PD 2-7. Move Freshwater to Terrebonne Basin from Barataria Basin via the Gulf Intracoastal Waterway (GIWW)
This measure will restore and protect critical lengths of deteriorated channel banks in the vicinity of Delta Farms using hard shoreline stabilization materials, and will increase freshwater flow to the west to sustain marsh in the Terrebonne Basin.

PD 3b-3. Convey Atchafalaya River Water to Terrebonne Marshes
This measure includes increased flow of Atchafalaya River water into Terrebonne marshes from an area west of the Avoca Island Levee for freshwater and sediment delivery to enhance and sustain wetlands.

5.4 Planning Unit 3b: Bayou de West to Freshwater Bayou Canal

PD 3b-1. Levee Protection from Franklin to West of Abbeville (0.2% annual probability)

The levee alignment includes a barrier levee from Berwick and Patterson using the existing levee from Morgan City to Franklin and then a new levee to west of the Vermilion River. The levee alignment will provide protection at 0.2 percent annual probability level.

PD 3b-2. Stabilize Gulf Shoreline of Point Au Fer Island

Gulf shoreline of Point Au Fer Island is located in the southwestern area of Terrebonne Parish, south and slightly east of the mouth of the Atchafalaya River. The stabilization will minimize annual losses along the gulf shoreline of the island.

PD 3b-3. Increase Atchafalaya River Water Influence in Terrebonne Marshes via the Gulf Intracoastal Waterway

This measure includes increased flow of Atchafalaya River water via the Gulf Intracoastal Waterway into Terrebonne marshes from an area west of the Avoca Island Levee for freshwater and sediment delivery to enhance and sustain wetlands.

PD 3b-4. Freshwater Bayou Bank Stabilization – Belle Isle Bayou to Freshwater Bayou Canal Lock

The stabilization is located on the eastern bank of the Freshwater Bayou Canal between Freshwater Bayou Canal Lock and Belle Isle Bayou in Vermilion Parish. The canal bankline is experiencing significantly erosion from boat traffic in the canal.

PD 3b-5. Increase Sediment Transport Down Wax Lake Outlet

Wax Lake Outlet is located in St. Mary Parish at the eastern side of East Cote Blanche Bay. The outlet discharges water and sediment from the Atchafalaya River into an actively growing delta. Realigning the upstream end of the inflow channel to intersect the Atchafalaya River at a different location will increase the sediment load per unit of discharge.

PD 3b-6. Stabilize banks of Southwest Pass off Marsh Island

Southwest Pass connects the Gulf of Mexico and Vermilion Bay. The Pass has experienced significant erosion and is more than 30 feet deep. Rip-rap is recommended along each side of the Pass to minimize further widening.

PD 3b-7. Stabilize Gulf Shorelines – Lighthouse Point to South Point/Marsh Island

The site is the gulf shoreline between Lighthouse Point on the west end of Marsh Island and South Point on the eastern tip of Marsh Island. Stabilization would minimize loss of this gulf shoreline.

PD 3b-8. Stabilize Banks of Gulf Intracoastal Waterway (GIWW)

Erosion of the banks of the Gulf Intracoastal Waterway is a coast-wide problem. Stabilization is anticipated in two sections of the GIWW. The first section begins on the west side of the Atchafalaya River near Morgan City and extends west to the east bank of the Wax Lake Outlet and the second section extends from the west side of the Wax Lake Outlet to the east bank of the Vermilion River.

PD 3b-9. Stabilize Gulf Shorelines from Freshwater Bayou to Southwest Pass

Segmented breakwaters will be utilized to stabilize the gulf shoreline between the east bank of Freshwater Bayou and the west bank of Southwest Pass, to minimize the continuous loss of the gulf shoreline.

PD 3b-10. Convey Atchafalaya River Water Westward to St. Mary, Iberia and Vermilion Marshes

This measure would utilize hard shoreline stabilization materials at strategic locations along the Gulf Intracoastal Waterway (GIWW) to increase movement of freshwater and sediment from Wax Lake Outlet via the GIWW westward to and beyond the Vermilion River to restore and sustain St. Mary, Iberia , and Vermilion Marshes.

PD 3b-11. Create Marsh at Weeks Bay
This measure will utilize dredge material from off-shore borrow sources or the proposed deepening of the Commercial Canal and GIWW to restore critical marsh between Weeks Bay and the Gulf Intracoastal Waterway in Iberia Parish.

PD 3b-12. Restore Marsh at Marsh Island via Dedicated Dredging
This measure will utilize hydraulically dredged material to restore and sustain the interior wetlands of Marsh Island in Iberia Parish.

PD 3b-13. Pipeline Conveyance of Sediment to Create Strategic Marsh Platform, Including Beneficial use of Dredged Material from the Atchafalaya River Navigation Channel
This measure will restore and sustain wetlands using sediments mined offshore and delivered, via slurry pipelines with pumps and outlet units, to sites across the marshes on Point Au Fer Island.

PD 3b-14. Stabilize Shoreline of Vermilion Bay and East and West Cote Blanche Bays
This measure would provide shoreline protection at strategic locations in Vermilion Bay, West Cote Blanche Bay, and East Cote Blanche Bay using hard structure detached breakwaters and/or dredged material.

PD 3b- 15. Freshwater Management for Penchant Basin
This measure is to manage freshwater from the Atchafalaya River through the operation of numerous existing small water distribution structures such as weirs, culverts and etc., and through new distribution structures as needed, to benefit wetlands on the east side of the Atchafalaya Bay.

PD 3b-16. Raise/Maintain Evacuation Routes Located Outside the Hurricane Protection Plans.
This measure applies to all evacuation roadways that are not protected by a hurricane levee or levees. These routes will be raised and armored as needed to provide adequate evacuation capability and return access for recovery after passage of storms.

PD 3b-17. Fortify Spoil Banks on GIWW in St. Mary and Vermilion Parish, Freshwater Bayou Canal
This measure will use the dredged material from the AGMAC port development. The fortified spoil bank will function as a first line of defense against hurricane surge and will extend along the GIWW westward to the intersection of Freshwater Bayou, then along Freshwater Bayou to the Gulf of Mexico.

PD 3b-18. Maintain Existing Levees from Atchafalaya River to Franklin
This measure will utilize existing levee alignment along the Atchafalaya River to Franklin. The existing levee height does not meet the 0.2 percent annual probability level and will need to be upgraded.

5.5 Planning Unit 4: Freshwater Bayou Canal to Sabine River

PD 4-1. Hurricane Surge Protection for Lake Charles Metropolitan Area and Vinton Using Ring Levee (0.2% Annual Probability)
The levee is protection for the Lake Charles metropolitan area extends westward to include Sulphur and Vinton, Louisiana and eastward to Iowa, Louisiana. The level of protection is 0.2 percent annual probability.

PD 3b-1. Levee Protection from Franklin to West of Abbeville (0.2% annual probability)
The levee alignment includes a barrier levee from Berwick and Patterson using the existing levee from Morgan City to Franklin and then a new levee to west of the Vermilion River. The levee alignment will provide protection at 0.2 percent annual probability level.

PD 4-3. Hurricane Surge Protection from Vermilion River to GIWW/Calcasieu River Lock (l% annual probability)
This levee alignment provides protection for the Mermentau region and begins at the 0.2 percent annual probability levee near Abbeville, from where it descends directly south to the GIWW north bank near Leland Bowman Lock, crosses at the lock to the south side of the GIWW and extends westward to the Calcasieu Lock, a distance of 65 miles. This measure would be needed if analysis shows that first lines of defense (PD 3b-17, PD 4-4) are not adequate to provide this level of protection.

PD 4-4. Raise and Maintain Highways 82 and 27 for Hurricane Surge Protection, Hurricane Evacuation and Marsh Protection
Highway 82 traverses the lower coastal area from the Sabine River east to Pecan Island and then north to the GIWW. Highway 27 is a north/south evacuation route from Highway 82 north to the Lake Charles area. Both highways will be elevated and maintained.

PD 4-5. Provide Water Control Structures at Strategic Locations along Highways 82 and 27
This measure will provide environmental structures to pass freshwater from north to south across Highway 82 and west to east along Highway 27 and restrict the intrusion of saltwater to the area south of Highway 82 and west of Highway 27. The environmental structures will be culverts with flapgates at 10 to 15 mile intervals along the highways.

PD 4-6. Stabilize Banks of Gulf Intracoastal Waterway (GIWW)
The GIWW extends across the entire gulf coast from the west Louisiana state line to the east Louisiana state line. This measure includes the segment from the west bank of Freshwater Bayou to the west Louisiana State boundary line, which experiences erosion of the bankline as a result of boat wake waves.

PD 4-7. Stabilize Grand Lake Shoreline
This measure will stabilize the shoreline of Grand Lake, located south of Lake Arthur, which is experiencing significant shoreline erosion, ranging from 11 to 32 feet per year.

PD 4-8. Stabilize White Lake Shoreline
This measure will stabilize the degrading shoreline of White Lake, which is located immediately east of Grand Lake and south of the GIWW.

PD 4-9. Bank Stabilization of Freshwater Bayou
This measure will stabilize the shoreline located on the west bank of Freshwater Bayou Canal, south of the the GIWW, beginning at Schooner Bayou and going south to the Freshwater Bayou Canal Lock. Banklines of Freshwater Bayou are deteriorating due to waves created by boat traffic.

PD 4-10. Salinity Control Structure in Calcasieu Ship Channel Near Ferry
Salinity control will allow simulation of the historic estuarine gradient and maintain large areas as fresh and intermediate marsh. This measure may also function with fortified Highway 82 (measure PD 4-4) as a first line of defense against storm surges.

PD 4-11. Stabilize Gulf Shoreline and Beach from Sabine River to Calcasieu River

This measure extends along the gulf shoreline from the Sabine River to the Calcasieu River. Beach loss and shoreline erosion have diminished the ability of the shoreline to reduce inland propagation of wave energy and storm surges. The protection will be in the form of near-shore detached breakwaters.

PD 4-12. Stabilize Gulf Shoreline and Beach East of Calcasieu River to Freshwater Bayou Using Dredged Sediments and/or Breakwaters

This measure would use detached breakwaters to protect the gulf shoreline, and facilitate deposition of sediment on beach areas, from Calcasieu River east to Freshwater Bayou.

PD 4-13. Build New Chamber for Navigation at Calcasieu Lock on GIWW and Use Old Lock to Evacuate Excess Water from Mermentau River

This measure would move excess freshwater into Calcasieu Lake from the Mermentau Basin. The measure will also provide more efficient locking ability to reduce waiting time for commercial boat traffic.

PD 4-14. Dedicated Dredging from the Gulf of Mexico for Marsh Creation and Enhancement

This measure would utilize pipeline movement of sediments from the Gulf of Mexico to restore and sustain the southern marsh areas both east and west of the Calcasieu Ship Channel.

PD 4-15. Beneficial Uses of Dredged Material from Calcasieu Ship Channel

This measure would utilize material dredged from the Calcasieu River Ship Channel to restore marsh at five sites within the Sabine National Wildlife Refuge.

PD 4-16. Salinity Control Structure at Sabine Pass Near Highway 82 Causeway

This salinity control structure at the south end of Sabine Lake, would allow simulation of the historic estuarine gradient and maintenance of large areas of fresh and intermediate marsh.

PD 3b-10. Convey Atchafalaya River Water Westward to St. Mary, Iberia and Vermilion Marshes

This measure would utilize hard shoreline stabilization materials at strategic locations along the Gulf Intracoastal Waterway (GIWW) to increase movement of freshwater and sediment from Wax Lake Outlet via the GIWW westward to and beyond the Vermilion River to restore and sustain St. Mary, Iberia , and Vermilion Marshes.

PD 3b-17. Fortify Spoil Banks on GIWW in St. Mary and Vermilion Parish, Freshwater Bayou Canal.

This measure will use the dredged material from the AGMAC port development. The fortified spoil bank will function as a first line of defense hurricane surge feature and will extend along the GIWW westward to the intersection of Freshwater Bayou, then along Freshwater Bayou to the Gulf of Mexico.

5.6 Large Scale Studies of Promising Concepts

PD D-1. Louisiana/Mississippi Hydrodynamic Study

The study will utilize existing water and sediment dynamics data for the northern Gulf of Mexico system to develop, calibrate and verify a comprehensive hydrodynamic modeling tool that would allow reliable estimates of how major river diversions would alter salinity and sediment patterns between the Mississippi River and Mobile Bay, Alabama.

PD D-2. Mississippi River Hydrodynamic & Delta Management Study

The measure is to conduct a comprehensive modeling/study effort that would allow reliable estimates of the quantities of the total resources (water and sediment) that can be allocated for restoration purposes without compromising the existing navigation and flood control functions of the Atchafalaya and Mississippi river systems. It will also analyze two types of projects including large diversions (greater than 50,000 cfs) from the

lower Mississippi River, and alternative navigation channel alignments, which may include new channels to the east or west of the current river while providing navigation either in the new channel or by maintaining the existing channel as a slack-water channel through construction and operation of a lock system. The comprehensive study would assist in determining the need, location, size, and seasonal variations for planned diversions and future restoration projects and evaluate potential impacts of natural and man-made factors on the environment and economy. The model would be used to evaluate the impacts of potential large-scale restoration features and to identify adaptive management strategies and necessary adjustments to restoration features.

PD D-3. Third Delta Study

This measure would complete the reconnaissance level evaluation of the Third Delta Conveyance Channel Project, including evaluation of alternatives identified in the Louisiana Department of Natural Resources, Phase 2 Reconnaissance-Level Evaluation of The Third Delta Conveyance Channel Project – Draft Report, prepared by CH2MHill, 2006. The Third Delta Study area includes the Barataria-Terrebonne National Estuary, and Lower areas of Terrebonne, Lafourche, and Jefferson Parishes.

PD D-4. Upper Atchafalaya Basin Study

This restoration study would conduct a system-wide comprehensive analysis of the problems and opportunities related to flood control, navigation, and ecosystem sustainability for the lower Red River, Old River, Mississippi River, and Atchafalaya River Basins. This large-scale study would examine, among other things, modifications to the Old River Control Structure operation to alter water circulation in the Atchafalaya Basin back swamps and associated lakes and bayous.

PD D-5. Maximize Beneficial Use of Dredged Material Where Feasible

This measure would increase and maximize the beneficial uses of dredged material from all sources to provide stronger foundations for marsh-building and allow marsh recovery to occur throughout coastal Louisiana, and would include adequate funding for existing navigation maintenance programs to take full advantage of the available sediment resources. All major navigation channels would be part of the beneficial use program. This is currently being implemented as a component of the LCA Program.

PD D-6. Strategize and Implement Plan to Elevate and/or Relocate Assets Located Outside the Hurricane Protection Plans

This study would include all areas within the Chenier Plain that are not protected by the planned hurricane surge protection levees, but would still be vulnerable to hurricane surges. The study would conduct surveys in the impacted areas to identify assets to elevate for better protection, and determine what assets should be relocated to unaffected areas.

PD D-7. Backfill and/or Plug Non-essential Oil and Gas Canals

This measure would identify and close non-essential oil and gas canals in the Deltaic Plain by plugging abandoned location canals, as allowed by ongoing production operations, to restore natural hydrological systems and sustain wetlands.

PD C-1 Develop a Plan to Elevate and/or Relocate Assets Located Outside of the Hurricane Protection Plan

This study would include all areas within the Chenier Plain that are not protected by the planned hurricane surge protection levees, but would still be vulnerable to hurricane surges. The study would conduct surveys in the impacted areas to identify assets to elevate for better protection, and determine what assets should be relocated to unaffected areas.

PD C-2 Maintain Mermentau Basin as Fresh Water Basin: Complete/Accelerate the Chenier Plain Freshwater and Sediment Management and Allocation Reassessment Study which was included in the LCA Near-Term Plan

This study would determine examine the availability of existing freshwater and sediment resources and be useful in finalizing details of the restoration of the Chenier Plain..

PD C-3 Maintain Mermentau Basin as Freshwater Basin: Manage Watershed to Reduce Rapid Inflows into Mermentau Sub-Basin

This study would investigate the feasibility of pro-actively managing the Mermentau River Watershed located northeast of Lake Charles, Louisiana. Managing the watershed would include minimizing the rapid accumulation of runoff in the lower reaches of the drainage basin by the possible use of a 10 square mile retention basin upstream of Mermentau, Louisiana.

PD C-4 Maximize Freshwater Inflow from Sabine River

The study would investigate the feasibility of managing salinity regimes within the Calcasieu/Sabine Basin by directing freshwater into the area via the Gulf Intracoastal Waterway to restore the historic Sabine River influence.

6.0 Stakeholder Engagement

A critical part of the process to define the Preliminary Draft of the Master Plan has been an ongoing engagement with a wide range of Stakeholders. This engagement process has sought to capture the understanding of Louisiana's coast from local, state and federal agencies, as well as local government and other interested nongovernmental organizations and has also sought their comment upon the goals, process and outputs of the plan formulation process. This engagement process ensures that the best technical understanding of issues is available for Plan development and that those affected by its outcomes have an opportunity to input to that development process.

This appendix presents a summary of the stakeholder engagement activities undertaken in the process leading to the publication of the November 2006 Preliminary Draft Master Plan. The input provided through these activities is summarized within the body of this appendix with fuller notes provided in a series of supporting Annexes.

The input provided by stakeholders has formed an important part of the information upon which the preliminary draft has been defined. The process has taken full account of inputs received, with the review and incorporation of new information being an ongoing process throughout the plan formulation process. However, it must be recognized that not all suggestions for measures to be incorporated into the plan can be accommodated as the plan seeks to balance a range of objectives and interests.

Following the definition of alternative plans for appraisal, the Coastal Protection and Restoration Authority's Integrated Planning Team (IPT) began meeting with individual stakeholder groups to inform them of the process by which the Master Plan was being prepared, together with information on the ongoing appraisals. The objective of these meetings was to provide an opportunity for groups to discuss the developing plan in detail with members of the IPT and their contractors, and provide input to the process. Sections 6.1 and 6.2 provide a full summary of the issues raised at these meetings. Additionally, the IPT met with levee boards and these comments are presented in Section 6.3, with the resulting levee board resolutions in Annex A.

In addition to the information provided to the IPT at these meetings, a number of stakeholder groups submitted detailed reports in support of the plan development process. These are referenced in Section 6.4.

Section 6.6 and 6.7 then present summaries of the outcomes from two workshops held in October 2006, to assist in definition of the November 2006 Preliminary Draft Master Plan. These were the IPT Interagency/SERT Alternative Plans Review Workshop and the IPT-ITT Plan Refinement Workshop. The IPT Interagency/SERT Alternative Plans Review Workshop attendees undertook an initial review of the outputs from appraisal of the two alternative plans, and application of the IPT's decision making process, to identify a preferred set of 'outcomes' and measures for a complete draft plan that best achieved the defined objectives. The IPT-ITT Plan Refinement Workshop attendees then reviewed these outputs and further resolved the draft plan. Following these October meetings the IPT and CPRA further refined the November 2006 Preliminary Draft of the Master Plan.

In addition to the formal stakeholder engagement activities set out in this appendix, a project website has been created and actively maintained to disseminate information on plan development and provide a vehicle for comment. A number of project newsletters have also been disseminated and these are available, along with other documentation, from the website. The website address is: louisianacoastalplanning.org

6.1 Stakeholder Meetings

6.1.1 Overview

A series of stakeholder meetings were undertaken, starting in mid-August 2006, to present and gain feedback on the role of the Master Plan, together with the approach to its formulation and the two alternative plans being appraised. Presentations were made at arranged meetings with Parishes against Coastal Erosion (PACE), floodplain managers, regional planning districts, environmental interest groups, and the parishes of Calcasieu, St. Mary, and Vermilion. The IPT also made presentations as guests of board meetings of the Louisiana Landowners Association (LLA), at approximately fourteen levee boards, and at the Barataria-Terrebonne National Estuary Program Management Conference. Information in Table 1 provides a list detailing stakeholder group meetings, levee district meetings, and parish board meetings where IPT presentations were made.

The following sections outline the comments provided to the IPT at these stakeholder meetings. The meeting notes are arranged by meeting date; however, the levee and parish board meetings are grouped together. Recorded comments at times paraphrase the speaker's comments. The personal names of individual speakers have not been included.

The IPT requires that feedback from these and other stakeholders are evaluated and, where appropriate, incorporated into the planning process. Inquiries and input from stakeholders have been received, reviewed, and assessed continuously as part of the planning process throughout the project analysis phase of plan preparation leading up to publication of the November 2006 Preliminary Draft Master Plan.

Annex B to this appendix presents a tabulated summary of the comments received during the Stakeholder Meetings.

Table 6.1.1: Schedule of IPT Presentations to Date

Presentation	Date	City	Location	Time
Terrebonne Levee and Conservation District	Aug. 14	Houma	220-A Clendenning Rd	6:30 PM
Parishes Against Coastal Erosion West	Aug. 16	Lafayette	Wetland Research Center	1:00 PM
West Jefferson Levee Dist.	Aug. 17	Marrero	7001 River Rd	6:00 PM
Parishes Against Coastal Erosion East	Aug. 18	Hahnville	Council Chambers	1:00 PM
Floodplain Managers and Planning Districts	Aug. 21	Baton Rouge	Department of Natural Resources Building	1:00 PM
Pontchartrain Levee District	Aug. 21	Lutcher	2204 Albert St.	6:00 PM
Louisiana Landowners Association	Aug. 22	Lafayette	Wetland Research Center	1:00 PM
Environmental Interest Groups	Aug. 23	Baton Rouge	Department of Natural Resources Building	1:00 PM
Vermilion Parish	Aug. 23	Abbeville	City Hall Building	5:00 PM
Calcasieu Parish Board	Aug. 31	Lake Charles	Parish Government Building	5:30 PM
Atchafalaya Basin Levee District	Sep. 6	Port Allen	525 Court Street	4:00 PM

Presentation	Date	City	Location	Time
Lafourche Basin Levee District	Sep. 7	Vacherie	21380 HWY 20	6:00 PM
Louisiana Landowners Association Board	Sep. 8	Baton Rouge	Embassy Suites, Capital Board Room	12:00 PM
South Lafourche Levee District	Sep. 11	Galliano	17904 Hwy 3235	3:00 PM
East Jefferson Levee District	Sep. 12	Harahan	203 Plauche Court	10:00 AM
St. Mary Parish Board	Sep.13	Franklin	500 Main Street	5:00 PM
Barataria-Terrebonne National Estuary Program Management Conference	Sep. 14	Thibodaux	Nicholls State University Plantation Room	9:00 AM
Amite River Basin	Sep. 19	Baton Rouge	3535 S. Sherwood Forest	6:00 PM
Kenner Kiwanis Club	Sep. 21	Kenner	2050 Veterans Blvd.	7:00 AM
Grand Isle Independent Levee District	Sep. 26	Grand Isle	3711 Hwy 1	10:00 AM
St. Mary Parish Levee Board Advisory Committee	Sep. 26	Franklin	Court House	7:00 PM
Lake Borgne Levee District	Sep. 27	Violet	6136 East St. Bernard	3:00 PM
Vermilion Parish (multiple stakeholders)	Sep. 28	Abbeville	405 E. St. Victor, Abbeville Library	6:00 PM
Vermilion Parish	Oct. 17	Abbeville	Library	9:30 AM
Orleans Levee District	Oct. 18	Orleans	6500 Spanish Fort Blvd	1:00 PM
Lake Pontchartrain Basin Foundation	Nov. 7	Baton Rouge	Shaw Building, Essen Lane	12:00 PM
North Lafourche Levee District	Nov. 20	Raceland	308 Hwy	1:00 PM

6.2 Stakeholder Groups

The following section lists each stakeholder group meeting in chronological order. Noted below in Table 2 is a list of stakeholder group meetings (excluding the levee district and parish board meetings). Stakeholder and/or attendee input is presented as comments and questions followed by IPT representative responses.

Table 6.2: Stakeholder Meetings and Presentations of the IPT

Presentation	Date	City	Location	Time
Parishes Against Coastal Erosion West	Aug. 16	Lafayette	Wetland Research Center	1:00 PM
Parishes Against Coastal Erosion East	Aug. 18	Hahnville	Council Chambers	1:00 PM
Floodplain Managers and Planning Districts	Aug. 21	Baton Rouge	Department of Natural Resources Building	1:00 PM
Louisiana Landowners Association	Aug. 22	Lafayette	Wetland Research Center	1:00 PM
Environmental Interest Groups	Aug. 23	Baton Rouge	Department of Natural Resources Building	1:00 PM
Louisiana Landowners Association Board	Sep. 8	Baton Rouge	Embassy Suites, Capital Board Room	12:00 PM
Barataria-Terrebonne National Estuary Program Management Conference	Sep. 14	Thibodaux	Nicholls State University, Plantation Room	9:00 AM
Kenner Kiwanis Club	Sep. 21	Kenner	2050 Veterans Blvd., Radisson Hotel	7:00 AM
Vermilion Parish (multiple stakeholders)	Sep. 28	Abbeville	405 E. St. Victor, Abbeville Library	6:00 PM
Vermilion Parish	Oct. 17	Abbeville	Library	9:30AM
Lake Pontchartrain Basin Foundation	Nov.7	Baton Rouge	Shaw Building, Essen Lane	12:00 PM

6.2.1 Western Parishes against Coastal Erosion

The IPT met with members of PACE on August 16, 2006, in Lafayette at the Wetlands Research Center. Representatives from Iberia, St. Mary, Vermilion, Cameron, and Tangipahoa Parishes were in attendance. Comments and questions touched on (1) storm protection, (2) data accuracy and detail, (3) levee alignments, and (4) the planning process and the integration of pre-existing plans. Comments, questions, and responses are outlined below.

Question:

Will the hurricane levee protection be the only line of defense?

- Multiple lines of defense by way of natural ridges, barriers, and surge protection levees are proposed. The Master Plan incorporates breaking the surge by overtopping from these natural systems.

Question:

How high was the surge from both Katrina and Rita?

- The surge depth varied. During Hurricanes Katrina and Rita, it was 35 feet along the Mississippi coast and approximately 23 feet in Louisiana and that depended on the land use, size, shape, intensity, and geography of the area. The U.S. Army Corps of Engineers (Corps) is currently running models for a 100-year event with varying intensities and rates of movement.

Comment:

A survey was done in Abbeville showing the depth and range of storm surge. The modeling tool could be used and should be considered.

- Comment was acknowledged by IPT staff.

Comment:

A Cameron Parish representative noted concern about storm event monitoring equipment holding up and being able to record data or survive an actual storm surge.

- The IPT representative acknowledged the comment and stated that a re-evaluation of storm surge calculations is on-going with data being crossed checked to verify readings. Peak surge is being re-calculated based on field data.

Question/Comment:

Was a LIDAR survey done?

- Yes, the problem is that LIDAR is not highly accurate and it does not penetrate all physical environments. In certain areas, it functions well; in other locations, reliability is not dependable. LIDAR functions well in agricultural areas for example, but it can not be used with high reliability in the marsh or anywhere with trees in full leaf.

In order to find accurate elevations, everything must be connected.

- Existing data is being used and incorrect data will be revised. The correct data will be obtained. What will be protected must be decided, as well as where the levees will be positioned. There are strategic assets that have to be protected, and the methodology must be consistent across the state. Communities and assets including agriculture will be addressed.

Comment:

Agriculture was not addressed at the Louisiana Speaks meetings. That is a huge problem.

- Values on various crops are currently being estimated, and the more Vermilion Parish and the western Parishes are involved, the better.

Comment:

The U.S. Army Corps of Engineers may not be able to come up with any type of structural protection for a Category 5 hurricane.

- Developing more manageable structural protection is key. However, developing cat 5 protection is not always the best way to sign for hurricane protection. All options are being evaluated.

Question:

Reference to Planning Unit 3b alternative 2: What is the Corps of Engineers doing structurally in the west? What about at Wax Lake outlet? Is the Corps following a contour plan?

- The Corps plans have been included in the IPT Master Plan.
  Planning Unit 3b Alternative 2 bypasses that levee alignment. In Alternative 1, what happens from Amelia to the Atchafalaya? The plan would have to pass over Bayou Boeuf, split it in half, and have a pump station and a lock. All of the industry in that area would be left unprotected. However, Alternative 2 incorporates the industrial area. Instead, the path crosses over the Intracoastal Canal and ties into Bayou Boeuf. Will a lock or floodgate be put there?
- A lock will have to be constructed. However, that decision has not been made.

Question:

Will the GIWW lock be incorporated into this Master Plan? Has is it been finalized?

- No, but the alignment is in the state plan.

Question:

How receptive to the Master Plan is the Corps going to be? What are they incorporating into their plan?

- The Corps is supposed to present its plan to Congress using Category 5 alignments and incorporating a risk mechanism without using a benefit/cost ratio.

Comment:

Cameron recognizes that surge protection is minimal in the parish. Breakwaters off the shore line and sand nourishment has helped. Something has to be in place to slow down the surge and break the water. There is a 70-mile coast, and it would be ideal to have breakwaters and find sand sources for pumping sand as Florida does. Three rivers run through Cameron Parish, and the width of those channels should be managed to keep the Gulf from inundating the parish at the next storm. Levees would be tolerated at the south shore as long as the estuaries are not harmed. Cameron Parish has the nation's four liquid natural gas terminals existing as planned and a strategic petroleum reserve that provides 22% of heating oil in winter. This resource needs to be protected; it can not be protected by solely putting a levee on the shoreline. Getting the money to protect this area will be a challenge, so the importance of this area must be highlighted to the nation. It must be made clear that Louisiana is one of four areas in the world that have cheniers.

- Comment was acknowledged by IPT staff.

Comment:

It is important to acknowledge disagreements between the State and the Corps so that you can work them out at the beginning.

- Comment was acknowledged by IPT staff.

Question:

Will the final Master Plan have one recommendation or two alternatives? Who is going to make the final decision?

- The preferred alternative will be presented in November of 2006 through a public process. It will be revised/modified and then presented to the CPRA for final revisions. It will then go from the CPRA to the Legislature.

Question:

The Parish would like to submit the St. Mary plan as recommendations for the area. What will it take to upgrade the existing flood control features and add features that are non-existent?

- Question was addressed by IPT staff.

Comment:

The planning unit boundaries of the Chenier Plain and the Deltaic Plain have been merged together. Since they are two different systems they should not be in the same boundary for planning purposes. Therefore, the boundaries should be changed.

- Comment was acknowledged by IPT staff.

Question:

Will the IPT hold an additional meeting with the five mayors of St. Mary Parish?

- Question was addressed by IPT staff.

6.2.2 Eastern Parishes against Coastal Erosion

The IPT met with members of PACE eastern parishes on August 18, 2006, in Hahnville at the council chambers. Representatives from St. Bernard, Plaquemines, Terrebonne, Lafourche, New Orleans, St. Charles, Jefferson, and St. John the Baptist Parishes attended. Questions and comments concerned the reliability of modeling data for planning assumptions, the planning process, integration of existing plans, the approval of the Master Plan by the Legislature, and whether the Master Plan will be implemented. The comments and responses from the meeting are documented below.

Comment:

Sensitive issues need to be discussed because the storms have changed the evaluation standard. Lowering the levees is a way of maintaining wetlands. Development in south Louisiana has changed because of the storm (insurance). When storm protection is evaluated, the difference between the effects of marsh and land needs to be incorporated into the equation. Additionally, natural ridges need to be incorporated and we need to be aware of inaccurate assumptions regarding wetlands. Modeling, such as ADCIR, is not accurate. The inaccuracy of modeling tools must be recognized.

- Comments were acknowledged by IPT staff.

Question:

The Louisiana Coastal Areas (LCA) feasibility study is moving ahead and has discarded what the State wants. How do you see this Master Plan in five years? There is a concern due to the lack of participation from the Corps. Will the Corps adopt the State's plan or keep it separate?

- Question was addressed by IPT staff noting that the Corps is required to incorporate input from the State plan.

Question:

How did Alternative 1 and 2 get split? Can you mix together Alternative 1 and 2?

- Alternative 1 has short-term benefits and Alternative 2 has long-term benefits. The preferred alternative can and will be a hybrid version of both alternatives.

Question:

Will anything be done with Donaldsonville to the Gulf?

- Yes, the project is under consideration.

Comment:

Jefferson Parish President David Carmadelle would like the Grand Isles Master Plan included in the state plan.

- Comment was acknowledged by IPT staff.

Comment:

Bayou Lafourche was a project in CWPPRA, but a "technical review" was required. This verbiage was used to delay the project. Might there be a new tactic to deal with projects that are unfavorable?

- IPT staff noted that all projects are should be reviewed equitably.

Question:

Will the Corps follow the same methodology and maps as the IPT?

- The Corps is participating in IPT reviews and collaboration is of paramount importance.

Question:

How will Plaquemines Parish be handled in the Master Plan? How are decisions made as to which assets are incorporated in protection?

- How far to go with hurricane protection will be determined by analysis of concentrated, distributed, and strategic resources.

Question:

Are fisheries considered as a strategic resource? How was the definition of strategic resources agreed upon? Are roads and bridges, oil & gas facilities, fisheries (oyster leases, spawning grounds) strategic assets? Was fishery landing data used? Is pre- and post-Katrina data being used? The post-Katrina data is not accurate and may be unfair. The eastern part of the state lost as much wetland as was predicted by 2050, how is the plan incorporating land loss rates? Please consider average annual loss rate. Terrebonne Parish is losing wetlands at a faster rate than any other Parish.

- IPT staff indicated that Terrebonne Parish concerns were documented and are being incorporated into the planning process. By definition, fisheries are not considered a strategic resource: however, fisheries data is being incorporated into the decision-making process. Emphasis is placed on pre-Katrina data as post-Katrina data is preliminary and temporary. A detailed account of "resources" was offered.

Comment:

A group desires to meet with the IPT separately to go over local problems and plans.

- Comment was acknowledged by IPT staff.

Question:

What happens when administrations and priorities change? When will the implementation begin?

- Question was addressed by IPT staff noting that data is based on objective, documented data, and implementation has already begun.

Question:

Will the Legislature be allowed to make changes to the Master Plan once adopted?

- No. The Master Plan can be accepted or rejected by the Legislature. Only the CPRA can make revisions.

Question:

Will the Master Plan receive an up or down vote by the legislature?

- Yes.

Comment:

Many completed studies have been finished for years. These studies have never been implemented, many of which were shelved and never implemented.

- The federal government is not going to fund every project, but this Master Plan will ensure that previous projects are evaluated.

Comment:

There is never a consistent amount of money and there was not an entity to consolidate plans. Now the state has one repository—an information source—to make a difference. Katrina gave us the will to do what we needed to do, a political will.

- Comment was acknowledged by IPT staff.

Question:

When will implementation start? There is money here now.

- Question was addressed by IPT staff.

Comment:

The current system must be changed. This Master Plan will serve as a blueprint, and implementation strategies have must begin.

- Comment was acknowledged by IPT staff.

6.2.3 Floodplain Managers and Planning Districts

The IPT met jointly with members of the Louisiana Floodplain Managers Association and Regional Planning Districts on August 21, 2006, in Baton Rouge at the Department of Natural Resources building. Questions and comments concerned the reliability of modeling data for planning assumptions, the examination and incorporation of floodplain management, non-structural measures, the planning process, the approval process, and implementing other strategies. Comments and responses from the meeting are documented below.

Comment:

Cameron Parish does not want levees all along the coast. However, the parish would like barriers to break the natural flow of water.

- Comment was acknowledged by IPT staff.

Comment:

Building codes should be mandated.

- Comment was acknowledged by IPT staff.

Comment:

The Master Plan should be consistent with the plans of Mississippi and Texas. The planning process should incorporate what those states are doing, in addition to looking at the FEMA-55 coastal construction manual.

- Comment was acknowledged by IPT staff acknowledging that the IPT was coordinating with Mississippi and Texas when and where practical.

Comment:

Jobs, including fishing jobs, should be part of the concentrated assets.

- Comment was acknowledged by IPT staff.

Question:

There are many different plans. How will the final be chosen?

- The process of evaluating projects is based on resource protection, timing, feasibility, and cost was addressed.

Question:

If each plan has its own projects, who determines which projects are chosen?

- A continued explanation of the planning process was ensured.

Question:

When will the draft be finished?

- It is anticipated that the draft will be ready for public review in October 2006.

Question:

Can the Legislature change the final Master Plan? Does the Legislature either veto or approve the final Master Plan?

- The Legislature may not change the final Master Plan. It will either veto or approve the Master Plan. Changes can only be made by the CPRA.

Question:

Does the Legislature have the ability to take out projects from the Master Plan?

- No, they may not alter the plan.

Comment:

The Master Plan should incorporate non-structural measures and floodplain management.

- Comment was acknowledged by IPT staff.

6.2.4 Environmental Interest Groups

The IPT met with members of environmental interest groups on August 23, 2006, in Baton Rouge at the Department of Natural Resource building. Representatives from the following organizations were in attendance: Lake Pontchartrain Basin Foundation (LPBF), Barataria-Terrebonne National Estuary Program, Sierra Club, Atchafalaya Basin Foundation, Atchafalaya Basinkeeper, Restore or Retreat, RESTORE, and others.

Most of the questions centered on basic information concerning the following:

- strategy, approach, and decision-making process of the final plan;
- future development possibilities of the coast;
- maximizing marsh restoration, and use of all sediment sources from the Mississippi and Atchafalaya Rivers;
- using non-structural restoration in preference to linear and ring levees;
- policy and legal issues;
- and the need for additional information on maps and documents.

Comments from the meeting are documented below.

Comment:

Diverse constituencies want various types of ecosystems. Some want brackish, some want fresh, but what does Mother Nature want? What Mother Nature wants is how it will end up. The LPBF recommends having ecological goals with maps depicting such ecosystems. There are so many dynamics and there must be a target—the engineer needs to know what to build. In the Coast 2050 plan, there are goal maps but they are problematic. For example, in one location the target habitat is brackish, but the plan called for a major diversion. The goal habitat and the project conflict with one anther. The LPBF can offer where certain types of habitats should be located. The engineer needs something more explicit. There should be a habitat map that goes in each planning unit. The habitats need to be restored to early 1900's (pre-industry).

- Comment was acknowledged by IPT staff.

Question:

How will the Master Plan keep short-term protection from becoming long-term so that people do not do some of the basic fundamental things like raising their houses? People are promising some outrageous things. Political considerations, traditions, and non-structural options should be considered. Those things should be considered first and then certain assets that have to be protected should be considered. People of Louisiana are retreating, and

the state needs to avoid making short-term decisions. People have a right to take a risk but the state needs to emphasize the risk.

- The issue of short-term protection becoming long-term was discussed in regards to the political, social, physical complexities associated with social issues.

Comment:
Children of Louisiana cannot override their parents and should not be living in risky areas. The State should relocate communities to north of I-10 and let Mother Nature take over the coastal zone.

- Comment was acknowledged by IPT staff.

Comment:
An emphasis needs to be placed on habitat restoration and mitigation. The State should not encourage a false sense of security with levees. In addition, more money should be spent on mitigation.

- Comment was acknowledged by IPT staff.

Comment:
The Master Plan should maximize non-structural measures before exploring structural measures to give the coast more value.

- Comment was acknowledged by IPT staff.

Comment:
If the Corps does not build levees, people will not live in unsuitable or risky areas and those areas can revert to natural systems on their own.

- Comment was acknowledged by IPT staff.

Comment:
The State should deny building permits on private property below sea level and outside existing levee systems, deny flood insurance, and force relocation away from historic homes and property.

- Comment was acknowledged by IPT staff.

Comment:
The Master Plan does not adequately address maximum restoration of all types of marshes. The plan should use non-structural restoration instead of levees, especially linear levees.

- Comment was acknowledged by IPT staff.

Comment:
All river sediments should be used for marsh restoration.

- Comment was acknowledged by IPT staff.

Question:
What is the advantage in putting more sediment in Wax Lake? If it is done along with filling the reefs, it might work. There is sediment available in the Atchafalaya basin.

- The benefits of Delta building was discussed

Comment:
Piped sediment or freshwater should rebuild the coastal areas.

- Comment was acknowledged by IPT staff.

Comment:
Opposed to the Morganza to the Gulf project.

- Comment was acknowledged by IPT staff.

Comment:
It is unclear what the rationale is behind the two Alternatives.
- Comment was acknowledged by IPT staff and the basic premise of Alternatives 1 and 2 were delineated.

Comment:
The plan might not be feasible and people might need to relocate.
- Comment was acknowledged by IPT staff.

Question:
Is the state attempting to relocate assets outside of the protection?
- IPT staff indicated that in some cases, this option may be preferred.

Comment:
Evacuation and education about risk is important, and the State should put mandates on building codes so that people are safer.
- Comment was acknowledged by IPT staff.

Comment:
The State should place heavy interest on non-structural measures and not support a "great wall" along the coast. The land should be given back to the people and pipelines and dredges can bring sediments back into the system. Levees are not necessary.
- Comment was acknowledged by IPT staff.

Question:
People have rights to live where they wish, but they should understand the risk along the coast. Evacuation routes should be illustrated on the maps so that the networks can be seen. Why aren't the evacuation plans on the map? The routes will help determine how measures are evaluated.
- Question was addressed by IPT staff with the response indicating the concept of distributed and strategic resources relative to highways and evacuation.

Comment:
Evacuation routes are not adequate so people do not leave. The levees are expensive and some of that money should go to evacuation.
- Comment was acknowledged by IPT staff.

Comment:
Many projects are looking at restoration, but the State needs to go back to natural barriers. If people can not get insurance and build at their own risk, something like the Road Home should not be able to help people.
- Comment was acknowledged by IPT staff.

Comment:
Bring sediment into areas that need replenishment
- Comment was acknowledged by IPT staff.

Comment:
All of the money should not be spent today because long-term solutions should be the focus instead of near-term.
- Comment was acknowledged by IPT staff.

Comment:
The state should address the current operations that have a negative impact on the coast such as cypress logging. Cypress trees along the coast are being logged. The State needs to take a clear position saying these acts are not

welcome. The State should also take a position and not allow development in wetlands. The State should buy out the people living in wetland areas and donate those areas to conservation.

- Comment was acknowledged by IPT staff.

Comment:
If you are protecting wetlands from water, the levees should leak. Sediment should not be wasted and put somewhere productive. It should be against the law to waste sediment. The Coastal Zone should be less tolerant to dredging and should not allow dredging new channels.

- Comment was acknowledged by IPT staff.

Comment
Models showing surge reduction are not accurate.

- Comment was acknowledged by IPT staff with and indication of the CLEAR modeling process.

Comment:
The Master Plan should not be rushed. The agency preparing the plan should study all scenarios.

- Comment was acknowledged by IPT staff.

Question:
Is cost being evaluated?

- Question was addressed by IPT staff noting that the overriding premise to project recommendations is more complex than previous cost-benefit analysis.

6.2.5 Louisiana Landowners Association

The IPT met with members of the Louisiana Landowners Association on August 22, 2006, in Lafayette at the Wetlands Research Center and again on September 9, 2006 at the Embassy Suites in Baton Rouge. Due to the paucity of attendees at the first meeting, the few questions recorded have been merged into those of the later meeting.

Question:
Is the Master Plan on a website? Why has the IPT used outside consultant firms and conceptualized earlier studies?

- The goals are defined in the report. The references for the measures recommended are defined in the report and posted to the LACPR website. Because of the time and staff constraints, professional consulting firms are being utilized. Concepts are utilized in place of detailed plans in some cases because of time constraints.

Comment:
This Master Plan is a two-dimensional plan that is being used to address a four-dimensional problem; it cannot be sustainable. The group and resources needed to evaluate the plan should be critical. The current process and group preparing the plan is not transparent. The group cannot/should not wait to get the public involved and limit the public comment period to 30 days. Waiting to go to the public is dangerous. Coast 2050 should be used as a model for process, not the LCA plan.

- The decision-making process for the measures selected was determined within the CPRA-IPT group based on the best information and professional judgment available. However, workshops have been held, ideas from stakeholders have been evaluated, and conflicts have been resolved. This is why we are currently soliciting comments from various stakeholders.

Comment:
The planning process is flawed and the Department of Natural Resources is doing the same thing they have done in the past--the same thing as CWPPRA. There are no long-term projects. Instead, they are all short-term projects which will be piece-meal. Therefore, the major process problems have not been addressed. Levees are

not the answer. Morgan City had 2 feet of surge while Golden Meadow had 8 feet of surge because the Atchafalaya Basin and Wax Lake Outlet were there to break the surge. This should be an example of why a 6' x 6' plot of marsh can be built for the best results. Instead 6' speed bumps should be built.

- The Louisiana Coastal Areas (LCA) feasibility report was heavily relied upon for measured selection because of the effort put into the report. The report also incorporated feasibility and long-term sustainability. The LCA measures considered both short-term and long-term projects. For example, the third delta is one of those measures. All measures from the LCA report were included in the two alternatives.

Question:
The problem with the LCA report was decision-making policies. The same decision tree is being used in this Master Plan?

- This Master Plan includes a new decision-making process. The LCA plan consisted of two parts, one emphasizing the coastal restoration issues while the other part emphasized benefit-cost ratios. The process for CWPPRA projects took 16 years and was still not agreed upon. Unlike previous plans, this Master Plan and the mandate to the State includes an annual look at project feasibility each year. The Master Plan will use adaptive management; therefore, each year the plan may evolve based on additional information or changing conditions.

Question:
Are their any plans to build up the Avoca Island area and allow water and nutrient flow where they naturally did?

- Question was addressed by IPT staff noting that the Avoca Island levee and its relationship to the barrier plan is being considered.

Question:
There are state-owned water bodies that can be blocked or filled in to break storm surge, but they have been ignored. The Bayou Mound dam broke and the state has never repaired. Will the Master Plan address these types of issues?

- Question was addressed by IPT staff and the state-owned water bodies were discussed.

Comment:
The east-west levee alignment makes no sense. The marsh that was there took the energy out of Rita, so why are millions of dollars being spent for a levee across the parish instead of putting money back into the marsh restoration. No marsh restoration projects are shown in Cameron. This ruins the credibility of the Master Plan. It presents alternatives and measures that will be opposed.

- The Corps had to look at Category 5 protection for the coast. Maintaining the shore break line and building interior marsh could be an alternative and will be evaluated.

Question:
Is the Master Plan mostly about protection?

- No, the Master Plan will include non-structural protection and restoration measures. The State will not say that people cannot live where they want because of no protection. Encouraging enforcement of zoning, permitting, and conformance to building codes are non-structural, institutional options are being evaluated.

Question:
To protect against storm surge, Parish President Broussard suggested that the Master Plan incorporate sinking mothballed-ships to act as a surge barrier. Why is the protection recommended always about building levees?

- All protection/restoration measures used in the planning process were taken from existing projects, studies, and reports. Professional judgment was used to select a reasonable set of measures going forward. After Parish President Broussard suggested using sunken ships, it was determined that the ships would not be adequate to reduce surge, but there will be more answers after storm surge modeling is completed.

Question:
The levees are an integral part of the coastal needs but not the final answer. The government is re-inventing the wheel. The Coast 2050 plan has all the answers and the States finest scientist worked to put it together, so why are we using European's input as to what Louisiana needs to do along the coast. Take the long-term plans and use them to get results, CH2M Hill has completed the third delta study, and DNR is ignoring it. Why isn't the plan using what has already been done?

- The response noted that the LCA and the 2050 plans were considered and the third delta concept will also be considered in the CPRA planning process.

Question:
Regarding a measure for conveyance of sediment, where would sediment be conveyed to and from?

- Sediment would originate from in. Or out-side of the respective basin from offshore sources. The sediment conveyance measures were part of all the previous studies and projects.

Comment:
The problem with the Master Plan is how the measures were allocated. For example, Planning Unit 1, Measure 1-14 is pipelined sediment to LaBranche wetlands. But, Measure 2 has East Orleans Land bridge maintenance which does not make sense.

- These alternatives were originally called rationales, and were assembled to meet the objectives within each basin. Rationale 1 was intended to be amore short-term land-building measure. It is more mechanical and with short-term benefits while Rationale 2 was intended to be more structural and with long-term results.

Comment:
There are fundamental problems with the modeling efforts and inputs into the Master Plan which need to be addressed.

- Input from the CLEAR model and Corps surge models will also assist in enhancing the Master Plan and the alternatives going forward.

Question:
Were the LCA plans evaluated and what about the Myrtle Grove diversion?

- LCA plans were either evaluated or incorporated.

Comment:
The LLA has gotten together to reach common ground on issues such as the MRGO, restoration components, levee alignments, and the Pontchartrain Basin, which has a comprehensive plan that needs to be considered in the other basins. The LLA can merge these plans and submit them to the IPT. This action will allow the LLA to say what they want going forward.

- There is no final plan and there is no time to complete studies; we are using what we have at hand in terms of what studies have already been completed. The short-term plans are in WRDA as we speak and will not be hindered by Master Plan approval.

Question:
Planning Unit 3a, Alternative 2: Private property exist where two locks installations are wanted because of 40% loss of property, but there are no projects shown for the alternative to address this. The project would include closure of the Bayou Savan, why is this not depicted?

- If there is an existing formal plan for this project, IPT staff was not aware of it. It was noted that this is the type of input being elicited through the planning process. This project recommendation will be noted for the IPT.

Question:
Is there enough sediment available anywhere in the proximity of the LaBranche wetlands to build marsh the way it is shown on the CPRA-IPT maps? How can this be done?

- The area shown is not being built. It is showing the area that will be affected by sediment conveyance. The Modeling will show the area that can be built with a sediment conveyance based on the amount of sediment available.

Question:
What has happened to the Bonnet Carre Spillway?

- Question was addressed by IPT staff indicating that issues relative to the Bonnet Carre Spillway are wherever applicable.

6.2.6 Barataria-Terrebonne National Estuary Program Management Conference

The IPT was invited to attend and present at the Barataria-Terrebonne National Estuary Program Management Conference on September 11, 2006. Approximately 30 people were in attendance. The content of the discussion, regarding the November 2006 Preliminary Draft Plan is noted below.

Question:
How is the state outreaching to get input on the planning process? Are you outreaching to the parishes to get that data?

- Parish level labor and other socioeconomic information is being provided by the Department of Labor. In addition, each affected parish has been contacted regarding the specific nature of the program and similar presentations are being made.

Question:
How was the Scientific and Engineering Research Team (SERT) established? Is the membership listed on the website?

- It is comprised of a team of technical professionals and academics that was intended to establish projects and data. Randy Hanchey of DNR was largely responsible for putting the team together.

Comment:
The importance of the national perspective is understood; however, local insight is needed to completely understand all of the intricacies of the Louisiana physical and social system. You will need certain "big" names at the national level, but the local knowledge must not be overlooked.

- Comment was acknowledged by IPT staff.

Comment:
Local scientist feel left out of the planning process. And, the national people are sometimes off the mark.

- Comment was acknowledged by IPT staff indicating the outreach program being utilized by the IPT staff.

Question:
Wetlands experts from the Great Lakes are providing advice into the plan. This has caused some angry responses from local scientist. Who is on SERT?

- Question was addressed and the SERT membership described.

Comment:
BETNEP supports the pipeline sediment strategy and is concerned that not enough cells and polygons exist in the system. All of the polygons should be shown and the planning process should not limit anything. Scientists disagree as to how much sediment is in the river, and projects should be developed to harvest sediment.

- The state is looking at establishing long-term management of sediment mining and distribution. How the state has constrained itself in the past is being considered.

Comment:
The port commission, Lafourche Parish, and Grand Isle desire to maximize beneficial use of dredged material for commercial benefit as well as restoration and protection.

This speaker acknowledged that duplicative efforts are occurring along the coast. For example, a group planted vegetation on Grand Isle, and the group was not aware that the area had already been planted by another group. This shows that these acts need to be planned a more efficiently. Use the port commission as a clearing house for planning projects. The port can help with logistics and coordination.

The goal is to start a coastal plant nursery on Grand Isle mainly dealing with hard woods or larger vegetation. Mangrove seeds will be connected this winter.
- Comment was acknowledged by IPT staff.

Comment:
The Corps is talking about a sediment management plan and hopefully that will include how the state will best use dredged sediments.
- Comment was acknowledged by IPT staff.

Comment:
The beneficial use of dredged material needs to be recognized within the Master Plan.
- It is a strategy aggressively being used in the plan.

Comment:
The LCA team is tasked with a beneficial use component and is accepting written comments by Oct. 14. A primary objective is to make long distance transport more suitable.
- Comment was acknowledged by IPT staff.

6.2.7 Kenner Kiwanis Club

The IPT was invited to present at the Kenner Kiwanis Club meeting on September 21, 2006, at the Radisson Hotel in Kenner. Approximately 30 attendees were present. Comments and questions are documented below.

Question:
The Corps has been taught over the years that Mother Nature cannot be controlled. What is being done to deal with such matters?
- The ITT team is composed of individuals from universities and other research teams from across the state that have completed studies for coastal Louisiana. Additionally, SERT, the scientific and engineering research team, is involved with development/review of portions of the plans being proposed and CLEAR is modeling relative to impacts of future events and future landscape scenarios of south Louisiana.

Question:
Where are the strategic oil resources?
- Strategic oil resources are located in both concentrated and distributed areas across the coastal plain.

Comment:
Knocking levees down at some locations restored land quickly and allowed for lands to be reclaimed. Is this included in the plan?

- Any and all facets of coastal restoration are being considered including sediment diversions and beneficial use of dredge material. However, levee removal, per se, is not included at this time, but nothing has been ruled out or decided upon as final.

6.2.8 Vermilion Parish

The IPT presented at the Abbeville library in Vermilion Parish on September 28, 2006. Approximately 50 participants attended including mayors from municipalities in the parish, representatives from the Vermilion Parish Office of Emergency Preparedness, members from the Vermilion Parish Coastal Restoration and Advisory Committee, the LSU Ag Center, the Corps, the Rice Growers Association, the Vermilion Cattlemen's Association, and others. Comments and questions are documented below.

Comment:
Vermilion Parish needs a plan to show that the parish does not approve of large levees going along the western coast. The plan also should address the importance of the culture that is highly valued in this area. Additionally, this basin must be maintained as a freshwater basin. These actions will affect Vermilion, Jefferson Davis, and Cameron Parishes.

- A significant amount of modeling has been done to determine potential surge impacts, but the two storms generated revisions to the probabilities. Estimating levee heights continues. Some models of the 100-year event project a 14 foot surge along the coast, but variable storm tracks affect the predictions significantly. Currently alternatives being discussed include a levee along the GIWW and elevating LA Hwy. 82. In Cameron Parish, discussions also include no levees and maintaining the shorelines. If the GIWW levee alignment is not acceptable, that needs to be voiced by the Parishes.

Comment:
The GIWW levee is fine but that is not all that is needed. The parish does not want the same issues that exist in Lafitte. Vermilion Parish is being infiltrated by saltwater on a daily basis.

- Some groups are saying that the Mermentau Basin does not have a saltwater problem. The plan must look far in advance taking sea level rise into account. The land is sinking, so we have to make sure that the right commitments are made to live behind levees. If levees are to be built, the citizens in an area must make a commitment to live behind the levees forever. Act 8 mandated that the CPRA-IPT consider long-term effects. Building something like a levee and not maintaining it is worse than not building something at all. The levees must be able to economically sustainable from a long-term maintenance perspective.

Question:
Is the GIWW project in the WRDA bill?

- The plan must be feasible. Right now the funding breakdown is 65-35% and discussion continues to create a 50-50% match. Local governments currently must provide 35% of the cost, and parishes can not afford that amount. Therefore, OCS money is necessary to move forward with plan implementation.

Question:
Is freshwater diversion for this area included in the plan? Building a levee on the GIWW will prohibit freshwater interchange in an area that needs freshwater. Freshwater is needed to rebuild land.

- It is an expensive process to bring water from the Atchafalaya. Some want Vermilion Bay to stay brackish, so moving water west from the Atchafalaya may not be ideal. All approaches are being considered.

Comment:
Vermilion Parish attempted to work with the 2050 plan, and the parish was always told that there were not as many problems in the West as in the East. But subsidence and sea level rise is affecting both areas. Does the state want to divert the Mississippi River at Violet?

- Yes, that is in this plan. The plan includes all of the LCA projects.

Comment:
This area did not fair well in 2050 plan and is not included in the LCA plan. Therefore, it is not sufficient for the IPT to use the existing plans for this area. How will this area be included if there are no existing plans? Please be aware that the area has not been involved in previous plans.

- Some of the CWPPRA plans are included and others continue to be considered.

Comment:
The DOTD removed a bridge before the hurricane, and the area could not evacuate people. These issues need to be addressed.

- Comment was acknowledged by IPT staff.

Comment:
By forming the CPRA, is the State diluting the restoration efforts of CWPPRA? Also, the State seems to be overly concerned with levees. But levees will cause the area to lose the southwest pass and other areas if restoration is not the primary concern. Levees should not be the first priority. The CPRA must not wait five years to complete Volume 3 or many areas will be lost in the time it takes to build a levee.

- Those decisions have not been made. The reason for making this an integrated plan is that the state needs to incorporate both restoration and protection. Some things will have to be implemented first, but everything will depend on when and from where the money comes. The first thing that has to been done is a plan.

Comment:
The plan and implementation must be fair across Louisiana. In the Breaux Bill, most of the money went to the eastern part of the state. If you do not allocate the same amount of resources across the state, the public will not accept the plan. The western part of the state loses every time.

- Comment was acknowledged by IPT staff.

Comment:
Look at the difference between Katrina and Rita. The eastern part of the state is receiving more money and aid such as levees.

- A plan must be created for this area and it must be implemented equitably.

Comment:
A plan for this area can not be created over night. It would be best to have an organized committee to submit a plan.

- Comment was acknowledged by IPT staff.

Comment:
The consensus is that the area is depending on the Mermentau Basin to maintain freshwater.

- Comment was acknowledged by IPT staff.

Comment:
Even before the storms, the basin was not protected. The Corps did not have authority to maintain what was there.

- Comment was acknowledged by IPT staff.

Comment:
The parish should come up with some alternatives. We have some problems on the western and southern portions of the parish. Sellers and Associates should come up with some ideas and get together with the rice growers and other groups.

- Comment was acknowledged by IPT staff.

Question:
If the East- West HWY 82 existed on the eastern side of the state, would the government have saved the HWY?
- To put barriers across those basins is difficult. The Eastern part of the state is struggling to have levees constructed in areas as well.

Comment:
This area has been battling for coastal and marsh management, but the bureaucracy must be changed. These problems need to be addressed in the Master Plan. The authority to change some of the projects needs to be addressed. Insert language into the plan so that some agencies do not have such power. If the state has input into the Corps plan, then that needs to be included. The whole permit process between the Corps and DNR needs to be changed.
- Comment was acknowledged by IPT staff.

Question:
Do you think implementation of these proposals will happen in this lifetime?
- Implementation will depend on the amount of resources that are available.

Comment:
The Vermilion Parish saltwater conservation district will put together a plan that can be submitted, but it is necessary to coordinate with Iberia, Vermilion, St. Mary, and Cameron Parishes. The police jury and the Vermilion Parish Coastal Restoration Advisory Committee should organize a meeting.
- Comment was acknowledged by IPT staff.

Comment:
A lot of emphasis is being put on western Vermilion Parish. However, most of the flooding occurred in eastern Vermilion. Most of the water came from Vermilion Bay located in the east.
- Comment was acknowledged by IPT staff.

Comment:
The plan should acknowledge the geographical area and be aware of where the bay and Gulf are located. The basin should be used to trap the overflow, and the levee should protect everything else. The locks can handle the differential and then water will mix. Everything is different once on the other side of the Intracoastal.
- Comment was acknowledged by IPT staff.

Comment:
The area does not need a 20-foot high levee. It does need a combination of barriers to break the surge.
- Comment was acknowledged by IPT staff.

Comment:
The area will have a surge no matter what. But, that is not what flooded the area during Rita. Vermilion Bay is what flooded the area because it did not drain.
- Comment was acknowledged by IPT staff.

Comment:
The south side of the GIWW is a critical part of the parish and it is where the majority of the water came from during the storm. The canals may be closed, but water will still infiltrate.
- Comment was acknowledged by IPT staff.

Comment:
The locks do not have to stay closed all of the time. They should rather act as barriers.
- Comment was acknowledged by IPT staff.

Comment:
This area would like to stop the surge but is not in favor of living behind levees forever.
- Comment was acknowledged by IPT staff.

Comment:
It is important to recognize that this area has a lot of natural drainage.
- Comment was acknowledged by IPT staff.

6.2.9 Abbeville Meeting

Subjects that were raised and discussed at the meeting included the following:

Southwest Pass- The group voiced concern about the eroded condition in Southwest Pass and how much more conditions might advance without some sort of protection. It was noted that Southwest Pass was a measure in the plans being considered. It was also noted that the problem of protection was not easy to formulate but a plan for rock protection was being looked at. After several minutes of discussion the subject was closed.

Hebert Canal- Hebert Canal was presented as a problem area. The Hebert Canal Watershed is located in east central Vermilion Parish, Louisiana near the community of Ester. The 7,600 acre watershed is in close proximity and hydraulically connected to Little Vermilion Bay. This connection influences salinity regimes within the watershed especially during storm driven tides.

On the day of the meeting a strong southeast wind was blowing and there were several comments of the water levels being 2 feet above normal and some roads with low elevations were almost under water. A main concern was to make folks aware of the problem with hopes of getting some help.

Observations from hurricane Rita surges were brought out. There were descriptions of debris in many areas where some semblance of ridge, high ground, or spoil banks oriented parallel to the surge with woody vegetation existed. Viewing this result provided confidence that focusing on theses sort of features would provide a degree of first line of defense for storm surges. The idea would be to aide development of these sorts of things at every opportunity.

These discussions led to the subject of another possible line of defense, namely Highway 82. Again, there was a lot of discussion about the value of Highway 82 as a secondary line of defense.

A main theme of the presentations was the vulnerable location of the general area of Abbeville and the region southward to the coast relative to saltwater intrusion and storm surges. It was again pointed out that on that day a strong southeast wind was causing problems in areas south of Abbeville.

6.2.10 Lake Pontchartrain Basin Foundation Meeting

The USACE LaCPR Alignment No. 1 was discussed and it was agreed that no decision on a preferred alignment can be made until the results from the storm surge modeling for Alignment No.1 (with structures at Chef Pass and Rigolets) and Alignment No.2 (without structures at Chef Pass and Rigolets) are available. If the results as published in the USACE Preliminary Report to Congress are proven right by this modeling (1.5 ft increase in Lake Pontchartrain with Chef Pass and Rigolets open) an alignment without structures should be the preferred.

It was understood that the bankline stabilization along the MRGO will be part of providing a "backbone" for marsh creation along Lake Borgne. Even though the measure includes the entire length between Michoud Canal and Bayou LaLoutre it will be determined as part of this measure where exactly the areas/sections in need are located along this stretch of the MRGO.

The Closure of the MRGO is highly appreciated by the Lake Pontchartrain Basin Foundation and details about the closure will need to be discussed - see to resolve with CPRA-IPT.

The Lake Pontchartrain Basin Foundation recommends for the area of Planning Unit 1 that the habitat goals (salinity gradients, oyster beds etc) be defined by the 1912-1932 baseline.

The Lake Pontchartrain Basin Foundation agrees that a large diversion at Violet (15,000 to 20,000 cfs) would be a good design to accommodate pulse events. The freshwater would need to be dispersed into Lake Borgne and trough the MRGO to Bayou LaLoutre. It is understood that the Bayou at the LaLoutre Ridge would need to be dredged to disperse the needed freshwater into the Biloxi Marsh area.

A new measure will be incorporated into the Preliminary Draft Plan: PD 1-1a: Raise St. Bernard 40 Arpent Levee System to 17.5ft and Connect Through Verret

The MRGO Constriction needs to be taken out of the Bayou LaLoutre Ridge measure.

The Biloxi Marsh measure includes a rock dike not an earthen ridge. Factsheet and costs will need to be updated.

To resolve with CPRA-IPT:

- The Preliminary Draft Plan as presented at ITT included only shoreline protection (rock) along the Jefferson Parish South shore of Lake Pontchartrain. Previously this measure included shoreline protection and marsh buffer creation (300 ft wide marsh buffer). It was agreed upon that shoreline protection is needed in a first step of this project, but that the creation of a marsh fringe would provide a long-term protection to the existing levee berm. Therefore, it needs to be decided what the final measure as included in the preliminary draft plan should include and if marsh is included how wide the marsh buffer should be (between 300 ft – 1500 ft)
- The East Orleans Landbridge measure has too many acres for marsh creation which increases the cost tremendously. The marsh area within the Landbridge was multiplied by 0.6 to account for water, bayous, railroad etc. but still seem not to account for existing marsh areas that do not need further lifting. It was recommended by Mr. Lopez to identify the marsh loss between 1932 and 2001 and use that number as a guideline to how much marsh needs to be restored. A factor to account for future subsidence would still need to be applied. Mr. Lopez will contact Mr. Greg Miller (USACE) to see if the described loss data would be available. Shaw agreed to send Mr. Lopez the shapefile of the marsh area to identify the loss for the period between 1932 and 2001. A decision will have to be made on how to handle the marsh creation area's to account for water portion of the healthy marsh. Either a factor can be applied (as we did) or the loss from 1932 to 2001 can provide the acreage.
- How will the MRGO be closed? (rocks, 2 sheet pile rows with rocks in-between, etc). This information is needed to calculate the costs.
- IPT measure map shows a small diversion arrow but the measure factsheet describes a medium diversion at White Ditch. Which size should be included in the Preliminary Draft Plan?

6.3 Presentations before Levee District and Parish Boards

After the IPT presentations were made at levee district, parish council, and parish police jury or council meetings, comments were raised by board members and recorded by IPT staff. However, these comments were considered by the respective board members as comments representing the personal opinions and concerns of the individuals making them and their constituents and not officially that of the board. For comments to be considered officially as board comment, board action is required. In addition to the comments provided at these meetings, a number of the Parish and Levee District Boards have passed Resolutions in relation to the Master Plan. These are reproduced in full in Annex A to this Appendix.

Table 6.3: Levee District and Parish Board Meeting Schedule

Presentation	Date	City	Location	Time
Terrebonne Levee and Conservation District	Aug. 14	Houma	220-A Clendenning Rd	6:30 PM
West Jefferson Levee District	Aug. 17	Marrero	7001 River Rd	6:00 PM
Pontchartrain Levee District	Aug. 21	Lutcher	2204 Albert St.	6:00 PM
Vermilion Parish	Aug. 23	Abbeville	City Hall	5:00 PM
Calcasieu Parish	Aug. 31	Lake Charles	Parish Government Building	5:30 PM
Atchafalaya Basin Levee District	Sep. 6	Port Allen	525 Court St., 70767	4:00 PM
Lafourche Basin Levee District	Sep. 7	Vacherie	21380 HWY 20, 70090	6:00 PM
South Lafourche Levee District	Sep. 11	Galliano	17904 Hwy 3235	3:00 PM
East Jefferson Levee District	Sep. 12	Harahan	203 Plauche Court	10:00 AM
St. Mary Parish Board	Sep. 13	Franklin	500 Main St.	5:00 PM
Amite River Basin	Sep. 19	Baton Rouge	3535 S. Sherwood Forest	6:00 PM
Grand Isle Independent Levee District	Sep. 26	Grand Isle	3711 Hwy 1	10:00 AM
St. Mary Parish Levee Board Advisory Committee	Sep. 26	Franklin	Court House	7:00 PM
Lake Borgne Levee District	Sep. 27	Violet	6136 East St. Bernard, 70092	3:00 PM
Orleans Levee District	Oct. 18	Orleans	6500 Spanish Fort Blvd, 70126	1:00 PM
North Lafourche Levee District	Nov. 20	Raceland	308 Hwy	1:00 PM

6.3.1 Terrebonne Levee and Conservation District

The IPT presented as a guest at the Terrebonne Levee and Conservation District meeting on August 14, 2006. Comments offered at the meeting are listed below.

Comment:
Terrebonne supports the Morganza to the Gulf alignment.
- Comment was acknowledged by IPT staff.

Question:
Please explain the GIWW interior alignment in Terrebonne Parish.
- Question was addressed by IPT staff.

6.3.2 West Jefferson Levee District

The IPT presented to the West Jefferson Levee Board on August 17, 2006. Comments offered at the meeting are listed below.

Question:
Will this effort exceed the in-house capabilities of the Levee Board?
- Question was answered as "NO" then detailed by IPT staff in attendance.

Comment:
Is the Corps hydraulic surge data reliable?
- Yes, but constant revisions are being made as new data is interpreted.

Comment:
The GIWW alignment of the Donaldsonville - Gulf project is supported.
- Comment was acknowledged by IPT staff.

Question:
Why do the alternative maps show shoreline protection in PU-3a (Alternative 2) along the entire coast but do not include the entire coast in PU-2 (Alternative 2)?
- The line along the entire coast does not mean that shoreline protection will be implemented everywhere, but because the exact locations and the total affordable length has not determined, the map shows the line for this restoration feature along the entire coast.

Question:
The question was raised whether the IPT team had all available plans in hand.
- The team thinks every plan is accounted for. But if one is missing, these presentations and meetings are held to gather all missing information and gather all the necessary input of the stakeholders.

Question:
The Levee District wanted clarification on the "steering committee."
- The IPT explained the committee's role and named its five members.

Comment:
Agreement was reached that as long as future funding sources are not clarified, it is important to cooperate with the Corps.
- A process could potentially be implemented in the future to allocate federal money directly to the implementation of state plan projects instead of going through the Corps. DOTD was presented by way of example.

6.3.3 Pontchartrain Levee District

The IPT presented before the Pontchartrain Levee District Board on August 17, 2006. Comments offered at the meeting are listed below.

Comment:
Support the West Lake Pontchartrain Levee alignment project in the feasibility study.
- Comment was acknowledged by IPT staff.

6.3.4 Vermilion Parish Board

The IPT presented before the Vermilion Parish Police Jury board meeting on August 23, 2006. Comments offered at the meeting are listed below.

Question:
Do the alignments follow the Intracoastal Canal?
- Yes and a description followed.

Question:
Has it ever been proposed to widen the GIWW?
- The Acadiana to the Gulf of Mexico Access Channel was noted.

Question:
Where in relation to Kaplan would the levee go?
- The IPT needs input from members to describe where to put levees in their area. Currently, levee locations are present only conceptually.

Question:
Gueydan already has ring levees. The ring levees will protect Gueydan from a storm surge but what about storms that drop 10-20 inches of rain?
- Question was addressed by IPT staff as a function of storm drainage and pumps.

Comment:
A model is being run by the Corps and is part of the plan to get water out.
- Comment was acknowledged by IPT staff.

Question:
Has it been definitely decided upon that a levee will be built between Gueydan and Kaplan?
- No, but the potential is being discussed.

Question:
When will the plan be initiated?
- The draft report is due mid-February 2007, then the final plan will be submitted to the Legislature.

Question:
What is your estimate for when the first project will get implemented?
- This will depends on how much money is allocated and when.

Question:
The five-year action plan, is that a study?
- No, projects would be implemented every year as often as possible.

Question:
What will determine whether Alternative 1 or Alternative 2 goes forward and will parts of Alternative 2 be put into Alternative 1?

- There will only be 1 final plan – no alternatives. The final set of recommendations will include projects of both alternatives.

Question:
Everyone is concerned with flood protection, but is the ball going to be dropped on restoration?
- Not at all.

Question:
Who will determine funding allocations and by what method will it be determined?
- The Legislature will decide this with scheduling dictated by federal funding allocations.

Question:
Has the levee along the GIWW along the south bank been studied?
- Yes, it has been studied.

Question:
Will the public get to see the results of the study and tested models?
- Not sure if the test results will be made public.

Question:
All we need to do is come up with a conceptual idea?
- Yes, and if it is not in the report, then the IPT should be able to tell you why it is not in the report.

Question:
What was your train of thought about putting levees around Kaplan, which has not had a history of flooding, and left out Erath and Delcambre, which do have flooding problems?
- Question was addressed by IPT staff.

Comment:
The Saltwater Conservation District is working on a watershed plan around Erath. That needs to be considered.
- Yes, we have information on that.

Comment:
Another watershed plan that is being worked on encompasses 3b and 4; we would like to have that incorporated as well.
- Comment was acknowledged by IPT staff.

Question:
Regarding Unit 4, Alternative 1: is the storm surge at the coastline?
- Surge is at the coastline, not at the levees.

Comment:
The language in Unit 4, Alternative 1 needs to be re-worded because it is confusing.
- Comment was acknowledged by IPT staff.

Question:
Was it ever considered to use existing levees or oilfield canals to make barriers before it gets to the GIWW?
- No, but the IPT might want to take a look at that.

Comment:
We have to get through to DNR, the Corps, etc. These agencies must acknowledge the concept for enhancing ridges with man made sources.
- That can be done through CIAP. Coastal Zone Management Section of DNR and Permitting the Corps need to be in line with this plan.

6.3.5 Calcasieu Parish Police Jury Committee

The IPT presented before the Calcasieu Parish Police Jury Committee Meeting on August 31, 2006. Comments offered at the meeting are listed below.

Question:
Are you aware of a plan using gray water that build up land? This gray water plan is being used in Hammond, LA and other places. We will start using the gray water plan in various parks in Calcasieu Parish. This can be done at RV parks in the sewage system and there is nothing but positive outcomes. If everyone would get involved it would be a milestone for the state.
- Question was addressed by IPT staff.

Question:
What are the neighboring Gulf states doing? Are you looking at those state's activities?
- Question was addressed by IPT staff.

Question:
Do you have an estimate price tag on this plan?
- Question was addressed by IPT staff.

6.3.6 Atchafalaya Basin Levee District

The IPT presented to the Atchafalaya Basin Levee District board meeting on September 6, 2006. Comments offered at the meeting are listed below.

Question:
Explain the 100-year level of protection and the 100-year perspective.
- Question was addressed by IPT staff differentiating the difference between the 100-year storm event and the 100-year planning horizon.

Question:
How will the hurricane levee presented in the state plan affect the Mississippi River and Tributaries (MR&T) levees?
- IPT staff indicated that the intent is to assess the .MR&T alignments and incorporate them into the state plan when and wherever practical. When differences are noted, coordination with the Corps takes place.

Question:
How will the state plan mesh with the Corps LACPR plan?
- The response to this question was the same as above.

Question:
How much money will the levee system in the Atchafalaya Basin cost?
- Because the project is not yet in the design phase, the cost is yet to be determined.

Question:
What is the role of the Corps within the IPT?
- A senior Corps representative is assigned as liaison to the IPT. The Corps also participates in the IPT planning sessions.

Question:
When do you decide that there will be no protection? What will be done?
- Outside protection is indeterminate at this time. If destruction was greater than 50%, rebuilt structures must be elevated. Hazard Mitigation programs by FEMA dictate this mandate.

Question:
Is there a mandatory plan to evacuate certain areas? Will this be a private or public relocation?
- No, but this matter is being discussed as a function of distributed assets and among other agencies. The Master Plan will not say as to what can and cannot be built.

Question:
Will construction of new buildings (hospitals, homes, etc.) be permitted?
- All permits will be based on FEMA flood elevations and other similar criteria. A major question is what base flood elevation criteria must be met regarding building and re-building elevation.

Question:
Congressional funding and the new oil reserve in the Gulf… what will these potential resources and this money be used for?
- The money will be eligible for flood control and the relocation of assets if pending bills offered by our congressional delegation pass.

Question:
Was Katrina greater than a 100-year flood surge?
- Yes, in certain areas and according to current maps.

Question:
Will there be no guarantee that a 100-year surge would be stopped to protect areas?
- Correct. There is no guarantee.

Question:
In the Atchafalaya Basin, which is more appropriate: planning for the 100-year plan or a 500-year plan?
- The CPRA authorization ensures that the plan will be revisited every year. The 100-year planning horizon remains the most practical approach.

Question:
What is the relationship between the Corps, the LRA, and the CPRA plans?
- The "egg" graphic was re-described. Also noted was the fact that the CPRA IPT is moving faster than the other groups and desires to present its plan to the Corps as soon as practical, even in the draft stages. Having the Corps participate in the state's planning process also helps. OCS funding will likely be available, and if the OCS does not fund key components, the State and the Corps must find funds elsewhere.

Question:
How much of the Atchafalaya Basin Levee District area is involved?
- Only the area in the southern part of the Atchafalaya Basin.

6.3.7 Lafourche Basin Levee District

The IPT presented to the Lafourche Basin Levee District board meeting on September 7, 2006. Comments offered at the meeting are presented below.

Question:
Will the Master Plan support the GIWW alignment of the Donaldsonville-Gulf project? Should the Levee District pass a resolution supporting this project?

- The Donaldson-Gulf project is a consideration as are all plans. The decision to officially offer board support of this project to the IPT depends upon the board.

Question:
Can the Lafitte area be included in the Donaldsonville to the Gulf project?

- That matter should be addressed to the agency personnel assigned to that project.

Question:
Will the GIWW and Morganza to the Gulf connect? (Referencing Unit 2, Alt.1)

- Yes.

Question:
Doesn't the GIWW protect more people?

- Not really; it would protect more land.

Comment:
If you travel from Donaldsonville to the Gulf (south of Lake Salvadore), then that alignment will be pushed back several years. We keep putting the alignment off.

- Losing money that is put into that project is difficult, but the long-term overall outcome must also be considered.

Question:
How does the GIWW tie into Lafitte?

- The Donaldsonville to the Gulf project includes a floodgate in Lafitte and leaves Lafitte out. The CPRA plan to date includes Lafitte.

Question:
Can the GIWW surround Lafitte?

- Not in the Donaldsonville to the Gulf project.

Question:
What alignment would protect St. James?

- If high enough (Plan 2, Alt. 1), the approach outlined would protect lower elevations of St. James Parish.

Question:
What is being done to rebuild the barrier islands?

- In Unit 2, Alt. 1and 2 includes projects to rebuild the barrier islands.

Question:
How do you plan on rebuilding Barrier Islands?

- Several options address this issue. First of all, the decision to rebuild barrier islands must make it to the final plan.

Question:
Should the Lafourche Basin Levee District vote on a plan?
- Yes, if the board so chooses. Then the Lafourche Basin Levee District should let the IPT know which alternative is approved by the board.

6.3.8 South Lafourche Levee District

The IPT presented before the South Lafourche Levee District board meeting on September 11, 2006. Comments offered at the meeting are offered below.

Comment:
The Larose-Golden Meadow system was left out of the 4th supplemental appropriation.
- Comment was acknowledged by IPT staff.

Question:
How will the state plan interact with the Corps plan?
- Question was addressed by IPT staff as noted numerous times heretofore.

Comment:
How long will the whole project take?
- Project completion will depend on funding.

Question:
What is the priority for the Barrier Islands?
- The State of LA has not committed to rebuilding the barrier islands. Restoration of the islands is included in all existing plans, but commitment from state authorities is needed. Additionally, support from local levee districts and government bodies will be necessary for reinforcement of this commitment.

6.3.9 East Jefferson Levee District

IPT representatives offered a presentation before the East Jefferson Levee District (EJLD) board meeting on September 12, 2006. Comments made at the meeting are listed below. Two colored copies of the presentation *"Category 3" Protection for 4th Supplemental 2006* and a CD containing this presentation and supplemental presentations, was provided to IPT staff to be distributed among the CPRA-IPT team and is included as part of this report by reference.

Comment:
Please support structural lake front protection (stone) and restoration of eroded lake shore. (Written recommendations for measure provided herewith.)
- Comment was acknowledged by IPT staff.

Comment:
The title of measure 1-9 (PU-1, Alt 1)/ 1-10 (PU-1, Alt 2) *"Construct Jefferson Parish Fringe Marsh Buffer"* does not represent everything that needs to be done in this area and therefore, needs to be changed to: *"Jefferson Parish Foreshore Protection."* This measure will include replacement of lost shoreline, protection of shoreline with riprap, and marsh creation behind new breakwaters.
- Comment was acknowledged by IPT staff.

Comment:
The LSU AgCenter is working on a landscape design for the shoreline that included the creation of a coastal forest/wetland and could be incorporated in this feature due to its protection benefits.
- Comment was acknowledged by IPT staff.

Comment:
This particular shoreline is eroding with every storm (small to big) and therefore continuously diminishes the distance between Lake Pontchartrain and the toe of the protection levee. Because of the urgency to stop this land loss and protect the levee, this measure is listed in both alternatives.
- Comment was acknowledged by IPT staff.

Comment:
The most urgent feature of the entire measure is the riprap or bulkhead protection along the shoreline. The costs to place riprap have been estimated by the EJLD at approximately $100 million. This part of the measure could be implemented fairly, quickly and should therefore be of high priority.
- Comment was acknowledged by IPT staff.

Comment:
The EJLD supports the Lake Pontchartrain Barrier Plan.
- Comment was acknowledged by IPT staff.

Comment:
The EJLD supports the "Ships for Shores" project for short-term protection.
- Comment was acknowledged by IPT staff.

Comment:
The LSU Center prefers to change measures 1-5b & c (PU-1, Alt 1 & 2) *"Small Diversion @ Hope Canal"* and *"Small Diversion @ Convent/Blind River"* to medium diversions to increase the benefits for the region. A small diversion is anticipated to not deliver the expected results.
- Comment was acknowledged by IPT staff.

Comment:
The LSU AgCenter also recommends moving the drainage canal away from the Jefferson/St. Charles Parish line to flow into the LaBranche wetlands and strongly supports the suggested sediment conveyance project to further bolster that as well as the Pontchartrain/Maurepas land bridge.
- Comment was acknowledged by IPT staff.

6.3.10 St. Mary Parish Board

The IPT presented before the St. Mary Parish Council meeting on September 13, 2006, at the Court house in Franklin, Louisiana. Comments offered during the meeting are listed below. The *St. Mary Parish Storm Surge Protection Study* (2006) by Miller Engineering was submitted as their official comment to the IPT and is included herewith by reference.

Question:
How specific will the draft plan be for public review? For example, regarding levee assignments, at what point do we stop and not split Bayou Boeuf?
- The levees for Morgan City and points east are pretty much set. Regarding Morgan City and points west, no state or federal studies have been noted and detail is severely limited. The IPT will only offer conceptual plans because of time constraints. The IPT requests your comments as soon as possible regarding this region of the state.

Comment:
On the maps distributed, the levees appear too small, and detail cannot be seen. Without such detail apparent, how can important questions be asked?

- Higher resolution maps are available for download from the website (louisianacoastalplanning.org). The maps distributed here depict a lower resolution because the maps denote a broad area of coverage. More detail can be seen in the digital maps. Pdf versions of the maps were promised (and delivered).

Comment:
Morganza to the Gulf is in 4-5 plans and goes to Bayou Boeuf, but we never got a chance for input
- Amelia is not to be separated. And while the IPT cannot draw a line there, it can take the alignment or suggested realignment into account.

Comment:
Amelia and Morgan City have a levee but have no major protection for backwater flood protection. A tropical storm in 1992 was used by way of example. The IPT needs to review the St. Mary Parish Storm Surge Protection Study by Miller Engineering prepared earlier this year.
- Comment was acknowledged by IPT staff. A copy of the study was received as an official comment from the St. Mary Parish Government. As noted previously, the document is included herewith by reference.

Comment:
The Gibson alignment does not go all the way to the Bayou Boeuf Lock, and reference was made to the Terrebonne Barrier Plan as verification.
- Comment was acknowledged by IPT staff.

Question:
Amelia is both residential and industrial, and it is difficult to decide where to provide protection within these areas. Will the plan come up with a recommendation for this area?
- The Master Plan will not provide this level of detail at this time.

Comment:
All of St. Mary Parish must be protected.
- Comment was acknowledged by IPT staff.

Comment:
Deep water commerce needs to be considered. Also, a parish study was prepared relative to the need for flood gates by Franklin and Hansen Canal. As part of the Miller Plan, this project should be included for upgraded protect in the western part of the parish.
- Comment was acknowledged by IPT staff.

6.3.11 Amite River Basin Commission

The IPT presented to the Amite River Basin Commission at its regular monthly meeting on September 19, 2006. Comments offered at the meeting are listed below.

Question:
Together, the oil industry and the Corps have done great harm in causing coastal erosion and destroying the coast. What is in the works to get them to change their methods, and what restitution can we get so that they pay us for what they have done?
- Off shore oil revenues may end up funding future projects. The State is trying to change the regulations, and many institutionally based changes offered by the IPT and others are included in the state's protection and restoration strategy.

Question:
Let the river do what it ought to do. We have a lot of residue from destroyed construction debris—concrete and brick for example. What is the possibility of using those items to build up our coast?

- We are trying to do some of that work, but it is very difficult. It is more cost effective to go build new things rather than use existing materials in most instances. This matter has not been discussed in detail.

Question:
Will the plan address the need for oversight of levee board decisions?
- Question was addressed by IPT staff relative to levee board representation is active in the CPRA and the IPT steering committee.

Question:
You have given two substantiality different alternatives. Where are we leaning today? Which plan is more generally accepted?
- It is a consensus that the final protection and restoration plan will include parts of both alternatives.

Question:
Does any of this address saltwater intrusion?
- Yes, the Master Plan addresses saltwater intrusion.

Comment:
An article in the New York Times today was about using Mississippi River sediment to help. We are getting a lot of great publicity.
- Comment was acknowledged by IPT staff.

Comment:
So much of the problem is that we are trying to expedite freshwater into the Gulf, and that has created a lot of the problem.
- The IPT is working on a Mississippi River water nutrient budget. The budget will have a highly efficient use of the resources that can be used. The challenge is using those to the maximum without flooding other areas.

Comment:
The Caernarvon and Davis Pond projects are useful freshwater diversions, but they are not used to the maximum capability. They are susceptible to the surge issues in the basin; and what I have heard is that in the lower end of the basin, people do not think of themselves as being on the coast. You will have to communicate to them that they are living on the coast since these areas have been induced to tidal surge flooding over and over again. You have to let people know their level of surge risk. In this basin, the following is factual:

1) Freshwater ecosystems need to be protected, in particular, the cypress and tupelo swamps that protect against surge. They need to be protected and restored.
2) The Maurepas land bridge is an important critical topographic feature that protects this end from surge, and we do not hear about it enough. The Manchac area needs to be maintained, and we must do everything to protect Pontchartrain.
3) People who live in the flood plain ought to have flood insurance. If that would have been the case, we would be much better off.

- The comment was acknowledged and noted that the IPT is looking at mandatory flood insurance as an institutional policy-based initiative.

Question:
What is the possibility of getting oil companies to fund projects or portions of projects?
- Question was addressed by IPT staff noting that private sector investment has been minimal historically.

6.3.12 Grand Isle Levee District

The IPT presented before the Grand Isle Levee Board on September 26. Comments offered at the meeting are listed below. No official or specific comments were noted. Nonetheless, the board offered a consensus opinion of support for the planning process and the interagency coordination.

Comment:
Grand Isle is fully supportive of the Master Plan.
- Comment acknowledged by IPT staff.

6.3.13 St. Mary Parish Levee Advisory Committee

The IPT presented before an ad hoc Levee Advisory Committee meeting on September 26, 2006, in St. Mary Parish at the Franklin Court House. The meeting discussion focused on the positive and negative aspects of consolidating local and regional levee boards and had little to do with the actual CPRA planning process. Comments offered at the meeting are listed below.

Comment:
The Barrier Island plan and alignment options must be discussed further.
- Comment was acknowledged by IPT staff and a third meeting in St. Mary Parish was offered. No date was set however.

6.3.14 Lake Borgne Levee District

The IPT made a presentation to the Lake Borgne Levee District on September 27, 2006. Comments offered at the meeting are as follows.

Comment:
The levee board opposes the Corps levee alignment in the vicinity of Bayou Dupre and Verret. It is preferred to cross the MRGO with a gate at Verret and continue with a new 17.5-foot high levee along the northern bank of the MRGO to Bayou Dupre (see St. Bernard Plan Attachment 6)
- Comment was acknowledged by IPT staff.

Comment:
It is also requested that the 40 Arpent levee will be connected through Verret (see St. Bernard Plan) and the entire 40 Arpent levee, which separates developed areas from the Central Marsh, will be raised to 17.5 feet so that it can function as a second line of defense. This 40 Arpent connection requested around Verret is estimated to be approximately 2,400 feet in length.
- Comment was acknowledged by IPT staff.

Comment:
The Central Marsh area could function as a reservoir for overtopping waters from the MRGO and Lake Borgne and also as a storm buffer if it is kept in healthy condition with appropriate vegetation. Therefore, marsh restoration projects in this location will be supported.
- Comment was acknowledged by IPT staff.

Comment:
Marsh restoration within the Lake Borgne land bridge is supported as well due to its storm attenuation function.
- Comment was acknowledged by IPT staff.

Comment:
Where possible, a vegetative barrier (preferably trees) should separate the toe of a levee and a water body. Trees should be considered as a feature in restoration projects as well as levee projects.
- Comment was acknowledged by IPT staff.

Comment:
First hand observation indicated that those areas protected by a tree line suffered considerably less damage than areas without a tree line. Throughout the planning process, consideration should be given to structure placement to allow for the installation of healthy strong trees (such as cypress) by maintaining fresh water.
- Comment was acknowledged by IPT staff.

Comment:
The Lake Borgne Levee Board is concerned about who will operate and maintain a gate at the MRGO. The concern is that St. Bernard Parish would have to pay for a structure that would not benefit St. Bernard and yet, at the same time, increase the risk to St. Bernard.
- Comment was acknowledged by IPT staff.

Comment:
The Board supports the closure of the MRGO.
- Comment was acknowledged by IPT staff.

Comment:
If any structures are put in place to prevent the passage of water those levees which subjected to additional surge as a result will need to be upgraded to withhold the increased surge height resulting from the structure.
- Any levee constructed or upgraded needs to be designed for overtopping and must be protected against erosion and scouring.

6.3.15 Orleans Levee Board

Structures at Rigolets and Chef Pass are requested.

6.3.16 North Lafourche Levee District Committee Meeting

No comments at this time, however the board stated they would make comments at a public meeting during the week of December 11-15, 2006.

6.4 Written Comments

At each of the meetings, members of the IPT asked that participants submit comments for inclusion into the planning process and final master plan. Several parishes and organizations chose to submit either electronic or hard copies of plans. Those plans submitted are the following:

1. Biloxi Marsh Lands Corporation. The Biloxi Marsh Stabilization and Restoration Plan, St. Bernard Parish, Louisiana. St. Bernard, June 2006.
2. Miller Engineers & Associates, Inc. Engineers & Land Surveyors. St. Mary Parish Strom Surge Protection Study for the St. Mary Parish Government. Franklin, Louisiana, March 2006.
3. Ronny Paille, U.S. Fish and Wildlife Service, Ecological Services. Louisiana coastal Protection and Restoration Final Technical Report to Congress, Plan Formulation Aid Report, Provided to U.S. Army Corp of Engineers, New Orleans District/Vicksburg District. Lafayette, Louisiana, October 2006.

4. Shaw Coastal, Inc. Town of Jean Lafitte Hurricane Protection Plan, Prepared for West Jefferson Levee District. Westwego, Louisiana, September 2006.
5. USDA Natural Resources Conservation Service. Herbert Canal Watershed Resource Plan. Vermilion Parish, Louisiana (DRAFT). Alexandria, Louisiana, May 2006.
6. Vermilion Soil and Water Conservation District. Bayou Tigre Watershed Project Proposal. Vermilion Parish, Louisiana, October 2002.

In addition to published or draft documents, the following public comments were submitted August 21- October 9, 2006.

6.4.1 Rod E. Emmer

Assessment of the Master Plan and Recommendations

Rod E. Emmer, Ph.D.
August 21, 2006

Under BACKGROUND excerpts identify the key concepts that capture the essence of the nature, purpose, principles, and conclusions of the Louisiana Comprehensive Coastal Protection Master Plan Formulation Report. The ASSESSMENT OF THE PLAN AND RECOMMENDATIONS were developed in consideration of the background material.

Background

p. i The document is presented as a "comprehensive coastal master plan" and is portrayed as "an integrated plan" that will "provide for protection of coastal communities and infrastructure… " (p. 1)

p. 1 The evaluation was "based on its benefits in reducing storm damage to communities and infrastructure..."

p. 4 PURPOSE
The purpose of the plan is to "formulate and implement a strategy for long-term comprehensive coastal protection including policies, plans, and programs that integrate a substantial solution to hurricane protection and coastal restoration."
(ACT 8 of the First Extraordinary Session 2005 includes "projects". The reason "projects" is omitted is not explained.)

p. 4 PROGRAM PRINCIPLES
Protection will be provided "through the use of a holistic, comprehensive plan incorporating structural and non-structural measures."
(Nonstructural is not defined, but appears to be represented by "elevation", "building codes", and "evacuation routes".)

p. 4 The State and Nation must conserve, restore, etc. coastal Louisiana "while encouraging responsible use of coastal resources and recognizing that it is in the public interest of the people of Louisiana to establish a balance between sustainable development and conservation."

p. 5 "Storm damage reduction can be achieved by many combinations of strategies, such as … sustainable wetland landscapes, floodgates or barriers on channels …, building codes, and evacuation routes."

p. 5 PLAN FORMULATION PRINCIPLES
"As defined by Act 8 of the First Extraordinary Session of 2005, coastal protection means plans, projects, policies, and programs intended provide hurricane protection or coastal conservation and restoration."

p. 7 COASTWIDE PLANNING OBJECTIVES
"The coastwide planning objectives, which represent attributes of any plan …" include:
"A. Reduce storm damage vulnerability of coastal communities, resources, and infrastructure."

p. 11-12 The document assesses the risk of vulnerability of the coast and builds on this information.

p. 16 Table 8a – PU-1 Objectives and Measures Table – Concentrated Assets".
This table "sets out the planning unit objectives, the coastwide objectives they reflect, and possible measures to achieve them."
The Coastal Objective is "A. Reduce storm damage vulnerability of coastal communities, resources, and infrastructure."
It appears "Measures" means "policies, projects, plans, and programs" as specified in Act 8 SES of 2005.

p. 17 Strategies "provide variable levels of structural protection with non-structural alternatives."

Assessment of the Plan and Recommendations

1. The document professes to be a "comprehensive coastal protection master plan" as the reader is reminded frequently throughout the Summary Report. Comprehensive means inclusive and covering completely. It may be comprehensive in theory, but it is not comprehensive in fact. For the most part, policies, plans, and programs are ignored or are given only token, superficial recognition. The document does not define "policies, plans, and programs" except to reference Act 8 of the SES of 2005 and say they may have their origin in other studies. Readers cannot objectively assess the application of alternative policies, plans, and programs to the built environment (Coastwide Planning Objective A) because of the minimal treatment they receive.

2. The document is not "an integrated plan that provides protection of coastal communities and infrastructure" nor can the reader conclude "protection of coastal Louisiana is through a holistic, comprehensive plan incorporating structural and nonstructural measures." Hurricane protection is more than building levees, closing canals, placing sand on barrier islands, and creating wetlands. Hurricane protection has a human component as well, for example keeping people out of harms way through acquisition, relocation, removing or preventing construction of critical facilities in high hazard areas, setbacks in storm surge zones, flood proofing, and insurance. In other words, hurricane protection reduces or eliminates the risk and vulnerability of people through actions taken at the parish and community levels of government. We never read about parish and community responsibilities and what individuals can do to help themselves. Where are these measures if this is an integrated plan?

   To achieve storm damage reduction experienced and knowledgeable planners and wise decision makers incorporate all options including "nonstructural" measures into a comprehensive methodology. The opportunity was missed in this exercise. The Master Plan does not define, accurately describe, or thoroughly present the concept of "nonstructural". Without this minimal treatment, "nonstructural" alternatives can never undergo a rigorous evaluation of their potential contributions to storm damage reduction. At best, use of the term "nonstructural" demonstrates a lack of understanding of the concept. At worst, the study approach is purposely deceiving, saying "nonstructural" measures are considered but designing the study so only structural projects appear as the best solutions.

   To understand the concept of "nonstructural" preparers should review the literature. Begin with: U.S. Water Resources Council. 1981. Floodplain Management Handbook. Prepared by Loss Reduction Associates. Washington, D.C.: US. Government Printing Office. September. 69 p. plus appendix. Additional source documents exist and are readily accessible.

   The discussion of nonstructural measures should be completely rewritten and strengthened to make nonstructural options meaningful alternatives. Then the measures should be reassessed and the tables (in particular Table 8a) revised.

3. The PURPOSE of the plan is to "formulate and implement a strategy for long-term comprehensive coastal protection including policies, projects, plans, and programs…" PROGRAM PRINCIPLES means protection will be provided "through the use of a holistic, comprehensive plan incorporating structural and non-structural measures."

   See: Table 8a – PU-1 Objectives and Measures Table – Concentrated Assets.

   The Coastal objective (Column 6) is "A. Reduce storm damage vulnerability of coastal communities, resources, and infrastructure."

   Assigning the 82 Measures in Column 7 to four categories - Plans, Projects, Policies, and Programs (Act of the First Extraordinary Session of 2005) reveals a skewed distribution:

   Plans – 2
   Projects – 79
   Policies – 1
   Programs - 0

   Where are the "nonstructural" measures the reader was lead to believe were integral to the Master Plan? Plans? Policies? Programs? These categories when developed to their potential and creatively applied to the coastal landscape can "Reduce storm damage vulnerability of coastal communities, resources, and infrastructure." They certainly can be supplements or complements to the favored Projects.

   The document does not achieve its PURPOSE or conform to the PROGRAMS PRINCIPLES. The focus of the Master Plan is clearly justifying "PROJECTS".

4. Given the above disproportionate distribution of measures, it is impossible to reach the conclusion that the plan offers "variable levels of structural protection with nonstructural alternatives."

5. The Master Plan should include a discussion of how the state and Federal agencies will consider a parish or municipality: 1. policies as expressed by their planning commission through its adopted Master Plan (LRS 33.109.1); 2. the Hazard Mitigation Plan; and 3. The Phase II NDPES program when locating levees.

6. The reader is told the Master Plan will result in "encouraging responsible use of coastal resources". Similar to wetlands, floodplains are a coastal resource that has values and functions. The Master Plan does not address "responsible use" of coastal floodplains as an integral component of storm damage reduction. Simply building levees and creating wetlands without incorporating "nonstructural" options extends our "false sense of security" to future developments. We have not made progress, but repeat our error of relying solely on "structural" projects. Have we learned nothing from the floodwall failures and levee overtopping in 2005? "Responsible use" of coastal floodplains will contribute to storm damage reduction and that is what we are all working to achieve.

7. When I read the title I thought, "This "Master Plan" finally recognizes the need for coordinating actions through comprehensive land use planning, nonstructural measures, policies, programs, and "structural" elements." After I read the report I realized I had jumped to a conclusion that did not materialize.

   The Master Plan should be revised in one of two ways.

   A. The discussion of the plan methodology and its development should be reworked to eliminate references to policies, plans, and programs and how this is a "comprehensive" and "integrated" approach. At the same time the title should be changed. As written it is misleading.

   B. The discussion of policies, plans, and programs should be expanded and strengthened and the analysis (see for example Table 8a) should be amended to include the new information.

6.4.2 Barataria-Terrebonne National Estuary Program

6.4.2.1 Michael Massimi

In section 4.1 of the Plan Formulation Summary Report, the authors mention the Estuary Program as a source of information about the coast and restoration measures. Much appreciated. But I would like to make certain that the Comprehensive Conservation and Management Plan for the B-T estuary be incorporated into the planning effort for the pertinent region. The CCMP took five years to complete, had multiple stakeholder authorship (including DNR), and most importantly, received federal and state approval for implementation in 1996. It now serves as the guiding document for restoration activities, among other things, in the region. Any measures proposed by the Master Plan for Barataria or Terrebonne must be in agreement with the BTNEP CCMP. The Estuary Program office and Management Conference would hate to find ourselves at cross-purposes with the state's Master Plan. A downloadable electronic version of the CCMP (minus the appendix) is available at http://www.btnep.org/default.asp?id=30 or I would be happy to deliver as many hard copies as you would like.

At the presentation I mentioned that we would like to see marsh creation emphasized in the plan. To elaborate, we believe that pipeline delivery of dredged sediments is a proven technology for marsh creation, ridge restoration, and shoreline protection that will build new land and quickly protect resources and infrastructure. But more importantly, we can maximize the economy of this technique if we plan for the most aggressive program.

By considering as many project site polygons as possible, we can achieve the maximum economy of scale by utilizing a permanent infrastructure of pipelines and a geographically prioritized list of fill sites. If each site is taken as an individual project, we will be wasting valuable resources by constantly having to move pipes and reconsider project designs. The consulting firm CH2M Hill, by contract with DNR, looked at pipeline sediment delivery as an alternative to the Third Delta project. They identified 76 site polygons in their report and exhaustively evaluated each for suitability. This included estimates of sediment sources and availability, pipeline routes, required amounts of fill material, degree of existing confinement, degree of influence on natural hydrology, sources of freshwater inputs, habitat types, oyster leases, landowners, and myriad other criteria for each polygon. In short, CH2M Hill's work has already established that these are viable marsh creation sites. The BTNEP proposes that all of these sites be included for evaluation in the Master Plan, especially considering that the plan is supposed to have a 100-year outlook. The CPRA should make every effort to obtain the CH2M Hill report and incorporate it into the Master Plan.

Freshwater diversions in general should be thought of as a long-term protective and sustaining strategy, not a land-building strategy. We believe that existing marsh, as well as newly created marsh, can and should be sustained over the long term by diversions. These diversions may be many in number, but need not be large. They should be designed and located to sustain critical marsh, not to radically alter salinity regimes. All diversions should be controlled to allow for adaptive management, and none should introduce so much freshwater into any one system as to greatly disrupt fisheries and wildlife dependent on healthy salinity gradients. We are extremely concerned about large-scale channelized diversions in particular, as the channels will act as conduits for saltwater to enter the estuary during periods of low flow, no flow, or storm surge.

The plan's two rationales seem to link mechanical marsh creation with the greatest possible structural protection in one alternative, and "sustainable" restoration features like diversions with a lesser level of structural protection in the other. We believe that this artificially separates two types of projects that should be used in tandem: pipeline sediment delivery and small diversions. Of course we see that both types of projects are considered to some extent in both plan alternatives, but the BTNEP would like to see maximum marsh creation (and ridge reconstruction, shoreline protection, and barrier island restoration) linked with multiple small diversions and minimal levee building. We propose a "30 ft. surge at coast" level of protection for greater New Orleans only, smaller ring levees where appropriate, and an extremely aggressive plan for immediate marsh creation to be sustained in the long term by diversions.

6.4.2.2 Kerry St. Pé

I also thank you for allowing us to provide input into the draft plan yesterday.

John makes some excellent points here that many of us support. As a supplement to John's comments, I would like to add the following point.

There would most likely be wide-spread agreement that levees placed through a wetland system would result in a negative impact to the ecological functions that these systems provide. Additionally, there would also most likely be a reasonable amount of agreement that, in the current degrading condition of our wetlands system coupled with the public and political outcry for the immediate need for storm surge protection, that new levees are going to be a part of the new state plan.

These 2 points provide some obvious conflicts in the minds of those charged with protecting and restoring our wetland system while providing community protection from ever increasing threats from storm surges. Compromise seems to be the way to resolve this and it was in the spirit of compromise that the levee alignment we have been calling the Hwy 90 Alignment was offered. That alignment was placed along existing hydrological barriers so that it offered a way of providing some levee protection with the least amount of ADDED ecological damage.

In other words, if we are going to construct a new levee, then the most environmentally sound place to put it would be along an existing hydrological barrier and not necessarily along the shortest, straight-line path.

Thanks to all for listening.

Kerry M. St.Pé, Program Director
Barataria-Terrebonne National Estuary Program

6.4.3 Lake Pontchartrain Basin Foundation

Thanks for the review of the draft LaCPR Master Plan for coastal Louisiana. Everyone with IPT and their consultants have been working very hard. I do have couple of comments or suggestions. During the formal draft release, we will have additional formal comments.

A few observations:

1) The maps are very helpful. However, the list of projects on the maps is very hard to read.

2) We find the “Resolve/Close MRGO to Deep draft Navigation” measure unnecessarily vague. Is it not the official policy of the state that the MRGO is to be closed? Nevertheless, final authority rests with the US Congress. We suggest the measure be described as follows “Pending approval of the US Congress, closure of the MRGO to deep draft navigation”

3) For Planning Unit 1, LPBF has a strong preference for alternative 2. This includes more diversions providing a more sustainable coast with more coastal restoration.

4) We recommend a set of maps be generated for the draft release with all the alternatives with an overlay of official evacuation routes.

5) We recommend that at least in Planning Unit 1 that the habitat goals be defined by the 1912-1932 baseline.

6.4.4 Vermilion Parish Coastal Restoration Advisory Committee

6.4.4.1 W.P. "Judge" Edwards

Public comment from W.P. Judge Edwards, Vermilion Parish Coastal Restoration Advisory Committee.

Louisiana Comprehensive Coastal Protection Master Plan
Plan Formulation Report

Comments and Recommendations
W.P. "Judge" Edwards, Vermilion Parish Coastal Restoration Advisory Committee

Executive Summary, pg. iii – Fourth sentence should read: "Further **input was** gained …" in lieu of "Further **were** gained…"

Since stated in 1.2 Master Plan, Purpose and Principles, "Plan formulation principles have also been defined to serve as the basic truths that cannot be violated during plan formulation", therefore the recommended following changes are considered vitally important.

Overview, 1.2.2 Program Principles, Bullet 6, pg. 3 – Second sentence should read: "…that reduces, **but does not necessarily eliminate**, scientific uncertainty…"

1.2.3 Plan Formulation Principles, Bullet 6, pg. 4 – First sentence should read:
"…nature of the coastal system **should recognize the vast differences between the eastern and western regions of the state."**

1.2.3 Plan Formulation Principles, Bullet 8, pg. 4 – I would recommend deleting the last sentence of this paragraph that begins with "Because" and ends with "coastal ecosystems". Dedicated dredging and/or sediment mining is often done in south Louisiana. The only point in question may be the depth from which material is extracted. Leaving this sentence in could cause an already costly, yet highly effective, method of marsh reclamation to be unaffordable if this sentence is applied.

1.2.3 Plan Formulation Principles, Bullet 12, pg. 4 – Delete the words "**avoid or**" in this sentence. If the wording is left in, it is conceivable that a hurricane protection levee, not yet constructed in southwest Louisiana, may be prohibited from being constructed in the most appropriate place.

1.6.2.1 Relative Damage from Storm Surges, pg. 10 – It is stated that to quickly assess the impacts of storm surge at the coast, the SLOSH model was run for all five planning units. The flood risk assessments provide the basis upon which current requirements for improved flood defense are based, and are used to identify those assets which are at greatest risk. I believe that some surge height numbers for southwest Louisiana are very wrong, and as a result some southwest Louisiana communities will not identified as being at risk (see charts).

1.6.4.1 Existing Conditions and Problems Identification Tables, IV. Saltwater Intrusion, pg. 16 – No mention is made of the removal of clam and oyster reefs from the Louisiana coastal ecosystem as a cause of saltwater intrusion. All coastal charts in the state date back to the time prior to the dredging of these reefs. These charts show that reefs slowed the tidal flow in and out of the estuaries allowing for a head of freshwater to be maintained in the upper reaches of the systems. Therefore their removal is believed by many to be a prime cause of saltwater intrusion. I recommend that this be listed in the causes of saltwater intrusion.

1.7 Plan Formulation Rational, the first rational, item 2, pg. 18 – I recommend that the sentence read "…minimize overall length of flood protection features, **while maximizing the number of acres protected,** regardless of …" For example, some would have us build a ring levee around the town of Gueydan. This would both limit future growth and leave the economic base of the community susceptible to hurricane storm surge.

1.7 Plan Formulation Rational, the second rational, item 2, pg. 18 – I recommend adding to the end of the sentence "…**and maximize the use of dredge material, where possible, to create storm surge buffers.**

Page 34 – It is unclear to me what wetlands are experiencing problems related to disconnection from riverine sediment sources. If there is such a problem, it is due to as much as a lack of a river as to anything. This should be made clear.

Page 34 – It is stated that both alternative plan 1 and 2 must include 4 measures of the LCA. Two of these are studies. This master plan should focus on action, not more studies. Should academia need to study, they can monitor the results of the plan and as stated the plan will be actively managed.

Page 35, Item 5.2 – Bank stabilization along Freshwater Bayou should be for the entire length of said canal, not just Bell Island to Freshwater Locks as indicated.

Page 37, Item 6.1, Par. 3 – This paragraph speaks of the loss of wetlands due to drowning because they are hydrologically isolated. Areas where this has occurred have typically been pumped off marsh used as pasture and not simply segments of marsh isolated by canal levees. Levees in Southwest Louisiana provide an ideal situation for dedicated dredging and proper marsh management. Therefore, it should not be insinuated that they are a problem.

Page 39, Item 6.3, Par. 2 – This strategy provides ring levees around the larger communities in Planning Unit 4. These communities have an agricultural base to their economy. With their economic base destroyed by salt water, there is little point in protecting these communities. Therefore, a continuous levee to the south is more desirable.

Page 39, Item 6.3, Par. 3 – Stated in this paragraph is that Grand and White Lakes will be managed as freshwater lakes. Currently, the COE spends millions of dollars annually maintaining four (4) lock structures on these lakes and zero (0) dollars on levees and other infrastructure that protect them from salt water intrusion. One could liken this to caulking the windows on their house, while the wind blows through the hole in the wall.

Page 39, Item 6.3, Par. 4 – Freshwater Bayou should also be included for bank protection.

Additional comments are handwritten on charts.

Recommendations for Planning Unit Maps

CPRA-IPT/PUM/LDNR, Map Document dated 5/11/06

1) Figure 5.4, Planning Unit 3b, Alternative Plan 1 Measures, Measure 1

It is unclear where this levee alignment will end. It should be stated here that it will tie into the levee system selected in Unit 4 in order to maintain the integrity of the Mermentau Basin. (Similar large marsh areas are protected by proposed levees in Planning Unit 1 (Alt. 1 & 2), Planning Unit 2 (Alt. 1 & 2), Planning Unit 3a (Alt 1 & 2), Planning Unit 3b (Alt. 1).)

Opinion: It appears that only in southwest Louisiana where soils are more stable (and therefore capable of supporting a 30' hurricane protection levee), but where today's population is less dense, that the hurricane protection levee is moved north to the fast lands. It should be noted that a significant portion of the Greater New Orleans population has moved to this region of the state and if we are planning for the next 100 years we will make a serious mistake if we do not plan a wetland reservoir into this planning unit to absorb tropical rains as well as protecting it from storm surge. It has been stated by Bill Fenstermaker that the greatest threat of flooding to southwest Louisiana is from torrential rains rather than storm surge. Therefore having the wetland reservoir capability is wise planning. Having wetlands behind the levee provides several functions:

1) as a reservoir for freshwater to be used for agriculture, i.e. the Mermentau Basin
2) as a reservoir to retain excessive rainfall as might occur in a storm event
3) as a freshwater marsh that could be restored should sea levels rise at the fastest projected rate. Without areas like this <u>all</u> wetlands would be lost without any opportunity for restoration or reclamation.

2) Figure 5.4, Planning Unit 3b, Alternative Plan 1, Measure 11

This measure states "Freshwater Bayou bank stabilization – Belle Isle to locks." "**Belle Isle to locks"** should be deleted as there are numerous areas in addition to this segment of the channel that need stabilizing. One could insert "…**from Intracoastal to the Gulf of Mexico."**

Opinion: One would wonder with the great significance given to the importance of protection of barrier islands in Units 1, 2, and 3a, why no barrier island protection is planned for this planning unit while it still has barrier islands to protect.

3) Figure 5.5, Planning Unit 3b, Alternative Plan 2

Measure 1 should indicate that this measure will tie into the selected hurricane protection measure that is selected in Unit 4. Measure 5 should read, "…stabilize banks of Southwest Pass off Marsh Island **and the Rainey marshes.**" In measure 7, should read "…stabilize banks of the GIWW **and Freshwater Bayou.**" In measure 11, add at end of sentence, "**and storm surge buffers".** In measure 14, Freshwater Bayou bank stabilization should read, "**from Intracoastal City to the Gulf, or all**", not just Belle Isle to Freshwater Locks.

Planning Unit 4, Boundary and Base Map

1) Comment on legend: On the map are many areas that appear as a "V", yet the legend makes no reference to these landmarks.

2) Figure 6.2, Planning Unit 4, Concentrated Assets and Distributed Assets

Number 8 on the legend is titled "Coastal Communities," however the only coastal communities that are identified as such are Holly Beach, Freshwater City and Intracoastal City. I recommend adding Johnson's Bayou, Constance Beach, Creole, Grand Chenier, Pecan Island, Little Prairie, Forked Island, Cow Island, Esther, Mouton Cove, Henry, and no doubt several others.

3) Figure 6.4, Planning Unit 4, Alternative 1, Measure 16

This item does not appear in the correct place on the map.

4) Figure 6.4, Planning Unit 4, Alternative 1, Measure 21

This item is only partially shown on the map.

5) Figure 6.4, Planning Unit 4, Alternative 1, Measure 24

As per the Vermilion Parish Police Jury, this measure should read, "Elevate Highway 82 for hurricane protection and evacuation."

6) Figure 6.5, Planning Unit 4, Alternative 2, Measure 14

This measure is only partially shown on the map.

Opinion: If the distance covered by the ring levees were stretched in a linear fashion, parallel to the coast (whether that is La. Highway 82 or the GIWW), for a few more miles of levee, hundreds of thousands of additional acres could be protected. If properly planned, the wetlands included behind the levee could help to absorb the tropical rains that are common in this area.

Recommendations for Tables, Planning Unit 3b

Table 5.5, Distributed Assets – It is recommended that a recreational and fishing column be added to the asset list. Under recreational assets can be listed: Palmetto State Park, the Rainey Wildlife Sanctuary, State Wildlife Refuge, Cypremort Point, Boston Canal, the Oaks Canal, Bayou Tigre, and Marsh Island. Intracoastal City and Cypremort

Point should be listed under fishing ports. Intracoastal City, Cypremort Point, the GIWW, and Freshwater City should be added to the asset list in the appropriate Distributed Asset Area.

*Note typo – This is Planning Unit 3, not Planning Unit 2.

Table 5.6, Existing Conditions/Problem Identification – I have questions about many of the rankings listed on this table. Please see me for personal comments.

Table 5.7, Changes in Natural Resources – No Comment.

Table 5.8, Objectives and Measures Table - The storm surge presented under the "Current Issues" column appear to be too high for anticipated damage. For example, Hurricane Rita had a storm surge of 14 feet at Freshwater City and there was 100% devastation at Intracoastal City and Delcambre. The "Current Issues" column shows a storm surge of over 20 feet to produce greater than 50% of the area to be flooded.

Under the "Create Marsh at Weeks Bay" column (Measure 3), New Iberia should be given a positive mark.

Under the "Increase Sediment Transport down Wax Lake Outlet" column (Measure 6), Intracoastal City, Delcambre, Abbeville, and New Iberia should all receive improved coastal protection from this measure due to healthier marshes nourished by riverine sediments.

Under the "Stabilize Banks of Southwest Pass off Marsh Island and Rainey Marsh" column (Measure 9), all of the described geographic locations on this table should benefit from this measure as it stabilizes the existing barrier islands in their current conditions. This opening could easily double in width in the next 30 years.

Under the "Freshwater Bayou Stabilization" column (Measure 26), Intracoastal City, Delcambre, Abbeville, and New Iberia could all be adversely impacted if this measure is not implemented. Continued erosion of the banks and adjacent marshes will soon create a large inland bay in which the benefits of inland navigation provided by the channel are lost. The protection of the adjacent marshes to the surrounding communities is lost. And future maintenance dredging costs of the channel which will traverse an inland bay increases substantially.

Table 5.8c, Ecosystem Units –

Comment: Under EU3b-7 Acadiana Bays, the table claims there is function disruption due to subsidence, wave/wake energy, and freshwater/sediment disruption. We must be very cautious here, in that the greatest freshwater and sediment diversion project that the State of Louisiana has acquired at no cost is the Wax Lake Outlet. We are asking the Federal Government for billions of dollars to create similar situations in other areas of our state. Saltwater fishing enthusiasts have within their power the ability to kill the entire coastal restoration process if this issue is not handled properly. The scientific community fully understands that freshwater and sediment are necessary to rebuild Louisiana's coastline. Perhaps it has been worded in such a way that no one understands it anyway. Exercise caution.

Planning Unit 4, Freshwater Bayou to Sabine River

Table 6.1, Relative Damages from Storm Surge to Concentrated Assets – This chart shows several communities' chances of flooding, moving from extremely low to extremely high damage as storm surge height increases. It seems that some transitional mid-ground, i.e. low, medium, high, would result before extremely high chances of flooding. Although, I'm not sure how the scores were assigned.

Table 6.5, Distributed Assets Identification – The first sentence should say, "No coastal communities are included in these assets." Is this oversight or intentional?
Assets that need to be added in the distributed assets:
DA4-1: Exxon Mobil Gas Field at Pecan Island, Columbia Gulf Gas Plant at Pecan Island, 200+ producing wells in White Lake (various producers – check with DNR for accurate numbers), Superior Canal Field at Rockefeller Refuge, numerous gas plants west of Cameron, and other assets I am sure I am unaware of.

DA4-2: Schooner Bayou Water Control Structure and Catfish Lock Water Control Structure. To my knowledge, the railroad in Vermilion Parish was abandoned west of Abbeville in the late 1980's or early 1990's. I don't believe it exists in Cameron Parish or in Calcasieu Parish outside of concentrated asset areas or south of La. Highway 14. This asset probably belongs in DA4-4.
DA4-3: The ferry across the ship channel and La. Highway 82.
DA4-4: Highway 82 and the bridge at Sabine Pass.
DA4-6: The I-610 Loop.

Table 6.6, Existing Conditions/Problem Identification – The table indicates that there is a high amount of direct removal, i.e. dredging, from the Grand Lake/White Lake system. In the last 25 years, I am unaware of any significant detrimental dredging within the White Lake system.

Table 6.8a, Objectives and Measures Table – Concentrated Assets
Measures 12 and 13 – Add all Geographic Locations to these two columns. Looking 100 years into the future, water needs in these areas will increase tremendously. This will put a strain on the Chico Aquifer which serves this area and will probably consume all existing sources of surface water. Therefore, additional surface water sources will be needed to meet both population growth demands and ecological needs.
Measure 17, Stabilize White Lake Shoreline and Land Bridge – Lafayette, Abbeville, Crowley, and Jennings should be added to this column.
Measure 18, Stabilize Banks from Schooner Bayou to GIWW along Freshwater Bayou and along GIWW near White Lake – Lafayette, Abbeville, Crowley, and Jennings, as well as, Western Central Coastal Zone Management Communities and Agricultural and Crawfish Towns, should be added to this column.
Measure 24, Maintain Hwy. 82 for Hurricane Evacuation and Marsh Protection -Lafayette, Abbeville, Crowley, and Jennings, as well as, Western Central Coastal Zone Management Communities and Agricultural and Crawfish Towns, should be added to this column.
Measure 25, Provide Water Control Structures at Strategic Locations along Highways 82 and 27 - Lafayette, Abbeville, Crowley, Jennings, Cameron, and Lake Charles, as well as, Western Central Coastal Zone Management Communities and Agricultural and Crawfish Towns, should be added to this column.
Measure 30, Stabilize Banks of GIWW - Lafayette, Abbeville, Crowley, Jennings, Lake Charles, and Vinton, as well as, Western Central Coastal Zone Management Communities and Agricultural and Crawfish Towns, should be added to this column.

Table 6.8b, Objectives and Measures Table – Distributive Assets
Measure 21, Stabilize Banks of Freshwater Bayou – Add Planning Unit Objective: "Provide coastal protection to Vermilion Locks"
Measure 25, Provide Water Control Structures … along Highways 82 and 27 - Add Planning Unit Objective: "Provide outlets for freshwater flow under La. Highway 82"

6.4.4.2 Sherrill Sagrera

Public Comment from Sherrill Sagrera, Vermilion Parish Coastal Restoration Advisory Committee.

PU-4 Alternative Plan 1
Measures
4-1. Proposed Hurricane Protection Levee for 30-A storm surge @ coastline
4-2. Complete/Accelerate the Chenier Plain Freshwater and Sediment Management and Allocation. Reassessment Study which was included in the LCA Near-Term Plan:
4-3. Maximize freshwater inflow from Sabine River
4-4. Salinity Control structures along the east shoreline of Sabine Lake nr Blue Buck Point, Sabine Is and Black Bayou
4-5. Beneficial Uses of dredged material Program: utilize sediment from Sabine Ship Channel and dedicated dredging for marsh enhancement and construction of terraces
4-6. Salinity control structure east Hwy 82 Causeway
4-7. Stabilize Gulf shoreline and beach west of Calcasieu River to Sabine River using dredged sediment or breakwaters
4-8. Stabilize Gulf shoreline and beach east of Calcasieu River to Freshwater Bayou using dredged sediment or breakwaters

4-9. Salinity control structure in Calcasieu Ship Channel near ferry
4-10. Beneficial Uses of dredged material Program: utilize sediment and dedicated dredging for marsh enhancement and construction of terraces in Calcasieu Lake
4-11. Salinity control structures at points on east side of Calcasieu Lake to aid in salinity control
4-12. Maximize freshwater inflow to tributaries of the Mermentau h r n outside sources
4-13. Maximize freshwater inflow to tributaries of the Mermentau from outside sources
4-14. Stabilize Grand Lake shoreline and land bridge
4-15. Freshwater Introduction/Retention structure or sill on Little Pecan Bayou
4-16. Freshwater Introduction/Retention structure or sill on Rollover Bayou
4-17. Stabilize White Lake shoreline and land bridge
4-18. Stabilize banks from Schooner Bayou to GIWW along Freshwater Bayou and along GIWW near White Lake
4-19. Salinity Control on Black Lake Bayou near Hackberry
4-20. Build new chamber for navigation at Calcasieu Lack on GIWW and use old lock to evacuate excess water
4-21. Stabilize banks of Freshwater Bayou
4-22. Stabilize eastern shore of Lake Calcasieu
4-23. *Develop a plan to elevate and/or relocate assets located outside the hurricane protection Levee
4-24. Maintain Hwy 82 for hurricane evacuation and marsh protection along with maintaining Hwy 82 in good travel condition, we suggest the elevation of said Hwy from Schooner Bayou to Cameron. In addition a levy from Schooner Bayou control structure to Hwy 82 on south bank would not only buffer storm surge but maintain the integrity of the Mermentau Basin.
4-25. *Provide water control structures at a strategic locations along Hwys 82 and 27
4-26. Manage watershed to reduce rapid inflows into Mermentau Sub-basin
4-27. Restore Marsh by Filling Abandoned Canals
4-28. Utilize freshwater inflow from Atchafalaya River
3-29. Improve hydrology of the old Mermentau River Channel between Mud Lake and GOM
4-30. *Stabilize Banks of GIWW
4-31. *Toll road on tap of levee south of GlWW
4-32. Hebert Canal Watershed
4-33. North Prong-Salinity control - flood protection for Mermentau Basin
4-34. Storm buffering systems
* Not tied to specific geographic location

Hebert Canal Watershed
Location: Chenier Plain Southwest Louisiana
Problems:
1. Contamination of fresh surface water by creating shortage of irrigation water for rice and crawfish.
2. Increased soil contamination of soils rendering land, noncrop production

Implementation/ Restoration Strategy:
1. Install structural measures to protect homes, cropland and pastures
2. Raise existing levies to an eight (8) foot elevation

Progress:
1. Resource plan complete
2. Existing Levies elevations complete
3. Landowner participation

Cost: 2.5 Million
Total Acres: 4,400 acres
** Area is split between Region 4 and 3b**

Region 4 Alt. 1 Measure 33
Location: Vermilion Parish North Prong
Problems: The spoil banks have numerous breaches allowing saltwater/storm water to enter the Mermentau Basin.
Implementation/ Restoration Strategy: Lift remaining spoil bank, install flap gates to drain through structures allowing refurbish of marshes and the removal of excess water from basin without the intrusion of salt water.

Progress: New project
Cost: To be determined (Should be incorporated within measure 24)

Storm Buffering Systems
Region 4 Alt. 1
Location: South Vermilion Parish
Problems: With the loss of buffering wetlands, the area of storm protection has diminished.
Implementation/ Restoration Strategy: The existence *of* numerous eastwest oil field canals lined with woody vegetation has acted as a buffer. The raising of these spoil banks would create a buffer to better protect the area.
Progress: Conceptual
Cost: Possible *$0* Cost
Planning Unit 3b—Alternative 2—Measures

1. Construct hurricane protection (30-foot storm surge at. the coastline) for Berwick and Patterson and levee alignment from Wax Lake Outlet to the Vermilion River.
2. Completed/Accelerate the Louisiana Coastal Area (LCA) Near-Term Plan including:
   a) Stabilize Gulf Shoreline at Point Au Fer Island.
   b) Convey Atchafalaya water to northern Terrebonne Marshes.
   c) * Acadiana Bays Estuarine Restoration Feasibility Study.
   d) *Upper -4tchafalaya Basin Study.
3. Increase sediment transport from the Atchafalaya River down Wax Lake Outlet.
4. Stabilize banks *of* Southwest Pass off Marsh Island.
5. Stabilize banks of the GIWW.
6. Stabilize shorelines - Freshwater Bayou to Southwest f ass.
7. Stabilize shorelines across south shoreline of Marsh Island Eorn Lighthouse Point to South Point (east of Mound Point) using dredged sediments and/or breakwaters.
8. Beneficial use of dredged material and dedicated dredging wherever possible to rebuild marsh shorelines, historic reefs, and barrier islands.
9. Stabilize and implement plan to elevate and/or relocate assets located *outside* of the hurricane protection plan.
10. Freshwater Bayou Bank Stabilization - Belle Isle Bayou to Freshwater Lock.
11. Create marsh at Weeks Bay (from A1 - M3)
12. Hebert Canal Watershed 3B - 4
13. Bayou Tigre Watershed Project
14. Storm Buffering System

* Not tied to geographic location.

Storm Buffering Systems
Region 3b Alt. 2
Location: South Vermilion Parish
Problems: With the loss of buffering wetlands, the area *of* storm protection has diminished.
Implementation/ Restoration Strategy: The existence of numerous east/west oil field canals lined with woody vegetation has acted as a buffer. The raising of these spoil *banks* would create a buffer to better protect the area.
Progress: Conceptual
Cost: Possible *$0* Cost

Bayou Tigre Watershed Development Project
Region 3b
Location: Southwest Louisiana
Problems: Area is prone to major flood damage to homes and property due to

1. Run off of up-stream areas

2. Inadequate/restricted drainage
3. High tidal/storm events
4. Water quality impairment

Implementation/ Restoration Strategy: Installing water control structures with flap gates to prevent storm/tide waters from entering system and holding a manageable system water level to accommodate up-stream runoff.
Progress: Survey done-Plan of work complete
Cost: To be determined
Total Acres: *33,435*

Create Marsh at Weeks Bay
Location:
Project is located in Iberia Parish, Louisiana, in the northeastern area of Vermilion and Weeks Bays. *(Alternative I, Measure* 3)
Problems:
Shoreline and bank erosion is occurring within this area as a result of heavy wind and wake activity. Openings along the shoreline, along with the dredging of Commercial Canal, have resulted in increased tidal energy and adverse saltwater intrusion into interior wetlands. These openings also prevent the Atchafalaya River's sediment-laden fresh water from reaching marshes within the western portion of the Teche/Vermilion Basin.
Implementation/Restoration Strategy:
Measure or measures are to reduce erosion rates along the northern shoreline of Vermilion/Weeks Bay and provide protection to Weeks Island and adjacent interior wetlands by restoring the isthmus that existed between Weeks Bay and the GIWW. Project components will include constructing retention levees for placement of dedicated dredged material to restore the isthmus to 1.0 foot above MSL, repairing critical areas along the northern shoreline of the GIWW and protecting the shoreline of Vermilion Bay/Weeks Bay as shown on the attached map. Shoreline protection can be vegetative or stone dike. Vegetative protection projects seem to have worked well on shoreline segments west of this project.
Progress to Date:
The Louisiana Coastal Wetlands Conservation and Restoration Task Force approved funding for engineering and design. Vibracore soil samples have been taken in the project area to verify foundation conditions. Initial review of these samples confirms that the bearing capacity of the bottom is very limited. Hydrographic surveys are currently underway to support hydrologic circulation modeling and design studies. This project is on Priority Project List 9.
Cost: October 2003 cost estimate $1.23 million.

6.4.4.3 Ernest Girouard

Public Comment from Ernst Girouard, Vermilion Parish Soil & Water Conservation District.

Vermilion Soil and Water District will be submitting comments on the hurricane protection plan for our Parish. Some of the projects we have in our Conservation District have already been submitted. We are aware of the tight schedule everyone is working under however; we would like to have the opportunity to review the final plan prior to it being submitted or prior to a public meeting. If this plan is to be the Parish Plan, then the public and agencies such as ours should have ample time to review, digest, and consult with others concerning these important changes which will affect us for many years.

Please give consideration to our district and the people of Vermilion parish by granting this request.
Sincerely,

Ernest Girouard

Ernest Girouard, Chairman

6.4.5 William Fontenot

I am a life long resident of Louisiana, born in Washington, grew up in Opelousas and have worked in New Orleans and Baton Rouge. In 1974 I ran for Congress against Mr. F. Edward Hebert. Some of the primary issues raised in that campaign were the threats presented by the MRGO and the failure of the Corps of Engineers to design and build an adequate hurricane flood protection system for the New Orleans Metropolitan Area. Since moving to Baton Rouge in 1975 my work has involved me with other issues like hazardous waste and water pollution across this and many other states.

The inadequate hurricane flood protection system that existed in 1974 is almost exactly what was there to protect the city in 2005. Not much had changed in all of the years since Betsy struck and drowned Chalmette, Arabi and the Lower 9th Ward. We are just lucky the predictable death and destruction was not worse.

Two of my concerns are:

1. That adequate money has not been made available to build an effective hurricane flood protection system for the New Orleans Metropolitan Area. Such a system will cost between six and seven billion dollars. Part of this system has been constructed since Katrina struck. What is needed is the additional three or four billion dollars to complete the job.

Considering that the destruction from Katrina exceeded one hundred billion dollars and the long term damage will likely reach two hundred billion we should be able to invest the relatively small amount of money needed to provide real protection. Can the state or the nation fail to find three or four billion dollars to rebuild New Orleans? I believe the answer to this question is YES.

2. The Mississippi River is not carrying the gravel, sand and silt load that was present historically and needed to build coastal Louisiana. This loss of coastal building material is a combination of decisions and projects to maintain navigation on the lower river and structures in the upper river system to improve navigation, decrease the threats of flooding and to stabilize the banks of the river system.

We cannot maintain the shipping channel at Southwest Pass. Because of the location of this shipping channel near the outer continental shelf the Mississippi River is dumping massive amounts of rock, sand and mud into very deep waters. The second problem related to the sediment load of the Mississippi River is the reduction of the sediment load in the river from all of the dams and bank stabilization projects on the Mississippi, Ohio, Missouri and all other rivers that make up the Mississippi River drainage system. All of these dams and other structures, especially those on the Missouri River have reduce the sediment loads in the Miss. river by about 90 percent of the river's original load.

All of these problems tend to make the problems of land loss and flood protection in Louisiana real National problems. We cannot solve these inadequacies on our own and they definitely cannot be solved by only looking for answers below I-10.

Please let me know if any of this makes sense.

Sincerely yours,
William A. Fontenot

6.4.6 Windell A. Curole

COMPREHENSIVE HURRICANE PROTECTION
PLAN AND CONSTRUCTION

1. Protect evacuation routes with a hurricane levee system or flood proofing.

2. Plan for freshwater and sediment diversion projects to regain natural protection from storm surges.

3. Coordinate on-going flood studies by the Corps of Engineers and others. State and local officials should decide when and where the flood protection should be directed.

4. Consolidate finances through local, state and federal funds. The state has to focus on tidal flooding along with its river flooding responsibilities.

5. Keep the public informed of the threat a hurricane poses to them and their property.

6. Increase level of already constructed hurricane protection levees to category 4 or 5 standards.

7. Plan for internal drainage from the upper reaches of the drainage basin to the barrier islands.

    a) Gravity drainage through water control structures in the hurricane levee
    b) Interior drainage levees
    c) Pump systems
    d) Channel improvements

8. Protection of infrastructure (highways, navigation channels)

9. Stress elevation in construction of buildings through education not regulation.

The most dependable way to protect from all types of flooding (river, rainfall, or hurricane) is constructing buildings with as high an elevation as possible.

Windell A. Curole

03/28/00

6.4.7 Restore

Public Comment from Michael Tritico, Biologist and President of RESTORE

RESTORE
P.O. Box 233
Longville, LA
70652

Thank you and the Shaw Group for inviting me to the planning meeting yesterday at DNR in Baton Rouge. I know that I sounded frustrated about the way things have developed or not developed over the years since I founded our little environmental group RESTORE in 1974. We have testified in many hearings, sent many comment letters, participated in one thing after another, always trying to get across our point-of-view with reference to facts and using straight language, only to see that we are about exactly where we were thirty years ago when it comes to public safety during floods and hurricanes, and we are even worse off than we were where ecosystem restoration is concerned. The two concepts are very much intertwined, and I suppose that at least that reality may be finally recognized by some people.

Some of us talked too much yesterday and some people had very little time to say whatever was on their minds, so I probably will, in the future, submit my comments by mail. I did not get into specific items that were in the presentation yesterday but I do appreciate the chance to comment on them. I will do that shortly but first I want to summarize and re-emphasize what I did say yesterday (and I hope that this admittedly-not-mainstream perspective will somehow make it into reports that will be read by final decision makers.)

One of the other participants wanted to know if what I was saying yesterday was RESTORE'S "official position" and I told him that it was. We have changed our position very little in all these years. The one thing that we have changed, as I think I mentioned, is that, since society has wasted decades addressing the loss of wetlands, now we believe that it is too late to be trying to save or restore areas right near the coast, that salvation and restoration efforts would be better expended in the marshes and forested wetlands that have some degree of elevation above sea level and some distance between them and the surf zone. We do see the value of "marsh building" using reestablishment of distribution of large amounts of sediment into shallow sea areas but we do not believe that other structural “fixes" can be sustained given the acceleration of the rise in sea level and the likelihood that global warming will lead to increased tropical storm frequencies and intensities.

RESTORE believes that what would be best for people and for the rest of the ecosystem would be to relocate humans to high ground and let nature reestablish an equilibrium unhampered by our interventions.

As the presenter O’Neil said yesterday, people in this country have a right to live wherever they want to live, and that goes planet wide for everything from nematodes to polar bears. However, there is a natural selection process that culls out the organisms that choose to live in unsuitable habitats. RESTORE has tried for all these years to resist the temptation to "just let it go, if they are fool enough to live below sea level, let them drown." Our main reason for trying instead to get people to relocate has been the fact that children, even of fools, are not necessarily fools but do not have the authority to override their parents' irresponsibilities. We have wanted to believe that, if society stopped bailing out people who lived in denial and instead made clear to those people that some decisions are just stupid, that many of those people would understand that it makes no sense to stay where disaster is inevitable.

We are grieved that despite warning after warning, and now even after a far-less-than-worst-case catastrophe in New Orleans but one that should have made perfectly-clear the most basic truths about living at or below sea level, the drumbeat now is "rebuild, rebuild the deathtrap, rebuild the deathtrap."

In our opinion, the Mercies have been used up, the job will be finished. We think that anyone who uses "balance" and "compromise" as excuses to rebuild that deathtrap will have on their hands the blood of the next set of drowning victims. (Mr. O'Neill yesterday mentioned that people in his area, Chauvin, and a nearby Native American tribe were calling for levees. The Native Americans over here were nomadic. They took advantage of the Chenier Plain Coastal Ecosystem, harvested its renewable surpluses, but knew better than to stay down there during hurricane season. I am a member of a remnant of that group. Our band is called The Four Winds Tribe because it was scattered by pressures from newcomers. However,
even though some of our members love to shrimp and crab, our primary domicile is, like our forefathers', up here in the piney woods.)

As I said yesterday, levees are a failed concept. Yet I see in the Comprehensive Master Plan Update and its attached maps all sorts of proposals for levees, not just in New Orleans. Those will create false senses of security and make it impossible for nature to reestablish itself (which reestablishment would be the best way to protect human life).

Levees will lead people into investing their energies, money, and other resources in places that are dead-end, and eventually all those investments will be lost. Why should those of us who do not want to see that happen to our fellow citizens participate in setting it up to happen? Why should high ground Louisiana and high ground America continue to be dragged down into the quicksand of denial that pervades lowground thinking? Why should our resources be invested in losing deals? More importantly, why should we have the blood of the next set of drowned children on our hands?
I was very distressed yesterday to hear Mr. ONeill say something to like "at least in Southeast Louisiana, with its numerous levee boards, we have a head start on this problem. Now we are going to have to scramble to get the rest of the state set up with levee districts." **That kind of statement clearly-reveals a locked-in bias in the very people who claim to be conducting an open-minded planning process.**

In the early 1700's the French engineer de La Tour resisted orders to build a town at the current location of New Orleans. He said he could not keep it dry, that it would be unsafe and lead to a loss of resources. The governor did not want to hear that since it would mean that the sailing ships would have to navigate more turns going upstream to high ground where La Tour wanted to build the town. So, for three hundred years people have been trying to "shackle" the Mississippi River and keep the Gulf of Mexico out of their New Orleans living rooms.

After the Great Flood of 1927 a great Louisiana biologist, Percy Viosca, explained that the proposed massive new levee system would backfire by preventing river sediment from spreading out, nourishing the marshes, and sustaining the ecosystem that was vital to not only hurricane protection but also the seafood supply. He also was overridden.

It is not that many people have not seen the truths or spoken them to their fellow citizens, for 300 years. What has happened is that the political leadership has not had the strength and courage to PROPERLY represent the best interests of their constituencies, instead having chosen to take the paths of least resistance and give the entrenched economic interests what they want even if it is economically-shortsighted and contrary to sensible public safety policies.

America must change that momentum and turn toward common sense. We are not a country with limitless resources. We do not want to become beggars in the eyes of the rest of the world as Louisiana has become a beggar in the eyes of the nation. If we act like beggars we will be treated like beggars. We must move toward self-sufficiency and to do that we must not waste resources on bad ideas. We must just tell people "no" if they are asking for dead-end sharing of our energies and assets.

To give people the idea that if they establish a levee board the Feds will help fund new pet projects is just the opposite of what we ought to be doing. As Randy Lanctot of the Louisiana Wildlife Federation said yesterday, building the "Great Wall of Louisiana," that is, the levee along the entire coast of the state, is just absurd, and as Percy Viosca said, it will just backfire, in way after way.

I mentioned yesterday that I might be more focused (or obsessed?) with these issues since my Aunt Alice died during Hurricane Audrey in Cameron, LA in 1957, a hurricane I experienced in Lake Charles. I went through Hurricane Betsy in 1965 in New Orleans and saw acquaintances' homes flood then, with no break in the denial that those people embraced. I went through Hurricane Rita here on high ground in the "piney woods" Mr. O'Neill sarcastically-referred to several times yesterday, and, except for having to house some "last-minute" Lake Charles refugees and their 5 dogs, I made it through well-enough, (I have said in a FEMA meeting that the planners should not count again on the hospitality we first-high-grounders showed during Katrina and Rita to the last minute dumbasses. Next time the last-minuters can weather the storm on the highway because their attitudes and lack of planning put too much a burden on those of us who'd gotten ourselves ready and had hoped that everyone else had done the same.)

About that planning by lowlanders: I do want to repeat in writing something I said yesterday, that, despite my personal experience with some of the Rita refugees, I am very pleased that **Southwest Louisiana had ZERO FATALWITIES despite getting hit by Rita, one of the top five strongest hurricanes ever recorded in the Atlantic Basin.** That survival was the result of many years of not just planning, but quiet yet firm diplomacy by some heroes in the Calcasieu Office of Emergency Planning, led by Dick Gremillion. He understood the significance of the National Hurricane Center's SLOSH Model which showed 27 feet of sea water at Interstate 10 in Lake Charles during a Category 5 storm on a certain path. He and the other OEP people made sure that the local political leaders also understood that reality.

Then, when Rita approached, there had to be a double evacuation since Katrina's refugees had jammed all available lodging and shelters in Lake Charles. The politicians knew that it would be a big embarrassment if OEPs Contingency Plans were not followed immediately and people drowned. All the decision makers
met and then spoke publicly with unity. That caught the attention of the residents who noticed that there was not the usual separation of attitudes among the leadership. People listened and left when they were told to leave. Some have said that the reason everybody left was the freshness of what people had seen happen after Katrina in New Orleans, but I know from having watched Southwest Louisiana all these years that **the**
Audrey experiences, the planning by OEP, and the unity of the political leadership here saved all the lives, and <u>that is a model that should become a major part of the Coastal Protection and Restoration Authority Plan.</u>

The Southwest Louisiana Chenier Plain Coastal Ecosystem is designated as Planning Unit 4 in your presentation. Let me make a few comments on some of the "Measures" that have been proposed in this area. (I will try not to comment, beyond what I have said earlier, about measures proposed in the planning units to our east.)

PU-4 Alternative Plan 1 Measure 4-1, a proposed levee for a 30-foot storm surge, mapped across a distance of about 120 miles in the upper marsh, part of the “Great Wall of Louisiana," would exacerbate hydrological interruptions and lead to further degradation of the ecosystem as well as encouraging more precarious residential development in the zone just inland from what appears to be the 10 feet above sea level contour. RESTORE opposes Measure 4-1.

PU-4 Alternative Plan 1 Measure 4-23, “develop a plan to elevate and/or relocate assets ..” That makes a lot more sense and should be the overriding Measure for any and all areas along the Louisiana coast!

PU-4 Alternative Plan 1 Measure 4-1, salinity control structures on the Louisiana side of Sabine Lake... we understand the thought, trying to counteract intrusion caused by human alteration of natural hydrological balms, but we believe that such well-intentioned stopgap measures, even though they might protect the wonderful Sabine National Wildlife Refuge for a few decades, would eventually lose their effectiveness. For good causes like this, we would suggest companion efforts to address the roots of such problems. In this case and other saltwater intrusion issues in the Sabine, Calcasieu, and Mermentau Basins in Planning Unit 4, the major culprits are channels that have been built by maritime and energy interests. Those interests continue to press for more and deeper channels. Unless those private profit-motivated intense pressures are relieved, it hardly makes sense for public monies to be spent on patchwork remedial efforts. We do not oppose Measure 4-1; we just want to go more fundamental along with the temporary treatment and eventually cure the disease.

PU-4 Alternative Plan 1 Measure 4-7, stabilization of shoreline west of Calcasieu River to Texas line ... Years ago RESTORE pointed out that the cause of the erosion along the Western Chenier Plain Coast were the manmade structures, the jetties at the mouth of the Calcasieu River. Those jetties intercept the westerly current that runs along the shoreline. The current becomes deflected southward as it goes around the rock barriers. That sets up a gyre in the water to the west of the jetties as the current tries to come back and hug the coast. That giant slow-motion whirlpool that persists west of the jetties digs, on its northward leg, into the shoreline, scouring away sand where once sand was accreting, building a new chenier or ridge.
The best way to stabilize the coastline west of the Calcasieu would be to remove the jetties. RESTORE realizes that it will take a long time for society to accept such a reversal of policy so we have suggested that, meanwhile, with the advent of computer technology, it should be possible to **model changes in the configuration of the jetties to see if there might be a way to allow restoration of the coastwise current's historic pattern and lessen the energy carried shoreward by the gyre.**

PU-4 Alternative Plan 1 Measure 4-9, salinity control structure in Calcasieu Ship channel near ferry, was, if I am not mistaken, suggested by a RESTORE engineer many years ago. That was, as was the above idea, an attempt a "compromise" in order to get something done to alleviate a serious manmade problem, or, at least, to generate discussion of the problem by engineers who seemed at the time to think merely in terms of dredging and jetties and more dredging to deeper depths with more and more saltwater intrusion. Measure 4-7 in PU-4 Alternative Plan 2 would just let the Calcasieu ecosystem become and remain brackish to saline. Actually, neither idea is best. The best idea is to stop dredging, take down the jetties, allow the Ship Channel to silt back to its proper depth, allow the old hemispherical **sand** bar at the mouth of the river to reestablish itself and act as a low-level salt water barrier, and have the maritime industry go to the lighter-aboard-ship (LASH) technique and do what the old lumber schooners used to do, cross the bar at high tide. **Therefore, RESTORE does not support PU-4 Alternative Plan 2 Measure 4-7, to allow Calcasieu Lake to become and remain brackish to saline.**

When Jean Lafitte used Negro slaves to cut the first loop out of the river to make it easier for him to have a straight shot escape route to the Gulf, our Calcasieu troubles began. Carpetbaggers later and modem day scalawags have simply sustained Lafitte's policies, sacrificing our renewable resources while exploiting suppressed workers.

PU-4 Alternative Plan 1 Measures having to do with hydrology of White and Grand Lakes ... I submitted a comment back about twenty years ago (I cannot remember the forum), in which I reported a personal observation: Blue crabs I was catching in those lakes appeared to have their biological clocks distorted. Their diurnal and seasonal colorations were not all synchronized alike nor with the time of day or year. There were giants and dwarfs. I asked for a study of the endocrinological implications of the alterations of hydrology in that zone. I have not heard that such a study has been done and it has been a long time since I trapped crabs there**. I would suggest again that such a study be done to assist in making better decisions about the various measures proposed for Grand and White Lakes.**

In conjunction with that study I believe that there should be a study to verify the physiological value of shell reefs (and the impacts of their removal). In my opinion as a biologist, the reefs were an important acid-base balance mechanism in our estuaries. Unlike higher animals that have various organs that maintain electrolytic equilibrium within their bodies, many aquatic organisms rely upon that balance being maintained externally. The loss of estuarine calcium carbonate to our roads may have helped people drive around but it has surely placed untold strain on survival of our seafood as well **as** the other members of the food web. **A plan should be developed for aggressive restoration of the shell reefs.**

PU-4 Alternative Plan 2 Measures 4 -1,2, and 3, ring levees and/or other storm protection for Lake Charles, Lafayette, Gueydan, Kaplan, and Vinton ... should be nothing other than PU-4 Alternative Plan 1 Measure 4-23, **"develop a plan to elevate and/or relocate assets…" and not build any more levees to entice people into deathtraps.** I am sure that the people of Sulphur, Iowa, Jennings, etc. will wonder why Vinton rates a ring levee and they don't.

PU-4 Alterative Plan 2 Measure 4- 13, dredging from Gulf of Mexico for marsh creation and enhancement ... as with many of the other projects, the intent is admirable, but there will be adverse impacts, such as, in this one, increased disruption of the Gulf benthos and turbid plumes that will alter plankton dynamics. RESTORE believes that this kind of stopgap measure does not have as much inherent value as would have a major change in policy away from activities that lead to the need for stopgap measures. As Randy Lanctot said yesterday, it would be truly wise to stop the wholesale permitting of c a d s in our coastal zone. As PU 4 Alternative Plan 1 Measure 4-27 says "Restore Marsh by Filling Abandoned Canals ..."

Something else Randy Lanctot said yesterday, consider every source of sediment precious, do not waste it. We agree. There **are** many examples of use of sediment in the Plan's proposed measures, and most of them we do support but do have the concerns about temporary disruptions caused by human translocation of the sediments from source areas to destination areas.

To address that issue, years ago, using the Louisiana Wildlife and Fisheries "red books," an inventory of coastal biological resources, I put together a "Migratory Clock;" It was simply a diagram of the ingress and egress of various organisms from the Gulf into the estuary and then the marsh, month-by-month. The Gulf was an outer circle, the estuary concentric within that one, and the marsh was like the bullseye of a target. The clock diagram made very obvious that during certain months there are clusters of migrations taking place from one ecosystem to another whereas at other times many wee& would go by without any major intersystem travel. **RESTORE plead for channel dredging to be allowed only during those non-migratory intervals. We renew that plea and ask that it be incorporated into this CPRA planning process.**

Another problem that we do not see addressed in the CPRA plan so far: The existence of massive deposits of hazardous wastes at or near sea level. The responsible parties should be made to remove such deposits before the wastes are scoured up and spread inland by storm surges or before they are inundated by rising sea level. In Planning Unit 4 there is such a Hazardous Waste Site called by LADEQ 'Carlyss Pit #2" just south of the GIWW by the Ellender Bridge. Less than 4 miles outside the boundary of Planning Unit 4, on Olsen Bayou just before it enters Moss Lake, is "Carlyss Pit #1." Although there has been some removal of wastes from those areas, we remain unconvinced that they should be considered "secure." A far more extensive deposit of hazardous wastes exists buried below sea level (original ground surface was 5 feet above *sea* level) at the still-active CWMI site along Bayou Choupique about a mile north of the boundary of Planning Unit 4, which appears to be the GWW at that spot. Tons of RCRA and HSWA poisons are still being trucked into that site each month. The reverse should be happening, and the sooner the better. During our intervention in the DEQ Adjudicatory Hearing on the CWMI permit, we had an expert come testify about the vulnerability of the site and its clay cap to hurricane storm surge. His words were ignored and the permit was issued. It is not too late to prevent a poisoning of the entire Carlyss to Sulphur land mass. **We would like to see within the Louisiana Comprehensive Coastal Protection Master Plan some kind of admonition about sitting of hazardous materials within the storm-surge- prone areas and some kind of pressure for removal of existing hazardous materials.** (One of the most lasting impacts of Hurricane Rita has been the dispersion of hazardous materials from coastal oil and gas facilities into the wildlife refuges.)

We would like to see within the Louisiana Comprehensive Coastal Protection Master Plan some kind of admonition about release of persistent organic pollutants and release of heavy metals along with some kind of increased pressure for removal by the responsible parties of those massive amounts of materials that have already been bioaccumulating and biomagnifying. Such POPS and heavy metals not only poison animals but also poison phytoplankton and marsh plants thereby weakening the coastal ecosystem in many ways.

When I was on the Regional "208" Water Quality Advisory Committee for the Southwest Louisiana areas learned that the **Mermentau Basin had the nation's greatest input per acre of agricultural pesticides and herbicides. Those chemicals,**

along with the turbidity that happens every year as a consequence of runoff from soybean and rice farming practices, heavily impact coastal ecosystem strength and solving those problems should be part of a comprehensive strategy for coastal restoration. The existing process obviously was, as some RESTORE members said a long time ago " '208,' too little, too late."

RESTORE was happy that Stacy Sauce of the Atchafalaya Basinkeeper/LEAN group yesterday championed the need for protection and restoration of forested wetlands, the swamps that, in the ecological continuum, lie between high ground and the wet prairie or marsh zone. For the marshes to work most efficiently in their various roles in nature, including as nurseries for seafood species, there is a need for hormonal inputs at certain times from swamp runoff, sort of like a tea full of not just nutrients but also full of signals that help plankton know when to bloom or larval fish know how fast to mature or adult female crabs know when to begin migrating offshore. Certainly incident light, salinities, tidal flux and many other things contribute to each species' instinctive behavior, but those **populations do best when all components of their environment remain natural in a dynamic equilibrium rather than in a state of adaptive stress. We support Stacy's call for emphasis on the forested wetlands and thereby an emphasis on viewing the coastal ecosystem in a holistic way, not in fragments or rigid compartments.**

If I see reasons to try to provide more input **as** the process continues I will do that, however, as I said yesterday, one of the most bizarre things I have ever seen is the continuing denial that pervades the thinking of people, especially decision makers, despite Katrina's undeniable proof that, on the topic of public safety and ecosystem preservation, in Louisiana, the main decisions of the past 300 years have been folly.

I appreciate the chance to provide input in this new planning process. I hope that it goes better than have all the others. Maybe that will happen now that there is more national attention focused on our state and its many messes.

I would like to have the Final Ran well-publicized, circulated, and public hearings held not just here at home, but in each of the other 50 states since those people will be paying most of the bill for anything that gets done through the plan.

Sincerely,
Michael Tritico, Biologist and President of RESTORE
Restore Explicit Symmetry To Our Ravaged Earth

6.4.8 Charlie Smith

When fishing a cut to a pond on one of the Barrier Islands all the water receded suddenly—I looked behind me to the horizon and saw a four foot tsunami heading back to the beach. I was later told that was a wave caused by a passing super-tanker 5 to 10 miles away.

I keep up but have never heard anything about the potentially destructive affect of wave action—caused by super-tankers—on the Barrier Islands and the coastline.

6.4.9 Restore or Retreat

Our organization would like to thank you for the invitation to participate in the CPRA-IPT stakeholder meeting on Wednesday, August 23, 2006. We found this meeting to be very informative on the directive of the team and the goals outlined for the future. We have thoroughly reviewed the materials presented and would like to officially submit the following comments on the measures incorporated in Planning Units 2 and 3a.

General Comments
We support the planning team's utilization of already existing work, as well as incorporating input from a wide variety of stakeholders; however, a plan must finally be prepared to be executed aggressively and expeditiously, as many others of the past have not been. It is vital for the CPRA's Master Plan to include both near-term and long-range perspectives and to incorporate already existing and planned structural, management, and institutional components of both efforts, which, too, has also not been truly incorporated in past plans. The abbreviated near-term LCA effort awaiting Congressional authorization is a good example of such exclusion of implementable long-term restoration efforts beyond just their future study.

Planning Unit 2-Alternative Plan 1

- *Completion/Acceleration of LCA Near-Term Plan*
  - Small Bayou Lafourche Reintroduction
    The seemingly easy task of reinvigorating Bayou Lafourche with freshwater from the Mississippi River has been an example of the many challenges restoration has faced in Louisiana. Although it was ideally designed at a higher rate of flow, the time has come to not only implement this project, but incorporate the project with such long-term features as the Third Delta Conveyance Channel, and to perhaps even reevaluate the introduction at its original higher rate of flow.

  - Re-authorization of Davis Pond
    A key component of the state's plan should include the better use of the considerable time, money and effort spent on already existing restoration projects and structures. While the Corps continues to make much progress on repairing Davis Pond to its full operational intent, future plans must also be made for the reauthorization of Davis Pond to include its modification to divert more fresh water and sediment, which will have a far reaching effect on the deeply effected Barataria Basin.
  - Third Delta Study
    It is our understanding, due to Congressional request, that the state was asked to pare down the original $14 billion LCA plan. This request, however, should not limit the state during their master planning process for comprehensive coastal restoration and protection. Many of the studies, such as Third Delta, was included in the full LCA study and the Coast 2050 plan, and also included the full construction of the project. If the state is to remain true to their mission of planning near term and long--range projects, the financial planning ibr the implementation of long term plans should not be excluded, especially for area of the greatest need-the Barataria and Terrebonne Basin.

- *Barrier shoreline restoration projects*
  Barrier islands provide our first line of defense from the encroaching salt water and hurricane surge from the Gulf of Mexico. These projects will prevent the barrier islands from breaching through the deposition of dredged material, and will provide a continued barrier to reduce wave and tidal energy, thereby protecting the mainland shoreline from continued erosion.

- *Pipeline Conveyance of Sediment*
  Pipeline conveyance of sediment is an essential short term restoration technique that must be wisely planned and implemented in conjunction with a freshwater diversion for sustainability. Techniques such as rebuilding historic ridges is key and prioritizing projects to areas of the greatest need, as time and cost will be a considerable limiting factor to such projects.

- *Beneficial Use of Dredge Material*
  The New Orleans District of the U.S. Army Corps of Engineers has the highest annual channel operations and maintenance program in the nation, and is also situated in right in the heart of the highest land loss rates in the world. While, not all of this material is available for beneficial placement in the coastal ecosystem, there is a greater potential to use more of this material for the benefit of wetland nourishment, marsh creation, and barrier island and ridge restoration. As for location of these projects, priority of basin-wide loss rate should weigh heavily in site selection. Our organization wholly supports the state's initiative for improved use of this material for the betterment of the entire south Louisiana ecosystem, while also benefiting navigation critical to economic development.

Planning Unit 2-Alternative Plan 2

- *Completion/Acceleration of LCA Near-Term Study Plan*
  - Small Bayou Lafourche Reintroduction
  - Third Delta Study
  - Re-authorization of Davis Pond
- *Barrier shoreline restoration projects*
- *Pipeline Conveyance of sediment*
- *Beneficial Use of Dredge Material*
- *Restore ridges including Bayou Lafourche Ridge, etc.*
  There is a great need for the contemporary rebuilding and/or redesign of historic landscapes in future planning of coastal restoration. Pipeline sediment transfer from the Mississippi River or dredge material can be beneficially used

to rebuild historic ridges to strengthen the "bones" of the system needed to support any additional "muscle" that is to come from other methods of restoration such as freshwater and sediment diversions or sediment pipeline conveyance. Planning to incorporate the topography and vegetation of the ridges can also directly contribute to the diversity and productivity of the world's seventh largest delta

Planning Unit 3a-Alternative Plan 1

- *Completion/Acceleration of LCA Near-Term Study Plan*
  - Small Bayou Lafourche Reintroduction
  - Multi-purpose operation of the Houma Navigation Canal (HNC) Lock

    The installation of a lock complex at the Houma Navigational Canal is vital to the community for two different reasons: restoration through the prevention of salt water intrusion and community protection from storm surge that has inundated low-lying areas more frequently than ever before. Both reasons would be significant alone on their own merits. The Morganza to the Gulf Hurricane Protection System was meticulously proactive in its design and intention-to be environmentally responsible while providing adequate protection for a community of 200,000 plus. The wise use of the navigational canal's lock is essential to the healing and restoration of this area.
  - Third Delta Study
- *Beneficial Use of Dredge Material*

Planning Unit 3a-Alternative Plan 2

- *Completion/Acceleration of LCA Near-Term Study Plan*
  - Small Bayou Lafourche Reintroduction including Company Canal Diversion
  - Multi-purpose operation of the Houma Navigation Canal (HNC) Lock
  - Third Delta Study
- *Protect and Maintain Ridge*
- *Beneficial Use of Dredge Material Conclusion*

Unfortunately, hurricane protection has only recently become a front-burner issue because of the exposed vulnerability caused by the devastating hurricanes of 2005, and so much time, effort, and hope has already been dedicated to past efforts for a master plan to satisfy the state's needs and desires relative to a sustainable vision of comprehensive coastal restoration. Now, more than ever, the state needs to aggressively and expeditiously implement a comprehensive master plan, in coordination with the federal government and the Louisiana Recovery Authority, of both near-term and long-range restoration and protection features, for the sustainability of our coast, communities, and culture.

Thank you for your time and consideration of our comments in the formulation of the CPRA's master plan. If you have any questions about these comments, please do not hesitate to contact our office at 985/448.4485

Sincerely,
Simone Theriot Maloz
Executive Director

6.4.10 John Ettinger, U.S. EPA Region 6

Thanks for the meeting yesterday. I greatly appreciated the opportunity to review and discuss the current iteration of the State's draft plan. I realize that the associated fact sheets are very preliminary and will likely be revised. To that end, I would like to comment on the fact sheet pertaining to the GIWW levee alignment in Barataria Basin.

As I think you know, EPA has long-standing concerns with the potential of this alignment to result in adverse environmental impacts, including altered hydrology, reduced fisheries access, induced development in wetlands, potential conflicts with future up-basin diversions, and possibly changes in Clean Water Act jurisdiction over enclosed wetlands. Partner Federal resource agencies have raised the same or similar concerns. Consistent with these concerns, the January 26, 2006, final draft report by the Working Group for Post-Hurricane Planning for the Louisiana Coast states that "... building on the spoil banks of the GIWW would require numerous floodgates as the system is more open at this location, likely restricting tidal exchange and jeopardizing the functioning and sustainability of extensive existing wetlands between the GIWW and Highway 90."

The draft fact sheet for the GIWW alignment does not appear to discuss these potential concerns. Rather, it describes what appear to be net environmental benefits from the proposed alignment. Here is what is says:

"Other structural features would be integrated into the system to provide flood protection, drainage, navigational passage, and environmental benefits including reduction of saltwater intrusion, freshwater management, and reduction of frequency and duration of wetland flooding."

I am aware of no scientific rationale to back up a claim that this levee would benefit wetlands. Indeed, the very notion of levees saving wetlands runs counter to what we have experienced here in Louisiana and elsewhere. In the absence of a discussion of the aforementioned potential adverse environmental impacts, the fact sheet could be misleading. Accordingly, I would encourage the State to include a full discussion of potential adverse environmental impacts in this fact sheet and in other instances where a proposed levee alignment would enclose wetlands.

Thanks again for your continued work to include EPA in this planning process. Please let me know if you have questions or would like to discuss this further.

John Ettinger
U.S. EPA Region 6

6.4.11 Patrick Williams, NOAA

Thank you for inviting NMFS, Habitat Conservation Division to continue participating in the CPRA process as a SERT and a ITT member. I offer the following as points of emphasis to today's meeting and the development of the draft CPRA plan:

1. There is not consistency in the implied definition of the various mapped levee measures. Specifically, I suggest revising the map legend and including detail in the plan text to clearly specify that the 500-yr level of protection does not necessarily mean a 500-yr levee. Specific examples exist for the interior lines of defense at Houma and the West Bank and Vicinity when those are presented in concert with an outer 100-yr line of defense.

2. The measures discussed today are much closer to the agency-developed guiding principles presented at the USACE workshop in February. As a reminder, attached are those guiding principles. Of particular continuing environmental concern is the need to strive to have levees that are determined to be necessary located along the wet/non-wet interface and enclose as little wetlands as possible.

a. The GIWW alignment is problematic and one which NMFS is very concerned. To be clear, we prefer no levees at all from an environmental standpoint, but are not opposing protecting life and property. We find the Swamp and HWY 90 alignments to be compromises.
NMFS continues to express that concern to the USACE under the LaCPR and Donaldsonville to the Gulf processes.

b. Optimizing "spoil" along the GIWW in Vermilion Parish for levee function for surge suppression somewhat referenced in the closing remarks is concerning. NMFS is not supportive of a levee along the north side of the GIWW between Commercial Canal and Abbeville because of the lesser environmentally-damaging alternatives such as a rock revetment and marsh creation in the GIWW.

c. Lifting HWY 82 and HWY 27 also could be problematic and environmentally concerning. Drainage issues already are problematic for the areas north of the highways. I recommend measures are fully explored to enhance existing drainage independent and/or in addition to lifting the highways to identify a lesser environmentally damaging and practicable alternative.

d. I suggest continued consideration of the HWY90 alignment for the Barrier Plan in addition to the GIWW and/or other alignments.

e. Induced development of wetlands is a big concern and should be fully acknowledged and addressed.

3. I am not supportive of a 100-yr or greater protection on the backside of Grand Isle. Lesser environmentally-damaging alternatives that are consistent with island geology/hydrology as well as implicit risk by siting on island include beach

nourishment, dune maintenance, and various shore protection structures. The Grand Isle Master Plan the state is preparing under NOAA grant should be considered in lieu of a new, extension, or lift of a levee on the backside of the island.

4. I appreciate the consideration of stakeholder issues and recommendations in revising the size, number, and location of diversions as presented today. We will continue to work with the stakeholders to develop and analyze a plan to optimize protection in the short term and maintain it in the long term while minimizing impacts to habitat gradient and dependent fisheries.

5. Noticeably absent from the process continues to be a Regional or Programmatic Sediment Management Plan. There is seemingly little progress on this issue which is critical to inventory, prioritize allocation, and base practical associated costs. Any plan developed in the absence of RSM Planning/Costing should disclose that limitation.

The above are the main items that jump to mind, but omission of others does not mean support by NMFS of the features presented today. Thank you again for coordinating.

Patrick

Attachment: Part 2 guiding principles.doc

Part 2: Guiding Principles for Hurricane Protection AND COASTAL RESTORATION Planning

- Fully evaluate non-structural alternatives (such as elevating individual structures and re-location of willing landowners and communities). In less densely populated areas, ring levees should also be evaluated as an option to basin-scale levee alignments.

- Hurricane protection should not come at the expense of the coastal environment. Rather, hurricane protection planning should identify and incorporate opportunities for synergy between structural protection measures and coastal restoration. The potential hurricane protection benefits of large-scale coastal restoration measures that offer multiple lines of natural defense should be fully evaluated as part of the environmental alternatives discussed below.

- Involve the public early and often. Levee construction and other hurricane protection measures have the potential to affect the economy, safety, and culture of coastal Louisiana. Levees are, in effect, land use planning measures that can profoundly influence where and how people live in the future. For this reason, USACE (U.S. Army Corps of Engineers) should go well beyond the public participation opportunities available in standard civil works planning processes.

- Understand the effects of levees and other structures on hydrology. The USACE should commit to developing system-wide and area specific isolated drainage models to help guide, for example, decisions on the location, number, and size of levees, gates and other water control structures. Similar to the process used in the Louisiana Coastal Area (LCA) Ecosystem Restoration Plan, USACE should assemble a modeling team consisting of various experts from agencies, academia, and elsewhere.

- Use existing levee alignments to the maximum extent practicable. This will minimize both wetland losses and additional hydrologic disruption.

- Locate new alignments on the upland side of the upland/wetland interface to the maximum extent practicable. This also minimizes wetland impacts and hydrologic disruption. Equally important, it directs future development towards relatively higher, safer ground. Alternative southern alignments could be considered as an iterative step if and when it is determined levees for the upland/wetland interface alignments would have to offset existing infrastructure and be constructed in wetlands.

- Avoid enclosing wetlands to the maximum extent practicable. Enclosing wetlands within a levee system (particularly where there are no provisions to maintain tidal flow) can facilitate development in the enclosed wetlands and alter wetland hydrology. In so doing, the levee project would result in secondary environmental impacts, while promoting development in low-lying, high-risk areas.

- Minimize hydrologic changes and restore natural flows where possible. Where there is no practicable alternative to enclosing wetlands and other aquatic resources within the system, the levee should be "leaky", consistent with the concept used in the Morganza to the Gulf hurricane protection project. Specifically, gates and other structures should be used to minimize and, where appropriate, undo the disruption of natural hydrologic processes.

- Where gates and structures are used, there should be clear criteria established regarding when and for how long such structures are closed. In general, these criteria should limit closure to only those instances when (1) a storm surge threatens people and/or infrastructure; and/or (2) the structures can be used for ecosystem restoration.

- Anticipate and accommodate river reintroduction projects. Water control structures should be sized to accommodate reasonably foreseeable up-basin river reintroduction projects – particularly those in Coastal Wetlands Planning Protection and Restoration Act (CWPPRA), LCA, and the South Louisiana Hurricane Protection (SLHP) itself.

- Expand management of both the Mississippi River and Atchafalaya River to include ecosystem restoration and storm protection in addition to flood control, navigation, and potable water management.

- Use external sources (e.g., rivers and offshore sources) of borrow material to the maximum extent practicable. Use of local, interior sediment should be considered only as a last resort. (More below under "Programmatic Sediment Sources".)

- All unavoidable impacts to wetlands should be fully offset through compensatory mitigation measures, unless it is determined that coastal restoration measures contained within the SLHP fully offset such impacts. Mitigation should be in-kind and to the maximum extent practicable within the same hydrologic basin as the impact it is to offset. No mitigation credit should be given to theoretical benefits to wetland areas enclosed within the levee system unless there is definitive, quantitative information to support such claims.

6.5 Stakeholder Reports

In addition to the inputs provided through the various stakeholders engagement activities undertaken by the IPT, several stakeholder groups also submitted technical reports in support of the plan formulation processes.

These submissions variously contained information and data relevant to development of the Master Plan, together with recommendations of measures that could be incorporated into the Plan.

These submissions have all been fully reviewed by the IPT in defining the Preliminary Draft of the Master Plan, however it should be noted that not all recommendations/suggestions can be accommodated as the plan integrates a number of objectives and interests.

A complete list of the reports submitted to the IPT by stakeholder groups is presented in Annex C.

6.6 IPT Interagency/SERT Alternative Plans Review Workshop, October 2006

On October 24 and 25th, 2006 the IPT met with the Science & Engineering Review Team (SERT), a group of local and national scientists charged with assisting in the development of the Louisiana Coastal Protection Master Plan, and State and Federal Agency staff. Approximately 38 professionals gathered to discuss the various alignments and projects suggested in the planning process so far, and to assist in determining the recommendations featured in the preferred preliminary draft plan to be submitted to the CPRA. The challenge of the planning process was to find consensus on the draft plan despite the diverse positions and perspectives advocated by the many participants.

In their introduction to the SERT group, the IPT outlined the meeting goals and then described the decision making process, materials, and scoring to be used in the analysis of the plan. The meeting then divided into working groups based on the planning units used in plan development. During this breakout session, one room was devoted to projects and alignments in the Deltaic Plain (planning units 1, 2, and 3a). The second room contained groups focused on the Chenier Plain (planning units 3b and 4). Each group was tasked with reaching consensus on the restoration and protection outcomes for their planning units by the end of the first day. On the second day they were then asked to identify a suite of measures to deliver those outcomes. At the end of each day the outputs from each table (and room) were collated and presented back to the full group for discussion.

Groups evaluated the relevant planning units to determine their preferred regional plan. They then chose which areas to protect, considering whether to protect them with structural features (such as levees) or non-structural features (such as marsh terracing). To review the effectiveness of a plan, the groups identified pros and cons and sought outcomes that best balance the identified objectives. Groups also decided on which protected areas would be given priority over others.

At the end of the day, the groups presented consensus decisions for the protection and restoration of the coast in their respective regions. These determinations are not final, but formed a valuable input for the IPT in the formulation of the preliminary draft plan to undergo future review by the CPRA and the public during the public comment period, November 2006 through February 2007.

A summary matrix of all workshop comments follows below. The comments in the matrix are organized by the Deltaic and Chenier Plains.

To preserve the provenance of each transcribed discussion, the full notes from the workshop are presented in Annex D to this Appendix.

Table 5.6: IPT Interagency/SERT Alternative Plans Review Workshop, October 2006
Summary Notes

Deltaic Plain	Chenier Plain
Northeast corner of 3a needs more protection, northwest of Morgan City, due to storm surge indicated on 100-year map. Will probably need a structural solution; there are a lot of buildings/assets around PU 2: Measures 7, 10a, 8, etc. and PU 3a: 2e, 4, and 8.	If we raise highway 82 that would provide the protection needed for the outlying area.
Need to protect Fourchon more than Grand Isle.	Need level four to protect all area for salt water basin and not loose to salt water basin by the white lake area.
Lafitte could benefit from protection. Consider non-structural protection.	In analyzing the Calcasieu Ship Channel, if lower salinity control is from the lake to optimize this, lets get it from the river.
With Lafitte you could save a lot of money by not building levees on back side and connecting levee on water side to Westbank levee alignment.	Shoreline protecting Grand lake and White lake
Tidal protection in area of PU3a 1a-1e	The Black Lake and other areas under management will help with reduce salinity.
Start having levee protection further inland in areas south of Houma.	Shupick Bayou (north of Lake Charles) – drain uplands to introduce freshwater into marshes south of GIWW-additional measure needed.
Along river, improve existing levee – bring up to 100-year protection.	We are looking at putting a stone and a seal near Light house point.
Larose to Golden Meadow – 100-year protection	Maintain Smith's Ridge.
Leeville to Lafourche – non-levee solutions to 100-year protection (if raised to 500-year level there will be wind issues)	Moving water from north to south of highway 82 and maintain connection.
Grand Isle: breakwaters, berms, continue with what is currently being done	Soils in area of Grand Lake/White Lake are mainly organic. Therefore, if you are going to manage as a more saline system, may have large soil loss.
South of PU3a 1a-1d – 100-year protection (500 is not feasible).	Closing up the outlets of the Sheridan and all the major leaks; there are seven gates that will be closed just south.
Houma – 500-year protection	Close off Freshwater Bayou to reduce salinity.
LaPlace – 500-year protection	The existing ship canal for the Calcasieu needs to be bigger. Build or create a structure past the lock east or west. Reconnect the Red River back into the system again.
Need more marsh in Barataria.	Lakes can be source of sediments for marsh.
Headland protection across coast.	Mermentau: Outflows go in and out and then long periods without any flow, so it comes up and floods and then it does nothing; so we need a reservoir to capture and hold flow until needed, but Mermentau is a small basin with very little relief so hard to find area to make a reservoir in this system.
Marsh creation east of MS River	Lake Charles/Sulphur: Need protection
Two proposed diversions off of Mississippi River	Lafayette: Under 500-year storm doesn't need protection.
Want to see more marsh creation in Biloxi Marsh and Breton Sound.	Abbeville has to be protected w/levee.
Encourage headlands along barrier islands.	Henry Hub needs to be protected.
Ultimately Alternative 2 is the baseline/minimum of what is acceptable. Need more area of land built if we can get it.	Berwick/Patterson is already ring levee at 500-year protection. Need to reanalyze.
Communities around PU3a 1a-1d: Marsh creation south of these assets would be beneficial.	New Iberia needs structural protection.
Can sacrifice lower MS Delta if able to create more marsh in other areas throughout all Pus.	Strategic Petroleum Reserve sites need protection.
Maintain upper basin swamps East of Morgan City, North of Gramercy/Reserve, and around South Vacherie area.	It looks like GIWW alignment would be more beneficial; single alignment as opposed to rings looks better.
More discharge capacity needed; need more freshwater & sediment to swamp (South Vacherie); also need to protect populated areas with storm protection.	Assets worth Review: New Iberia, Lafayette, Abbeville, Lake Charles/Sulphur, Henry Hub, Lake Arthur, Strategic Petroleum Reserves.
Priority is land building and system sustainability with the cavier that habitats will be protected where feasible to protect biodiversity.	Lake Charles/Sulphur need 500-year protection and Lafayette is primarily residential but a 500-year protection is too much.
Seasonally putting fresh water into swamps to enhance crawfish farming amongst other things.	Shoreline protection and keeping the lakes from coalescing is important; maintaining banks is as important as the coastline.
Need to address drainage through the basins; develop a watershed management plan.	Consider water management plan for both irrigation and marsh nourishment – a Groundwater Commission for surface and groundwater-Abbeville to west to Mermentau basin (for rice farmers).
Improve hydrology in South Vacherie swamp area – through Des Allemandes, past proposed levee.	
Have to balance flood protection for LaPlace/Reserve areas with freshwater diversions for the surrounding swamp areas.	
North of PU2: No storm protection needed (Springfield/Ponchatoula area).	
Basin communities may need to be considered more than those on the ridges.	
Include all parts of South Houma to be protected. The South Houma fingers should get some sort of protection.	
Cocodrie: Needs structural protection. Follow Morganza alignment.	
Leeville > Fourchon > Grand Isle: Protect roads between each area.	
Bayou Lafourche Ridge needs protection the entire way.	

Table 5.6: IPT Interagency/SERT Alternative Plans Review Workshop, October 2006
Summary Notes

Deltaic Plain	Chenier Plain
Des Allemandes: needs protecting	
Port Sulphur: Protect with ring. Currently protected to Oakville. Ring to Myrtle Grove.	
East New Orleans: Lower protection for wildlife refuge area – Bayou Savage	
Northshore: Protection needed	
North of Sorrento: needs structural protection	
Chandeleur Islands: Restore. Plant trees or some top of land protection. Restore marsh for benefit of wildlife habitat, ecosystem.	
Area west of MRGO, Lake Borgne: Orleans Land Bridge. Create/strengthen land bridge & salt marsh	
South of Mississippi River, Bayou Lafourche, Barataria Bay: Create marshes	
Area between River & Lake Borgne (Breton Sound): cannot divert any more river water; if area grow, more oyster beds are lost and must sustain as it is.	
Bonne Carre area: Open more often to add water into swamps.	
South of Lake Maurepas: Maintain area	
Head of Passes/Birds Foot area: Maintain area of existing crevasses.	
Protection is needed at Sorrento Field because of the gas reserves.	
Upper Maurepas/Upper Basin Swamp needs a reintroduction of freshwater.	
Atchafalaya water, if there is a way to get that water out and near the Terrebonne it would be more beneficial.	
The oil and gas infrastructure needs to be protected (shipping channel) in the vicinity of Venice (see Map) using marsh restoration.	
The Barrier Islands need to be restored. Recommends abandoning the "bird's foot" south of the barrier islands and creating 2 diversions from the MS River to the East and West ~ even with the barrier islands.	
Recommend dredging the GIWW and increasing the flow rate through the GIWW (from ~30K cfs to ~80K cfs). The dredged material would be used to restore marsh in the area, and the increase in flow rate will move freshwater into the Houma area.	
Violet Reintroduction	
Bayou Lafourche – would need to increase the flow from ~300 cfs to ~1000 cfs.	
A Caernarvon-like diversion (see map) – this diversion is existing, but only one of the structures is operational the other one would need to be activated.	
Biloxi Marsh – sediment introduction	
Breton Sound Area – need small diversion to merge marsh creations	
Davis Pond Area – Freshwater introduction	
Recommend maintaining the Bird's Foot Delta.	
The introduction of the freshwater to the Breton Sound Area (see above) can be accomplished by the existing Caernarvon Diversion (8 cfs) and the White's Ditch (~ 1 to 5 cfs) with the other small diversions from the MS River in the area having ~ 1,000 – 5,000 cfs.	
New Orleans landbridge needs marsh creation.	
Bankline stabilization is needed for Lake Borgne.	
A diversion at Myrtle Grove (PU2) is required (5 – 10 cfs).	
We need to show gradation between fresh and saline water and extend sediment down into areas closer to the Mississippi River.	
Diversions need to be added to the west side of river to create marsh creation (1,000 – 5,000 cfs).	
Breakwaters (PU 2) are needed. Bankline and shoreline protection are needed as well.	
Protection for Lacombe and Slidell	
Lower Ascension, Gonzales, and Prairieville need structural protection.	
Slidell area does not need structural but should have non-structural protection.	
It was suggested structural protection for Plaquemine Parish extend down to Oakville then below has non-structural protection. Dulac, Grand Isle, and Cocodrie should all have non-structural.	
A 100-year levee was suggested for Morgan City.	

Table 5.6: IPT Interagency/SERT Alternative Plans Review Workshop, October 2006
Summary Notes

Deltaic Plain	Chenier Plain
It was strongly emphasized that New Orleans should have both structural and non structural protection. Putting structural protection does not rule out non structural policies or zoning laws. Areas that already have structural protection and are considered for non-structural protection should shift priorities to non structural protection implementations.	
Re-build Bayou Lafourche Ridges-salt marsh creation on both sides and create freshwater and an intermediate area up-north.	
Save cypress forests and create oyster reefs.	
Maintain Terrebonne ridges; restore marshes (brackish/saline) Lake Boudreaux/band of fresh water intermediate.	
Restore & maintain Bayou Lowey ridge w/ protective band of Marsh.	

6.7 Interdisciplinary Technical Team (ITT) Workshop, October 2006

On October 31, 2006, the IPT held a day long workshop with the Interdisciplinary Technical Team (ITT), a pre-selected group of state and federal-agency officials, scientists, engineers, planners, and representatives from the U.S. Army Corps of Engineers (Corps). Their mission was to review the coastal protection preferred plan for each of the planning units, arising from the IPT Interagency/SERT Alternative Plans Review Workshop (see Chapter 4). Comprised of over 50 experts, the ITT divided into working groups to discuss aspects of the plan. Facilitators helped each group approach consensus on a number of difficult decisions: whether certain areas should benefit from structural or non-structural protection features, measures used for coastal restoration, and other aspects where consensus was not reached at the IPT Interagency/SERT Alternative Plans Review Workshop.

The facilitated groups sat at tables with various maps showing surge levels for 1%v and 0.2% annual probability storms, levee alignments, coastal restoration projects—all part of the IPT's measures of the plan. The IPT held discussions around the planning units (PU 1, 2, 3a, 3b, and 4). Each PU had a plan made up of different measures (e.g., levee alignments, restoration projects, etc.) The groups went through each measure and decided on whether they agreed upon it or what modification was necessary in the measure to make it agreeable.

A summary matrix of all workshop comments is presented below. The comments in the matrix are organized by table discussions.

The complete and unabridged comments for the workshop are presented in Annex E to this Appendix.

Table 5.7 Interdisciplinary Technical Team (ITT) Workshop, May 2006
Summary Notes

Table 1	Table 2	Table 3	Table 4	Table 5
Lafitte will need a lot of marsh restoration, if some areas are to be kept as fresh water and marsh tidal surge needs to be prevented	Protection around HWY 90	Protect communities along Hwy. 90	Needs a gate at Verret, Bayou Bienvenue (NW corner of Lake Borgne) and at Seabrook	Shoreline protection and land-building from Point au Fer to Sabine Lake using combinations of detached, near-shore, segmented breakwaters and dedicated dredging from off-shore sources
Open culverts in Hwy 90	Protect Lake Catherine along HWY 90	Vital to not "levee" in as much coastal wetlands as possible	Structure at west of Chef's Pass (N.O. east)	Improve and maintain Highways 82 and 27, raise their elevation where needed, and provide better drainage under the highways to allow water in Grand and White Lakes areas to escape to the Gulf
Pipe sediment into Wax Lake Outlet	Holly Beach- no levee protection	Maintain bird foot delta	MRGO stabilization- Lake Borgne side	Dredge GIWW and use material to build berms along the south bank across entire area, leaving openings where appropriate for drainage and hydrology. Some places may require gates .
Feasibility of creating fringe marshes	100 -year protection along HWY 90 (near Terrebonne) is desired.	Levee system/structures at land bridge between east New Orleans and Slidell	Keep MRGO open for small craft- just close to Gulf/salt intrusion	Salinity control at Calcasieu near Hwy 82 bridge
Marsh creation alone will not be sustainable.	Ecosystem restoration which can not occur in some areas if you construct levees.	Bonnet Carre Spillway levee- (add length)	Restoration of Cypress Swamp	Ring levee southside of Lake Charles Metro and Lafayette Metro
Must have permanent infrastructure that allows us to put sediment where we want it and supplement it with a fresh water source.	Structural protection around Gibson, Morgan City, Lafitte, but have to reach maximum technically feasibl structural protection.	Continue existing diversion at Bonnet Carre Spillway and divert into LaBranche Wetlands and not lake	Agree with marsh creation at measure 1-20	Freshwater management in Mermentau and Red River watersheds, including reservoir construction to control high flows
Enhance sediment traps, slow velocity by digging sediment "retention centers" and import sediment from up north.	Chandeleur Islands- unresolved	Add marsh creation south of Lake Leary by increasing from 15,000 to 20,000 cfs	Want 3rd line of defense levee	Use dredged material from all 4 rivers (Mermentau, Calcasieu, Sabine, and Atchafalaya, plus GIWW) for marsh construction.
Bayou LaFourche was suggested as a source of freshwater	Birds Foot- unresolved	Add/Elevate Tidewater Road (2-7)	Raise river levees	Stabilize banks of GIWW using rock dikes, and innovative bioengineering where possible
Improve conduits in LaFourche to make water head southward rather than run amuck	Re-dredge Pass A Loutre	Agree to keep both alignments- 2-1 and 2-4	Calcasieu ship channel- salinity control	Would rather levees be at or close to the coast as opposed to inland along the GIWW for example
Put sediment retention centers along GIWW and Terrebonne.	Beneficial use of dredged material to the maximum possibility.	(2-16) add marsh along west (up to Venice)	Third levee along Lake Borgne to Lake Verret	Design the levee with gaps that allow hydrology to continue without change.
Creating Marsh closest to levees and working outward should be a priority.	Include the Bonnet Carre and direct the water into the LaBranche wetlands.	add march creation at head of bays	Only close structures in MRGO area when necessary (e.g. a hurricane)	Build levees around Lake Charles and to protect Lafayette/Kaplan/Abbeville connecting to the Atchafalaya Basin along GIWW alignment.
Connect GIWW with levee	Construct a 500-year levee from Bonnet Carre		Opposition to putting gates at Chef and Rigolets	Managing Mermentau Basin as a Freshwater system- must be able to pass water through Hwy 82, emphasize basin wide management strategy, coordinate with local land owners to blend uses of real estate with needs for resources.
Look at rainwater as a resource-pump the rainwater in a way that gives over marsh an on overflow	Evaluate impact of 500-year levee on communities surrounding Lake Pontchartrain		Put up levees on N. shore but no structures where flood gates are currently marked	Structure at lower Calcasieu (salinity barrier)
Introduce two-way pumps at divergences that pump water in and put as needed.	Additional marsh and ridge creation south of Lake Leary		Proposes putting overflow weirs instead of flood gates	Lock at GIWW/Calcasieu
As a source of funding generating energy at siphons to pay for upkeep	1-17 Violet; they ought to be 15,000 -20,000 cfs		Weir option would have to consider all 4 objectives is opposed to total closure of water flowing into Lake Borgne	Elevate at Schoorer Bayou Control Street at Hwy 82 and North Pronge
Restore and sustain Lake Whitman area.	1-19 make to 15,000-20,000 cfs, double it.		Beneficial use of dredge material to Chandeleur Island is desired.	Small ridge restoration in pipeline canal ridges
Affluent discharge used as a technique for storm fresh water and nutrient inputs for marsh growth (investigate the opportunities)	1-20; evaluate toward post-Katrina initiative. Prioritize toward marsh areas lost most recently.			Existing complete lock at Cal. River & GIWW needs to be replaced

Table 5.7 Interdisciplinary Technical Team (ITT) Workshop, May 2006
Summary Notes

Table 1	Table 2	Table 3	Table 4	Table 5
Pipeline canal reduces levee by 14-18 miles and also reduces footprint size and less trees to reduce and may manage freshwater intrusion.	Medium diversion in White Ditch; use Big Mar to build surrounding marsh, increasing capacity to White Ditch, Medium Diversion is o.k.			Consider Priority-Coastline 1st, Hwy 82 2nd, GIWW Alignment 3rd – 100 year protection with bank stabilization
Shorten levee length around Plaquemine parish, Regarding Lafitte; Geotech levees in marsh land increasing the base width of levees. Changing the levee to this route increase risks to ecosystem and may cause greater impacts.	1-24; you will destroy all oyster beds.			Ship Channel needs structure to shunt in order to get GIWW water to the west
Need to create Bay Da La Chenier (ridge)	Medium diversion, Benny's Bay; lets continue what we are doing, 30,000 cfs diversion is being planned in Breaux Bill			Fresh water management in Basin, Atchafalaya River, Vermillion, Mermentau, Calcasieu, Sabine (Include reservoirs & sediments)
Water diversion will not help with land build, we have to harvest sediments and have small diversions to sustain them.	Re-open Pass a Loutre and utilize material; restore it to what it used to be			Restore marshes, land bridges, & Chenier's
Include Lafitte area within the structural protection due to it's importance to Jefferson, cultural heritage, and economy (fishing, oil and gas, tourism)	2-1, alignment encloses wetlands where no-one lives and it will alter hydrology			
Add ridge restoration at Barataria Ridge west of BBW, add Goose Bayou Ridge restoration.	2-5, only if HWY alignment is added			
Donaldsonville to the Gulf Study Area –shortest levee alignment possible to reduce cost, use pipeline canal levee alignment instead of Hwy 90. Pipeline alignment will produce smaller footprint	2-6, agreed but some might want a backside levee			
Drainage improvements are needed	2-7, LA-1 to Grand Isle, include Tide Water Road in Venice to get people of Venice to HWY			
If other levees (100yr) were designed with overflow, 500yr levees could be lessened (300 or 250yr design)	2-9 unresolved			
Can build another siphon next to the Naomi siphon	Look at re-authorization of Davis Pond			
A ring levee in Lafitte could minimize damages if Lafitte was overtopped, once you get a 500yr storm marsh does not slow surge down.	2-12 with additional diversions at Diamond and West Point-a-la-Hache.			
Planning Unit 2 would be sustained by the river through river processes.	2-16 additional marsh needs to be created			
Lower Atchafalaya re-evaluation study- address navigation and drainage concerns (Amelia)	Maintain the existing Naomi siphon.			
From Berwick following Corps. Levee alignment 3- follows the existing alignment from Wax Lake West, review alignment from Charenton drainage canal West to Iberia. Corps alignment 3 needs to be compared to St. Mary's suggested study alignment.	Add drainage pumps, properly locating			
Make sure that there are flood gates in navigable waterways and bayous	3a-9, do not want to see Verret basin put under a pump			
There needs to a jetty or reef in 3b to assist in delta forming and sustainability of floating marsh.	Opposed to rocks all along the GIWW			

Table 5.7 Interdisciplinary Technical Team (ITT) Workshop, May 2006
Summary Notes

Table 1	Table 2	Table 3	Table 4	Table 5
Eugene Island. The point of the island is degrading and needs an intertidal structure to slow the exchange rate.	4-5, make sure that you maintain hydrology			
Need to hold the lines at the heads of the bays in 3b at the fringing marsh to prevent loss of estuaries.	4-10, move to 3b			
Central and East Terrebonne CWPPRA project needs to be looked at.	4-11, allow to evolve to brackish-remove measure			
Bayou Lafourche- structures in levees are not needed if we follow the GIWW.				
Reduce the levee distance at Golden Ranch and include 2 drainage structures.				

Annex A: Parish and Levee District Board Resolutions

A.1 Vermilion Parish Resolution 2006-R-39

RESOLUTION

2006-R-39

A resolution supporting to maintaining the Mermentau Basin as a freshwater basin and opposing a hurricane barrier along the Gulf Intracoastal Waterway (GlWW) from Leland Bowman Locks west to the Calcasieu Locks and supporting a hurricane barrier between La. Hwy. 82 to the Gulf of Mexico

WHEREAS, the Vermilion Parish Police Jury is heavily dependent upon the agricultura1 industry and other businesses that were affected by Hurricane Rita's storm surge; and

WHEREAS, the agricultural industry and other businesses in Vermilion Parish cannot continue to recover, without maintaining the Mermentau Basin as a freshwater basin and a hurricane protection barrier; and

WHEREAS, the Parish recognizes that without a hurricane protection barrier and maintaining **the** Mermentau Basin as a freshwater basin, all of Vermilion Parish will be affected; and

NOW, THEREFOR, BE IT RESOLVED, by the Vermilion Parish Police Jury that it supports the maintaining the Mermentau Basin as a freshwater basin and opposing a hurricane barrier along the Gulf Intracoastal Waterway (GIWW) from Leland Bowman Locks west to the Calcasieu Locks and supporting a hurricane barrier between La. Hwy. 82 to the Gulf of Mexico.

***

I, Clay P. Menard, Secretary-Treasurer, of the Vermilion Parish Police Jury, do hereby certify that the above is a true and exact copy of a resolution adopted by the Vermilion Parish Police Jury at their meeting held on September 5, 2006, at which a quorum was present and acting,

Clay P. Menard
Secretary-Treasurer
Vermilion Parish Police Jury

A.2 Jefferson Parish Resolution No. 106280

On joint motion of all Council members present, the following resolution was offered:

RESOLUTION NO. 106280

A resolution requesting the Governor's Coastal Protection and Restoration Authority to include Lake Pontchartrain shoreline restoration and protection in east Jefferson Parish as a priority in its Master Plan for comprehensive coastal protection.

WHEREAS, Jefferson Parish has lost more than 175 acres of shoreline along Lake Pontchartrain since 1978, with a large portion of that loss attributable to Hurricane Katrina; and

WHEREAS, restoration and protection of the Lake Pontchartrain shoreline is vital to the protection of Jefferson Parish from hurricane storm surges and for the protection from erosion of the levees along the lake; and

WHEREAS, On August 9, 2006, the Jefferson Parish Council adopted Resolution No. 106040 requesting Congress to restore originally proposed funding in the amount of $100 million for Lake Pontchartrain shoreline restoration and protection in Jefferson Parish; and

WHEREAS, this Council wishes to urge and reiterate its desire to have Lake Pontchartrain shoreline restoration and protection in east Jefferson Parish included as a priority in the Coastal Protection and Restoration Authority's Master Plan for comprehensive coastal protection;

NOW, THEREFORE, BE IT RESOLVED by the Jefferson Parish Council of Jefferson Parish, Louisiana, acting as governing authority of said Parish:

SECTION 1. That the Jefferson Parish Council hereby requests Governor's Coastal Protection and Restoration Authority to include Lake Pontchartrain shoreline restoration and protection in east Jefferson Parish as a priority in its Master Plan for comprehensive coastal protection.

SECTION 2. That a copy of this resolution be sent to the Coastal Protection and Restoration Authority, c/o MS. Sidney Coffee, Chairperson, Governor's Office Street, Suite 138, Baton Rouge 70802. The foregoing resolution having been submitted to a vote, the vote thereon was as follows:

YEAS: 5 NAYS: None ABSENT: (2) Roberts, Lee

The resolution was declared to be adopted on this the 13th day September, 2006.

THE FOREGOING IS CERTIFIED
TO-BE ATRUE & CORRECT COPY

EULA A. LOPEZ
PARISH CLERK
JEFFERSON PARISH COUNCIL

A.3 South Lafourche Levee District

SOUTH LAFOURCHE LEVEE DISTRICT
BOARD OF COMMISSIONERS
P.O. Box 426 Galliano, LA 70354
Telephone 985.632.7554 Fax 985.632.7555
Email slld@mobiletel.com Web www.slld.net

Ronald Callais, *President* **Windell Curole,** *General Manager*

September 21, 2006

SHAW GROUP INC
ATTN: O'NEIL MALBROUGH
4171 ESSEN LANE
BATON ROUGE, LA 70809

Dear Mr. Malbrough:

We thank you for the opportunity to comment on the master plan for the protection of coastal Louisiana. The South Lafourche Levee District, because its members have work experience, personal experience, and formal education on issues involving coastal communities, has led Louisiana in the need to integrate restoration and flood protection.

Increased flood protection in the wake of the 2005 hurricane season is a necessary desire for everyone living in South Louisiana. Since the Larose to Golden Meadow Hurricane Protection Project is an authorized project and has been critical in the development of Port Fourchon and its benefit to national interest, it must be named and included in the category 5 report. "Larose to Golden Meadow" is the closest protected area to Port Fourchon and is becoming an increasing secondary support area for the port. Protection of that portion of LA 1 and LA Hwy 3235 in the levee system grows in importance daily. It is a critical part of the energy corridor from Port Fourchon to highway 90. Our hurricane levees protect that section from flooding.

The communities protected by this system are unique culturally and have produced individuals who have excelled on a world class level in arts and sciences. At the same time businessmen from this area have been world leaders in shipbuilding, barge transport and oilfield support industries. Its population does not register in quantity, but occupies attention with its quality.

We support a comprehensive approach to flood protection from Morgan City to the Lake Pontchartrain Basin. We believe that 98% of the population in that area can be protected with levees below the Intracoastal Canal which are designed to support interior marshes and wetlands. In fact, if designed properly these levees, in conjunction with barrier islands, marsh, and sediment diversions, could reestablish the functions of our estuaries in a method which would be biologically more productive and keep the Gulf at bay.

Again, we strongly believe that Larose to Golden Meadow is deserving of a higher level of hurricane protection not only for the people of this area, but because of national benefits.

Sincerely,

Ronald L. Callais
President, Board of Commissioners

WAC:mp

Cc: Col. Richard P. Wagenaar, USACE

Ronald Callais	President
Roy Gisclair	Commissioner
Bob Faulk	Commissioner
Clarence Marts, Jr.	Commissioner
Monty Vegas	Commissioner
Lula Auenson	Vice President
Robert Eymard, Sr.	Commissioner
E. J. Gremillion	Commissioner
Ernest Richoux	Commissioner
Windell Curole	Executive Secretary

A.4 Lafourche Basin Levee District Resolution

R E S O L U T I O N

On motion of Commissioner Folse, seconded by Commissioner Orgeron, the following resolution was proposed and unanimously adopted.

BE IT RESOLVED that a resolution stating the Lafourche Basin Levee District's support of the Coastal Protection and Restoration Authority's Draft Comprehensive Master Plan Update as presented to the District on September 7, 2006 and to inform the Coastal Protection and Restoration Authority of their preferred alignment for the Hurricane protection alignment labeled 2-1 - USACE Levee Alignment No. 1 on Figure 2-1: Planning Unit 2, alternative Plan 1 Measures on the handout materials.

WHEREAS, the Lafourche Basin Levee District is responsible for maintaining the levee and hurricane flood protection for the Southeast Louisiana residents located in a portion of the west bank (of the Mississippi River) of Ascension Parish, the entire west banks (of the Mississippi River) of St. James Parish, St. John the Baptist Parish, and St. Charles Parish, a portion of Assumption Parish (east of Bayou Lafourche) and a portion of Lafourche Parish (the east bank of Bayou Lafourche), and

WHEREAS, the Coastal Protection and Restoration Authority has a draft comprehensive Master Plan Update that addressed both hurricane protection and coastal restoration as an integrated project, and

WHEREAS, this Comprehensive Master Plan Update addresses hurricane protection to the areas represented by the Lafourche Basin Levee District by incorporating the Donaldsonville to the Gulf of Mexico Project, and

WHEREAS, the Lafourche Basin Levee District in a partnership with the Louisiana Department of Transportation and Development are the Local Sponsor for the Donaldsonville to the Gulf of Mexico Project, and

WHEREAS, two of the alternative alignments currently included in the Donaldsonville to the Gulf of Mexico Project are shown in the Coastal Protection and Restoration Authority's Comprehensive Master Plan update, and

WHEREAS, the first alignment presented is commonly referred to as the GIWW alignment (as shown on Figure 2-1: Planning Unit 2, Alternative Plan 1 Measures of the Master Plan Update) and the second alignment presented is commonly referred to as the Highway 90 (as shown on Figure 2-2: Planning Unit 2, Alternative Plan 2 Measures of the Master Plan Update), and

WHEREAS, the Highway 90 alignment provides hurricane protection to the communities represented by the Lafourche Basin Levee District;

WHEREAS, the GIWW alignment not only provides needed hurricane protection for the communities represented by the Lafourche Basin Levee

District, but also provides a second line of defense in project areas with existing hurricane protection projects and additional hurricane protection to the Parishes of Jefferson, Orleans and Plaquemines; and

WHEREAS, qiven added benefits of the GIWW alignment, the Lafourche Basin Levee District would like to adopt the GIWW alignment as their preferred alignment for the Coastal Protection and Restoration Authority Comprehensive Master Plan Update; and

NOW, THEREFORE, BE IT RESOLVED, by the Commissioners of the Lafourche Basin Levee District that:

The Lafourche Basin Levee District's hereby grants its support of the Coastal Protection and Restoration Authority's Draft Comprehensive Master Plan Update as presented to the District on September 7, 2006 and uniforms the Coastal Protection and Restoration Authority of their preferred alignment for the Hurricane protection alignment labeled 2-1 - USACE Levee Alignment No. 1 on Figure 2-1: Planning Unit 2, Alternative Plan 1 Measures on the handout materials.

I, Shelley Tastet, President of the Board of Commissioners for the Lafourche Basin Levee District do hereby certify that the above and foregoing resolution is true and correct copy of the original passed by the Board at its regular meeting held on the 7th day of September, 2006 and is of record and on file in the Board's office.

Signed at Vacherie, Louisiana this 13th day of September 2006.

A.5 Jefferson Parish, November 15, 2006, Resolution No. JPNO-11 & R-06-481

On joint motion of the members of the Jefferson Parish Council and of the New Orleans City Council present, the following joint resolution of the Jefferson Parish and New Orleans City Councils was offered:

JEFFERSON PARISH COUNCIL RESOLUTION NO. JPNO-11

NEW ORLEANS CITY COUNCIL RESOLUTION NO. R-06-481

A joint resolution of the Jefferson Parish and New Orleans City Councils expressing their support of the lower Jefferson Alignment as a modification to the proposed alignment of the Donaldsonville to the Gulf Hurricane Protection Project and requesting its consideration by the U.S. Army Corps of Engineers, the Louisiana Department of Transportation and Development, and the Louisiana Coastal Protection and Restoration Authority to be included as the authorized alignment for the Donaldsonville to the Gulf Hurricane Protection Project.

WHEREAS, the Jefferson Parish Council and the City of New Orleans Council have both expressed the great need for adequate flood protection to allow their citizens to live and work in the metropolitan area without concern for flooding from hurricanes; and

WHEREAS, the west Jefferson Levee District and the Louisiana Department of Transportation and Development, as non-federal sponsors of the West Bank and Vicinity Hurricane Protection Project, are working diligently with the U .S. Army Corps of Engineers to construct approximately 64, miles of levees and floodwalls, including a sector-gate in the Harvey Canal; and

WHEREAS, this federally-funded, locally cost-shared project, when completed, will provide hurricane flood protection for more than 250,000 citizens living and working in the communities of West Jefferson Parish, Algiers in Orleans Parish and Belle Chasse in Plaquemines Parish; and

WHEREAS, the U.S. Amy Corps of Engineers has determined that the flood protection provided by this project, once completed, will not be sufficient to protect Algiers and the lower coast in Orleans Parish and the Communities of West Jefferson Parish from a 100 year storm event; and

WHEREAS, in June of 2006, Congress passed and the President signed a Fourth Supplemental appropriations bill directing the U.S. Army Corps of Engineers to raise the existing Project to 100 year criteria; and

WHEREAS, acquiring new rights-of-way for this project enhancement will require the removal of many businesses and homes, making the new project unacceptable to a lot of the citizens it will be designed to protect; and

WHEREAS, the additional cost of construction to 100-year flood standards may well be in excess of current federal appropriations and will certainly be very expensive for local interests; and

WHEREAS, the U.S. Army Corps of Engineers and the Louisiana Department of Transportation and Development are currently cooperating in a flood control study entitled

Donaldsonville to the Gulf Hurricane Protection Project which when complete will extend flood protection from Bayou Lafouche to Plaquemines Parish; and

WHEREAS, if the alignment for the Donaldsonville to the Gulf Hurricane Protection Project is modified to allow for the protection of the communities Crown Point, Lafitte and Barataria, the citizens of this segment of west Jefferson Parish would also receive the benefit of adequate flood protection; and

WHEREAS, taking into account the overall constructability and cost of providing the needed flood protection for both of these areas, consideration should be given to using the Donaldsonville to the Gulf Hurricane Protection Project to accomplish this goal; and

WHEREAS, in support of this concept, the West Jefferson Levee District has prepared a report entitled the Lower Jefferson Alignment that provides a preliminary determination as to the feasibility for modifying the alignment of the Donaldsonville to the Gulf Hurricane Protection Project such that it would provide flood protection for the entire area; and

WHEREAS, the Lower Jefferson Alignment if incorporated into the Donaldsonville to the Gulf Hurricane Protection Project would, once constructed, provide a "first line of defense for all of the communities currently to be protected by the West Bank and Vicinity Hurricane Protection Project;

NOW, THEREFORE, the Jefferson Parish Council, acting as the governing authority of the Parish of Jefferson, Louisiana, and the New Orleans City Council, acting as the governing authority of the City of New Orleans, Louisiana, hereby resolve that:

SECTION 1. These Councils hereby express their support of the Lower Jefferson Alignment as a modification to the proposed alignment of the Donaldsonville to the Gulf Hurricane Protection Project and request its consideration by the U.S. Army Corps of Engineers, the Louisiana Department of Transportation and Development, and the Louisiana Coastal Protection and Restoration Authority to be included as the authorized alignment for the Donaldsonville to the Gulf Hurricane Protection Project.

SECTION 2. The Jefferson Parish Clerk is hereby requested and authorized to send a certified copy of this resolution to the District Engineer, U.S. Army Corps of Engineers, New Orleans; to the Secretary for the Louisiana Department of Transportation and Development; to the Chairperson for the Louisiana Coastal Protection and Restoration Authority; and to the Louisiana Congressional Delegation.

The foregoing resolution having been submitted to a vote, the vote thereon was as follows:

JEFFERSON PARISH COUNCIL:
YEAS: 7 NAYS: None ABSENT: None
YEAS: 7 Young, Capella, Roberts, Lagasse, Lee, Congeml, Sneed
NAYS: None
ABSENT: None

NEW ORLEANS CITY COUNCIL:
YEAS: 7 NAYS: None ABSENT: None
YEAS: 7 Carter, Fielkow, Head, Hedge-Morrell, Midura, Thomas, Willard-Lewis
NAYS: None
ABSENT: None

The resolution was declared to be adopted on this 8" day of November, 2006.

JEFFERSON PARISH
LOUISIANA
OFFICE OF THE COUNCIL

PARISH COUNCIL

JOHN F. YOUNG, JR.
Chairman

THOMAS J. CAPELLA
At Large

CHRIS ROBERTS
District 1

ELTON M. LAGASSE
District 2

BYRON L. LEE
District 3

LOUIS J. CONGEMI
District 4

JENNIFER SNEED
District 5

WESTBANK
POST OFFICE BOX 9
GRETNA, LA 70054
(504) 364-2600

EASTBANK
POST OFFICE BOX 10242
JEFFERSON, LA 70181-0242
(504) 736-6600

SONNY BURMASTER
Chief of Staff

EULA A. LOPEZ
Parish Clerk
OFFICE OF THE CLERK
GRETNA, LA 70054
(504) 364-2626

November 15, 2006

Michele Deshotels, Integrated Planning Team
Louisiana Department of Natural Resources
P.O. Box 44027
Baton Rouge, LA 70804-4027

Dear Ms. Deshotels:

Enclosed herewith is a certified copy of Resolution No. JPNO-11 & R-06-481 adopted by the Jefferson Parish Council and New Orleans City Council on Wednesday, November 8, 2006, which is self-explanatory.

Yours truly,

Eula A. Lopez

Eula A. Lopez, Parish Clerk
Jefferson Parish Council

EAL/db
Encl.

9/22/06

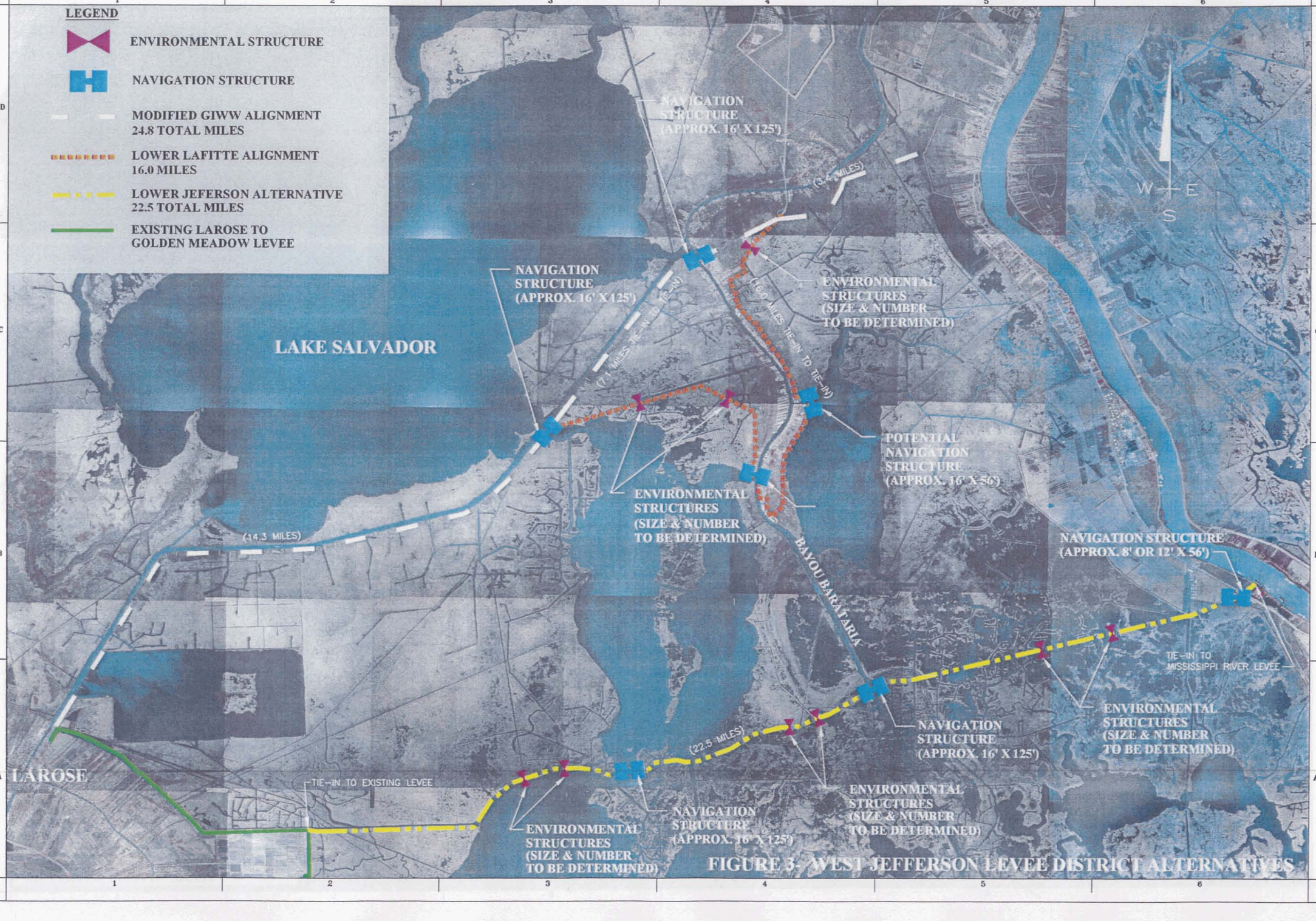

FIGURE 3- WEST JEFFERSON LEVEE DISTRICT ALTERNATIVES

A.6 West Jefferson Levee District

WEST JEFFERSON LEVEE DISTRICT

7001 RIVER ROAD MARRERO, LA 70072
TEL: (504) 340-031 8 FAX: (504) 340-7801

September 30,2006

Ms. Sidney Coffee, Chairperson
Coastal Protection and Restoration Authority
1051 North Third St., Suite 138
Baton Rouge, Louisiana 70802

Dear Ms. Coffee:

The purpose of this letter is to provide the position of the West Jefferson Levee District in regard to the CPRA - LA Coastal master Plan, as it impacts the citizens of (west) Jefferson Parish, Louisiana.

On August 17,2006, members of the CPRA Integrated Planning Team met with the Board of Commissioners for the West Jefferson Levee District to present processes and concepts of the "draft" LA Coastal Protection Master Plan.

Concerned with the flood protection alignment as proposed in the draft plan as it crossed lower Jefferson Parish, the district contracted with Shaw Coastal, Inc. and tasked them with preparing a flood protection alignment that included Crown Point, Barataria, and the Town of Jean Lafitte, all communities located outside of the West Bank and Vicinity Hurricane Protection Project alignment.

Sincerely,

Harry L, Cahill III
President, West Jefferson Levee District

cc: Mr. Randy Hanchey, CPM- Integrated Planning Team Leader
Department of Natural Resources
P. 0. BOX 44027
Baton Rouge, Louisiana 70804-4027
Mr. Larry Ardoin, CPRA - Integrated Planning Team
Louisiana Department of Transportation of Development
P. 0. BOX 94245
Airport Building l00
Baton Rouge, Louisiana 70804-9245
Ms. Michele Deshotels, CPRA- Integrated Planning Team
Department of Natural Resources
P. 0. BOX 44027
Baton Rouge, Louisiana 70804-4027

A.7 Gulf Coast Soil and Water conservation District

GULF COAST SOIL AND WATER CONSERVATION DISTRICT

To: Dr. Ernest Girouard, President Vermilion SWCD Abbeville, La
From: Gulf Coast SWCD Lake Charles, La
Re: Hurricane Protection Proposals

Dr. Girouard,

The Gulf Coast SWCD Board is in concurrence with the information and material forwarded for our consideration. Specifically, we strongly support maintaining Hwy 82 for hurricane evacuation and marsh protection under the revised PU-4 Alternative Plan 1 measure 4-24.

Please keep us informed as to how we may assist in this effort.

Jim Paul Dupont
Chairman
Gulf Coast SWCD

PU-4 ALTERNATIVE PLAN 1
Measures

4-1. Proposed Hurricane Protection Levee for 30-ft storm surge @ coastline
4-2. Complete/Accelerate the Chenier Plain Freshwater and Sediment Management and Allocation Reassessment Study which was included in the LCA Near-Term Plan:
4-3. Maximize freshwater inflow from Sabine River
4-4. Salinity Control structures along the east shoreline of Sabine Lake nr Blue Buck Point, Sabine Is and Black Bayou
4-5. Beneficial Uses of dredged material Program: utilize sediment from Sabine Ship Channel and dedicated dredging for marsh enhancement and construction of terraces
4-6. Salinity control structure ast Hwy 82 Causeway
4-7. Stabilize Gulf shoreline and beach west of Calcasieu River to Sabine River using dredged sediment or breakwaters
4-8. Stabilize Gulf shoreline and beach east of Calcasieu River to Freshwater Bayou using dredged sediment or breakwaters
4-9. Salinity control structure in Calcasieu Slup Channel near ferry
4-10. Beneficial Uses of dredged material Program: utilize sediment and dedicated dredging for marsh enhancement and construction of terraces in Calcasieu Lake
4-11. Salinity control structures at points on east side of Calcasieu Lake to aid in salinity control
4-12. Maximize freshwater inflow to tributaries of the Mermentau from outside sources
4-13. Maximize freshwater inflow to Mermentau from outside sources
4-14. Stabilize Grand Lake shoreline and land bridge
4-15. Freshwater Introduction/Retention structure or sill on Little Pecan Bayou
4-16. Freshwater Introduction/Retention structure or sill on Rollover Bayou
4-17. Stabilize White Lake shoreline and land bridge
4-18. Stabilize banks from Schooner Bayou to GIWW along Freshwater Bayou and along GIWW near White Lake
4-19. Salinity Control on Black Lake Bayou near Hackberry
4-20. Build new chamber for navigation at Calcasieu Lock on GIWW and use old lock to evacuate excess water
4-21. Stabilize banks of Freshwater Bayou

4-22. Stabilize eastern shore of Lake Calcasieu
4-23. Develop a plan to elevate and/or relocate assets located outside the hurricane protection Levee
4-24. Maintain Hwy 82 for hurricane evacuation and marsh protection along with maintaining Hwy 82 in good travel condition, we suggest the elevation of said Hwy from Schooner Bayou to Cameron, In addition a levy from Schooner Bayou control structure to Hwy 82 on south bank would not only buffer storm surge but maintain the integrity of the Mermentau Basin.
4-25. Provide water control structures at strategic locations along Hwys 82 and 27
4-26. Manage watershed to reduce rapid inflows into Mermentau Sub-basin
4-27. Restore Marsh by Filling Abandoned Canals
4-28. Utilize freshwater inflow from Atchafalaya River
4-29. Improve hydrology of the old Mermentau River Channel between Mud Lake and GOM
4-30. Stabilize Banks of GIWW
4-31 Toll road on top of levee south of GIWW
4-32. Hebert Canal Watershed
4-33. North Prong-Salinity control - flood protection for Mermentau Basin
4-34. Storm buffering systems

* Not tied to specific geographic location

A.8 Vermilion SWCD

September 25, 2006

Dr. Ernest Girouard
Chairman
Vermilion SWCD
1049 W. Summers Drive, Suite B
Abbeville, LA 70510

Dear Dr. Girouard:

This is in response to your letter of September 11, 2006 requesting comments and support to proposed hurricane protection alternatives in Southwest Louisiana.

The Iberia Soil and Water Conservation District discussed these alternatives at their board meeting held on September 30, 2006 and motioned to approve the all measures submitted with the exception of changes made to Planning Unit 3b. Enclosed is a list of the desired alternatives for Iberia Parish which was derived from combining features of both Alternative Plan 1 measures and Alternative Plan 2 measures. These alterations are reflected by an underline.

It is also the desire of the District that at parish lines, each parish will determine features and alignments that would provide the greatest points of intersect to determine the best corrective avenues.

Your cooperation and support in this matter is greatly appreciated.

Sincerely

Darrell P. Judice
Chairman

DPJ/Igh
Enclosure

PLANNING UNIT 3b - ALTERNATIVE 2 - MEASURES

1. Construct hurricane protection (30-foot storm surge at the coastline) for Berwick and Patterson and levee alignment from Wax Lake Outlet to the Vermilion River. In favor of alignment along marsh upland interface that could follow existing farm levees and would be constructed on firmer soils that could support levee. This alignment also allows for control of surface water in smaller channels with smaller structures that could be operated and maintained without travel by boat.

2. Complete/Accelerate the Louisiana Coastal Area (LCA) Near-Term Plan including:

    a) Stabilize Gulf Shoreline at Point Au Fer Island.
    b) Convey Atchafalaya River water to northern Terrebonne Marshes.
    c) *Acadiana Bays Estuarine Restoration Feasibility Study.
    d) *Upper Atchafalaya Basin Study.

3. Increase sediment transport from the Atchafalaya River down Wax Lake Outlet.

4. Stabilize banks of Southwest Pass off Marsh Island.

5. Stabilize banks of the GIWW.

6. Stabilize shorelines - Freshwater Bayou to Southwest Pass.

7. Stabilize shorelines across south shoreline of Marsh Island from Lighthouse Point to South Point (east of Mound Point) using dredged sediments and/or breakwaters.

8. Beneficial use of dredged material and dedicated dredging wherever possible to rebuild marsh shorelines, historic reefs, and barrier islands.

9. Stabilize and implement plan to elevate and/or relocate assets located outside of the hurricane protection plan.

10. Freshwater Bayou Bank Stabilization - Belle Isle Bayou to Freshwater Lock.

11. Create marsh at Weeks Bay (from Al - M3)

12. South Iberia Watershed Plan (Tied to proposed levee system in Item 1 and should be implemented prior to levee construction to provide protection benefits utilizing existing infrastructure.)

13. Hebert Canal Watershed 3B - 4

14. Bayou Tigre Watershed Project

15. *Storm Buffering System

16. Restore marsh at Marsh Island south shoreline and Rainey Marsh via dedicated dredging.

17. Restore Vermilion Bay and West Cote Blanche Bay shorelines via beneficial uses of dredged

material and/or detached breakwaters.

18. Install a structure in the Delcambre Canal which is operated only during storm events.

* Not tied to geographic location.

Region 3b Alt. 2 Measure 18

Location: Delcambre Canal

Problems: The area in southeast Vermilion parish suffered extensive damage due to storm surge. The Delcambre Canal is a direct conduit which allows the storm surge to devastate the Delcambre and western Iberia parish.

Implementation/ Restoration Strategy: The strategy is to install a structure in the Delcambre Canal which is operated only during storm events and does not hamper navigation.

Progress: New project

Cost: To be provided at a later date.

Annex B: Stakeholder Meeting Response Matrix

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General Issues/Themes								Planning Units				
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Restore habitats to early 1900s. (EIG)	Concern of dependability of monitoring equipment during an actual storm surge. (WPACE)	The Public Comments must be reviewed by the IPT in detail. See page 41-50 of the Stakeholder Summary Report.	Does the plan include structural protection for a category 5 hurricane event? (WPACE)	Are the petrochemical industries going to be pointed out as the bad guys in terms of coastal degradation? (KKC)	What happens when administrations change? (EPACE)	There are completed studies that have never been implemented. (EPACE)	Need map depicting Ecological goals within various ecosystems. (EIG)	The Lake Pontchartrain Basin Foundation has a strong preference for alternative 2. (PC)	Can the Lafitte area be included in the Donaldsonville to the Gulf project? (LBLD)	Opposed to the Morganza to the Gulf project. (comment did not represent all participants) (EIG)	See section 4.4.1 and 4.4.2 in the Stakeholder Summary Report.	See section 4.4.1 and 4.4.2 in the Stakeholder Summary Report.
Traditions, culture, and political considerations should be included. (EIG)	Modeling tools are not accurate, especially for agriculture. (WPACE)	Is the Corps following the same methodology and are the maps similar? (WPACE)	The LLA would like time to merge plans and ideas and submit to IPT. (LLA)	Place mandates on building codes. Look at FEMA-55, the coastal construction manual. (FMPD and EIG)	Will the Corps adopt the plan? (EPACE and WPACE)	How long will the entire plan take? (SLLD)	Should have a habitat map for each planning unit. (EIG)	Habitat goals need to be defined by the 1912-1932 baseline. (PC)	What will happen with the Myrtle Grove diversion? (LLA)	Support the Morganza to the Gulf alignment. (WJLD and TLCD)	Concern for Amelia to the Atchafalaya in Planning Unit 3b Alternative 1 due to split in Bayou Buff and exclusion of industry. (WPACE)	Incorporate other watershed plans which encompass 3b and 4 Planning Units. (VP)
Emphasize habitat restoration and mitigation (EIG)	What is the accuracy of modeling? There are problems with the modeling that need to be addressed. (EPACE and LLA)	Evaluate cost alternatives when considering projects and policies along the coast. (EIG)	Include how the Corps will use sediments from dredging and where those sediments will be used. (BTNEPMC)	Look at negative impact such as cypress logging. Enact policy to not allow cypress logging. (EIG)	Concern for Legislature approval and possible changes. (EPACE and FMPD)	This plan should serve as a blueprint. (EPACE)	Maps need parish lines drawn on them. (PC)	Request that the 40 Arpent levee be connected through Verret and the entire 40 Arpent raised to 17.5 feet.(LBL)	Why do the alternative maps show shoreline protection in PU-3a (Alt II) along the entire coast but do not include the entire coast in PU-2 (Alt II)? (WJLD)	Levees are integral part; not the final answer. Use the 3rd Delta study to come up with solutions. (LLA)	Planning Unit 3b Alternative 2 lock or floodgate at Intracoastal Canal. (WPACE)	Create Marsh at Weeks Bay. (PC)
People will not live in areas that are at risk if the Corps does not build levees in such areas. This will allow for these areas to revert back to natural systems. (EIG)	Need to understand storm reduction differences between marsh and land. Be aware of inaccurate assumptions in modeling regarding this protection. (EPACE)	Plan for internal drainage from the upper reaches of the drainage basin to the barrier islands (i.e., Gravity drainage through water control structures in the hurricane levee, Interior drainage levees, Pump systems, Channel improvements). (PC)	Coordinate on-going flood studies by the Corps and others. State and local officials should decide when and where the flood protection should be directed. (PC)	The Corps has been taught over the years that Mother Nature cannot be controlled. What is being done to deal with such matters? (KKC)	The plan and implementation must be fair across the state or the public will not accept the plan. (VP)	When will implementation begin? (EPACE and VP) When will the first project begin? (VP)	Would like Planning Unit boundaries changed. Does not want Chenier Plain combined with the Deltaic Plain for planning expediency. (WPACE)	The levee board opposes the Corps levee alignment in the vicinity of Bayou Dupre and Verret. It is preferred to cross the MRGO with a gate at Verret and continue with a new 17.5-foot high levee along the northern bank of the MRGO to Bayou Dupre. (LBL)	The Larouse-Golden Meadow system was left out of the 4th supplemental appropriation. (SLLD)	Unit 3a, alt. 2: private property exist where two lock installations are wanted because of 40% loss of property but there are no projects shown. The project would include closure of the Bayou Savan, why is this not depicted? (LLA)	Vermilion Parish- would like Planning Unit boundaries changed. Does not want Chenier Plain lumped with Deltaic Plain for planning expediency. (WPACE)	Language in Unit 4 under alternative 1 needs to be re-worded because it is confusing. Also, is the storm surge at the coastline? (VP)
Levees are not the answer. Instead the state needs "speed bumps" to break the surge. (LLA)	The Mississippi River is not carrying the gravel, sand and silt load that was present historically and needed to build coastal Louisiana. (PC)	The public should be more involved. 30-day time frame is too short. (LLA)	How will the State plan interact with the Corps Plan? (WPACE, ABLD, and SLLD)	Do not allow building in wetlands. (EIG)	How can the Louisiana Landowners Association (LLA) validate this plan?	How will money be allocated among Parishes? Who will allocate the money? (VP)	Evacuation routes should be on the maps. (PC and EIG)	Incorporate the Biloxi Marsh Stabilization and Restoration Plan, St. Bernard Parish. (LBL)	Grand Isle is fully supportive of the Master Plan. (GILD)	Will there be a Bayou Boeuf lock be included in the Master Plan? (GIWW intersection) (WPACE)	Incorporate other watershed plans which encompass 3b and 4 Planning Units. (VP)	Incorporate the Hebert Canal Watershed Resource Plan, Vermilion Parish in Planning Unit 4. (PC)
Concern that Master Plan may not emphasize maximum restoration. This includes use of non-structural restoration and reefs instead of levees. (EIG)	Are jobs included as concentrated assets? (EPACE)	How is the IPT outreaching to Parishes and local scientists? (BTNEPMC)	Incorporate other watershed plans which encompass 3b and 4 Planning Units. (VP)	The Coastal Zone should become less tolerant to dredging and not allow new channels to be dredged. (EIG)	How will the final plan be chosen? (FMPD)	Is cost being evaluated? (EIG)	The levees appear too small and detail can not be seen on the maps. (SMP)	Include Lake Pontchartrain shoreline restoration and protection in east Jefferson Parish as a priority. (Jefferson Parish Council)	Will the Donaldsonville to the Gulf project be included? (EPACE)	St. Mary plan submitted. (WPACE)	A lot of emphasis is being put on western Vermilion, but most of the flooding occurred in eastern Vermilion (water came from Vermilion Bay). (VP)	Raise spoil banks of east-west oil field canals in South Vermilion Parish. Alt.1. (PC)
The Barrier plan and alignment options must be discussed further (SMLA)	Does the data accurately show where sediment should be conveyed from? (LLA)	How was a Science Engineering Review Team developed? (BTNEPMC)	Include the work on pipeline sediment delivery done by CH2M Hill. (PC)	How does the plan address changing the practices of the oil industry's activities which are harmful to the coast? (ARBC)	Who determines which projects are chosen? (FMPD)	What is the estimate of the cost to implement the plan? (CPPC)		Close shipping channel at southwest pass as it cannot be maintained. (PC)	Would like Grand Isle Master plan included in IPT plan. (EPACE)	Protect "Larose to Golden Meadow" area from LA 1 to La Hwy 3235 with levees. (SLLD)	Raise spoil banks of east-west oil field canals in South Vermilion Parish. Alternative 2. (PC)	Fix saltwater/storm water breaches in Mermentau Basin spoil banks. (PC)
What is being done to rebuild barrier islands? (LBLD)	Concern regarding the modeling efforts and inputs. (LLA)	Make sure to involve local scientist in process. (BTNEPMC)	Want plans to be consistent with what Mississippi and Texas have done/are doing. (FMPD)	What about restitution for coastal damage caused by oil exploration? (ARBC)	When will the draft be finished? (FMPD)	What is the priority for the Barrier Islands? (SLLD)		LLA concerned about the Bonne Carre Spillway. (LLA)	The state should repair the dam at Bayou Mound. (LLA)	Explain the GIWW interior alignment in Terrebonne Parish (TLCD)	Implement Bayou Tigre Watershed Development Project (PC)	Vermilion Parish supports Mermentau basin as a freshwater basin (Vermilion Parish Police Jury)

ABBREVIATIONS	
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CPPC	Calcasieu Parish Police Jury Committee
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Do not want levees along the coast that would allow for future commercial or urban development (EIG)	Consider average annual loss rate for wetlands. Terrebonne has lost more wetlands than any other parish. (EPACE)	Become involved with people who do the dredging process. (BTNEPMC)	Levees are an integral part but not the final answer. Use the 3rd Delta study to come up with solutions. (LLA)	Force relocation away from historic homes and property through denial of permits for property below sea level and property outside of levees. (EIG)	Who will determine funding allocations and by what method will it be determined? (VP)	How does the IPT see the plan in 5 years? (EPACE)		1-9 (PU 1, Alt. 1)/ 1-10 (PU.1, Alt.2) Title does not represent everything that needs to be done in this area and should be changed to "Jefferson Parish Foreshore Protection" and include replacement of lost shoreline, protection with riprap, and marsh creation behind new breakwaters. (EJLD)	Will the Master Plan support the GIWW alignment of the Donaldsonville-Gulf project? Should the levee District pass a resolution supporting this project? (LBLD)		Incorporate the Bayou Tigre Watershed Project Proposal, Vermilion Parish (PC)	The south side of the GIWW (in Vermilion) is a critical part of the parish. That is where the majority of the water during Rita came from. The canals may be closed, but water will still infiltrate. Locks should act like barriers and not be locked all of the time. (VP)
Emphasize risks. (EIG)	The measures table is skewed and emphasizes projects over plans, policies, and programs. (PC)	Coordinate efforts in order not to duplicate work. (BTNEPMC)	Vermilion Parish did not fair well in the 2050 plan nor the LCA plan so it is not sufficient for the IPT to use existing plans for this area. (VP)	State should deny building permits on private property below sea level and outside existing levee systems, deny flood insurance, and force relocation. (EIG)	The problem with the LCA report was the decision-making process--the same process being used in this plan. (LLA)	The plan might not be feasible and people might need to relocate. (EIG)		The Central Marsh area could function as a reservoir for overtopping waters from the MRGO and Lake Borgne and serve as a storm buffer. Marsh restoration in the Central Marsh and Lake Borgne area are supported. (LBL)	Do the levee alignments follow the Intracoastal Canal? (WJLD)		Review The St. Mary Parish Storm Surge Protection Study by Miller Engineers. (SMP)	Vermilion Parish opposes a hurricane barrier along GIWW from Leland Bowmand locks west to the Calcasieu Locks. It supports a hurricane barrier between La Hwy 82 to the Gulf o f Mexico (VP)
What will the new reserve found in the Gulf be used for? (ABLD)	Define non-structural measures. (PC)	How specific will the draft plan be for public review? (SMP)	How will the hurricane levee presented in the state plan affect the Mississippi River and tributaries levees? (ABLD)	Mandate education on risk and evacuation to communities. (EIG)	The problem with the LCA report was the decision-making process--the same process being used in this plan. (LLA)	Does the IPT believe that the plan will be implemented in this lifetime? (VP)		LLA concerned that there is not enough sediment available anywhere in the proximity of the LaBranche wetlands to build a marsh the way it is shown. (LLA)	PU 2, Alt. 1: will the GIWW and Morganza to the Gulf connect? (LBLD)		All of St. Mary must be protected. (SMP)	Include constriction of width of rivers that run through Cameron Parish (WPACE)
Measure 4-23 (Alt. 1) should be the overriding measure for any and all areas along the coast. (PC)	Is the IPT aware of how high the surge was during both hurricanes? (WPACE)	What are the neighboring Gulf states doing? (CPPC)	What is the relationship between the Corps, the LRA, and the CPRA plans? (ABLD)	Put more money towards improved evacuation routes. (EIG)		Who will determine funding allocations and by what method will it be determined? (VP)		The Lake Borgne Levee Board is concerned about who will operate and maintain a gate at the MRGO due to possible cost and risk to the Parish. (LBL)	Doesn't the GIWW protect more people? If you go from Donaldsonville to the Gulf (south of Lake Salvadore) then the alignment will be pushed back several years. (LBLD)		Do you include the west levee alignment- Wax Lake Outlet-in the contour plan. (WPACE)	No problems with levees on the South shore of Cameron Parish as long as estuaries are protected. (WPACE)
Do not want levees to be the only line of defense. (WPACE)	Use modeling tool used in Abbeville to show depth and range of storm surge. (WPACE)	Consideration should be given to structure placement to allow for the installation of healthy strong trees (such as cypress) by maintaining fresh water. (LBL)	Include the Comprehensive Conservation and Management Plan for the Barataria-Terrebonne Estuary. (PC)	Make sure that sediment is not wasted and mandate beneficial use of dredged materials. (EIG and BETNEPMC)				Support the West Lake Pontchartrain Levee alignment project in the feasibility study. (PLD)	How does the GIWW tie into Lafitte? Can the GIWW surround Lafitte? (LBLD)		Question diversions in lower Mississippi and Atchafalaya sediments into Wax Lake Outlet. Also concerned with Terrebonne marshes. (EIG)	Protection for liquid natural gas terminals in Cameron Parish. (WPACE)
Agriculture was not addressed at the Louisiana Speaks workshop but should be addressed by IPT. (WPACE)	Clearly define "measures". (PC)	What was the rational behind creating two alternatives? Can the alternatives be combined? (EPACE and EIG)		Will the plan include policy/techniques to deal with various state and federal verbiage that delays projects? (EPACE)				East Jefferson Levee District (EJLD) recommended and provided written support of structural lake front protection and restoration of eroded lake shore.	What alignment would protect St. James? (LBLD)		The Gibson alignment does not go all the way to the Bayou Boeuf Lock (SMP)	Levees on the South shore in Cameron Parish will not work. WPACE)
Has saltwater intrusion been addressed? (ARBC)	Is the Corps hydraulic surge data reliable? (WJLD)	What will determine whether Alternative 1 or 2 goes forward and will parts of alternative 1 be put into alternative 2? (VP)		Will there be policies for public or private relocation after evacuation? (ABLD and EIG)				The Board supports the closure of the MRGO. (LBL)	What is being done to protect the Barrier Islands? (LBLD)		What is the advantage in putting more sediment in Wax Lake? It would have to be done along with filling the reefs. (EIG)	Cameron Parish does not want levees all along the coast but does desire natural barriers to break the natural flow of water. (FMPD)

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The eastern part of the state is receiving more money than the west. The west loses every time. (VP)	The plan should not emphasize protection, it should be about both restoration and protection. (LLA)	The evaluation process of this plan needs to be critical and transparent. (LLA)		DOTD removed a bridge before the hurricane, and the area could not evacuate. These political issues should be addressed. (VP)				The most urgent feature is the riprap or bulkhead protection along the shoreline. The cost has been estimated by EJLD at $100 million. (EJLD)	Lafourche Basin Levee District in support of the preferred alignment PU 2, Alt. 1. (the GIWW alignment). (LBLD)		Should build up the Avoca Island area and allow water and nutrient flow where they naturally did. (LLA)	There should be heavy emphasis on marsh restoration projects in Cameron parish. If no, the plan will not be creditable. (LLA)
The Corps may not be able to come up with Cat 5 protection. (WPACE)	The Barataria-Terrebonne National Estuary Program supports pipeline sediment strategy and is concerned that not enough cells and polygons exist in the alternatives. (BETNEPMC)	Is the five-year action plan a study? (VP)		By creating the CPRA, did the state dilute the efforts of CWPPRA? The state also seems to be overly concerned with levees which will cause us to lose the southwest pass. Restoration must be the primary concern. (VP)				LSU AgCenter prefers to change measure 1-5 b & c (PU-1, Alt. 1 &2) to medium diversions to increase the benefits for the region. A small diversion is anticipated to not deliver the expected results. (EJLD)	How will Plaquemines Parish be handled in the Master Plan? How are decisions made as to which assets are incorporated in protection? (EPACE)		Amelia is both residential and industrial. Will the plan make recommendations for this area. (SMP)	Where would levees go in Kaplan? (WJLD and VP)
The state should not encourage a false sense of security with levees. (EIG)	Clearly define strategic resources and assets. (EPACE)	Will the public get to see the results of the study and tested models? (VP)		Coastal restoration and management bureaucracy must be changed and addressed in the plan. Insert language in the plan so that some agencies do not have certain powers. Opposed to the permit process between the Corps and DNR. (VP)				LSU AgCenter recommends moving the drain e canal from the Jefferson/St. Charles Parish line to flow into the LaBranche wetlands and suggest sediment conveyance to bolster the Pontchartrain/Maurepas land bridge. (EJLD)	EJLD supports the "Ships for Shores" project for short-term protection.		Look at where Vermilion Bay and the Gulf are located. The basin should be used to trap the overflow, and the levees should protect everything else. The locks can handle the difference and the water will mix. (VP)	Considerations need to be made regarding the saltwater diversion plan being created around Erath. (VP)
Do not want a "Great Wall" of levees along coast. Instead place heavy interest on non-structural measures. (EIG)	Are fisheries considered as a strategic resource? How was the definition of strategic resources agreed upon? Are roads and bridges, oil & gas facilities, fisheries (oyster leases, spawning grounds) strategic assets? Was fishery landing data used? (EPACE)	Fishing jobs should be included in the concentrated assets. (FMPD)		Will the CPRA-IPT effort exceed the in-house capabilities of the levee board? (WJLD)				EJLD supports the Lake Pontchartrain Barrier Plan. (EJLD)			Vermilion Parish does not need a 20 foot high levee. It does need a combination of barriers to break the surge. Recognize that this area has a lot of natural drainage. (VP)	Freshwater diversions should be included in the plan to rebuild the land. Building a levee on the GIWW will prohibit freshwater interchange in an area that needs freshwater. Another watershed plan encompasses 3b and 4, that too needs to be considered. (VP)
Piping sediment or freshwater to rebuild coastal area. (EIG)	Is pre- and post-Katrina data being used? The post-Katrina data is not accurate and may be unfair. (EPACE)	IPT should avoid making short-term decisions regarding coastal restoration, hurricane protection, and policy. (EIG)		Will the plan include permitting for new buildings? (ABLD)				The LSU AgCenter is working on a landscape design for the Jefferson Parish shoreline that should be incorporated into the plan. (EJLD)			Has the levee along the GIWW south bank been studied? (VP)	Instead of putting millions into levees, invest some into marsh restoration projects in Cameron. (LLA)
Consider deep water commerce. (SMP)	Where are the strategic oil resources? (KKC)	Focus on long-term impacts. (EIG)		Include the human component of protection (keeping people out of harms way through acquisition, relocation, etc. (PC)				Has it ever been proposed to widen the GIWW? (WJLD)			The Saltwater Conservation District is working on a watershed plan around Erath. That plan needs to be considered. (VP)	Why are levees around Kaplan which does not have a history of flooding, but not around Erath and Delcambre, which does? (VP)
Need to upgrade any structures that prevent the passage of water. (LBL)	Everyone is concerned with flood protection and the ball is going to be dropped on restoration. (EIG and VP)	Make the plan comprehensive by not ignoring policies, plans, and programs. (PC)		Plan should include a discussion of how the state and federal agencies will consider a parish or municipality. (PC)							The need for floodgates by Franklin and Hansen Canal should be included. (SMP)	Would ring levees in Gueydan be able to handle storms that drop 10-20 inches of rain? (VP)

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Freshwater diversions should be thought of as long-term but not land building. (PC)	Clearly explain the 100-year level of protection and the 100-year perspective. (ABLD)	Confusion on the determination of final plan from the three different plans under development. (WPACE and FMPDM)		Consolidate finances through local, state and federal funds. The state has to focus on tidal flooding and river flooding. (PC)							Was it ever considered to use existing levees or oilfield canals to make barriers before it gets to the GIWW? (VP)	Cameron parish would like emphasis on breakwaters and using fine sand sources for pumping. (WPACE)
Marsh creation by pipeline delivery of dredged sediments should be emphasized. (PC)	Was Katrina greater than a 100-year flood surge? (ABLD)	What is the Corps role in the IPT planning process? (ABLD)		Responsible parties should remove deposits of hazardous wastes at or near sea level. The plan should include some kind of admonitions about sitting of hazardous materials within the storm-surge-prone areas and removal of existing hazardous materials. (PC)							Freshwater diversions should be included in the plan to rebuild the land. Building a levee on the GIWW will prohibit freshwater interchange in an area that needs freshwater. Another watershed plan encompasses 3b and 4, that too needs to be considered. (VP)	Measure 4-7 (Alt. 1) The best way to stabilize the coastline west of the Calcasieu would be to remove the jetties. Or, model changes in the configuration of the jetties to see if there might be a way to allow restoration of the coastwise current's historic pattern and lessen the energy carried shoreward by the genre. (PC)
Protect highways and navigation channels. (PC)	Will there be no guarantee that a 100-year surge would be stopped to protect areas? (ABLD)	How much of the Atchafalaya Basin Levee District area is involved? (ABLD)		Keep the public informed of the threat a hurricane poses to them and their property. (PC)							Morganza to the Gulf is in 4-5 plans and goes to Bayou Boeuf but St. Mary never got a chance to input. (SMP)	Has it definitely been decided upon that a levee will be built between Gueydan and Kaplan? (VP)
IPT should acknowledge disagreements between the state and the Corps. (WPACE)		So much of the problem is that we are trying to expedite freshwater into the Gulf and that has created a lot of the problem. (ARBC)		Stress elevation in construction of buildings through education not regulation. (PC)							Amelia and Morgan City have a levee but have no major protection for backwater flood protection. (SMP)	Measure 4-1 (Alt.2) the levee would exacerbate hydrological interruptions and lead to further degradation of the ecosystem as well as encourage more development. (PC)
Plan should incorporate non-structural measures and floodplain management. (FMPD)		Do dredging from inside. (VP)		Regulate speed of super-tankers to lower impact of wave action on coast. (PC)							PU 3b, Alt. 2: Measure 1 should indicate that it will tie into the selected hurricane protection measure that is selected in Unit 4. (PC)	Measure 4-23 (Alt. 1) should be the overriding measure for any and all areas along the coast. (PC)
Vermilion Parish does not approve of large levees going along the western coast. The plan also should address the importance of the culture that is highly valued in this area. The area must be maintained as a freshwater basin. (VP)		The plan should be well-publicized, circulated, and public hearings held not just in Louisiana but in all other states. (PC)		The state-owned water bodies should be filled in to break storm surge--these bodies have been ignored. The plan should address these issues. (LLA)							PU 3b (alt.1, measure 11) "Belle Isle to locks" should be deleted and one could insert "..from Intracoastal to the Gulf of Mexico." Why is there no barrier island protection for this planning unit, which still has barrier islands to protect? (PC)	Study the endocrinological implications of the alternation of the hydrology in this area in order to make better decisions about the various measures proposed for Grand and White Lakes. (PC)

ABBREVIATIONS	
ABLD	Atchafalaya Basin Levee District
ARBC	Amite River Basin Commission
BTNEPMC	Barataria-Terrebonne National Estuary Program Management Conference
CPPC	Calcasieu Parish Police Jury Committee
EIG	Environmental Interest Groups
EJLD	East Jefferson Levee District
EPACE	Eastern Parishes Against Coastal Erosion
FMPD	Floodplain Managers and Planning Districts
GILD	Grand Isle Levee District
KKC	Kenner Kiwanis Club
LBL	Lake Borgne Levee District
LBLD	Lafourche Basin Levee District
LLA	Louisiana Landowners Association
PC	Public Comment
PLD	Pontchartrain Levee District
SLLD	South Lafourche Levee District
SMLAC	St. Mary Levee Advisory Committee
SMP	St. Mary Parish Board
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Annex B: Stakeholder Meeting Response Matrix

General Issues/Themes								Planning Units				
Basic Assumptions and Emphasis	**Data Reliability, Measures, and Modeling**	**Planning Process**	**Integration of Existing Plans**	**Policy**	**Plan Approval**	**Project/Plan Implementation and Construction**	**Proposed Changes to Current Maps**	**Planning Unit 1**	**Planning Unit 2**	**Planning Unit 3a**	**Planning Unit 3b**	**Planning Unit 4**
The Master Plan does not adequately address maximum restoration of all types of marshes. The plan should use non-structural restoration instead of levees, especially linear levees. (EIG)		What is the possibility of using residue concrete and brick to build up the coast? (ARBC)		Are there any plans to have mandatory evacuation ? (ABLD)							PU 3b (alt.1, measure 1). It is unclear where this levee alignment will end. It should be stated that it will tie into the levee system selected in Unit 4 to maintain the integrity of the Mermentau Basin. (PC)	Measure 4-1 (Alt.1) salinity control structures would eventually lose effectiveness. (PC)
The state should relocate communities to north of I-10 and let Mother Nature take over the coastal zone. (EIG)		Use mothball ships to act as a surge barrier. (LLA)		Is the GIWW project in the WRDA bill? (VP)							The Barrier Plan and alignment options near St. Mary must be further discussed. (SMLAC)	The major culprits in PU 4 are channels that have been built by maritime and energy interest. Those interest continue to press for more and deeper channels. (PC)
Freshwater ecosystems need to be protected (the cypress and tupelo) against storm surge. The Maurepas land bridge is a critical feature. The Manchac and Pontchartrain area needs to be maintained and protected. (ARBC)		The panning process is flawed and DNR is doing the same thing as they have done in the past. There are no long-term projects. (LLA)		When the state decides that there will be no protection, what will be done? (ABLD)							Should have a wetland reservoir in planning unit to absorb tropical rains (greatest threat in area.) Having wetland behind the levee provides several functions. (PC)	Measure 4-7 (Alt. 2) This would allow Calcasieu ecosystem to become and remain brackish to saline. Neither is a good idea. (PC)
Why has the IPT used outside consulting firms and conceptualized earlier studies. (LLA)		Where would sediment be conveyed? (LLA)		Will construction of new buildings (hospitals, homes, etc) be permitted? (ABLD)								Should be a study to verify the physiological value of shell reefs in the area. (PC)
The Plan is limited to a two-dimensional view and should be four-dimensional to address the problems and be transparent. (LLA)		Use gray water to build land. (CPPC)		What will the funding from Congress and the new oil reserve be used for? (ABLD)								Measure 1, 2, and 3 (Alt. 2) do not plan for ring levees. (PC)
Knocking down levees at some locations restored land quickly and allowed for lands to be reclaimed. Is this included in the plan? (KKC)				The Caernarvon and Davis Pond projects are useful freshwater diversions, but they are not used to maximum capacity. (ARBC)								Measure 4-13 (Alt. 2) there will be adverse impacts from dredging to create marsh. (PC)
DNR, the Corps and other agencies need to acknowledge the concept for enhancing ridges with man made sources. (VP)				Will the plan address the need for oversight of levee board decisions? (ARBC)								

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Vermillion Parish does not want the same issues that exist in Lafitte. The area is being infiltrated by saltwater on a daily basis. (VP)				People who live in the floodplain ought to have flood insurance. (ARBC)								
It would be best for people to relocate to high ground and let nature reestablish an equilibrium unhampered by our interventions. (PC)				Include plan to deal with run-off from soybean and rice farming practices (PC)								
Levees will create a false sense of security. (PC)												
Plan should include upgrading existing flood control features and add non-existent features. (WPACE)												
Habitat goals need to be defined by the 1912-1932 baseline. (PC)												
Protect evacuation routes with levees or flood proofing. (PC)												
Plan for freshwater and sediment diversion projects to regain natural protection from storm surges. (PC)												
Use 100% of river sediments for use in marsh restoration. (EIG)												
Vegetative barrier (preferably trees) should be planted wherever possible, including at the toes of levees. (LBL)												

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Annex C: Reports Provided in Support of Plan Formulation

The following reports were provided to the IPT to inform the plan formulation process. The full reports are available.

Biloxi Marsh Lands Corporation. *The Biloxi Marsh Stabilization and Restoration Plan, St. Bernard Parish, Louisiana*. St. Bernard, June 2006.

Miller Engineers & Associates, Inc. Engineers & Land Surveyors. *St. Mary Parish Strom Surge Protection Study for the St. Mary Parish Government*. Franklin, Louisiana, March 2006.

Ronny Paille, U.S. Fish and Wildlife Service, Ecological Services. *Louisiana coastal Protection and Restoration Final Technical Report to Congress, Plan Formulation Aid Report, Provided to U.S. Army Corp of Engineers, New Orleans District/Vicksburg District.* Lafayette, Louisiana, October 2006.

Shaw Coastal, Inc. *Town of Jean Lafitte Hurricane Protection Plan, Prepared for West Jefferson Levee District*. Westwego, Louisiana, September 2006.

USDA Natural Resources Conservation Service. *Herbert Canal Watershed Resource Plan,* Vermilion Parish, Louisiana *(DRAFT)*. Alexandria, Louisiana, May 2006.

Vermilion Soil and Water Conservation District. *Bayou Tigre Watershed Project Proposal.* Vermilion Parish, Louisiana, October 2002.

Annex D: Science & Engineering Review Team (SERT) Master Plan Drafting Workshop, October 2006

D 1.0 Introduction

This Annex contains the detailed notes from the October 24 and 25th, 2006 the SERT and Agency meeting. These notes are arranged according to the workshop date and table at which they were recorded. Tables were either primarily concentrated on the Deltaic Plain or the Chenier Plain. Therefore, this is reflected in the notes. Additionally, for cross-table "open discussions," notes are arranged by scribe with the intention of capturing the most comments at the expense of some duplication.

D 2.0 SERT Workshop Meeting Notes, October 24, 2006

D 2.1 Delta Plain Discussion

D 2.1.1 Table 1 Discussion

Attendees:

Kelli Shuttleworth–Shaw
Lewis Hornung–(HDR) for USACE
John R. Monzon–LA DOTD
Brian Marcks _ DNR/CMD
Mac Sayes–LA DOTD
Valerie King –Shaw
Ronny Paille–FWS
Brian Harper–USACE-IWR

Protection Discussion:

- Tiny communities with less than 1000 structures: Is protection required? If yes, can communities be grouped for structural protection? Should non-structural protection be considered?
- 100-year surge map: Questioning red triangle area between Planning Unit (PU) 3a & 3b.
- Northeast corner of 3a needs more protection than the northwest corner of Morgan City due to storm surge indicated on 100-year map. Will probably need a structural solution; there are a lot of buildings/assets around PU 2: Measures 7, 10a, 8, etc. and PU 3a: 2e, 4, and 8.
- It was agreed that the Morganza to the Gulf would likely alleviate many of the storm surge issues in the discussed areas.
- Question posed: Eliminate any areas from levee protection?

Belle Rose down to Raceland:

- Not on high priority level
- Cost to benefit ratio may not be good ratio for areas surrounding
- Bayou Lafourche

PU3a_M2a-2d:

- Low risk, high number of structures–low level/depth flooding.
- Need to protect Fourchon more than Grand Isle
- Feasibility of levee building around Lafourche is good; soils would be able to sustain load
- Fourchon can currently withstand storms (e.g., the industrial area was running approximately 2 days after the two storms).

Lafitte:

- Could benefit from protection
- West Jefferson levee board currently working to 'beef up' levees in area.
- A lot of structures in area; most are already built up.
- Consider non-structural protection
- Already levee system in place, but not above GIWW

Grouping of 1000 to 5000 structure areas:

- Lafitte: Could save a lot of money by not building levees on back side and connecting levee on water side to Westbank levee alignment
- PU2, area surrounding M1c (11308)–1a & 1b–do not need to do anything here; this is not a high risk for flooding.
- Areas south of Houma–a lot of recreational/cultural assets but not a lot of industry; it wouldn't be as economically devastating if the area was damaged.
- Tidal protection in area of PU3a, M1a-1e
- Start having levee protection further inland
- Discussion of floating structures and potential wind impacts; builders are starting to recommend structures that will rise with surge; structures are more vulnerable to wind damage.
- Lockport to Larose–currently low-level of protection.

Agreed:

- Max protection in red zones (assets).
- Along river, improve existing levee–bring up to 100-year protection.
- Larose to Golden Meadow–100-year protection.
- Leeville to Lafourche–non-levee solutions to 100-year protection (if raised to 500-year level there will be wind issues)
- Grand Isle: breakwaters, berms, continue with what is currently being done.
- South of PU3a_M1a-1d–100-year protection (500 is not feasible).
- Houma–500-year protection
- LaPlace–500-year protection. Some areas with high structure are sitting on high ends. But just by looking at the map will not justify this.
- Basin communities may need to be considered more than those on the ridges.
- Marsh areas need special attention.
- Unstable swamps and upper basin swamps need to be maintained.
- Alternate 1 and 2–Balance: In order to maintain swamps, fresh water must be pushed in.
- 1A and 1C: No flood protection is needed. Protection already is in place.

Questioned:

- Different levels of protection for areas with 10K–15K structures vs. 5K–15K structures; will basin communities be considered differently than communities along the ridge?
- Lafitte area protection still in question–non-structural likely fate.

Restoration Discussion:

- Goal: Discussions should not be project specific; what is trying to be achieved by restoration in the area?
  - Need more marsh in Barataria.
  - Headland protection across coast.
- Marked in PU1 on map; more marsh creation east of MS River; 2 proposed diversions; probably will be more.
- Want to see more marsh creation in the following areas:
  - Biloxi Marsh
  - Breton Sound
  - Barataria Bay
- Encourage headlands along barrier islands.
- Ultimately Alternative 2 is the baseline/minimum of what is acceptable. Need more area of land to build.
- Communities around PU3a 1a-1d: Marsh creation south of these assets would be beneficial.
- Can sacrifice lower MS Delta if able to create more marsh in other areas throughout all planning units?
  - Required salinity for oyster farming; will creating marsh disturb oyster reefs? Will oyster habitat shift outward?
- Potential solution: disruption of habitat during certain seasons for a couple of years then letting habitat adjust accordingly.
- Maintain upper basin swamps:
  - East of Morgan City
  - North of Gramercy/Reserve
  - Around South Vacherie area
- More discharge capacity needed; need more freshwater & sediment to swamp (South Vacherie); also need to protect populated areas with storm protection
- Why put more water in Barataria? Atchafalaya water already going there & Mississippi River is adjacent and water can be diverted.
- General consensus: Losing habitat now; need to do something now; start restoring by any means necessary/possible now and try to accommodate fisheries/diversity before they are all gone and there is nothing to sustain.
- Priority is land building and system sustainability with the caveat that habitats will be protected where feasible to protect biodiversity.

Resolution of Conflicts:

- Seasonally putting fresh water into swamps to enhance crawfish farming amongst other things.
- Need to address drainage through the basins; develop a watershed management plan.
- Improve hydrology in South Vacherie swamp area–through Des Allemandes, past proposed levee.
- Have to balance flood protection for LaPlace/Reserve areas with freshwater diversions for the surrounding swamp areas.
- Biggest conflict–sustaining system; no net land loss and maintaining fisheries.
  - May lose some of Mississippi River Delta but beneficially gain in other strategic areas.
- North of PU2: No storm protection needed (Springfield/Ponchatoula area).

- If we have a 3rd delta, what would the outcome become of the river edges?
- We can sacrifice the Mississippi Delta once we take care of Planning 2 area.

D 2.1.2 Table 2 Discussion

Attendees:

James McManis –LADOTD	Brian Marcles --CMD/DNR
Ennis Johnson –DOTD	Patrick Williams --NOAA/NMFS
Mike Slack –DOTD	Gerry Galloway –Univ. of Maryland
Larry Donovan –USACE	Cindy Steyer –NRCS
Adam Hosking –Halcrow	Nina Reins –Shaw

Asset Density Map:

- Data Concerns: USACE data changing, unreliable. Projects are in place.
- Lines on building map based on census blocks. Not necessarily where people live.
- CA outlined (not levee outlines)
- Montegut Area flooded during Rita. Map excludes airport at Montegut.
- Oil distribution area near east of Sorrento excluded from protection area. Sorrento Field.
- Houma: Is it a single asset? Morganza does not exist at this time & cannot assume it will be done. Include all parts of South Houma to be protected. The South Houma fingers should get some sort of protection.
- Cocodrie: Needs structural protection. Follow Morganza alignment.
- Area between fingers at Houma?
- Leesville > Fourchon > Grand Isle: Protect roads between each area.
- Fourchon needs to be accessible but not necessarily structurally protected.
- Grand Isle–2000 properties
  - Build shore
  - Raise buildings
  - Cannot prevent bridges/structures from getting wet but need to make sure they can withstand flooding
- Leesville: needs non-structural protection.
- Bayou Lafourche Ridge needs protection the entire way.
- Des Allemandes: yes, needs protecting.
- Lafitte: 10,000 people: yes, protect.
- South Vacherie: structural or non-structural protection. One or the other.
- Plaquemines South: Fishing/shrimp processing plant. Must protect oil facilities
- Port Sulphur: Protect with ring. Currently protected to Oakville. Ring to Myrtle Grove.
- East New Orleans: Lower protection for wildlife refuge area–Bayou Savage
- Northshore: Protection needed
- Pont V., North of Sorrento: needs structural protection.

Habitat Map:

- For combination land/water area, whichever is majority, map shows. If 51% water & 49% land, will show water only.

- CLEAR model did not account for O&M.
- What outcome do you want to see?
- Chandeleur Islands: Restore. Plant trees or some top of land protection. Restore marsh for benefit of wildlife habitat, ecosystem.
- Area west of MRGO, Lake Borgne: Orleans Land Bridge. Create/strengthen land bridge & salt marsh.
- South of Mississippi River, Bayou Lafourche, Barataria Bay: Create marshes.
- Area between River & Lake Borgne (Breton Sound):
  - Cannot divert any more river water. If area grows, more oyster beds are lost. Must maintain as is.
  - Marsh: create/maintain saline to fresh transition.
- South of Morganza: Reestablish continuous marsh area.
- Bonne Carre area: Open more often to add swamp water into swamps.
- South of Lake Maurepas: Maintain area.
- Terrebonne/GIWW: feeding fresh water south for continuous transition from saline to fresh water.
- Head of Passes/Birds Foot area: Maintain area of existing crevasses.

D 2.1.3 Table 3 Discussion

Attendees:

Fran Campbell–East Jefferson Levee
Jordan Fischback
Carl Anderson –USACE
Constance Porter –DOTD
David Miller –DOTD
David Groven –RAND
Gretchen Brown –DNR -CMD)

Questions:

Map–Concentrated and Distributed Asset Boundaries with Strategic Assets: Why was the decision made to incorporate certain areas as one larger (more concentrated) area versus two areas (one yellow and one orange)? For example, Fran questioned why 3a area was split into two areas versus one area.

Concerns:

- North end of HNC (south of Houma):
  - Joining areas of concentrated assets.
  - There was a discussion about focusing the coastal restoration/ protection on the future population density of these areas versus the existing population densities.
- Protection is needed at Sorrento Field (see map) because of the gas reserves.
- Northshore (Mandeville/Madisonville): The area is developing quickly and population is increase quickly. The marsh is eroding and needs restoration.
- East Jefferson Parish (3d area–southshore):
  - Does not think that marsh creation alone would be sufficient.
  - Would like to see a hard barrier on the existing shoreline, not only on the side of the fringe buffer adjacent to Lake Pontchartrain. She would like the issue researched to see if there can be land restoration to the extent that the state will allow.
- Bayou Savage Wildlife Refuge has an issue with salt-water intrusion. Most of the vegetation has been destroyed.

- Upper Maurepas/Upper Basin Swamp needs a reintroduction of freshwater.
- Future Population Concentration Areas–It was recommended that not only the existing population concentrations be taken into account, but also consider the future population concentrations:
  - Northshore area (Macomb to Slidell–connect the population areas)
  - Houma and Larose area (connect population areas based on ridges and Hwy 24)
  - Houma and Morgan City (connect areas)
- Brought up that the area passed the study area in southern Ascension Parish (Gonzales and Prairieville) is growing and is will be affected by storm surge. The 100-year map and 500-year map was reviewed.
- Marsh restoration (see map *): Leeville, Grand Isle, etc.
- Grand Isle area needs more substantial breakwaters on the front and the back of the island (see map).
- The oil and gas infrastructure needs to be protected (shipping channel) in the vicinity of Venus (see Map) using marsh restoration.
- The Barrier Islands need to be restored. He recommends abandoning the "bird's foot" south of the barrier islands and creating 2 diversions from the MS River to the East and West ~ even with the barrier islands.
- Beneficial use of dredged material and dredging–He recommends dredging the GIWW and increasing the flow rate through the GIWW (from ~30K cfs to ~80K cfs). The dredged material would be used to restore marsh in the area, and the increase in flow rate will move freshwater into the Houma area.
- Diversions:
  - Bonne Carre Diversion–freshwater diversion (he said that this one is in the works, just waiting for the state to complete it.)
  - Violet Reintroduction
  - Bayou Lafourche–would need to increase the flow from ~300 cfs to ~1000 cfs.
  - A Caernarvon-like diversion (see map)–this diversion is existing, but only one of the structures is operational the other one would need to be activated.
  - Group effort–Areas that need freshwater and sediment. In certain areas, we may need to use pipeline conveyance.
- Near Da 3a-d, 3a-f, 3a-g–sediment introduction (Sue says that there is probably good sediment in the bay. The recommendation is to shallow dredge the bay to create the marshes in the area.)
- Biloxi Marsh–sediment introduction
- Breton Sound Area–need small diversion to merge marsh creations
- Davis Pond Area–Freshwater introduction
- DA 2a Area–Freshwater introduction
- All are in favor of barrier island restorations along the coast.
- River Delta/Bird's Foot: She recommended to maintain it; it a critical area.
- The introduction of the freshwater to the Breton Sound Area (see above) can be accomplished by the existing Caernarvon Diversion (8 cfs) and the White's Ditch (~ 1 to 5 cfs) with the other small diversions from the MS River in the area having ~ 1,000–5,000 cfs.
- New Orleans landbridge needs marsh creation.
- Bankline stabilization is needed for Lake Borgne.
- A diversion at Myrtle Grove (PU2) is required (5–10 cfs).

- DA 2d Area–We need to show gradation between fresh and saline water and extend sediment down into areas closer to the Mississippi River (see map - red).
- Diversions need to be added to the west side of river to create marsh creation (1,000–5,000 cfs).
- Breakwaters (PU 2) are needed (see maps areas). Bankline and shoreline protection are needed as well in areas (see maps for areas).

Agreed Outcomes:

- Protection/South of Houma/DA 2-C/Joining the levees in this area/dense population in this area (The three ridges)/Structural protection.
- Reserves/Sorrento Field/DA 1-C/Gas reserves need protection (Upper Basin Swamp)/Structural protection.
- Wildlife Refuge/Bayou Savage/DA 1-B /Katrina brought salt water into this area and a huge majority of the vegetation was destroyed/Needs to be flushed and needs fresh water.
- Fresh Water/Lake Maurepas/DA 1-A/Needs to be flushed and needs fresh water (Upper Basin Swamp)
- Protection/Lacombe and Slidell/DA 1-B/These two should be incorporated in the future for protection.
- Restoration/Grand Isle/4B/Marshes need restoration around this area/Southeastern Louisiana coastal line marshes/Need sediments
- Restoration/Barrier Islands/DA 2/Restore the ridges
- Protection/Houma and Morgan City/ DA 2-C/ These areas should be protected in the future/Structural Protection

Outcome for later discussion:

- Surges. Lower Ascension, Gonzales, and Prarieville/3B. These areas have been growing rapidly. These places will see surges in the future/Needs structural protection.
- Fresh Water/David's Pond, Delta Farms, Myrtle Grove/DA 2. Needs fresh water.
- Marsh/Madisonville and Mandeville/DA 1-B/Marsh is eroding. This area has developed quickly. Needs sediments.
- Protection/Breakwater/4A & 5. Frontside and backside needs more extensive breakwater.
- Protection/Northshore and Houma/CA 3: These areas should be connected. The ridges along Hwy 24. Needs structural protection.
- Protection/New Orleans Land Bridge. Structural protection.

D 2.1.4Table 4 Discussion

Attendees:

Ronnie Robinson –DOTD
Michael Massimi –BTNEP
Honora Buras –DNR
Tim Axtman –USACE
Norwyn Johnson –CPRA IPT
Randy Tresclaire –Lafourche Basin Levee
Bren Haase –NOMFS
Bruce Baird –USACE
Kerry St. Pe –BTNEP
John Ettinger –EPA

Discussion on Protection:

- Should be a threshold for non structural protection. The group then began discussing which concentrated assets should have structural and or non structural protection.

- New Orleans metro area was initially the only area which structural protection was deemed necessary. It was noted that data used was pre-Katrina. The west bank area was included in the New Orleans area for which structural protection should be provided although group was divided whether low density areas in west bank needed structural protection . Different levels of structural protection was brought up but not pursued by the group.
- Slidell area does not need structural but should have non structural protection. Non-structural was identified by various group members as numerous implementations including but not limited to: building codes, evacuation plans, zoning, and moving communities.
- A discussion occurred regarding Lafitte. It was not unanimously decided if Lafitte should have structural or non structural protection. It was assumed that it may be more cost-effective to raise the homes rather than build levees due to the low-density population.
- It was suggested structural protection for Plaquemine Parish extend down to Oakville then below has non structural protection. DuLac, Grand Isle, and Cocodrie should all have non-structural.
- Group was divided about if lock (structural) was needed in Morganza. A 100-year levee was suggested for Morgan City.
- The group also discussed changing or expanding the current boundary of protected assets. Port Fourchon was added for protection. No need to protect non-community areas. Bring in boundary to developed areas.
- It was strongly emphasized that New Orleans should have both structural and non structural protection. Putting structural protection does not rule out non structural policies or zoning laws. Areas that already have structural protection and are considered for non-structural protection should shift priorities to non structural protection implementations.
- It was also noted that no public insurance for new developments should occur.

Restoration Discussion:

- Re-build Bayou Lafourche Ridges-salt marsh creation on both sides and create freshwater and an intermediate area up-north.
- Rebuild barrier islands and Grand Isle. Change Deltas and adjust flow. Maintain Barataria land bridge.
- Purpose of Chandelier Islands was questioned? How well will they survive in 50 yrs?
- Purpose of bird's foot area? Could sediment be used in better way?
- If river changes route should delta be maintained?
- Save cypress forests and create oyster reefs.
- Maintain Terrebonne ridges; restore marshes (brackish/saline) Lake Boudreaux/Band of fresh water intermediate.
- Restore & maintain Bayou Lowey ridge w/ protective band of Marsh.
- It was suggested by Kerry St. Pe to perform or create strategies to rebuild landscape to resemble 1956. 1956 should be a template. Also mentioned was the uncertainty of sea levels.

D 2.2 Chenier Plain Discussion

D 2.2.1Table 1 Discussion

- Risks are associated with salt and water levels. How do we look or analyze these areas?
- There are some important assets that we need to look at and examine.

- By looking at the levee alignment we need to look at the assets and concern and define to see if we are capturing smaller areas or what we can do to either one of these plans to make a different. As far as elevating highway 82 if we raise highway 82 that would provides the protection needed for the outlying area.
- Highway 6 shows the lover elevation of 6 or 4 and by the coast is where we initially lost even some of the road. The storm surge came up rapidly after the storm and the surge. The storm surge and flux in water levels
- Need in level four to protect all area for salt water basin and not loose to salt water basin by the white lake area. What is the tolerance for accepting risk would 100-year be adequate? What is the elevation difference based on 100–500-year. Ring levee is less expensive then the 500-year. The big debate was where to baffle or to bring levees around it. A series of levees pointing at an angle is baffling. If there is a fresh water problem then the question is how you baffle the water to so you will not create a problem. Some flow rate on the GIWW 800 cfs. The coastal protection and restoration: Isn't it about protecting the Atchafalaya basin. The control structure is the key start there and work your way across. Discussion on how water moves and were are all want to end up at.
- The question is about alternative one and two it seems to be an over kill. The alternative seems to be for the project a control structure or a ship channel for protection if you needed a level of protection you would look at a salinity courses to analyze as far as to which alternative you would use.
- We have a limited marsh use and habitat level we will not reach n agreement on in this room. In analyzing the Calcasieu ship channel if a lower salinity control is from the lake to optimize this lets get it from the river. Why in both plans do we have the same measures in both plans it is because they were both significant. Some are in both plans because it was significant. The Acadiana is in there but just because it is there does not mean we studied both of these plans. We are not necessary committed to something in the plan. If it is on both plans we are not mandated to those commitments.
- Shore line protecting grand lake and white lake. The east bank lines are being stabilized currently. The protection has not been completed very long but what about other shoreline protection being lost. Do you forget others? We would look at the 50-year protection as far as others.
- Where are the higher protection area or important to create marsh. By the black lake and other areas under management will help with reduce salinity. The protection and restoration is or can be managed to reduce solution just west of the Calcasieu and of the coastal GIWW. Maintaining the ridge is the key to the whole element. Maximize the use if you can not maximize the use of the wetland area.
- Atchafalaya water if there is a way to get that water out and near the Terrebonne it would be more beneficial. We are looking at putting a stone and a seal near Light house point. Oyster reefs the USGS maps for 1983 show the area that the area could create a surge. You could dredge the area and that would resolve some of your problems if you tap into some saltwater.
  - Recommendation water management plan be included for marsh nourishment and nutrition? Look as agriculture and groundwater, surface and ground water.
  - Moving water from north to south of highway 82 and maintain connection.
  - In the shoupa bayou and tie or move the fresh water out of that area and drain the uplands and utilize the fresh water in the GIWW
  - closing up the outlets of the Sheridan and all the major leaks there are seven gates that will be closed just south

- One measure is to rebuild the area and another is just south of the GIWW and water near we will provide a burn. Gate on the canal in water and in New Iberia we do not want another storm surge. If you have a high Atchafalaya you can close the gate. Is the Atchafalaya high the GIWW I heard it was height if heading in the control you lose a lot of when you are heading with it. If you close of fresh water bayou then that would reduce salinity.
- The existing ship canal for the Calcasieu is it used for drainage? It is used for drainage right now you need a bigger ship channel and no one wants to pay for a new channel or lock for the system they rather allow ships to navigate to other area.
- There are times that the lock will drain through the Calcasieu ship channels and there is more salt in the channel. Most of the open areas have control structures already in place. Build or create a structure pass the lock east or west. Just reconnect the Read River back into the system again.
- Ecosystem outcomes- shore line protection along the gulf was to move water south of highway 82, resuming channel spikes along the ante ship channel, move water along the ship channel and addressing breaches. Look at ground water use and admission and surface water and look at the recommendation, Rockefeller commanded to maximize components that might be resourceful.
- Are we really micro-managing the system as far as freshwater resources? The bearer needs to provide enough water. Has the Barataria or water capture has it increased over the years. There are some major wells and rice is vast in the Louisiana "everglades" there is a high demand as far as agriculture is concerned for this area. If we try to get more resources into the area from the Atchafalaya, can the coastal erosion be used as one of the viable resources? The salinity is reaching a coastal boundary or protection. The key is to reestablish the river system and go back down to the old stages. The Mermentau is the key or seems to be the key. The 27 might even be something else we need to look at. If you could get more flow coming down.
- What maintained the soil so many years ago? Shore line erosion more threat coming in from the coast. Soil and preparation rate are enormous. Is the river trying to go is original state?
- Pending further study, preventing out and stabilizing the shoreline.

D 2.2.2Table 2 Discussion

Planning Unit 4:

- Have geologists and sedimentologists agreed with this? Lakes can be source of sediments for marsh. Did you look at negative environmental impact of building structures?
- We want to have the capabilities to redistribute the freshwater. There is no external source of sediment for this unit, there is sediments coming and dredging, but the rate is less than 3b.
- 4-7: allow it to become saline/brackish. Are you going to take the structures out? How is it going to vary from existing conditions?
- Do you have maps that show landscape with no action? Helps to put alternative into perspective as well. For this region (unit 4) does the shoreline with no action, does the shoreline regress? Is it shown on the map?
- Diversions to the east, does this alleviate the need to do shoreline stabilization? Anything we do for the Atchafalaya won't help protect the shoreline of the coast/lakes
- Are these questions we've had with previous workshops that have already been discussed, is it appropriate for me to ask these?
- Is one alternative proposing to do more breakwaters?

- These two rationales were for modeling purposes so we can see if there are actually differences between the two, in the results from them, we're trying to come up with the good combination, if it exists, and using that information.
- Mainly about making freshwater available during the summertime when the system is more stressed.
- Red Rive plan in alternative 2: The Mermentau system, bring freshwater in to the tributaries of the Mermentau and then the next was bringing freshwater in to the Mermentau, so I thought of them as the same. I think this is something that deserves more study and it should be turned into a study and not a measure, unless we do more PED on how to get it there. Mermentau: Outflows go in and out and then long periods without any flow, so it comes up and floods and then it does nothing; so we need a reservoir to capture and hold flow until needed, but Mermentau is a small basin with very little relief so hard to find area to make a reservoir in this system.
- Don't use two lakes to store water, but rather to maintain the water level.
- Two measure difficult to deal with and require a well engineered system.
- Objectives try to list out systemic problems in these areas, around lakes in gulf erosion problem (too high water level, too salty); bring more in, manage saline. One measure was to bring water from wax lake outlet down GIWW to PU4, but GIWW has holes and be hard pressed to bring water past freshwater bayou.
- Measures in 3b can help.
- What is the accuracy of the topographic data used?
  +/- 2 feet
- Best currently available data set out there, corps is using it now, FEMA using it now, more work ongoing to refine the material but it is the best out there.
- Are the data sets used for this the 2000 census?
- All data used is pre-storm, assumption that people will go back. People drive these recovery actions.
- What about proposed L and G facilities in Calcasieu area? Are those included?
- Generating plants included in strategic assets.
- Is there enough sediment available to feasibly to create marsh in that area and how long will it take to create it?
- The plan is not limited by sediment budget. Diverting more cumulative, more out of river than is actually in river. When we come up with a final plan, we will utilize this. Some are pumping offshore, others from various places, but they do have specified source.
- There are issues here about whether these things are achievable. All this stuff done with same methodology and assumptions so we can compare apples for apples.
- Historical Black lake that is covered with marsh creation, would we want to leave black lake or fill it in?
- Map of buildings per concentrated asset area
  - Lafayette and Lake Charles two major population centers
  - Can see where people are at risk?
  - For outcome mapping–goal: determine what asset areas should be combined (mainly related to hurricane protection–levees)

Habitat Map:

- Composite of land and habitat type
- Outcome mapping–use available info combined with potential affect on ecosystem to determine best outcome
- Do we have a vision statement for the region?
- Also captured by the two alternatives: Alt 1 is leave this as they are; Alt 2 is change (which is less engineered)

- ITT Meeting–Chenier Plain–problems were salt intrusion and water levels. Is there a consensus on water levels?
- Does depth affect surges? A long study may be a needed measure
- What is our goal today?
  - Aggregate assets for levee protection
  - Ecosystem restoration: shoreline protection? Manage system as is or allow some areas to go salinity? Continued man-made structures?
- Chenier Plan will have to be engineered as there are no major rivers (for distribution)
- Goal is also consensus on what should be protected and how–what areas should not have manmade protection
- Natural shorelines (lakes) vs. Artificial shorelines (bayous)–was this an in-depth approach?
- No, used a general approach.
- Levee alignment comparisons b/n Alts?
- GIS based to tabulate expected damages, etc.
- Drawing in existing protection, GIWW, ring levees; drawing comparisons between the two alternatives. If you overlay surge maps, under no action the high ground around Lafayette stayed dry for 100/500-year storms. Under both scenarios, the tiny communities are where the water is deepest. Is there any way we need to treat all small areas as industrial corridor? Combine things along I-10? Are there rational groupings for protection purposes? When we overlay maps, what needs to be protected and/or flood proofed.
- What about direct impact of marsh on levee alignments?
- Hazardous waste/hospital on the coast, what's the plan for that kind of concentrated asset?
- Because height of water vs. value of asset, we don't do anything?
- What we looked at is that the entire coast should have 100-year level of protection, but is this provided by hard structures (pumping plants and levee) or through raising structures and evacuation of assets. This is underway as we speak: FEMA specifies that if people build back, they have to build back at elevations to get permit/insurance. Rita took out everything and they're building back at 100-year elevation (12 feet). Depending on where you are 4-6 feet above ground.
- Do they have to withstand velocity of water under them?
- High wind velocity areas where water can wash under them, in area where just have rising water and no wind then just build on elevation.
- Are we going on current infrastructure or growth?
- No data on future growth, however looking at establishing policy to where if built outside of protection then built to certain specifications. We're looking at not letting people build in low lying inside protection as well as new areas outside of protection springing up.
- If you look at levee alignment with the GIWW, look at the assets inside and outside and decide whether or not we're capturing and protecting the assets that need to be protected and also the implications on the environment. Ultimately, which one is better or is there something we can do to either plans to make them better.
- Local level: Elevating hwy 82, surprised to see how low water levels are on surge model, most of locals believe if elevated 82, it will ensure first line of defense from surge and protect evacuation routes.
- In a lot of this area, it's already raised.

- There were washouts in the last storm, several areas that were damaged that prohibited people from using the roadway; from accounts firsthand and newspapers, after Rita, people were returning home and water came up after the wind when people were returning home. It didn't behave like it should have.
- Is there an expectation in this area that the agricultural areas are to be protected?
- The big question from locals is that they want to maintain area as freshwater, want levee south to protect b/c if too north then would be saline. (White lake area)
- They trapped a lot of salt water in this area after Katrina.
- This alignment is 500-year. What is your tolerance? Should we take 500 or is 100-year protection adequate. With these choices
- Baffles on the river or levee the river? USACE want the levee and engineers want the baffles. It slows it no salt water intrusion. Can inverse baffle salt water to distribute it better?
- This is the same with storm surge. Can create a gradient that is not linear like the map (# of buildings map) using inverse baffles.
- What do you mean by baffles?
- There are places where we can look at hydrology.
- This levee is open, with streams crossing. Gates used to close during storms. Can put in more holes, but will be expensive. When freshwater is available, it's abundant; CWPPRA put in project for openings under highway to allow freshwater out and to keep salinity out. The desire is to get fresh water when wanted. In summer, if problem south the problem is always north too, diverting from Red River not necessarily a solution. Solution is to create area to hold it and the levee is a problem on this.
- One of the problems is hurting one part of ecosystem while protecting another. Oysters in the east are being buried by sediments that are being diverted.
- 6,000-8,000 flow rates across the GIWW, when the Atchafalaya is moving water through, this is good b/c we're losing some along the way, but we have measures to help with holes in GIWW;
- Doesn't this whole plan include restoring and managing the Atchafalaya?
- Not allowed, it's a different project; under LRA starts at old river control structure and goes to coast.
- Where are the Senators? Congressmen?

500-Year Map:

- Draw alts 1 and 2 on map.
- Non structural around Kaplan, based on 500-year storm little to no storm surge (Lisa Wadsworth, USACE)
- Is it easy to take out or add in? It's up to you.
- The outcome that we're looking for is what needs to be protected. Where do we think there is sufficient critical mass that it needs a levee? What needs to be protected?
- Lake Charles/Sulphur: Need protection
- Lafayette: Under 500-year storm doesn't need protection.
- Corps ran models every 30 miles and we don't have a lot of accuracy. During Rita, Vermilion River was going backwards and that might not have been worse case scenario.
- Let's double check Lafayette though.
- Don't look at surge, look at assets and decide what needs protection.
- Abbeville has to be protected w/levee. All look like fairly independent area except Lake Charles/Sulphur.

- Henry Hub needs to be protected.
- Calcasieu: L&G Plants? Do they need flood protection? Very vital facilities that need protection.
- Didn't Tina say at the meeting that they need to do that?
- Intracoastal City is big for oil and gas companies; key link to gulf but not a strategic asset.
- Berwick/Patterson is already ring levee at 500-year protection, flag to reanalyze. Flag New Iberia as needing structural protection.
- Strategic Petroleum Reserve sites need to be flagged.
- Specialized machine shops in Benton, specific to oil and gas industry; is this something that can be flood proofed or does it need to be behind levee?
- 65,000 homes not protected if we go by ring levees, lots of farmlands. It's the largest number across the planning units that would be left unprotected, in other units people built on higher areas.
- It looks like GIWW alignment would be more beneficial; single alignment as opposed to rings looks better.
- Is the question each community yes or no, this brings us back to ring levees? Isolated, not very dense areas, but still need to be protected as "unit".
- GIWW is federal and levee alignment along this would be on federal land, land rights are something to think about.
- Why Gueydan and not Lake Arthur? Lake Arthur does have oil fields. Couldn't figure out how to put ring around Lake Arthur and I didn't know there was anything strategic about Lake Arthur so relocation/rezoning may have been another option.

Assets worth Review:

- New Iberia, Lafayette, Abbeville, Lake Charles/Sulphur, Henry Hub, Lake Arthur, Strategic Petroleum Reserves
- Is it all 500-year protection? Or some of it 100-year protection? Do these assets warrant 100-year or 500-year protection? Adding up Lake Charles/Sulphur and Lafayette gives a huge portion of the assets.
- Corps of engineering has ring levee around Lake Charles/Sulphur and Kaplan, Abbeville, and Erath; Gueydan has an existing levee.
  - 100-year protection through flood insurance, hazard mitigation, looking at these maps only Lake Charles/Sulphur need 500-year protection and Lafayette is primarily residential but a 500-year protection is too much.
- Habitat No Action Map:
  - Making comparison between map and Asset map, there are areas south of White lake that will become open water. Shoreline erosion processes not captured in modeling. There is severe shoreline erosion along this coast; there are some jetties and breakwaters for protection. All the lakes are getting bigger.
- Breakwater protection installed in Cameron parish did Function as shoreline protection for Rita, but not as asset protection.
- Are we loosing 100 feet a year near Rockefeller area? For a 100-year life, we're going to lose about 5 miles if we don't do anything.
- I think shoreline protection and keeping the lakes from coalescing is important, maintaining banks as important as coastline. The issue is how to manage water to maximize production in ecosystem, whether it's bringing more water in or something else.

- Where there were water control structures or levees from impoundments, they were hammered during the storm and now there is no control and nothing has been done. Drainage system couldn't handle storm, it had to be breached (Calcasieu and Cameron).
- Interior levees damaged as a result of Rita
- Sabine River–salinity intrusion as a result of tidal surge
- Why not put a salinity control structure at Calcasieu ship channel in Alt 1?
- Probably won't build all structures listed.
- Concern will loose marsh if no salinity control near Calcasieu ship channel–how do we do that?
- Either structures to control intrusion or ecological measures to create higher freshwater head
- 3b–some areas where feature in both plans, and some only in one; why is that?
- Shoreline protection in White Lake and Grand Lake, what about for the other smaller lakes nearby?
- Where are higher priority areas in Unit 4 and Unit 3b (mainly along coast)?
- Lighthouse Point–new breach just east
  - Have a measure to armor along coast in that area
- What type of material for Point au Fer to marsh island, off of Atchafalaya
- What is the best plan to prevent subsidence and saltwater intrusion for Abbeville to west to Mermentau basin (for rice farmers):
- Consider moving water north/south across Hwy 82–maintain exchange with whatever is done in the master plan
- Shupick Bayou (north of Lake Charles)–drain uplands to introduce freshwater into marshes south of GIWW–can we consider as an additional measure?
- Were closing outlets considered? Cheraton was considered–7 gates in Unit 3b levee alignment
- New Iberia canal will be gated? Yes
- Separate funding? Yes - WERDA
- Is the gate in WERDA? Probably not
- Consider pushing freshwater and sediment along GIWW
- Do you have to widen GIWW for flow? Already wide enough and has adequate flow
- Would navigators object to statement of increasing flow? Don't anticipate objection.
- Artificial height at Grand Lake/White Lake is done by what?
- Any evidence increase water–resulting from the project–affects shoreline of the lakes?
- Basically, can Grand Lake/White Lake–b/c of the Corps project–be used as a freshwater source during certain times of the year?
- Existing structure just east of Calcasieu ship channel, use it as a control structure, and build another lock to move freshwater?
  - Lock is too small
  - That lock is no. 2 on lock replacement list
  - Boats wait 18–24 hours to wait before moving, year-round traffic, highest traffic count on GIWW at that lock. Lock can handle head in either direction
- Soils in area of Grand Lake/White Lake are mainly organic. Therefore, if you are going to manage as a more saline system, may have large soil loss
- Most of the water bodies in the area have levees.

- Have looked into reservoirs north of Mermentau for freshwater reserves

Ecosystem summary of issues:

1. Shoreline protection along gulf
2. Keep two lakes from combining
3. Moving water south of 82
4. Minimize salt intrusion through Calcasieu
5. Moving water and sediment along GIWW–address breaches
6. Marsh creation and shoreline protection at Point au Fer
7. Groundwater Commission–groundwater and surface water
8. Shupick Bayou for freshwater introduction
9. coordination/utilization of Atchafalaya fresh water and sediment source

- How much of vision is preventing wetland loss vs. vegetation change?
- Accounting for the fact that Mississippi River is not allowed to move back west coupled with sea level rise?
- Are we micromanaging system?
- Any evidence Mermentau flow has changed?
- Would more flow from Atchafalaya affect area geology?
- Would stabilize without GIWW?
- Does Mermentau flow all go to GIWW?
- Do we have marsh creation in White Lake area?
- A meter of soil is a member of that system for over 200 years, this is how the system works for over 300 years. What was it that maintained that soil over that length of time, there must have been some freshwater somewhere that allowed all that soil to develop.
- The salt water tap was cranked way back then.
- When salt comes in, it consolidates soils. It burns them. Factor of 4 respiration rate compared to normally, oxidizes the soil, with the absence of iron that soil disappears.
- So let's spread iron…. Take two Geritol and call me in the morning!
- How far was the shoreline out a couple of hundred years ago?
- We want highway 82 serving as a barrier with structures to let the water out once it gets in.

Perimeter is the way to go:

- Big picture is preventing the shoreline from receding; if we can't do that then we can't do anything. Try to manage this thing as low salinity; do a big diversion out of the river but how far west will it go? Will it get down to PU4? Probably not. Will it do much for the shoreline? Probably not. When the river moves east there is regression in the Chenier plane.
- Storage seems to be an obvious solution, but still dealing with shoreline erosion.
- Combination of breakwaters and sand geologically fits in Holly beach, but it won't work in other places. Become not effective at some points.
- I haven't heard any discussion about the Cheniers themselves. Did they survive Rita and are they healthy?
- They are endangered, they're digging the sand up for housing, it's a matter of local permitting concern, but that may be something good to discuss.
-

D 2.3 General Open Forum Discussion

D 2.3.1 Scribe 1 Notes

Bird's Foot Delta:

- Opposition to completely abandoning current footprint; diversion of sediments and water; need to strike a balance not to completely get rid of delta; need to carefully place diversions to strategically distribute sediments from MS River.
- Build up Bird's Foot now while sediment is available in the MS River.
- Delta currently not being fed adequately–naturally sustaining area may be impossible, it may be more beneficial to divert sediment to supply gulf coast to get 1950s/1960s land levels.
- There is a finite amount of sediment available from the MS River; use it beneficially however necessary until it runs out.

Chandeleur Islands:

- Some research indicates they will not come back after Katrina/Rita so it is likely not worth spending money on restoration.

Protection:

- Everyone agreed–Maximum protection Houma and New Orleans.
- North Shore of Lake there is some disagreement:
  - Non-structural comment: Clarify that it's residential and not commercial that should be raised.
  - Agreed for the most part that structural protection is needed.

Bayou Savage:

- Will have same fate and be included as the Greater New Orleans area

Levees down MS River:

- Location of stopping point? Myrtle Grove or Venice?
- People of lower Plaquemines will be satisfied with the levees they have now if destroyed areas will be restored.
- Need to protect industries down there.
- Support for non-structural protection and maintaining current levee system.

Lafitte:

- 2 groups said structural and 2 groups said non-structural protection.
- Non-structural support: There is a cost benefit. Could implement higher level of protection with non-structural protection with lower cost.

Fourchon:

- Non-structural: Not necessarily raising structures.

Morganza:

- Structural protection for five finger areas.

Upper Barataria Basin:

- Still no resolve.
- Dual purpose of levees in areas; protection from back flooding from Atchafalaya and storm surge.

D 2.3.2 Scribe 2 Notes

After reviewing all of the maps agreements and diversions were collected from the different tables.

Agreements:

- More land is needed
- Restore Barrier islands

Diversions:

- Some want less structural more non structural protection
- Some want the 1956 footprint
- Some want just to stop net loss
- Some want sustainable marsh creation

General Discussion:

- A discussion regarding the expense of structural and non structural protection. Questions about the economic viability of structural protection in low density areas were raised. Non-structural measures in Slidell were given as an example as how they are not always enough.
- Unknown participant mentioned that some people may be satisfied with current levels of protection if coastline is restored.
- Avoid being extreme in expectations. To convert back to original
- Consider protecting Birds Foot area
- Birds Foot delta deterioration is being caused by lack of feeding of new sediments. With subsidence rate increasing, we need to place sediments in place where most needed. We cannot maintain entire coast. We need to see what we have and where we can use it.
- There are a lot of sediments but we need to prioritize. If we make it ease for the sediments to be placed, it would be more practical.

Chandeleur Islands:

- Since Katrina & Rita, sampling has been done at Chandeleur Islands. It appears that the Chandeleur Islands only have about 10 years life left. The Islands are not rebuilding themselves as they have in the past. It may not be worth rebuilding.

Protection:

- Groups had different opinions of what areas needed protection.
- Non-structural protection:
- Non structural protections will not work for residences.
- Prevent redundancy. Use zoning, building codes, requirements.
- Several areas in Slidell had requirement for non-structural building, but the raised homes flooded anyway.

Bayou Savage, New Orleans East:

- Map is inaccurate for population.
- Most of Bayou Savage is inside levee system. Decision has been made.
- We are not discussing what is protected, but what should be protected.

Lafitte:

Most of Group 4 suggested a non-structural protection because of low population.
How do you single out Lafitte when other areas are as small or less populated?

Hwy 20, West of Thibodeaux:

- Structural Protection needed

D 2.3.3 Scribe 3 Notes

- We need to achieve restoration without doing anything too drastic because it has to be accepted by the voting public.
- The map should be updated to the 1950s or 1960s.
- He was asked if he agreed with shifts. He said that he agreed with some shifting but not drastic shifting (i.e., shrimp in Des Allemandes - needs to be shifted).
- He also mentioned that they need to predict where public opposition would be and act accordingly.

Bird's Foot Delta:

- Maintain versus abandon to a degree by diverting sediment to more inland areas that need it?
- There needs to be a balance between diversions and marsh creations. They may run out of sediment before the plans are complete, thus the sediment is the limiting factor for the projects.
- Should there be sediment added to the Bird's Foot even though it doesn't protect. However, it would be easy to put in a 200,000 cfs diversion at the Bird's Foot to increase marsh creation in that area, which would be easier than creating marsh elsewhere and have less of an impact on the fisheries. There needs to be a balance without impacting fisheries.
- We need to show Congress a good picture of the projects that we intend on getting done. Need to show how it will protect lives and property.
- The sediment needs to be placed strategically.
- The Bird's Foot Delta is as big a speed bump as the barrier islands, thus it should be maintained.

- Birds Foot is dimensioning because the sediment is subsiding (decreasing per time) because of reservoirs etc. Because of the decrease of sediment, it needs to be used strategically. There may not be enough material to maintain the Birds Foot.
- It can serve as storm protection, but the sediment needs to be used strategically.
- The inlet areas should be maintained and recreated before the Bird's Foot because they are more important. Should limit ourselves in the planning stages of the project just because we may run out of sediment in the future. If we run out, then we'll wait for the river to be replenished.

Chandeleur Islands:

- In 10 years that the Chandeleur Islands will be gone. After Katrina, the islands didn't come back the way that they normally after a hurricane. They are too far from the land to help with surge protection, thus it may not be worth it to restore them.
- Need to decide why do we want to restore them–because they are a wildlife refuge or because they are a speed bump for hurricanes?

The Working Group discussed non-structural everywhere. They based protection on codes and zoning for future residents.

- Favored the 500-year protection based on his personal experience with flooding (2 ft in his house) even with zoning (+13 and +14 feet)
- The barrier plan plus coding and zones would work, so it would be no structures.
- Do we want to keep the land dry, whichever way we do it?
- That's the advantage of the barrier plan.

Bayou Savage:

- Should it be part of the New Orleans System?
- The maps are incorrect. The Bayou Savage area should not be red.
- The maps follow the census data.
- Most of Bayou Savage is already within the levee system, so the decision has already been made.
- We can't assume that they will continue to be maintained.

Levees:

- Most of the people in Plaquemine Parish will be satisfied with existing levees as long as the restoration of marshes etc would take place, it will be dictated by the industry and the people that use the area/system.
- There is a lot of support for non-structural protection the more southern you go.

Lafitte's Area- Structural vs. Non-Structural:

- Non-Structural- there may be economic/cost benefits. The cost of a ring levee would be too high for a few houses. Elevating homes/wind-proofing would cost less money and would probably be a higher level of protection. The population density cost per home for protection vs. elevating is greater.

Lower Lafourche:

- Nonstructural- Port Fourchon

Morganza Area:

- There is a consensus to use structural protection for the five fingers of families.
- Do communities warrant protection? Yes. Structure/Non-structural?
- Small communities may get protection based on proximity to larger communities (tie into existing levees).

D 3.0 SERT Workshop Meeting Notes, October 25th 2006

D 3.1 Delta Area, Planning Unit 1

D 3.1.1Table 1 Discussion

- An early discussion began concerning the use of organic matter for marsh creation. Concerns about sources were voiced and having processed supply for a steady stream of organic matter.
- Discussion of the location of the levee alignment for alternative began. A discussion regarding placing the levee on the Hwy 90 alignment. It was decided that Hwy 90 ROW is too narrow and not feasible to use for the levee alignment.
  - Concerns were brought up about enough sediment being carried by the Pearl River and whether the swamp/m will be aversely affected.
  - Discussed the displacement of people and the strength of soils in the area and marsh development on both sides of Alternative 2 levee alignment.
- Source of sediment include dredging Pearl River, Tangipahoa River, offshore sediment sources, and Bonne Carre spillway.
- Continue to build up Bayou LaLoutre Ridge to connect to Biloxi Marsh (Alternative 2).
- Create shoreline protection along north shoreline of Lake Ponchartrain with rock and wave protection along with vegetative protection all the way down to Hwy 11. Regarding alternative 1 measure 9, should we save the landbridge? What is the benefit of it?
- Suggested adding a weir on the I-55 canal and evaluating its impact.
- Alternative 2 levee alignment and restoration was preferred with the addition of some measures from alternative 1 mentioned above.

D 3.1.2 Table 2 Discussion

Levee alignments East and Southeast Shore of Lake Pontchartrain:

- Levees in the Pearl and Slidell area are debated in alignment. Nina says that the community would have to be cleared out to move the alignment or beefing up the Hwy 90 alignment.
- Two structures will have to be placed on each side of that area.
- Group agrees:
  - The existing alignment of the levee and beef it up
  - Leave the Hwy 90 alignment on the table to help protect.

- Group discussing making the 500-year protection come to the same point (Belle Chase- 60 mile point) and decided to make the levee on the east side of the river for PU 1 to come to that same point.

Southwest Shore of Lake Pontchartrain:

- Agreed upon: 100-year protections on the western levee alignment.
- Development on the northshore is increasing substantially with the events happening on the south side. Zoning and building codes are the main way to protect the future northshore development.
- Non-structural needs: Zone area so that they will raise developments. Avoid construction in areas involving sloshing.

Restoration:

- Marsh creation south of MRGO using the resources that are available. (Mobile sand, etc.)
- PU1-Measure12: maintain and restore.
- Marsh creation in the golden triangle as well as a swamp project in the central wetlands (restore cypress swamp) grade to higher elevation dredge and plant. With 7 feet of material with a target of 2-3 ft elevation.
- Swamp area on the north side of the Lake Borgne: Some small divisions in this area to help maintain restoration. Restore the swamp in LaBranche.
- Restoration measures agreed on: Belle Chase area:
  - 200,000 cfs is outrageous for the modification of Caernarvon. Mobile sand is a source for restoration.
  - Chandelier islands: Restore or not? Do not construct Jefferson Parish? Just protect the levee?
  - Maintain Lake Bourne land bridge? Yes.
  - Benny's Bay sediment diversion: Agree with all measures Nina is proposing.

D 3.1.1 Table 3 Discussion

Attendees:

Gretchen Brown --DNR–CMD
James McManis –DOTD
Jerome Zeringue –TLCD
Larry Donovan –USACE
Mike Stack –DOTD
Cindy Steyer –NRCS
Patrick Williams –NOAA

- Want structures for flood control? 500-year protection.
- West-Shore Alignment on Lake Pontchartrain: If west shore warrants protection then north shore warrants protection as well.
- Should we close the Rigolets structure based on storms?
  - The north shore needs 500-year protection; however, if the Rigolets is closed then the north shore wouldn't need protection for 500-year storm surge protection, just protection from the effect of the 500-year flood.
- 500-year surge elevation map: There is a difference of water depth of 12' between the center of the lake and the edge of the lake for the 500-year. The old rule of thumb used to be that they would close the gate at an elevation of +3 (in Golden Meadow). The only reason for this rule of thumb is that the roads in Golden Meadow floods at +3. The new information suggests that waiting until +3 may be too late for some areas. The question is: When do you close the gates? At what elevation? Theoretically, the southshore should be OK with +5 elevation of water, but the northshore isn't protected to that level.

- Ascension drains through to the lake area and if the lake fills up then Ascension and Livingston may flood due to backups. Need to keep lakes lower to eliminate flooding in Ascension Parish.
- Suggested protection areas marked on map in gold circled area. All areas protected to 500-year event behind the gold circle.
  - Structural on northshore and non-structural in Livingston and Ascension Parishes.
- How do we protect Livingston and Ascension Parishes without using structural means?
- Marshes need to be excluded from levees not under or behind levees.
- Change levee alignment near Lake Borgne so that less marsh area is impacted and outside of levee. This will lessen the maintenance of the levees.

Restoration Features:

- PU 1-4 MRGO: Keep measure as is.
- PU 1-5a: eliminate.
- PU 1-5b: Keep measure as is.
- PU 1-5c: Keep measure as is.
- LeMoque Diversion (12.8K cfs): Open both structures and let flow.
- Amite Canal Gaps: Keep measure as is. May be accomplished by mitigation.
- Medium Diversion White's Ditch: Keep measure as is.
- Mod at Caernarvon: Increase ~15,000 cfs by enlarging it. Capacity is only 8,000 cfs.
- Studies: They don't object to studies but would like to see the results.
- Chandeleur Islands: eliminate measure.
- Biloxi Landbridge: Keep measure as is plus add marsh creation. Consider wave infraction. Use sediment from Chandeleur Sound if feasible.
- Bayou LaLoutre Ridge: Keep measure as is.
- Change Jefferson Parish fringe buffer to frontal protection for erosion protection.
- Lake Borgne Landbridge: Keep measure as is.
- Sediment delivery to American/California Bay: Don't want it delivered by pipeline–remove.
- Benneys Bay: (20000 cfs).
- Main Pass Ridge–eliminate.
- Bankline Stabilization: eliminate.
- Goose Point: Eliminate Alt 1.
- St. Tammany: Keep measure as is in Alt 2.
- Adaptive Management: Keep measure as is.
- Maximum beneficial use of dredged material: Keep measure as is.
- 1-22–Landbridge. Marsh creation: smaller version of marsh creation.
- Violet: 10,000 to 15,000 cfs
- Eliminate breakwaters in Lake Borgne.
- Sediment delivery by pipeline marsh creation and swamp: Keep as is. (Central Wetlands).
- Golden Triangle: Keep measure as is.
- Sediment delivery to LaBranche: Eliminate

- Orleans landbridge - Keep measure as is.
- Bonne Carre diversion: 13,000 cfs.
- Ostrica lock (across from Buras): Existing lock system. Possible change to a diversion. (10,000–20,000 cfs) It is 40-feet wide and is heavily silted in. The lock has been broken since Katrina. It was built in the 20's or 30's. May have a navigation problem.

D 3.2 Delta Area, Planning Unit 2

D 3.3.1 Table 1 Discussion

Levee Alignment:

- Alternative 1 levee alignment was preferred. Concerns by two members regarding maintaining water flow and the estuary if the levee is built up. The majority of the participants, however, wanted the leaky levee depicted in alternative 1. The Lafitte area was included into the program. The GIWW alignment was preferred.
- Alternative 1 was preferred for restoration measures with the inclusion of fringe marsh area instead of rocks. Locals may object to Delta farms and The Pen areas in areas of marsh creation.
- In Measure 2.7, CH2M Hill's alternatives to pipeline convey sediment should be implemented.

D 3.3.2 Table 2 Discussion

Levee alignments and levee protection:

- Existing levee south to Diamond is for 50-year and south of Diamond to Venice is for 100-year storm. The total cost from Golden Meadow through the GIWW down to Diamond for 500-year south for 100-year, $8.6 billion.
- Suggestions for protection: Larose 100-year; New Orleans 500-year; below New Orleans south to Plaquemines 100-year. The Hwy 90 alignment currently is planning to have only one opening and hopefully we will have more openings in the new system.
- It will be almost impossible to place a 500-year levee system in the Lafitte, Barataria and Crown Point areas. Most of the group agrees.
- Davis Pond is not operating as it is suppose to operate at this time.
- Where will we get the resources to build these large levees in Lafourche? Insufficient resources are the reason the environmental groups were down grading the protection in that area. Finding footprints to place 1,000-ft wide levee will be hard in some areas.
- Looks like it will be difficult logistically to get the lower Plaquemines below Belle Chase protected for the 100-year storm by using existing levee system.

Agreed:

- Metro New Orleans and West Bank areas need to be protected to a 500-year storm south to Belle Chase. Maintain existing levee system down to Venice, protecting at the 100-year level.
  - Measure 2-9. Levee alignments in the Golden Meadow area is agreed upon, but needs to be beefed up to protect Port Fourchon. Minimum 100-year protection north of Golden Meadow with some saying up to a 500-year protection. Others think 500-year protection will be difficult for environmental reasons and existing constraints.
- Restoration of marsh creations are included to help with the levee protection.

Restoration in PU 2:

- More coarse material exists in the River instead of offshore are available to plan the restoration in fresher areas. Hundreds of thousands of cfs is too much. Sees diversions as a sustaining strategy but not a building strategy. Not opposed to any of the diversions in the plan.
- Study has shown there is not much sand in the Barataria area. Existing sand is being used in the islands. Barataria soils will not support rocks.
  - Barataria-Barrier Island Complex-CWPPRA: Reefs could help.
- Regarding subsidence and achieving sustainability. Costs associated with addressing oysters may be a bigger constraint than the soil. We must think strategically. The future systems will be on a smaller, more detailed scale. How much is needed to sustain the system. More Diversions are desirable. Hundreds of thousands of cfs is way too much.
- Restorations further Des Allemands in north should use small diversions to protect swamps. Also prevent clear cutting of timber.

D 3.2.3 Table 3 Discussion

- Group
  - PU 2-4e: Remove Bayou Lafourche measure.
  - PU 2-4a: Keep measure as is.
  - PU 2-5: Keep measure as is.
  - PU 2-4: Myrtle Grove: Keep measure as is for Alt 2 with sediment enrichment (size 1,000–15,000 cfs).
- The 3rd Delta Study: don't oppose the actual study, but are not in support of the 3rd Delta Channel. Want to see the results of the study. Against the potential outcome. The marsh creation from the study was good.
- PU 2-7: Marsh creation Alt 1 and 2 are the same.
- Diversions. Naomi–maintain (2,400 cfs)
- West Point-a-la-Hache: change from 4,800 to 5,000 cfs.
- PU 2-10 Pike's Peak: (1000 cfs): Keep measure as is.
- Small diversion at Port Sulphur: Eliminate. Move the money to the Point-a-la-Hache diversion.
- PU 2-9: They don't object to the study.
- Want to replace the breakwaters with a marsh creation landbridge with a berm on the gulf-side edge, if necessary.
- What's the priority of sediment management? Behind the levees 1st, then move sediment from north to south.
- PU 2-7–They expanded it to include all marsh creation areas in the 3rd Delta Study. Add other marsh creations.

Levee Alignments:

- Alt 1–Donaldsonville to the Gulf (including GIWW, Golden Meadow, Lafitte). Place levees versus other structures. Structures would require a width of 100' to 250 or 300' maximum.
- It was cheaper to build the lower alignment.
- Objects to lower alignment because it wouldn't maintain the ecosystem. Productive fisheries will be impacted. The impact of enclosing the lower alignment wetlands is greater than for the northern alignment. Dutch studies show highly degraded ecosystems behind levees.
- The decision could not be made between upper and lower alignments. GIWW can't be crossed with a structure.

- Alignments comments: 500-year protection west of the Mississippi River; 500-year protection at tip of Bayou Lafourche area. One group decided PU 3a should be 100-year levee, but has to be changed to 500-year protection based on recommendation made in PU.
  - 500-year protection for Plaquemines Parish. It may be cheaper to build the levees than to raise the elevation of the roads. 500-year protection at north of the refinery/Jesuit Bend subdivision in Plaquemines Parish.
- Grand Isle: Breakwaters are needed. Patrick and Cindy say they do not want a levee on the back side of the island, but bankline stabilization would be OK.
  - They agree with non-structural protection; raise and maintain the dunes. They consider it habitat restoration versus hurricane protection.
  - Ed, Mike, and James disagree with no structures.
  - Agree that the breakwaters behind Grand Isle should be complete.
  - There was no resolution regarding levee/no levee on the back side of the island.
- Fourchon needs 500-year protection based on the stand point of assets. They are unsure if the bridges and highways are higher than 100-year protection.
- Restore Fifi Island. Keep this measure as is with rock stabilization/breakwaters.
- Repair Elmers Island; keep this measure as is.
- Raise Hwy 1 to +5 elevation from Grand Isle to the new road at Port Fourchon. Keep measure as is.

D 3.3 Delta Area, Planning Unit 3a

D 3.3.1 Table 1 Discussion

- Alternative 2 leaky levees: Discussions regarding the purpose of structural support for a 100-yr storm event. There is concern that there will not be support for the levee for a long period time.
- Would the 100-year levee serve a purpose? Do we need a speed bump that big? Or can they build a smaller levee? Are there other options? Is it economically feasible? By building a levee for a 100-yr storm, will we be giving incentives for people to move and develop these areas? Would this levee impact the marsh systems? Is the Louisiana coast salvageable? Non-structural protection includes, but is not limited to barrier islands, higher home elevations, and relocation.
- Something is needed in the Morganza-to-the-Gulf study area. A 100-year levee would add redundant protection.
  - Alternative 2 was preferred for the levee alignment; however the group did not come to a consensus regarding structural or non-structural protection in the Morganza-to-the-Gulf project area. Mechanisms to control development growth within the new levee areas are needed.
  - Alternative 2 restoration measures were preferred.

D 3.3.2 Table 2 Discussion

Levee Alignment:

- Adopt existing alignment for the first line of protection which is the Morganza to the gulf alignment; 100-year protection.
- Not worth fighting the battles that have already been fought. Unless they wanted to go to a category 5 protection, seems to be too expensive on a cost benefit basis.
- Not all agree that Houma needs 500-year protection.

- Because of the new measures for the 100-year protection, the levee should include protection at the alignment of the Morganza to the gulf.

- Will the HNC lock be affected by the 500-year protection levee? No, it is protected by the 100-year protection.
- If we have a 500-year protection levee in north Terrebonne, we would need to tie into Morgan City and the 500-year protection levee to the east (New Orleans). 100-year protection is sufficient for the southern part of Houma.
- We are mainly discussing if want a second line of protection for the city of Houma?
- There is an existing 22' flood wall in Morgan City as denoted on the maps.
- Morganza to the Gulf stops at Minor's Canal and Lower Atchafalaya River (LAR) levees stop at Minor's Canal.
  - Is flooding coming into Houma from the north from Gibson and the Catahoula basin?
  - The problem with using ring levees in Houma is that when you place a levee from Larose to Gibson, tying in to both sides, it is not much different than the total circumference of encircling Houma.
  - Discussion about the Catahoula basin plan and how the water is taken out of the basin when the three gates are closed.

Restoration:

- Regarding 10,000 cfs diversion at the east and west of Bayou Dularge, it is desirable at 10,000 cfs in Houma.
  - It is better to diver more water east, to west of Bayou Lafourche and Bayou Dularge. Group agreed.
- The group does not want to proceed with the third delta study (3a-3f) because it is not feasible.
- West of Dularge: We must maintain/implement the brackish barrier since it is deteriorating due to being founded on poor organic soil.
- Reef from Point au Fer to Eugene Island falls in Planning Unit 3b but affects Planning Unit 3a.
- When the river is at a high level they will move water at 30,000 cfs to the west.

New Measures:

- Prefers additional marsh creation in the Terrebonne and Timbalier Bay areas. Use oyster reef islands but they don't want rocks.
  - Include barrier island restoration.
  - HNC lock: The area does not need the rocks because it involves a lot of motion with not a lot of benefits. The group agrees that rock armoring both shorelines of the GIWW and HNC is excessive.
  - Add more marsh areas regarding the alternative of the third delta study.
- Alternative 3a-13 measure includes additional ridge features.

D 3.3.3 Table 3 Discussion

- Why wasn't bankline stabilization included in Alt 1? The reason was to include the full range of protection levels and landscape features. Alt 1 includes the maximum protection with mechanically created and sustained landscape features. Alt 2, which includes variable levels of protection with self-sustaining environmental options. The idea is to develop a referred plan between the two alternatives.

Levee Alignments:

- Western Terrebonne Marshes. Hackburg Lake will have an approximately 10,000-cfs diversion. There should be a minimum of 2,000–4,000 cfs for this diversion.

- Discussed expanding Minors Canal to 29,000 cfs. One of the measures includes a pumping station. It can have a potential flow of 20,000 cfs, and other waterways/bayous can be dredged to increase the flow into the areas that need it.
- Recommended installing pumping stations to introduce freshwater in the area.
  - It was agreed to introduce freshwater to help the upper basin Gibson Ridge. Water needed to be moved from the Verret Basin.
- Morganza to the Gulf (MTOG) alignment: Decided that 100-year protection is sufficient.
- Has anyone researched the fact that once "fast-lands" are built that the state loses the regulatory authority (coastal use regulator program)? The land becomes exempt from regulatory process (DNR). Jamie
- Discussed that there will be more wetlands impacted near the western point of MTOG if the levee alignment is accepted. (This alignment wasn't included in the MTOG EIS.) They would not like to see any wetlands enclosed behind levees.
- There is a disagreement within the group over where to put the alignment:
- It doesn't matter which alignment is used for hurricane protection. Either could be designed/ engineered, but the alignments would not necessarily facilitate restoration.
- Does the Houma area warrant 500-year protection? The answer by group is yes.
  - There is also an agreement on the 100-year alignments. Both alignments are needed. The group liked Alternative 2 (protection with 100-year external and 500-year internal levees).
- Need to consider a freshwater bypass (to bypass the GIWW) to get freshwater to the east (in the Distributed Assets 3a-d area) and to use as a borrow source. It would have to be about the same size as the existing GIWW (authorized for 12-feet deep). Navigation on this canal would be incidental, but could be prevented by structures if necessary.
- There was a discussion about where the alignments for 100-year protection would be located. The waterways need to flow toward the gulf. How can a levee be constructed in this location? Will the water levels be affected? No conclusion.
- See MTOG for 100-year alignment. Wetland versus non-wetland impacts. There would be an obvious impact from the western levee alignment compared to the eastern levee alignment. It was decided that the plan should include the measure which has less environmental impacts.
  - The 500-year levee alignment: Creates a bypass for the GIWW. Some of the levee material would be borrowed from the bypass channel. Part of the alignment has to move fresh water eastward. It may be better environmentally to relocate the alignment further south. Agreed it may be better to place alignments through sugarcane fields instead of wetlands. Minimize the wetlands that are enclosed behind levees.
- Agreed to construct a ring-levee around Morgan City (500-year).
- It was discussed that Donner and Gibson may not need additional levees if the wetlands south of the area is restored. Cindy said that the deltas south of the area are increasing in size and will protect the area, so it may not be required to add a 100-year protection in that area. The population density warrants either levee protection or non-structural proactive protection.
  - They decided that they either had to increase the height of Hwy 90 (I-49) to 100-year protection to protect the evacuation route or to include a 100-year protection levee. Jerome said that before Katrina, a 100-year protection levee was being considered for the area.
  - The compromise is to flood-proof Hwy 90 (I-49).

Diversions:

- It was decided that the maximum utilization of the Atchafalaya River for freshwater introduction is desirable.
- Is it better to have a 100-year levee at MTOG and sustain damage between the levees for a greater than 100-year event? Would rather see damage than not have a 100-year protection levee system there.
- Diversions–They agree with all diversions (10,000 cfs at HNC to the west).
- They agree with the 3rd Delta Report's marsh creation concept. Sediment would come from offshore or the river. Landbridge marsh from southern edge of Timbalier and other marsh creation locations. They decided the shorelines of some marsh creation need to be protected by rocks or some other means.
- Want a wide marsh creation project associated with PU 3a-11 Alt 2 with bankline stabilization.
- Want the reestablishment of the Bayou DuLarge Ridge and Bayou LaPointe Ridge.
- They want a new marsh creation area in Harry Burg section.
- Eliminate the Bayou Lafourche measure (PU 3a-2a). Cost too high for too little benefit.
- Want a pumping station to move water from the Verret Basin (PU 3a-3g).
- Eliminate the 3rd Delta measure. The deltas maintained without this measure.
- Maximized beneficial use of dredged material needs to be maximized. If the sediment that is dredged from the channel between N.O. and B.R. is put back into the river, it should be utilized. It's as much as 18M cubic yards/yr. It may take as long as 50 years to build the marshes that are proposed near the coast. Other states would love to barge down sediment that they have dredged out of the river.
- Added marsh creation sites from Alt 1 and Alt 2. See the ridges on the maps.
- All barrier islands should be restored for habitat purposes.
- The Marsh Creation projects fill will come from both offshore and rivers (outside the basin).
- Remember that deep water and storm surge don't mix.

D 3.4 Chenier Plain Discussion, Planning Units 3b and 4

D 3.4.1Table 1 Discussion

- This is a map showing of what we discussed yesterday. We compiled a list and flagged areas of concern. The surge maps are based on Hurricane Katrina, corresponding to a 1% surge and generated from multiple runs using characteristics of a 1% hurricane data. Model included paths similar to that of Hurricanes Katrina and Rita and a 4- to 5-percent error. We have to consider habitat and shore line protection. The Mermentau basin is left for fresh water coming into the system as a whole. In the area west of Abbeville, includes farm land and other areas we may want to protect.
- Areas between Abbeville and Lake Arthur, should be considered for protection due to our long 100-year planning horizon. These areas are protected along the Mississippi River today as a result of levees constructed after the 1927 floods that are no more important than this area.
- Cannot determine if structural or non-structural is better. Work together so there is equal protection for everyone.
- Raising existing roads may be a feasible way to protect the low- levels of surge. There is not a comprehensive plan that implements the control of existing levees around farm levees. Ground- and surface-water organizations are working independently and need to work together with a comprehensive water-management framework. The drainage issues are enormous. These are privately and government owned areas and some want them fresh and some want them to be more salt water. The aquatics have been tackled, but how do you protect a viable aquatic area and protect the structure of an area as well?

- PU 3b and 4 are losing 100 to 150 miles of shore line each year in some areas. If this is allowed to progress, areas near I–10 will be vulnerable too. We need to address critical areas and how to get sediment in that area. The protection for farm land and eleven species on the Chenier plane is a conflict. Do we drain farm land? Do we buy land?
- People feel that if you have something in place to examine a more saline Chenier plain then you can have both worlds - a fresh and a salty water plain. The management of a gate system is complex. Shifting the system into a management more similar to other areas will require lots of planning and design efforts. The goal would be to control the saline and freshwater regimes to meet objectives of the area. The control of salinity goal would be to control the outcome we want to achieve. If you send more water down the Sabine River you in effect maintain a more freshwater strategy for the system.
- The scenario analysis was geared toward the Mississippi River and not a Calcasieu River channel. Do we want to monitor our progress in the Mississippi River to see how we can enhance the Calcasieu? There is not enough protect of the Calcasieu shoreline. The river delta will never regenerate. The system is vast and will not come about naturally.
- What do we want? We have experienced 50 years without shoreline protection. There are not enough resources here to prevent the salt water that will continue to encroach year after year and the regression is inevitable. The small amount of Chenier fresh water availability might be there and could help. Artificial materials can be used to stabilize the shore line. A coastal community must be committed to convert the areas tending towards salt water into fresh water systems and expanding the necessary resources to do so.
- Two approaches are feasible with the appropriate commitment. Holly Beach is one example where the selected solution stabilized the shoreline. But it is hard to implement the Holly Beach approach across the entire. The channels and the 20-foot contour are 28 miles of the growing Atchafalaya Bay. The Calcasieu River ranges from 5- to 28-feet deep and the sediment are not moving as a bedload like the Mississippi River.
- What are the results using the CLEAR model? The shore line retreat or wetland erosion is not included in the CLEAR model for this big picture view. Shoreline erosion is an unresolved issue. Let's find a way to maintain a freshwater regime under extreme conditions.
- To evaluate the rate of transgression we should look at the east side of the river. To enhance the Mississippi River Basin Control Structures would aid in assisting these problems. If we let Mother Nature do the job, can east and west side of the Atchafalaya basin take care of our problem considering the extend of the region's sedimentation problem.
- Freshwater Bayou locks/structures could allow controlled flow. Salinity comes up and then flows in Freshwater Bayou.
  - Possibility for finer silts and clays from Atchafalaya River to enter the system.
  - Are we going to worsen problems by over-engineering? No response.

Specific measures:

- Salinity control at Calcasieu Channel (currently 1,500-feet wide, the natural channel is 200-feet wide)
- Freshwater from the Sabine River may help salinity, but a structure would be needed to address storm surge.
- Red River water at times does get salty. Runoff from Oklahoma increases salinity in Red River at times.
  - Are some Corps projects addressing this? Don't know success.
  - Red River water is used for rice irrigation at times.
  - Most sediments in Atchafalaya come from the Red River. Sediment load in future will be reduced due to structures in Red River.

- What is best case scenario for source?
  - Pact with Texas will probably not allow increased flow from Sabine to LA.
  - Water from Sabine would require long distance channels with many pumps. Engineering and cost would be extensive. One estimate suggests $100M for only 2,000 to 3,000 cfs of flow.
  - Best option may be best to manage freshwater sources in area.
  - Reservoirs offer possibility for increased source of freshwater to capture runoff and manage its release.
  - Currently water management practices include using water from Bayou Teche.

Restoration:

- Regional water management would be preferred instead of site/area specific management.
- Hwy 82 as a barrier/levee.
- Need to conduct analysis and feasibility studies to better evaluate issues.
- Shoreline protection: can better evaluate what areas require protection based on available data.
- Grand Lake/White Lake banks are eroding and becoming more permeable. Address to ensure system can be maintained as fresh.
- Terraces
  - Results vary based on environmental conditions. Shoreline erosion is reduced by reducing fetch.
  - Where the clay is strong they can be effective in reducing the erosion rate.
  - Terrace work to stabilize the area.
  - In other areas terraces are not an effective solution because of depth of water or mitigation issues.
- The State should consider a programmatic contract for rock to reduce cost by bulk and stock piling.
- What data do we have from the CLEAR model to show if there would be benefits if we move Measure 4-7 alternative 2 to more brackish sediment?

Unit 4 Marsh:

- Losing fresher areas.
- There is a percent change in alt 2. What should we expect? Which are saline species?
- When marsh areas are compared, 50-yr analysis indicates we will lose saltwater habitat types and will gain more freshwater-type species in future.
- If no action taken, we create a fresher habitat for the future.

Chenier Plain:

- Water settling plane model is generating water usage

Fresh water usage and protection key areas:

- Grand Lake
- White Lake
- GIWW
- Vermilion Bay

- Are we creating a shore line in Vermilion Bay?

- Freshwater management: maintain/enhance river influence channel
- Surge and loss of coastal shores
- Do nothing; go back to remodeling.
- For oyster reefs, salty is not good.

- We may want to leave the reef out
  - Southwest Pass: oyster reefs channel will only get so big in response to environmental condition.
  - 100-yr life
  - Shore line protection is needed
- Where do you get the material to build your levee?
  - PU4 alt 2: $4.1B and alt2 Lake Charles $7.1, Kaplan, Gueydan and Vinton $2.8B
- Is highway 82 priced in Unit 4?
  - PU 4-2 Alt 2: $300M.
  - Hwys 85 and 18: roads could be elevated instead of building a levee. It could save money; I–49.
  - Elevating road will help evacuation concerns also.
- Is it sufficient to elevate Hwy 82 and levee the upland interface? What is left unprotected and what is left out of the plan?
  - Building are already elevated
  - Long-term non-structured solutions
  - Hwy 82 is an evacuation route and can provide a first line of defense.
  - The Chenier residential area is flourishing as a linear community.
  - We don't have enough information to make decision.
  - Let the public make the decision on the final decision. Proceed where the will be taxed in areas like Terrebonne.
- What is the decision that we would give?
  - It would not be a 100-yr storm protection
  - The measure was originally designed to maintain Hwy 82 as a first line of defense.
  - Recommend 100-year protection for Hwy 82. May not be feasible.
- Surge map
  - Ridges increase protection levels.
  - Increase protection beyond FEMA would be desired
  - Design a spillway system to direct surge
  - Minimal elevation level for the road
  - Increase the land grade in that area
  - Maintain Hwy 27 for evacuation route
  - Elevate some existing roadways for additional protection
  - Use this map as a starting point or process of thinking

PU4 Considerations:

- Could we get FEMA to increase to $500 thousand?
- Lobbying FEMA to increase the amount of coverage for their level of protection.

- Maintaining this area and maintaining fresh water outlook in this area.
- Another issue is the GIWW for the benefit of the area
  - How much elevation for Hwys 82 & 27?
  - Quantify the level of protection
  - Need a model to run the storm surge
  - Raise the road to provide the level of protection
  - Can work be performed with available funds?
  - Model water levels and spoil banks, manipulating the GIWW roadway. Roadway or levee elevation we can utilize.

D 3.4.2 Table 2 Discussion

- Unresolved issue from yesterday: Calcasieu/Sabine Basin fresher or more saline?
- One thing we didn't talk about was Chenier protection, from a policy standpoint.
- Would you go over the blue? (on edited Asset maps)
  - Lake Charles and Sulphur are blue due to the need for 500-year protection.
  - There are issues with Lake Arthur, if structural protection is even possible.
- We flagged Berwick, Patterson and Lafayette because our current information shows that they're already protected or not vulnerable, but we want to go back and verify that information.
- Storm surge maps based on event that will happen on a 1% probability, they are establishing runs to establish 100-year storm surge, and these maps are 100-year hurricane forces that mimic. Rita and Katrina paths every 30 miles down the coast. Anticipate change, but not a lot, they're still subject to study due to new data in the next few months.
- A model is only a model, predicted surge versus actual, the +/- 2 feet and also errors. There could be as much as 4 feet of error in some places, with no feel whether plus or minus.
- Is there anything else to add to the outcome map? This is what we have to work with now, along with the unresolved issue of Calcasieu/Sabine basins.
- The areas we talked about, Abbeville and Lafayette being protected, but we debated whether the communities west, the farmland and houses, should be protected. I feel like these areas should have some sort of protection.
- 112,000 Structures captured in the concentrated asset areas: Lake Charles to Lafayette area:
- Unlike other parts of the state, if you look at the checkerboard condition of roads between Abbeville and Lake Arthur, there are a tremendous number of roads through here and I think it warrants more discussion, I don't want to throw these people out. I'm not ready to abandon these people. On the 100-years planning horizon, if we think about what has evolved over the 100 years: up and down the Mississippi there are hundreds of small communities that are protected by massive levees.
- I don't like the term "abandoning people"; there are other means for protection outside of the levees.
- As far as FEMA goes, the flood insurance has been in effect since the 70s and a lot of the people do have flood insurance, you can get it without structural protection but the premiums are high.
  - When you get a payout from a storm event, you are then required to build to new heights so things are being built now to 100-year protection.
  - We can't assume that structural is better than non-structural.
  - They had structural in New Orleans.

- This is a first step, when you go out to local communities you have to work together to ensure that there is protection for these people. If there are no levees (I think it's a bad idea to levee entire state) then parishes need to step up with building codes, etc.
- Can we raise all these roads without damaging the environment?
- I'm not so sure issue are residences (I do agree with Heather that evacuation of areas that are under threat is a much better option), but the land and how people use the land and getting their livelihood from it.
- After Rita, I think people are more interested in levees around fields and water control, they got all that salt water in there and they can't get it out now. There isn't a plan in where we would put water through, every flood we get request to breach levees to obtain drainage. There is comprehensive planning that could occur.
- There is a lack of groundwater/surface water management. Louisiana is little kingdoms traditionally and everyone wants to operate independently and now is the time for us to work together, to push parishes and municipalities in that direction.
- What happens to drainage, development if we put a levee there? It's not just a local concern, but they have to help out with it.
- There are some big government owned tracts of land, as well as privately owned and those people don't want it to be salty, they want it fresh. To get buy in from people in these areas….
- We haven't done a good job of accommodating agriculture in these areas, how do you protect it without providing structural protection? We haven't talked about these at all. Crop insurance? Disaster Insurance? You pay into it, and if you don't make what you anticipated, you get it.
- There is no insurance for cattle industry. There should be some serious before hand planning, we can't levee every cow pasture.
- The big red line is shoreline stabilization, could be breakwaters or sand… when we talk about it, hopefully we can segment it to critical areas. I hope by the end of the day it is less.
- What is the definition of restoration? Protection of farmland can be complete conflict with restoration around it. I didn't see an example. There is scoring for 11 different species, where are these 11 species in the discussion. How do they relate to the Chenier plane, is any of this farmland better as restored ecosystem rather than farmland, looking at efficiency and cost to drain, we spent so far 2 billion in Florida buying up land. These are options, to buy land.
- There is an incentive to turn drained wetland back into wetland, maybe we need to energize this program. NRCS and Department of agriculture have programs with incentives to turn land back into natural wetlands.
- Beginning at the Grand Coteau Ridge (as far north as Opelousas/Lafayette) and moving west to Texas, it was the coastal prairie system. Along this area (between the Chenier), it is a wet system and then farther north it's flat and dry.
  - Most of the budget for the program (to turn wetlands back) has been used up in the east.
  - It seems that if there is interest, it could be done.
  - We try to stay away from eminent domain, property rights, you don't touch them. Only DOTD has the power to expropriate land. The bigger picture is that we didn't hear a lot of restoration, protection is easy and restoration is hard. It's a harder question, how far back in time are we looking, what are we looking at? Before people arrived, that's impossible. We do have these 11 species, are any of them relevant on the Chenier plane?
  - Alligators are. Cameron is a big shrimp port, further off land. Delacambre and Vermilion Bay; Calcasieu Lake is Trophy Lake for trout; there are a huge number of ports that are major; ducks too.

- I didn't hear so much about restoration and protection over the next 500-years. How do you do that in the Chenier plane?
- I'm not sure that we know what all is going on in this area. I would classify this as a study that needs to be done.
- As you look at it, the places that are unmanaged (marsh island and brackish to saline areas), a large portion of the coast is under active management to maintain water levels throughout the year, some of it is refuge management.
  - So the land loss is not an issue?
  - The magnitude is substantial in the east, but here in the west it is largely storm related.
  - You can see the beach ridges and that they're being eaten away.
  - If some private landowner wants to mine sand on his property, what is the answer?
  - I think as long as their in the coastal zone, I don't think you can mine Chenier anymore.
  - No, it's a local matter and the locals won't say no.
  - The Cheniers are above the elevation to where they're out of jurisdiction.
- Can we engineer system to go saline/fresh in the Sabine/Calcasieu basin? We've convinced ourselves that we can engineer it to go either way.
- A lot of industry is geared toward fresher environments.
- The fresher, the better at closing in the open water areas.
- If you want to keep it fresh, there will be periodic saltwater pauses, and we don't want those "pauses" to kill everything.
- Can we ensure a way to drain the saltwater out? If there is, I don't think it will kill things.
- Is the groundwater aquifer restoring freshwater during storm surges? If you're pulling water out for agricultural regions, then there is a chance that salt could get into the aquifers.
- No, we have deep aquifers, they're recharged more northern.
- The reason for salty impoundments is from saltwater coming, if we can decrease that then maybe we can reduce number of impoundments out there.
- Calcasieu Lake, the plan has closed it off to estuarine access, in reality, it's not that often that salinity spikes to where there might be problems, but for example, when we looked at 13 years pre and post Cameron Creole, the brown shrimp harvest is ½ in the post what it was in the pre. So these managed wetlands, can we find more creative ways to manage it and still maintain the marsh.
- How do you manage the system? You have to leave it open some.
- Did you look at shrimp production before they dredged the ship channel in the 1940s?
- Our data only goes back to the 1960s.
- I think you'd have to look at production pre and post ship channel.
- Control salinity at the mouth of the channel.
- You can control salinity in wetlands at the coast and at the lake rim. The LCA focuses on coastal salinity control.
- What I'm hearing here is that people think you don't have to choose between salt/saline, you can have a functioning estuary that has some salty areas and some fresh areas.
- It would serve a dual purpose for storm surge protection into Lake Charles up the ship channel. With this project, we're doing storm surge protection and coastal restoration.

- Putting gates in at coast with the intent to manage the interior less.
- With any system, when you change the mode it takes working together and education, so you have close them when you have to close them.
- There is tremendous pressure from navigation to leave them open and from landowners to keep them closed. Who would win?
- The modeling shows that the salinity spikes aren't all that frequent.
- 18,000 and 20,000 ppm salinity spikes all summer long, coming from ship channel. The things we can do regionally to manage salinity is allowing fresh in and salt out.
- If you could get control of Toledo bend reservoir, you could run for president.
- Not in Texas.
- Send more water down Sabine when things get too bad, the structures are there and all we have to do is flip a switch. What we're talking about now is building things. Flipping a switch is short term, building structures coastally is long term.
- As the delta builds out, we're putting more and more sediment out into the long stream current south of Freshwater Bayou, in the ecological future, you would see increased sediment load in the long shore current. More sediment would be relevant for Chenier processes as well as marshes. The further west you go, the less sediment. But you would see more surge protection.
- Wasn't Chenier formed by the long shore current and now it's transgressing and moving inland. Do we want to develop restoration that reverses that trend? What is going on in the east that is reversing this natural process? In the Mississippi or Atchafalaya? Sediments are being diverted to where they don't enter long shore current and don't build up the Chenier plane.
- You'd have to divert river back to way back when for this to happen.
- It's clear on what choices are made about diverting Miss. river sediment; these choices made east will affect the land west.
- The Atchafalaya River back in the 1920-30s, it wasn't building a delta. Back in the early 1920s, it was very small. The delta building out will eventually help, but the way it is depositing long shore, it won't help build land.
- There are lakes and streams open to the gulf, they are filling in and forming marsh. The whole system north of Chenier isn't available and influenced by the tidal flow.
- Can I challenge the question of "What do we want"? We have tremendous transgressions force, and the thing we can get to reverse that process is a commitment that doesn't exist. It will literally be moving the river. the problem I have with this river is that we micromanage relative to forces at work, when we think of 50 meters of erosion without a resource to deal with it, and a sea level rise of 3-4 mm a year, I think and argue that this area is at a greater risk than the east because we don't have resources here to deal with the eventual fates, and if you want to build insurance on salt water that is coming closer and closer, I come back to the red river, we have to tap Atchafalaya or the red river, or we prepare for salt water environment.
- I think the shoreline is much easier to protect in the east.
- When the river switched to the east, we lost what we needed to protect the shoreline.
- Can we engineer the coast to do that? We're up against a real challenge and until there is a resource and feature that can stabilize the shoreline, I want to see the calculations. If we hang the river to the right and abandon Birds foot delta, I'm not even sure that this will be a resource.
- Five decades from now, I can't imagine what this region is going to be dealing with as far as the salt.
- I'm confidant that we can find the freshwater.

- What is done at Holly Beach can't be done across the entire coast. There are areas along the coast that won't support rock. But there may be other solutions there that could work. There is clay on the shoreline (at Rockefeller), when you throw clay into the mix, the understanding of protecting the shoreline is lost.
- Once you get to 82, are we going to armor the shoreline and put a concrete structure there? Like the Netherlands?
- Once the shore gets to 82, what do you do? In Holly Beach they were able to draw a line and put rocks b/c it supports it. What do you do when it isn't supportable?
- The transgression in this area over the last 50 years is very dramatic.
- The twenty foot contour is only four miles from freshwater bayou, but south of the Atchafalaya there is the trinity shoal, it's small but it is building. The sediment coming out of the Atchafalaya isn't moving right.
- In the east, it isn't erosion, it's sinking. In this area though, it is erosion.
- In the end, I think the threat of salt and the groundwater threat is the big issue.
- Our unresolved issue may be disappearing, if we can find way to stabilize shorelines and maintain a freshwater head, it seems like we can manage the system appropriately and have a stabilized shoreline.
- Is rate of transgression is something other than the fact that MS River is to the east or is there some other process (e.g., human) causing problem?
- Problems south of Lake Charles are not related to MS River. Even if you took jetties out, problems would still exist
- What is root cause of transgression? Soils indicate MS River would not greatly resolve problems south of Lake Charles
- Is Wax Lake outlet too far to west to bring sediments? Yes
- LAR study shows water continues to grow in Wax Lake Outlet. If let nature do what it wants–Atchafalaya and Wax Lake have increased freshwater flow–will it help problems south of Lake Charles (e.g., re-route)?
- As delta builds out, more water is moving west through GIWW and then it hits a lock, but it could be opened to manage salinity.
- You could make lock completely superfluous, take it out.
- As far as water coming down Atchafalaya/Wax Lake Outlet into the GIWW, it might be enough to have an impact on the shoreline at Freshwater Bayou. But there are a number openings where it leaks out. It's forming a delta at "The Jaws".
- Are we going to make issues worse by monkey-ing with the delta forming trying to get it to build somewhere else?
- As far as specific measures, shoreline stabilization:
- Salinity control at Calcasieu Channel
- What you suggested about bringing freshwater from the saline, it may solve problems of salinity but not storm surge protection. A structure would reduce salinity and reduce storm surge up the channel.
- If we had access to freshwater from Sabine/Red, what would be the best thing that we could build?
- There is runoff in Okalahoma and Texas where the minerals leach out, 8-9 pp thousand, it's unbelievable.
- There are some corps projects that address the salinity in the upper red. The red isn't as salty and people are using it for irrigation, but it is salty sometime in high flows. In the spring, they don't want to use it for irrigation but they will use it in the summer.
- Most of the sediments in the Atchafalaya comes from the Red, and the effects of the Red development is finally showing and the lock and dams on the Red are reducing sediment flows to the Atchafalaya.

- There is already a Sabine River authority pact and the idea that we are going to get more for ecological restoration; it's possible but very hard.
- What's the cost breakdown on getting water the Mermentau from Red? What's possible is that there aren't very many freshwater sources, now it's a question of managing the resources that we have.
- There may be links between protection and restoration. The place we take dirt for the levees could be a possible reservoir.
- There are still things not transferred to the map, dredge material, marsh creation, land bridge… these are all still on the table. The emerging map doesn't deal with protection yet. Maintaining the two separate lakes and managing as freshwater, means we're committing to the structural protection needed for this.
- (look more into land loss rates and data, focus in on more strategic areas to focus shoreline stabilization areas that are more needed, prioritizing)
- There is significant erosion of banks of White/Grand Lake, we need to go back and asses in order to maintain system as fresh.

D 3.4.3 Table 3 Discussion

- The terracing projects, have they been successful?
  - They vary. In areas with freshwater and sediments, the terrace works and it accretes sediment between them. In areas that aren't getting water and sediment, the terraces may do alright and hang on, but they won't accrete between them. There is still some reduction in shoreline erosion by reducing fetch.
  - What about Pecan Island?
  - They're pretty stout, the clay is strong. The terraces look good but I'm not sure if enough time has passed to quantify erosion rates of marsh.
  - In Sabine, one corner has nutrients; the shoreline around it seems to have stabilized.
- Where they can be built, they have been or are in planning.
  - Is this because of water depth?
  - Water depth and soil
- We leveraged buying power to get a better deal on rock. We should do something like that for these projects.
- There are a lot of little things we could do, terraces, strategic dredge. We haven't talked about the little things and that's ok. Is there anything else that we need to talk about that hasn't been covered yet?
  - Are there results from the clear model?
- Yes, it's how we scored.
- What would the area look like if we allowed alternative 1, measure 4-7 to go more saline? What's the model say?
- Around the lakes, these are the areas that are more likely to go saline and we would lose the fresh areas.
- (Looking at species total spreadsheet)
- I wanted compare the two alternatives as far as marsh acreage go.
- Numbers represent conversion and loss
- So no action and alt 1 for brackish marsh have the same effects.
- If you look at Chenier plane as a whole, there is an exercise to develop a sediment and water model
- So where does all this leave us?
- Do we need to do restoration, finish, and then do protection?

- I want to make sure what's on this map is what we have on the table right now, and if there are other things out there that people feel strongly about then we need to cover it now.
- We're not throwing out the GIWW as an option now?
- No, that's the red arrow.
- As far as restoration, there were measures in Vermilion bay; we talked about recreating land between the GIWW and the bay at Weeks bay.
- Stabilization of Southwest pass was another discussion; can we add that to shoreline stabilization?
- Is that what we want? Can we add it?
- If you let it go, there is a surge issue under a small storm event. If we don't do something, we have to remodel on the 100-year event.
- Rebuilding the reefs: There is a model that shows it doesn't make any difference. So it will probably be taken off.
- Southwest pass, it can only get so big before it finally stops growing. Is it going to keep getting bigger?
- There are a lot of good ideas in various stages of PED, some areas we know more about what will and won't happen and I don't have a problem leaving the reefs off the map.
- Just because someone is outside a levee, they are still working towards 100-year protection whether it's hazard mitigation or flood insurance.
- (look at costs of levees for 3b and 4, alternatives one and two)
- I'd like to look at some the existing roads that could be elevated to capture this.
- Then we'd have to engineer something to allow for drainage.
- The issue with using any road as a barrier (including 82 for some extent) is there still needs to be a roadway surface which is an added cost. If you go farther north, the pattern of landscape use, housing and properties close to the structure will create slope and right of way issues which lead to relocation issues. There are other costs involved other than just construction cost.
- Let me ask this question. What's wrong with Highway 83 elevated as a plan. Except for towns, most of it is unpopulated and what are we leaving unprotected? It would give protection with room for surge to spread out. It could act as 1st line of defense.
- We're not at a level to where we can distinguish what is most cost effective, etc. Leave these for future planning.
- The Chenier itself, it's residence after residence after residence, and there are families and schools and all. It's not just a point, it's a unit.
- What do we want to articulate as our vision, knowing that some of these things are going to change with PED?
- Down the road we need to consider protection and let the public be involved in the decision making. If they want to take the risks, then let them as long as they make an educated decision. Then we will have given them a range of options to consider and not limiting them to what we show them.
- This wouldn't be 100-year storm protection? Would it do something for the ecosystem? Would it allow added certainty for holding the roadway that is essential to oil and gas industries in the area.
- There is some minimal level that the road has to be safe for evacuation. Good for evacuation as well as access back into the area after the storm.
- I think further north, if we wanted to elevate some additional highways, it would be more economical and tie back into the overall water management. It has to be looked at from a big picture point of view. Treat white/grand lake basins as not only a flood reservoir …

- This plan show's that we're talking about evacuation, flood protection of assets, things that the public and press want to see.
- Do we have to go all the way to the Atchafalaya?
- Could we get FEMA to increase the insurance value up of $250,000? Where 82 heads north, that is where the existing levees that the locals want to reinforce, an additional method could be to bring additional protection to that triangle area.
- We want our delegation to Lobby FEMA to increase coverage: sustainability, diversity, and protect communities.
- The northern boundary of the GIWW needs to be actively managed for freshwater movement east and west. This keeps us from looking at the whole thing instead of little bitty pieces.
- Are there pros, are there still problems that people have with areas, do these resolve the issues that people have.
- The unresolved big issue is how much protection is given to area north of blue dashed line (GIWW); it's unresolved until we do more modeling. How much does elevating 82, 27, and managing the GIWW and Freshwater Bayou Canal, how much does this elevation protect the area north of the GIWW? We need to make sure it provides protection, and an idea of how much protection is available. There could be another measure to raise a highway just north of the GIWW.
- Another part of the unresolved issue is the active management of the water patterns in this whole area.
- Elevate and manage 82 and 27 and quantify the amount of protection that this provides (how much does this cost? How does it affect the people and ecosystems surrounding this area?)
- Maintain the northern shoreline of the GIWW (and controlling the flow) and spoil bank utilization
- May be additional highways or additional embankments that can be utilized for an overall water management.
- Pending what happens in 3a, if they leave area from Morgan City and Houma, do we need supplemental protection along east bank of Atchafalaya? No.
- Establish and maintain banks of the GIWW are included.
- This will be next to no new interruptions in hydrology. Except for the GIWW.

Annex E: Interdisciplinary Technical Team (ITT) Workshop, October 2006

E 1.0 Introduction

This Annex contains detailed notes from the October 31, 2006, ITT workshop.

The following notes are organized by individual notes taken from each table. Some tables were large and had two scribes sitting at opposite ends to capture the full discussion. Each scribe presents meeting content in a different format.

To preserve the provenance of each transcribed discussion, the full notes are arranged according to the scribe who recorded each table discussion. Tables were primarily concerned with unresolved issues from the SERT meeting, and individual measures across all of the planning units.

E 2.0 ITT Workshop Meeting Notes, October 31, 2006

E 2.1 ITT Meeting Notes by Lily Hassan

Notes present same table discussion as transcribed in section 2.2 by April Dykes.

Participants:

Ronny Paille: Fish and Wildlife Service (FWS)
Sean Michael: U.S. Army Corps of Engineers (USACE)
Tim Axtman: USACE
Randy Trosclair: Lafayette Basin Levee District
Frank Duarte: USACE
Cheryl Brodnax: National Oceanic & Atmospheric Administration (NOAA)
Daniel Dearmond: Louisiana Department of Natural Resource (LDNR)
Henry LaGrange: St. Mary Parish
Paul Naquin: St. Mary Parish
Patrick Williams: NOAA/NMFS
Kerry St. Pe: Barataria-Terrebonne National Estuary Program (BTNEP)
Marnie Winter: Jefferson Parish Environmental

Map discussion:

- Stated that Lafitte will need a lot of marsh restoration, if some areas are to be kept as fresh water and marsh tidal surge needs to be prevented…..levee may not be the answer-will cause serious fisheries issues even w/ a leaky levee
- Possibility of opening culverts in Hwy 90?
- Suggest that the map change river dominated to river influenced. River dominated indicates something different.
- Concerns were voiced regarding the use of sediment stockpiled in old barrow pits since location of sediments have yet to be identified. This led to a discussion about piping sediment into Wax Lake Outlet. A comment was made stating that sediment should move to build land rather water and vegetation, piping will get this done faster. After Rita this area suffered a large loss of land which may have not been land and only vegetation.
- Regarding marsh creation in general: “Are we willing to sacrifice small bays and outlets for marsh building?”
- Feasibility of creating fringe marshes was also discussed.

- Main Idea: Marsh creation alone will not be sustainable. Must move towards building a system for marsh creation. Must have permanent infrastructure that allows us to put sediment where we want it and supplement it with a fresh water source. Look at ways to enhance sediment traps, slow velocity by digging sediment "retention centers" and import sediment from up north.
- Bayou LaFourche was suggested as a source of freshwater, however it was noted that it cost over $100 million to get 1500cfs. Could also improve conduits in LaFourche to make water head southward rather than run amuck. Also look at putting sediment retention centers along GIWW and Terrebonne.
- Comment to change map regarding areas influence by divergences to another color so it does not look abandoned.
- Creating Marsh closest to levees and working outward should be a priority.

Structural and non structural measures:

- Question asked about the Morganza levee alignment, "Do we need a levee to a 500 yr protection?"
- Suggested to connect GIWW w/levee, "it is in synergy with movement of the Atchafalaya, the state would have property to acquire though."
- Suggested to look at rainwater as a resource-pump the rainwater in a way that gives over marsh an on overflow beneficial use of sustaining Marsh. Introduce two-way pumps at divergences that pump water in and put as needed.
- As a source of funding generating energy at siphons to pay for upkeep is suggested.
- Restore and sustain Lake Whitman area.
- Affluent discharge used as a technique for storm fresh water and nutrient inputs for marsh growth (investigate the opportunities) good sustaining techniques
- Watch and be careful of wording regarding Marsh creation vs. Marsh sustainability.
- Question asked about California Bay being selected for a divergence, caused a discussion about the flow regime and how to control it. How will resource be affected by Cali divergence? Can we get sediment without water? Suspended load will be in the water? Do we need a place where the soil can settle and stop fluctuating?
- Water can not be controlled in high flow.

Levee alignment:

- Question asked "Why isn't pipeline canal included?" It reduces levee by 14-18 miles and also reduces footprint size and less trees to reduce and may manage freshwater intrusion. (Statements made by: Frank Duarte: USACE) Shorten levee length around Plaquemine parish, regarding Lafitte; Geotech levees in marsh land increasing the base width of levees. Changing the levee to this route increase risks to ecosystem and may cause greater impacts.
- Drainage improvements are needed
- If other levees (100yr) were designed with overflow, 500yr levees could be lessened (300 or 250yr design)
- Can build another siphon next to the Naomi siphon
- A ring levee in Lafitte could minimize damages if Lafitte was overtopped, once you get a 500yr storm marsh does not slow surge down.
- Need to create Bay Da La Chenier (ridge)
- Water diversion will not help with land build, we have to harvest sediments and have small diversions to sustain them. Dredged availability-industry will build equipment must use resources.

- Include Lafitte area within the structural protection due to it's importance to Jefferson, cultural heritage, and economy (fishing, oil and gas, tourism)
- Add ridge restoration at Barataria Ridge west of BBW, add Goose Bayou Ridge restoration.
- Donaldsonville to the Gulf Study Area –shortest levee alignment possible to reduce cost, use pipeline canal levee alignment instead of Hwy 90. Pipeline alignment will produce smaller footprint

E 2.2 ITT Meeting Notes by April Dykes

Notes present same table discussion as transcribed in section 2.1 by Lily Hassan.

- Planning Unit 2 would be sustained by the river through river processes. Thinks the word dominated infers something it is not supposed to mean. Marine dominated area of Planning Unit 2 is too far from the river.
  - Instead of dominated, rename it to sustained
  - Agree that there needs to be more freshwater in marine dominated area
- Morganza to the Gulf- How will the official alignment be set?
- More sediment and water from Wax Lake. Make sure that all considerations are taken- pull water out of Wax Lake than there will be less water in the river and will salt water move up the bayous eventually?
- Lower Atchafalaya re-evaluation study- address navigation and drainage concerns (Amelia)
- From Berwick following Corps. Levee alignment 3- follows the existing alignment from Wax Lake West, review alignment from Charenton drainage canal West to Iberia. Corps alignment 3 needs to be compared to St. Mary's suggested study alignment.
- Make sure that there are flood gates in navigable waterways and bayous (i.e., Charenton in St. Mary's Parish plan to have a flood control structure)
- Marsh creation cells were found near Bayou Pigeon. If there is a limited supply of sediments, than give it to the other areas. This area is floating marsh and sustains itself on its own.
- Why didn't the Corps follow the Intracoastal Waterway?
- There needs to a jetty or reef in 3b to assist in delta forming and sustainability of floating marsh. Drawn on the map to Eugene Island. The point of the island is degrading and needs an intertidal structure to slow the exchange rate.
- Need to hold the lines at the heads of the bays in 3b at the fringing marsh to prevent loss of estuaries. Similar to what we are doing in Sister Lake.
- From the Atchafalaya, water flows across and through the GIWW. Without dredging Bayou Lafourche we can put a few diversions to do similar things. Hard to increase the size of Bayou Lafourche now.
- Central and East Terrebonne CWPPRA project needs to be looked at.
- Bayou Lafourche- structures in levees are not needed if we follow the GIWW.
- Reduce the levee distance at Golden Ranch and include 2 drainage structures. This area is currently privately owned marsh and is not developed.

E 2.3 ITT Meeting Notes by Camille Manning-Broome

Notes present same table discussion as transcribed in section 2.4 by Jay Leblanc.

Participants:

Andrew MacInnes –Plaquemines Parish

Cindy Steyer –USDA NRCS
Carl Anderson –USACE
Jerome Zeringue –Terrebonne Levee and Conservation District
Michael Massimi –BTNEP
Charlotte Randolph –Lafourche Parish President
Connie Porter –LADOTD
Amy Clipp –Journalist
David Millren –LADOTD
Becky Griffitr –USACE
John Monzon –LADOTD
Jamei McMenis –LADOTD
Sue Hawas –USACE
Jamie Bartel –Shaw
Oneil Malbrough –Shaw
Jay Leblanc –Shaw
Mohan Menon –Shaw
Camille Manning-Broome –Shaw

Unresolved Issues on structural measures:

- Is there a barrier plan? Should the area around Bayou Black receive protection? Would like some form of protection around HWY 90.
- Unresolved: Would like to protect Lake Catherine along HWY 90. However, this is not consensus around the table. Some people believe that that area does not want to be protected.
- Is there any area that should not be protected by a levee? Yes, Holly Beach.
- 100 -year protection along HWY 90 (near Terrebonne) is desired.
- Why are the areas unresolved (chose GIWW alignment or HWY 90). Should we provide protection to those unresolved areas? Yes. But it is not resolved on the best method, structural or non-structural?
- The table is divided on whether or not structural protection is needed for Lafitte, Morgan City area, and Gibson area. Some believe that you should restore the habitat in these areas to rebuild the areas to how it was before. Some believe that levees should or could not be constructed near Lafitte. Others believe that you have to build structural protection in order to protect businesses which can not be elevated (only homes can be elevated).
- Everyone wants protection, but then we also want ecosystem restoration which can not occur in some areas if you construct levees.
- There is a debate on cost and whether levees will cost more than restoration.
- Consensus, is structural protection around Gibson, Morgan City, Lafitte, but have to reach maximum technically feasible structural protection.
- Consensus, all brown areas are now blue as long as they reach maximum technically feasible.
- Chandeleur Islands—leave them as unresolved
- Birds Foot— Some believe to continue some maintenance so that you do not loose it to the gulf. One would like to re-dredge Pass A Loutre, and make a diversion which will take time but there are resources in that area. However, if you start cutting crevasses then you will loose velocity at the bird's foot. We need to use the Corps dredged material beneficially. Use beneficial use of dredged material to the maximum possibility. We should keep doing what we are doing but maximize use of dredged material. This should be a river dominated area. It is unresolved because some people want to abandon the area all together. The area ought to be part of the delta study.

Measures for PU 1:

- 1-1: How is the flood gate tied into the levee alignment? The levee along the south side seems to be a problem for some. Consensus: Should include the Bonnet Carre and direct the water into the LaBranche wetlands.
- Construct a 500-year levee from Bonnet Carre (mistake on map).
- Measure 1-4; evaluate impact of 500-year levee on communities surrounding Lake Pontchartrain. Include non-structural and structural.
- Additional marsh and ridge creation south of Lake Leary, (PD 1-20).
- 1-17 Violet; they ought to be 15,000 -20,000 cfs
- 1-19 make to 15,000-20,000 cfs, double it.
- 1-20; evaluate toward post-Katrina initiative. Prioritize toward marsh areas lost most recently.
- Medium diversion in White Ditch; use Big Mar to build surrounding marsh, increasing capacity to White Ditch, Medium Diversion is o.k.
- 1-24; you will destroy all oyster beds. Additional smaller diversions, not too large. How much land can you build with a diversion?
- 1-25, medium diversion, Benny's Bay; lets continue what we are doing, 30,000 cfs diversion is being planned in Breaux Bill.
- Why don't we have medium diversions in the west instead of the East of the MS River?
- Re-open Pass a Loutre and utilize material; restore it to what it used to be.

Planning Unit 2:

- 2-1, alignment encloses wetlands where no-one lives and it will alter hydrology so you will either build up too much water or not enough. This will increase subsidence. Should maintain area, why are we protecting this area? This is unresolved.
- 2-2, some confusion on measure and seems to be some disagreement. Is pre-Katrina height good enough (13-15 ft); Consensus reached on 100-year frequency storm.
- 2-5, only if HWY alignment is added
- 2-6, agreed but some might want a backside levee and what is there now is not tied into the measure
- 2-7, LA-1 to Grand Isle, include Tide Water Road in Venice to get people of Venice to HWY
- 2-9, UNRESOLVED yes for some and no for other (too expensive) $200 million to build it. Keep it in the build as continuing concepts. It requires a lot of dredging upstream. We have to put something in this plan to continue looking at this.
- 2-11, the water will not get into the wetlands it will go straight into the Lake. It is only good for salinity control. This is not a land building diversion. Consensus that we ought to re-look at the authorization of Davis Pond.
- 2-12, If you are going to do this you should also add an additional diversion at Diamond and West Point-a-la-Hache.
- 2-16, expand and you need to have more marsh all the way down. Additional marsh needs to be created—consensus (north Barataria Bay)
- Maintain the existing Naomi siphon.
- Add drainage pumps, properly locating.

Planning Unit 3a:

- 3a-9, do not want to see Verret basin put under a pump. Induced development is the fear. Eventually reached consensus.

Planning Unit 3b:

- 3b-7, are you digging a new canal? Proper environmental impact studies need to be conducted.
- 3b-9, need to prioritize and strategize, not for rocks all along the GIWW.
- 3b-15, fear with wording. Should not use the term "Maintain", why do we have to say that we are going to maintain as brackish environment. So, consensus to eliminate measure.

Planning Unit 4:

- 4-5, make sure that you maintain hydrology. Elevated roads must be constructed not to interfere with hydrology.
- 4-10, move to 3b
- 4-11, allow to evolve to brackish—CONSENSUS to remove measure.

E 2.4 ITT Meeting Notes by Jay Leblanc

Notes present same table discussion as transcribed in section 2.3 by Camille Manning-Broome.

- Would like to protect communities along Hwy. 90 (east of New Orleans).
- Vital to not "levee" in as much coastal wet lands as possible.
- Could we build new Chandeleur Islands as opposed to restoring existing Chandeleur?
- Existing plans in motion to maintain bird foot delta.
- O.k. with establishing east and west of Mississippi going to Fresh to Brackish
- Levee system/structures at land bridge between east New Orleans and Slidell
- Bonnet Carre Spillway levee- (add length)
- Why wasn't Bonnet Carre Spillway levee not used in the plan?
- Continue existing diversion at Bonnet Carre Spillway and divert into LaBranche Wetlands and not lake
- Add marsh creation south of Lake Leary by increasing from 15,000 to 20,000 cfs
- Why do we have more diversion going east as opposed to west?
- Restore Pass A Loutre—no resolution
- Planning Unit 2
  - Agree to keep both alignments- 2-1 and 2-4
  - Think putting levee around undeveloped wetlands.
  - Add/Elevate Tidewater Road (2-7)
  - (2-9) consider alternatives to diversion at Bayou Lafourche (unresolved)
  - (2-16) add marsh along west (up to Venice)
  - add march creation at head of bays

E 2.5 ITT Meeting Notes by Chris Howard

Notes present same table discussion as transcribed in section 2.6 by Kelli Shuttleworth.

Participants:

David Fruge, Tom, Rick, Steve Price, Mike Stack, Mike Abadie, Norwyn Johnson, Edmond Russo, Bob Athow, Henry Rodriguez

Planning Unit 1:

- 1-13
  - Shows measures to close
  - Will ensure measure includes task to close
- 1-14
  - Bankline protection
- 1-15
  - Related to funnel
  - HR concurs- has to be cypress (can be salt tolerant); HR- closure of MRGO is key for relation measures
  - Simplest and cheapest
- Preferred alignment:
  - Needs a gate at Verret, Bayou Bienvenue (NW corner of Lake Borgne) and at Seabrook
  - Structure at west of Chef's Pass (N.O. east)
  - MRGO stabilization- Lake Borgne side
  - Keep MRGO open for small craft- just close to Gulf/salt intrusion
  - Two issues:
    - Salt water intrusion- close MRGO to Gulf
    - Hurricane protection- levees and gates most important; Chandeleur also big issue
  - Restoration of Cypress Swamp
    - Can not do this with seedlings
    - Use 3 years +, plant in existing stumps (measure 1-15)
    - Hurricane Protection, but MRGO is cheapest
    - Then move out to Chandeleur
  - 1-20- agrees with marsh creation at measure 1-20
  - 75 feet + levee along Lake Borgne will be to tough
  - wants 3rd line of defense levee
    - 40 Arpent Levee
    - Existing- has been raised to 10 feet
    - Needs to be 15 feet
    - Wants to get it into federal system
    - Neither Katrina nor Rita topped the levees
- Raise river levees
- Calcasieu ship channel- salinity control

E 2.6 ITT Meeting Notes by Kelli Shuttleworth

Notes present same table discussion as transcribed in section 2.5 by Chris Howard.

Discussion:

- If MRGO is closed there will be civil disobedience; N Bank MRGO.
- No plan for restoration of road to Shell Beach
- Chandeleur Islands priority vs. MRGO priority
- look at St. Bernard Plan
- Priority # 1 – total closure at ridge
- Priority # 2 – third levee along Lake Borgne to Lake Verret
- Chandeleur restoration is down priority list
- Usage of Violet Canal?
- Coming from river, bypass business areas, build a bridge on canal below intersection with river.
- Only close structures in MRGO area when necessary (e.g. a hurricane)
- Opposition to putting gates at Chef and Rigolets—they will flood St. Bernard
- Levee heights still undecided. The surge was almost 20 ft at Violet and in 12 hours the levee was exceeded.
- Error of modeling analysis will determine how to fix flooding issues in impacted areas (specifically St. Bernard)
- Modeling is not necessary; Katrina showed everything people need to know.
- However, new features are being added to modeling tools and there is no way to know the flooding trends without modeling.
- Plan in lieu of gates at Rigolets and Chef: put up levees on N. shore but no structures where flood gates are currently marked
- There will be possible minor flooding at N. Shore. What about MS Gulf Coast?
- Claim that there is no continuity between what we are doing and what the USACE is doing ($4M study)
- Doubt the people currently doing planning work--don't really know what's going on in St. Bernard
- Fundamental issue; people of N.O. no longer trust word of USACE
- Why is there not a levee along Lake Borgne? Because people of N. Shore don't want it… thinks that will flood St. Bernard again. All of the plans are political.
- A levee that will allow overflow is desired
- Proposes putting overflow weirs instead of flood gates. If it is good enough for MRGO, it should be good enough for protection of North Shore
- Weir option would have to consider all 4 objectives is opposed to total closure of water flowing into Lake Borgne
- Discussion focus around levee heights; potentially making them such that surges will over top them to provide flooding relief
- Beneficial use of dredge material to Chandeleur

E 2.7 ITT Meeting Notes by Mary Landin

Notes present same table discussion as transcribed in section 2.8, 2.9, and 2.10 by Jim Tuttle, Tony Thomas, and Ricky Brouillette.

Participants:
Judge Edwards, Mark Snow, Rickey Brouillette, Tony Thomas, Jim Tuttle, Mary Landin, Troy Mallach, Cindy Steyer, Andrew Beall, Robert Twilley, Mark Ford, Ronnie Parlle, Garrett Broussard, Sherrill Sagrera,, and John Foret

1. Shoreline protection and land-building from Point au Fer to Sabine Lake using combinations of detached, near-shore, segmented breakwaters and dedicated dredging from off-shore sources (FIRST line of defense) (PU 3b and 4)

2. Improve and maintain Highways 82 and 27, raise their elevation where needed, and provide better drainage under the highways to allow water in Grand and White Lakes areas to escape to the Gulf (SECOND line of defense) (PU4)

3. Dredge GIWW and use material to build berms along the south bank across entire area, leaving openings where appropriate for drainage and hydrology. Some places may require gates (THIRD line of defense) (PU 4)

4. Salinity control at Calcasieu near Hwy 82 bridge (PU 4)

5. Ring levee southside of Lake Charles Metro and Lafayette Metro (PU3b and 4)

6. Freshwater management in Mermentau and Red River watersheds, including reservoir construction to control high flows (PU 4)

7. Use dredged material from all 4 rivers (Mermentau, Calcasieu, Sabine, and Atchafalaya, plus GIWW) for marsh construction (PU 3b and 4)

8. Stabilize banks of GIWW using rock dikes, and innovative bioengineering where possible (PU 3b and 4)

E 2.8 ITT Meeting Notes by Jim Tuttle

Notes present same table discussion as transcribed in section 2.7, 2.9, and 2.10 by Mary Landin, Tony Thomas, and Ricky Brouillette.

- Does not approve of large levees going along the western coast. The Mermentau Basin must be maintained as a freshwater basin. This is coming from those who are not interested in levees, at least large levees, along the coast. At the same time there are some stakeholders that would rather levees be at or close to the coast as opposed to inland along the GIWW for example. There is a fear that building a levee on the GIWW will prohibit freshwater interchange between the areas north of the GIWW and the area south of the GIWW.
- The consensus is that the area is depending on the Mermentau Basin to maintain freshwater. To this end, studies are included in the planning for finding and developing a more dependable freshwater regime for the Mermentau Basin. This includes consideration of reservoirs to capture and hold excess freshwater runoff and/or increase the ability of the GIWW transport more Atchafalaya River water from the east and/or develop more dependable sources of freshwater from adjacent drainage basins such as the Red River

E 2.9 ITT Meeting Notes by Tony Thomas

Notes present same table discussion as transcribed in section 2.7, 2.8, and 2.10 by Mary Landin, Jim Tuttle, and Ricky Brouillette.

The following points were made by the Independent Technology Team during their review of the state's preliminary Draft of the Master Plan for Hurricane Protection and Coastal Restoration. This meeting was held at the Holiday Inn, Baton Rouge, LA on 31 October 2006.

1. Comments on purposed Levee Plan
   - Do not agree with the levee plan around Abbeville/Kaplan because it will trap storm runoff from upland rainfall.
   - Give more attention GIWW alignment. It a very attractive measure because it protects people and heritage (See Objs 1 and 4).
   - GIWW is a major conveyance channel for flood runoff from uplands.
   - design the levee with gaps that allow hydrology to continue without change
   - Quality of locally available soils is good and volume is adequate to construct a levee along GIWW. It will not be necessary to haul soil from outside sources.
   - Removing soil from the GIWW will deepen it, and it will trap salt water in future overtopping. This might conflict with the objective to management the Mermentau as freshwater system.

2. Hurricane Surge protection
   - Levees are not the only features that are needed in the protection plan
   - Why is there no levee across southwestern Louisiana? Much discussion followed this question. It was led by Judge Edwards.
   - **Fourth priority:** Build levees around Lake Charles and to protect Lafayette/Kaplan/Abbeville connecting to the Atchafalaya Basin along GIWW alignment
   - Agriculture is now suffering from the salt residual left in the soil after hurricane surge from Rita. The same problem occurred, and lasted seven years, after the last hurricane passed through this area.

3. Managing Mermentau Basin as a Freshwater system
   - must be able to pass water through Hwy 82
   - emphasize basin wide management strategy
   - coordinate with local land owners to blend uses of real estate with needs for resources

4. Import Freshwater from outside sources
   - Needed
   - NRCS has investigated estimated costs for this plan
   - Texas developers expect resolution to Sabine River Water issues in 2007

5. Modification to Evacuation Routes
   - Measure to Hwy 27, East and West, seems to create a funnel for surges into Lake Charles metropolitan area.
   - Second priority build measure,

6. Salinity Levels.
   - seem to be migrating further inland on Calcasieu
   - Disposal of dredged along Calcasieu Lake will block recreational and oyster fishery
   - salt water wedge is continually mixed in vertical by passing vessels

- need structure at Calcasiue Ship Channel

7. Groundwater issues
   - S. Vermilion Parish rice farmers pump very little ground water. Ninety-eight percent of the water they use is surface water.

8. Shore Lines
   - first priority: provide shoreline protection
   - third priority: GIWW bank protection and berm.

E 2.10 ITT Meeting Notes by Ricky Brouillette

Notes present same table discussion as transcribed in section 2.7, 2.8, and 2.10 by Mary Landin, Jim Tuttle, and Tony Thomas.

- Concern about elevating Hwy 82. The concern it will trap salt water behind the roadway during events that overtop the road and the time it will take to remove the water. This problem already exits
- Texas capturing water from the Sabine is potentially a difficult problem to deal with
- Sabine has low sill and a structure at lower Calcasieu could serve as a salinity barrier
- Elevate HWY 82 at Schooner Bayou and North Pronge
- Small ridge restoration in pipeline canal ridges (place along only existing canal ridges so don't effect planned design and consider policy issues)
- Gueydan has a ring levee
- Kaplan has prime farm land
- Vermilion to Rapides cooperative for Mermentau drainage basin is to be maintained as a freshwater basin
- Existing complete lock at Cal. River & GIWW needs to be replaced.
- Now the state's only breakwaters east of TV16 constructed after Rita is building (and sands, salts, clays) behind the breakwaters
- Primary land building of the Chenier Plain is long shore transport from the Atchafalaya River Delta
- Rockfeller shoreline protection 10 miles
- Submerged breakwater vs. walled structure
- Crushed stone on existing beach
- Crush stone with breakwater
- GIWW – Need to elevate to meet 100 year surge protection if it's raised
- Levee along south side of the GIWW
- Need to maintain farming with time north of GIWW
- 10 years to recover from salty water affecting farms (Levee along GIWW)
- Southern Vermilion is mostly surface irrigation, north of that they use groundwater.
- Consider Priority (Coastline 1st, Hwy 82 2nd, GIWW Alignment 3rd – 100 year protection with bank stabilization.)
- Maintenance dredging on the GIWW—borrow fill source
- No one sees a problem w/ saltwater wedge entering the basin

- Leland Bohman – existing lock
- Ship Channel needs structure to shunt to get GIWW water to the west.
- Delcambre and Bayou Tigre canal structure
- Avery Canal eroding 100ft. per yr

Priority List:

- Gulf Shoreline protection
- Hwy 82 elevated
- GIWW > 100 year protection (keep openings open)
- Hold shoreline keep Mermentau basin fresh and protect farmlands & culture
- Use GIWW dredged material
- Flesh water management in Basins (Atchafalaya River, Vermilion, Mermentau, Calcasieu, Sabine and include reservoirs & sediments)
- Salinity content at Calcacieu Ship Channel (Sabine & at GIWW too)
- Restore marshes, land bridges, & Chenier's
- Bank stabilization in inland lakes & bays
- GIWW levee protects farmland
- Concern of Hwy 27 funneling surge
- Sediment mining SW of Point Au Fer Atchafalaya Delta area for restoration areas
- Existing roads north of GIWW still considered
- Consider feasibility outside normal benefits/cost ratios
- Leave openings in GIWW to provide surge protection

Planning Unit 1:

- Total closure of MRGO
- Where will barrier plan cause waters to go should be considered
- Are L. Borgne shoreline OK.
- Evaluate North Shore protection.
- Don't eliminate Chandeleur Island yet.
- Revisit and include more of St. Bernard Plan.
- New Orleans compartmentalization and 40 Arpent levee.
- Look at Bonnet Carre division.
- Prioritize restoration basin on what's lost by Katrina.

Planning Unit 2:

- Continue to evaluate GIWW & Hwy 90 alignments for Donald. to Gulf.
- Elevate Lafitte
- Need for zoning
- Fringe marshes south of Little Lake regulators of
- Proceed with caution on Delta Mgt. Plan and include of Amer./Cal. Bay.

Planning Unit 3b & 4:

- Barrier alignments to protect small basin 3b & 4
- Shoreline protection—La 82 –navigation bank/GIWW
- Keep Mermentau Basin fresh
- Spoil banks GIWW/freshwater Bayou/Schooner Bayou
- Reevaluate St. Marsh Parish projects with the St. Mary Parish Plan
- O & M needs to follow guidelines of FEMA to be eligible for FEMA recovery dollars
- Review what policy and guidance exist in F1, cost coast & west coast

Annex F: Agency Alternative to Plan

F 1.0 Introduction

This Annex contains a PowerPoint file provided to the IPT by various resource agencies.

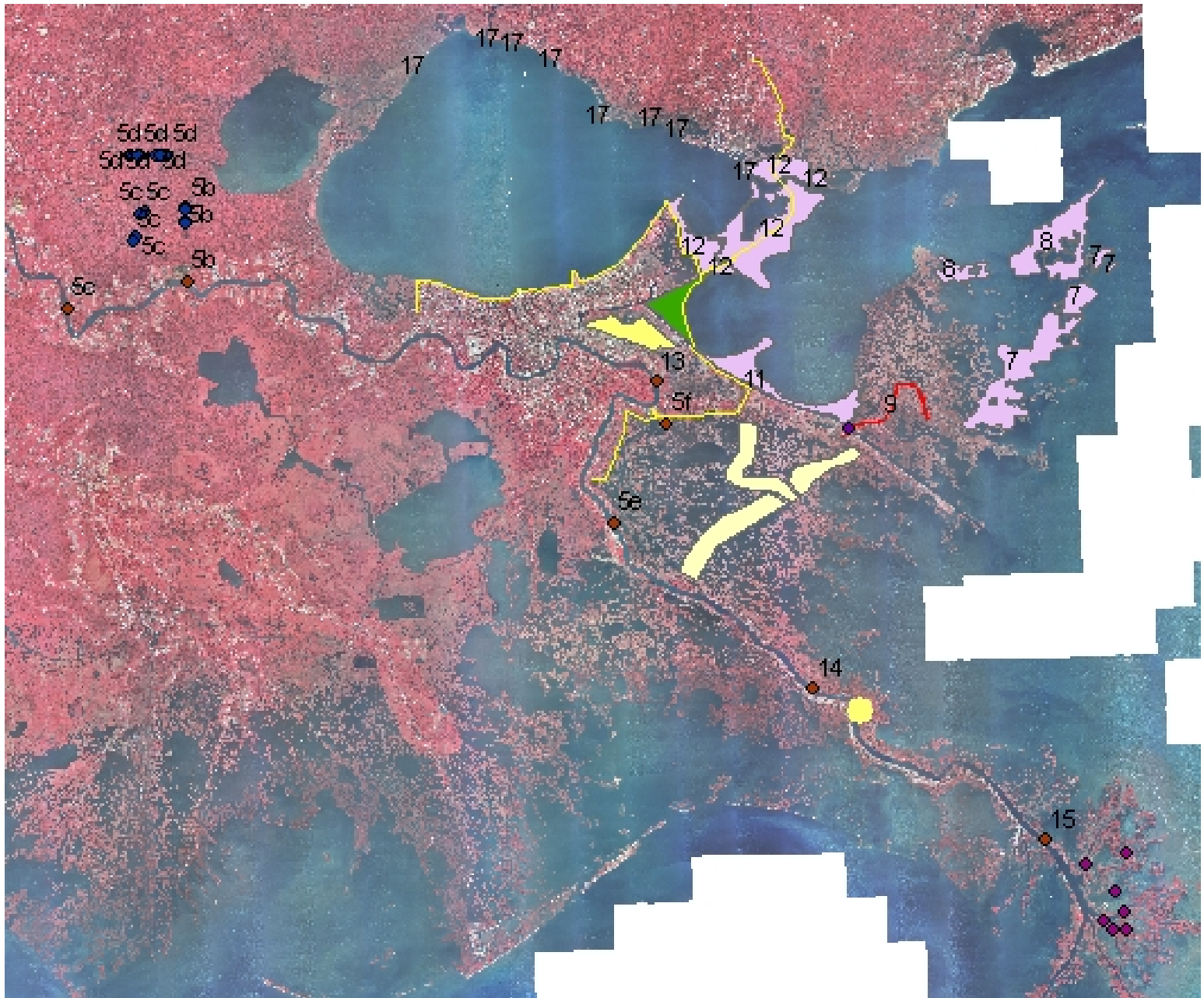
The IPT coordinated its efforts with the following agencies working as part of the U.S. Army Corps of Engineers LACPR NEPA group: U.S. Fish & Wildlife, NOAA National Marine Fisheries Service, USDA Natural Resource Conservation Service, Louisiana Department of Wildlife & Fisheries, Barataria-Terrebonne National Estuary Program, and the Environmental Protection Agency. This group proposed a draft alternative 3 to the IPT's alternative 1 and 2. The IPT has taken the following comments by the resource agencies into consideration and continues to meet with the agencies on a regular basis.

F 2.0 PowerPoint Presentation Presented to IPT by Resource Agencies

Modified Hwy 90 alignment
Hybrid plan: Some overtopping of this levee combined with increased levee height along South shore as needed.

1-4*
1-5b*
1-5c*
1-5e*
1-5f*
1-7
1-8
1-9
1-11
1-12
1-13*
1-14*
1-15*
1-17
1-18
1-19
1-20

Add'l marsh creation as shown in green (from Alt 1) & tan
Demo project: Restore cypress swamp in Central Wetlands (yellow)



1-4*: No floodgate on MR-GO at La Loutre Ridge – but instead include a sill and restriction of the channel SE of B. La Loutre

1-5b: Diversion at Hope Canal

1-5c: Diversion at Convent/Blind River

1-5f: Diversion at Caernarvon

1-7: Maintain and Restore Biloxi Landbridge – South

1-8: Maintain and Restore Biloxi Landbridge – North

1-9: Restore La Loutre Ridge

1-11: Maintain Lake Borgne Landbridge including shoreline protection

1-12: Maintain critical marsh shorelines and ridges of the East Orleans Land Bridge

1-13**: Restriction in MR-GO to reduce flow, based on shallower channel depth, to limit saltwater intrusion and enhance effect of Violet diversion.

1-14: Diversion at American Bay

1-15:: Benneys Bay Sediment Diversion

1-17: St. Tammany Marsh restoration and shoreline protection with Dredge material and vegetative planting.

1-18: Maintain existing crevasses, construct new ones at the Delta.

1-19: Maximize beneficial use of dredged material.

1-20: Elevate/Relocate Assets – Non Structural solutions.

PU 1

Diversion flows in cfs

		Alt 1	Alt 2	**DRAFT**	**Draft 2**
Pontchartrain Basin					
	Bonnet Carre	?	?	13,000	13,000
	Blind River	1,000	1,000	1,000	1,000
	Hope Canal	1,000	1,000	1,000	1,000
	Violet Canal		1,000	15,000	15,000
		2,000	**3,000**	**30,000**	**30,000**
Breton Sound Basin					
	Caernarvon	195,000	200,000	8,000	15,000
	White's Ditch	10,000	10,000	-	5000
	Bayou Lamoque	*12,000*		12,800	12,800
	American Bay		200,000	-	-
	spillways-revetments*				
	Benny's Bay*	20,000	20,000	20,000	20,000
		237,000	**430,000**	**40,800**	**52,800**
		239,000	433,000	70,800	82,800

Marsh creation totals in **PU 1**

Alt 1	Alt 2	Alt 3
238,881	113,239	167,007

Additional Acreage of
Marsh creation in 3rd alt not taken from polygons
In Alts 1 or 2:

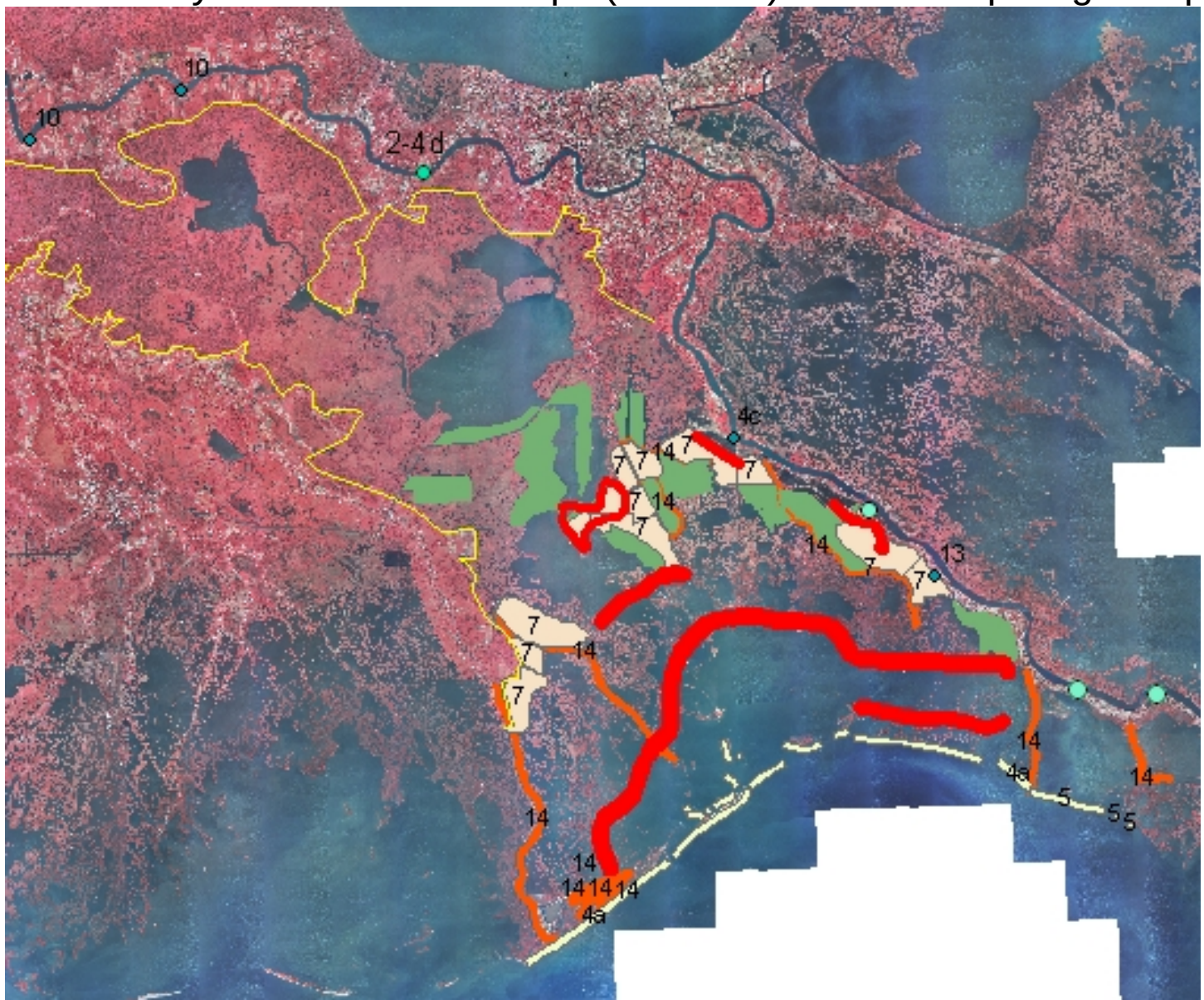
6749
10646
14184
31,579 = SUM

(represents the three tan polygons Shown in slide 2 in the Breton Sound Basin.)

2-4a
2-4c
2-4d
2-5
2-7*
2-10
2-11

2-12
2-13
2-14
N. Bar. Bay marsh creation strips (red lines)

W.P.A.L.Hache Div.
Buras Diversion
Ft. Jackson Diversion
* Tan plus green polygons



Cat 5 level protection from Oakville to Davis Pond, 100 year protection from Davis Pond to throughout the “Swamp Alignment” shown in yellow, with only Non-Structural Measures for Lafitte, Barataria and Crown Pt.

2-4a-Barataria Basin Barrier Shoreline Restoration (Caminada Headland and Shell I.)
2-4c-Diversion at Myrtle Grove
2-4d-Re-authorization of Davis Pond – Optimize for Marsh Creation
2-5-Barrier shoreline restoration projects – restoring the Barataria barrier Islands
2-7* -Pipeline conveyance of sediment to create marsh
2-10-Small diversions at strategic locations in upper basin
2-11-Maximize beneficial use of dredge material
2-12-Elevate/Relocate Assets – Non Structural solutions.
2-13-Diversion at Port Sulphur
2-14-Restore ridges (see Alt 2)

N. Bar. Bay marsh creation strips (red lines)
W.P.A.L.Hache Diversion
Buras Diversion
Ft. Jackson Diversion
*Areas from Alt 2 plus areas from the Alternative 1 of the 3rd Delta Report, shown as Tan plus green polygons

Diversion flows in cfs

		Alt 1	Alt 2	**DRAFT**	**Draft 2**
Barataria Basin					
	upper basin diversion	1,000	5,000		
	upper basin diversion	1,000	5,000		
	Bayou Lafourche	340	1,000		
	Davis Pond	10,000	10,200	10,650	10,650
	Third Delta				
	Naomi	1,000	1,000	2,000	2,400
	Myrtle Grove	10,000	15,000	2,000	5,000
	West Pointe-a-la-Hache	1,000	1,000	2,000	4,800
	Pt. Sulphur-Homeplace		2,000		
	Buras				
	Fort Jackson			15,000	15000
		24,340	**40,200**		
Mississippi River Delta					
	West Bay*	20,000	50,000	50,000	50,000
	SUM=	**44,340**	**90,200**	**81,650**	**0** **87,850**

Marsh creation totals in **PU 2**

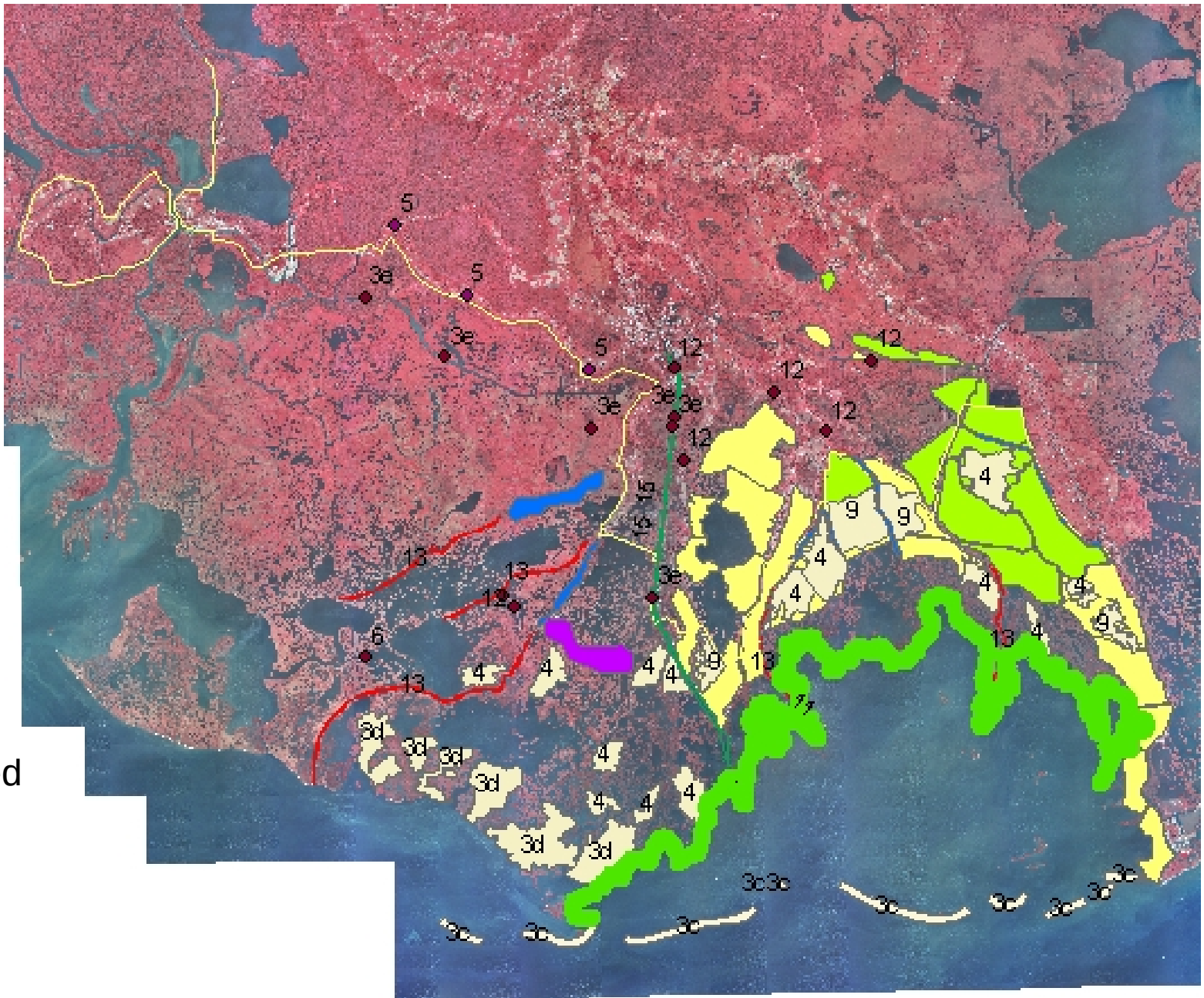
Alt 1	Alt 2	Alt 3
42,699	59,651	127,595

Tan polygons from Alt 2 total 59,651 acres. An additional 67,944 acres was added for Alt 3, shown in green in Barataria Basin map.

3a-3c
3a-3d
3a-3e
3a-4*
3a-5*
3a-6
3a-7
3a-8
3a-9
3a-11*
3a-12
3a-13
3a-14
3a-15*

*=modified

DuLarge to Grand Caillou landbridge



PU3a

Morganza alignment (as shown in EIS) with updated 100-year protection, then following Hwy 90 as shown in yellow line on map.

3a-3c- Terrebonne Basin shoreline restoration

3a-3d- Maintain land bridge between Caillou Lake and Gulf of Mex. w/ marsh creation

3a-3e- Convey Atchafalaya River water to Northern Terrebonne marshes

3a-4*- Pipeline conveyance of sediment to create marsh, **with additional acreage from 3rd Delta Report's alt 1 and 2 (green and yellow polygons on map)**

3a-5 modified –Implement Chacahoula Basin Plan and other projects to alleviate inundation in Verret Sub-Basin, **with max. use of Non-structural measures**

3a-6- Freshwater introduction via Blue Hammock Bayou

3a-7- Freshwater introduction to S of Lake Decade and shoreline protection (not shown)

3a-8- Penchant Basin Plan (not shown)

3a-9-Non-Structural measures for areas outside the hurricane protection plans

3a-11 modified- Stabilize/maintain northern shoreline of Terrebonne/Timbalier Bay **with a band of marsh creation (wide green stripe on map)**

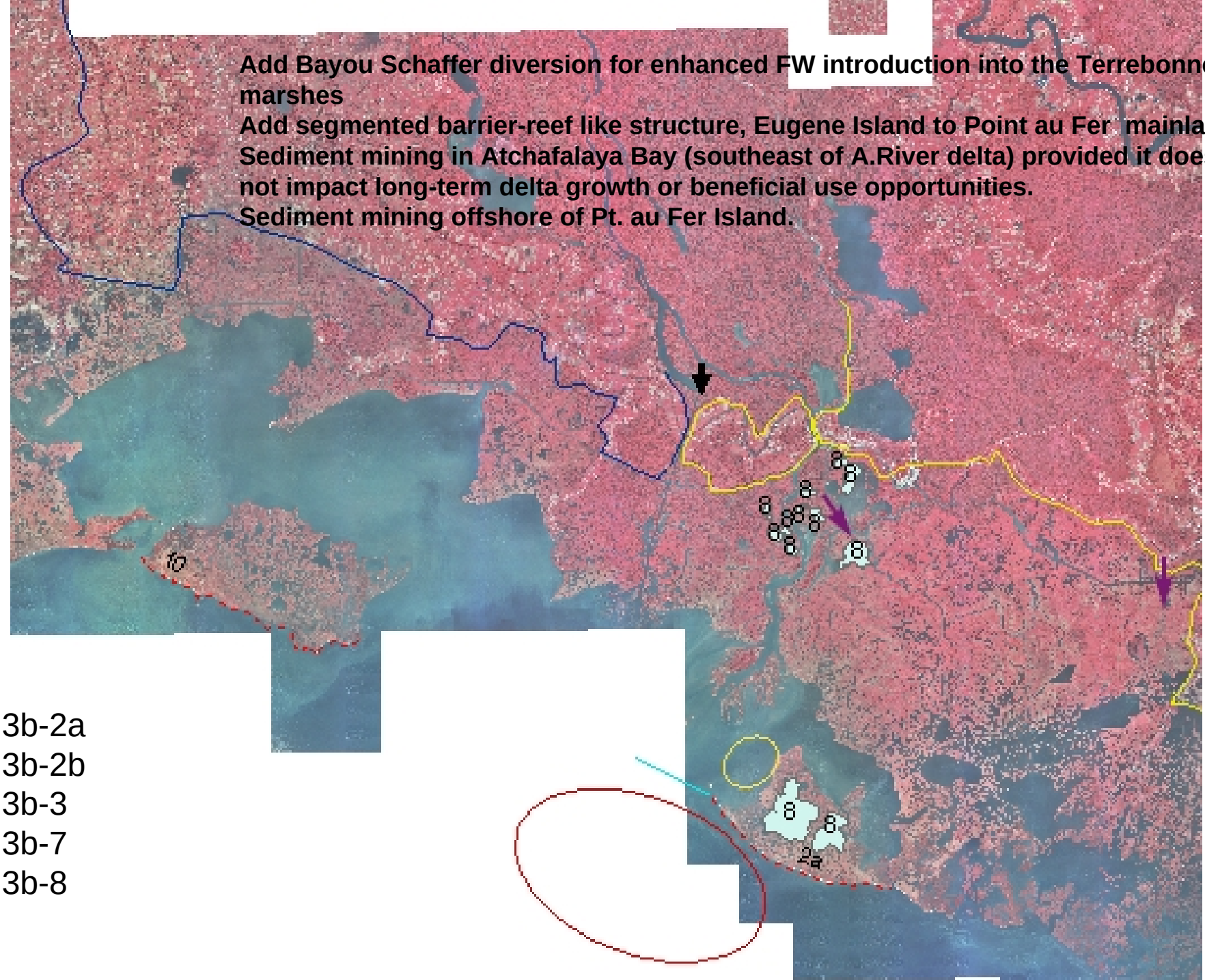
3a-12- Short term freshwater redirections to nourish and sustain intermediate marshes that are affected by salt water

3a-13 modified- Protect and maintain ridges, **adding some from the January Environmental Alternative presentation (blue lines on map)**

3a-14- Maximize beneficial use of dredge material where feasible

3a-15** modified- Bankline protection for the Houma Navigation Canal, **in critical areas only**

DuLarge to Grand Caillou landbridge (Purple polygon on map)


Add Bayou Schaffer diversion for enhanced FW introduction into the Terrebonne marshes
Add segmented barrier-reef like structure, Eugene Island to Point au Fer mainland
Sediment mining in Atchafalaya Bay (southeast of A.River delta) provided it does not impact long-term delta growth or beneficial use opportunities.
Sediment mining offshore of Pt. au Fer Island.
3b-2a
3b-2b
3b-3
3b-7
3b-8

PU 3b

Levee alignment – ring levees only West of the WLO, see Alt 2

3b-2a- Stabilize Gulf shoreline at Pt. Au Fer Island

3b-2b- Convey Atchafalaya River water to N. Terrebonne marshes

3b-3- Increase sediment transport from the Atchafalaya River down Wax Lake Outlet **(Black arrow)**

3b-7- Stabilize shorelines across south shoreline of Marsh Island from Lighthouse Point to South Point (E of Mound Pt.) using dredged sediments and or breakwaters

3b-8- Beneficial use of dredged material and dedicated dredging to rebuild marsh shorelines, historic reefs and barrier islands

Add Bayou Schaffer diversion for enhanced FW introduction into the Terrebonne marshes (per USFWS plan)- could also include gapping or degrading the existing Avoca Island Levee to increase Atchafalaya influence in western Terrebonne **(purple arrow)**

Add segmented barrier-reef like structure, Eugene Island to Point au Fer mainland **(aqua line)**

Sediment mining in Atchafalaya Bay (southeast of Atchafalaya River delta) provided it does not impact long-term delta growth or beneficial use opportunities. **(yellow oval)**

Sediment mining offshore of Pt. au Fer Island **(brown oval)**

Ring levees only (Purple lines)

4-6 modified- **marsh creation and terracing, but not using dredged material from the Sabine**

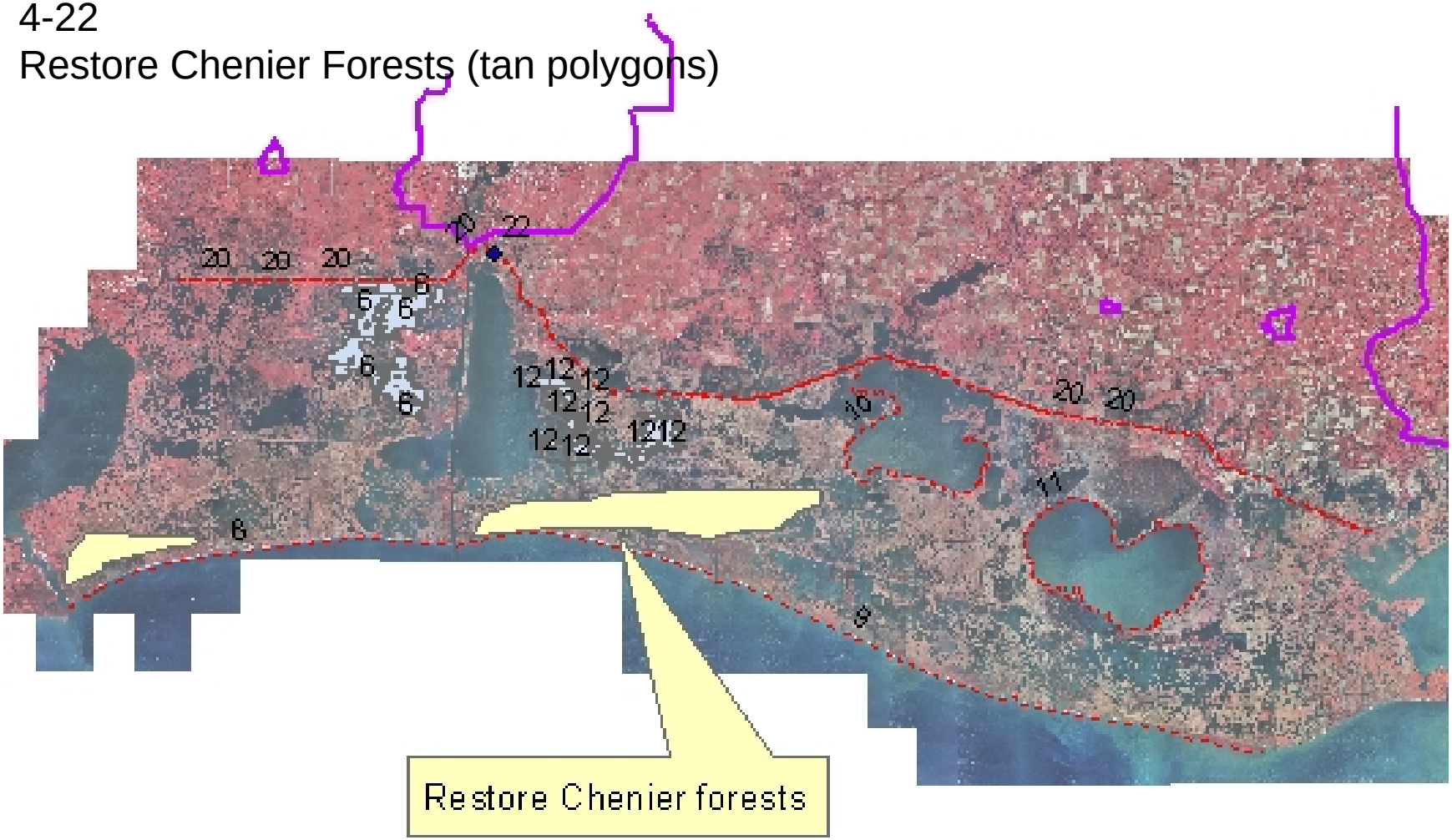
4-8 thru 4-11**at critical areas only**

4-12

4-20 **at critical areas only**

4-22

Restore Chenier Forests (tan polygons)



PU 4

Ring levees only (Purple lines)

4-6 modified- Beneficial use of dredged material for **marsh creation and terracing, but not using dredged material from the Sabine**

4-8 Stabilize Gulf shoreline and beach west of Calcasieu River to La. Point, **at critica areas only**

4-9 Stabilize Gulf shoreline and beach east of Calcasieu River to Freshwater Bayou, **at critical areas only**

4-10 Stabilize Grand Lake shoreline and land bridge, **at critical areas only**

4-11 Stabilize White Lake shoreline and land bridge, **at critical areas only**

4-12 Beneficial use of dredged material for marsh creation and terracing

4-20 Stabilize banks of the GIWW, **at critical areas only**

4-22 Build new chamber for navigation at Calcasieu Lock on GIWW, and use old lock to evacuate excess water

Restore Chenier Forests (tan polygons)

Integrated Ecosystem Restoration and Hurricane Protection: Louisiana's Comprehensive Master Plan for a Sustainable Coast

Appendix C (Part 1): Public, Stakeholder, and Scientific/Technical Comment of the February 2007 Draft Plan

Coastal Protection and Restoration Authority of Louisiana

April 2007

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1.0 Coastal Protection and Restoration Authority (CPRA) Public Hearings February 26- March 1, 2007

The February 2007 Comprehensive Coastal Protection Master Plan for Louisiana (Draft Plan) was released to the public Tuesday, February 6, 2007. The Draft Plan was made available to the public on the internet (www.louisianacoastalplanning.org) and at public hearings held in New Orleans, Houma, and Lake Charles by the Coastal Protection and Restoration Authority. In addition, a public meeting was also held in Abbeville, Louisiana, to provide residents with an additional opportunity to provide input on the Draft Plan. Local officials, residents, and other stakeholders gathered at the public hearings and the public meeting to review and provide comments to the CPRA on the State's Plan.

Display boards were provided around the room depicting elements of the Draft Plan. Informational packets were distributed to attendees containing an excerpt from the Draft, a list and map of proposed measures, and comment forms. A summary of the comments received during and following the hearings can be found in Section 4.0 of this Appendix. Transcripts from each of the hearings as well as the meeting are located in Section 4.2 of this Appendix.

Table 1.1 CPRA February Public Hearings

Houma Terrebonne Civic Center 346 Civic Center Boulevard Houma, Louisiana	Monday, February 26, 2007 5:30 pm
Lake Charles Civic Center 900 Lakeshore Drive Lake Charles, Louisiana	Tuesday, February 27, 2007 5:30 pm
Lindy Boggs Conference Center 2000 Lakeshore Drive New Orleans, Louisiana	Wednesday, February 28, 2007 5:30 pm

Table 1.2 CPRA March Public Meeting - Abbeville

Abbeville Branch Library 502 East St. Victor Street Abbeville, Louisiana	Thursday, March 1, 2007 6:30 pm

2.0 SERT and LCA Science Board Comments

The Science and Engineering Review Team (SERT) and the Louisiana Coastal Area (LCA) Science Board conducted independent reviews of the February Draft Plan. The purpose of the independent review was to provide candid and critical comments to assist the IPT in making the Draft Plan as sound as possible. The SERT meeting was held March 14, 2007, on the campus of the University of New Orleans, and the LCA Science Board meeting was held March 29, 2007, in New Orleans. Comments provided to the CPRA-IPT on the Draft Plan by the SERT and LCA Science Board are provided in their entirety in Section 4.2.

3.0 Cameron Parish Police Jury Sponsored Public Meeting

The Cameron Parish Police Jury sponsored a meeting at the Cameron Parish Courthouse March 14, 2007, at 5:00 pm. The Master Plan was presented to those in attendance and attendees were allowed to make statements/comments and ask questions in regards to the Plan. The following is a summary of the notes taken at this meeting.

1. Coastal Restoration should begin at the coastline. Protect the entire coastline with rock breakwaters and place sand behind the rock. That combination - rock breakwaters and sand, saved Highway 82 during Rita. We must create marsh. Long term studies are not needed to do this. We already have these kinds of structures along the coastline in a few areas, but we just need more of them.
2. Do not raise Highway 82 or 27. Raised highways will just create bowls and trap water once the roadway is overtopped. The water cannot get out, and we could not live in it. It would devastate Cameron.
3. The existing roads provided adequate access to and from Cameron Parish during Rita. The only problems encountered were power lines that had to be removed from across the roadway.
4. There are only three Cheniers in the world. This is the only Chenier in the United States and no one seems concerned that we are about to lose it.
5. There is not enough space on the Cheniers to raise the highway 10 feet. Raising the highway is a plan to allow the state to take people's property.
6. Several speakers were concerned over whether or not the state would be allowed to take their property to make a protection plan. Even if paid, they knew of no place else where they could go and acquire more property like that which they have now.
7. No levee is needed. A levee would create a bowl that would keep water from running off the land. Not even rainwater could run off.
8. People discussed erosion of their beaches due to the day-in and day-out forces of the currents from tides and vessels. They pointed out that 50 years had passed since the last hurricane, and their shoreline was eroding during all of those years.
9. There is no space to raise Hwy 27 through Hackberry.
10. The representative from Rockefeller Refuge spoke. They have been working to protect their shore from erosion since 1992. He states that there is no foundation on which to place rock over much of their coastline. The depth to a suitable foundation is 90 feet. A rock structure would simply sink out of sight. They have just developed 4 alternative designs to rock for shoreline protection and are ready to test them. Also, they have levees that were damaged by Rita and need to be repaired.
11. Continue to dredge the Ship Channel and the GIWW to create marsh.
12. They are predicting 400 LNG ships per year. These are very large vessels and their waves tear up the banks. Rock is needed.
13. Coastal property is prime property everywhere except in Louisiana. Why is it not given prime consideration in our State?

4.0 Summary of Public Comments

4.1 Summary of Written Public Comments

All comments made at the public hearings and meetings, as well as those provided by mail or email on the February Draft Plan, were reviewed. The following is a summary of the public comments/suggestions given. All environmental organizations and natural resource agencies comments have been included in their entirety in Section 4.2.

1. Cameron Parish Resident: "I am against an elevated road as a plan for hurricane protection…We are finally able to call some things normal. Please give this situation another option. We have ideas of making water breakers that have been known to work. We don't want to lose our home again with no chance of coming back this time if the road is built."
2. Cameron Parish Resident: "I am against the elevated road as a hurricane protection Plan. I think that it would hurt lower and upper Cameron Parish as for letting the water in and out. Hurricanes are a cleaning machine it is part of Mother Nature and by stopping this process you would be hurting the ecosystem. If the water was trapped here it would hold all of the pollutants in……We have always heard that the future plans for our parish was converting it into a big refuge and bird sanctuary." This is coming true.
3. Cameron Parish Resident: "I think that the next meetings and public hearings that need approval should be held in the towns that are directly affected by these decisions and maybe we would not have such a bad taste in our mouths about decisions being made for our best interests."
4. Anonymous: Consider the relevance of the Dutch engineering.
5. Professor of Civil Engineering, Director of the Coastal Engineering Center: "My concern is with the protection levels for storm surge….In the Netherlands, the Delta Plan provides protection from flooding at the 0.01% chance (10,000 year recurrence interval) level. This is 20 times greater. How can the Dutch afford this level of protection? Why can't the state of Louisiana and the US government provide this level of protection from flooding for the city of New Orleans?"
6. Cameron Parish Resident: "Seems to me it would be better to elevate Trosclair Road instead of Highway 82/27 in my area."
7. Jim Boudreaux's Flood Levee and Barrier Protection System is recommended.
8. Plaquemines Parish Resident: The Marsh in Plaquemines Parish has continued to die due to saltwater intrusion. This problem is due to levees built for protection of communities along the Mississippi River delta. 3 possible projects to reverse this damage include: Examining old river maps (pre-levee) and build river diversion projects in canals and bayous that once ran between the River and the marsh, placement of large boulders or rocks along the coast (at beaches and where marsh meets the Gulf of Mexico) with openings at locations that existed before coastal erosion, and the dredging of sand from the River and the Gulf of Mexico to assist in the building of land and marsh.
9. Golden Meadow Resident: "By placing Category 5 levees no lower than the Intracoastal Waterway, your plan, as currently written, abandons communities such as Bourg, Buras, and Cut Off. Does the State's Plan make provisions for compensating the property owners for the devaluation of their property once the plan is finalized? How do you propose to place a Category 5 levee on the Intracoastal in downtown Houma?"
10. Patterson Resident: Concerned with how the money for this project will be spent.
11. Cameron Parish Resident: Asks that breakwater projects, such as that in Holly Beach, be considered.
12. Cameron Parish Resident: "I think that we should work on coastal erosion before we do anything else."

13. Cameron Parish Resident: Suggests that rocks in the Gulf and the pumping in of sand be considered. Believes that it is working in Holly Beach and that it would work in other areas.
14. Louisiana Resident: Suggests that people take claim to what they know is theirs and that they clean up the mess and not wait for the government to do it for them.
15. Former Cameron Parish Resident: Suggests that a rock barrier be built 1 to 1.5 miles from the coast and staggered to prevent tunneling by high seas. This would potentially block storm surge and provide for fishing grounds.
16. Vermilion Parish Resident: Concerned for families south of the Intracoastal Waterway. Believes that it would be better for a levee to be built South of Highway 82.
17. Unknown: Believes that by repairing the Coast, the coastal water temperature may be lowered. Suggests that this lower temperature water could be used to cool surface water through windmill technology.
18. Cameron Parish Resident: Concerned with what will become of their property since it is located along Trosclair Road.
19. Unknown: Concerned due to lack of consideration for sea level rise within the Plan.
20. New Orleans Resident: Consider the following projects for inclusion in the Plan: 1. Construction of free flowing spillways from the River to the Marsh along the entire west bank of the River in Plaquemines Parish (appropriate size to accommodate tidal surge and to drain water while being lined with levees constructed of dredge material and back levees) 2. Enhancement of CWPPRA projects for the barrier islands by increasing height, utilizing rock armoring for erosion prevention, and restricting the number of access channels 3. Reconstruction of the east bank river levee from Bohemia to Baptiste Collette Pass to serve as storm surge protection for the Breton Sound while canceling the CWPPRA project for a river diversion south of Ostrica so that finds may be used to rebuild this levee.
21. Unknown: “Because of the increased velocity of the River above the diversions, what erosive effects and undercutting of the River bank will be realized?”
22. Unknown: Suggests that “flows” within the plan be changed to “velocities”.
23. Unknown: Excited about the Plan, especially with the use of sediment from the Mississippi River in South Louisiana. “Complete reversals to the past before there were levees also need review….Past River dynamics also created undercutting of peak meander points on the river with oxbow lakes eventually being formed. The Master Plan may bring this unwanted river dynamic along with the diversions and the intent to bring the River to past conditions must be tempered with some variables held constant to values close to present values. One variable is river height associated with a flow. If the River height is allowed to drop too much than the river velocities above Donaldsonville will increase and follow past conditions with this unwanted river dynamic (undercutting of peak meander points) coming to pass.”
24. Cameron Parish Resident: Asks that rock reefs be used and that the picket fences, such as those at Johnson Bayou, be used.
25. Cameron Parish Resident: “Rerouting rivers and playing God is a dangerous game. Raising Highway 82/27 will result in huge losses in usable land due to setback buffer zones on the landward side north of the road.” Also states that “levees adversely affect natural drainage and worsen flood conditions, resulting in the need for pumping stations, maintenance budgets, and higher taxes….The only option viable to all of Coastal Louisiana is the offshore breakwater rocks, nothing more.”
26. Cameron Parish Resident: “Almost every structure (church, school, business, and residence) along Highway 82/27 is well within 150 feet of the road, which makes additional easement/setback/buffer zones impossible without dislocating all assets including historic Live Oak tee forests. Relocation is not an option.” Also states that “expanding the authority for expropriation, eminent domain, quick take, land grabs and all other tools of this nature

undermines individual property land rights….Rerouting the Atchafalaya River Basin to the Mermentau Basin will negatively impact flooding in Little Chenier and East Creole. Leveeing the Intracoastal Canal/ICWW will negatively impact flooding in Grand Lake, Sweet Lake, and Hackberry. Rerouting the Mississippi River to Houma is an extreme undertaking, not recommended to attempt to play God and hijack nature."

27. Jarreau Resident: "Diversion of Mississippi and Atchafalaya water to the marshes is a good thing and it will resume the process of building Delta which was interrupted by levees to protect developments. But the building of more and higher levees to protect coastal developments is improbable to succeed… To protect against this would require extensive compartmentalizing of the levee system similar to principles used in shipbuilding. While this is doable, it seems highly impractical and not cost effective…What I miss in your plan as well as in Louisiana Speaks campaign is a formal consideration of the obvious option to deliberately retreat from the coast to the extent possible and to rebuild on higher ground further inland…To create the infrastructure for such a development would be a better investment into the future of Louisiana than spending megabucks for a system of defense against nature that will at best have marginal chances for success."
28. Calcasieu Parish Resident: Against any levee other than one in the Gulf. Suggests only raising Highway 82/27 1 foot to assist with evacuation.
29. Calcasieu Parish Resident: Believes that there should be a focus on coastal erosion and that highway improvement should be considered later. Believes that the rivers, bayous, and canals should be left alone.
30. Abbeville Resident: Include the Bayou Tigre Watershed project, the Hebert Canal Watershed project for protection from the Vermilion River, and storm buffering systems (oilfield/navigational canals that run parallel to the coast with elevated banks to mimic the lost ridges- use of present footprints eliminates loss of additional wetlands).
31. South Louisiana Resident: Believes that we should recycle mud to form levees and land instead of digging additional channels. We should also use windmills for a source of power.
32. Chemical Corporation located in South Louisiana: Concerned with the feasibility and potential cost of the State's Plan. Believes that the United States Army Corps. Of Engineers alternative approach should be used given the limited state and federal resources. (USACE approach includes the installation of two gates on the Gulf Intracoastal Waterway, one to the east of Pump Station 15 and one to the south of the mouth of Bayou Bienvenue connected by a floodwall. De-authorization of the MRGO would further improve protection also.)
33. Cameron Parish Resident: "The raising of Highway 82 would expropriate the property and displace the citizens that this project was intended to protect…. An alternative approach would be to utilize the existing infrastructure located on the south side of the Cheniers. You could also start on the East end of Pecan Island and continue on to the West end of Johnson Bayou. You could achieve the same purpose by raising the existing canal levees, continue on through Rockefeller Refuge again raising the existing canal levees, raise the North bank of Hog Bayou South of Grand Chenier, put in a locks system at the Mermentau River cut entrance at the Gulf, raise the levee on the North side of the Mermentau River South of Oak Grove and open the original entrance of the Mermentau River to its original state and continue on using the existing infrastructure to the Texas border."
34. Calcasieu Resident: The following projects should be considered: 1. "Repair and reinforce the levee on the South end and the East side of Big Lake. This is a levee that is already there, permitted and ready to be repaired. This levee is essential to cut down on the amount of water that comes into Calcasieu Parish." 2. Build reefs off of the coast to protect the only usable beach in the State of Louisiana. These reefs would have to be built out of rock to be substantial enough to withstand the waves year round." 3. "Be careful of building a levee down Intracoastal Canal as it

may cause Calcasieu Parish more problems of flooding." 4. "Locks built across the Cameron end of Calcasieu River would cause serious flooding in Calcasieu Parish during storms."

35. Cameron Parish School Board President: Concerned with the elevation of Highway 82 due to the impact on 7 school facilities.
36. American Institute of Fisheries Research Biologist: Concerned with the proposal of a levee across the state through wetlands due to the fact that levees affect hydrology and marsh grass ecology. Also states that "I believe that the proposed leveeing of most of the coast will seriously harm Louisiana's commercial and sport saltwater fisheries. Most of our important commercial and sport saltwater species spawn in the Gulf of Mexico, but their very young larvae migrate into the coastal marsh where they remain for a few months or years, grow rapidly, and then migrate back to the Gulf… These levees and other water control structures seriously interfere with organism movements. Consequently, they also seriously interfere with fisheries production." Further reports that there may be more sediment available for land building in the Mississippi River now than there were in 1800's when the Mississippi River formed six delta lobes.
37. Cameron Parish Office of Planning and Development: Opposes the Integrated Ecosystem Restoration and Hurricane Protection Comprehensive Master Plan. The following are the reasons submitted: 1. "…surprised that you go forward to memorialize these discussions, there has not been true evidence given as to the placement implications and the objectives of these levees whether or not they be placed along the coast or along the inland waterway of the Intracoastal." 2. "If in fact your objective is coastal protection, then inserting a levee system midway through the parish debases half of this community, especially since the parish has a strong socioeconomic and industrial base in the way of its fisheries, maritime, and petro-chemical sectors." 3. "…our primary interest in protecting the coast is the continuation of the breakwaters and sand nourishment, that has proven so effective in protecting the coast of Cameron parish while at the same time allowing natural drainage to subside as naturally intended." 4. "…unilaterally opposed to the placement of a levee system anywhere until sufficient hydrologic, geographic, and socioeconomic implications have been studied as well as a series of alternatives, given the basis of this development." 5. "We are equally uncertain without the submission of direct impacts regarding needed acquisitions or expropriations regarding the raising of LA 82, LA 27, or other state or federal highways that could significantly result in displacement of the current citizenry." 6. "There has also been no evidence revealed in the litany of the public and private discussions establishing communication between other environmental and coastal protection groups and or programs that do not reflect the conflict in this drafted master plan." 7. "This initiative should also involve other agencies that are involved in coastal protection, maritime transportation, economic development, and other coastal barrier issues." 8. "…Cameron Parish is now formulating and engaging its independent recovery initiative and is currently considering land use, transportation, housing and basic infrastructure in order to determine its collective future. We are astonished that this plan does not capture the gentrification efforts of lower Cameron, its development pressures experienced in the northern part, and its resilience in the current efforts to protect both wetland and improved areas for both environmental and urban development for future development needs."
38. State Representative: "Vermilion Parish's economy is being adversely impacted by saltwater intrusion…saltwater is coming in by circumventing the Leland Bowman Locks, north and west of the locks, pushing that saltwater into the Intracoastal Canal. Another area being inundated with saltwater is the north prong…more than forty percent of the rice in Vermilion Parish could not even be planted because of the salinity level…On behalf of our rice, crawfish, and cattle farmers, I am requesting that at least $1 million from the $800 million surplus be set aside to rebuild the levee along the north prong- just a simple levee similar to the one that lasted for more than 70 years."

39. Metairie Resident: Requests that the following projects be included within the plan: 1. Shoreline stabilization along the west bank of the Rigolets as an urgent measure due to destabilization of the East Orleans landbridge resulting from breaching into Lake Catherine. 2. Restoration of the Chandeleur Islands because of their role in storm surge attenuation. 3. Orleans Parish CIAP project as a priority. 4. Planned protection and restoration of the Biloxi Marsh. 5. "Layered or staggered barrier arrangement" for 100 year protection. This should include "strengthening of the CSX railroad levee with wetland restoration to the south and engineered oyster reefs in Lake Borgne".
40. Buras Business: Not in favor of 18 foot levees. In favor of unobstructed flow of the Mississippi river and its tributaries. Believes that man trying to control the river led to the current problems we are facing with coastal erosion and loss of estuaries. Suggests that money should not be spent on levees, but instead on non-obstructed spillways and development of a new deep water outlet in order to save money for the Corps. Of Engineers by omitting dredging at the heads of passes.
41. Belle Chasse Resident: "I would like to see the Myrtle Grove to St. Jude levees put into the plan for 100 year flood protection. This would allow for the protection of Highway 23 access to the rest of the parish for evacuation routing, oil and gas, and fishing industry access. I appreciate the fact that you have included 100 year protection down as far as Myrtle Grove, a small distance further would tie in the system…We need to advance the coast and restore a vital ecosystem for humans as well as all other living creatures."
42. Buras Resident: Concerned with the Plan's limitations in regards to levees in Plaquemines Parish below Myrtle Grove and Phoenix and also with the planned diversions in this parish. Pipeline sediment transport should be used for many different coastal restoration sites and not just Myrtle Grove and West Point a la Hache.
43. Unknown: Not interested in any further studies to determine what it takes to save Louisiana Coast.
44. Grand Lake Resident: "…it is most important to expedite the raising of highways along the southern most East-West direction (Highway 82). Highway 27 is a North-South route and should be done after the raising of Highway 82….Highway 82 will provide immediate protection to lower Cameron Parish. Who will maintain/operate the water control devices on these roads/levees? Will these operators leave when a storm threatens or hits? How soon will the floodgate be opened after a storm, will we even have the means to open them with no electricity?"
45. Sulphur Resident: Recommends that the following be added to the Plan: 1.Use diversion canals along Highway 23 in lower Plaquemines at Grand Bayou from Highway 23 to Empire, Buras, and Homeplace to Bay Chicot. 2. Rebuild area of Calcasieu Lake from 9 mile cut to the old washout.
46. South Lafourche Levee District: Asks that "the report states that because of the economic importance of the LA 1 corridor that a higher level of protection is justified for the Larose to Golden Meadow Hurricane Protection project.
47. Baton Rouge Resident: Suggest that the State make arrangements with demolition companies to receive concrete debris for a "sea wall" to be constructed 20 miles from the coast of Louisiana. This sea wall should contain navigational beacons and navigational passes where necessary, which may require floodgates in the future. This sea wall would assist with storm surge attenuation and would cease coastal erosion. It would also reduce insurance premiums and costs of recovery after storms.
48. Lafourche Basin Levee District Representative: The GIWW alignment should be written back into the plan as it was originally. It is believed that this alignment provides multiple levels of hurricane protection including evacuation routes and residential homes.

49. The Town of Golden Meadow: In support of the Larose to Golden Meadow Hurricane protection project (Leon Theriot floodgate conversion to a lock) due to the future success of Port Fourchon and the protection of LA 1.
50. Terrebonne Parish Consolidated Government: Requests that a portion of the money designated for beneficial use of dredge material projects be used "in conjunction with scheduled maintenance of the Houma Navigation Canal."
51. Lake Charles Resident: Would like to ask why there is not a plan to repair the Big Lake levee that was damaged during the hurricane since it played an important role in preserving Lake Charles.
52. Grand Chenier Resident: Feels that the levee should be "built on the South side of Bayou Hog from the deep channel leading to the Gulf on the western end of Grand Chenier to the southern most levee on Rockefeller Refuge eastward towards Rollover Bayou in Vermilion Parish. There will still be outlets at the Mermentau River, Joseph's Harbor, and Rollover Bayou. Also, floodgates could be installed at the various sites where smaller bayous enter the Gulf to allow quicker outages for the water after the fact."
53. Councilman from Jefferson Parish: "I am concerned that the report does not provide specific assurance that the proposed hurricane protection levee for the Barataria Basin and the West Bank includes 100 year level of protection for all of the currently developed areas of Jefferson Parish, particularly Lafitte and Barataria." Requests that the language be changed to include "The project would provide a 100 year level of protection to Lafourche Parish and the communities in the central Barataria Basin, including Lafitte and Barataria".
54. Cameron Parish Resident: "As a resident of lower Cameron Parish, I am appalled at your plan to save Louisiana. Why don't you stamp "Pawn for the North" on our foreheads and drown us in the Gulf." Suggests that it is necessary to build rock levees in the Gulf and on the beaches.
55. Southeast Louisiana Flood Control Authority East Individual: Suggests that there not be a specific list of projects that are made law and that a law should not be passed that states the CPRA must use outside peer review. Believes that it is essential that the CPRA have the ability to adjust the Plan as necessary.
56. Houma Resident: Believes that pipeline conveyance of sediment should be used to deliver sediment from St. Mary Parish to Terrebonne Parish and to the Barataria Terrebonne Basins. Suggests medium diversions starting with Bayou Lafourche at Donaldsonville. Focus on projects that do not affect fisheries and people in Terrebonne, Plaquemines, and Lafourche Parishes. Donaldsonville to the Gulf should follow the Highway 90 alignment. Do not need a category 5 wall across Louisiana. Coastal restoration in needed in Vermilion, Cameron, Lafourche, Terrebonne, and Plaquemines Parishes. Should not use large diversions that may affect people when we can use medium and small diversions in combination with pipeline sediment. Plaquemines Parish should have the same protection that they had before Hurricane Katrina.
57. Luling Resident: "There should be a moratorium on CUPs for residential development in wetlands. The West Bank and Vicinity Hurricane Levee Project may potentially harm St. Charles and Lafourche Parishes. Would like the permitting of the neighborhood development called Willowridge Estates halted due to its impact on the surrounding areas and the wetlands in which it will be built.
58. Unknown: Does not feel that a levee from Slidell to Morgan City will protect the environment and people. Feels that levees and floodgates will stop the flow of water into the marsh and would hinder development of fisheries. Would like to know what the "feasibility of placing two rows of rocks 20+ feet high with alternate openings every half to quarter mile to allow boat traffic at the barrier islands" would be. Believes that this area could be used instead of the Intracoastal and that the reef formed by the rocks could enhance the oyster production and make a suitable habitat for sea life.

59. Loranger Resident: "Put aside business and political interests and really listen to the facts to get a legitimate understanding of what is going on." Decisions must be made on real science and regulations need to be put into place and enforced.
60. Theriot Resident: The dead-end canals should be plugged and the spoil banks should be used to fill them. States that pipeline sediment should be used for the marshes.
61. Hackberry Resident: There should be a 30 foot high rock break one mile off of the coast. One fourth of a mile north, levees should be jettyed to form pits. A pipeline should be run from different points along the ship channels to pump sediment into these pits forming islands that are protected from erosion by the rocks. Believes that this would promote the regrowth of the coastline.
62. Theriot Resident: Rebuilding marsh should be the first priority. Agrees with pipeline conveyance of sediment.
63. New Orleans Resident: The area bound by I-10, the MRGO, the Rigolets, and the Chandeleurs should be classified as the highest priority for implementation because of its role in stopping storm surge though Lake Pontchatrain.
64. Mayor from South Louisiana: "I would like to see more specific language in the report stating that the proposed hurricane protection levee for the Barataria Basin and the West Bank includes 100 year level of protection for all of the currently developed areas of Lafitte." Requests that the language be modified. He would like for it to say "The project would provide a 100 year level of protection to Lafourche Parish and the communities in the central Barataria Basin, *including Lafitte*."
65. Southeast Louisiana Flood Protection Authority: Endorses the framework of the Plan and urges that it is presented to the legislature with a process for outside peer review of the proposed projects. Also requests that the authority have the ability to improve the Plan after being passed through legislature.
66. Company Located in Hammond, Louisiana: Recommends HESCO Concertainer Units.
67. Raceland Resident: "…Congress appropriates money to repair and maintain thousands of miles of interstate highways, so too must congress appropriate monies for the extraction, transportation, and deposition- and return trip, and every few years thereafter- of sediment accruing behind those locks and dams for the restoration of the Mississippi River Delta. This is why I suggested to the CPRA at the 12-11-06 meeting in Houma, Louisiana, to inquire about getting law professor Jonathan Turley's assistance who represented U.S. government employees employed, formerly, at the U.S. military base known as Area 51." Proposes that a formula be created which allows for each state along the River to obtain a certain percentage of the sediment. The majority of the sediment should be allocated for the Mississippi River Delta. The Gulf Intracoastal Waterway should be restored to its original width. Landowners' land that was taken by the G.I.W.W. should be restored. Lakes through which the G.I.W.W. passes should be restored to their original state. Any highways and railways created from Venice to Cedar Groves, should occupy the footprint and rights-of-way as the Mississippi River levee and Highway 23. Resident is against the I-49 Corridor project. Believes that no new roadways should be built since many existing roadways are not maintained. Believes that ox-bows should be reintroduced into the Mississippi River and that the indigenous flora and fauna will be productive. Also believes that there should be some type of control structure at each diversion that captures the fauna and prohibits it from leaving the area. Proposes that laws be created which mandate that indigenous flora be planted in subdivisions or developments in "the country". States that if a storm surge barrier is built similar to the Dutch design, that transportation lanes should not exist on top of it.
68. Landowners Association: Upset that the Master Plan "loses focus on restoration, proposes unworkable, if not damaging, measures in the name of protection and restoration, omits consideration of features which are obviously critical to the restoration and protection process and

appears to erroneously focus on land use planning and expropriation of private property rights as a short term remedy to a long term problem. At best, the Draft Master Plan is a hastily concocted document that lacks any real substance. Clearly the State has put this document together in an effort to seize some control over what will ultimately be a federal planning process." Believes that there are three critical features that have been omitted from the Plan. These are: A Third Delta Conveyance Channel, Old River Control Structure, and restoration of the Chandeleur Islands. Believes that the Old River Control Structure is a source of sediment to nourish the marshes and reduce chronic flooding. The Third Delta Conveyance Channel is required for the Old River Control Structure to move water.

69. Plaquemines Parish Government: Would like to see the language in the Plan changes so that it reflects the standards of the levees that are to be built.
70. The League of Women Voters of New Orleans: Believes that the public should be informed of all proceedings regarding the projects proposed in the Plan. The public should be informed of failures and successes of projects along with any changes that are made to anything within the Plan. The public must be educated on the importance of each part of the Plan so that there is understanding of why projects are included and their importance to the Plan as a whole.
71. Vermilion Parish Resident: Suggests a barrier reef in the Gulf as a first line measure of defense.
72. Metairie Corporation: In agreement with complete closure of the MRGO, but believe that a restoration plan and protection plan must accompany this closure. One restoration feature that they would propose is armoring the bank lines of Bayou LaLoutre due to the excessive amount of boat traffic that will occur due to closure of the MRGO. In agreement with the Violet Diversion project, but believe that 5,000 cfs in not sufficient to "meet the overall goals of Planning Unit 1". Proposes that the Louisiana Department of Natural Resources coordinate with the Army Corps. Of Engineers and stakeholders to assure that planning efforts are consistent. Requests that shoreline stabilization of Biloxi Marsh on the seaward side from Christmas Camp Lake southeast to the MRGO be added to the Plan. This requested because the Corporation feels that if this area is left out of the Plan that it will be very hard to ever receive funding for this area due to its unimportance and "low State priority". In favor of the multiple lines of defense strategy and request that it begin "on the most seaward line of defense and work inland".
73. Louisiana Resident: Concerned that Mangrove Trees are not mentioned within the Plan. Recently educated on these trees through an article that he read. Believes that the use of these trees may help to preserve the coast of Louisiana by saving land from erosion and through storm surge attenuation.

4.2 Transcripts/Notes of Public Hearings/Meetings and Copies of Written Public Comment

The following documents are a compilation of copies of all written public comments received along with the transcripts of the CPRA and CPRA-IPT public hearings and public meetings held during the months of February and March of 2007 regarding the February 6, 2007 Draft Master Plan.

4.2.1 SERT Review of the Draft Plan March 14, 2007

Report to the Louisiana Coastal Protection & Restoration Authority

Interagency Planning Team

Science & Engineering Review Team

review of the

Draft Master Plan

14 March 2007
University of New Orleans

Compiled by the Coastal Louisiana Ecosystem Assessment & Restoration (CLEAR) Office

Meeting Participants	Affiliation	
George Arcement	USGS (LA Water Service Center)	
Len Bahr	LA Gov. Office	
Conner Bailey	Auburn Univ.	
G. Ronnie Best	USGS (Everglades)	
Don Boesch	Univ. of MD Center of Environmental Science	
Don Boyle	PBS&J	
Dan Cavanaugh	USGA (Reston, VA)	
Piers Chapman	CREST	
Jerry Daigle	USDA (Natural Resources Conservation Service)	
Charlie Demas	USGS (LA Water Service Center)	
Chandra Dreher	USGS (St. Pete, FL)	
Jamie Favorite	LA Dept. Natural Resources (CRD)	
Joseph Fernando	AZ State Univ.	
Gerry Galloway	Univ. of MD, College Park	SERT
Peter Goodwin	Univ. of ID	
Paul Kemp	Audubon Society	
Barb Kleiss	USACE-ERDC	
Shirley Laska	University of New Orleans	SERT
Dawn Lavoie	USGS	
Steve Light	Adaptive Strategies	
Bob Marshall	The Times Picayune	
Hassan Mashriqui	LA State Univ.	
Irv Mendelssohn	LA State Univ.	SERT
Ehab Meselhe	Univ. of LA at Lafayette	SERT
Alaina Owens	CLEAR Office	
Jim Pahl	LA Dept. Natural Resources (CRD)	
Carol Parsons	LA Dept. Natural Resources (CRD)	
Barbara Poore	USGS	
Jon Porthouse	LA Dept. Natural Resources & Integrated Planning Team	
Rick Raynie	LA Dept. Natural Resources (CRD)	
Denise Reed	Univ. of New Orleans	SERT
Lawrence Rozas	NOAA Fisheries Service	SERT
Juanita Russell	USACE (New Orleans) & Integrated Planning Team	
Fred Sklar	South FL Water Management District	SERT
Greg Smith	USGS (National Wetlands Research Center)	
Cindy Steyer	USDA (Natural Resources Conservation Service)	
Greg Steyer	USGS (National Wetlands Research Center)	
Chris Swarzenski	USGS	
George Tanner	Univ. of FL	
John Teal	Woods Hole Oceanographic Inst. & Teal Partners	
Robert Twilley	LA State Univ.	SERT
John Wells	VA Institute of Marine Science	
Sally Yost	USACE-ERDC	

Additional Members of SERT (not in attendance at the March 14 meeting)		
Mead Allison	Tulane	SERT
Rex Caffey	LA State Univ.	SERT
Jim Coleman	LA State Univ.	SERT
Jim Cowan	LA State Univ.	SERT
John Day	LA State Univ.	SERT
Robert Dean	Univ. of FL	SERT
Robert Gilbert	Univ. of TX	SERT
Patrick Hesp	LA State Univ.	SERT
Rick Leuttich	Univ. of NC	SERT
Doug Meffert	**Tulane**	**SERT**
Gary Parker	Univ. of IL	SERT
Ken Potter	Univ. of WI	SERT
Nancy Rabalais	LUMCON	SERT
Jim Richardson	LA State Univ.	SERT
Harry Roberts	LA State Univ.	SERT
Kenny Rose	LA State Univ.	SERT
Charles Simenstad	**Univ. of WA**	**SERT**
Gene Turner	LA State Univ.	SERT

Note: SERT members denoted in bold submitted an electronic review of the DMP

The first half of the day was a joint meeting of the Science & Engineering Review Team (SERT) and the Louisiana Coastal Area (LCA) Science Board

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[Specific recommendations are denoted in italicized text]

1) Draft Master Plan Presentation:

a) Comments on DMP relative to PDMP:

- Louisiana has a significant challenge to integrate restoration and protection. The efforts of the IPT are extremely impressive with regard to how the conceptual framework is being laid out and the policy for addressing multiple levels of stakeholders. There have been substantial changes from the PDMP to the DMP, so it shows that the IPT has been willing to listen and incorporate change through the process. SERT has seen that the IPT has taken our prior comments to heart. Under program management, it seems that the IPT paid close attention to the Boesch et al. *New Framework* report. ***SERT encourages the IPT to continue an open dialogue with the continued development of the Master Plan.***

- After reviewing both the PDMP and the DMP, it appears that many of the major assumptions are the same in both drafts; however, the DMP has a softer edge because of

the use of words such as ‘maybe’ and ‘suggests’. The most important difference is that the DMP really lays out the assumptions. The DMP also mentions the need for a sediment inventory. Everything about shoreline stabilization and ridge restoration is still in the plan; it’s just presented in a different tone. How the public perceives the use of terms such as ‘stabilization,’ which we continue to believe are inconsistent with the dynamic nature of the coast, is yet to be seen. The DMP is a huge improvement from the last version; at least the word ‘restoration’ is now in the title. *SERT continues to challenge some of the assumptions in the DMP (see section 2 of this report). And we also encourage the IPT to continue a clear description of assumptions used to develop the vision for both restoration and protection.*

- There have been some changes from PDMP to DMP which we see as questionable. We are concerned that the locations of land building diversions (i.e., delta management plan) changed since the last draft. Even if we don’t have any additional information to refine the placement of the diversions, the second location ignores information that was used the first time around. *What exactly is the concept of water management? Why have these features changed since the last draft?*

- We believe the public will want to know if projects will be constructed in the locations specified on the maps. They know that these are projects the State would like to do if the funding comes through, but most may not be aware of the conceptual nature of many of the map features. Also, the DMP (as written and presented) seems appropriate for congress, but the average person on the street won’t necessarily understand many aspects of it. *As discussed elsewhere, the IPT should continue to improve the communication value of the Master Plan in informing the public about the nature of trade offs involved in developing a vision for both protection and restoration.*

- *The DMP needs to say explicitly that the models will be improved as the process continues, and that the group is actively learning and the process is continually improving.*

- Why does this version of the Master Plan use words such as ‘our’ and ‘we?’

b) Maps need clarification

- One issue is associated with presentation is using maps as a representation of a vision rather than a specific plan. Regardless of what it's called, maps are generally going to be taken literally by just about anyone except, possibly, those who created them. Residents will look to see if they are inside or outside a levee...or above or below where the Mississippi River will be "visioned” for reconfiguration and they are making assumptions and taking action regarding that. And, this is at a time when there is no clear articulation of exactly what the compensation will be for these folks, if any, and where it will come from. The scientific as well the community at large will see these very large scale shifts (e.g., the diversion of the modern delta) change location between one plan and another and will, therefore, not only then see that as a real location but they will also not understand WHY it shifted...a dangerous combination in terms of community trust (again, because, like it or not, maps are interpreted as *real plans*).

- *The DMP maps are the source of several issues because of the many possible interpretations. There is nothing in the legend to define the dotted lines around Houma. The word 'representative' in the legend should be changed to 'option;' however, some members of the group feel that the word 'option' isn't strong enough. People see a line and think it's written in stone exactly where it's drawn on the map, and then they get anxious. It is important to use terms that convey the vision concept throughout the document, especially in relation to the maps.*

- *Somehow, it should be conveyed to readers that even 'proposed' projects may not be built. For example, after more evaluation, some projects may be found unnecessary or too damaging to the environment to be constructed.*

- We support the outcome the IPT is seeking, and there are many ways to get there. The problem with the maps in the DMP is that the way they are presented many of the features appear detrimental to the environment. *The IPT could consider keeping the lines (designating levees) on the maps, and have a note in the legend stating that 'lines indicated in color X are potentially very damaging to the environment.'*

- *Point out that items of one color represent currently existing features and items of another color are proposed. Also give the option to read more information about each project by including a project list with a brief description.*

c) Lists of projects in tables need clarification

- Providing the list of projects sets up an expectation that these are the final project plans, set in stone. *Either remove the project table or add a title that says 'the following are example projects indicated on the map.' Make sure people know that the projects are not listed by priority. Tables should be grouped by project type (all diversions together, distinguished by brown arrow icon; shoreline stabilization, distinguished by red line icon, etc.).*

- The DMP (page 72) describes the next step for each of the projects, and they are different for each project. Some projects are ready to go to planning, some to engineering design, etc. *It would be helpful to come up with a symbol to represent projects based on status, and put a 'status' symbol next to each project in the table.* That way, people can quickly get an idea of how far along each project is, whether it's in need of planning or if it's ready for construction. Group projects by type but also have icons to represent status. The State cannot expect the public to participate if they don't understand what is being presented to them.

2) Science and Engineering Principles of the Master Plan:

a) Protection Principles: Stronger emphasis on nonstructural protection

- *SERT strongly recommends that IPT place more emphasis on non-structural protection (e.g., providing financial incentives/compensation to encourage sustainable architecture*

and urban/rural development). This should be greater emphasized in addition to the structural measures. In addition, as we describe how communities can manage remaining flooding risk, SERT recommends that IPT should add "clustering" of developments (e.g., residential, commercial) in communities to less flood-prone areas and near basic support infrastructure as well as infrastructure for evacuation. Evacuation routes are clearly mentioned in this report but those routes, linked to other infrastructure in more sustainable areas, should be more clearly articulated as a basic premise of any community plan.

- In the annual plan, the term 'non structural' is only used twice, and the option of elevating buildings is only brought up a few times. *With regard to the science concern of 'hardening the coast' – we still need to provide an option for viable flood protection; non structural protection is what we should focus on. It should be stressed in great detail as being a viable hurricane / flood protection option.*

- On p 53 of the DMP, the IPT starts to mention the human dimension; IPT needs to combine both restoration and protection with strong emphasis on how community resilience needs to be described. *The SERT would feel more comfortable if these were integrated; use the Barataria alignment as an example of why an honest discussion of tradeoffs is necessary.*

- *What if the State laid down principles stating that any armoring of the coast would only be allowed on the edge of natural ridges?* Let people know in advance that it may not be possible to provide hurricane protection outside of the natural ridges. If the State doesn't stick to certain principles, then we have no consistent pattern in integrating protection and restoration along the coast. Is there a new principle that defines "*we did not want flood protection works right up next to development,"* as this seems to be a justification for the Barataria alignment? In some ways it makes sense – the idea of storage basins between levees and areas being protected. But does this statement represent the level of a principle and if it does, then how will it impact alignments on the east bank of New Orleans.

- *In response to items on page 33 of the DMP, stating that 'in order to reduce damage, we need to…)* can we actually do any of those things?

b) Concept of leaky levees:

- The concept of the 'leaky levee' has been questioned by the LCA Science Board, the SERT, and several others in the academic community (eg. letter to Governor). Each of these groups has questioned whether it is actually possible to engineer leaky levees; there is a great level of skepticism that such structural features will have no consequences to the natural processes of hydrologic basins. We shouldn't limit ourselves to currently existing alignments just because we think it will be more cost effective. Even though the Barataria alignment is shorter and cheaper, the levees may be more likely to fail because they would be built across the wetlands (soft, unstable sediment). *Wouldn't levees be more likely to provide protection if they were built on high, dry, stable ground such as the natural ridges of distributaries? For example, in reference to the infinite number of oil*

and gas pipeline canals, how could levees possibly be constructed across such a mutilated landscape, and how can you block access by the oil and gas industry by constructing such levees?

- The IPT is jeopardizing the entire plan by proposing such ecologically unsound projects across extensive areas of coastal wetlands. Even people in Washington DC will question the concept of constructing levees across wetland basins and they will question the negative effects that these would have on the wetlands. We have decades of study that show how altered hydrology negatively affects wetlands. We're not sure what the implications are for everything, but we do know that levees across hydrologic basins can have severe consequences and marsh management is not a sustainable solution for the coast.

c) Water Management within Hydrologic Basins

- If the levee itself goes on top of existing hydrologic barriers (e.g., at least 3-4 ft high) it will not alter tidal/cold front processes. Floodgates would need to be designed at the waterways to ensure they too don't alter tidal exchange. These are both possible – and if they could be done to provide protection they might have little negative impact. The problem is that the plan calls for the areas behind the levees to be managed – this is what really concerns SERT. If the levee floodgate structures do not alter tidal exchange, how will they impact the marshes? Less hurricane sediment is an impact, but diversions (process restoration not management) could ameliorate that. In response to the idea that *'water management areas would be managed as little as possible,'* the text is unconvincing.

- *Water management areas should not be placed over the natural system; it is recommended by SERT that the State remove these altogether.* SERT suggests that the levee across Barataria combined with water management zones will spark environmental litigation, and there will be strong conflict between the scientific and engineering communities over this single issue.

d) Sediment supply, inventory, and options

- Previous engineering projects along the Mississippi River have already cut off sediment supply to hydrological basins along the coast. There is still some level of sediment supply from the Gulf during hurricanes and cold fronts. If the State constructs a large levee, horizontal to the coast, then wetlands in these hydrologic basins could loose their last source of sediment.

- Has the IPT looked operationally at the combined management of the rivers of the Mississippi Basin and the combined potential for transporting sediment down the Mississippi River? The entire discussion and the concept of river sediment is void if we continue to let the sediment pour into the Gulf of Mexico. Unless the Master Plan commits to a large delta management project, then discussions regarding river sediment sources are of little value.

e) Need to be more explicit in addressing climate change:

- SERT was pleased to see the efforts to include climate change explicitly in the discussion of the challenges to restore and protect the Louisiana coast. Two major unknowns are described - future sea level rise and future frequency / intensity of storms. *SERT encourages the IPT to ensure that the Master Plan includes a serious discussion as to how these could play into the restoration and protection alternatives proposed by both the CPRA and the LACPR.*

- *What are the planned upgrades to account for climate change given a 100 year plan? Where did the decision to use a 0.2% return frequency come from? There is a fundamental problem with using the concept of 100 yr or 500 yr event; it is not possible to provide everything for everybody. There is also an issue of national policy: dialog has already begun at the national level regarding appropriate levels of protection.*

f) Stabilization vs. Restoration

- There is still an issue associated with the degree that both restoration and protection would be compromised by the over-engineered approaches represented in the plan. *It should be represented as more than just a disagreement about where the footprint of the engineered solution is located…whether solid or dashed lines. It still appears that the IPT's 'sustainable landscape' is from the perspective of a STABILIZED landscape, not one of naturally dynamic landscape processes.*

g) Marsh Creation vs. Restoration

- There was discussion regarding why barrier island projects are called barrier island 'restoration' and marsh projects are called marsh 'creation.' Both should be called restoration or rehabilitation. It doesn't make sense to refer to these as being different. When you use the word 'creation,' it creates a perception that there were no wetlands there before, but when you use the word 'restoration,' it creates a perception that there were wetlands there before (which is more appropriate). Also, the PDMP and DMP point out that marsh creation areas need to be maintained over time with sediment additions, but there is no reference to this same maintenance that would be needed for restored barrier islands. *Be consistent- either say they both need to be maintained, or don't say anything about maintenance.*

- Isn't the problem, at least with barrier islands, that 'restoration' implies that natural processes will be restored or allowed to sustain or alter these features, but barrier islands are both dynamic and degrading features? You can't restore something that's at the end of its 'lifespan.' *It's either enhancement/rehabilitation or creation.*

h) Wetland Wastewater Treatment Projects

- Another issue concerns enhancement of wetland/cypress tupelo systems to explore greater use of coastal habitat for water treatment, which would save money on treatment while enhancing wetland productivity. The Bayou Bienvenue project in CIAP is a great

example of this and serves as an opportunity for Louisiana to catch up with parts of the country that have much wider use and enhancement of wetlands for this purpose.

3) Plan Implementation

a) Scale and nature of projects in the Delta Management Plan:

- *SERT is concerned that the plan is still focusing on 'urgent early action' – we need to ensure that some of the larger, bolder projects are indeed moving along into planning.*

- *Focus more on natural processes and less on mechanical processes for coastal restoration. There is concern over the level and location of marsh creation in the PDMP, and there is concern over the cost to sustain wetlands based on their location (i.e., around Bayou Lafourche). Think big; do not focus on small-scale projects (eliminate or limit shoreline stabilization projects altogether)*

b) Decision making, sequencing priorities, and precise documentation:

- *The implementation plan is sketchy. There is a need to renegotiate the CWPPRA Conservation plan. The IPT needs a more comprehensive approach to developing an annual plan.*

- We need to be upfront with the public about what we know now – this kind of approach *(i.e., telling the public that we will analyze projects that we truly feel to be unacceptable / unviable options)* only perpetuates the notion that we don't know enough. We do know enough to say that some things should be OFF the table, and some things should be considered for high priority.

- Interesting that (certain) comments place the IPT as the group making recommendations and having ownership of the Plan. The IPT (assembled agency staff, no matter how good they are individually) is not the right group for this. *How does the IPT plan to have the coastal assessment group involved in program management?* The thinking should go on within the coastal assessment group; where do the thinking and ideas come from with regard to the Master Plan? The IPT needs to establish governance so that the scientific input is from the scientific community. The scientific community can advise the IPT on how to change the vision along the way - it's ok to change the vision. There is no doubt that it will be changed and revised many times over the next 100 years. We should not view it as being fixed. Make clear the process by which planning is done and decisions are made. *It appears at times that the IPT has basically said, "these are all the things we can throw at the LA coast to stabilize it," without any process to critically (scientifically, engineering, and socially) examine and compare trade-offs. However, SERT appreciates the difficulty that the IPT is facing in trying to meet the public's expectation.*

- While we can't slow down the process of getting the report out, it is time to begin fleshing out the tough details. It is a question of implementing the Plan as a process of assessing the consequence of 'alternative futures,' rather than implementing a structural solution? SERT extends words of praise for the efforts of the IPT. Even though there are

good people in the offices now, the legacy will drop once they're gone. *The IPT should closely document the process that they've followed so far. They should have an advisory committee (including social scientists), and also smaller subgroups that are tasked with working on the sticky issues.*

c) Public education/outreach:

- With regard to removing or limiting shoreline stabilization - we need a document that can educate the public so that a plan can be created that will meet their expectation. We, as the science and engineer community, need to tell them, "this is what the coast needs." Right now, the public thinks shoreline stabilization is the answer to wetland restoration. *This misconception needs to be corrected, so that the public has a better understanding of the processes at hand. With regard to restoration, the state needs to plan on the offensive, not defensive.*

d) Lack of Coordination between the State of Louisiana (CPRA) and the US Army Corps of Engineers (LaCPR):

- *SERT would like to see a single vision/strategy for restoration and protection that the state and federal government shared. There could be alternative tools/methods/projects offered that would be assessed to achieve the goals of this unified vision. We must have compromise on principles and objectives between the state and USACOE; we must have one plan moving forward with two entities (state and federal) pushing it.*

- *SERT is concerned that the nation and congress will view a large disjoint between the state and federal plan. Leadership needs to be taken by either CPRA or LACPR to initiate a collocation effort. This effort would also need to include the CWPPRA, CIAP, and LCA. Each of these groups needs to be represented in a collocated team. It is difficult to grasp the structure and connectivity of all of the state and federal restoration groups and efforts.*

e) Need more consideration of adaptive management:

- IPT should consider describing an example/scenario that illustrates the logical, scientific/engineering sequence (priority, in one sense) that would have to be pursued to implement an adaptive management approach to testing one option.

- Navigation does not appear to be considered in the planning process of developing the State Master Plan. This could be a problem if they are not brought to the table early in the planning process.

- *SERT would like to see a single vision/strategy for restoration and protection that the state and federal government shared, but that there could be alternative tools/methods/projects offered that would be assessed to achieve the goals of this unified vision.*

Acknowledgments

The Draft Master Plan (DMP) was reviewed by individuals chosen for their diverse perspectives and technical expertise, in accordance with procedures approved by the Integrated Planning Team (IPT) of the Louisiana Coastal Protection and Restoration Authority (CPRA). The purpose of this independent review is to provide candid and critical comments that will assist the IPT in making the DMP as sound as possible.

Although the reviewers listed above have provided many constructive comments and suggestions, they were not asked to endorse the conclusions or recommendations, nor did they see the Master Plan before its release. The review of the DMP was overseen by Dr. Robert Twilley (Louisiana State University) and the staff of the Coastal Louisiana Ecosystem Assessment and Restoration (CLEAR) office. Appointed by the IPT, CLEAR was responsible for making certain that an independent examination of the report was carried out in accordance with procedures that allow review comments to be carefully considered. The final content of this review is a compilation of oral and written comments posed by the authoring SERT committee.

4.2.2 Report from the LCA Science Board Meeting March 29, 2007

Science Board of the Louisiana Coastal Area (LCA)
Ecosystem Restoration Program
CERM Building, University of New Orleans
2000 Lakeshore Drive, New Orleans, LA 70148

Preliminary Report by the Science Board
On
Louisiana's Comprehensive Master Plan for a Sustainable Coast
February 2007 Draft

March 29, 2007

At its December 13-14, 2006, meeting the Science Board discussed the Preliminary Draft of the State's Comprehensive Master Plan and offered comments in a January 5, 2007 report to the LCA Program Management Team. In early February, the Integrated Planning Team (IPT) of the Coastal Protection and Restoration Authority (CPRA) released a substantial revision in the form of a Draft Report entitled *Integrated Ecosystem Restoration and Hurricane Protection: Louisiana's Comprehensive Master Plan for a Sustainable Coast*. The Science Board's January 5th report was included among public comments in Appendix C of the Draft Plan.

The IPT is in the process of preparing the Final Plan for consideration by the Louisiana Legislature in April 2007. To provide the opportunity for discussion of the Draft Plan and recommendations for completing the Final Plan, a joint meeting of the Science Board and CPRA's Science and Engineering Review Team (SERT) was held on March 14, 2007. This preliminary report of the LCA Science Board is being made available in advance of its complete meeting report in order to provide timely input to the IPT for preparation of its Final Report.

General Comments

The Science Board was very impressed with the careful consideration given by the IPT regarding the Board's comments on the Preliminary Draft Plan. It is clear that the February 2007 Draft Plan incorporated many of the suggestions made by the Science Board. Specifically, the IPT:

- gave considerable thought to the vision, process and appropriate level of detail as it developed the Draft Plan;
- provided an appropriate level of frankness and clarity in their answers during IPT member Jon Porthouse's discussion with the Science Board and SERT;
- showed considerable diplomacy in dealing with multiple stakeholders; and
- most importantly, demonstrated significant willingness to consider input from stakeholders and technical reviewers, alike.

With the significant challenges imposed by the continued and potentially increasing threat of severe tropical storms, sea-level rise and continued loss of coastal wetlands, there is an urgent need to address coastal restoration and hurricane protection through a unified and integrated strategic plan that is "offensive" in actively increasing environmental sustainability and public safety rather than being just "defensive." Because of the significance of the Louisiana Coastal Area as a natural and economic resource both to the State and the Nation, it is critical that there be a unified vision and direction that guides not only the State's efforts but also Federal activities through the Louisiana Coastal Protection and Restoration (LaCPR) Plan. Nevertheless, the Science Board recognizes that these plans cannot and should not specifically detail all of the measures to be undertaken but rather present guiding principles and technical bases; a clear, compelling and feasible vision; and a coherent framework for project integration. The Plan must also require that new information, improved models, technological innovation and rigorous review processes are used in updating and implementing the Plan.

Responsiveness to Prior Science Board Comments

The Draft Plan is a dramatic improvement over the Preliminary Draft Plan and the Science Board acknowledges the earnest efforts to directly respond to its prior comments and those of the SERT. Specifically, the Draft Plan addresses the Board's key comments in the following ways:

1. **Recognition of the central importance of a sustainable coastal landscape**. The Preliminary Draft Plan was entitled *Comprehensive Coastal Protection Master Plan* and presented only cursory treatment of coastal restoration in contrast to its primary focus on hurricane protection. The present Draft Plan not only adds "ecosystem restoration" and "sustainable coast" to the title, but provides substantive consideration to the essential requirement to achieve a sustainable, if dynamic, coastal landscape, not only for fisheries and wildlife habitat, but also for hurricane protection, energy infrastructure, commerce, water quality, and culture. Restoring sustainability of the Mississippi River Delta, the Atchafalaya Delta, and the Chenier Plain is treated first, providing the context for hurricane protection. In the Preliminary Draft, coastal restoration was considered rather briefly after hurricane protection. We recognize that the greater emphasis on coastal restoration as a fundamental element may well draw criticism given the public's desire to be protected first and foremost.

2. **Greater consideration of community adaptation**. The Draft Plan is much more frank and direct in indicating that enhanced hurricane protection is not feasible for some communities and that other approaches are required to minimize risks. The Draft Plan specifically identifies the need for smart growth within the hurricane protection system, as well as the need to integrate the plan with flood insurance, elevating and retrofitting structures, strengthening building codes, improving hazard mitigation plans and evacuation routes, and compartmentalizing protection systems to avoid catastrophic failure. The Draft Plan also recognizes the need for

improving land use planning, zoning and permitting and for streamlined processes to acquire land rights. There is obviously more work to be done within this outline and the Science Board again stresses that the State should not just leave these responsibilities to local jurisdictions.

3. **More forthright facing of tradeoffs and technical challenges**. The Draft Plan is much improved in its efforts to make citizens and others aware that changes are unavoidable and that there will be significant tradeoffs, choices and imperatives ahead. These include where people can live, the level of protection that is reasonable, and the dramatic changes in fisheries and other uses as the land building power of the rivers is unleashed.

4. **More explicit incorporation of climate change.** The Science Board commends the IPT for its brief, but head-on, look at the potential consequences of global climate change on coastal restoration and protection. Specifically considering the findings of the new Fourth Assessment of the Intergovernmental Panel on Climate Change will not only help in the development of robust plans but will assure the national scientific community and policy makers that these complications are recognized as being very real and are not being ignored.

The Science Board also notes, however, that several issues that it we raised earlier remain to be sufficiently addressed. These include reconciliation between the State Comprehensive Master Plan and the LaCPR plan; improving outreach to the regional scientific community, national environmental organizations, and maritime transportation and energy interests; and looking forward at how threatened and endangered species considerations will be dealt with in plan implementation. Pprioritization and sequencing also remain very much a work in progress, with the Fiscal Year 2008 Annual Plan falling well short of accomplishing those objectives.

In the following sections, we briefly elaborate on four additional issues that we recommend for further consideration in the completion of the Final Comprehensive Master Plan.

Levees Encompassing Wetlands

The Science Board recognizes the efforts of the IPT to address the issues raised in the Board's report from the Board's December 2007 discussion of levees intended to enclose still functioning tidal wetlands, the so called "leaky levees." This is addressed under the discussion of Other Technical Challenges on pages 31-33 and the Barataria Basin and West Bank levee alignment on pages 58-59. While acknowledging that scientific uncertainties and technical challenges are yet to be addressed, the Draft Plan nonetheless includes "representative alignments" of such levees in the map on page 60. Such levees have become the most controversial element of the Draft Plan among a substantial number of scientific experts (as evidenced by not only in the comments of the Science Board and SERT, but also in the recent letter from a group of scientists to the Governor and Chief of Engineers) and environmental advocates.

The Science Board recommends a precautionary approach, wherein the burden of proof is on those advocating such a potentially risky scheme to demonstrate that it is unlikely to have negative impacts on the sustainability of wetlands and productivity of their resources, rather than on those who have raised reasoned concerns about such negative impacts. Our experience in discovering many unintended negative consequences of wetland impoundments suggests that this would be prudent. This means, for example, that the assertion that "the West Bank will face an unacceptable level of vulnerability to storm surge" without the Barataria Basin levee (page 59) must be supported by a more thorough examination of alternatives before accepting that a cross-basin levee is the only solution.

The Science Board is also concerned about the description of areas presently impounded or proposed for some level of impoundment as Water Management Areas as it suggests "marsh management" though water-level control. It is ironic that such Water Management Areas are being proposed for coastal Louisiana at the same time that we are attempting to restore the Everglades by decompartmentalization of its Water Conservation Areas. It must be remembered that the long term survival of the coastal wetland landscape is as much or more about "getting the sediment right" as it is about "getting the water right."

Getting the Sediment Right

In that regard, while the importance of sediment resources is clearly recognized in the context of river diversions and barrier island restoration, it could be more clearly stated that management for sediment accumulation in wetlands is essential to their sustainability. This includes sediment delivered by tidal and meteorological processes as well as by river diversions and pipelines that retain sediments in the coastal system rather than discharging them into deep waters. "Getting the sediment right" should be a central design principal of the Plan. This includes maximizing sediment availability, addressing constraints, and managing in consort with the sedimentary processes that sustain wetlands. From this perspective, then, marsh "creation" seems to us to be somewhat off target in comparison to marsh "restoration" or "rehabilitation."

Drawing Maps

There was substantial and lively discussion among the Science Board, SERT and others participating in the discussion of the Draft Plan of the potential problems of showing specific features on maps included in the Plan. The Science Board clearly understands that the Plan cannot be simply verbal and formless and that laying out the design on maps is needed for effective public communication. After all, several members of the Science Board were authors of the National Research Council's *Drawing Louisiana's New Map* report. However, the IPT should be sensitive to the likelihood that placing features on maps that are "representative" or positioned in order to get "buy in" may create false expectations and problems in the long run. There is a continuing need to develop a vision for the comprehensive protection and restoration program that is shared between the State

and Federal governments. The Comprehensive Master Plan can and should be a major impetus in the development of such a shared vision.

Science and Engineering Input and Review

It is important that the State engage the best scientific and technical expertise available even under the severely time-constrained circumstances in which the Comprehensive Master Plan had to be prepared. Reviews of the Preliminary Draft have raised important deficiencies, many of which have been addressed. But, reviews are no substitute for engagement of experienced experts in the conceptual design, refinement and adaptive implementation of the Plan. Moving forward, the Science Board recommends the engagement of the regional scientific community in conceptualization, evaluation and design, particularly with regard to the more challenging or controversial alternatives identified in the Plan.

Summary

In conclusion, the Science Board emphasizes that the Draft Comprehensive Master Plan is about right in terms of presentation of objectives, an initial vision, uncertainties that must be resolved, and the process for refining and implementing the plan following principles of adaptive management (i.e., constant evaluation and modification in light of new information). Given the nature of the vulnerabilities and pace of deterioration it was urgent to develop the plan quickly rather than take the time to develop highly detailed plans that are unlikely to be fully implemented in the end. The CPRA has done a commendable job in developing such a plan, seeking extensive public comment, articulating scientific and technical challenges and responding to reviews. We feel confident that the remaining concerns that we have expressed can be satisfactorily addressed as the Final Report is completed.

4.2.3 New Orleans Public Hearing Transcript

Drafts of Louisiana's Comprehensive Master Plan for a Sustainable Coast, FY 2008 Annual Plan & CIAP Plan

STATEMENT CARD

Name Randy Moertle

Street or Box 1008 Mar DR.

City Lockport State LA Zip Code 70374

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DNR
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Baton Rouge, LA 70804-9396

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STATEMENT CARD

Name Dewell Walker

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City Bura State LA Zip Code 70041

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STATEMENT CARD

Name Henry J Rodriguez

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STATEMENT CARD

Name Matt Rotenberg

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STATEMENT CARD

Name JANE P. MCMANCON

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STATEMENT CARD

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STATEMENT CARD

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STATEMENT CARD

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STATEMENT CARD

Name Leo Richardson

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STATEMENT CARD

Name John Lopez

Street or Box _____

City _____ State _____ Zip Code _____

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STATEMENT CARD

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STATEMENT CARD

Name BILLY NUNGESSER

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STATEMENT CARD

Name Billy Wingesser Plaquemines Parish President

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City Po Box 56 Hwy State LA Zip Code 7003

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COASTAL PROTECTION AND RESTORATION AUTHORITY

INTEGRATED PLANNING TEAM

TRANSCRIPT AND PUBLIC COMMENTS

OF

PUBLIC HEARING

FOR THE

DRAFT OF LOUISIANA'S COMPREHENSIVE

MASTER PLAN FOR A SUSTAINABLE COAST,

DRAFT FY 2008 ANNUAL PLAN

AND DRAFT CIAP PLAN

HELD IN THE

LINDY C. BOGGS INTERNATIONAL CONFERENCE CENTER

2045 LAKESHORE DRIVE

NEW ORLEANS, LOUISIANA 70148

ON

WEDNESDAY, FEBRUARY 28, 2007
5:30 P.M.

TRANSCRIPT OF HEARING PROCEEDINGS

[HEARING CALLED TO ORDER]

MS. COFFEE:

I'd like to welcome everyone here tonight and I certainly appreciate you coming out in the rain. My name is Sidney Coffee and I'm the chair of the Coastal Protection & Restoration Authority in Louisiana, and our State's team tonight is going to present you with a lot of information. Some of it you have seen; however, it's a little changed at this time. We have taken into consideration some of your comments earlier and the master plan itself has had some work done to it and they are going to re-present that tonight as well as our annual plan as well as the CIAP plan, and I'll get into that in just a second a little bit more. But first I'd like to recognize some folks tonight in the audience. The President of St. Bernard Parish, Junior Rodriguez. Welcome, Junior. I'd also like to welcome Keith Hinkley and Lynda Banta, both Plaquemines Parish Council members. Welcome. Thank you for coming.

And if there is -- I don't see anyone else, any more elected officials, but if you are here, please stand now or wave at me so I'll know that you are here. And, anyway, welcome. Glad that you are here.

This public process has been a very thorough one from beginning to end, and we first came out with our master plan November 1st, and since then, it has been a very intense process of listening to every comment, answering questions, making suggestions. You have all been amazing with the information you have given us and the dialogue that's gone on. It has been -- I think it's been a pretty amazing process. And I've been -- I've been with this not nearly as long as a lot of folks but for about ten years and this is a fairly, I tell you what, it's been a very thorough process and I'm very proud of our team and what they have accomplished, and the amount of information that we have received has been really exciting.

There are three pieces tonight, very critical pieces that you are going to hear about the master plan. The master plan, as I said, this is the last time it will actually be presented in public. We -- earlier this week we were -- no, tomorrow night. We have another one. I forgot. We are going to be in Abbeville tomorrow night. Of course, tonight here in New Orleans. We were in Lake Charles last night and the night before that in Houma.

You will still be able to turn comments in, go to our website and, Michelle, after the plan is presented, will give you more details on how to continue if you know of anyone who wants to comment who couldn't be here tonight, we will give you that information of how you can get in touch with us.

We are also going to go over the annual plan. You know, every year we have to go to the Legislature. Until this year it's always been a coastal restoration annual plan. Of course this

year it combines hurricane protection with coastal restoration, completely integrates the two efforts.

And we go to the Legislature and what that annual plan does, which many of you know, are well aware of, some of you may not be, it outlines the money that we are saying needs to be spent in the coming year. It will talk more about the actual projects and initiatives that we are going to undertake within the next fiscal year so that the money that will come out of the trust fund over the next year can be approved or not by the Legislature. So that's -- you are going to see two things, then. It's almost like two public hearings, if you will.

Then you are going to also see the CIAP plan, and the CIAP plan, all of this has been (inaudible) during a break and very -- brought together very consistently, these three piece that are being brought.

The CIAP plan is going to be --

that's the Coastal Impact Assistance Program, that is what is going to actually start pushing forward our first priorities in the master plan. Some of the initial priority projects are going to go forward. And if you will recall, the Coastal Impact Assistance Plan is -- that came out of the Senate -- the US Senate Energy Bill that came out in 2005, and this is what -- it's not really OCS revenue sharing but it's based on that concept somewhat. It's just, it's direct spending and it comes in a lump sum each year for the first four years. And during that four years we will get approximately 523 million, and 65 percent of that goes directly to the State, 35 percent of that goes directly to the coastal parishes. And this has been a remarkable -- I think it's been a remarkable job that's been done in cooperation between the State and the parishes on pulling this plan together. And you will see, Greg Grandy will show you that in a little while.

And speaking of funding, I just want to catch you up, also, and fill you in on some other things. In the near term -- first of all, in the long term, the OCS revenue sharing past profits. Sharing with Louisiana and the other coastal producing states, also offshore, outer continental shelf revenues. The real bulk of that money doesn't start until the year 2017, that's 10 years from now. But in the meantime, this year we anticipate that the Tobacco settlement will be sold. That can mean as much as 300 to $380 million for coastal trust fund. There is also the prospects of some surplus money. Depending on how much that is, it could be $200 million. That's another lump sum. Then you have got the CIAP money that I just talked about over the next four years. That's another approximately $500 million that will be coming in for this purpose.

You have ongoing programs like the CWPPRA program and there are the

prospects this year finally that WRDA bill -- in fact, at the hearing, Senator Barbara Boxer brought to the field hearing in New Orleans two days ago, I had to testify at that hearing, she said point blank WRDA will be marked up by the end of March. So, you know, that's another prospect. Our prospects are good, is what I'm trying to say, over the next four -- about four years. They are very good for the money that we are going to need to start ramping this thing up.

Then there is always, to be able to bridge the gap, say, after about year four, between year four and year 10 when the big OCS money starts coming in each year, there is the prospect of bonding, and we are looking at creating a corporation just like the Tobacco Corporation. This would be a Coastal Restoration & Protection Corporation that would be ready and we can pull the trigger on that and bond the money when it's necessary at the time it's needed.

Because you don't want bond money that you don't need and pay a ton for it until it's time. So I think that in the short-term we are going to be better off than we anticipated, and that's very good news. And that means that we are going to be able to get started as quickly as is humanly possible with projects on the ground.

So right now I would like to introduce King Milling, and King Milling just wanted to say a couple of words. He came -- assists as a member on the CPRA and he's also the chair of the Governor's Coastal Commission so he -- and is, of course, a native New Orleanian.

And, King, I'd like you to say a few words, and after that, I'm going to turn it over to Michelle Deshotels. Michelle will then introduce the members of the team and take your comments. Thank you very much for coming.

MR. KING:

Thank you, Sidney. Let me, if I

may, just make one point that I think is not in accordance with what she anticipates, but this entire state owes this lady a tremendous debt of gratitude for the work that she has done over the last four years. She has truly been the person that has kept the engine going, and you may like or not like parts of this plan, but I will tell you because of her efforts and the way that she has been able to work with Secretary Angelle and Bradberry and everyone else, we have something that is quite unique. We thank you very much, Sidney, for everything.

(Applause.)

MR. KING:

My comments tonight are brief. I'm just going to speak about the plan itself. It is a reflection of exactly what we told you it would be four months ago. It is a plan that is a product of significant thought and effort combined with thoughts that derive from a number of the meetings that were held

throughout the state of Louisiana. Obviously every thought and every comment was not included, but every thought and every comment was given great consideration. This is a plan that is -- we have all been waiting for. It is courageous in terms of what it is asking for. It is courageous in terms of how it is being projected, and I will tell you that it is a product of a state that is truly convinced that unless we get to the business as soon as possible of restoration and protection, we are going to be in very deep problems. And that is what's driving it. The scientists and the engineers have been on top of it, and I would recommend to all of you that you read not just the pictures but read the whole thing. It is a plan that really sets out the scope and the purpose of what we are all about. Thank you very much for coming tonight.

MS. DESHOTELS:

Thank you, King.

Before we actually get started with the program, I do want to go ahead and introduce some of the representatives and Federal agencies here this evening and the integrated planning team. From Corps we have Edward Russo, project manager for the LACPR project. Tim Axtman is also here. And we have Juanita Russell, who is on assignment from the Corps to the integrated planning. From MMF we have Stephanie Gambino with Bruce Baird and Bob Mortensen. Thank you for coming this evening.

Speaking -- from DNR working on the CIAP plan, we have David Fruge, Will Norman and Greg Grandy, who are going to speak to you later this evening about that plan.

The team members we have this evening for the master plan are Jon Porthouse. Jon. As I said earlier, Juanita Russell. Jean Cowan, Ricky Brouillette, Larry Ardoin, Norwyn Johnson and Andrew Beall that will later

give you details on the State's annual plan.

As Sidney said, we have three plans to discuss this evening, the master plan, the annual plan and the CIAP plan. The master plan lays out a vision for the future of coastal Louisiana.

If you will excuse me, I'm going to put this a little lower, maybe it will travel a little better.

The annual and CIAP plans are the first draft of implementation of the master plan. This is the draft. Copies of this are available online at www.louisianacoastalplanning.org along with appendices, and the Executive Summary from that Master Plan is part of the handouts this evening.

There are four objectives to the Master Plan. We know that we need to reduce risk to our communities, restore sustainability to the coastal ecosystem, maintain a diverse array of fish and wildlife habitats. We know that we need

to sustain Louisiana's unique heritage and culture.

This is the time line for the Master Plan. The team has put together in February of 2006, and this is where we are today, and the end of April we hopefully will be submitting this plan to the Legislature for their approval.

There are three large planning efforts that are ongoing right now, LRA regional planning process, Louisiana Speaks, the Corps LACPR process and the CPRA Master Plan. What I want to assure you this evening, I'm not going to go into detail about each of these plans, are that all three plans are working together. They are cognizant of one another and we are cooperating with one another.

These totals are from work that the IPT has done with the Corps. In fact, this was a teleconference that we were having with the Governor.

This graphic, which is from the Lake Ponchartrain Basin Foundation, kind

of shows a little bit about the responsibility of the CPRA and how that relates to the Louisiana Speaks planning process.

As you can see, our responsibility is to lay down the foundation for the actual protection and restoration of this coast and Louisiana Speaks can build on that process with community growth issues. And all of these plans are sharing data and resources.

Back in November of 2006, after extensive stakeholder involvement, we released a preliminary draft plan. We had public meetings. We had a scientific review by the the LCA, Area Ecosystem Restoration Science Board, by the Science and Engineering Review Team, both groups composed of distinguished scientists from all over the United States. We had nine public meetings.

And then what have we heard from that process? First, we heard that it looked good. It read well. It was clear. It was direct. The concept of

restoration and hurricane protection being integrated was praised. People realized and told us that we are making real progress towards solutions.

We also heard that protection and restoration expectations may not always be achievable, that protection of a sustainable restoration may not always be compatible, that the scale of necessary restoration actions will shift natural resource distribution.

There is a great need for rapid advances in science and technology, but there is also a great need for enhanced dialogue between scientists, planners and the public.

We know that there is climate change that is happening. The sea level will rise and there are changes in rainfall patterns occurring. We know that we need to look more closely at the effects of levies on hydrology and the effects of river diversions on hydrology. There is also a question focused on the effectiveness of marsh

creation by dredging.

In that preliminary draft plan, deliberately we did not establish priorities. We were told establish priorities, we want to see what is important, how the projects will come online. Prioritize systemic projects, prioritize quick fix projects. It was also recognized that policy, legislative and institutional issues are just as important as the constructible projects and need to also have a high priority.

We heard that there was a perception that ecosystem restoration was a secondary priority. We heard that there was concern that plan implementation, specifically large river diversions, would affect people's livelihoods. Some people were concerned that the report was describing features with too much certainty. Some reviewers were concerned that the plan submitted may not be technically feasible. There was concern that climate change challenges sustainability, that costs

would be too high, that some strategies may not work as intended, that some targeted protection levels may not be achievable.

We also heard that many citizens of the coastal zone expressed the opinion that the targeted levels of protection were too low. We heard this from Terrebonne Parish, Plaquemines Parish and Lafourche Parish.

We also heard, Where is the project? You need to put this project on, you need to take this project off. We also had received many comments that are not usable at this stage of a broad concept look at what has happened, but that will also be useful later in the process when we get to a project specific level of designing structure.

Many reviewers commented on the plan management framework. We need to maintain integration in program management. We need to define the decision-making processes. We need to define an adaptive implementation

program.

So what did we do with this? How were these comments considered and incorporated? The draft Master Plan was issued at the beginning of this month. It consists of a main report, 11 appendices. Some of these are more than a thousand pages long. All are online and available. The main report is also available at the parish library. We clarified our message. We added a chapter to the main report to more explicitly acknowledge scientific and technical challenges inherent in the plan. We revised maps and text to better convey relative levels of certainty of measures. We added discussion of the prioritization process. Project specific priorities, however, are defined in the annual plan, and we worked with CIAP to assure priority focus. We clarified the relationship between actions needed to achieve a sustainable landscape and sustainable hurricane protection. Both

are needed. We added discussion of long-term management needs, utilizing an adaptive management framework. We recognized that restoring sustainability to the coastal landscape is the backbone of what we are doing, that we need to maximize the use of the river and its resources. That includes restoration of system hydrology, the land building diversions as well as the land sustaining diversions.

We recognize that sustaining critical land forms is important. We need to take control of hydrology of the navigation channels. We need to do marsh creation with dredged material. We need to do barrier shoreline restoration, ridge restoration and shoreline stable renovation are important. We need to look at the sustainability of the delta plain.

I'll pull out the little pointer. We will go over a little bit. This map is in the handout that you received this evening and I think the colors are going

to show up a little bit more clearly on what you have, but we are looking at the barrier island restoration in here. We are looking at managing the Chandeleur Islands. We are looking at a large river diversion somewhere in this area. We are looking at the smaller roads and water improvement control in here. All of this area of the water management area. We are looking at moving water along in this area controlling it. The green areas in here are marsh restoration. You see all of that up in here and here and along in here.

In the Chenier Plain we are looking at similar concepts. There is some shore stabilization in this area. We are looking at moving water along the navigable water channels. We are looking at maintaining and improving the evacuation routes. We are looking at marsh creation in these (inaudible) areas in here, and we are looking also at water management in these paler blue areas. And, again, all of these show up

clearly in you handouts and the legends are there.

Reducing risk to the community based on restored ecosystem and sustainable landscape. It also includes looking at nonstructural measuring and recognizing no matter what you do, that these will be necessary in the future. That includes elevated homes and businesses, improved building codes, evacuation planning, land use planning.

Insurance is a very important issue. Hazard mitigation planning and implementation. And levies and flood gates are an important part of that picture, a key part of that picture.

And reducing risk to the community. The solid lines represent locations of existing levies and we are showing the Morganza to the Gulf Project. Although it's not built, construction has started on it and it is in the WRDA Bill.

We are also in here, there is color coding to indicate a greater than

100-year protection in the blue areas. The red is indicating 100-year protection, and the purple is indicating maintaining the existing authorized protection.

In the Chenier Plain we recognize that there are two large urban areas, in the Lafayette area and the Lake Charles area, and both of these areas will require protection, although we do not know to what detail at this time. We are also looking at actively managing the existing features provided by the Cheniers and the roadway through here and the stabilization of the GIWW shoreline.

The MRGO, we are recommending that it be immediately plugged. We recognize that there are economic issues with that plugging and those need to be addressed, but there will be an immediate earthen plug, we can then proceed and address those other issues.

And as part of it, we are also looking at the marked restoration in

this area. In Plaquemines Parish, we are looking at a major diversion in the lower area of Plaquemines without a specific location detailed yet. We are looking at maintaining authorized level of these levies and we are looking at the minor, lesser diversions in here to sustain the marshes and improve them.

The implementation process. We need to establish a process by identifying priority actions within the annual planning framework. We need to develop an adaptive implementation framework to focus scientific and technical advances and promote program learning. We need to develop the standard process for revising the Master Plan in a deliberate manner in the future while maintaining focus.

We recognize that there are challenges to the implementation of this plan. It's dependent on resolving several key policy, legislative and institutional issues. We have to develop a structure for Master Plan

implementation that maintains the focus and the integration of the program. We must focus Federal involvement in plan implementation including process modifications to speed up implementation. We need effective mechanisms for focusing land use regulations. Once the levee is built, it does not mean that it's safe to build on the other side. There will be areas that will not be able to be developed that need to be maintained as wetlands.

We must develop fair, equitable and expedient method for acquiring surface land rights for project implementation and we must establish a strategy for preserving and managing our coastal parts.

Funding the program. Ms. Coffee talked earlier about some of these issues. We know that the total Master Plan will be in excess of 50 billion, but the typical cost share would require that State match be at least 20 billion. Existing state funding sources total

approximately 150 to 200 million a year. The OCS revenue sharing estimates would increase this by 20 million a year until 2017, then by approximately 4 to 600 million a year every year thereafter. That existing and projected state funding sources can be utilized as match for authorized Federal funds but we know that additional funding will be needed. This challenges us to maximize and leverage the existing funding sources, to seek additional funding sources, and to prioritize appropriately.

We need to identify urgent early actions. These are measures that will reduce key uncertainties for future plan implementation. They include operational modifications to existing projects when those modifications may deliver rapid improvements. They include measures that deliver the highest priority outcomes, and this includes hurricane protection for our highest asset, highest risk areas. Landscape features that sustain or

restore hydrologic area regime.

We need to restore natural processes to areas of high projected land loss and measures that sustain or improves processes critical to the socioeconomic viability of an existing community.

Sequencing urgent early actions. We need to recognize that objectives can be achieved quickly in a balanced manner, and we also need to recognize that time scales are dependent upon resource availability including funding, manpower, time.

So how do we begin doing this? What's our first step? I'm going to turn the program over to Andrew. He's going to talk about one of those first steps, our State Annual Plan.

MR. BEALL:

Thank you. As Michelle indicated, what I'd like to talk to you about is the FY2008 Annual Plan. Every year we come out to you-all and talk to you about the expenditures that are being

requested by the implementing agencies, DNR and DOTD for coastal protection and restoration. However, this year is slightly different. We have that information for you. It's in the handout that resembles this slide up here.

But we also want to talk to you briefly about the outcome of the natural plan prioritization. Again, both of these topics can be found in more detail in the handouts you have.

Michelle went through the process of identifying these urgent early actions. What we try to do is take those urgent early actions and kind of group them into categories that will provide synergies and this is an attempt to summarize some of those synergies.

What we are looking at are things like large scale planning. This includes the Mississippi River Delta Management, the Chenier Plain Freshwater and Sediment Resource Allocation. The coast -- things of that is coastwide

programatic measures. How we can ramp up the program so there can be construction on site as quickly in the near term as possible. Focus research monitoring and benefits of use program, looks at nonstructural and evacuation planning, hurricane protection where the early work will concentrate on the highest assets and the highest areas at risk. Specifically falling on the closure of MRGO and following ecosystem restoration.

Restoration of critical land forms, such things as land bridges, marsh creation, barrier shorelines, operation and sizing and diversion of the Mississippi and Atchafalaya water, which is water, the greatest resource we have. And this has to be used in a coordinated and balanced manner as well as water shed management.

Looking at -- Michelle talked to you also about complete construction for all the measures in the plan, cost in excess of $50 billion. We took that

estimate and looked at the first three years, 2008, '09, '10, and looked at it based on those early action synergies and seeing that in the first year, next year, FY'08, it's going to cost approximately $126 million. That's going to ramp up through 575 million in just the near term. And that increase in spending is what you see an increase in spending on, to get to construction as quickly as possible on critical measures. With this knowledge of this need for this ramp up, we also recognize the fact that we have to need and aggressively seek new resources of funding.

This specifically is starting to talk about what the implementing agencies need to do in the near term in FY'08. If the final Master Plan has not been submitted to or approved by the Legislature and implementing agencies, propose a budget, request that supports implementation of the Master Plan as well as carrying forward ongoing

efforts.

Real briefly you see this 54 percent here. That's for planning, engineering and design, and right now that's the majority of the work that's being done and that's solely as an effort of implementing the Master Plan. We know there are measures that we need to get to quickly and aggressively. 22 percent of this is also construction in FY'08 and that relies greatly on synergies but ongoing programs, things like CIAP you will hear Dave talk about -- Greg, excuse me, talk about it in the near -- shortly.

But then also we realize in FY'09 and FY'10 that that graph will change to be the lion share of construction activities.

Real briefly, I also want to talk to you in a little bit detail about what some of those activities are ongoing within each of those categories.

Under planning, engineering and design, you are looking at ecosystem

restoration at the closure the CIAP program, LCA program and more specifically (inaudible), finish that design.

Hurricane protection for metro New Orleans and Morganza to the Gulf project, Donaldsonville to the Gulf project. For construction, under ecosystem restoration, again, CIAP construction activities as well as CWPPRA. Hurricane and protection and construction activities to be ongoing in Grand Isle, Westbank, New Orleans and also Morganza to the Gulf.

For operations and maintenance, taking care of current constructions that are out there, current activities that are out there, again, CWPPRA freshwater diversions, their state only projects that have been built that need to be maintained as well as the barrier island monitor program. And, again, hurricane protection for levee inspection program.

Finally, two things, science and

technology program, we need to ensure that we are moving forward with the science technology program to date. Future actions and future decisions can be made with the best available knowledge. We always need to be investing into the future.

And finally the state only programs sets us up for handling future emergencies as well as the beneficial use of small dredge and public outreach programs.

With that, I'd like to turn it over to Greg, who will go into more detail about the activities.

MR. GRANDY:

Good evening. Before I get into the presentation on CIAP, I just want to take a minute to thank all of the people with the local parishes, the 19 coastal parishes in Louisiana who worked so hard to get their part of the plan together. This isn't just the State plan that I'm presenting tonight. It's also the plan for the 19 coastal parishes and how

their funding will be spent. Particularly we appreciate their work over the last year in 2006 when they had a tremendous amount of work. Their regular work, FEMA work, LRA work, disruption in their personal lives. Then we added this request for CIAP on top of it. Not only were their answers to our calls timely, but also we appreciate the quality of the work. And locally those folks in Plaquemines Parish, the CIAP point contacts, Mr. Andy MacInnes in St. Bernard Parish, Mr. Charles Rapel in Orleans Parish, Ms. Winecka Fisher in Hugh P. Long Parish. In Jefferson Parish, Ms. Marty Winter. In St. Charles Parish, Mr. Earl Matherne. St. John's Parish, Ms. Adrian Labal. St. Tammany, Mr. Greg Gordon. In Livingston, Donald Burgess, and Tim Fuller, Mr. Morris Jordon. We appreciate their efforts and also the other efforts of the local parishes.

All right. To get into the Coastal Impact Assistance Program, these

were funds that were authorized by the Energy Policy Act of 2005. Back in August of 2005 is when they came to the state of Louisiana and five other states. This was in August before the storms. I know it seems like a long time ago, but that was August of 2005 when this was signed. It's estimated that Louisiana and our coastal parishes will receive approximately $523 million. The State will receive 65 percent of that fund over four years and the parishes will receive 35 percent.

There are five authorized uses of the program. The first three in general are conservation restoration protection of our coastal areas. The fourth is planning and administrative costs associated with complying with the act of CIAP, and then the fifth is mitigation of impacts of offshore continental shelf, OCS, activities through funding of infrastructure projects and public service needs. The last two categories had a cap of 23

percent for the State and for the parishes and not only for the total but across each annual year.

The funding requirements, the State must submit a plan to the Minerals Management Service and that plan has to cover the State's uses and all 19 parishes. That plan has to be approved before the MMS will receive grants, and that will be our funding instrument between the State and MMS, between the parishes and the Minerals Management Service.

The projects that are included in the plan, again, the State-funded projects, the parish-funded projects and the cost-shared projects. The plan we are putting together is the plan four years of funding. Some of the other states are doing two, two-year plans or four, one-year plans. We are going to do one, four-year plan, but we also allow for revision of the plan as we move forward in time.

The plan development actions to

date. Back in early 2006 we established the goals and objectives and criteria on how we would evaluate the projects. We held five initial public meetings in, I believe it was February 17th of 2006. In Metairie we had one of the public meetings where we discussed with the public what the goals and objectives were, how anyone could propose a project for CIAP funding. We briefed agencies, parishes, the CPRA, the Government Coastal Commission, CWPPRA, anybody else who will sit down and listen to us talk about the CIAP program. We worked very closely with the 19 coastal parishes on their proposals. We solicited proposals and May 22nd of last year we placed all of the proposals on the DNR website, DNR CIAP website, and we also held two regional open house meetings in June of 2006 to review those proposals and receive comments from the public on them. The proposals are still on the website if anybody would like to go back and look at those.

We evaluated the proposals and selected the projects for State approval, for CIAP funding for State dollars, and then began to work back with the parishes on helping them refine their proposals. And also, as mentioned earlier, we ensured that the CIAP proposals were consistent with the draft coastal Master Plan that's been presented tonight. We wanted to make sure as we went forward with our actions they were consistent with the Master Plan we had developed.

We had two major goals. The first goal, restoration, conservation. We wanted to implement support and accelerate division of coastal restoration. It was articulated in the Coast 2050 plan, in a LCA plan, in a number of other collaborative restoration and conservation planning efforts. We didn't feel like we needed to reinvent the wheel. We have already identified some of the problems in the state with the wetlands and strategies

we could use to implement it. We wanted to move forward and identify projects that would help us achieve those strategies and protect our wetlands. We wanted -- particularly after Katrina and Rita, we wanted projects that would also help reduce coastal wetland loss. We wanted projects that would work in synergy with other restoration and coastal protection projects and also projects at least some of which could be implemented in the near term.

The second goal, to implement, support and accelerate coastal infrastructure projects which mitigate onshore OCS-related impacts, especially those that directly benefit OCS oil and gas exploration and production, those that work in synergy with restoration and protection projects, and also those that can be implemented in the near term.

The evaluation of the project proposals, we received 337 proposals for CIAP funding. 253 of those involved the

State's share of funding, 84 proposals involved the parishes' share of funds. Including overlap, there was at least $3.8 billion of State's CIAP share requested. For every dollar of funding that we had, we had $10 of projects that were requested. There was a tremendous amount of competition for these funds.

So the selection process, DNR, we had an external site review. We included members from the CPRA planning teams that evaluated proposals initially. We reviewed projects first to make sure they met the five initial uses that are in the legislation. If it didn't meet one of those legislative uses, it went off to the side and continued further review of the other projects. DNR recommended a list of projects to the CIAP project selection committee, and that selection committee actually selected the draft project list that I'll show you in a few minutes. We released the draft plan February 16th and we have public hearings, as was

discussed, we were in Houma, Lake Charles last night, we are here tonight, we will be in Abbeville tomorrow night.

DNR, after all the comments come in April 2nd, we will resolve any of those comments. The final plan, we will submit that to the CPRA and receive approval from them, and then submit that final plan to the Minerals Management Service for their review hopefully in May of this year.

The external review, reviewed 66 of the proposals and we had 11 scientists led by Dr. Robert Twilley of LSU. In addition, after that, that external review, we had a DNR technical review panel that looked at the proposals, he took into consideration the science panel findings and other information that we had, had generated through in-house analysis. We recommended a preliminary list of projects to the CIAP selection committee.

That selection committee was

composed of members of the Governor's Office of Coastal Affairs, Department of Natural Resources, Department of Environmental Quality, Wildlife and Fisheries, Agriculture and Forestry and also the Transportation and Development, and they were the ones who selected the projects that are in the list.

The projects that are supported with the State funds, we have selected 18 restoration and conservation projects that compose 80 percent of the funds that are coming to the State. There are five infrastructure projects, and that's approximately 20 percent of the funds coming to the State.

On both sides, there are cost shares coming to the parishes that are included in both of those areas.

The restoration and conservation projects, we will go ahead and get into these, the groupings in the different areas.

This first grouping is Enhanced Management of Mississippi River Water

and Sediment. The first project is the Violet Diversion process. This is a 5000 CFS diversion, St. Bernard Parish, water, nutrients will get into the central wetlands and benefit those wetlands.

The next project is the Mississippi River Long Distance Sediment Pipeline Project. This is a pipeline that will go from the Mississippi River approximately somewhere in the Bayou Dupont, Myrtle Grove area. It will go across Plaquemines, Jefferson, and all the way to Lafourche Parish, approximately 20 to 25 miles long. This project is intended to build a conduit whereby we will do some marsh creation through this project but also to provide the infrastructure for future marsh creations to come back in and be able to move sediment long distances across the Barataria wetlands.

The Blind River Siphon Project is in St. James Parish. This project will take Mississippi River water and

sediment, move it through the Blind River up into the coastal forest in the upper swamp area.

The fourth project, Bayou Lamoque flood gate removal, lower Plaquemines Parish. This was one of the first diversions built in Louisiana in the 1950s. Approximately 12,000 CFS Mississippi River water can move through this diversion. It has not been operational over the last few years. We want to go back in, remove those flood gates out, drain it out, put gaps in some of the levies to allow that water and sediment to start to build wetlands down in lower Plaquemines Parish.

The fourth one, the Delta Management Strategic Planning, this is an initiative, continuing evaluation of the lower Mississippi River to maximize environmental and economic uses of the river's resources.

The next grouping of projects are various shoreline restoration and protection projects. The first one is

the East Grand Terre Island Restoration Project. This was formerly a CWPPRA project. It was engineered and designed by CWPPRA. It's in Plaquemines Parish just east of Grand Isle. The project will do barrier shoreline nourishment and then that barrier marsh creation on East Grand Terre Island.

The next project is the Rockefeller Refuge Gulf Shoreline Demo. This is in Cameron Parish along the Rockefeller Refuge. What we do is three or four techniques along that shoreline. It's -- the erosion rate is 50 to 100 feet per year along the shoreline. It's a clay shoreline with marsh that you can literally stand there and watch it fall into the Gulf of Mexico. We are going to need to use some techniques out there that haven't been used anywhere else in Louisiana, so we are hoping to learn a significant amount from this particular project and expand on it later.

The next grouping of projects are Protection and Restoration of Critical

Land Bridges. The first one is the Orleans Land Bridge Shoreline Protection and Marsh Creation along the northern rim from Lake Warren, from Alligator Point all the way to Bayou Bienvenue. Shoreline protection in the golden triangle area in the lower left-hand corner, approximately 200 acres of marsh creation. Orleans Parish is cost-sharing approximately $15 million with the State on this project.

The next project is the Barataria Land Bridge Dedicated Dredging, $18 million. This is the project where CIAP in CWPPRA, Coastal Wetlands Planning Protection and Restoration Act, are going to partner on this project. CIAP is going to put approximately 60 percent of the funds into it, and CWPPRA, approximately 14 percent of the funds into building this entire project in Barataria Land Bridge in Jefferson Parish.

Interior shoreline protection, there is actually two groupings here.

The first two projects on Federal navigation channels, Freshwater Bayou Shoreline Protection Project in Vermillion Parish. This is to shore up the western side primarily of the freshwater bayou where there are some areas that have breached and some other areas that are beginning to breach in that shoreline and threaten the freshwater marshes and the Mermentau basin.

The second one is GIWW, Gulf Intercoastal Water Way, critical areas in Terrebonne Parish. This is part of a previously-designed CWPPRA project. There are four breaches along the GIWW in this area. Those breaches that are currently opening and they are allowing a lot of water to flow through. This project will go and plug those breaches and do shoreline protection along the GIWW.

The second two are interior shoreline lakes in Cameron Parish, Grand Lake Shoreline Protection. Again, this

is another CWPPRA project. CIAP will build approximately 85 percent of this project. At a task force meeting last week, CWPPRA voted to construct the remaining 15 percent and also to pick up the long-term operations and maintenance of this project.

Then the final one, Lake Salvador Shoreline Protection Project in St. Charles Parish, this is Phase III of the third phase of the western shoreline protection in Lake Salvador. We are really looking forward to getting this project done in coordination with St. Charles Parish.

Marsh creation with dredged material. The top item, beneficial use of dredged sediment of Federal navigation channel maintenance. These are dredging projects with the Corps of Engineers to do maintenance along Federal channels to pay the incremental cost difference to allow that material to be beneficially used. There are some fantastic opportunities, particularly

upon the Calcasieu Ship Channel, but we are looking at other opportunities in other parishes, as well. We are probably going to buy land rights to acquire conservation easements to do environment clearance or to construct containment where that dredge material can be pumped in behind it.

The last item, fringe marsh repair via dedicated dredging, lower Plaquemines Parish, this is a project that primarily Plaquemines Parish is putting up the funding for but the State is going to cost share with the parish, as well, to rebuild some of the marshes that fringe, they chose the levee in lower Plaquemines Parish.

Coastal Forest Initiative, this is a project, will protect some of our coastal forests in Louisiana. To acquire conservation easements from willing land sellers. Now, these are coastal forests, primarily, but it can also include maritime forests, areas in Fourchon or down in Cameron Parish, as

well. Some of the funds could be used to implement restoration projects to approve hydrology or to do vegetative planting, and also some of these projects could be cited in conjunction with wetland assimilation projects that would enhance the coastal forest restoration and sustainability.

That brings us to the last grouping of restoration projects, the Central Wetlands Assimilation Project. This project, again, is near the central wetlands in Bayou Bienvenue to use secondarily treated wastewater from Worthing to St. Bernard Parish, to take that water that's got heavy duty nutrient loads and put it into the marshes in Bayou Bienvenue and central wetlands. Areas that have been impacted by salinity that's come in from the MRGO, areas that used to be beautiful cypress swamps, right now is open water. So we are really looking forward to working with the sewage and water board of St. Bernard and Orleans Parish on

this project.

And then the last one, Performance Evaluation and Science Monitoring. We want to evaluate these projects to make sure that there is biological and engineering goals that we have set up in the design phase of these projects and allow us to better design projects in the future.

The infrastructure projects that we have for State funding, the first one, the IHNC Lock, which is part of the Morganza to the Gulf Flood Protection, IHNC is a major conduit for ships that service the OCS, Offshore Continental Shelf, in the Gulf of Mexico, and this will build a lock that would help not only keep salinity out but also be a part of the flood protection system from the Morganza to the Gulf.

The second one is the LA-1 Improvements. This is the stretch of road from Fourchon to Leeville. In Leeville, where they are building the new bridge currently, this would take it

from Leeville down to Fourchon.

The last three are basically road improvement projects in Iberia, St. Mary, Cameron Parish on roads that have been heavily impacted by traffic from trucks that support the OCS activities in those parishes.

CIAP Project Synergy, I'll just talk briefly about this. One of the projects I talked about earlier, East Grand Terre Island, which is the yellow chevron at the center of this area, this is the Barataria Barrier shoreline. There are a number of other projects that are either planned, that have been constructed or are getting ready to go into construction along with this reach, and the East Grand Terre Island hopefully will work in concert with those projects when it's constructed. We just finished construction on the Papillon to Pass Labert Unit, which is one of the red areas to the right. We are hoping later this year to move the construction on the Papillon, the Grand

Bayou Pass, and on the Pelican Island two other of the red CWPPRA projects that are up there.

In addition, we are working and we hope to have the feasibility study completed with the Corps of Engineers on Shell Island and the Caminada headlands reach and to present that for funding through WRDA next year. So this project will work in coordination with a number of other projects along this area.

There are other projects like the Freshwater Bayou, the Maurepas Swamp, the Orleans Land Bridge and Central Wetlands and the Barataria Land Bridge Project that have other projects synergies, as well.

We have been directed by Secretary Angelle that we will begin work on a number of these projects before the plan is approved and before we receive grants from the Minerals Management Service. This is allowable in the law. We have some funding available through the State Trust Fund on wetland restoration. We

are going to begin work on these projects and reimburse ourselves later when the grant money becomes available through MMS. Those seven projects, three of them will go to construction, East Grand Terre Island, the Barataria Land Bridge and the Grand Lake Project, one of them is land acquisition for the Coastal Forest Initiative and then three others will begin the engineering and design, Violet Diversion, the Mississippi River Sediment and Delivery Pipeline and the Bayou Lamoque Bridges. We will begin those in May of this year, begin the process.

Just briefly, I'll talk about the projects to be supported with the parishes' CIAP funds. 86 percent of parishes' CIAP funds are dedicated to restoration and conservations project program, and 14 percent of the funds are dedicated for infrastructure, public service needs, planning and administration.

Just a brief review of these

projects. The parishes have included barrier shoreline protection and restoration, marsh creation and restoration, aquatic habitat restoration of the Atchafalaya Basin, vegetative plantings and the OCS-related roadwork. There are details of the parish projects and of the State projects, and those are included in the -- we have an Executive Summary that was on the front table. If you didn't get a copy and you would like to, grab a copy on the way out.

The tentative plan we are working on at this point in time, we released the draft CIAP plan for review at the CPRA meeting February 6th of this year. We are in the process of public hearings. We have already briefed the CPRA and the Legislature and we plan to brief the Governor's Coastal Commission next month. We hope to receive the comments and resolve those and submit the plan to the Minerals Management Service by May 1st, and we hope to obtain CIAP approval from MMS in late

August.

Development of the plan, once the plan is approved, we have got to then move out, get the grants approved so that the money can begin to flow between the State and the parishes and then start the engineering, designing, construction, permitting of these projects so the parishes know we have begun to look at obstacles, future obstacles that we need to overcome, and basically get this moving as fast as we can.

As I said before, the Executive Summary was out in front. We didn't put a copy of the full draft plan, but if you would like, you can go to the website. The full draft plan is about 400 pages. You can go and see that as much as you want. On page 10 of this summary, there is the website. If you don't want to take the plan home, don't want to take the summary home, you can Google Louisiana CIAP and find the information on there.

MS. DESHOTELS:

Thank you, Greg.

So what is next? This is our current schedule. One thing that I want to point out is that our public comment period on all three plans ends on April 2nd. So we are going to be taking comments this evening, listen to what people have to say, and as Greg pointed out earlier in Houma this week, in Lake Charles, here tonight, tomorrow in Abbeville, but you are also welcome, you can send in comments by e-mail through the louisianacoastalplanning.org site. You may write by old fashion mail with a stamp. Our mailing address is on the handout on the table. We welcome all of your input. We do ask that we have it in hand by April 2nd, however, because we are on a very tight time schedule. The sooner you get it to us, the more quickly we can incorporate your comments into our consideration process. We are on schedule submitting to the CPRA and to the Legislature.

We are going to go ahead and start taking public comments. Let me take a quick count of the cards I have in hand.

Okay. I have got a few cards, and so I will ask that comments to be restricted to no more than five minutes.

Randy Moertle.

MR. MOERTLE:

Michelle, can we put up a regional map?

MS. DESHOTELS:

Yes.

MR. MOERTLE:

And can we borrow a pointer?

MS. DESHOTELS:

I will allow you to use my pointer.

MR. MOERTLE:

Very good. Thank you, ma'am. How do you turn it on? Oh, there it is.

Thank you very much. My name is Randy Moertle. I'm representing the Biloxi Marshlands Corporation and the Lake Eugenie Land Development Company. And we are the landowners here in St.

Bernard Parish. We own the majority of this property right here, both north and also right in here south of the MRGO. I want to bring up several points in the plan, please, the first one being the Mississippi River Diversion at Violet Canal. CIAP is proposing to spend $49 million to put in a diversion right here in Violet, whereas the State plan is also proposing to put in a diversion. We do not think that 5,000 cubic feet per second is large enough to allow sustainability and freshwater introduction into the Biloxi marshes. CIAP is using that money just to freshen up the central wetlands. And when you look at Objective 2 of the State plan, it says to promote a sustainable coastal ecosystem by harnessing the processes of the natural system. The only way we are going to sustain these marshes up here is going to be through fresh water coming out of the Mississippi River. John Lopez I'm sure is going to say more about it, but we are afraid that we are

going to spend $50 million here and that might cause a larger diversion to not happen, and say, well, it's already happened, you already have a diversion, whereas we need a much larger diversion to go ahead and get sustainability from the Biloxi marshes. That's Point 1.

The second point is the Chandeleur Islands are basically being left out. They are just saying, well, let Fish and Wildlife Service handle it. That is a barrier island. We personally believe that it does provide protection. It is the first line of defense. I don't think Fish and Wildlife Services ever done much out there. I don't think they will do anything out there, and I think we are losing our first line of defense for New Orleans area by not doing more with the Chandeleur Islands. Junior Rodriguez, I'm sure, will tell y'all more about that.

The third point is the multiple line of defense, also. It has been our experience and we have been in this

coastal restoration business a long time, but we are real concerned, right here we have shoreline protection on the Biloxi marshes, whereas down here on the lower end we have absolutely nothing. And it's been our experience when you are after other funding sources such as CPRA or grant money or anything else, they are going to follow the State plan. I would like to see very much some shading and some arrows here so that even if the State doesn't plan on spending a lot of money, it's part of the State plan. Because when you read this stuff closely, even the LCA plan, it talks about that is one of the critical areas, is the Biloxi marsh. It is protecting the New Orleans area. If you allow this to move all the way to Bayou la Loutre Ridge, you are losing five miles of your first line of defense.

So we do need to include shaded in, you know, even if it ends up Priority 2, it needs to be a part of the

plan because what's happening here is it's being left out and the first line of defense is five miles inland as the Bayou la Loutre Ridge.

Okay. The last item, and what we consider one of the more important items, is the MRGO is -- it is proposed by the State Annual Plan that there is going to be an earthen plug. And I've lost my white light. There it is.

So we have an earthen plug that's put in here right in the MRGO. What that's going to do is it's going to divert all the traffic that presently uses the MRGO up the Bayou la Loutre and out this way or it's going to try and go around that way.

The problem, if we do not include some kind of shoreline protection of Bayou la Loutre, we already have huge erosion problems. We have got 6 foot to 8 foot cut banks. We have some places where it's eroded directly into the marsh already. And what we are going to do, all the erosion and wake problems

that have been caused along the MRGO, we've armored it and put rock all up and down it now to stop the wake erosion, all we are going to do is convert it directly into Bayou la Loutre and it's going to break right into the marsh. And I know we have other plans for ridge restoration and everything else, but any plugging that goes on there and diverting the traffic that way, we already have bad erosion problems, we need to include some kind of rock armoring on the bank line or any kind of ridge restoration or anything else we do is just going to be worthless and we are just going to make more and more erosion problems for the Biloxi marsh.

Okay. And that pretty well wraps up all I've got to say. Thank y'all very much, and I want to say it again, I know I said it in Houma the other day, I appreciate very much all the hard work that everybody has done, all of y'all, you have used us as stakeholders, as landowners. There has been an open

door. You have come and talked to our landowners association. We very much appreciate all of the help and the input that everybody has given us, and we appreciate having -- and we believe this has been the best process so far where we have actually had a voice through the MRGO deauthorization and throughout this entire process. Thank y'all very much.

MS. DESHOTELS:

Thank you. Dewell Walker.

MR. WALKER:

I'm just a local fisherman down here but I've lived down here in lower Plaquemines my whole life almost. I've seen how the marsh has come and gone, and I'd just like to add a few things today.

Down in lower Plaquemines y'all are talking about getting a big spillway. The river, when it builds land, it's always been from a great flood. The river blocks up and backs up and diverts and goes to another place. It builds land. Never do you build land

by putting freshwater into it. Our system is not a freshwater system, it's a brackish water system. Our plants out there are brackish water plants. When you are going to put a big spillway in, you are putting freshwater in it. It's real cold. It won't work. They will wash land away. If you put the Chandeleur Islands back out to stop the water completely, it will eventually fill in.

My other concern is there is other cuts that he was just talking about up there in Myrtle Grove. The Myrtle Grove project they built a few years back, about 11 years ago, it only been barely open just a little bit. It fills up at the end quickly because of not being opened up wide. I think it said something like 5 million CCs that should be flowing through there. Maybe it will go 1 now. If you don't have some kind of diversion, pipeline diversion to put the silt where you want it, it's hard to make it go. I know y'all are trying to

put it on over there by making the current go on out farther, which is a pretty good plan. Every time you put freshwater you need to stop it first and then move it.

About Bayou Lamoque, y'all are talking about breaking Bayou Lamoque out. It's never hardly been opened. Ever who thought about putting it there was a pretty smart fellow. That's where it was needed. It's been closed over the last 48 years, only one or two years it's been open just a little. Some local fishermans have been trying to keep it open but it still, it's not been doing much. If you take the dam out, you will have a MRGO right there. So far the surge has been coming up the river for the last few storms. It has been stopping somewhere around that diamond area there, about as far as the surge come up from them hurricanes almost gets there. If you open up Bayou Lamoque, Belle Chasse will have your surge then.

For instance, they opened up the structure this year since the storm, they left the structure opened, and they think, well, that will be good, put freshwater, should build land, but yet it didn't. The freshwater run over the islands out from Taylor Pass over to Baptist Collette and tore the islands up. The water went over it. It had no stop. It just pushed land around. If you open up a big spillway, all you are going to do is flush the land you have all the way down to Baptist Collette out. You need to stop at Chandeleur Islands and build Chandeleur Islands up first. It's got to be a closed system. That's the only way land will build, is a closed system.

One of my points was you can't just open up something without checking the other end of the water hose, and that's what happened when you built that.

We have a map, if you can Google on Google Earth, you can see where our

problem lies here in southeast Louisiana. The whole curvature of the Gulf curves these storms into us. If you look back in history over 270 years, there have been 53 floods in southeast Louisiana from hurricanes that went over the levee. You hear about Betsy, you hear about Camille, you hear about Katrina. There is many lives have been killed in lower Plaquemines Parish. How many people will die at a stop sign before you finally put up a stoplight? I think it's time to put a stoplight up in Plaquemines Parish. Thank you.

(Applause.)

MS. DESHOTELS:

Henry J. Rodriguez.

MR. RODRIGUEZ:

You have got to forgive me, Boys. I've got a little age on me. Things don't quite move as well as they used to.

First of all, I want to thank y'all for putting together a real good program, good projects. I think Randy

covered most of my fears that I had and the gentleman that spoke before me. The Chandeleur Islands, I see nothing at all in the program and that kind of disturbs me, particularly when I see all of these big focus items where they want to put big structures across Lake Borgne to stop the water and we just don't want to see them take care of the things that mother nature had there first. Randy covered it quite well. My only problem is I'd like to really emphasize the Chandeleur Islands. And St. Bernard put in a plan for the Chandeleur Islands. I don't know if it fell on deaf ears, and we also had a break water that Randy brought up. And we think that's a doable thing, take the rocks along the MRGO can be used for that break water.

And I'd like to compliment the gentleman that spoke before me, "just a fisherman." The funny part about it is, "just a fisherman"? You know, they don't have the degree that some of you people have. They got it from the

school of hard knocks. They got it the hard way. They know about it because they do it every day, they fish every day. When you are sitting on your backsides and going by the book, these people do it, and we need to listen to the fishermen. Fishermen can give you a lot of knowledge if you are willing to listen. Basically I just want to say yes, y'all have done an excellent job. We are proud of you, and there are some problems with your program, but I think they can be addressed. Thank you.

MS. DESHOTELS:

Thank you, sir.

(Applause.)

MS. DESHOTELS:

Matt Roter?

MR. ROTER:

Hi, my name is Matt Roter. I'm from the Gulf Restoration Network, and first of all, I would like to, like a lot of people are saying, thank you. You guys are putting a lot of information together in a relatively

short period of time and I congratulate y'all.

There are a few things that I would like to address, though, and it kind of got summed up with the map that you had up there with Donaldsonville to the Gulf levee there. I know it was a dashed line, but the line that you had there was the most environmentally destructive alignment that is proposed for the Donaldsonville to the Gulf project. And I think -- put the project aside, I think that is indicative of whenever you just put a map up there and tell the public "This is what we are going to do," even though in the back of your mind you know that you have a ton of options. The public, people out here are smart enough to look at options and decide what they think is the best and give that input, but if they aren't given that map, if they aren't given those options to look at, then they can't make an informed decision. I think it's really important that people

are given those options and know that different options are on the table and that a big wall that's going to cut off half the marsh there isn't the only option to protect ourselves. There are other options that are much more environmentally friendly and friendly to the people and in the end are going to take less maintenance because I've seen a lot of reliance, especially when they are talking about that and other levee alignments, is this leaky levee thing, which in theory sounds great. You can put the levee there and the water can get through, the hydrology is maintained. But you are talking about lots of maintenance and you are talking about science and engineering that hasn't been proven on a large scale.

So I think it's really important before to put our eggs in one basket that this idea of leaky levies is not just thought of as a panacea because I frankly don't believe it's going to work on such a large scale and having the

continued maintenance that is going to have to happen in perpetuity.

And I really urge y'all to take a look at it and have some outside people take a look at this idea of leaky levies before we start putting all of our faith in that and trying to make our processes as natural as possible. And we live in an engineering system and I recognize that, but we have to make sure that that engineering isn't going to even exacerbate the problem more. So I urge you to take into consideration the most natural solutions as possible while still trying to keep with the four goals of the program, which I think are very admirable goals. Thanks.

MS. DESHOTELS:

Thank you, sir. Zane Melancon.

MR. MELANCON:

I decline.

MS. DESHOTELS:

Dan Arceneaux.

MR. ARCENEAUX:

Dan Arceneaux, St. Bernard Parish

Coastal Zone. I'd like somebody to just add the Lake Ponchartrain barrier plan to Pearl River. Why you people even up Plaquemines Parish and St. Bernard Parish on that? You have got about a 15-mile stretch that took a real beating from Katrina and to stop all of the Ponchartrain basin barrier plan, why can't we continue right across from that 15 miles and save some of Plaquemines Parish, too?

(Applause.)

MS. DESHOTELS:

We will take that under consideration, sir.

MR. ARCENEAUX:

Thank you.

MS. DESHOTELS:

Don Serpas.

MR. SERPAS:

Would you put that map back up?

MS. DESHOTELS:

You can have that.

MR. SERPAS:

Don Serpas, St. Bernard Parish.

Well, it's been my experience, if you have a hole or a ditch to fill in or a cloak, you are doing by filling it in. You don't do it by leaving it there and damming it off. May I borrow your -- I've been fighting for over 17 years to try to get the channel not only closed but pumped in with sand from the Mississippi River and I really believe that all of these things that we are talking about and doing is really not going to solve much problem. Sooner or later one generation beyond ours is going to decide to fill this section in. It's been proven that Lake Borgne has been our main contributor of hurricane surge and flooding because we were flooded -- in my lifetime we have been flooded three times from this area, and the first time, 1947, there was no Ship Channel and we had all our pristine marshes and everything protected. Of course, we didn't have levies inside the -- in the St. Bernard area, we didn't have the levies like we do now.

But, anyway, this is something I really think somebody ought -- nobody's talking about it, they just say closed and they don't say fill in. The thing was dug out, so why not fill it back in?

Freshwater diversions, I really don't think they do much good. We had the Davis Pond Diversion, which is last year's big article in the paper stating that it was a big flop, and we have an Army diversion by ours, and like Junior was saying and the other fisherman, I've been in the Ship Channel since before it was open, so that's over 40 years, and I feel like I'm part of it, and since Katrina, I feel like it's part of me. So I have an understanding of it.

But five years before Hurricane Katrina I watched the current every day because we had a camp right by the locks, the Dupre locks, but this area here from Bayou Thomas across towards Shell Beach, if nothing's done to block the storm surge from this area, we are more or less spinning our wheels because

if a storm from the right direction, nothing's going to hold this water back. I really think that should be considered big time. And I don't see too much about St. Bernard being protected. I can't help but think, and I could be wrong, but this diversion talking about through Violet and this land bridge here at Loutre, it looks like it's to help out the oil industry and the big landowners rather than the property owners in here. I live right around this area right here, and it don't seem like they are protecting us much.

But, anyway, when the freshwater diversions, what we are doing is we are going to dig a canal for freshwater diversion and freshwater and saltwater erodes. So it's just another canal with more erosion, and the benefit from it is not going to -- is not going to pay off. I mean, we can all think, oh, imagine the Grand Canyon being cut by freshwater.

Now, another thing I found that

seemed more foolish now that I'm looking back on it, to retop our levies there, we actually came back in St. Bernard and dug big ponds to get clay to top the levies off and here we are creating a pond or a lagoon, you might say, right inside our levee systems, is more erosion, more water and more erosions. We are just spinning our wheels. And we talk about the Dutch influencing us. My idea is like the Dutch, they think 50 years ahead. So I'm thinking 50 years in the future, if we pump this area in with a barrier all the way across and then pump in behind it, this can be used for, say, 15, 20 years, it can be used for regional airport, which would connect New Orleans, Plaquemines, St. Bernard and across the lake here, St. Tammany, and the rest of the world, really.

The water -- this diversion, we have a diversion at Violet right now and it's been running several years. It doesn't do much good, and we are talking

about putting a much larger one in and -- well, I'm getting -- backing up here. But, anyway, you know, like I said, on the diversions, I don't think they do much good.

But I want to say last thing is on the dumping of the treated sewer and it's going to be talking about this area, I believe, right here, and I need to remind whoever is deciding on it, is that tons and tons of shrimp are caught in that area. Now, how people -- what's going to happen when people eat this stuff, I don't know, if they survive -- the shrimp actually survive.

But this was done in the lower part of St. Bernard and it was dumped into the marsh that's coming out of the -- water that's coming out of Bayou Dupre and Violet, which would be right there, and then going right into Lake Borgne. And if you would see that water, you would never want to eat anything that came out of it. Thank you.

MS. DESHOTELS:

Thank you, sir. Katie Brasted.

MS. BRASTED:

I'm Katie Brasted. I'm president of Woodlands Trail & Park. Woodlands Trail & Park is a regional greenway effort to establish educational, recreational and historical trails, and one of our regions last stands the bottom land hardwoods. Our focus is a 10,000-acre peninsula, which is formed by Orleans and Plaquemines Parish. This area is a critical habitat, right over 100 species of migratory birds. And listening to everyone else talking about our critical coastal issues, I was sort of thinking of not getting up here and saying anything, but it's like I said in David Vitter's office years ago, it costs a lot more money to correct our mistakes. If we use a little money and invest in doing some preventative measures, well, it just makes a lot more sense. And it's nice to see that you have put some money in for the

protection of coastal forests and we would like to offer the opportunity of working with you with our 14 local regional national partners, and funding that's already been dedicated to us, to leverage additional support and do something that's smart for Louisiana. So I'll submit that to you.

MS. DESHOTELS:

Thank you. Thank you. Leo Richardson?

MR. RICHARDSON:

Good evening. I'm Leo Richardson, Executive Director of the Lake Hazard Civic Association on the East Orleans Land Bridge. I'm also here in representation of Venetian Isles, Irish Bayou and the Bayou Savage community. Just some general comments on the application of the coastal management plans, objectives on the New Orleans area and our area. The objectives are to reduce risk to economic assets, restore sustainability to the coastal ecosystem, maintain a diverse array of

habitat for fish and wildlife, and sustain Louisiana's unique heritage and culture. All of those things come together for New Orleans out in the land bridge area.

With respect to the economic assets, right now New Orleans lake front levies are being restored at a great, great national public expense to previously inadequate levels of protection. Lake Ponchartrain Basin Foundation has identified three major lines of defense for New Orleans before the water gets to those levies. That's, as others have called your attention to today, Chandeleur Islands, which are now looking like a broken strand of Mardi Gras beads, Biloxi marshlands, also mentioned, New Orleans land bridge and then surrounding wetlands. We hope that you will continue to take into consideration the combination of those lines of defense and view them holistically along with the barriers on the western side of Lake Borgne for the

St. Bernard area because that becomes the back door to New Orleans.

I have a couple of specific items I'd like to call to your attention. One of them is bank stabilization along the westbank of the Rigolets, which should be identified as an urgent need for attention due to the destabilization or potential destabilization of the East Orleans land bridge that will result from breaching into Lake Catherine. Pretty quickly lose at least 700 acres north of Grand Coin Pocket. It's an imminent threat to Highway 90, Fort Pike, and the Rigolets bridge, should that occur, it's very close to happening.

No. 2, physical restoration and protection of the Chandeleur Island land forms, not just habitat protection, should be identified as a real priority. I agree with everyone who has stood up here to mention that point. And, of course, it's the first stop on the movement of storm surge energy toward

Lake Ponchartrain and the lakefront levies and the northshore and the 850,000 people that live around that basin.

No. 4, the -- as Mr. Moertle mentioned, the western shorelines of the Biloxi marsh really need to be included in your planning and restoration strategy because it leaves a big gap in the barrier plans.

In the area of the East Orleans land bridge, the design for the hundred-year hurricane barrier protection we believe should not be in the form of, as some have referred to it, the great wall of Louisiana. It is a sensitive estergreen environment. We produce 20 percent of all the inland shrimp in Louisiana, five million number one male blue crabs per year are exported from there to Chesapeake. I could go on and on.

But the point we want to make is that the design for that hurricane barrier protection should be a layered

or staged barrier arrangement including the strengthening of the CSX railroad levee, which has a wonderful sand stripe under it with wetlands restoration to the south and engineering oyster reefs in Lake Borgne.

MS. DESHOTELS:

Thank you, sir. John Lopez.

MR. LOPEZ:

John Lopez, Lake Ponchartrain Basin Foundation.

I'd like to hit on one major theme there's been a lot of talk about, diversions and impacts, negative or positive, and diversions are part of the State's master plan, which is welcome, but there are concerns about diversions, and I'd like to try to give you an analogy that maybe sheds lights at least on how I see diversions. You can think of it as a -- freshwater diversion as the human heart. The human heart delivers oxygenated blood and nutrients to the body just as the river delivers freshwater and nutrients and sediments

to the estuary. Where we built estuary, we severed the heart from the rest of the body. And so the people that may be suggesting or applying that diversions are bad altogether, you know, are simply wrong. It's how the estuary works.

The question then becomes, is how do you effectively use diversions considering all the other considerations of fisheries, rebuilding the marsh, flood protection, and all the other environmental issues. Well, if you were a doctor and you were trying to reconnect the heart to the human body, you would -- the doctor could look at the human anatomy and say where the veins are, where the major arteries are.

Well, what is the blueprint for our coast? Well, the way environmentalists see the estuary is through wetland habitats. We have four basic wetland habitats in this coast, and they find the estuary, the gradient and salinity that's necessary for the vegetation and the plants and animals to

function in, the fresh water, the brackish and salt waters, that is the anatomy of our coast. So we need to reconnect the versions that conforms to that anatomy.

Then how do you know what the appropriate anatomy is for the coast? In other words, how do you define these habitat goals? What we have established in the Lake Ponchartrain basin is historic habitat goals that existed prior to all the damage to the coast. These are very clear goals that find fisheries, design of diversions, hydrologic restoration, and we see a lot of those elements in the Ponchartrain basin in the State's master plan, although it's not definitive. There is no clear habitat goals that are in the State's master plan for the Ponchartrain basin or the rest of the coast. And until that's done, we won't know how to connect the heart to the rest of the anatomy. Thank you.

MS. DESHOTELS:

Thank you, sir. Andrew MacInnes.

MR. MacINNES:

Good evening, everyone. My name is Andrew MacInnes. I'm the Coastal Zone Administrator of Plaquemines Parish. A lot of good has come out of these plans and I've really enjoyed the opportunity to work with DNR, the Corps, other State and Federal agencies. I appreciate all of your efforts in bringing this to fruition and allowing the public to comment tonight.

I'd like to preface my comments with a quick quote from the executive summaries that everybody was given a copy of tonight. Levies are crucial aspects of the plan given that many south Louisiana communities are situated in the delta plain of one of the world's major rivers. Many of these communities are historic and integral to the delivery of essential services to the nation, but they would not exist without levies. In recognition of the need for structural protection, levies are

recommended in high risk areas that must be protected to avoid severe consequences for the state and the nation.

If you can bring up the map for Plaquemines Parish, if you don't mind, I can point out what I want to make comments on a little more sensibly.

Right now the CPRA plan has 1 percent protection with levies in the westbank, upper westbank vicinity of Plaquemines Parish down to the Myrtle Grove area. That's a good idea that incorporates the alliance refinery, a very important component of not only Plaquemines but the rest of the state. However, ending the line at the Myrtle Grove area leaves out another approximately 10 to 15 miles of Plaquemines Parish that has absolutely no levee protection whatsoever beyond a small 4 foot ridge. Maintaining existing levee heights, as the purple color up here shows, will not do much for the lower end of the westbank of the

parish, which from Myrtle Grove is approximately 30 to 40 miles.

So my comments are I would like to see that line adjusted further south so that we have 1 percent storm protection beyond Myrtle Grove all the way down to St. Jude, which is where existing Federal levies begin to tie in again, and the Corps has already worked on restoring them to pre-Katrina levels. Otherwise, we are talking about building a house but leaving out one exterior wall. Our protection and our -- our protection from the elements is fruitless if it's not going to make any sense if we leave this glaring omission in the system.

So we would like to see that area incorporated. It's not much more of a stretch to tie it into St. Jude and then at least all of the westbank of Plaquemines Parish has protection, which will allow the operation of Venice, a very important oil and gas community, and that's reflected in the comments in

the Executive Summary. Thank you.

MS. DESHOTELS:

Thank you, sir.

(Applause.)

MS. DESHOTELS:

I have two cards with the name Billy Nungesser on them. Are there two Billy Nungessers here this evening?

MR. NUNGESSER:

Thank you. I'm Billy Nungesser and I'm the newly-elected parish president in Plaquemines Parish. Thank you. Thank y'all for what y'all are doing here tonight.

Let me first say that, you know, Plaquemines Parish needs recommended from this program Federal levies for all of our parish. Obviously we are not going to get hundred-year or 500-year levies in the south end, maybe even not on parts of the eastbank, but by this program recommending Federal levies gives us a chance in Washington to get funding, if not now, in the next session to fund these levies by the State

supporting and recommending that.

You know, it's hard to say the economic benefit to the people that live there. You have got to show some sign of saying, hey, we want you to come back. We want you to build here. We have two facilities recently on the eastbank with over a billion dollars of revenue and ethanol plants going to be built, a cement factory employing over a thousand people that are building now on the promise that we are going to fight hard to get these levies, protect the industry but also protect our people.

On the westbank to not recommend Federal levies to Venice, as my counterpart just said, is like leaving a wall out of a house. Plaquemines Parish has recently stepped up to the plate and funded a study to make Baptiste Collette the corridor of the eastern Gulf. It's 69 miles to that field, over 100 from Mississippi to Alabama. They will not go from Fourchon. If we don't support Plaquemines Parish with Federal levies

all the way to Venice, that project is dead. The Governor has supported $3 million for the complete study to take to Washington to get this project funded. We have also stepped up to the plate with money to engineer a bypass road. So that's the second part of the puzzle. Without Federal levies all the way to Venice, the other two things does not matter. You know, the parish has stepped up to the plate, put up their money and seen the importance of Plaquemines Parish as a whole, east and westbank, to the whole region. Several of the people at the plants on the eastbank will live in St. Bernard and help bring St. Bernard back. It's obvious the whole region, the number of people that work at the chemical plant go offshore out of Venice, if we do not develop Baptiste Collette as the corridor for the eastern Gulf, it will go to Mississippi or Alabama. The companies have said it. It's not debatable. Where will those people

live? Not in Jefferson, not in Orleans, not in St. Bernard or Plaquemines, they will move to another state. At a time when we are recommended to the Federal government to save Louisiana and our region, how can we say we are not going to support the lifeline of Plaquemines Parish?

Today Jefferson Parish supported the Baptiste Collette project. We will go to New Orleans next week. They realize the importance of Venice to the whole economic region as well as we have just signed an agreement with the New Orleans Port because with the MRGO closing, many of those companies will go east or west or they will go to Plaquemines Parish. If we realize how important the port facility is in Plaquemines Parish, not just to Plaquemines, to this whole region, it will save jobs and economic development for the whole region. All those people could live in Plaquemines. They will live in New Orleans, Jefferson, St.

Tammany.

So I urge you to rethink your project on the east and westbank of Plaquemines and give us Federal levee recommendation. We will fight our battle in Washington to get them funded, but at least put in there "We recommend Federal levies." They don't have to be 30-foot tall, but at least get them in the Federal system and make that recommendation.

Thank you very much.

MS. DESHOTELS:

Thank you, sir.

I have no more cards in my hand. Does anyone else wish to make a statement or a comment this evening? Thank y'all very much for coming. We deeply appreciate it tonight.

[Hearing concluded.]

* * * * *

Coastal Impact Assistance Program (CIAP)

1. **Project Title:**

   - Woodlands Trail and Park - regional greenway project

2. **Entity/Individual Nominating the Project:**

   - Woodlands Trail and Park, Inc.

3. **Contact Information:**

Woodlands Trail and Park, Inc.
4123 Woodland Drive
New Orleans, Louisiana 70131

Woodlands Trail and Park, Inc.
106 Avenue G
Belle Chasse, Louisiana 70037

(504) 433-4000
www.woodlandstrail.org or www.woodlandstrail.com
woodlandstrail@aol.com

4. **Total CIAP Funds Requested:** **$1, 500,000**

5. **Parish CIAP Funds Requested:** **$ 300,000**

6. **State CIAP Funds Requested:** **$ 800,000**

7. **Infrastructure Funds Requested:** **$ 400,000**

8. **Descriptions and Location of Project:**

Woodlands Trail and Park is a regional project contained within the 10,000-acre peninsula formed by Lower Coast Algiers and a largely undeveloped portion of Belle Chasse. We are currently in the process of establishing 13.6-miles of Woodlands Trail, a portion of America's Wetland Birding Trail in a 609-acre tract of Plaquemines Parish owned forested land. Infrastructure funds requested will be used in combination with MRT obligated funds to design, engineer and construct parking areas and an Interpretive Center (in combination with corporate donations). The Interpretive Center and a potential Equestrian Center (later phase) will serve the public in the immediately surrounding area as well as serve as a tourism attraction and economic engines to help sustain operation and maintenance. Parish funds would assist with O & M in Plaquemines Parish. State requested funds would allow acquisition of parcels of greenway corridor and conservation easements from willing landowners who have expressed interest in Orleans Parish.

University of Louisiana Lafayette is currently completing site assessments for parking and an Interpretive Center in Plaquemines Parish. Tulane City Center is working with Woodlands on addressing the expansion of this vital migratory bird habitat by addressing connective issues in Orleans Parish via acquisition of land and conservation easements from landowners who have

expressed interest.

9. Project Type:

Mitigation of the impact of OCS activities through funding of onshore infrastructure projects and public service needs.

10. Project Justification:

The Woodlands Trail and Park project was studied in the Plaquemines Parish Bike Pathway Plan conducted by the Regional Planning Commission in 2001. It received HUD funding in 2003 for Engineering and Design of Woodlands Trail, location of interpretive kiosks, pavilion and bridges. Currently recognized as one of three American Heritage Rivers Initiative "Keystone" projects for Louisiana, the Woodlands project has been incorporated into the City of New Orleans Master Plans for Recreation and Open Space, Master Plan for Transportation, Riverfront Vision 2005 and the Plaquemines Parish Master Plan. This is an overall smart growth plan that is establishing a series of educational, recreational and historical greenways in one of our regions' last stands of bottomland hardwoods.

The Woodlands project calls for the connection of greenway corridors in low-lying areas without public sewerage to preserve habitat while also considering the value of this "natural sponge" to the health and safety of the surrounding community. As efforts continue, this project will link to the City of New Orleans Wilderness Park, a 132-acre wild magnolia forest. This connection will allow increased public access to this LWCF funded facility that contains existing bathroom facilities and picnic shelters.

As stated in the recent Proclamation made by Louisiana Wildlife Federation and the New Orleans City Council during America's Wetlands Month, implementation of the Woodlands' conservation efforts "will protect and improve the environment for the future well-being of our children and the wildlife we treasure".

11. Project Cost Share (Type and amount of non-CIAP funds proposed, if any):

Current funds that have been allocated to Woodlands Trail and Park include:

2003 Governor's Office Recreational Trails Grant	- $ 70,000 (in process)
2005 Governor's Office Recreational Trails Grant	- $ 60,690 (in process)
Barataria-Terrebonne National Estuary Program	- $ 30,000 (executed)
FEMA funds for debris removal	- $ 30,351 (completed)
MRT funding	- $400,000 (awarded)
American Hiking Society	pending

Note: additional cost share possible from the multitude of volunteers and donated items and services in addition to funds from private citizens and corporations via the nonprofit, 501-C-3 organization, Woodlands Trail and Park, Inc.

WOODLANDS TRAIL AND PARK

Woodlands Trail and Park

a nonprofit 501-C-3 corporation

"Creating a Legacy" for future generations

Woodlands Trail and Park was founded with the mission to "establish and embellish an educational, historical and recreational greenway within the Lower Coast Algiers and Belle Chasse areas."

Vol. 5, No. 1

Vision Becoming a Reality

Mississippi Riverboat Cruise

Join Woodlands Trail and Park aboard the Cajun Queen on May 19, 2007 for a stunning historical sunset cruise along the Mighty Mississippi River. The cruise will feature the famous Mardi Gras Mambo Dinner, complimentary wine, door prizes, silent auction and live music. The sunset cruise will sail from the Poydras Street Wharf along the Woodlands Trail – Mississippi River Trail corridor and back for a 3-hour tour. Dr. Hank Bart, Director of Tulane University's Natural History Museum and local Historian, Rod Lincoln will unveil some of the little known history along this section of the Mississippi River. The trip will feature southern rock music by "The Stargezzers". Boarding will begin at 5:00 p.m. Sailing time will be 5:30 p.m. and will return to dock at 8:30 p.m.

$50 per passenger.

Tickets are available at: www.woodlandstrail.org or 504.433.4000

Navigate Our River Cruise

Help us raise funds to develop a parking area and construct bridges to expand trail access by becoming a sponsor for the Mississippi Riverboat Cruise. Opportunities include sponsorship, donation of items for the Silent Auction, donation of beverages or purchase of tickets for your family and corporate friends.

For more information:
visit www.woodlandstrail.org or call 504.433.3000

Trails Cleared

Clearing of debris from Woodlands Trail was finalized in early February with funds provided by FEMA. Thanks to the understanding of FEMA contract Engineers, the work order allowed the

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Printing courtesy of Freeport-McMoRan

fallen trees to be placed off of the cleared trails to naturally disintegrate, thus providing nutrition to the next generation of native vegetation and trees.

Over 13 miles of trails are now cleared! Currently, there are over 2 miles accessible from the entrance; a 1.1 mile loop to the right of the entrance and a 1.1 mile path that leads in along the Plantar's Canal. Once three bridges are constructed, the entire trail system will be accessible. Entrance to Woodlands Trail is located at 449 F. Edward Hebert Blvd. in Belle Chasse.

Alex White (left) and Paul Richard (right) assist runners through water during 2nd Annual Woodlands Trail Classic

2nd Woodlands Trail Classic - A Grand Success!

Despite heavy rainfall for the days preceding the 2nd Annual Woodlands Trail Classic, the event was a grand success! 132 individuals registered to participate in the New Year's Eve event held on Woodlands Trail in Belle Chasse. McDonalds, General DeGaulle arrived early to provide breakfast before the race. Following the race, participants listened to music provided by "The Stargeezers" and enjoyed food and beverages provided by Abita Brewing, Algiers Kiwanis Morning Edition, Boomtown Casino and Whole Foods Market. Benny Rousselle and Katie Brasted gave out 35 awards in various categories.

Photo courtesy of Phil Casper, Ghost Images Photography

The 2nd Annual Woodlands Trail Classic was presented by ConocoPhilips and sponsored by West Jefferson Fitness Center, Freeport-McMoRan, Chevron Oronite, Fidelity Homestead, Computers, Communication & Controls. Despite the rustic conditions of the trail, race organizers received nothing but positive feedback of the experience such as a comment from Mark Schafer, Baton Rouge participant, "we had a blast, nothing like we have ever ran in before. We are looking forward to making it an annual run for us". With funding recently received from the Governor's Office of Community Programs, Woodlands hopes to have bridges and trail improvements in place for next year's race!!

Local Artist Captures Spirit of Regional Effort

Local artist, Debbie Kraemer, DK Clay and Pottery on Magazine Street, created unique designs for Woodlands Trail and Park to be used at the 2nd Annual Woodlands Trail Classic held on New Year's Eve in Belle Chasse, Louisiana. Debbie utilized the shape of the upper portion of the Barataria-Terrebonne Basin to serve as the background of the unique awards representing the regional focus of Woodlands Trail and Park. The center of the award contained he Palmetto, a plant common to the understory in the bottomland hardwood forest.

Although rushed with filling holiday orders, Ms. Kraemer easily accepted the additional creative challenge of designing a free-form bowl for Woodlands' Board Members to present to Plaquemines Parish President Benny Rousselle on his last day in office and in gratitude of his long-standing support. The bowl was designed of earthen tones representing the regional effort of Woodlands Trail and Park to connect low-lying greenway corridors in the peninsula formed by Orleans and Plaquemines Parish. The outside of the bowl contained Palmetto images, the logo of Woodlands Trail and Park.

Dr. Barbara Benson (left) and ULL students view aerial and property maps in preparation for site visits to Woodlands Trail

ULL Students to Conduct Site Assessments

Dr. Barbara Benson of University of Louisiana Lafayette and her students in Naturalist and Docent Practices have again volunteered their services to Woodlands Trail and Park for the Spring Semester. During the previous spring semester, students received some real "hand-on" experience utilizing GPS equipment to locate the trail system that was essentially indiscernible following Hurricane Katrina.

During Spring Semester, 2007, Dr. Benson's class will be assisting the Woodlands Trail and Park effort move their vision forward by conducting some site assessments. Katie Brasted of Woodlands Trail and Park visited the class at ULL on February 14, 2007 to provide an overview of the Woodlands Trail and Park effort and aerial and property maps with the students. Under the direction of Dr. Benson, the students will spend two weekends at the Woodlands Trail and Park site in Belle Chasse this semester to conduct a site assessment for parking areas and entrance area amenities. Woodlands Trail and Park is one of two sites for which an Interpretive Center was recommended in the study conducted for America's Wetland Birding Trail. In addition to providing a site for educational information on wetland habitat and wildlife, the center would also allow a location to house artifacts and information about local cultural and military history. As land has not been acquired for an Interpretive Center, the ULL students will evaluate potential sites for an Interpretive Center in Belle Chasse near Woodlands Trail and a potential site in Lower Coast Algiers.

Palmetto Design Released on World Wetlands Day

In recognition of World Wetlands Day on Friday, February 2nd, Woodlands Trail and Park board members unveiled the new design for Mignon Faget-Woodlands Trail and Park Palmetto Earrings at Jeff's Haberdashery. Brasted expressed appreciation to ConocoPhillips, a long-time corporate sponsor, for underwriting the current Palmetto design. Gratitude was also expressed to Jeff Chouest who joined Woodlands Trail and Park in "Creating a Legacy" for future generations by selling the Palmetto jewelry in both his store in Aurora Village on the West Bank and on the East Bank on Severn. Betsy Brien, Public Affairs Director for ConocoPhillips, attended the event to emphasize the company's support for the regional effort of Woodlands Trail and Park to establish greenways and trails in the peninsula formed by Orleans and Plaquemines Parish. Brasted acknowledged that it is such partnerships

of nonprofit organizations, artists such as Mignon Faget, corporations such as ConocoPhillips,

(left to right) Plaquemines Parish Councilman Anthony Buras, Carol Osborne Cowley, Woodlands Trail and Park Board Member , Betsy Brien, ConocoPhillips, Katie Brasted, Woodlands Trail and Park, Jeff Chouest, Jeff's Haberdashery, Hank Willie and Clayton White, Woodlands Trail and Park Board Members.

family businesses such as Jeff's Haberdashery and governmental agencies working together that will bring quality of life efforts such as Woodlands Trail and Park to fruition. The Palmetto earrings are being sold now through May, America's Wetlands month at a below retail cost.

NEW!
Palmetto Earrings

Clip Earring

Dangle Earring

Reserve your pair today at www.woodlandstrai.org or call 504.433.4000

In stock April 01, 2007 -

Just in time for Mother's Day!

Woodlands Trail and Park
Palmetto

The Mignon Faget - Woodlands Trail and Park Palmetto is available in both Sterling Silver and 14K Gold as a Pendant, Lapel Pin and the newly released Dangle or Clip Earring.

The Palmetto collection is available exclusively through Woodlands Trail and Park at:

- Jeff's Haberdashery - 4100 Gen. DeGaulle
- Jeff's Haberdashery - 3321 Severn
- Woodlands Trail and Park - 504.433.4000
- online at www.woodlandstrail.org

PARTNERS
Algiers Economic Development Foundation
American Heritage Rivers Initiative
Barataria-Terrebonne National Estuary Program
Land Trust Alliance
Library of Congress - Veterans History Project
Louisiana Department of Agriculture and Forestry
LSU - T. Harry Williams Center for Oral History
Mayor's Office of Economic Development; OEA
Mississippi River Basin Alliance
Mississippi River Trail Organization
Orleans Audubon Society
Our Lady of Holy Cross College
Plaquemines Parish
Regional Planning Commission

BOARD MEMBERS
Katie Brasted, President
Clayton White, Vice President
Benny Rousselle, 2nd Vice President
Carol Osborne Cowley, Secretary
Stuart Gay, Treasurer
Timothy N. Hewitt, Ochsner Medical Center
David Muth, Orleans Audubon Society
Paul Richard
Carol Roberts, Plaquemines Parish School Board
Rob Salus, LCSW
Hank Willie

Coastal Protection and Restoration Authority

PUBLIC HEARING COMMENT FORM

Draft of Louisiana's Comprehensive Master Plan for a Sustainable Coast,
Draft FY 2008 Annual Plan
and Draft CIAP Plan

To insure that your written comments are considered, they should be turned in this evening at the reception desk located near the entrance or mailed to the following address so that the comments are received no later than Monday, April 2, 2007:

CPRA – IPT
DNR
Post Office Box 94396
Baton Rouge, LA 70804-9396

Email comments may additionally be submitted at: comments@louisianacoastalplanning.org

Please consider the following comments:

1) Banks stabilization along the west bank of the Rigolets should be identified as an ~~urgent~~ need due to the destabilization of the East Orleans Land Bridge that will result from breaching into Lake Catherine (est 700 acres ~~loss at~~ Savoinell Pass and imminent threat to Hwy 90, Ft. Pike and Rigolets Bridge.

2) Physical restoration and protection of the Chandeleur ~~Islands~~ landforms ~~that~~ should be identified as a priority due to its potential surge energy ~~absor~~ attenuation en route to Lake Pontchartrain

3. Include Orleans Parish CIAP Project in early start list.

4. Include western shorelines of Biloxi Marsh in planned protection and restoration ~~strategy~~

(Use the back of this form if more room is needed)

Name: Leo F. Richardson Date: 2/28/07

Address: 107 Stella ST Metairie LA 70005

over

In the area of the East Orleans Land Bridge

5. Design a 100 year Hurricane Barrier protection using a layered or staged barrier arrangement including the strengthening of the 10–15 miles CSX RR levee with wetlands restoration to the south and engineered oyster reefs in Lake Borgne

R & A ELECTRICAL SERVICES, INC.

◆◆◆

36192 Hwy. 11 ◆ P.O. Box 449 ◆ Buras, LA 70041
Phone (985) 657-9497 ◆ Fax (985) 657-9455
Email: raelect@bellsouth.net

CPRA Integrated Planning Team
P.O. Box 44027
Baton Rouge, LA 70804-4027
Attn: Jon Porthouse
www.louisianacoastalplanning.org

Ladies and Gentlemen,

As a spokesman of Plaquemines Parish, I am a life long resident and businessman in South Plaquemines Parish. It's time for the people of Plaquemines to take a stand and support our well-being and heritage. As a whole we can and will get our message to local, state and federal government!

As we now sit in question, what is the Corps of Engineers up to now? People, have you ever seen anything that would deter Mother Nature? The answer is clearly NO! The Corps of Engineers, or man in fact, never will. Like many others, I will take a stand and fight to save our parish, and most importantly, our heritage. I'm tired of watching our hard-earned tax dollars drift out to sea to benefit the rest of our great nation while we get nothing in return. Our federal government took our land from us once already and it is clear to me that the downward spiral began there.

The federal government says the money is not there to rebuild levees to 18' plus. Great! We don't want 18' plus levees! Man's attempts to control the flow of the mighty Mississippi River is what got us into the situation we are in now…coastal erosion, vanished fishing estuaries, abandonment of oil and gas industry development. Now all of the sudden, OH NO, New Orleans is going under! The natural, unobstructed flow of the mighty Mississippi River and its tributaries is the key. Take a look back to our forefathers and the Native Americans of this land, who lived in sync with nature in their day.

Instead of spending BILLIONS on levees, isn't it more logical to spend mere *MILLIONS* on non-obstructed spillways that would re-establish lost tributaries, fishing estuaries, oil and gas industry development, great marine sea ports, etc.? Development of a new deep water outlet alone would save billions on the Corps of Engineers yearly budget by omitting the continued dredging of the head of the passes and South West Pass.

Please observe the map illustration showing sand bars created by Mississippi River sediment just waiting to be utilized as nature intended, ***not*** the Corps of Engineers way.

People of Plaquemines, St. Bernard and New Orleans, I have personally watched our parish land and barrier islands disappear during my lifetime of 46 years. I have listened to countless stories of my elders, stories about what they originally had and what they have observed since the organization of the Corps of Engineers.

Please don't get me wrong, I am not trying to discredit our government or the Corps of Engineers, but merely to put this very dire situation into perspective. If we do as Mother Nature intended, with the help of the Corps of Engineers, we can restore what was lost – our land, barrier islands, fishing estuaries, etc. Man can work in sync with Mother Nature to achieve a greater result - if we work geologically, nurturing the flow of nature as it was intended.

People of Plaqumines, St. Bernard, and New Orleans let's take a stand! Please refer to the map illustrations I have provided. Plaquemines Parish residents in particular, it is critical to support the utilization of unobstructed spillways which could save us all and keep us on the map, ***period!***

If the Corps of Engineers gets their way, within the next 100 years we can say goodbye to New Orleans and all surrounding areas and hello to *Orlandist*! Is this the legacy we want to leave behind for our children and grandchildren?

Thank you for your time today,

Zane P. Melancon

Notes:

1.) Water / Silt diversion will not do any good to far south and should be installed as illustrated in these drawings.

2.) Fresh water alone needs to carry river sediment utilizing strategic construction as these drawings.

3.) Conduit system using hydology to help the local fishermen.

A. Ship/Navigational Outlet:
    1. Quick access to deep water
    2. Allowing sediment disbursement
    3. Omit dredging to head of passes and South West Pass
    4. East Bank hurricane approach acts as counter-flow towards West through West Spillway.

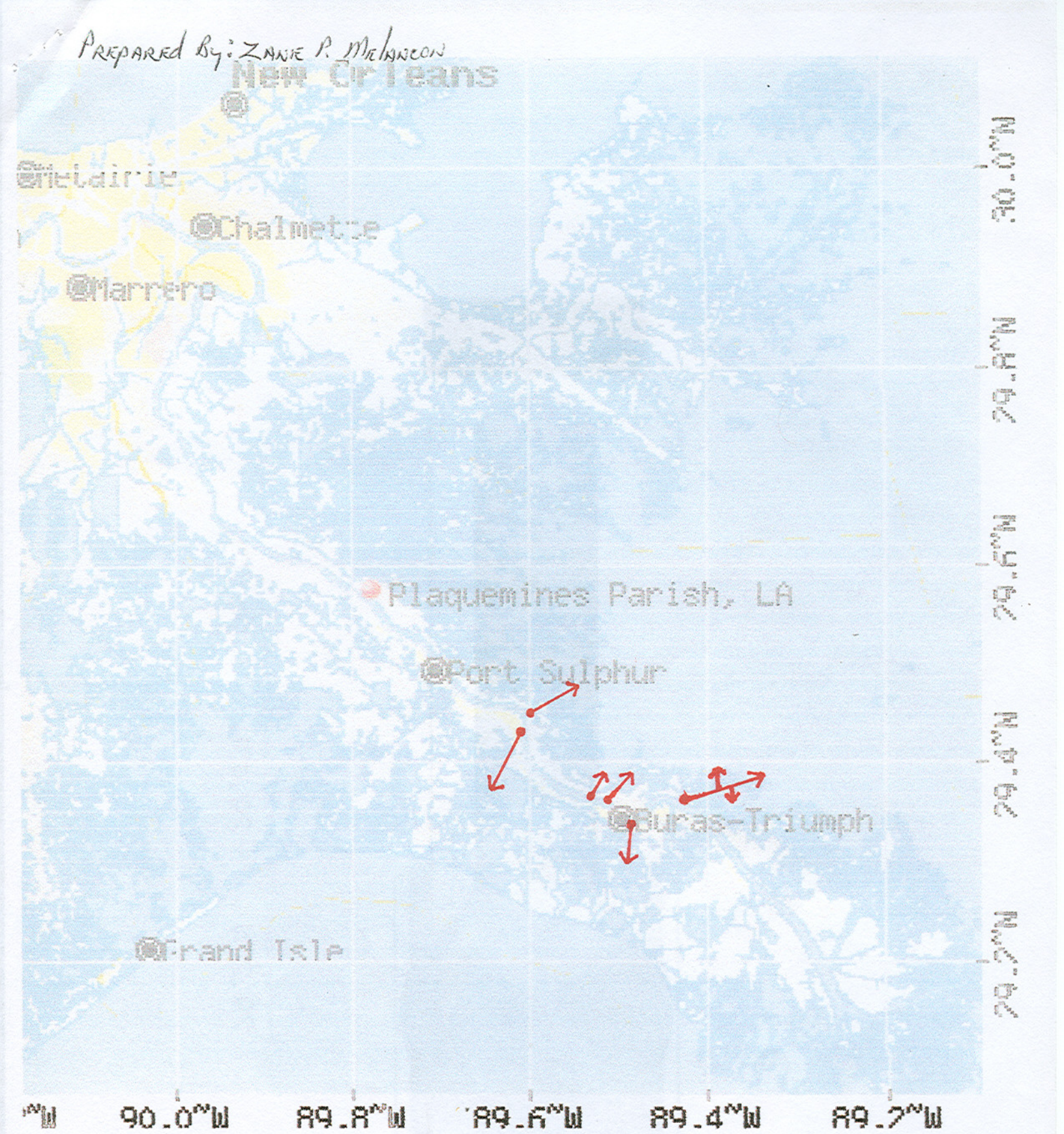
B. West Spillway:
    1. Crossed by Hwy. 23 bridge at existing levee system elevation and connecting northern and southern ends of Parish.
    2. Cluster piles driven at river/spillway intersection detouring a navigational channel.
    3. Utilization of river sediment and fresh water for marsh development
    4. Acts as counter-flow relieving pressure on levee system due to hurricane tidal surges through ship/navigational outlet and East Spillway.

C. East Spillway:
    1. Utilization of river sediment and fresh water for marsh development
    2. Spillway will be unobstructed, as mentioned for West Spillway.

D. Bayou Lamuchk, Ostrica Outlet, and Spanish Pass:
    1. Unobstructed free flow

E. Pipeline Spillway:
    1. Controlled water and sediment flow
    2. Excavated through levee system and beneath Hwy. 11 and Hwy. 23
    3. Regulatory operation in sync and co-existence with oyster leases.

Prepared By: Zane P. Melancon
Meraux
Marrero
Poydras
Belle
Chasse
Lake Borgne
Big Mar
St. Bernard
Lake Lery
Pointe A La Hache
Port Sulphur
Bayou L'Ardoise
Breton Sound
Ostrica Outlet
Empire
E. Spillway
Buras
Boothville
Barataria
Bay
W. Spillway
Spanish Pass
Venice
Grand Isle
Ship outlet (Diversion)
E./W. Spillways (Un-obstructed) 200yards Wide
Bayou Lirard / Spanish Pass / Ostrica Outlet / Bayou Lamoque (Free Flow)
River Sand Sediment
Pipeline Spillway (Un-obstructed)
Levee System (Certify @ existing elevation)


Prepared By: Zanie P. McInnon
New Orleans
Chalmette
Marrero
Plaquemines Parish, LA
Port Sulphur
Buras-Triumph
Grand Isle
90.0°W
89.8°W
89.6°W
89.4°W
89.2°W
Coastal Erosion
Sediment Outlets

Coastal Protection and Restoration Authority

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Baton Rouge, LA 70804-9396

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Please consider the following comments:

I would like to see the ~~Jesuit Bend~~ Myrtle Grove to St. Jude levees put into the plan for 100-year flood protection. This would allow for the protection of Hwy. 23 access to the rest of the parish for evacuation routing & oil & gas & fishing industry access.

I appreciate the fact that you have included 100-yr protection down as far as Myrtle Grove, a small distance further would tie in the system.

Make sure you show the Corps of Engineers your plan. They could learn a lot from you! They appear to be retreating from the east. We need to advance the coast and restore a vital ecosystem for humans as well as all other living creatures. Oil & gas, fish, plants, animals and humans can all live together peacefully in our wetland environment. Let's work together & take back our coast!

(Use the back of this form if more room is needed)

Name: Emily Campbell Date: 02/28/07

Address: P.O. Box 416 Belle Chasse, LA 70037

Coastal Protection and Restoration Authority

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Please consider the following comments:

I am Concerned about Page 72 of the plan and it's limitations to increase and fortify levees in Plaquemines Parish below Myrtle Grove on the westbank and Phoenix on the eastbank. It has been said that our Small Population does not warrant the monies Spent. I argue that Plaquemines Parish brings a Huge amount to the State of Louisiana and the nation. Our energy trade is a 1.2 billion dollar industry we have Supplied to the State 2.1 billion dollars over the past decade. Prior to Katrina Plaquemines Parish was home to the 3rd largest Seafood Port in the nation. over 60 million dollars of Seafood products are exported internationally. One of my main Concerns is with the large-Scale diversions that have been planned for our parish In the revised CPRA plan they have been placed

over →

(Use the back of this form if more room is needed)

Name: Patrisha Walker Date: 2-28-2007

Address: 141 E Collins Buras, LA 70041

river where there is already an outflow from the river.
Studies have shown these diversions take decades upon deca to build land.
I am concerned that the CPRA Plan only calls for Pipeline Sediment transport systems at Myrtle Grove or West Pointe La Hache.
The Pipeline Sediment transport System is a proven quicker Solution that would harvest Sediment from the river and deliver it to much needed Coastal restoration Sites.
I urge decision makers to locate these projects throug Out our Parish <u>not</u> in limited areas.

4.2.4 Houma Public Hearing Transcript

Drafts of Louisiana's Comprehensive Master Plan for a Sustainable Coast, FY 2008 Annual Plan, & CIAP Plan

STATEMENT CARD

Name DICK LOUIDRY

Street or Box 109 E. 15TH. ST

City GALLIANO, State LA Zip Code 70354

If you would like to present your views orally at this meeting, please fill out and submit this Statement Card at the reception desk located near the entrance. When called by the meeting moderator, please come to the microphone to make your comments.

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Drafts of Louisiana's Comprehensive Master Plan for a Sustainable Coast, FY 2008 Annual Plan, & CIAP Plan

STATEMENT CARD

Name Kandy Theriot - Houma Chamber

Street or Box 6133 Hwy 311

City Houma State La Zip Code 70360

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STATEMENT CARD

Name PRESTON VERRET

Street or Box 2855 Bayou Dularge

City Theriot State La. Zip Code 70397

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Drafts of Louisiana's Comprehensive Master Plan for a Sustainable Coast, FY 2008 Annual Plan, & CIAP Plan

STATEMENT CARD

Name RANDY MOERTE

Street or Box 1008 MAR DR.

City LOCKPORT State LA Zip Code 70374

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Drafts of Louisiana's Comprehensive Master Plan for a Sustainable Coast, FY 2008 Annual Plan, & CIAP Plan

STATEMENT CARD

Name A.J. "Buddy" Cantrelle, Jr.

Street or Box 111 East 26th Place

City Cutoff State LA Zip Code 70345

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---

Drafts of Louisiana's Comprehensive Master Plan for a Sustainable Coast, FY 2008 Annual Plan, & CIAP Plan

STATEMENT CARD

Name Heidi Neil

Street or Box 105 T-Bob ST

City Montegut State LA Zip Code 70377

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Drafts of Louisiana's Comprehensive Master Plan for a Sustainable Coast, FY 2008 Annual Plan, & CIAP Plan

STATEMENT CARD

Name Mrs. Evelyn Lirette

Street or Box 207 Oleander St.

City Chauvin State LA Zip Code 70344

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Drafts of Louisiana's Comprehensive Master Plan for a Sustainable Coast, FY 2008 Annual Plan, & CIAP Plan

STATEMENT CARD

Name Reggie P. Boring

Street or Box 6685 Shrimpers Row

City Delacroix State LA Zip Code 70353

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Additionally, comments may be submitted by email to: comments@louisianacoastalplanning.org

Drafts of Louisiana's Comprehensive Master Plan for a Sustainable Coast, FY 2008 Annual Plan, & CIAP Plan

STATEMENT CARD

Name Neil Adams

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COASTAL PROTECTION AND RESTORATION AUTHORITY

INTEGRATED PLANNING TEAM

TRANSCRIPT AND PUBLIC COMMENTS

OF

PUBLIC HEARING

FOR THE

DRAFT OF LOUISIANA'S COMPREHENSIVE MASTER PLAN FOR A SUSTAINABLE COAST, DRAFT FY 2008 ANNUAL PLAN AND DRAFT CIAP PLAN

HELD AT THE

HOUMA CIVIC CENTER

346 CIVIC CENTER BOULEVARD

HOUMA, LOUISIANA

MONDAY, FEBRUARY 26, 2007

5:30 P.M.

P-R-O-C-E-E-D-I-N-G-S

MR. ANGELLE:

Let me, first of all, welcome each of you to tonight's meeting. A special thank you to the Terrebonne Parish Consolidated Government and parish president, Don Schwab, and the parish council for their gracious accommodation in allowing us to use this building tonight. My name is Scott Angelle. I'm your secretary of the Department of Natural Resources, and I'm pleased to be here tonight.

And before I kind of go through some of the ground rules for what we're going to do here tonight, I want to welcome, I think, or recognize a few folks, I should say.

From the Louisiana state legislature, we have with us Senator Reggie Dupre and Representative Damon Baldone. Appreciate you-all being here. And let me say that the Department of Natural Resources is very, very pleased and happy to have a great relationship with Representative Baldone and Senator Dupre. Not one single time have I called on you to help sponsor legislation affecting coastal restoration that you have not jumped up and signed your name up and been a very,

very strong advocate. So on behalf of Louisiana, I want to thank you and would tell the folks here in the audience that you have two great legislators here.

Also with us, we have from local government Madam President Charlotte Randolph from neighboring Lafourche Parish. Thank you so much for being here, as well as Morgan City mayor, Tim Matte. Where's Tim? Thank you very much, Tim. I appreciate you being here.

And, likewise, would say to the folks in the audience, both Mayor Matte and president Randolph have been key allies for some of the things we've been doing in coastal Louisiana. We can count on you-all to come to Washington with us when it was necessary for your voices to be heard. And on behalf of all of Louisiana, I want to thank you for that.

And then my last special recognition of elected official, or former elected official, is a gentleman who I had the pleasure of meeting when I was just a kid. My dad served in the House of Representatives with him when my dad was in the house, and that's former state representative Dick Guidry. Where is Mr. Guidry at? Why don't you stand, Mr. Guidry?

I will tell you that -- that the history books are going to be very kind to Representative Guidry

for his great work in flood control and coastal restoration. And I think he was a visionary. He started talking about coastal restoration before most of us knew what it was. And I know that my daddy's smiling right now down on me for having recognized one of his old buddies. So, again, it was good to see you here. Thank you very much.

Okay. Tonight we're conducting a public hearing, or actually kind of two public hearings in one. First, you will -- you're going to have a presentation on the draft plan for Louisiana's Comprehensive Master Plan for a sustainable coast. You will recall that we were here several months ago on the preliminary draft and we received public comments from several folks here as well as in other coastal venues. We were in New Orleans. We were in Lake Charles. I know at least these three in Houma, as well. And a lot of those public comments were -- all those public comments were recorded, and the staff used those public comments to try to make a good plan better. And they will then come to you today and kind of detail to you what it is that they'll change and again seek public comments on that to make something that is better, yet even better. We are all moving towards a final plan, which we will be introducing to the Louisiana legislature in the coming

month.

The second public hearing that we're going to have is going to be kind of two public hearings in one. It's going to be on the Coastal Impact Assistance Program, otherwise referred to as the CIAP Program. And what the CIAP Program is, is a federal program that a bill was passed and signed by the president in August of 2005, right before the storm season, to share with Louisiana a -- I want to give you an estimate of about 530 million dollars or so to be shared, 65 percent with the state of Louisiana and 35 percent with the 19 parishes within the coastal zone to be used exclusively for coastal restoration and to offset some of the -- offset some of the impacts of offshore exploration on onshore infrastructure, so things like Highway 1. You're going to hear things about the Houma navigation locks and those kinds of things tonight. And again we will be having a public hearing, getting you feedback on both of those.

Just by way of history, this is the first time -- this is the first time the state has had a combined comprehensive effort to take coastal restoration and hurricane protection and roll it into one plan. And I can tell you that after the storm season of 2005, many of us looked at this and said that

there is no way we can continue to move forward. We cannot continue to move forward by having coastal restoration done in one building and hurricane protection in another building. They in fact have to be integrated. And, like I like to say, the barrier islands protect the wetlands, the wetlands protect the levees, and the levees protect the people. So it is one system.

When you look at all of this and begin to say, okay, well, that's all fine and dandy, we have a plan. It's a combined plan. How are we going to pay for this, okay? Let's go back to around December, December of '06, late last year, the federal government passed and the president signed the bill to share royalties with the coastal-producing states. Now, that bill will begin to give us some money over the next 10 years. But by way of money, it -- in terms of the scope of this project, it will be a relatively small amount of money. By the year 2017, that amount of money grows to a significant amount of money, okay? So we got a situation between now and 2017 that obviously we have to get things done. One of those things is that 540 million dollars that I talked about earlier, the CIAP Plan. That will take care of part of it.

In addition, you will be hearing in the

coming months that the state of Louisiana is getting ready to do a financial transaction on the tobacco settlement. The tobacco settlement is something, the state of Louisiana sued the tobacco industry and received a judgment for a multi-billion dollar judgment. The state is going to sell part of that judgment. And by state law, 20 percent of the value of that judgment or that transaction has to go towards coastal restoration and hurricane protection. And we based on some of the reports indicated that that 20-percent value will be anywhere from 200 to 350 million dollars. So that will be coming into a trust fund to begin to do the things that you're going to hear about today.

Now, on the -- on the offshore revenue, we're not going to wait until 2017 for the money to start coming in. We're working on a financial transaction that would allow us to borrow against those anticipated revenues. None of us, most of us don't build our homes on a cash basis. You go to the bank and you borrow money or a car or a building or a school, or whatever it should be. And we're working on that same situation where we would be able to go to the bond market and take the value of this bill and now have the bondholders quote an interest cost to us. And we're finding that the market is good for that. We won't be

doing that immediately. We're going to be getting -- we'll be setting things up for that. I've asked both Representative Baldone and Senator Dupre to author legislation this year that will set up the entity to sell those bonds. So as we are moving out in the first hundred and 200 and 3 and 400-million-dollar projects, we will have done our work and we will have a business plan that allows us to draw down successive years to keep it going through the completion of the project.

Finally, I would like to say that this again is a public hearing. It's not a debate. We are interested in hearing the comments that you have so that we can record them. And we are required to go through all of the comments and rationalize those comments as to whether or not we can solve the issue that you bring forth or whether or not for whatever reason through scientific challenges or engineering challenges it can't be done. But I think you will find that our folks will be very good listeners.

The team that has been putting this together is called the Integrated Planning Team, and it's made up of representatives from both the Department of Natural Resources and Department of Transportation and Development. And quickly, I just want to identify their names. If you could just give me a wave over here:

Norwyn Johnson, Rickey Brouillette, Juanita Russell, Andrew Beall, Larry Ardoin, Jean Cowan, Jon Porthouse and Michele Deshotels. From the Corps of Engineers, we have with us tonight Carl Anderson. Where's Carl? Carl, thank you for being here. And from the Minerals Management Service, which is a federal agency that manages the offshore assets of the federal government, we have Mr. Bruce Baird. Bruce? Where are you, Bruce? Thank you. Appreciate you being here.

Okay. After, I'm going to call up Ms. Deshotels. She's going to run through the presentation. I'm assuming that after you finish, we're then going to go to Mr. Fruge, is that correct?

MS. DESHOTELS:

That's correct.

MR. ANGELLE:

Dave, would you just stand and be recognized? Dave Fruge is going to bring you through a presentation on the Coastal Impact Assistance Program where you're going to hear about specific projects in the greater Terrebonne/Lafourche area that will be of interest to you. And then we'll open it up for public comments and receive those.

So, again, I just want to share, on a personal note, I'm from Breaux Bridge and it's French-

speaking, a lot of same last names that I -- when I come to Terrebonne and Lafourche that I see over here. I got a lot of commercial fishermen in my home parish. I got a lot of sugar cane farmers. And it's good to be -- it's always good to be in the Terrebonne/Lafourche area. I feel like when I come here, in a sense, I'm coming back to home. So thank you-all very much and go ahead and turn it over to Michele.

MS. DESHOTELS:

Thank you.

As Secretary Angelle said, we're covering three plans tonight, the Master Plan, the CIAP Plan and the Annual Plan. The Master Plan is what -- is the vision for all of coastal Louisiana. And the CIAP and Annual Plan are the first steps in that implementation.

As you remember from us being here before, we had four objectives for the Master Plan: Reducing risk to our community; restoring sustainability to the coastal ecosystem, not just restoring it, but restoring the sustainability; and maintaining a diverse array of fish and wildlife habitats, and then sustaining our unique heritage and culture.

We started this plan a year ago, in February of 2006, and we have a second draft before you tonight. So we're very proud of having done that. And we could

not have done that without all the state holder input and all the public input that we have received. Your participation has been very, very important to us meeting this time schedule, and we really, really do appreciate that.

I want to talk for a few seconds about three ongoing planning efforts that are out there right now: The Louisiana Recovery Authority; Louisiana Speaks effort, our effort, the CPRA, Comprehensive Coastal Master Plan; and the Corps' LACPR plan.

We have been working very closely with the Corps from the beginning of our group being put together, and they have been working very closely with us. This is -- was taken at a meeting, at a teleconference that we were having with the Corps and IPT and the Dutch a few months ago. We have also been working very closely with Louisiana Speaks. Our responsibility is that protection and restoration. Their responsibility begins with the community recovery and community growth. And one of the reasons I want to kind of cover this is that I know there is some kind of confusion with all these efforts out there. What I want to assure is that we’re making use of all of this information We're sharing it so that your effort in one arena is not is not in vain to the others. We understand what your

concerns are.

The preliminary draft was released this past November. We had public stake holders, scientific and technical review and comment on it, not only the comment that went into making it, the comment after. We had formal scientific and engineering review from the LCA Ecosystem Restoration Science Board and the Science Engineering and Review Team. We also had nine public meetings on that preliminary draft. And we learned a great deal. The public's protection and restoration expectations may not always be achievable. Protection and restoration may not always be compatible. We know that there are going to be shifts in natural resource distribution. We will not be catching the same fish necessarily where you're catching them now. There's a great need for rapid advances in science and technology. And we also recognize that there is a need throughout this process, not only what we're doing now, but into the future for enhanced dialog between planners, scientists, and all of us.

Climate change is an issue that is coming to the fore. It's something that we need to be cognizant of. There will be sea-level rise. There will be changes in rainfall patterns. There is concern about how levees affect hydrology, the effects of river

diversion on that hydrology, and is marsh created by dredging equal to marsh created by sediment distribution. What have the public, scientific and technical reviews said about our plan? Well, the nice thing that we heard is that our layout tone and direct wording was complimented. What we're trying to do was very much appraised. And there is a belief that we are making progress towards real solutions. We also heard that people were not necessarily happy that we did not have priorities expressed in the draft, preliminary draft plan. They wanted to see that outline. They wanted us to prioritize the systemic projects, prioritize quick-fix projects, and that there is a recognition that there are policy, legislative and institutional issues that are just as important as construction projects.

There was a perception that we were perhaps putting ecosystem with restoration as a secondary priority, and there was concern expressed that some of our plan implementation, particularly large river diversions, might affect peoples' livelihoods.

Some people said that we had too much certainty in the plan. There was concern that everything presented might not be technically feasible. There was concern that climate change may challenge

sustainability, that costs would be too high, that not all strategies might work the way that we intend, and that perhaps in some areas our targeted protection levels might not be achievable.

We also heard that some people thought that our targeted levels of protection were too low. And we heard that from Terrebonne Parish, Plaquemines Parish, and Lafourche Parish. We had several good suggestions for projects to be added and for projects to be deleted. We received numerous comments on detailed concepts that's going to be useful in a project level planning.

There was concern that we maintain integration throughout project management, that we define decision-making processes, that we define an adaptive implementation program, that we're flexible as we go forward with this, and if we make mistakes, that we recognize those mistakes quickly and adjust.

So what do we do with all of this? We issued a draft plan. And this plan took into account what we heard, we hope. The main report is on-line along with 11 appendices, some of which are more than a thousand pages in length. So I know that any of you who are out there who want to peruse all of that, you have a great challenge ahead of you. But it's good writing and it's good work.

We added a chapter in the main report to more explicitly acknowledge scientific and technical challenges, to be more blunt about what those are. We revised our maps and texts to better convey relative levels of certainty. We added the discussion on the prioritization process. But, very importantly, the main report does not prioritize projects. That prioritization is in the Annual Plan. We clarified the relationship between actions needed to achieve a sustainable landscape and sustainable hurricane protection, recognizing that both are needed. And we also added a discussion on long-term management needs, utilizing an adaptive management framework.

Our goal for returning sustainability to the landscape is maximizing use of the river and its resources. We know that unless we do this, sustainability will not be possible. We have to restore system hydrology, we have to have land-building diversions, and we have to have land-sustaining diversions.

We also recognize that there are critical land forms that must be sustained. We have to take control of the assets that navigation channels offer us. We have to look at marsh creation with dredge material. Various shoreline restoration is a central component.

Ridge restoration and shoreline stabilization are also necessary.

I think you have much better copies of this map in your handouts along with a legend that explains it in more detail, but I'll point out the major things.

These are a major river diversion. This blue area is water management. And you're looking at work that needs to be done on the barrier islands. Other diversions are in here. For the Chenier plain, again, water management from the assets of the Atchafalaya River is critical. You have water management in these areas and in these areas, and of great concern is the Mermentau Basin in this area.

We recognize that we must reduce the risk to the communities and that doing -- reducing risk is dependent on a restored ecosystem in a sustainable landscape; that nonstructural measures are also enforced; that this means elevating homes and approve building codes. It means evacuation planning, land-use planning. We recognize that insurance is a huge issue, and we must have insurance to sustain our communities and that hazard mitigation plan must be implemented. And then, finally, levees and flood gates are an essential component of that overall concept, reducing risk to the communities. Existing levees are dashed lines

and proposed levees are in the solid line. Morganza to the Gulf is shown as a solid line that is in the water resources bill, which, by the way, we did hear good news about this morning. But we hope that one day that will be on track.

The purple means that those existing levees will be taken to their authorized, currently-existing authorized levels. Red is where we propose a 100-year protection and the blue is for those areas where we propose greater than a 100-year protection.

In the Chenier plain, again, managing the water is an essential part of reducing risk to the communities. And in this area, LA 82/27 begins one of the first lines of defense along the shoreline stabilization.

There's difficult issues that we have out there. Closing the Mississippi River Gulf Outlet is one and our plan recommends immediately closure, and then also looking to see what the economic effects of that closure mean and addressing those effects.

For Plaquemines Parish, we're recommending that the existing levees be restored to their authorized height and we are also recommending a major river diversion.

As I said earlier, the process for

identifying priority actions is within the annual planning framework. Adaptive implementation requires us to focus on the scientific and technical advances and to promote program learning. We need a process for revising the Master Plan in a deliberate manner so that it remains relevant into the future while maintaining its focus. Rapid plan implementation is dependent on resolving several key policy, legislative and institutional issues that now exist. We have to develop a structure for the Master Plan implementation into the future. We have to focus the federal involvement, including process modifications, to speed implementation. We need effective mechanisms for focused land-use regulation. We must avoid inducing development in areas that are unsafe. And there will be some areas that remain unsafe behind a levee even after a levee is built. We must develop fair, equitable and expedient methods for acquiring surface land rights for project implementation, and we need to articulate a strategy for preserving and managing our wetland forest.

We know that the Master Plan will cost in excess of 50 billion. The typical cost share would require the state match be at least 20 billion. Existing state funding sources total approximately 150 to 200 million a year. OCS revenue sharing estimates

would increase this by 20 million a year until 2017, then by approximately four to 600 million a year every year thereafter. And assuming that the federal funds were out there, this stream would allow the plan to be implemented in a 50 to a hundred year time frame.

Now, what this means is that we are challenged to prioritize appropriately and to seek those additional funding sources. So, as part of that, we've identified urgent, early actions, and these are measures that reduce key uncertainties for future planning and implementation. They're operational modifications of existing projects that may deliver rapid improvements. They're measures that deliver the highest priority outcomes, that hurricane protection for the highest asset, highest risk areas, projects that sustain or restore hydraulic regimes, projects that restore natural processes to projects of high projected land losses, and projects that sustain or improve processes critical to the social, economic viability of an existing community.

Our sequencing of urgent early actions assures objectives are achieved quickly and in a balanced manner. And we recognize that the actual time scales are dependent upon resource availability.

How do we begin all this? Because you've heard me enough, I'm now going to turn this over to

Andrew Beall for a few minutes while he talks about the specifics of the State Plan and how we begin that implementation process. Andrew?

MR. BEALL:

Thank you. Like Michele said, what I want to talk about briefly is the Fiscal Year 2008 Annual Plan. By law every year, the expenditures that come out of the Coastal Protection/Restoration Trust Fund have to be brought out to the public and -- and receive public comment on. And that's the normal part of the Annual Plan that we usually come out and talk about. This year we have a slightly different case. In addition to that, we also have the outcomes to the Master Plan prioritization process that Michele just briefly talked about. More detailed information, than what I'm going to be able to in the few minutes I have to talk about tonight, can be found in the Annual Plan that you received by the door. The urgent early action outcomes from the Master Plan, we tried to take, as Michele described the processes of all the measures that you see on the boards up here and all the measures that you have in the map and group them into outcomes that we think can match project synergy to develop the most effective sustainable landscape for the coast. And these fill out the major plan groups, such as large scale planning,

which include things such as Mississippi River Delta management, that big diversion that Michele showed you at the south Plaquemines Parish, as an approximate location, Chenier Plain Water and Sediment Resource Allocation Study. They're a coast-wide program as measured under the focused resource monitoring and will include things like a beneficial use program. They're nonstructural and evacuation planning activities, specifically, hurricane protection where early works can concentrate on the highest assets and highest areas at risk, specifically, working towards a closure of the MRGO and ecosystem restoration, restoration of critical land forms, such as land bridges, marsh creation and barrier shorelines, the operation and sizing of diversions of both the Mississippi and Atchafalaya River so that resource can be used in a coordinated manner, and, finally, water-management areas that Michele showed you in blue.

Of those early urgent actions, those highest priorities that reached for each of those objectives, for those measures, we did an initial budget analysis through FY '010. And what we're showing is that for FY '08, this next coming fiscal year, we'd like to move forward with 126 million dollars of activities. And that carries through FY '010. And that shows you a big

jump up there to 575 million.

What this basically is telling us, we're starting planning and engineering in FY '08 on certain activities, but we can't move forward on construction of a lot of activities, but that 575 million dollars in FY '010, that is the construction area that we're looking for and moving forward with.

Specifically, for FY '08, as the final Master Plan has not been submitted to or approved by the legislature, the interested agencies had to commit or have to submit a proposed budget request, and that's what this reflects. It supports the implementation Master Plan as well as carrying forward ongoing efforts by both departments. The FY '08 activities, like I said, it shows the majority of this being and planning and engineering and design of approximately 54 percent of that money. But, again, as we move out into the near, immediate future, this will quickly swing over to that construction side, which you see at 22 percent right now.

Real quickly, I just wanted to go through these activities in slightly more detail. More detail, like I said, can be found in the handout that you have in front of you.

For planning, engineering and design under

ecosystem restoration, we're looking at moving forward with things, specifically, closure of MRGO, the CIAP Plan that Mr. Fruge will talk to you briefly in more detail, the LCA Plan, CWPPRA, and the Bayou Lafourche reintroduction and finish the E&D on that project. For hurricane protection, we're calling out metro New Orleans and the north shore of Lake Pontchartrain, completing the E&D on Morganza to the Gulf as well as Donaldsonville to the Gulf.

For construction, again, we have CIAP and CWPPRA projects that are ongoing as well as the new projects that have been recently appropriated, or authorized -- excuse me. For hurricane protection, again, we're moving forward with Grand Isle incentive. That's already gone through E&D, Westbank of New Orleans, and, specifically, the regions of Morganza to the Gulf that have already gone through the E&D process.

Operations and maintenance of ongoing projects, projects that have already been built, those listed there, some ecosystem restoration as well as the levee inspection program, and, finally, two final components are science and technology program so that we can make better informed decisions into the future. This is an important part of the Master Plan as well as state only programs preparing ourselves for future

emergencies. We have an up-state only benefits. We use a small dredge program as well as public outreach components.

With that, I'd like to hand it over to -- to Dave Fruge, who will talk more specifically on the CIAP plan and how it will relate to ongoing activities.

MR. FRUGE:

A little bit about the CIAP program, the -- as -- as Scott Angelle mentioned, the program was authorized by Congress in 2005. And the instruments that we've been working with in Louisiana, the coastal parishes are going to receive about 523 million dollars over a four-year period, beginning this year. The state share is 65 percent, or 340 million, and the parishes will receive 183 million, or 35 percent. That's just an estimate. And we'll begin to get more accurate projections this coming April.

There's really five authorized uses of the funds through this program. The first three bullets that you see up there deal with restoration and conservation. The fifth -- the fourth one is planning assistance, administrative cost. And the last one is really for funding of onshore infrastructure projects and public services needs to mitigate OCS impacts. There's a 23-percent limitation on the expenditures for

the last two bullets that you see up there.

To access this money, the state has to submit a CIAP plan to the US Minerals Management Service. They're part of the Department of the Interior. And MMS has to approve that plan before they can disburse funds to the state or any of the coastal parishes.

Really, in our plan, there's three types of projects that are included. And this is a draft plan I'm speaking of now. There are projects that will be funded with the state share of the dollars, the CIAP dollars, parishes that -- excuse me -- dollars in there for the parishes to implement projects, and then projects that would be jointly funded by the state and the parish with their CIAP dollars. The plan is for four years of funding with an opportunity to do periodic revision of that plan.

What we've done so far, and this began about a year ago, was to establish goals and objectives and ranking criteria for the projects that would be included in the plan. We held a series of public hearings across the coast about a year ago. We worked very closely with all 19 of the coastal parishes to help them to understand the program and to also help them as they put together their project proposals. We solicited

proposals from the public and anyone else who wanted to put them forth. We placed all the proposals that we received on the Department of Natural Resources' website. We also discussed those at the regional open-house meetings last June. We evaluated the proposals, and then we selected projects that would be funded with the state's share of the CIAP dollars. As we began to put that draft plan together, we made sure that the CIAP projects that were included for support with state CIAP dollars were consistent with the draft Coastal Master Plan that you just saw.

We had two goals for our CIAP plan, the first one being restoration and conservation. And what we wanted to do was try to advance the strategies that had already been identified in large scale planning efforts, like the Coast 2050 Plan and the LCA Ecosystem Restoration Plan, and other collaborative planning efforts. We tried not to reinvent the wheel. We wanted projects that would help us to reduce coastal flooding impacts. We wanted projects that would work together with other restoration and protection projects, and we wanted at least some of the projects to be goals that we could implement in the near term. We wanted to get projects on the ground.

The second goal dealt with infrastructure.

There, we were trying to pick projects, infrastructure projects, that would mitigate onshore OCS, what it impacts, particularly projects that would directly benefit OCS, oil and gas exploration and production, projects would work together with restoration and protection projects. And at least some of those projects, they could be implemented in the near term. We wanted to get on that list.

We received 337 proposals for projects. Two hundred fifty-three of those involved project proposals that would be supportive with state CIAP dollars and 84 of those proposals only involved the parish's share of CIAP funds. And, if you look at overlap, if you include overlap, some 3.8 million dollars of proposals just for the state share of the dollars came forward. So we've got a lot of competition for those funds.

This is a bit about the plan selection and approval process. Initially, the DNR staff screened the proposal to make sure they met the authorized uses that they served some sort of regional purpose, then our science advisors helped us to go through these proposals. We also consulted with members of the CPRA Integrated Planning Team. DNR then -- they recommended a list of projects to the CIAP Project Selection

Committee, and that committee selected the draft project list. We released our plan February the 6th just like the Draft Master Plan was released. And we, of course, this week we are participating in these public hearings. We're going to prepare a final plan. And before we submit that to the Minerals Management Service, we have to get approval from the coastal protection, restoration authority to do that.

The way we evaluated our proposals, we had an external review in terms of detailed analysis. We had an external review of 66 proposals that were conducted by a team of 11 scientists, led by Dr. Robert Twilley of LSU. Our DNR Technical Review Panel also reviewed those proposals and science panel findings and other proposals, and then we actually recommended, our review panel recommended, a preliminary list of projects for state funding.

We had a meeting of our CIAP Project Selection Committee, and that included representatives of the Governor's office, Coastal Activities, several departments, including DNR, DEQ, Department of Wildlife and Fisheries, Ag and Forestry, and the Department of Transportation and Development. That Project Selection Committee meeting also included participation by the DNR staff, the CPRA-accredited planning team members and

Dr. Twilley. DNR presented those recommendations to the selection committee. The committee reviewed those very thoroughly, and then they selected a list of projects for CIAP funding. That's with the state share of the CIAP funding.

The projects that would be supported by the state's share of the CIAP dollars, and that's 340 million dollars total, 18 of those projects were for restoration and conservation purposes. That included 80 percent of the state's share of the CIAP dollars and also some 37 million of -- of cost sharing from seven parishes using their dollars, their CIAP dollars. And then we supported five infrastructure projects representing 20 percent of our dollars. And then those five projects also included 16 million dollars of the parish CIAP cost shares.

Some of the proposals for restoration and conservation funding that are actually included as -- as being selected in our draft plan, we group these under several major categories. The first category is enhanced management of Mississippi River water nutrients and sediment. Five proposals there are in our plan; the Violet Diversion Project, about 5000 cubic feet per second of Mississippi River water diverted into the central wetlands of St. Bernard Parish; a long-distance

sediment pipeline to move Mississippi River sediment across the length of the -- or the width of the Barataria Basin, the central part of that basin. And the state is putting forth 31 million dollars, but there are three parishes that are each putting up one million dollars: Lafourche, Plaquemines and -- and Jefferson. And there's a Blind River siphon to bring Mississippi River water into the upper end of the Blind River and into the Manchac swamp to try to sustain some of those coastal swamps there; again, St. James Parish putting in money along with the state. There's the Bayou Lamoque Flood Gate Removal Project that would remove flood gates to allow up to 12 thousand cubic feet per second of Mississippi River water to flow into the adjacent wetlands in lower Plaquemines Parish. And then the final project on that list is actually development of a strategic plan for Delta Management. That would provide focus and direction for the large scale feasibility study of land building to occur next.

We have two barrier shoreline restoration protection projects in our plan. The first is the East Grand Terre Island Restoration Project in Barataria's chain, and then the Rockefeller Refuge shoreline in the western part of the state.

Next category is protection and restoration

of critical land bridges. Two major projects there. First is the Orleans Land Bridge Shoreline Protection and Marsh Creation Project, some 42 million dollars of which over 15 million's coming from the Orleans Parish share of their CIAP funding, and then the Barataria Land Bridge Dedicated Dredging Project to help shore up the central land bridge in Barataria Basin.

Next, we have several interior shoreline protection projects. The first two are along major navigation channels maintained by the Corps where we're trying to sustain the banks of those channels, the Fresh Water Bayou Shoreline Protection Project in the western part of the state and then the Gulf Intracoastal Waterway critical areas and erosion in Terrebonne Parish, trying to reduce the loss of -- of very sensitive floating fresh water marsh from -- from erosion from boat traffic.

The last two projects are lake projects, one being Grand Lake Shoreline Protection in -- in western Louisiana in Cameron Parish, and then the third and final phase of the Lake Salvador Shoreline Protection Project, which we are -- project which we are cost-sharing with St. Charles Parish.

The next category is marsh creation with dredge material. We have 20 million dollars earmarked

for beneficial use of dredge material along existing, federally-maintained navigation channels basically to make better use of the spoilage that's -- that's dredged from those channels. And the second project is repairing the fringe marsh that protects the back levees in parts of lower Plaquemines Parish. Plaquemines Parish is actually putting up the bulk of the 7.9 million. But the state is cost-sharing with that.

The next category is to establish a Coastal Forest Conservation Initiative. The major focus of that is to acquire conservation easements on high quality but threatened coastal forest areas. We know those areas are extremely important from a storm surge protection standpoint and for their biological value. We also want to use some of those funds to implement some small-scale restoration projects, such as projects to reduce ponding in the swamps, and then, finally, to facilitate wetland assimilation projects that would serve to help to sustain coastal forest.

The last two items involve, first of all, a central wetlands assimilation project that would use treated, secondarily-treated, sewerage effluent from two sewerage treatment plants, one in Orleans Parish and one in St. Bernard Parish, training that water to flow into the highly-degraded area of marsh and swamp, trying to

recover that area. The nutrient loads in -- in those discharges are extremely high and then those have been found to be beneficial in previous instances.

The last item is just a monitoring program to make sure that we're checking to see how these projects are performing and modifying them if we need to in the future.

In terms of infrastructure, there is -- first, there's five projects the state is putting money into under the CIAP Program. The first one is the Houma Navigation Canal Lock, the state putting in 33 million dollars and the parish putting up 10 million dollars. And that is to accelerate the construction of the Houma Navigation Canal Lock, which, as many of you know, is part of the Morganza to the Gulf Hurricane Protection Project, which is awaiting Congressional approval.

The second project is Louisiana Highway 1 Improvement Project, the Fourchon-Leeville stretch, the state putting money in, but also -- also Lafourche Parish. And then the final three projects are -- are road resurfacing projects in the New Iberia area and Morgan City area and in -- and in -- in lower Cameron Parish. All of those roads are affected by OCS traffic, traffic basically in support of those activities.

There are a lot of synergies among these

projects. I won't go into a lot of detail there. But the CIAP projects are working together with other CIAP projects and then projects like the Breaux bill and the -- and what we hope to be the Louisiana Coastal Area Program.

That yellow Chevron that you see in the upper part of the screen is the -- is the East Grand Terre Island Project, and you can see the red projects, the red Barrier Island components there are projects that are being funded through CWPPRA, and the one sort of yellowish brown would be funded through LCA. So they're part of an integrated system. And there are other areas along the coast, like in the fresh-water bayou area of the Maurepas swamp, the Orleans Land Bridge and the Barataria Land Bridge where you have a lot of different projects, including the CIAP projects are going to work together to provide a larger benefit.

We want to take early action on several projects even before the federal dollars arrive. Some of them are construction projects. Some of them are -- involve -- like one of them involves land acquisition and several of them involve engineering and design. We want to move forward with state trust fund money before the federal dollars arrive, and then we can -- then we'll be able to reimburse ourselves once we get the

grants, the plan's approved when we get grants.

Just a little bit about the projects that are going to be supported by the parish's share of those dollars. Some 86 percent of the money that the parishes expect to get is going to be for restoration and conservation projects and 14 percent is going to be for infrastructure and public service needs and for planning and administrative cost. The parishes really have done a great job of picking out some great projects and we think they're really going to make a difference.

Some of the types of projects that the parishes have put forth and that will be in this draft plan are shoreline protection, marsh creation, reef construction, even restoration of some aquatic habitat in the Atchafalaya Basin. I also mentioned the OCF-related roadwork.

Our timeline, of course, we have released our plan. We did that on February the 6th. We have these public hearings going on this week. And we've already briefed the CPRA, the Select, Joint Select Coastal Committee in the legislature, and, also, we have a briefing plan for the Governor's Coastal Commission. We want to submit our final CIAP plan on May the 1st, and we hope to obtain approval of our plan in August.

Thank you.

MS. DESHOTELS:

Thank you, David.

What's next? One of the things that I want to clarify and which Andrew and David spoke to a little bit is that time frame that I had talked about earlier can be shortened by aggressively maximizing the use of those resources that are out there available to us, such as CIAP and our OCS offshore money, such as Scott was talking about earlier. That's one of the things that we're looking at.

One of the things, also, in this current schedule is finalizing this plan, which will also enable us to go out and to aggressively pursue some of these projects. Our public comment period closes on April the 2nd. So we're here tonight to listen to what you have to say. You can also submit written comments to us, for us to receive by that April 2nd date. We will take what we hear, look at it, address it, as we can, as Scott has said earlier, Secretary Angelle had mentioned, and we hope to deliver on April 30th a plan to the legislature for their approval.

As David Fruge just mentioned, the CIAP Plan goes to Minerals Management Service on May 1st, hopefully, to obtain approval this August. April 2nd, for those -- and share with your friends. I think we

have some comment forms outside with our mailing address and e-mail address on them. We accept e-mail comments and we accept written comments. So if people were not able to come tonight, please let them know that they can provide comments on the plan. And, again, the plan in its entirety is available at www.louisianacoastalplanning.org along with our Annual Plan. And the CIAP Plan is also available on-line on the DNR site.

So, now, if someone will turn the lights up, please, we will go directly into taking comments from the public.

MR. ANGELLE:

Thank you, Michele. Let me wrap up my comments by addressing the time period. I didn't come over here to hear the state of Louisiana say that it's going to take 50 to a 100 years to build a plan and you didn't, either. Absolutely not. And I'm going to ask the staff to work on that wording, because the wording is clearly misleading and is not what we're talking about. What I want you to understand, I believe, is very, very important, is that at the current level of funding that we have to do the kind of work that we think needs to be done, it would take that long to do everything, okay? It's kind of like the Eisenhower interstate system. The Eisenhower interstate system got

started in 1959, and 40 years later they're still building the interstate system, you know, but, obviously, a lot of parts of it are working and are functioning. It's our job more than anything else to have a plan and to be able to go to the American Congress and be grateful for the OCS revenue-sharing bill that was passed, as I said, last year and substantial money will come in the year 2017 and 2018 and on, so forth. But even that is not enough to protect this area of America that produces the fisheries and the energy and the culture that we have here. It's going to take more money than we already know we have. But that's shouldn't allow us to quit dreaming about a protection scheme and about a restoration that we know is very vital to America. So when you hear of 50 years, that means to get from where we may be today to eventually putting the final finishing touches on something, okay? But it certainly means that starting in August, when we begin to get some of the federal revenues from the CIAP plan, that we are out here starting to do work. And that's why I was so excited about the 33 million dollars that the state was able to put up towards the Houma Navigation Locks, because that's real and that means a system of protection that we can get started on that is not waiting on another

study.

So, again, I thank you for the opportunity to visit with you and, you know, obviously, would invite any of you-all to bring your comments forward to our team. Thank you-all very much.

MS. DESHOTELS:

Thank you, sir. Our first speaker this evening is Senator Dupre.

SENATOR DUPRE:

Thank you, Michele. I want to first start on the CIAP Program. I want to thank, my sincere thanks, to DNR, Secretary Angelle, Mr. Fruge for working together with us and also for the two parishes I represent in Lafourche and Terrebonne parishes. I think we saw a coalition building over here where we were able to combine resources. And we didn't concentrate on small, pork-barrel projects. We concentrated on the big-scale projects. And if you just add up the agency lock, lower LA 1, the Slurry Pipeline Project and the Barataria Land Bridge, which just about all of them are in my legislative district. It's about 130 million dollars. Because we were able to work together and combine parish share and state share together instead of just building small projects and recognizing what our major needs are.

As far as procedurally, where we go from here, the legislature, you know, the CPRA and the Master Plan and Annual Plan is all part of Act 8 of the November 2005 session. And I believe on August the -- you-all's plan has to be submitted to the legislature on the August 30th session, when we go into session. We have a very, very short time period at the legislature to adopt it and approve it, only until May the 15th. I guess when we -- we didn't think when we first passed this that we will be in fiscal session and we thought we had six weeks, but we only have two and a half weeks.

I sent an e-mail today from the Senate president requesting that the first week of the session that we have to have a Special Joint Committee meeting of the transportation and Natural Resources Committee together, because that's the only way we can accomplish resolution to approve it.

Now, we already have staff working on the language, but I want to read you-all one part as part of the comments we got from this building on the last -- last meeting. And, you know, what resolutions, you just got to go where to get it resolved that we're going to maybe approve the Master Plan. But be it further resolved that the legislature of Louisiana does hereby express the specific intent that such a Comprehensive

Master Plan for coastal protection include and maintain a secondary level of hurricane protection and that Coastal Protection and Restoration Authority and other entities implementing such Master Plan extend coastal protection to include and protect the greatest number of coastal communities practicable.

And that's the number one issue that we heard at the last meeting we had over here in Houma. People are very concerned that we're drawing arbitrary lines to exclude half of parishes or entire communities, not recognizing the national significance that some of these areas play. For example, the Larose to Golden Meadow system where we're building, we're eventually going to build a half-a-billion-dollar highway, which can end up being under water if we don't have the levees built at least the same height as the plus-20-foot highway, which we want to build.

This plan, I think you-all did a fantastic job of putting together the Master Plan. The plan seems to have been done like from a bird's-eye view or maybe even from a satellite view. But I believe it's time now, after we go to the legislature, it's time you-all go back and start looking at the sub-basin level. You-all had looked at the major basin, the Terrebonne and Barataria basins. I personally believe it is

possible to provide additional, more than 100-year protection, if you go at the sub-basin level and consider all the sub-basins. What fits between Golden Meadow and Pointe-Aux-Chene might not fit between Grand Caillou and Little Caillou. We need to go to sub-basin level. And I can just give you-all a couple of examples.

In building the foundations we have, the main, the first foundation we have is the Larose to Golden Meadow Hurricane Protection System, which is the only federally-authorized system south of the Intracoastal Canal, and, by the way, the only one that did not fail, either Katrina or Rita, the only ones that did not fail. The Morganza to the Gulf builds upon that system and to the west. And it's going to be considered, and I think we'll finally get authorization this year from Congress for that. And the other foundation, of course, is our barrier island system. Let's build upon the foundation. We don't want to tinker with Morganza. Let's leave Morganza alone. But on the Morganza line, between west of Houma and Bayou Black, over to -- over to Bayou Lafourche, there are some levels of protection that can be done without sacrificing entire coastal communities. For example, between Golden Meadow and Pointe-Aux-Chene, we can go

with a more southerly alignment where we could have double-layer protection and not affect anyone where they live, between Bayou Petite Caillou and Bayou Grand Caillou, Little Caillou and Dulac area.

Go back -- let's go back to the original Morganza to the Gulf Reconnaissance Study and early feasibility studies that were done. You remember the first alignment was north of Lake Boudreaux, not south where it is now, north of Lake Boudreaux. Why not consider building hurricane alignment north and south of Lake Boudreaux, thereby protecting everyone in these coastal communities. There is a secondary level would be north of the main Morganza alignment. The other one I suggested, which is between Golden Meadow and Pointe-Aux-Chene, would be south of the Morganza alignment. But I think it's possible if you-all take off, you know, you stop looking through -- if we stop looking through a bird's-eye view and look through a telescope and start looking at these sub-basins to -- to accomplish those goals.

We need -- I'm very, very pleased to see we're final putting money in construction and not just studies in the short-term plan and the Annual Plan. There are some practical solutions. I mean, people are tired of hearing the word "study," and we have to

understand -- I just saw a film earlier this week. Sometimes when you take action without looking at the environmental implications, you can create a great deal of damage, also. Look what happened in 1904 when Bayou Lafourche was dammed off at Donaldsonville. If -- if a -- if a flood gate or some kind of control structure was put there, I don't think we would have other serious problems we're having today. So that's the balance we have to do. We need to consider what we're doing environmentally. But at the same time there are some short-term solutions out there. And I have suggested some of them. One of them we met with Secretary Angelle because of the -- the saltwater crisis we're having where people are actually drinking salt water in this area. And it was brought up at the last meeting. Valentine Paper Company had to shut down. People were tasting saltwater in Bayou Lafourche. And it's only going to be a matter of time before the saltwater wedge gets a little further north into where we draw Terrebonne Parish water. So you-all have a quarter of a million people drinking saltwater. And let's remember that there's no human civilization that's ever developed without a source of fresh drinking water. That's second only to air as far as human development. And so we want to build a structure in Larose to stop -- in the main

channel of Bayou Lafourche to stop saltwater from getting up into our drinking supplies. Secretary Angelle has offered some support in the short-term plan of that.

We're asking the CPRA and the Corps to do the modeling and let's go and choke the Houma Navigational Canal south of where the lock is going to be built. That can be built very quickly. Let's go from the 800- to a 1000-feet width. Let's choke it to 200 feet south of Dulac, between Dulac and Cocodrie, to slow down the saltwater coming north and forcing more fresh water further east, which would probably also help on the saltwater problems we have on Bayou Lafourche. All of this, one affects the other.

On the lock project, we're very, very pleased with the 43 million dollars we're going to get for the HNC lock project. But let's remember that lock project is a 180 million dollars. I'm requesting of CPRA and the Corps consider splitting the lock project and allowing us to build the 200-foot-wide flood gate while waiting a few years from now to build the locked portion of the lock complex and just sheet pile only and closing off the channel during the interim period. That's the big problem I see with coastal restoration in general. We're -- you know, we're like an 18-year-old,

an 18-year-old just getting out of high school, making 20 thousand dollars a year and we have desire to buy a 60-thousand-dollar Corvette. We're either going to walk or we can buy an old car to get us around. Well, it's time we can start getting around. And we can afford to do some component parts now. We can afford to do some of this now while waiting for the big-scale projects. We can't keep just studying and waiting. Just like Bayou Lafourche diversion. There are component parts that can be built, and that's what we're after. We're after building. Let's go -- if we can derive some short-term component parts of some of these large-scale projects, I say let's do it. Let's do it now.

And I guess the final statement I'll make, and I said it in Baton Rouge, another -- some of the other issues we need -- we need CPRA to act also as an advisory coastal protection group to us and the legislature. Some things are not just money-related. Some are public-policy-related. And we'll give you an example of the bill I'm contemplating on filing this year.

We -- we charge private companies who want to do coastal projects a fee for royalties when they dredge state water bottoms to go and restore wetlands. So we're going to charge them 10 thousand dollars or we

can put up a half a million or a million dollars for a smaller-scale project. I think it's worth waiving the fee or getting some other source to pay that fee, the Wildlife and Fisheries, what they're charging these people to encourage private-public partnerships. The other thing we need to do is change the attitude in getting to the building mode rather than the regulatory mode. We have agencies with the state and federal government that have been regulators for a 100 years and now all of a sudden we have to build things. Let's get in the building mode. Let's stop letting other things get in the way.

As I said in Baton Rouge, when you have only two out of 38 people are not signed right-of-ways for 13 million dollar CWPPRA Project in Terrebonne Parish and we have a federal agency that refuses to let the state and local government to use our expropriation power granted by our constitution, what are we going to do when these big projects come up? We're afraid of 13-million-dollar project and refusing to let us use the powers we have in our -- and tools we have in our tool chest. Let us use the tools we have and change public policy and change attitudes and letting us do what we have to do. Those decisions have to be made.

MS. DESHOTELS:

Thank you.

Dick Guidry. I do want to tell people I have 21 cards in my hand, 22 coming, and I'm going to be limiting people to about three minutes.

MR. GUIDRY:

Michele, I want to thank Secretary Angelle. I wish you would have been there in 1968 to help me.

MR. ANGELLE:

I was only seven years old.

MR. GUIDRY:

Well, you couldn't tell that.

You better look at this situation. And I'd like for the Department of Natural Resources to really take a close look at what you're trying to do, say, in Lafourche Parish. We built our levees. They were created in 1968. And by kicking and hollering and screaming, that money from the Atchafalaya Levee Board and Lafourche Levee District to give us seed money that started. It took us 39 years to get to the level where we are right now. And you've got to look at this as we're under construction right now, half-a-billion-dollar elevated highway to get to Port Fourchon. If ever you have a Katrina hit Morgan City, south Lafourche would be another St. Bernard, Plaquemines Parish. So why are we going to settle for a 100-year, or about 16,

17-foot levee when we're building a 22-foot elevated highway, which you will not be able to get to if you can't get from Larose to Golden Meadow to get to the elevated highway? That doesn't make much sense.

In -- in Leeville, it was -- it was like all honed in, the governor's representatives, the senators, they were all there, patting themselves on the back how great it was to build an elevated highway, but yet nobody mentioned how you're going to get to it in case you get wiped out.

What we'd like for the Department of Natural Resources, Mr. Secretary, is to seriously consider the southern route: Instead of Morganza from Larose to -- to Fourchon, to -- I'm sorry -- Pointe-Aux-Chene, we'd like for you to seriously consider from Golden Meadow to Pointe-Aux-Chene, the same distance. You'd have big advantage you'd have. You'd have a redundancy. We'd have two levees. It would help towards helping reach the effect of the 22-foot elevated highway. And not only that. It would create one of the most fantastic fresh water marsh you've ever seen from Pointe-Aux-Chene all the way up to the Intracoastal Waterway. And we've got a flood gate that we built. It's anchored by the existing floodgate. We worked very closely with the Port Commission, the South Lafourche Levee District

does, and if we're going to continue, it's a state -- it's a state and federal problem. It's not a South Lafourche problem. We're going to be getting billions of dollars from oil royalties. If ever that's interrupted, what happens, the federal government has a big problem. It's roughly 18 percent of oil, of the natural -- of oil does not go into the domestic US market overnight. Twenty-four percent of natural gas, that means that the farmers in the midwest and their fertilizers will be exhausted. They won't be able to afford prices. Gasoline will jump to five or six dollars a gallon overnight until it's remedied and deep water and lube can get back on line. And it's a state problem, because if you have interruptions, the state's not going to collect the royalties of the deep water to restore the marshes, and what have you.

I'd like for you guys to seriously consider putting in the program enough money for us to install our gate and which would, in effect, help the Port Commission for the simple reason that instead of stopping water from going in and out, you're going to have a lock system where the port will not be interrupted after and before a hurricane because of high tides. Right now, you may have eight foot more water in South Lafourche than you have in Bayou Lafourche for the

simple reason that -- that when we open the gates, you're defeating the purpose. So, anyway, that's the main thing I want to talk about.

And as far as your map over there, that right turn, left turn, that will do wonders for Barataria Bay, Timbalier Bay and Terrebonne Bay. You would be surprised what that's going to do in the marsh restoration that you're not even counting on to be that effective, but it will be.

And as far as the shipping industry, they shouldn't be concerned, because they're dredging 365 days a year now anyway from the mouth of the river all the way to that point. But it should be built south of where the population lives, because you don't need to interrupt those people more than they've been interrupted the last 18 months.

Thank you very much. Mr. Secretary, I'd like very much for you-all to consider that in your final draft.

MR. ANGELLE:

Thank you, sir.

MS. DESHOTELS:

Thank you.

Kandy Theriot.

MS. THERIOT:

My name is Kandy Theriot. I'm the CEO of the Houma/Terrebonne Chamber of Commerce.

I'm here, first, to thank the Department of Natural Resources for recognizing the importance of the Houma Navigational Lock and for committing 33 million dollars to the building of that lock, and also to thank Terrebonne Parish Consolidated Government for putting 10 million dollars also of -- of the local dollars that they're getting from the CIAP money.

We want to support the lock on the Houma Navigational Canal, because it has multi-purposes: The first hurricane protection and wetland preservation. It will be used to stop storm surges and saltwater intrusion and to manage fresh water resources.

Recognizing the importance of the Houma Navigational Canal Lock for the protection of our citizens, we request that you take as immediate action as possible to start the funding process.

I'm also here to support the state Master Plan and to thank you for recognizing the importance of the Morganza to the Gulf Hurricane Protection System. And we urge you to keep that in your final plan in its original, in its current form.

While we fully support the need for hurricane protection levees to protect our communities,

we also understand that no hurricane levee system will survive without a restored coastal landscape. We do support the rebuilding of our barrier islands as a first -- first line of defense. We understand the options available to rebuild the marshes and natural ridges of Terrebonne Parish are limited. We support water-diversion projects to feed the southern marshes. But this is not going to solve the problem on our coastal land loss and it won't rebuild any of the marsh in our area. Obviously, we need sediment to rebuild the marshes and the lands that we've lost. And we're asking that long-distance transport of sediments, from sediments harvested from the Atchafalaya and from offshore deposits have been shown by studies funded through the Department of Natural Resources to be a feasible project, and that can be done in a timely manner. We want to urge you to use this option and to clearly state it in your state Master Plan as an option that would be prioritized under your urgent early action. Thank you very much.

MS. DESHOTELS:

Thank you.

Preston Verret. Sir, would you go to the mike, please? We are recording.

MR. VERRET:

I will. I'm just putting the box there.

MS. DESHOTELS:

Okay. Thank you.

MR. VERRET:

All right. First -- first of all, I guess you-all wondering what's in the box. And this box is one of the main, the oldest devices known to man. It can create a lot of power, energy and fuel. We have three major resources of super powers. We have electricity, we have wind, and we have water. We can use this to help build levees, divert water from one place to another, and many other things can be done with this. It is also -- yeah. There's many other things that we could do with this if it's properly used.

I hear people talk, looking at -- for a new resources for fuel other than gas and oil. Maybe this would be a good project for vo-techs to work on, to see what they could do and can really be done with it. Once this device, with vo-tech to work on, on this project, can really be done -- once the device is made, there is no fuel cost. I can demonstrate for you right here and right now if you'd like to see what I'm talking about. This is what's in the box.

Now, I have a question. I'm going to go to the questions. How are we planning on building this

levee? Are we going to dredge this levee?

MS. DESHOTELS:

Sir, those are project-specific questions, and we're not at that stage yet.

MR. VERRET:

Go to the resources, then. These are the resources we have. We have air. We have rain. We have water. We have wind. We have mud. We have sand. We have oil. We have gas. We've got aerospace. We have machinery. We have technology. We have water bottoms. We have mountains. We have rock. We have sunlight, and we've got heat. All of these are resources.

MS. DESHOTELS:

Yes, sir.

MR. VERRET:

What's in the box is a homemade windmill. It could be used to recycle. What I'm talking about is this: In the -- I have over here, I read earlier -- in fact, let me just get it real quick.

MS. DESHOTELS:

Yes, sir. Sir, we're -- we're limiting all comments to about three minutes.

MR. VERRET:

I know we're limited. I know we're limited.

All right. It says right here, in this

place right here, every year, about 47 thousand square miles of aquaculture land are made worse in this way. That's because the land is drying up. Now, water is a resource. Why not take that water? Because nobody's doing anything with the water. What we need to do, we need to take this water, melt this dry land and pump it back here to make a levee. If we dredge, if you dredge it, you're just making your water deeper, giving your Gulf more ways to bring saltwater in. But if we -- if we recycle the dried mud that we have, it will get rid of some of the water. Right now, there's water -- water comes in many ways, shapes and forms. It comes through rain. It comes through ice. It comes through snows. It comes through fog. It comes through anything that makes water. It's just adding up. And every time you put something in the water, it has an effect. If you fill up your bathtub at nighttime to take a bath and you got too much water in it, and when you sit in that bathtub, that bathtub is going to overflow.

MS. DESHOTELS:

That's right.

MR. VERRET:

We are putting a lot -- a 100 years ago, we didn't have the pressure, pressure down on water. All the pressure that we putting on water, tugboat, no

matter what it is, water's got to rise. We're not doing any -- I don't hear no one talking about anything about getting rid of the water or using the water. The water is a valuable resource. The wind is a valuable resource. We could use the wind as power, because they do it. They already do it through windmills. In fact, they're supplying about 20 percent of California's electric supply.

MS. DESHOTELS:

Sir, I'm going to ask that one of our team members get with you and get your name and address so you can discuss this in more detail with us later in the week.

MR. VERRET:

Good enough.

MS. DESHOTELS:

Ricky, Mr. Broulliet, would you please meet with Mr. Verret? Thank you. Thank you, sir. Do you want your box, sir?

MR. VERRET:

Yeah. Yes indeed.

MS. DESHOTELS:

And did you want to hand the letter in for the record?

MR. VERRET:

Excuse me?

MS. DESHOTELS:

Do you want to hand in the letter for the record?

MR. VERRET:

Yes, my notes.

MS. DESHOTELS:

Okay. Thank you.

Randy Mollere?

MR. MOERTLE:

Moertle?

MS. DESHOTELS:

Yes. I can't read your handwriting. I prefer the first.

MR. MOERTLE:

My name is Randy Moertle, and I'm here representing several large landowners in the state. I'm representing the L. Miller Estate from Vermilion and Cameron Parish, Avery Island Incorporated, McIlhenny Company, the E.A. McIlhenny Company from Vermilion and Iberia Parish, Little Lake Land Company, General Agricultural Company from Lafourche Parish, Biloxi Marshlands Corporation and Lake Eugenie Land Development Company from St. Bernard Parish.

And what I'd like to -- first of all, I'd

like to thank everybody for involving all the -- the landowners in this process. We very much appreciate that. We have met with the secretary privately. We were able to give a lot of our input into this process. We're very appreciative for all of that. And we think the plan is very well thought out and very well designed.

I do have one thing, though, that I do need to bring to everybody's attention. It's in Chapter 4 of the Master Plan of the Draft. It's in the Master Plan Implementation. And it says on page 79 that 80 percent of coastal Louisiana is privately owned and the rights of these landowners must be honored. And I do believe that, you know, and I believe everybody here. We've fought for that for a long time. And we finally gotten to where we're one of the major stakeholders, because we do own 80 percent of the property that is out there that all the stuff is going to take place on.

Now, page 79, it also says we need to -- and it's under the Addressed Processes To Acquiring Land Rights. It's under this category. And it says here: Acquire the necessary easements by separating surface rights from mineral rights. The state could then purchase the surface rights to the land while the original landowner would retain all subsurface, including the mineral rights, which I think is a must.

If we're talking about these coastal restoration projects where a landowner has legitimate ownership to these land rights and we're talking about putting in things that could ease his property, that's the landowner. And I'm glad Secretary Angelle is here because of that. I think that we need to maintain the mineral rights to the proper entity, which is the landowner that owns that land.

Okay. Now, when you go to page 80, it says: Another choice for acquiring necessary land rights to construct projects that are in the best interest of the public is an authority known as Quick Take. Quick Take Authority allows the agency to place the offer of compensation in the court registry and file a lawsuit against the landowner. Okay. But then you go on. It says: The clear preference of the state is to work in partnership with landowners to achieve the objective of the Master Plan. We've been working for almost 15 years now through the Breaux Act and CWPPRA process to go ahead and put in a lot of projects, which landowners, I mean, why would they not want coastal restoration projects, you know, and not want levee protection? I mean, we're completely -- we're in partnership. We work with people and we've been doing it. But this Quick Take business is -- is completely unacceptable. And it

says in this plan that it is necessary at this juncture to have Quick Take.

Now, I know Senator Dupre just got up and made something to that comment; that, well, we have landowners that are obstructionists and that they're holding this project. And I would like to say to him that not every project that is being offered for a landowner's property is that well designed for that property owner. He's the one that knows the land better than anybody else. He knows what's going on on his property. And a lot of these projects that are given to a landowner from the resource agency is not that well thought out. It's not always in the best interest and the management for that property owner. So he's not an obstructionist. He's looking for the best management practices for his particular piece of property.

Now, if we do ever get into a Quick Take legislative and it does get passed, then we need to go ahead and separate the mineral rights from the surface rights so that the Quick Take, it does take the land, it takes the surface land, but it maintains the mineral rights to the landowner.

And I'm very glad to have the number of people that are here to hear that. And I don't know that it is necessary at this juncture, if the state's

intention is -- its preferred intention is to work with landowners, then let's exhaust that first before we get out there trying to get legislation for a Quick Take.

Thank you-all so much for listening to us. I really have high kudos for the plan, thank everybody for all the hard work you've done. Thank you very much.

MS. DESHOTELS:

Thank you, sir.

A.J. "Buddy" Cantrelle, A.J. "Buddy" Cantrelle, Jr.?

MR. CANTRELLE:

Thank you-all for letting me talk here today. Like the rest of them before me, I want to thank you-all for doing what you-all are doing. I think it's a great thing. I'm here representing my company that I work for down in Larose in the -- the 10th Ward of Lafourche Parish, Kevin Roy Offshore, which is an offshore supply company, offshore supply boat company, which relies heavily on the oil and gas industry. And I also live in Larose with my family. And I have lived there for most of my 46 years. I'm fifth generation Cantrelle in Lafourche Parish, and I'd like to continue living there as well as my family after me.

Mr. Dick Guidry kind of touched on a couple of things I want to talk about, and that is that when it

comes to Port Fourchon and the surrounding areas that supports Port Fourchon, which is Lafourche Parish, 10th Ward area, Lafourche Parish, Lafourche Parish itself, Terrebonne Parish and neighboring, other neighboring parishes, it -- it -- it should be of a national concern. It's not a local concern. It's not a state concern. It's a national concern. Because, like he said, and I -- I know I'm repeating it, but I think it needs to be repeated. I had Katrina pass up Terrebonne Bay or up Eugene Island Channel towards Morgan City. Lafourche Parish, the 10th Ward, which was protected by our levee, would have been underwater just like St. Bernard was. Now, my house would have been under 20 feet of water. I live right on Bayou Lafourche. I can throw a rock from my front yard into the bayou.

Now, having said that, you-all talk about 50 billion dollars. The way I look at it and I think the way everyone in this area and this nation should look at is it doesn't matter what the cost is. The cost of not doing it is more. You know, it's a national issue. Had Port Fourchon been heavily affected by the storm and 10th Ward underwater, I think the cost of the gasoline might have been even higher than what Mr. Dick said. I think it would have been eight, nine, 10 dollars a gallon. We're enjoying paying 2.20, 2.30 dollars a

gallon right now. We have the cheapest gasoline on the planet. I don't know if a lot of people realize that, but that's a fact.

So, like I say, I know my time is limited. But, again, we need to protect these areas and it doesn't matter the cost. The cost of not protecting it is even more. Thank you.

MS. DESHOTELS:

Thank you, sir.

Herdis Neil?

MR. NEIL:

Hi. Herdis Neil, 105 T-Beb Street, Montegut. You probably remember me from the last meeting. I spoke twice and asked you if you had a priority, if a consensus of all the meetings that have taken place, that you-all have achieved a priority. And, as far as I can see today, we still haven't really picked a priority, other than we're going to have an annual priority list, I guess, and we'll pick priorities annually as funding is available. I'm just hoping that these project that we do implement based on funding rather than need, it seems, that we don't repeat history as some projects we've had in our area, Montegut, Chauvin area are projects done or implemented 17 years ago haven't been completed yet, and it was said we ran

out of money. A project that should have been completed 17 years ago still, or maybe more than that still isn't finished. No fresh water into a project that was called water diversion device or marsh management device. And I'm talking about the Bush Canal area right here in Terrebonne Parish. And I'm hoping that we don't repeat this on a larger scale.

I see what happened in a little, small, 4000-thousand-acre marsh creation project. It failed. My understanding of this failed because we lost about several hundred acres of property, more, since it was implemented. And maybe we would have lost it all had not Bush Canal been put there. I don't have the science to figure that out. But we're doing projects. We're doing water diversion devices, and then quit monitoring in 2003.

I'm just hoping that all these projects we're doing are -- are going to be monitored in perpetuity, not because we ran out of money that we're going to stop. I'm hoping that you-all looking long-term. You're talking about 50-year, 100-year storm protection. And funding is sporadic, as we can convince our legislators to give us money to implement these projects. It's even harder to find money to maintain and monitor. I'm hoping that a bigger consideration

shall be put into a continued monitoring of all our projects. And those that have failed need to go back to the drawing board, redo them, make them work, change something that -- we're supposedly to been doing this for mitigation, I understand, just recently, it was said. It was a -- it was a project used in mitigation. We lost 1500 acres. How can you call it a successful plan or not revoke our credits for having mitigated or used it for mitigation for destroying some marsh. The plan actually destroyed it in my opinion another 1500 acres of marsh from saltwater just being put in there and blamed on the aquamarine fisheries, open cause.

Mr. Dick Guidry said a thing awhile ago, realignment of the Gulf from Morganza, rather than to Larose, go straight at a degree, 45 degree south to Grand -- to Golden Meadow somewhere, which would save a lot of miles possibly and save a lot of marsh from saltwater, but not if they put structures in this levee to allow the saltwater to continue to flow in and out, to protect marine fisheries. It's -- it's -- it's some brackish water marsh in there, some species that need maybe some flow of water. But it's unregulated water flowing in and out. What was cow pasture, like a little project I had, I had cattle on that property in 1992, and, right now, it's in five feet of water. So we're

taking farm land and creating estuaries with it. Maybe it wasn't planned, but that's what the end result was. Estuaries, basins, shrimp, crab, only a handful of people got access to it. That's 1500 acres of open water in there that belongs to the state, not accessible to the public, not accessible to the public. Just the few people that live there can harvest crab or fish or hunt ducks in it, whatever.

So -- so I'm hoping that we don't do those kinds of things around the entire state of Louisiana, that certain people have access to some of these projects that we're going to do, not open to the public, but it's public land and we spend public dollars to do all these projects. And I'm just hoping that we do have an overview that when a project doesn't work, let's not wait 17 years to figure out that it didn't work. Shouldn't take that long to realize that we're losing land. We need to continue to monitor what we're doing if we're going to spend all these millions of dollars.

And on the issue of money, I know I'm running out of my three minutes, I didn't bring a box to bring you-all to show, any kind of devices how we can prevent this thing from happening. But we have funding available that mostly came from people who were damaged from hurricanes. The windfall that the state has,

windfall that certain parishes have, from people having to replace everything they owned because it's gone. And other people in other states see this. And we're not going to spend our own dollars. And I voted against the tax increase because of how we spend our money locally. And I could be wrong, but it's my opinion, that if we need to prioritize at every level, if we're not going to prioritize our spending with our money, why should somebody in Montana tax theirself to fix a levee in Montegut or Dulac or Cocodrie, or anywhere in south Louisiana. So we need to be fiscally better stewards of our money, how are we going to use our money, pick out our priorities locally if we don't expect you guys to prioritize the projects.

MS. DESHOTELS:

Thank you very much, sir.

Evelyn Lirette?

MS. LIRETTE:

First of all, I want to let this gentleman know, the one that brought and suggested the windmill, I think about getting one every time I open my electric bill every month.

But, first of all, I'd like to ask you a question, honey. Is there any more studies involved in this, especially for Morganza?

MS. DESHOTELS:

There are more studies.

MS. LIRETTE:

How long is that going to take, another 20 years?

MS. DESHOTELS:

There are studies -- but the studies that we have in this Master Plan are studies that are directed to implementing projects, and then the studies that we have to have to reduce the uncertainty so we know what the right project is. We also have a lot of projects that are real projects, now projects, construction projects and not just studies. So it's a combination.

MS. LIRETTE:

Because Terrebonne Parish failed when Mr. Guidry had the levee built over there in Golden Meadow, we, the government of Terrebonne Parish, and if there's anybody here that was there on the parish when that happened, you really missed it. Because it's over 20 years that we needed this, over 20 years. So I'm asking you-all, begging you-all, get going now, day before yesterday. Because we have -- I don't speak for the ones with a lot of land. All I own in Chauvin is 180 feet wide, 96 feet deep. But I want to tell you, I've been working since I'm 12 to earn that money, and

it took me two husbands to do it with. And, finally, it's paid. It's paid. It's mine. I'm elevated six feet high. And it's tough to go up that steps. Now get my elevation in my area is 11 feet high. My poor husband, right now, he's 83 years old. He can barely walk. I can't barely work, walk, either. So we can't keep raising it up and raising it up. Do something to protect it. Because every time I file my taxes, the little bit I got to pay, that's a bit, going to the federal government, that's a bit going to the state, the state I don't mind because I get a check back. I work for the state, which I'm not too happy with sometimes. But get it going. I beg you. And these are large land of people that got a lot of land, let them have the mineral rights. It's theirs. I believe it.

When I bought my property, I had 10 years to wait before I could get the land rights, the oil rights on it. They can wait, too. But let them have it, okay? Let us go on. Let's not have any more setbacks. I'm proud of what Reggie and Damon are doing in Baton Rouge and the lady from the -- what is it? Chamber of Commerce?

MS. DESHOTELS:

Yeah.

MS. LIRETTE:

Okay. I wholeheartedly agree with her, wholeheartedly. So this has been waited on long enough. And don't look at our politicians. If you-all want to examine the federal government, want to examine there, examine it, look it over, because, frankly, I don't trust them, either, but no offense. But you-all have no idea. Does anybody over here have any idea what the people of other states think of us in Louisiana? Yes. Why? Because of what's going on right here in Terrebonne Parish. What a show at our committee meetings, a show. I mean, I've seen better comedies. I hadn't seen better comedies on TV.

So, please, step it up. Press on somebody's neck if you-all have to in Washington to get this through, because we're living long enough. We're losing our land.

My son that was living in Patterson, living in Vicksburg, recently moved to Patterson, now he wants to come live in Terrebonne Parish where he was born and raised. I tried to discourage him. I did. And I couldn't. He wants to come back home. My son, my oldest son, spent 22 years in the service to protect his country. He's living in Chauvin now. My daughter, she's living upstairs with me. She don't want to leave. I hope that this would get started now, not 10 years

from now, but now. It should have been done a long time ago.

I thank you-all very much.

MS. DESHOTELS:

Thank you.

Reggie Bourg?

MR. BOURG:

Thank you, Ms. Secretary. I can't disagree with much with what was said here tonight. Thank you-all for you-all work, what you-all doing, and especially giving the public a chance to speak here. And I -- to think, touch upon what Ms. Evelyn said is that we have transparency, that we have an opportunity to participate in the government, to make some of these decisions, or at least offer an opinion if things are not working the way they're supposed to be working.

I endorse rebuilding the Barrier Islands, the -- the chain from -- from the middle of Terrebonne Parish, which I would say maybe a little bit east of Last Island, but all the way to Grand Isle. And -- and when you look at -- at that, some of that already did work. And -- and -- and, yes, it would be a monumental task to rebuild the Barrier Islands. But we know if we had that first line of protection there and it would be -- and a significant elevation, then that would

reduce storm surge. It would also allow the water on the inside, fresh water, to be restored as a reservoir and keep it, the heavy salt content, offshore.

I want to voice my dissatisfaction with the parish for not putting the Barrier -- the Barrier Islands at the top of the list, number one. The meetings that I attended, Bayou Lafourche and in Thibodaux, every other person said Barrier Islands, let's restore the Barrier Islands. And while I see you-all have -- you talk about restoration and conservation, it doesn't say specifically Barrier Islands. And we can do some projects. We can do some projects that calls for mitigation. But what would be -- you know, okay. Why are we not using the mitigation funds to rebuild the Barrier Islands themselves? We can still make projects that will help. But it's a sense of, for me, priority. And what would we -- what would we get to do the best to protect ourselves for hurricane storm protection and restore, maintain fresh water, a high -- a high level of fresh water on the inside so that the marshes could rejuvenate themselves.

Thank you.

MS. DESHOTELS:

Thank you, sir.

Neil Adams? Neil Adams? Greg Linscombe?

MR. LINSCOMBE:

Thank you, Michele. My name is Greg Linscombe. I'm here representing Continental Land and Fur Company.

Continental owns and manages a large tract of fresh marsh in the northwestern part of Terrebonne. We commented on the same issue I'm going to talk about dating back to the 2050 plan, to the LCA plan and again to the Master Plan with a letter sent to the Integrated Planning Team in December of last year. I've also discussed the issue with the team to some extent, but I want to reiterate some points of concern again.

After reviewing the latest draft, just placed on the Internet, I think, in February, it appears -- I can't see any changes expressing or addressing our concerns.

Let me say, first, that I recognize and I applaud tremendous effort made in developing this plan in such a short time. It's really impressive. I also recognize that it's conceptual. It's conceptual in nature and the details are not there. However, I also know based on many years of working in state government, before this job, that the longer a concept remains in place, the more difficult it is to change.

I understand the great need for fresh water in lower Terrebonne to reduce salinities, and I also understand the tremendous needs of sediment in those areas primarily between Lake McCad and Lost Lake to perhaps rebuild marsh where it's still possible. However, I don't believe that introducing more water through the already flooded marshes of northern Terrebonne Parish could not accomplish that. Water levels in northern Terrebonne, marshes have been increasing for at least 30 years. As the Atchafalaya Delta and the Wax Lake Delta built, it's like a stopper in a bathtub. And they're going to continue. The water levels in northern Terrebonne are going to continue to rise. These higher water levels result in loss of banks along both natural and man-made swamp banks. Reaches created by this process result in increased velocity, and on our property loss of thin mat, floating marsh, converting areas to open water. We spend much of our time attempting to maintain those banks, to maintain the marsh. They're highly organic marsh soils. Increased water level will make that maintenance even more and more difficult.

CWPPRA recognized the problem in 1957 when they -- when they actually approved the TE34 Pinchon Basin Plan. And modeling indicated that in fact with

that plan, which is a great project, you can move more water into the Lake McCad area, but modeling also showed you can't get any significant amount of water out of the Pinchon Basin marshes. It's just very difficult, I think probably impossible.

Considering these facts, it becomes obvious to me that adding more water to these very productive but fragile marshes is going to be highly detrimental to the survival. More water from the river, more water from the GIWW is going to convert these marshes to open water.

I still see on pages 55 and 56 errors pointing to introducing water into these marshes. Wording changes that recognize the need to protect these fragile marshes would go a long way in addressing our concerns, something like recognizing the problems of high water levels and fresh marsh, evaluate alternatives to deliver fresh, fresh water and sediment into lower Terrebonne, just changes like that. If the greatest source of fresh water and sediment for Terrebonne is the mouth of the Atchafalaya River, we need to be innovative and look at how to move fresh water and sediment from that area. They dredge over two million cube yards of river from the mouth of the river every year.

Addressing erosion in the navigational

channels is part of the Master Plan, and we applaud that being included. We think it's -- it's -- we strongly support that. It's overdue, many times overdue. Also, approval of a CIAP project that was submitted and is in the draft plan to close critical breaches along the GIWW is a great first step in addressing that. So we're looking for some innovative wording changes.

And, again, I really appreciate the opportunity to make comments to you. Thank you.

MS. DESHOTELS:

Thank you, sir.

Stephen Smith? Stephen Smith?

MR. SMITH:

Pass.

MS. DESHOTELS:

Ted Falgout?

MR. FALGOUT:

Hi, Michele. I'm Ted Falgout, port director of Port Fourchon.

In essence of time, I'm going to echo Senator Dupre and Dick Guidry's comments, about the complimentary comments about this plan.

A couple of issues I wanted to bring up. In fact, one, basically, is the increased need for upgrading the hurricane protection for the Lafourche

corridor. It was mentioned by several people to be brief. I'm just going to add a few statistics that will help, hopefully, create the understanding of why we're asking for that to happen.

You know, certainly the corridor provides road access to the Gulf of Mexico. And we all know that's very important, and we heard all about that. But the port is currently servicing approximately 90 percent of the deep-water activity in the Gulf of Mexico. And a lot of people don't realize how significant that is. And that the capabilities to service the deep water only exist at Port Fourchon in the capacity necessary to efficiently service the deep water production.

Just to give you some idea about how rapidly deep water has grown, in '95, the Gulf was producing about a million barrels a day. In 2004, it has increased to a million-five, and in 2011 that will increase to 2.25 million barrels a day, the only place in America where we are increasing the production. Everywhere else, it's being depleted. Eighty percent of the Gulf oil will come from deep water by the year 2010, and well over 75 percent of the deep-water activity will be serviced by Port Fourchon. So this corridor is extremely significant.

Then we hear about this lower tertiary

trend, this tremendous find in the deep water Gulf of Mexico that could have as much as 15 billion barrels of oil in it, okay? How are we going to get to that? We're going to get to that through the Lafourche corridor if we can sustain it, of course.

The common question is: Okay, why don't we move this off the Gulf of Mexico, out of harm's way, 30 or 40 miles inland? It's just not practical. Environmentally, it would be a disaster. We're talking about 250 to 300 large vessels a day making this intermodal transfer, 1200 trucks, moving the pipeline capacity, billions of dollars of infrastructure already in place, the LOOP pipeline, all this sitting there. And where will much of the funding come from to do all of these improvements that we're talking about? And as Dick so eloquently said, it's going to come from offshore revenue sharing. So we better do something to protect the goose that's going to be laying the golden egg for us to do all these other things that we're planning and so desperately needed.

Finally, if you believe these facts or don't believe them, that's immaterial, but Port Fourchon has become, because of the LA 1 project, the poster child of critical energy infrastructure at risk nationally. People are going to be looking at how we spend this

money through a magnifying glass because of the distrust in Louisiana and all of the things you hear. What better way could we spend this money ensuring that we're going to get the yankee in -- in -- in Minnesota to be able to turn his lights on. I think that will encourage them to invest more in coastal Louisiana when they see our genuine interest in assuring we're going to have this energy connection out into the future.

So I'm pleased to hear of the intention to up grade the levee system. I've not yet seen it on the map. And, of course, we're skeptical and want to see that. But we applaud your effort in looking forward to changing that line to a different color.

Thank you.

MS. DESHOTELS:

Thank you.

Kenneth Smith? Kenneth Smith?

MR. SMITH:

Thank you. Kenny Smith. I'm here tonight representing South Central Industrial Association.

I just want to thank you-all again for coming. I'm always impressed when you-all come the first time and have these meetings and go through this and then you come back, either really dedicated or not too smart. No.

MS. DESHOTELS:

Maybe both.

MR. SMITH:

We truly, truly appreciate you coming down and coming back to Terrebonne and this region.

I'd like to be brief, but echo some of the comments on the effort of planning that has gone on in a short time period, again, coming from collaboration of both state, local and federal agencies. To get this level of work done is really phenomenal. I'd like to applaud you-all on that.

The South Central Industrial Association has taken every opportunity to voice our opinion on all of these public hearings, and we appreciate that. It's interesting. You come to these meetings, and you can just feel the passion of our -- our citizens. Make no mistake about it, our backs are against the wall, pointblank, our backs are against the wall. You can feel it in here and everybody's voice.

The CPRA Plan, while you gave us the opportunity to talk, and we talked and you actually listened. Thirty-three million for the Houma Navigation Canal, we highly endorse that. Thank you. Thirty-one million for LA 1 improvements, we endorse that. We'd also like to endorse Mr. Falgout's comments. You know,

we're going to build this beautiful road to Port Fourchon, and the levees need to be upgraded and the locks. Also, the half a million dollars in Morgan City on the -- on the industrial road; the eight million dollars on the GIWW. And I'm very interested to see the progress of the sediment pipeline that will affect the eastern portions of Lafourche Parish.

We appreciate your effort, appreciate the opportunity to comment, and look forward to action. Thank you.

MS. DESHOTELS:

Thank you, sir.

Charlotte Randolph?

MS. RANDOLPH:

Thank you, Michele. Thank you, Secretary Angelle, for coming today. It's very important to note that you're doing the first meeting here in Terrebonne and Lafourche, and we truly appreciate that.

I'm here simply, too, to thank you for your cooperation in putting this plan together. It was a coordinated effort of many different agencies, and this has been a great team that I think worked out the best plan possible.

I'd like to talk a little bit about priorities today, because certainly we look at a plan

that could possibly cost 50 billion dollars. And that's where I'd like to see local commitment and local involvement first, because I think, ultimately, the plan will be the greatest plan on earth. But I think what we're looking for is immediate action. And, therefore, if we have local input into -- into your priority list, we will then have a better plan for the near term.

Far term, I understand, is something that you have to include in a Master Plan. But we want to see Morganza to the Gulf built and we want to see it along the southern alignment from Pointe-Aux-Chene to Golden Meadow. We want to see Donaldsonville to the Gulf built. Morganza to the Gulf can help us reduce the amount of levees we need in the upper portion of Lafourche Parish as well. That's how critical it is. Just getting the lock on the Houma Navigation Canal can reduce some of the threats we have. So if we can have as -- as much input in the Master Plan and the final part of this that we did with CIAP, which worked out very well, then I think we'll be able to have the best plan possible with the local people involved.

Thank you.

MS. DESHOTELS:

Thank you.

Larry Weidel?

MR. WEIDEL:

Thank you very much, Michele. My name is Larry Weidel, and I'm the spokesperson and public information officer for Lafourche Parish Sheriff's Office. I'm also a father, a husband, a grandfather, and a resident of south Lafourche, and that's particularly what I'm interested in right now.

First of all, I'm very impressed with what I've seen, the work you've done. Congratulations for the effort that's been made thus far. We appreciate the opportunity for us all to be able to come here and put in our input, you know. And I think it makes a difference both for the work you do and it helps us to feel like we've made a contribution.

When you look at the maps, and a lot of people talk about looking at them from a satellite or something, used to be the south Lafourche area was a sleepy little fishing village and trapping village, and that all -- that all went away when the oil was discovered, both inshore and offshore. And then LOOP came and spent a billion dollars in building a facility. Now we're building a half-a-billion-dollar road. Then we have the Port Fourchon, which is a billion-dollar industry. We service this nation with energy. South Lafourche is a corridor. We have a levee system that

the local residents taxing themselves about 35 years ago to pay for it. We didn't wait for a lot of public funds. We wanted to build this because we recognized need. And now that levee system is about 12 feet high. The road to Port Fourchon is 22 feet high. I think enough has been said that you can't, you know, that we do need to elevate the levees, and we'd appreciate very much your consideration when doing so.

Thank you very much.

MS. DESHOTELS:

Thank you, sir.

Troy Voisin?

MR. VOISIN:

My name's Troy Voisin. I'm 43 years old. I'm from Dulac. My parents are here tonight. My dad is 82 and my mom is 77. Back in 1972, my parents went through all the process to make sure to add onto their house and make sure they went through the regulations and all that kind of good stuff. They paid flood insurance all their lives. And my question is, that's 35 years ago and they went according to the regulations then. And we're 35 years later. This last hurricane, they had two foot of water inside their house. You know why? They talk about us, our backs being against the wall. Why is our backs against the wall?

UNIDENTIFIED SPEAKER:

Neglect.

MR. VOISIN:

Why? Who put our backs against the wall?

UNIDENTIFIED SPEAKER:

Neglect.

MR. VOISIN:

My last question is, I'm from Dulac. How high would a person have to go to raise his house not to have to buy flood insurance and worry about floods?

MS. DESHOTELS:

I think we're all waiting on that answer from FEMA.

MR. VOISIN:

So FEMA. I think we ought to get rid of FEMA.

MS. DESHOTELS:

Thank you, sir.

Joseph Adair?

MR. ADAIR:

How you doing? I'm glad this lady and some of the people from down the bayous have come up, because it's like with the Iraqi war when you hear, you know, thousands of soldiers, the death toll and everything, you have compassion and you're concerned with

everything. But until it happens to a family member or a local, then you don't realize the significance.

So last summer I was here and you had on the news and reports that Allstate was considering and pulling out of the area. And I live below the Intracoastal in the Woodlawn area, and I was concerned for that. And my wife and I were discussing moving out of -- not just out of Houma, but out of the state possibly. And my daughter is 11 years old, and she told me she didn't want to have to move. And I agreed with her and told her we shouldn't have to move. But, you know, you have to realize, you know, that -- I don't know how to explain it. But, anyway, you know what I'm saying. So it actually inspired me to publish a book that I recently completed. But the information I gathered, the research that I was gathering while trying to put it together, I could see that you guys are personally concerned. And I'd like to commend you-all on that. I'd like to know, apparently you guys are considering everyone that lives within the boundaries of the parish and the coast. But I also realize that your hands are tied. Because, you know, like you said, it would be like a 100 years to fund these projects and that's a little depressing to some people because the land just won't be there by that time.

But what I was thinking, also, is recently there was a report on the news, I believe, and they were saying that certain people around the nation don't want to pay the extra premiums to cover for our loss and everything. But according to my personal calculations, as far as statistics with hurricanes, from what I understand is like the Terrebonne Parish is only one I can really answer for, but I guess about one in every 15 or 20 years, we get a hurricane that does flood the parish. And if you take like the midwestern states or California, like in tornado alley and California with the wild fire and flooding, and you get probably every state in the nation with devastation. And some of these get tornados every time they get a storm system come through. So if you would take these figures and figure them up over a 15, 20-year period as far as the state's loss is concerned, then the amount of loss we incur on one hurricane every 15 or 20 years is probably about the same or less, if you want to look at it that way. And if it's the rest of the nation, they don't believe they should help, you know, that we should move or whatever, then they should look into that. And I know Washington -- I know the money's available, obviously, because it's going to a lot of other things. And if we have officials that aren't doing what they're required to do,

then I believe Washington is responsible to investigate these, you know, allegations and take their necessary steps instead of just saying, You're not getting this money, so we're not going to send you any. So, you know, I put the root of the problem over there.

And, also, I believe if the rest of the nation was aware of the significance of -- like those statistics that I just mentioned, that maybe they would take into consideration that they, too, are effected by these, nature's wrath, and that they should have compassion on us, I guess you could say, and realize that we do, you know, we do deserve the money and we do deserve to keep the parish.

That's about it. Thank you.

MS. DESHOTELS:

Thank you, sir.

I apologize. I cannot read the first name on this card. A Cheramie lives on Country Club?

MS. CHERAMIE:

I'm Gwen Cheramie.

MS. DESHOTELS:

Thank you.

MS. CHERAMIE:

And I'm a resident of Lafourche Parish. I have terrible handwriting. I want to thank DNR and CPRA

and everybody. Obviously, a lot of work went into all of this. And it's good to see that finally there's going to be some movement. I'm here today to comment on the south Lafourche levee.

It was interesting after Hurricane Katrina to see Windell Curole going around handing out brochures to people around the state saying this is how you build a levee that works. And what we'd like to say is, we want this levee to continue working to help keep the LA 1 corridor open and clear in the case of a storm. Because if there is a Katrina or a Rita that would come in a little to the west of what it did, with the levees and the alignment in the red as they are the 100-year, it would be underwater. So we would like for you guys to consider raising it to the elevation of the new highway. This is really important, not only for Lafourche and Terrebonne and the area, but also the state and the nation that we keep Port Fourchon working.

Thank you.

MS. DESHOTELS:

Thank you.

Kerry St. Pe? Kerry St. Pe?

MR. ST. PE:

Hello, everyone. My name's Kerry St. Pe. I'm the director of the Barataria Terrebonne National

Estuary Program. Good evening and thanks for the opportunity to speak.

And I want to start off by thanking everyone. I know this has been a monumental planning effort. We understand what it takes to do such a planning effort. And I want to personally thank and acknowledge Secretary Angelle for his support, both privately and publicly, for a strategy that we think is a foundation-level strategy to restore our system, which is the pipeline sediment transport.

I want everybody to understand that BTNE, above all else, wants to see restoration and a restoration plan that can be implemented. There's a lot in the plan that we agree with, the marsh creation. We fully support anything that will bring us towards creating land masses that we've lost, Bayou Lafourche reintroduction, some of the levee alignments, and, particularly, the Morganza system that tries to lay levees down next to existing hydrologic barriers and takes full advantage of fresh water.

We understand, also, that we can't do everything immediately and that we have financial limitations. These are realities we have to deal with. And so, therefore, the sequencing and prioritizing of measures and projects is crucial. The criteria that we

use to prioritize these measures should be directed towards things that will reconstruct our cultural landscape now, immediately, as soon as possible. The plan as identified, strategies to accomplish this. And the pipeline sediment transport strategy is in there and could be used to recreate barrier islands, marshes and ridges. However, the criteria for selecting urgent early actions seems to be steering us away from strategies to build land now. There has been a decided shift, as we perceive it, in the tone of the draft plan from the preliminary draft that was released several weeks ago. Generally, this latest draft has been much more aggressive in advocating use of very large Mississippi River water diversions as the tool of choice of those lands. At the same time, the Draft Master Plan is downplaying marsh creation using pipeline sediment slurry transport as being less preferable because it is unnatural and unsustainable.

My obligation as director of the Barataria Terrebonne Estuary Program and to the conservation comprehensive plan that we created compels me to vigorously disagree with these labels.

The assignment of the label unnatural to long-distance transport of sediments from river beds to rebuild our coastal landscape is just -- is just spin.

To brand a strategy that has received a detailed evaluation by the Louisiana Department of Natural Resources and, in fact, is one of the CIAP projects and that could be used to embrace and use to rebuild land immediately and to label that as something we won't use because it is unnatural is -- is wrong. For decades we humans have altered our natural environment, especially in the Barrier/Terrebonne system, and we've done so to such an incredible degree that it, the whole system, is on the verge of total and absolute collapse if unnaturally cut it up. We have unnaturally treated it as a sewer. We have unnaturally allowed it to be subjected to a myriad of industrial effluence, some legal, some illegal. And now it comes to fixing our problems in the system where it is difficult to find any process at all that has not been unnaturally altered to the point of total collapse, the planned proposals, to prioritize restoration strategy that someone has branded as natural. We do not believe that these limitations are justified.

Additionally, to categorize large diversions as being a sustainable land-building technique is somewhat misleading. It is misleading because it does not tell the whole story. The most enormous of river diversions would take several decades before some amount

of land would form and then only relatively close to the end of the diversion channel itself. That's not to mention the drastic changes in our fisheries that would more or less eradicate a way of life that's been sustained for decades. Our coast is in need of immediate and emergency triage. We cannot wait for decades before rebuilding take place. Lafourche Parish, for sure, Terrebonne and probably Jefferson will never see any significant land building from the Mississippi River water diversion. Long-distance sediment transport to these regions should be the highest of priorities because it would give us the most timely land-building results.

The plan's measures include marsh creation, ridge restoration, barrier shoreline protection, and barrier island nourishment. All of these goals can be accomplished with pipeline sediment delivered. But the plan fails to acknowledge this.

In Chapter 2, the plan downplays the pipeline sediment, delivery strategy by saying that long-term investments and infrastructure may be necessary. Indeed, an investment in an infrastructure for pipeline sediment delivery should be the backbone of our restoration strategy and would be money well spent. Nothing in this plan leads us to believe at this point

that the pipeline sediment transport strategy has been fully embraced as a foundation-level strategy to restore our wetlands.

The BTNE urges the CPRA to re-evaluate the criteria by which the urgent early actions are selected so that the highest priority is given to the strategies that yield immediate results.

Thank you very much.

MS. DESHOTELS:

Thank you very much.

James Shacton? James Shacton?

Dan Walker?

MR. WALKER:

Thank you, Ms. Deshotels. My name is Dan Walker, and I'm here representing the Morganza Action Coalition. And on behalf of the Coalition, I'd like to express our sincere gratitude and appreciation for the efforts that have been made on behalf of the Morganza to the Gulf Hurricane Protection System. The fact that it's included in the Comprehensive Master Plan, that it's the subject of funding in the Annual Plan and it's the recipient of funding in the CIAP Plan speaks volumes to the efforts and to the work that's been done.

On behalf of the Coalition, we'd like to thank the parish government, the state government,

Secretary Angelle in particular for the effort and the personal attention that's been given to promoting Morganza to the Gulf and getting it to the status it is today.

And this has been a very good day for Morganza to the Gulf. This morning I attended the United States Senate hearing on the Environment and Public Works Committee, and no less than three or four times was Morganza to the Gulf mentioned. And in terms and in the context of the imminent need to pass a water bill, and those comments were made by no fewer than three or four of seven United States senators from various states across the country. So the level of attention to the problems of south Louisiana is really getting its focus in Washington.

Secretary Angelle, I'd like to thank you personally, because over two years ago, you met with us and you gave us your pledge that you would do everything you could to assist us in this area, and you have delivered. And I want to really acknowledge you and really give you a round of applause, Secretary Angelle.

The fact, also, needs to be mentioned that the Comprehensive Master Plan was mentioned numerous times in the senate hearing, and I believe that the fact that we have a Master Plan is a significant step

forward. Even though it's not in its final form, the fact that the state of Louisiana is undertaking this effort has moved us miles ahead of where we would have been had we not begun this process. It's not a perfect plan. It will never be a perfect plan. But it's going to be a living, breathing plan and it's going to take generations to do. We've already spent a generation on Morganza to the Gulf to get it to the point that it is today. And today is a good day for Morganza to the Gulf.

I appreciate you being here, I appreciate all the efforts, and I appreciate the opportunity to speak. Thank you very much.

MS. DESHOTELS:

Thank you, sir.

Connie Crochet?

Pat Adams?

MR. ADAMS:

How you-all doing tonight? My name is Pat Adams.

And I know you-all worked hard on all this here, but I feel in my heart it's not what we need. We need to go a little further. I believe we should go and make a first line of defense like the people wanted. This is what we need. You-all worked hard on this. All

these projects need to happen, fresh water and all this other stuff. But, of course, I think out the wall, or I think out the box like people tell me. But I just talked to Mr. Reggie and I told him this: I asked him to make one phone call for me and only one phone call was this. He's going to call and find out if the ships are available. And I know the money is not there. You-all are going to do you-all's thing. But he believes in it. He believes putting ships along the coast of Louisiana to protect the islands. If you don't, you can pile up all the sand you want. When that tidal surge is going to come, it's going to take the sand. Terrebonne Bay, you never cross it again. The shrimpers will be a disaster. You've got to stop the sand from going into the basin after the hurricane comes, because it's going to take all that sand you pile up and it's going to completely build a basin. And we're going to have a big disaster. So I want you-all to think about that further, not now, because you-all going with this Master Plan. And that's great. You-all worked hard on it and it's the things we need. We need jobs. But I just want you-all to think about that, about the ships.

Thank you-all.

MS. DESHOTELS:

Thank you, sir.

Evest Voisin?

MR. VOISIN:

I'm just a John Doe citizen. I'm not here to represent nobody but myself and my grandkids, which are 11.

MS. DESHOTELS:

Sir, we're taping. We're taping.

MR. VOISIN:

And my great grandkids and 310 nieces and nephews, they all live in Terrebonne Parish on Roberts. There's one little question that everybody seems to forget. Construction is perfect for a levee. But how about in the Dulac area that you-all want to put a lock, a locking system? Where are the levees? We still don't have a levee in Dulac. The biggest body of water in Terrebonne Parish that goes directly into Intracoastal Waterways, which is right here a half a mile away, the first tall bridge going over the Intracoastal, which ties you into Bayou Lafourche through back streams, they don't have any protection, none at all. When that saltwater, which is right now, from what I understand, because I'm in the seafood business, from what I understand right now, the saltwater is so high that it's around 2500 parts per million below that bridge.

They're catching redfish right there underneath that bridge. That is not supposed to be there. That's supposed to be catfish. They're catching crabs right now right there, underneath that bridge, in that area, because I can -- back of Cannon's over here. Okay? Okay? A lot of you folks are sportsman and you-all go fishing. Guess what? You-all fish are going to disappear. We're going to disappear as an entity. There will be no commercial fishing industry left. Because of what? Hey, when I was 14 years old, we were supposed to get a flood, a pump. We got it three years ago on the end of the street. They got a levee in Dulac that's about two miles long and it's not closed. Dulac again is on the Houma Navigation Channel. It's supposed to be maintained to 15 feet. I heard through the grapevine they going to put it 20 foot deep. Guess what. You know that saltwater that's below that bridge? Forget Lafourche Parish, St. Mary Parish. Hell, it's headed to Baton Rouge now. Hey, that's three things. Like I told you, I'm in the seafood business, but I'm not all that stupid, okay? They got a saltwater marsh, a brackish-water marsh and a saltwater -- a fresh-water marsh. Right now, below Houma, people, 100 feet, 163 feet, from Waterproof, they got water that cannot be stopped from the Gulf. There's no levee system around

there to protect it, to stop it. From that area there to the center of Houma, by Aris, maybe a mile, mile and a half, Houma's going to be underwater before you know it, unless you-all stop it. You-all got to control the salinity. The salinity is a very major problem. It's hurting me, fishermen. It's going to hurt the sports, because they're going to lose all the fish. Those fish -- believe what I'm telling you. They're going to be -- they're going to go as an endangered species first. So no. You-all say no. Watch.

Now, the levee system, Mr. Ted Falgout was in here. That's a very important man over there in Bayou Lafourche. You know, he's the port commissioner over there. He runs it, Port Fourchon, we understand. That's a lot of money. And, again, you're talking 18 to 20 percent of all the natural resources coming from the Gulf. And, by the way, 18 to 20 percent is nothing compared to what's going to happen. When they find that thing out in the Gulf and they start bringing it in over here, you're talking about 50-percent close, maxing out in about 20 years. It's going to be close to the 50 percent. We are going to go away from dependency on foreign oil.

We got a president. I kind of understood in January he wanted a hundred billion dollars to go fight

a war. Hell, I'm an American citizen. Everyone in this country, they're all American citizens. Hey, guess what. Remember about the guy who said pesticide -- wasn't enough money to pay for the pesticides to keep their gardens straight? But guess what. That's made from oil. Without the Port Fourchon area working -- by the way, I live in Dulac, okay? I live right on the side of this thing that you-all are going to put -- in fact, I can tell you where it's going to be put. I know where it's going to be put. The flood gates is connecting. A hurricane comes along, it's going to come around that booger and come up here. It's not going to stop it. And I'll say it again. We have no levees in Dulac.

You know what? And, look, I was 14, 15, 17, something like that, a young fellow. The first drainage pump that Terrebonne Parish that was supposed to be put was supposed to be behind our house, okay? It's not there. It's there now, since about three years.

My daddy and mama were sitting right there, okay ? My daddy had to leave because a bad heart, can't take it, can't take the pressure. We've been going to these meetings for years. You know what we're finding out? Somebody in government is sleeping. The lady says we need more studies from certain areas. The place I

live is actually above sea level, and I had four and a half foot of water in it, in the house. I'm above sea level where I'm at. There are places in this area. You can go within a mile from here and it's less than a mile of here where lower elevation than me. Elevation does not prevent the flood. Improper drainage does. A flood is caused by improper drainage, by keeping water out of the area you don't want it to be in.

And, by the way, I don't even -- I don't even know if the total answer to this problem is levees, because all a levee is, is a mound of dirt to keep water out. Well, how about the water in the Gulf, the knocking at the door?

You know, Last Island at one time was 222,000 acres. My family has maps that date back into the early 1800s. Last Island and Long Island ran the entire length of the state of Louisiana into parts of Texas and goes into Mississippi. That was a protection. It had an average height -- I mean, my family first got here in the 1600s. We were one of the first families in Louisiana, okay? That island there by itself had a height of 15 feet. It was a natural barrier. It doesn't exist, your first line of defense. Your second line of defense should be the locks. The first one should be those Barrier Islands. If you don't stop the

water coming in, guess what. You're going to suffer.

And I know I'm out of time. And I thank you. And, look, by the way, you-all did remarkable work in a short period of time. You-all should be applauded by everybody in here. Because I've never seen this kind of work done. But it was done in that short a period of time. You-all ought to be applauded.

MS. DESHOTELS:

Thank you, sir.

Henri Boulet?

MR. BOULET:

Good evening. My name is Henri Boulet. I'm the executive director of the Louisiana Highway 1 Coalition. I'll make it brief.

First of all, we appreciate the CPRA planning teams recognizing the need for LA 1 and keeping it in the revised draft plan as of today.

Two weeks ago, in a discussion with Mr. John Porthouse, he indicated to me that a higher level of flood protection for the south Lafourche system was one of the highest, if not the highest, comment topic the state received from the general public state-wide on the entire plan. So the public has spoken and so has the US Congress, which -- which named Louisiana Highway 1 as the only Congressionally-recognized high-priority

corridor in this state, one of only 44 in the nation. So we would ask that you acknowledge the voices of the people and the voices of your policy-making partners at the federal level and deliver a plan with this higher level of protection than the 100-year level of structural protection that was originally called for in connection with our planned elevated Louisiana Highway 1.

Thank you very much for being here in Houma tonight.

MS. DESHOTELS:

Thank you.

Jerome Zeringue?

MR. ZERINGUE:

Thank you. I'll be brief. I know everybody's ready to go home. I was hoping Ms. Lirette would still be here. Ms. Evelyn provided some ray of hope. I thought we could maybe leave people on a positive note, because I've been on the receiving end of her wrath, and, believe me, I don't "yes, ma'am" anybody faster than Ms. Lirette when she gets it going. She was somewhat subdued tonight.

But, again, on behalf of the Terrebonne Levee and Conservation District, I wanted to again express our support for the Master Plan, and also to

thank Secretary Angelle who's worked very hard on the funding for the CIAP funding. And we appreciate you very much, also, our delegation who worked on our behalf, too.

But the positive aspect I was hoping to leave everybody with, and I think if you look at the plan, what's included with the plan, in terms of capital outlay funding, what we've done with the local sales tax, which is dedicated to Morganza, can't be used for anything else other than that, that within the plan, there's a realistic possibility, if looking at the state capital outlay funding as proposed, that by 2010, if you look at the 20 million that's been generated locally with our plan, and, again, we're not coming empty-handed, we're providing plenty locally, you'll look at the capital outlay that's been generated by our delegation, I know Reggie, Damon, Butch Gautreaux and -- and 40 have been working real hard on our behalf, providing that funding. And if you put in the money that's been included with the CIAP funding, we're looking at approximately 83 million dollars for the Morganza project. If you include the additional money that's in the state plan, we -- if everything is approved, and, hopefully, it will be, we will conceivably by 2010 have close to 140 million dollars

for the Morganza plan. And I know Mr. Dick got up and talked about took 30 years to complete. I know Windell's here, too. Thirty-nine. If you ask Windell what was the main problem with why it took so long, is because they didn't have the local and state funding initially. They had the federal funding, but they didn't have the match. We had the outs of profit. And we will have by 2010 140 million before the Corps spends dollar one in construction.

Now, again, they can't -- in their defense, they can't spend anything until the project's authorized. As you heard, hopefully, today, that will happen sometime this year. But we stand ready and we are beginning to construct this project. And, you know, I'm glad Secretary Angelle clarified that. We can't wait 50 to 100 years, and we need it now. We've been needing it for 20 years. So, hopefully, we can implement it as quickly as possible, get it in place.

And, again, on behalf of the Levee District, thank you, Secretary Angelle. I know Dave Fruge and his group worked real hard. The governor's worked hard to get that funding as well. And on the state capital outlay, the Department of Transportation and Development worked hard to help us out in that, and we thank you for that.

MS. DESHOTELS:

Thank you.

I have no more cards. Before I close the hearing this evening, does anyone else wish to make a comment or a statement tonight?

Thank you very much. Good night.

(Hearing concluded.)

* * * * *

Coastal Protection and Restoration Authority

PUBLIC HEARING COMMENT FORM

Draft of Louisiana's Comprehensive Master Plan for a Sustainable Coast,
Draft FY 2008 Annual Plan
and Draft CIAP Plan

To insure that your written comments are considered, they should be turned in this evening at the reception desk located near the entrance or mailed to the following address so that the comments are received no later than Monday, April 2, 2007:

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DNR
Post Office Box 94396
Baton Rouge, LA 70804-9396

Email comments may additionally be submitted at: comments@louisianacoastalplanning.org

Please consider the following comments:

several. If the CPRA doesn't know what it takes to save our land by now, they will never know. We don't need anymore studies. It's time for action. Put our money to work. Save our land!

(Use the back of this form if more room is needed)

Name: Felicia Pierre Date: 2-26-07

Address: 346 Daralyn Dr

4.2.5 Lake Charles Public Hearing Transcript

Drafts of Louisiana's Comprehensive Master Plan for a Sustainable Coast, FY 2008 Annual Plan, & CIAP Plan

STATEMENT CARD

Name Kay Conner

Street or Box P.O Box 56

City Creole State La Zip Code 70632

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STATEMENT CARD

Name KIRK BURLEIGH

Street or Box 104 CYPRESS P.O. BOX 576

City CAMERON State LA. Zip Code 70631

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Drafts of Louisiana's Comprehensive Master Plan for a Sustainable Coast, FY 2008 Annual Plan & CIAP Plan

STATEMENT CARD

Name William M. B. Headlin

Street or Box 3819 Pinecrest Bluffs Rd

City Lake Charles State LA Zip Code 70605

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STATEMENT CARD

Name Curt Mercantel

Street or Box 1865 N. Gabriel Sq.

City Lake Charles State LA Zip Code 70611

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STATEMENT CARD

Name Scott Henry

Street or Box 160 Smith Circle

City Cameron State LA Zip Code 70631

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STATEMENT CARD

Name Jim Bel

Street or Box P.O Box 301

City Hackburn State La. Zip Code

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Name Michael Tritico

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City Longville State LA Zip Code 70652

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STATEMENT CARD

Name David Richard

Street or Box 40

City LC State La Zip Code 70605

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STATEMENT CARD

Name LYNN HOHENSEE

Street or Box 1592 TAM TARA CR.

City LAKE CHARLES State LA Zip Code 70611

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STATEMENT CARD

Name JOHN R. NORTON

Street or Box 3914 GENESSEE ST.

City LAKE CHARLES State LA. Zip Code 70605

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STATEMENT CARD

Name Carolyn Woosley, CRCL

Street or Box 1401 Shell Beach Dr.

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STATEMENT CARD

Name Jay Rutherford

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City Creole State LA Zip Code 70632

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STATEMENT CARD

Name MARK FORD

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City BATON ROUGE State LA Zip Code 70808

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STATEMENT CARD

Name John Hennings

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STATEMENT CARD

Name Randy Roach

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STATEMENT CARD

Name Mark Herbert w/Sen. Landrieu

Street or Box One Lakeshore Dr. Ste 1260

City LC State LA Zip Code 70629

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COASTAL PROTECTION AND RESTORATION AUTHORITY
INTEGRATED PLANNING TEAM

TRANSCRIPT AND PUBLIC COMMENTS

OF

PUBLIC HEARING

FOR THE

DRAFT OF LOUISIANA'S COMPREHENSIVE

MASTER PLAN FOR A SUSTAINABLE COAST,

DRAFT FY 2008 ANNUAL PLAN

AND DRAFT CIAP PLAN

HELD IN THE

L'AUBERGE DU LAC HOTEL & CASINO
777 AVENUE L'AUBERGE
LAKE CHARLES, LOUISIANA

ON

TUESDAY, FEBRUARY 27, 2007
5:30 P.M.

TRANSCRIPT OF HEARING PROCEEDINGS

[HEARING CALLED TO ORDER]

MR. BRADBERRY:

Well, welcome and good evening to you tonight. My name is Johnny Bradberry, and I'm the Secretary for the Department of Transportation and Development in Louisiana.

And before we get started, what I would like to do is take just a couple of minutes to recognize some elected officials in the audience. In fact, I believe I only see one elected official here, and that's Wilfred Pierre.

Wilfred, thank you for coming tonight.

And let's see who I have here, Betty.

MR. -------:

Rick (inaudible) with Calcasieu Parish Police Jury.

MR. BRADBERRY:

All right, Rick. Good to see you tonight. Thanks for being here.

I was in the mayor's office this

afternoon having a meeting, and he said he's got a City Council meeting he's got to attend to tonight, but he's going to try to make it sometime between 6:00 and 7:00, so we look forward to seeing the mayor.

What are we doing here tonight? You know, for the last year plus, we have been working on what we consider and what we call a "Master Plan for Hurricane Protection and Coastal Restoration" for the state of Louisiana.

This has been a long arduous process that's involved a lot of people, a lot of commitment, a lot of hours, a lot of experts; and we've come a long way in the last year.

So what we're going to do tonight is fundamentally give you, the people, in this area another opportunity -- and I say, "another opportunity," because back a couple of months ago, we gave you an opportunity to comment on the plan that was put together at that time, the draft of the Master Plan to give you a

feel for how it was coming together and what the components of the plan were, where we saw the priorities and where we say the hurdles and where we saw the need across the southern part of Louisiana as it relates to protection -- hurricane protection and coastal restoration.

So this is a public hearing; and what we want to do tonight fundamentally is go over three areas of what we've been working on.

The first area is the Master Plan itself. I mean, what is it? At the last hearing that we conducted in Lake Charles, I was here, Secretary Angelle was here from the Department of Natural Resources, and Sidney Coffee was here, Chairman of the Coastal Restoration Authority.

And really -- I'm really glad to see tonight that we've got a much better turnout than we did the last time. At that point in time, we gave you the opportunity to comment on the

development of the plan at that time.

And quite frankly, the comments that we received here in Lake Charles representing this area of Calcasieu Parish, Cameron and so forth, they weren't the volume that we saw in Houma and that we saw in New Orleans and so forth and so on.

So I'm really glad tonight to see the turnout that we have here, and I want you to know that this hearing, this meeting is for you. And so we're going to cover three things.

Again, we're going to cover the Master Plan. We're going to tell you what it's about and what it entails, what it does. We'll give you another opportunity to express concerns, support, lack of support, whatever. We want to get a feel from you how you feel about how the Master Plan has come together and an appreciation of what it means to you. So we'll talk about that.

We'll also talk about a program called C-I-A-P -- CIAP, the CIAP Plan,

Coastal Impact Assistance Program, a program that was fundamentally signed by congress in 2005. It represents about a $535,000,000 influx into the state for hurricane protection and coastal restoration efforts. Sixty-five percent of that money goes to the state. The other 35 percent is distributed across 19 parishes. And we'll talk a little bit more about finances as we go through this.

But the CIAP program, we want to give you an appreciation for what it is, what it means and what it does for us across the southern part of the state.

The third part of the program we want to talk to you about is called, "The Annual Plan," and the Annual Plan is fundamentally nothing more than a subset of the Master Plan.

This coming session, we will put the Master Plan in front of the legislature. And in May, they will get an opportunity to debate it and at the end of the day, hopefully approve that plan.

At the same time every year, we are required by law to put in front of the legislature an Annual Plan, that is a subset of the Master Plan, that basically says, "This is what I'm going to do. This is what I want you to approve, Legislature, for the next year in this overall process."

So we're going to explain to you how the Master Plan is -- excuse me -- how the Annual Plan is coming together, what it does, what its priorities are, and have you sort of rationalize that and be able to relate to what it means to you.

So you'll see that tonight, those three pieces: The Master Plan, the CIAP Program, and the Annual Plan; and we'll have presenters that will show you that.

Now, one of the questions that I know you'll ask that I know that you're interested in is, "How is all this going to get paid for? Where is the money going to come from?"

Well, you know, the formula for success has multiple variables. The

money is going to come from several different places, okay? Some of it is occurring and happening now; some of it will occur over time.

You heard me talk about CIAP money. That's a $535,000,000, plus or minus, a government-sponsored program where we take that money and we apply it to projects across the coast.

We've got money from the Federal Government after Rita and Katrina in supplemental bills IV and V to apply to hurricane protection projects and restoration projects through those supplemental bills, a lot of money, billions of dollars.

The money is coming from there. That money is put in and is contributing and put forth in these projects in phases.

As you're well aware, by now, we will receive a share of the offshore royalties and that revenue. Now, for the next -- starting in '07, for the next ten years, we'll get fundamentally

$20,000,000 a year over the first ten years, which creates $200,000,000; and then thereafter, a pretty good step up in the amount of revenue the state receives, anywhere from five to seven to eight hundred million dollars a year over the next long period of time that helps subsidize and support the restoration and protection projects that we've defined.

You've heard talk about the tobacco settlement. There is a commitment through the tobacco settlement that 20 percent of that settlement is applied to the projects that have been defined relative to coastal restoration and protection across the state. That translates to anywhere from three to -- or two to three hundred and fifty million dollars.

And then lastly, but by all means not least, although the $20,000,000 you heard me talk about with respect to royalty revenue in the first ten years is a small amount, when you talk about

these projects, you're really talking about huge sums of money to do some of these projects. Morganza to the Gulf, $800,000,000 plus. You know, you're talking about a lot of money, so $20,000,000 in the overall scheme of things is nothing.

But if you can bond that money out, you leverage your money, you can spend that money today. It will cost you less to do these projects, and that's some of the thinking that's going on right now relative to how that money is going to be utilize over time.

And so you can see -- and I realize I haven't answered all the questions relative to where the money is coming from. I'm just giving you a taste of how we're going to pay for some of these things and when that money is going to transpire itself relative to working on these projects.

You'll hear a little bit more about those as these presentations are brought forth.

So the objective of tonight is to give you, again, the opportunity to comment on and to make verbal your thoughts, if you want to speak, around the Master Plan, the Annual Plan, and the CIAP Program.

I want you to know that this is not really a debate between the people that are up here presenting this and yourselves. We are here to listen. We are here to take in what your concerns are, what your support is, whatever comments you might have, take that back and adjust the plans accordingly if, indeed, those ideas, those thoughts really fit or rationalize what you have to say and to incorporate it in the program.

So it's an opportunity again for you to make known what it is you want to do. We're not going to sit here and debate with you whether your comments are right or wrong or indifferent. Fundamentally, what we want to do is listen; and so that's what we're going to do.

Now, there have been a lot of people you heard me say that have been involved in this process; and what I want to do is just sort of introduce to you the integrated planning team that we've put together that have worked hard and long and spent countless hours working on this thing. It's a dedicated group of professionals that I'd like to recognize, and I'd like you to stand as I call your name so the people can see who you are, then you can duck after if you start (inaudible), and we'll see what happens.

Jon Porthouse? Where are you, Jon? There he is. Key integral player.

Norwyn Johnson? There's Norwyn over there. Norwyn.

Larry Ardoin? Larry. By the way, Mr. Porthouse and Mr. Johnson are with DNR, and Larry Ardoin with the DOTD.

Andrew Beall? Where are you Andrew? There you are.

Michele Deshotels with DOTD. Jean Cowan? Where are you Jean? Very good.

And then as part of the team, Juanita Russell, and she's a Corps representative on the team. Juanita, glad you could be here tonight.

This group of individuals, I'm very, very proud of. I'm very glad, and I guess there's no better choice of words than proud to be associated with them. If you would only know the amount of work that they have put into this effort.

The Master Plan, in its current draft form, has been recognized not only across the state but across this country and across the international community as a document that's unprecedented.

And, you know, we realize it's not perfect and, hopefully, we'll continue to try to make it perfect with the comments you have, but it's really a good document, and it has a lot of substance to it. And hopefully, at the end of the day, we can get it all implemented.

So with that in mind, and as a

framework for what we want to do, I'm going to turn this program over to Michele Deshotels, and she'll take you through, with other presenters, the rest of the program, then we'll give you an opportunity then to answer any questions.

Before I sit down, did I miss any elected officials in the audience? If not, thank you very much for being here. Michele, the program is yours.

MS. DESHOTELS:

Thank you, Secretary Bradberry. We have a lot to cover this evening, so I'm going to try to not go at super-fast pace but to keep the pace up.

As Secretary Bradberry said, we have three plans that we want to discuss this evening: The Master Plan, the Annual Plan, and the CIAP Plan.

The Master Plan lays out the overall vision for the future and hope for Louisiana. And the Annual and the CIAP Plans are the first steps to begin implementation of that Master Plan.

This is what we're discussing this evening. Copies of this are available online, and the Executive Summary is one of the handouts that you received at the door.

The objective of the Master Plan, which some of you have heard before, are to reduce risk to our community, to restore sustainability to the coastal ecosystem, to maintain a diverse array of fish and wildlife habitat -- we recognize the richness of our coast -- and to sustain Louisiana's unique heritage and culture. We are like no other place in the world.

The Master Plan Time Line. This team was put together in February of last year, and this is where we are this evening. In two months, we're going to be presenting the final plan to the legislature with the help of your input this evening.

There are three major planning efforts that are going on now, and I wanted to take a few seconds to discuss

them, because we are all working together, but we have different purposes and goals. Louisiana Recovery Authority, Louisiana CIAP Program --

And some of you may have seen the recent CBS show on that -- and participate in the stakeholder meetings, because some are held here in Lake Charles.

Our planning effort is to focus on coastal restoration and protection. And the Corp's LACPR Program was directed by Congress to look at providing a high category five level of protection across the coast, if possible.

We have worked very closely with the Corps' LACPR project. That project has included much input, and we are delighted to have a Corps member as a liaison on our team.

But the Louisiana CIAP efforts, using this graphic by the Lake Pontchartrain Basin Foundation, you can see that much of our effort is providing the basis, the protection and

restoration that Louisiana seeks and then focus on the planning that has to do with community growth and where we're going to stay in the future.

All three plans are sharing data input. We're trying not to be redundant. We are trying to be very efficient and make wise use of the taxpayers' money and more importantly of the time to get to final plans.

In November of 2006, we issued a preliminary draft plan. We took it out for public, stakeholders, scientific, and technical review and comments. It underwent review by the LCA Ecosystem Restoration Science Board, the Science and Engineering Review Team, both of which are composed of distinguished scientists throughout the United States; and it underwent a formal public involvement and review, including nine public meetings, including two here in Lake Charles.

And what have we heard? That the Preliminary Draft Master Plan was

extremely well received. People loved the way it looked, the tone, the correct wording. The concept of integrating ecosystem restoration and hurricane protection was praised, and the people thought that we are making true progress towards real solutions.

We also heard that protection and restoration expectations may not always be achievable, that protection and sustainable restoration may not always be compatible, that the scale of necessary restoration actions will shift natural resource distribution.

We know that resources and fisheries will not necessarily remain in the same location, cannot if we implement some of these measures at the scale that we are talking about. There's a great need for rapid advances in science and technology, and there's a great need for enhanced dialogue from scientists, planners, and the public.

There are technical challenges that will require focus in the future as well

as now: Climate change with sea level rise and changes in rainfall patterns are a real issue that we must look at.

What are the effects of levees on hydrology? What are the effects for river diversion on hydrology? How effective is marsh creation by dredging?

People told us that we need to establish priorities. While by design intentionally, the preliminary draft plan, did not have priority assigned in it, we heard that we need to establish priorities, to prioritize systemic projects, prioritize the quick-fix projects, and we heard that policy legislative and institutional issues are just as important as construction projects and also needs to be a higher priority.

There was concern that our objectives be balanced. There was a perception that we might be focusing on ecosystem restoration as a secondary priority. Some stakeholders were concerned that planning implementations,

particularly our large river diversion, would effect their livelihood.

There was some question about how accurate is the message. Some reviewers thought that we had too much certainty; some reviewers were concerned the plan as presented may not be technically feasible, that climate change challenges obtainability, that costs would be too high, that some strategies may not work as we intend, and that some targeted protection levels may not be achievable.

There was also concern that in some areas, the targeted levels of protection were too low: Lafourche Parish, Terrebonne Parish, Plaquemine Parish. We've heard this from them.

We also received some good input but at a project-specific level, and those things will be held into the future.

Many reviewers commented on the plan's management framework, that we need to maintain this integration in program management, that we need to define the decision-making processes,

that we need to define and adapt to implementation programs.

So what do we do with all this? How do we handle these comments? We hopefully addressed most of those issues, if not all of them, in this draft. The report is online, as I said earlier, the Master report including 11 appendices, some with as many as a thousand pages of information.

Specifically, we added a chapter towards explicitly acknowledge scientific and technical challenges inherent in the plan. We revised maps and text to better convey relative levels of certainty of measures. We added the discussion of prioritization process; however, the project-specific priorities are defined in the Annual Plan, and you'll hear a little bit more about that later from Andrew when he discusses that.

We worked with CIAP to assure priority focus. We clarified the relationship between actions needed to

achieve a sustainable landscape and sustainable hurricane protection. Both are needed.

And we added the discussion of long-term management needs utilizing an adaptive management framework. We recognized that restoring sustainability to the coastal landscape is the backbone of what we are doing.

We must maximize the use of the river and its resources. This includes restoration of the system's hydrology, land-building diversions and not just land-sustaining diversions, but also recognizing that land-sustaining diversions are an essential component.

It also means that we must sustain the critical landforms out there. Our coast is a complex system and all of that system is important. That means we need to take control of the hydrology of the navigation channels, that we must have marsh creation now with dredge material, that various shoreline restoration is essential, that ridge

restoration is a component and that shoreline stabilization is also something that is essential.

I don't know how well you can see this because from the angle I am at, I don't see it very well, but I'll point out a few features, and this is in your handout this evening that you received.

Along with measures, specific measures -- so we're looking at varied island work, we're looking at a large river diversion here, we're looking at water management in this area, and you can see where we're moving water across, along the marsh creation in some of these greener areas.

In the Chenier plain, we're also looking at using water from the river and moving it effectively to manage the freshwater and saltwater issues here.

We're looking at shoreline stabilization. We're looking at water management in this area and water management here in the Mermentau Basin, and also utilizing, as we control this

water, the resources we have available to us along the GIWW by moving water at LA-27 and 82 helping to control it.

Once you have that backbone in place, it reduces risk to the community.

We also recognize that nonstructural measures are part of this picture; and that includes elevating homes and businesses, improving building codes, evacuation planning, land use planning, insurance issues.

We've heard about insurance from one side of the coast to the other, about hazard mitigation plan implementation; and then finally, levees and floodgates are an essential part of that bigger picture.

In reducing risks to the community, we begin to look at a larger total picture. In here -- and also, which I hope you can see very clearly in the handout -- are levees and those that we have are existing levee system, this solid line, and proposed is hashed.

Morganza to the Gulf is shown as a

solid line, because it is waiting for authorization in the WRDA bill, in this area here.

And we heard the good news yesterday about the senate committee hearing about the desire to move that forward. Here in this area of the Chenier plain, we're looking at aggressively using 82 to 27, again, moving the water, again looking at the protection for the communities. And some of these levels of height have not been determined yet.

So we know the degree of protection or how many years that we're looking at, but we're still waiting on additional modeling that will come at a later stage from the Corps on specific height. But we have targeted the levels of protection here.

We recognize that there are difficult issues out there to address and that includes closing the MRGO. Our plan represents that that be closed down and that economic issues dealing with

that be dealt with after the immediate closure.

In Plaquemine Parish, we're looking at the levees being (inaudible) to their off project authorized height, and the major river diversion.

The implementation process. We recognize that we need to establish the process by identifying priority actions within the annual planning framework to develop an adaptive implementation framework to focus scientific and technical advances and promote program learning.

We recognize that we need to develop a standard process for revising the Master Plan in the future.

We recognize that rapid plan implementation is dependent on resolving several key policy issues, including both legislative and institutional issues.

We know that we have to develop a structure for the Master Plan to maintain its focus in integration into

the future. We have to focus Federal involvement in plan implementation, including process modifications to speed implementation.

We believe that it's taking too long now to implement some of these projects as we work with the Corps.

We recognize that effective mechanisms for focused land use regulation is needed to maintain program effectiveness, which means that we must avoid inducing development in unsafe areas.

As we build levees, that doesn't mean that all the areas behind the levees are safe to be developed. We must develop fair, equitable, and expedient methods for acquiring surface land rights for project implementation.

And we have to establish a strategy for preserving and managing our coastal forests.

Secretary Bradberry went over a little bit of some of the funding issues with the project. We know that

our total Master Plan costs will be in excess of fifty billion. The typical cost share is going to require that the state match be at least twenty billion.

Existing state funding sources currently total approximately 150 to 200 million a year. OCS revenue sharing estimates would increase this by about twenty million a year until 2017 and by approximately four to six hundred billion a year every year thereafter.

Existing projected state funding sources can be utilized as the match for authorized Federal funds; however, we recognize that additional funding sources will be needed. We need to maximize and leverage those existing funding sources to seek additional funding and to prioritize appropriately.

We need to identify the urgent early actions. We know that there are some measures out there that need to be started now so that later actions can proceed.

We know that there are modifications

to existing projects that will deliver rapid improvement such as some of the diversions that we have existing out there.

We know the measures that deliver the highest priority outcome: Hurricane protection to the highest asset, highest risk areas; those projects that sustain or restore hydrologic regimes that we would otherwise lose; those natural processes to an area of high projected land loss; those projects and measures that sustain or improve the processes that are critical to the social economic viability or existing community.

These need to be moved forward as quickly as possible. We also know that synergizing these actions mean looking at a total picture, which actions work well with other actions, which measures need to be put into place for other measures to be effective. And we are also aware that some of these time scales are dependent on resources; and that's money, the manpower, the time to

implement.

So how do we begin? I'm going to turn the program over now to Andrew Beall, who is going to talk about our very first step in that implementation process, the Annual Plan.

MR. BEALL:

Thank you, Michele. Real briefly, I know not everybody got copies of the Annual Plan as they came in. We were short a couple when the people were first coming in. If you didn't receive a copy of that in your handout, we have more in the back outside. Please feel free to pick one up on your way out.

As Michele said, what I want to talk about real briefly is the fiscal year 2008 Annual Plan. This is a portion of expenditures that is going to be coming out of the trust fund, the Coastal Protection Restoration Trust Fund.

By law, every year, we have to come out and give this portion of the plan as to what the two implementing agencies, DNR and DOTD, are planning on doing this

upcoming fiscal year. We're going to cover real briefly that portion of it.

Different from last year and the years before, we also want to talk real, very briefly about the outcomes of the Master Plan prioritization process.

Again, more details than I'm going to be able to cover briefly tonight are in the complete handouts that you have in front of you.

The outcomes of the Master Plan prioritization, we tried to take the measures and group them into outcomes and take those outcomes and find those measures that work in synergy to quickly achieve groupings of outcomes; and they're what you see on the screen in the front of you.

And those include things like large-scale plans, which include the Mississippi River Delta Management, Chenier Plain freshwater and sediment resource and allegation.

They include coastwide programmatic measures, focused research and

monitoring, and the beneficial use program. They include nonstructural evacuation planning, hurricane protection where the early work will concentrate on the highest areas and the highest assets of risk, closure of the MRGO in the ecosystem restoration, restoration approval landforms, land bridges, marsh creation, and various shorelines, and operation and sizing of diversions.

Water coming off the Mississippi and the Atchafalaya must be coordinated so that that resource is utilized in a unified manner; and finally, watershed management and basin scale approach to restore natural water flow through wetlands.

Real briefly, Michele told you that to complete construction on all elements of the Master Plan, it would cost in excess of fifty billion dollars. What you see before you is the proposed FY08 2009 to 2010 budgets for each of those outcome groupings; and the totals that

you see is basically acquiring $126,000,000 in total funded money. This is including a cost share, $271,000,000 for FY09 and $575,000,000 for FY10.

And you see that ramp up there, because what we're saying we need to do is we have initial work that has to be done but that jump in FY10, that is getting you to construction. That's why you see a significant increase in funding; and as time goes beyond 2010, that number will only increase as more and more construction activities can take place.

With this knowledge, knowing that we need to be seeking new money to find ways to implement construction in an efficient and timely manner as possible.

More specifically, I also need to talk to you tonight about the FY08 funding from the two implementing agencies. As a final Master Plan has not been submitted to or approved by the legislature, the implementing agencies

have to submit a proposed budget request that supports both the implementation of the Master Plan as well as ongoing efforts, and that's what you see before you tonight.

And this is the FY08 again, specifically, the FY08 request. You see, again, 54 percent of that is in planning, engineering, and design; and that's so that we can finalize the basis of work that needs to be done so that we can get to construction as quickly as possible.

For the next fiscal year, 22 percent of that is construction. And, again, in 2009 and 2010, you will see that graph change from being 54 percent PE&D to being a majority of construction activities.

I wanted to go real quick -- briefly through some specifics of what is in each of those categories.

Under PE&D, we're looking at -- under -- for planning, engineering, and design of ecosytem restoration, we're

including things such as the closure of the MRGO.

You'll see activities in the CIAP Program, which Greg Grandy is going to talk to you in a little bit more detail as I'm done. This includes projects and interactions with the LCA Program, the CWPPRA Program, and specifically completing the engineering and design on the Bayou Lafourche introduction.

For hurricane protection, we're looking at the metro of New Orleans and the north shore of Lake Pontchartrain, completing the work on the portions left to be designed for Morganza to the Gulf and the Donaldsville to the Gulf programs.

Under construction activities, again, we're looking at CIAP, which Greg will go into more detail for you, as well as the CWPPRA Program.

For hurricane protection, we have activities going on in Grand Isle vicinity, West Bank in New Orleans, and Morganza to the Gulf.

Operations and maintenance, this is maintaining our pre -- already built structures. In that, you'll see also activities in CWPPRA, the Caernarvon and David Pond diversions. You have state-only projects and as well as the barrier island projects.

And specifically for hurricane protection, we're also looking at the levee inspection program.

And then finally, you have the Science and Technology Program. This includes Coastal Engineering, Science, the LCA, S&T Program, and the CIAP performance evaluation. This allows us to learn from things that we've done in the past so that we can make better decisions and choices as we move forward to plan implementation.

Finally, state-only programs, these are things that prepare us for future emergencies, our beneficial use program, it's a small dredge program, as well as public outreach.

With that, I'd like to turn it over

to Greg Grandy who will give you more details about the CIAP Program.

MR. GRANDY:

Thank you, Andrew. Can you hear me? Very good. First of all, I'd like to acknowledge a couple of people in the room who worked very hard, along with myself, putting together this CIAP Plan. Mr. Will Norman and Dave Fruge with DNR, it's been our honor and pleasure to work together with these two gentlemen and a host of other people putting together the CIAP Plan for the State of Louisiana.

In addition, all the folks with the 19 coastal parishes that worked so hard over the last year, we know that they've had a tremendous amount of work beyond CIAP with their own jobs in addition to FEMA and LRA and so many other things to work to put these things together, we appreciate the speed and also the quality of the work. And locally in Cameron Parish, that was Ms. Tina Horn; and in Calcasieu Parish, Grant Bush and

Pam Maddingly.

I'll go ahead and jump into the CIAP Program. The CIAP Program is part of the Energy Policy Act that was signed in August of 2005 by President Bush. This was before Katrina and Rita hit our state. I know that seems like a long time ago, but that was just August of 2005.

Approximately $523,000,000 will come to the State of Louisiana. There's other money that will go to other coastal-producing states. This is the portion that's estimated to come to Louisiana.

Sixty-five percent of that money will come to the state and 35 percent to the 19 coastal parishes.

The authorized uses of the funds, there are five authorized uses of funds in the program. In general, the first three authorized uses go to conservation, restoration, and protection of coastal areas.

The last two uses of the funds on

here are planning administrative costs of complying with CIAP Act; also, mitigation of impacts of OCS, Offshore Continental Shelf Activities, through funding of onshore infrastructure projects and public service needs.

The last few areas were limited to only 23 percent, either the state or any parish that's been electively or annually on projects.

The funding requirements -- the first part of the funding requirements is the state and the parishes have to present a plan to the Mineral Management Service and that was the Draft Plan that we're presenting to you tonight.

Then also the MMS will have to approve that plan. The projects that will be included in the plan are three different areas: Projects that be will be funded strictly with state funds, projects funded strictly with parish funds, and then cost-share projects.

Also, our plan -- the plan we put together is for all four years of

funding. We're not going to do four one-year plans; we're going to do one four-year plan.

We also have the ability over time to revise the plan either annually or in between the annual revisions.

The plan development action to date: The first thing we did when we developed the plan was to establish the goals, objectives, and a ranging criteria. Then we came out and we held five public meetings in February of 2006.

I believe February 15th, we came to the Civic Center here in Lake Charles. We met with all of the parishes to talk about the plan, to talk about how they could work and develop their parts of the plan.

We also solicited proposals and those proposals were due May 22nd of last year to DRN. Those proposals were all placed on the DNR website. And I discussed the regional open house meetings in June of last year. We had one in Baton Rouge and one in Lafayette.

We evaluated the proposals and selected projects for state funding.

During this process, we also insured that the CIAP projects would be consistent with the Master Plan that you've heard about before this. We didn't want to go out and develop CIAP projects that were inconsistent with that plan, that might be inconsistent with the uses, so we worked during the process and we're continuing to work with the CPRA-IPT Group to make sure that we're consistent with their plan.

Part of that process is establishing the goals. The first goal was basically restoration and conservation. We wanted to implement, support, and accelerate the coastal restoration visions that would articulate the proposed 2050 planning effort through the LCA planning effort and a number of other collaborative restoration planning efforts.

We didn't want to go back and reinvent the wheel in this process. We

had a good understanding of where problems were, what different strategies needed to take place to help us solve those problems. We basically accepted that groundwork that was done. We moved on to the next stage.

We wanted to select projects that would help reduce coastal flooding impact in the immediate aftermath of Katrina and Rita. That was very clear to us, that that was something that restoration and protection would work hand-in-hand.

In addition, we wanted projects that would work in synergy with other restoration and protection projects, and we wanted at least some of the projects that could be done in the near term.

The second goal of this basically comes from the use of the program to -- or projects that would implement support and accelerate coastal infrastructure projects, which mitigate offshore OCS related impact, especially those that directly benefit OCS oil and gas

exploration and production, those that work in synergy with other restoration protection projects and those that can be implemented in the near term, and I'll talk a little more about specific projects.

A little bit more on the evaluation of the project, on May 22nd of last year, we received 337 proposals for CIAP funding. Approximately 253 of those involve state share of CIAP funds and 84 proposals only involved parishes share funds, including a little overlap between projects, because we had a number of projects where there were multiple projects in the same area; but when you include that overlap, approximately 3.8 billion dollars of state CIAP share was requested.

So that was about -- for every dollar we have to spend, there were ten dollars in projects that were requested, so it was a significant amount of competition for the funds that we had available.

What we did, DNR, we had some external science advisory group. We also worked with the CCR planning team representatives to evaluate proposals. Additionally, we screened proposals that came in to us to make sure they met the authorized uses in the legislature. If they didn't, we moved them off into one pile; we kept moving through the process.

DNR recommended a list of projects to the CIAP Project Selection Committee, and the selection committee actually selected the draft project list, which we'll see tonight.

We released the Draft Plan February the 6th in Baton Rouge at the meeting of the Coastal Protection and Restoration Authority in Baton Rouge. Eventually, after these public hearings, we'll hear the comments. We'll take any written, any oral comments tonight. Any final comments are due April the 2nd. We'll try to resolve the plan with the comments that we receive; and,

hopefully, we'll send the final plan to the Minerals Management Services in May of this year for their review and hopefully approval.

A little bit more on the review process. After we went through some more of the review process and looked at projects, we took 66 of the proposals for state funding and had those reviewed by an external science committee led by Dr. Robert Twilley at LSU.

That information and also some other technical review that DNR did in-house led to a proposal by a DNR Technical Review Committee to the Selection Committee. And then the Selection Committee was eventually responsible for the recommendation of the projects you see.

That Selection Committee was composed of members from the Governor's office, Coastal Affairs, DNR, Department of Environmental Quality, Department of Wildlife and Fisheries, Department of Ag and Forestry, and the Department of

Transportation and Development.

The selection meeting also included other DNR staff members and the CPRA integrated planning team and Dr. Robert Twilley to share the results of the external science review. That is the list of projects that we'll present to you in just a minute.

All right. The projects to be supported with state funds, there are 18 restoration and conservation projects, which represents approximately 80 percent of the funds. This represents $272,000,000 of state funds and also cost share from the local parishes of approximately $37,000,000.

There are also five infrastructure projects which represents 20 percent of the funding through the state, and there's also some cost share from the parishes of approximately $16,000,000 on those infrastructure projects.

We'll take a look at the restoration projects, and we've grouped these into several headings or categories. The

first heading is: Enhanced Management of Mississippi River Water, Nutrients, and Sediments. The first project is the Violet Diversion Project. This is a 5,000 CFS diversion at Violet and St. Bernard Parish through Mississippi River water and nutrients into the central wetlands in St. Bernard Parish that have been significantly impacted by saltwater intrusion of MRGO.

The second project is the Mississippi River Long Distance Sediment Pipeline. This is a project that will eventually move Mississippi River sediment around the Myrtle Grove area across Jefferson, across Plaquemine, and eventually into Lafourche Parish.

This is the design of a long distance pipeline and construction of that pipeline to move that sediment -- some sediment through this project and then also for future projects for the years to come.

The third project on the list is the Blind River Siphon. This is a siphon in

St. James Parish, which will move water in through Blind River, into the upper regions of the Maurepas Swamp. It not only will improve water quality in that area but also improve the health of the cypress swamps in that area.

The fourth project, the Bayou Lamoque Floodgate Removal, this is in lower Plaquemine Parish. This is a floodgate that was built in the 1950s, had a capacity of approximately 12,000 CFS. It hasn't been operational in recent years.

What we hope to do is remove the floodgate on there, clean out the Bayou Lamoque Channel, do some gapping along the levee for less water. Sediments and nutrients flow back into these areas. It's a pretty significant project for a relatively small amount of money compared to other diversion projects.

And the final one in this grouping, the Delta Management Strategic Planning Effort, this is an initiative that Andrew talked a little bit in the Annual

Plan, to continue some analysis on the maximizing the benefits of water nutrients and sediment on the entire reach of the lower mouth of the Mississippi River.

The next category is Various Shoreline Restoration and Protection. The first project is the East Grand Terre Island Restoration. This is a barrier island beach nourishment and back the area with marsh creations in Plaquemine Parish.

Plaquemine Parish is cost sharing with the state on this project, and that parish project is the Rockefeller Refuge Gulf Shoreline Demo. It's a series of demonstration projects along the Rockefeller Refuge in the vicinity of St. Joe (spelled phonetically) Harbor, which will implement three or four shoreline protection techniques, and then we'll evaluate those techniques to see which one is the best technique that will work in those areas.

We've got some pretty unique

situations on that shoreline along Rockefeller Refuge, some very weak clay soils and some pretty high energy from the Gulf of Mexico, so it's going to require us to do some pretty innovative things along that shoreline. And we hope that this project will help move us forward with that.

The next group of projects, Protection and Restoration of Critical Land Bridges. The first one, the Orleans Land Bridge Shoreline Protection and Marsh Creation, from Alligator Point along to Bayou Bienvenue.

On the northern right north shoreline in Orleans Parish, we'll do shoreline protection in there on a fast erosion shoreline. In addition, approximately 200 acres of the marsh creation is what's referred to as the "Golden Triangle" area that you see in the bottom left of that slide.

The next project, Barataria Land Bridge Dedicated Dredging Project. CIAP will build approximately 60 percent of

this project.

There's also a CWPPRA Project, the Coastal Wetlands Planning, Protection and Restoration Act Project, which will build the other 40 percent of this project. That's a little bit of the synergy of different programs coming together to build a large project in this area.

The next grouping of projects, Interior Shoreline Protection. There's actually two subgroups to this. The first two projects are federal navigation channels.

The Freshwater Bayou Shoreline Protection Project is in Vermilion Parish. This is primarily along the western shoreline of the Freshwater Bayou Project. Some areas that are nearer to breach along that shoreline, we will come in and shore up and protect the freshwater marshes in the Mermentau Basin.

The next area, the GIWW critical areas in Terrebonne Parish. Along the

Gulf Intercoastal Waterway, there are four existing breaches along the GIWW in Terrebonne Parish. We'll repair those breaches.

Behind those breaches are some sensitive areas of some flowtop marsh, and the volumes to come along the GIWW are eroding that marsh pretty rapidly.

The other two areas, the Grand Lake Shoreline Protection Project in Cameron Parish. This is another CWPPRA project where CIAP will build approximately 80 percent of that shoreline protection project.

And CWPPRA at their task force meeting last week approved construction through the CWPPRA Program of the remaining balance and also long-term operations and maintenance of that Grand Lake Shoreline Protection Project. We're pretty excited about that.

The Lake Salvador Shoreline Protection Project is in St. Charles Parish. This is the third phase, the final phase of the Western Shoreline

Protection Project in St. Charles Parish and both DNR and St. Charles Parish will be putting funds towards this project.

The next category, Marsh Creation with Dredged Material, the top program, the beneficial use of dredge sediments from Federal navigation channel maintenance. This is when the Corps of Engineers does dredging along Federal channels like Calcasieu Ship Channel.

What we'll do is we'll pay the incremental costs that they pay for dredging so that that material can be beneficially used. We'll either acquire our land rights, we'll build levees, or assist in some other way to adapt material that that sediment can be beneficially used to help create, restore, and protect our marshes.

I think there's some good opportunity along the Calcasieu Ship Channel with this program.

The next one, the Fringe Marsh Repair, will be a dedicated dredging in lower Plaquemine Parish. These are

marshes which fringe the toe of the levee in Plaquemine Parish, some of which were significantly damaged in the storm.

The state will partner with Plaquemine Parish. Plaquemine Parish is putting up the majority of funding for this project to restore some of those marshes that help protect the toe of the levee in both the east and the west bank in Plaquemine Parish.

The next initiative is the Coastal Parish Forest Initiative. This will be the acquisition of conservation easements from willing sellers of coastal forests.

Now, coastal forests will include both Cypress and Tupelo Swamp and other coastal forests as well as maritime forests, so maybe some of the Cheniers in Cameron Parish or along Fourchon would fall under this program.

We'll also implement some restoration projects to improve hydrology or vegetative planting in

these coastal forests, and also potentially select some projects that would facilitate wetland simulation projects that enhance coastal forest restoration and sustainability.

Next, the last two projects in restoration, the Central Wetlands Assimilation Project. There are two sewage treatment facilities, one in Orleans Parish and one in St. Bernard Parish, that were significantly impacted by the storm.

As they rebuild some of those, instead of taking the treated water and putting it back into the Mississippi River, they'll take secondary treated water and put it into the Bayou Bienvenue area so that the water and nutrients from those sewage treatment plants can be reused and help benefit the Cypress and Tupelo Forests in those areas.

And then the last one, which Andrew talked about briefly, Performance, Evaluation and Science Monitoring.

Basically, this is to evaluate the projects that we build to make sure that they're meeting the targets that we want to meet environmentally and also from an engineering standpoint.

The Coastal Infrastructure Projects through the CIAP Program, the first one, the IHNC Lock Complex, approximately 43 million dollars with a 10 million dollar parish match with Terrebonne Parish.

The IHNC Lock is part of the Morganza to the Gulf Complex. The lock that we're talking about itself will work for coastal protection from flooding. It will also reduce salinity -- saltwater intrusion of the IHNC Shipping Channel.

In addition -- and that IHNC Shipping Channel sees a lot of OCS travel. In addition, the LA-1 improvement, this is part of the elevation of LA-1 down to Fourchon, approximately 18 percent of our country's domestic produced oil and gas happens in Fourchon.

They're currently working on a new bridge in Leesville. This funding for the LA-1 improvement will go from that bridge in Leesville all the way down to Fourchon.

The last three projects are basically road improvement projects. The first one, Acadiana Airport Road in Iberia Parish; the second one, Morgan City Industrial Road in St. Mary Parish; the third one, Trosclair Road in Cameron Parish.

These are all roads that are heavily impacted by OCS-related traffic and that's how they qualify under this project.

The CIAP Project Synergy, I won't spend too much time talking about this, but there's a yellow chevron in the center of this plot. That's the East Grand Terre Island Project that I talked about previously.

There are a number of other projects that are planned in this area. One of the red project areas -- it

doesn't show up great on this slide -- the Papillon to Pass Labert Project was constructed -- the CWPPRA Project and we accepted that project, DNR, and NOAA, in January of this year.

There are two other projects in red up there, Pelican Island and the pass along (inaudible), which we hope to go to bid on later this year. And then the two yellowish-brown areas are the Shell Island in the Caprien Project, which DNR and the Corps are currently in a feasibility study on, and we hope to finish that feasibility study up this year and put it into the WRDA to request funding for next year.

There are other projects through CIAP, the Freshwater Bayou Schooner Bayou Project, the Maurepas Swamp, the Orleans Land Bridge and Central Wetlands and the Barataria Land Bridge, that had a lot of other beneficial impacts with other projects where the sum or part -- or the whole is greater than the sum of the parts. I won't go through all the

details on that, but that was a significant part of our thinking process.

As part of our program, there are seven projects that we picked out that we want to implement before we get our funding from Mineral Management Services. Before they approve the plan and before we get our grants in place, we're going to spend some state dollars on these seven projects bringing in green construction. One is land acquisition and bringing engineering and design.

The East Grand Terre Island Project, the Barataria Land Bridge, Dedicated Dredging Project, the Grand Lake Shoreline Protection Project, the Coastal Forest Initiative, Violet Diversion and Mississippi River Sediment Delivery Pipeline, and the Bayou Lamoque Diversion Project, all of those, we'll begin work on those as soon as we send the plan to the Mineral Management Service; and then when the plan gets

approved, we'll reimburse ourselves because it's part of the law, and we intend to take advantage of these opportunities.

Also, I want to talk just briefly about the projects to be supported with the parishes' CIAP funds. Eighty-six percent of the parishes' CIAP funds are dedicated to restoration or conservation projects or programs. Fourteen percent of those are dedicated to infrastructure and public service needs for CIAP planning and administrative costs.

And just briefly, some of the projects that the parish -- Barrier Shoreline Protection and Restoration, Marsh Creation and Restoration, a Quiet Habitat Restoration, the Atchafalaya, Vegetative Planting and the OCS related roadwork that I spoke about briefly.

The timeline that we're working on at this point in time, we released the Draft CIAP Plan for review and for comments by the public. That was February 6th that we released it. The

comment period, it actually closes April the 2nd since April the 1st is a Sunday.

The public hearings, this is the first of four public hearings. We were at Houma last night. We'll be in New Orleans tomorrow night. We'll be in Abbeville on Thursday night.

We briefed the CPRA. We briefed several legislative committees. Next month, we hope to brief the Governor's Coastal Commission in Baton Rouge.

We hope to receive comments by April the 2nd, resolve those comments and submit the final CIAP Plan to the Mineral Management Service May the 1st. And we're hoping that we'll receive approval from the Mineral Management Service in late August.

In general, that's my presentation. We did have a handout that was an Executive Summary of the plan. The full plan is on the website. The website is listed in this plan. We didn't pass out the full plan, because it's about 400 pages. So hopefully, the Executive

Summary will answer most of your questions; but if not, you're more than welcome to look at the full plan or you can get together with Will or Dave or I after the meeting.

MS. DESHOTELS:

Thank you, Greg. During Greg's presentation, Mayor Randy Roach was able to come in, and we welcome you this evening. Thank you so much for taking time out of your schedule to be here tonight. We know how busy you are.

Andrew, technical assistance, please. Thank you. I'm sorry. My mouth is not as responsive as it usually is this evening.

Because we worked so fast and we're a little bit ahead of schedule, I'm going to take a couple of minutes and go back to the slide that is in the Chenier area here. And I'm going to step to the back of the room so I can see the screen and I'm not looking up there at a blurred angle.

And I want to point out in a little

bit more detail some of the features. Technology is a wonderful thing 95 percent of the time. Thank you.

I want to describe a little bit more of what's going on in this area. Okay. What you cannot see very well in here is that we have shoreline stabilization along in here around Rockefeller and down in here and over here.

The red line -- and if you have your handout, those are much more clearly illustrated than here. The colors come out much, much better.

We're looking at, along this hash line in here, shoreline stabilization along the GIWW and other navigable waterways in here. Now, this is talking about shoreline stabilization.

In this area, that red line that's overlaid over that hash line, it's talking about the need for a hundred-year protection for this area in here; because we realize that while the population has distributed in this area, there are a great many people living

there and we recognize that we need you to be protected to at least that level.

These blue lines over here and over here recognize that we have two urban centers in this area, the Lafayette region over here and the Lake Charles region over here; and both of these areas need to be protected to a higher than a hundred-year level.

These blue arrows here denote the need that we recognize that controlling waterflow into this area and out of this area is essential to maintaining this basin's function.

This large blue area up here denotes the fact that water management is going to have to take place up in this area as well in order to help what happens down here.

The roadways here are vital not only for evacuation but they form a component of being able to help control water in this area and also in some ways as being that first line of defense.

We have a salinity control structure

down here. I'm trying to see if I'm mistaken. Over here, gained (sp) water management area. And these green is where -- we're looking at marsh creation in this area over here, over here, over here, and down along here.

And again, your handout illustrates this. Measures are listed in your handout, and we have maps outside that better describe this.

And in the previous discussions had by Andrew and Greg, we did list some of the specific projects that will shortly be implemented through either the CIAP funding or the State Annual Plan.

And now we're going to go and start taking public comments. When I call on you, would you, please, step to the mic. We are transcribing this evening and it will help our transcriber to be able to clearly hear your name.

I'm going to ask that everyone, please, limit their comments to no more than five minutes.

And we'll start with Ray Conner.

Sir, please, sir.

MR. CONNER:

I'm Ray Conner. I'm from Creole, Louisiana. I don't usually tell my age, but I will share it with y'all. I turned 79 last Sunday.

And I've been to a lot of meetings, because I was on the jury for 21 years for Cameron Parish. A lot of them project is familiar with me. But there's a lot of things entered my mind while I was sitting down there. I'm going to share this with y'all.

We had a project that took us 16 years before we could ever get a permit, a project behind Cameron. And I keep wondering, with all of this here and all of this, you're going in through the wetland, how is anybody going to get permits for all this?

And I hate to say this but a few years ago, I got up behind the mic and the only problem that the State of Louisiana was having, and still having and probably will keep on having, which

I hope I'm wrong -- I brought out this, and I know all the hard work that good people here did, it's bad to come out with it now -- but what I come out with was to get to some rocks from Johnson Bayou, and I know it's expensive, and you do whatever -- however the money you got to do it and you stop.

Next year, you start over. You don't have to get no permit for -- with rocks. This here, you're going to have continuing expenses; because levees, I had experience with it firsthand. A twenty-acre tract, I threw up a levee around it, pumped it out. I'd pump it out today; the next morning, I'd get there, the nutria would make holes through the levee.

Rocks, they can't -- nutria can't eat on them. And I brought this out; and after I was finished and I asked the crowd, I said, "How many of y'all in here with me?" One fellow raised his hand. I had one.

And I brought it out the second time

later on, and I got five; and the third time, I got fifteen. But the reason why I had to take a back seat was the money.

Tonight, as I was listening, that's quite a bit of money. I think that it needs to be looked at, because everybody would benefit from this.

We talking about how much land we losing. With rocks, you're not going to lose that much. And I wish y'all would maybe consider it, if it's not too late.

I have quite a few (inaudible) I seen up here on the Trosclair Road, which that was in my district. I was well familiar with it. But there was nothing about Highway 27 going out. We only got one highway in that area. What happened then?

I don't think there was a -- the study was made deep enough. If you going to consider this, you need to consider everything. And I'm not fussing. You know, I don't -- that's not my thought, but I want -- I want to get my point across.

And I could stand here for 24 hours. I don't think all of y'all want to listen to me, but there's a lot of question on this project.

Some of them -- number one, I have to tell it like I feel. I don't think Cameron Parish is getting enough project out of this deal here because --

[Applause.]

MR. CONNER:

-- because that project -- them project that I've seen -- I looked at a while ago was on when I was in office. It ain't changed.

So I think maybe -- you know, we got a lot of loss in Cameron Parish. We lost everything we had. There's a lot of things enters my mind.

You throw this levee up here on Highway 82 in Oak Grove, which is -- y'all well familiar with it -- what's going to happen to all that property south? Our poor people worked too hard years ago to save this and give it to us. Then what's going to happen with

this? I think it needs to be considered.

MS. DESHOTELS:

Yes, sir.

MR. CONNER:

And I want to thank y'all. I appreciate y'all giving me the time to speak, and I'm no engineer. I don't have too much education. And excuse me if I made any mistake. Thank you, ma'am.

MS. DESHOTELS:

Well, thank you, sir, for coming this evening.

[Applause.]

MS. DESHOTELS:

I do want to remind everybody that we're also taking written comments through April the 2nd. We have a website. You can submit comments by E-mail. You can mail us letters. We have our address on the forms outside. So if you think of something else you want to tell us, sir, please write to us as well.

Kirk Burleigh. Sir.

MR. BURLEIGH:

Good evening, ladies and gentlemen. A while back, we went to Lake Charles. I see a lot of familiar faces that was in there. We talked about the levee system, coastal restoration, raising 82, economic development from -- actually from Johnson Bayou up to Lafayette area.

A lot of good plans came out, a lot of good input. One of the plans that I submitted was the staggered rock barrier design -- would be the first line of defense to actually slow down the flow of water or the force. It's going to be really hard to stop the amount of water coming in, because there's so many tributaries, rivers, canals, creeks, wildlife. Everybody knows the situation.

Actually building a hundred-year plan north of Intracoastal City is allowing Cameron Parish people just out to dry. I mean, there's hard feelings. There's a lot of people in here I see

familiar shaking their heads, yes. It's like giving us out to the wolves.

Raising Highway 82 is one of the main arteries to the seafood and oil industry down in Cameron Parish. Questions about, that is, how long would it take to build this road. What about the people, like Mr. Conner said, south of 82? What about these people? Okay.

There's a levee system -- I was talking to Mr. Henry a while ago -- that is in effect. It worked great as for saving Grand Lake and the Lake Charles area. Okay. We have to develop something, a first line of defense.

One of the things that we have to look at is they wanted to put a salinity control lock in Calcasieu -- in Cameron Parish. With the amount of boat traffic that goes in and out, the oil industry, deep water port that's getting ready to kick in within the next year or two years, it's really going to be hard to put a salinity control device there because of the amount of boat traffic.

The input that we have here, I'm grateful that y'all have these meetings. One of the meetings that was scheduled for February 14th down in Cameron was cancelled. I'd like to see another one, if possible, to get a one-on-one more of a workshop instead of -- so people can point the fingers and look at it. That would be a great input.

I appreciate everything you've done. Their pie shape was one to four with 54 percent. It kind of baffled me a little bit.

But anyway, keep up the good work but stay in touch with the people that live in the area from Fourchon to Cameron to Johnson Bayou. That's the only way you're really going to get a true input and, you know, really come up to a well -- well-rounded design. Thank you.

MS. DESHOTELS:

Thank you, sir.

[Applause.]

MS. DESHOTELS:

Curt Marcantel.

MR. MARCANTEL:

Hello. My name is Curt Marcantel. I'm a landowner in Cameron Parish. I'd like y'all to really visit the Black Lake area again and look at some interior shoreline protection. Due to the wave action, I've lost 650 acres of property in that area; and also after Hurricane Rita, we lost our protection levee. So now we have approximately 80,000 acres of that saltwater intrusion, and through my property also is effecting another 20,000 acres that's due west of us.

So I'd like y'all to take another look at that property. Thank you.

MS. DESHOTELS:

Thank you, sir.

[Applause.]

MS. DESHOTELS:

Scott Henry?

MR. HENRY:

We have a lot of talk going on. I'm -- well, introduce myself -- I'm Scott

Henry from Cameron. I'm glad to see Cameron Parish well represented tonight.

And what we want to talk about that -- they're talking about protection levees and hurricane protection levees, and part of what we have already on the Cameron/Creole watershed is a protection levee that's 19 miles long; it's 200 feet wide; it's 7 foot tall. It was pre-Rita.

This levee comes from the --

MS. DESHOTELS:

Sir, would you, please, talk into the mic, because we are transcribing.

MR. HENRY:

The levee comes -- it starts here, well, in Cameron Parish at the old Calcasieu River and extends along the southern and southeast part of Calcasieu Lake all the way up to Hebert's Landing.

And this levee was built for several reasons. One of them was to restore the lake bank and to prevent sheet flooding from happening coming from the lake into Cameron as a hurricane protection.

It also has been designed to stop saltwater intrusion and develop the marsh areas and estuary.

So we do have a hurricane protection levee that was in place and that worked. This was a 7-foot high levee. As the storm came this way, it slowed down the surge water and held back that 7 foot of water. It kept that water from pushing up into this area, and it may have kept -- it may have even kept the Civic Center or I-10 from going under water. We don't know how much it helped. There's people that can calculate that.

But we know that the levee was there and it worked. And what we're afraid of now, there's no funding; there's no plans to repair it, and it's been washed out down to grade level in some places. The repairs that have been offered to be made to it is to repair the breaches in the levee where the old bayous blew out which help relieve the water pressure off of Cameron, and that was a good thing.

The plan now is to replace those with sheet piling so that that won't happen again, which would, you know, doom Cameron Parish to be under water until something could happen there.

But the levee itself is not in the plan to be replaced. They want to replace and repair the weirs. They want to replace and repair the breaches in the levee but not the levee itself, the hurricane protection levee that's there now that would cost pennies compared to all the other projects that's being offered.

This project is there. It's permitted. It was in place. It served its purpose. It needs to be restored. It protected Cameron as well as Calcasieu.

The water -- as you see, as the water comes up into the Calcasieu system, it flooded. Here is the airport right here, but these waters and these bayous, water pushed all the way up in here. Had that storm -- had that levee

not been here, the water would have came in much faster at more velocity and a higher rate. And we don't know where it would have -- the impact it would have had on the Calcasieu area.

So what we're asking is funding to do this now, not while the studies are going on, because we want to replace the levee, get the funding out there, get the manpower out there and start on that now, because it should be a project that was funded either through FEMA or through some of the other projects.

We had several people working on it but we don't have a plan that there's shoreline protection that -- we notice that was in your -- on page 10 of your -- in your brochure that show that there was a shoreline protection project to restore shoreline, but it's not to restore the levee itself.

Now, we've called it a "hurricane protection levee" for sometime. Different people have called it an "estuary management system." But it's

there and it needs to be repaired. That's what we're asking for.

We also -- the importance we look for in lower Cameron Parish when you talk about barrier islands, right now, Cameron Parish is probably the largest Barrier Island in Louisiana. It protects most of Calcasieu Parish and most of the land north of the Intercoastal Canal.

So in effect, if you're not going to protect Cameron Parish at the shoreline like Mr. Burleigh and Mr. Ray Conner talked about, you're not protecting much at all.

Anywhere you put a levee dooms somebody to the south of you. If you don't protect the shoreline, which extends some -- most of the beaches -- we have the most extensive beaches in Louisiana, the most accessible beaches are in Cameron Parish, public beaches -- if you don't protect the shoreline, then you're allowing the rest of it to eat away until it gets to the point where

you can't protect it.

When we talk about Fourchon having 18 percent of the oil and gas industry, well, the rest of it is located in Cameron Parish, because we have a port in Grand Chenier; through the Mermentau Basin, we have a port in Cameron; and we have also the port in Sabine -- at Sabine River in the Sabine Lake.

So we have three ports in Cameron that are operating in the oil field and they're public ports. Fourchon is a facility and it's run by the port board. Cameron, Grand Chenier, and Sabine Pass are public docks, and they handle just as much of the oil and gas influx that comes into the nation that's just as important as anywhere else.

So we are working with Fourchon to keep that supply line going. We are working with Calcasieu Parish to keep some protection in Cameron Parish. We want Calcasieu Parish to help Cameron protect yourself, you know. Give us a hand so that we can all come out of this

ahead.

We don't want to work so much on hurricane protection as we want to make sure that we take in coastal erosion and flooding that happens in between these hurricanes.

1957 was Hurricane Audrey. We haven't had -- our next hit was in 2005. We've had all kind of events in between that. We had flooding; we had high water; we had erosion. Things like that, we have to consider, all the things that happen in between the hurricane. Even if we have one this year, we still have to get straight on all the other issues that compounds our exposure to hurricanes.

So thank you for your time; and if there's any questions, I'll have this map in the back room. Thank you.

MS. DESHOTELS:

Thank you.

[Applause.]

MS. DESHOTELS:

Jim Bel.

MR. BEL:

Most of my concern has been addressed. The other issues that you just mentioned from the point --

MS. DESHOTELS:

Sir, let's put you over here.

MR. BEL:

Pardon?

MS. DESHOTELS:

Let's put you right here.

MR. BEL:

I'm worried about stagmentation. You know, like he said, between Audrey and Rita, we have a number of times where we had a lot of flooding. And I'm involved in management, about 8,500 acres of marsh in Cameron Parish. I've been living there all my life.

And I'm worried about -- marsh management to me is waterflow, and I'm worried about some of these levees backing water up and stopping natural waterflow, and I don't see a lot of control structures along the way.

And I've seen some areas where we

have put young -- people have put water control structures and they set these guillotine gates, and they haven't been touched for 25, 30 years.

And I would like to see more -- some more attention concerning the management of the marshes for the full benefit of all wildlife, all fish, shrimp, the whole works.

Now, I'm worried about if we just put a -- if we just block these marshes off, we're going to destroy a lot of natural habitat that we need.

MS. DESHOTELS:

Okay. Thank you, sir.

[Applause]

MS. DESHOTELS:

Michael Tritico.

MR. TRITICO:

I've done a lot of these hearings over the past thirty or so years, and it's very interesting to see that some of what used to lead to ridicule and scorn is now in the plan. I'm encouraged by that.

I'm discouraged by what seems to be a falling back on failed concepts. I mean, we've had lesson after lesson. We've seen the Creator's mercy, and yet we haven't seen the obvious, which is that the answer to all of this is to relocate people to high ground.

Now, you cannot out-engineer the Creator. There's no way to do it. People need to understand that there are uses for low areas, and yet human habitation is not one of them.

What I see in this plan is already having adverse impact. There's a plan to put a 300 million dollar hospital below sea level. People are being drawn back into the old deathtrap, New Orleans, because of this plan. It gives them a false sense of security, a false sense of hope; and we're going to be creating new deathtraps.

I did see a little phrase in there, "not to create new deathtraps." You didn't say it that way, but it's in there. But the momentum in this plan is

engineering fixes that cannot work given the climate change that we're undergoing, the expansion of the oceans.

All the monies that are being spent here, if even 1/10th of it were spent on relocating population centers and services, you would get a far greater return than you're going to get for all the money being spent on engineering projects that are impractical.

I am bewildered. I don't know what it would take for people to see the obvious. Maybe if the Creator sent a prophet that said, "On April 12th, 2007, a levee would disintegrate between Jackson Avenue and Louisiana Avenue and tear out the neighborhoods of New Orleans that survived Katrina." And if it happened, maybe people would wake up. Or if the prophet said, "On August 27, 2007, a Category-5 storm would finish the job for New Orleans," then there would be no more old deathtrap there. Maybe it takes something like that.

Because in 1721, the engineer,

Dilatore (sp) said, "I cannot keep that place dry. I don't build a city here." The governor ordered him to do it.

In 1927, the great Louisiana biologist, Percy Viosca, said, "Turn loose of the river. Quit shackling the river. You're going to lose the marshes, and then you're going to lose the City of New Orleans." Nobody listened. They ridiculed.

When are people going to see the obvious. I don't know what it takes. But it's encouraging that some of the stuff is finally making it into this plan. Thank you.

MS. DESHOTELS:

Thank you.

[Applause.]

MS. DESHOTELS:

David Richard.

MR. RICHARD:

Hi. David Richard. I'm just going to give you a few specific things that I think that maybe we need to add in the plan.

I want to echo a couple of things that Scott Henry just brought up. It is often mentioned that between 18 percent of oil and gas comes through Fourchon.

We had chairman of the house -- Speaker of the House Salter here this year. And with the LNG plants that are coming in Cameron Parish -- and I'm not including Vermilion Parish, just Cameron Parish -- we have 25 percent of the nation's natural gas coming through Cameron and Calcasieu Parish, yet Vermilion Parish, the Henry Hub, it pales the size of Fourchon.

When you look -- and Mr. Gueyman is in here -- when you look at going to this before the legislature, you see 36 or 38 million going toward the building of the road in Fourchon for infrastructure and you see a paltry 400 thousand to help Cameron Parish Trosclair Road. It does not look very equitable, and I suspect our legislature will understand that and see that.

We feel like there should be more

infrastructure with the amount of oil and gas industry that's in southwestern Louisiana.

I'm going to give you some specific things in regard to critical near term needs. If Randy is still in -- if Randy is in here, I know Randy testified yesterday at a senate hearing in New Orleans in regard to Cameron/Creole watershed.

And Cameron/Creole watershed is a tremendous importance here and FEMA has turned their back on it, and we need the state. And I want to commend the state, and especially Garrett Broussard, in regard to working towards getting that funding. We're 17 months out of the storm. The levee has not been repaired. We do not have a PW number in regard to FEMA, and it needs to be repaired.

Mr. Bradberry was here in regard to -- I want to talk about Holly Beach sand nourishment. Holly Beach sand nourishment and the Holly Beach Project is probably the most exemplary project

in saving our coastal highway that has ever been done in this nation. The Holly Beach with that sand nourishment that was done has actually been saved and was usable the day after the storm. No plans have been made to renourish that sand, and it needs to be done.

In regard to the --

[Applause.]

MR. RICHARD:

In the actual plan, there needs to be some modifications to your plan. Specific -- it was very obvious that your beach erosion control was on Rockefeller Refuge on public land, but it neglected the area of private landholdings between Rockefeller Refuge and Cameron and from Cameron west to the Holly Beach Project.

Both of those areas should be added in there so that private landownership can also have the benefit of public monies being spent to protect that beach shoreline.

Also, the eastern part of the

beneficiary use area is that east -- and I brought this up at your last meeting -- is that the beneficial use from Sabine Lake and from the Jefferson County Navigation District should be used on the east side of Sabine Lake, the western side of Sabine Refuge; and it's not on your plan this time, and I want to bring that back to your attention.

My last point is that the GIWW west of the Calcasieu, between the Calcasieu and Sabine, is not listed for erosion control to the same level of the hundred-year protection that you have east of the Calcasieu. I think we need to have a hundred-year protection west of the Calcasieu because of the population issues in Sulphur, Vinton, Carlyss, and the other communities in that particular area between Calcasieu and the Texas line.

Thank you for your time.

MS. DESHOTELS:

Thank you, sir.

[Applause.]

MS. DESHOTELS:

Lynn Hohensee?

MR. HOHENSEE:

Thank you. I'm Lynn Hohensee. Since June, I've been the director for the port, the West Calcasieu Port, small shallow water port on the Intercoastal Waterway about two miles west of the Calcasieu Ship Channel.

My only concern is -- and I'm hoping to get some more information, I don't have a lot to go with right now -- is what you're calling the navigable water stabilization lock, the Intercoastal Waterway, and I believe it's on the north side.

This would come in direct contact with our small port as we're trying to develop it. We're talking with people that possibly would like to use our port for base of operation. We just don't know how to communicate what this long range plan will do to them and their plans down the road, so we need

additional information, and we can get on that.

We really appreciate it. Thank you.

MS. DESHOTELS:

Thank you, sir.

[Applause.]

MS. DESHOTELS:

John Pouton (sic).

MR. MOUTON:

Mouton.

MS. DESHOTELS:

Mouton, I apologize, sir.

MR. MOUTON:

That's all right.

MS. DESHOTELS:

My sight is not as good as it used to be.

MR. MOUTON:

I'm originally from Lafayette, but I've been living here for thirty-something years. And I've been looking at this map, and I couldn't make the last meeting because I was working, but I try to attend every meeting that I can. And I don't have any interest in

Cameron Parish but I think you people are getting the short end of the stick, and that's the way I'm going to start my deal.

But when I look at this map here and I look and I see this blue line all the way around South Lake Charles, all the way around Vinton, Sulphur; and then right in the middle, it's got a little thing that says, "floodgate."

Well, it looks like to me they're going to have a floodgate on the Calcasieu Parish. Okay. Here is my big deal here. Everybody is talking about the water coming from the south. I'm talking about the water coming from the north.

Okay. I remember in 1953, they had a big flood here in Lake Charles. The water got up 14.7 feet up here. And the reason why I know that, because I bothered the people working for the government. They gave me a book so I've been reading that book. It got up 14.7 feet right there at Highway 171. Here,

the Port of Lake Charles, got 9 feet. Why? Because it came around here and they had a big, wide area so the flood spread so the water came down.

In 1953, the airport -- the base got flooded so the government said you had to do flood prevention all the way onto the base, so they built a levee right there on Coulee.

Okay. In 1980 -- 1987, we had the biggest flood you ever seen and the Coulee, the east side of Lake Charles, flooded because the water couldn't get out fast enough. They had the pump station or something happened to the pump. But anyway, I live south of town and the Contraband Bayou flowed like nothing. I think one or two days, they had water east of town. Me, that afternoon, I had water away from my house.

Okay. Now, if you look at the flood maps for the governor -- the governor has got flood maps -- and if you look at Interstate 10, and you can go right

there in Sulphur and you'll see one side of Interstate 10, they got a big old flood zone south of the Interstate 10. It's not a flood zone. Why? Because Interstate 10 holds the water coming from the north and the gullies -- the water that goes underneath, it's not big enough, so it holds water there.

My concern is, is that thing going to be big enough to hold -- that Calcasieu River is a big river, and they got a lot of water coming down that river. Is that thing going to be big enough to maintain a 30-inch rain coming from Leesville and all that area so it won't be backing up; and then if it does, then the federal government is going to come and raise the flood zone, and everybody is going to have to start getting flood maps and higher flood insurance. That's what I'm concerned about. I'm concerned about that.

And anytime -- and if we have a hurricane, who's going to be out there opening that floodgate? Who's going to

close that floodgate?

We had a problem here in town right here on Coulee for that hurricane. I got a lot of concerns. Believe me when I tell you that. And I just work for a living. I'm an operator at one of these plants. I have nothing to do with the State of Louisiana or whatever, but I'm an old Cajun. I look at that and I look at common sense, and that's what I see.

So I'm hoping y'all addressing that thing. We don't want to flood north to save -- you understand what I'm getting at --

MS. DESHOTELS:

Yes, sir.

MR. RICHARD:

-- from the rain. And that's all I got to say about it.

MS. DESHOTELS:

Thank you, sir.

[Applause.]

MS. DESHOTELS:

Carolyn Woosley.

MS. WOOSLEY:

Carolyn Woosley from Lake Charles, also, the Coalition to Restore Coastal Louisiana as was David Richard.

And we need more representatives on the board of the Coalition to Restore Coastal Louisiana. We're almost not represented at the state level on this non-profit, which is the largest and oldest advocacy group going to D.C. and Baton Rouge since the mid '80s. Two of us are on the board, as is Buddy Leach. So we need someone -- particularly someone with science or engineering expertise to represent our part of the state so that the dialogue continues in depth.

I want to say that one of the primary introducers of saltwater are our ship channels, the Calcasieu and the Sabine. I notice that there usually are -- and I realize this is a very long-term and a very high-priced item -- mentioned usually early on in plans and then are dropped. But they are aggressive introducers of saltwater into

our interior marshlands, and I'm wondering why. Is their dialogue on this? Is there study on this? Or is this a political hot potato?

Also, I would like to say that, is there dialogue with the parishes on the interior parish structure? We have eight drainage board districts for Calcasieu Parish alone. And so is there a look at our institutional structure of our parish when you view the three parishes, Calcasieu, Cameron, Vermilion, as one fantastic watershed.

Are we in the 21st Century with our own water management, and are these questions being asked throughout the 19 parishes?

Let's see. I agree with the stagnation and the holding water. This was a significant problem in Lake Charles during Rita. We had significant home damage of water infiltrating into lake -- city bayou that could not be or was not managed during Rita.

And perhaps -- the Calcasieu Lake,

perhaps, we need more aggressive CWPPRA discussion, for example, in rebuilding that levee quickly. Those conclude my comments, I think. Thank you.

MS. DESHOTELS:

Thank you.

[Applause.]

MS. DESHOTELS:

Jay Rutherford.

MR. RUTHERFORD:

Thank you for hosting this meeting. I'm a resident of Cameron Parish, and I have concerns about raising Highway 82/27 because of the buffer setback zone easement right-of-way and management of the forestry.

There are growing concerns that this is going to displace a lot of residents because virtually every residence, business, church, school, all structures, all assets are located within 150 feet of that road.

And I have a few short questions here, and thank y'all for rescheduling the meeting with Cameron Parish. I look

forward to meeting one-on-one with you and discussing it more in depth.

How high will the highway be raised? What is the setback buffer zone distance? What is the slope on the landward sides, one-to-30, one-to-100, one-to-three, one-to-ten? That could affect up to 1,000 feet. On 150-foot deep ridge, that wipes us out.

What happens to structures located within the easement zone? What happens to existing structures on the seaward side?

Also, the Grand Lake Intercoastal Waterway levee would negatively impact Grand Lake and cause flooding to Grand Lake, the residents up and down Grand Lake and Sweet Lake. Hackberry would be affected. All of Cameron Parish would be affected by these projects.

And we're very concerned about expropriation, eminent domain, quick take, quick grab. And everything I've read in the documents I've read, every page of the final draft -- and I know

it's going to go to the legislature starting April 30th -- I'm extremely concerned.

One reason is, I hold freedom very, very high. I'm a landowner in Cameron Parish. I just have three three-and-a-half acres, but I'm also a combat veteran. Sixteen years ago today, I was fighting for my life in Iraq. While I was there, Representative Roach sent me a Louisiana state flag, and I want to thank him for that some sixteen years later.

Mayor Roach has supported all of Southwest Louisiana, and we look forward to working together with all the parishes, but Cameron Parish is very concerned about this.

And as a veteran, I value my freedom very highly, and I will say -- and I want to choose my words carefully -- relocation is not an option. I will stand my ground. But basically this plan is very comprehensive. It's very well put together, very well engineered,

but it plays God and tampers with Mother Nature. It needs to take into consideration all of the residents. The most effective solution is the frontline protection at the shoreline, which is the offshore barrier rocks. With that, I thank you.

MS. DESHOTELS:

Thank you, sir.

[Applause.]

MS. DESHOTELS:

Mark Ford?

MR. FORD:

Good evening. I'm Mark Ford with the Coalition to Restore Coastal Louisiana. I have a real general, hopefully simple question here.

Yesterday at the committee hearing in New Orleans, Sidney Coffee mentioned that the Corps' plan is now going to be delayed by six months or more, and I want to know your thoughts of when and how you're going to keep your plan which is going to be released in just a few months and the Corps' plan which is

going to released over a year from now coherent and matched well together since (inaudible) and how you tend to --

UNIDENTIFIED SPEAKER:

Please get the mic.

MR. FORD:

My comments were that the Corps' plan is going to be delayed by more than six months. It was supposed to be released in December. It will now be released more than a year; so originally, there was a few months difference between the state land and the Corps' plan. Now, it's more than a year, so it's going to make it more difficult to keep these meshed, and I know you guys are going to have to deal with that, so at some point, we'd like to hear your thoughts on that. That's a concern of ours. Thank you.

MS. DESHOTELS:

Thank you.

[Applause.]

MS. DESHOTELS:

John Henning?

MR. HENNING:

How are y'all doing tonight? My name is John Henning. I have property in -- on Big Lake, which is about 500 feet of coastline. I did a survey in 1997, and there was another survey in 2005. I lost 15 feet, so that's a foot and a half.

In the meantime, I've contacted the Corps of Engineers about stabilizing that shoreline myself, because it's been over a year and a half, so I've already lost another foot and a half.

But my question is: Are y'all going to do the whole eastern shoreline of Calcasieu Lake? And that's basically my question. And also I'd like to submit my survey as a written document.

MS. DESHOTELS:

Okay. Thank you, sir.

[Applause.].

MS. DESHOTELS:

Mayor Randy Roach?

MR. ROACH:

Thank you, Michele, and thank you

for having the meeting here in Lake Charles. We appreciate it. Senator Bradberry, welcome again to Lake Charles. And all the representatives here from different agencies, we appreciate y'all coming out.

I'd like to just reiterate a couple of things, if I could, and I think we made these points at the last meeting, but I think it's important that everyone here understand it as well.

The levee system that is being proposed for Lake Charles, the first time I saw was when it was presented in our last meeting, and I don't really understand the engineering behind it or the actual thought processes that went into it other than I understand the concept, but I do have concerns.

I think Mr. Mouton raised some valid concerns about what it does the 98 percent of the time when the water is coming the other way; and so we have concerns about what that does with respect to drainage because, as he

pointed out, it's more probable than not that we're going to have high rain events more frequently than we're going to have Hurricane Ritas or Hurricane Audreys.

So I think we need to give some thought to that and perhaps maybe we could -- and maybe the parish has already been involved. I saw Brent Clement here a minute ago, but maybe the parish has been involved in the process of doing this, but we have not and so we would like to know a little bit more about that before we can really express an opinion on it.

In general, though, I would say this, and Ray Conner brought this up I think a minute ago when he made his comments, I think if you go back historically in the way in which the whole issue of wetland restoration has been handled for the last, oh, fourteen or fifteen years, we in Southwest Louisiana have tried to support our neighbors in Southeast Louisiana because

we understand the critical land loss that is occurring over there.

But I would suggest to you that Hurricane Rita has changed that and changed it significantly with the saltwater that Hurricane Rita pushed into the marshes of Cameron Parish and Vermilion Parish and those areas and with the severe drought that followed after that. That saltwater has stayed in those marshes for a long time. Some areas still have high levels of saltwater.

In some areas right after the storm or within a few months of the storm, you could actually measure salinities that varied that of the Gulf. And that's going to cause some severe damage and it's going to continue to cause severe damage to those marshes. And so I don't know that we can continue to sit back, because if we don't act now, then we will have the same problems that we're having in Southeast Louisiana and we know the difficulty and the challenges

and the expense associated with restoring those marshes now, so we shouldn't let our marshes get in that condition before we actually -- before we respond.

The one thing that I was curious, and I haven't looked at the plan yet, but I think the comments that Mr. Henry made -- that Scott Henry made and that David Richard made about the Cameron/Creole watershed illustrated a very important point.

Here, we are in coastal Louisiana. We understand that hurricanes happen and hurricanes are going to happen, and we're going to have to deal with that; but right now, we have the Cameron/Creole watershed, which is the largest hydrologic project of its kind along the entire Gulf coast. It has now been damaged. It needs to be repaired, and we're being told that FEMA says, "It's not our responsibility," and we're being told that we're going to have to go try to find somebody here and find

somebody here. If we're doing all these projects, if we're developing a long-term plan for coastal improvement and for coastal restoration, there needs to be given some thought to some insurance fund, for lack of a better word, that would be able to provide the response and the recovery or at least the short-term fix for those projects like Cameron/Creole watershed that are going to be destroyed or going to be damaged by hurricanes.

Last comment, and my good friend, Mike Tritico -- I don't know if Mike is still here -- and I have a lot of respect for Mike and I know that he feels very passionately about what he said, but the gentleman who just spoke here about Cameron Parish and about relocation is not an option, it concerns me that we even discuss those kinds of things, because I think we're being unrealistic.

The coast of Louisiana -- and we've said it ourselves, the coast of

Louisiana is a working coast, and we cannot have the activities, and we cannot support the activities that this nation requires and not expect small communities to be built along the coastal region of the state. And if you look back at what happened --

[Applause.]

MR. ROACH:

-- if you look back at Cameron Parish and you look at what was destroyed and the number of people, believe it or not, there's about 4500 people that were directly impacted by that storm, that supported that 25 percent of the nation's supply of natural gas that is coming through this Vermilion Parish/Cameron Parish area, four thousand people.

If you spent a hundred thousand dollars for each person, you wouldn't come near to what you're spending on some of the projects that we're already -- you know, already budgeting and already spending. So I think we have to

think about that cost benefit, and we have to recognize that if you're going to have any type of facility that does any type of work in the coastal region that provides any type of oil and gas production or any type of support for oil and gas production, you're going to have people.

If you're going to have people, you're going to have a grocery store. You have a grocery store, you're going to have to have a school. You have a school, you're going to have a doctor. If you have a doctor, you're going to have to have a church. All those things are related, and that's how those communities exist and that's how they have traditionally existed.

And that is what's so unique and special about the coast of Louisiana. We cannot allow one hurricane or two hurricanes or a bad hurricane season to destroy all of that.

And so I'd like to make sure that our comments tonight reflect that as

well, because what we're talking about is not just protecting marsh; we're talking about people and people that make that marsh so special. Thank you.

MS. DESHOTELS:

Thank you.

[Applause.]

MS. DESHOTELS:

Mark Hebert with Senator Landrieu's office.

MR. HEBERT:

Thank you. I appreciate you having the event here. We certainly appreciate all your comments tonight. I'll be sure to pass the -- there are numerous comments for me to address right now -- to the senator regarding concerns of Southwest Louisiana.

We want to be sure we're as responsive to Southeast as we are to Southwest. I certainly understand and appreciate as a resident of Southwest Louisiana the concerns about disparity and the funding from one side of the state to the other.

We certainly don't want to make anybody feel shorted about that, especially with the importance of the energy production that comes along here.

Also, I particular note that we're -- I won't belabor the point, but the water flowing north to south, of course, is going to be an issue that we want to -- we'll take a look at.

And we want to also -- and I also want to let you know that if you have any individual concerns or anything like that, I'd be more than happy to take those on and relay them on to the senator.

But most importantly, thank you for all of you coming here tonight and relaying your concerns along in this forum, and we look forward to working with Secretary Bradberry and the governor and all the other officials of this state to try to bring together a comprehensive plan that is fair and equitable to everybody. Thank you.

[Applause.]

MS. DESHOTELS:

Thank you. Again, before we close this evening, I want to remind you that our public comment period closes on April the 2nd; so through that time, we will take your written comments either by mail -- and our address is on the comment form outside -- by E-mail to our website www.louisianacoastalplanning.org, and we really do appreciate you coming tonight. We appreciate what you have told us.

Tomorrow night, we'll be in New Orleans and the next night, we'll be in Abbeville if any of you want to come again. Thank you very much. Good night.

[Hearing concluded.]

* * * * *

Coastal Protection and Restoration Authority

PUBLIC HEARING COMMENT FORM

Draft of Louisiana's Comprehensive Master Plan for a Sustainable Coast,
Draft FY 2008 Annual Plan
and Draft CIAP Plan

To insure that your written comments are considered, they should be turned in this evening at the reception desk located near the entrance or mailed to the following address so that the comments are received no later than Monday, April 2, 2007:

CPRA – IPT
DNR
Post Office Box 94396
Baton Rouge, LA 70804-9396

Email comments may additionally be submitted at: comments@louisianacoastalplanning.org

Please consider the following comments:

It appears most of SW Cameron Parish will not be afforded level protection. Therefore it is most important to expidite the raising of the Hwys along the Southern most east-west direction (Hwy 82). Hwy 27 is a North-South route and should be done after the RAISING of Hwy 82. Although Hwy 27 is an evacuation Route. Raising Hwy 82 will provide immediate protection to lower Cameron parish.

Who will Maintain/operate the water control device on these Roads/levees. will these operators leave when a storm threatens or hits. How soon will the Floodgates be opened after a storm, will we even have the means to open them with No Electricity.

What seems to be the problem of Rock Barriers offshore such as those West of Holly Beach they seem to have preformed well.

(Use the back of this form if more room is needed)

Name: Martial Young Date: 2/27/7

Address: 355 Hwy 384 Grand Lake, La. 70607

Coastal Protection and Restoration Authority

PUBLIC MEETING COMMENT FORM

Draft of Louisiana's Comprehensive Master Plan for a Sustainable Coast,
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and Draft CIAP Plan

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Please consider the following comments:

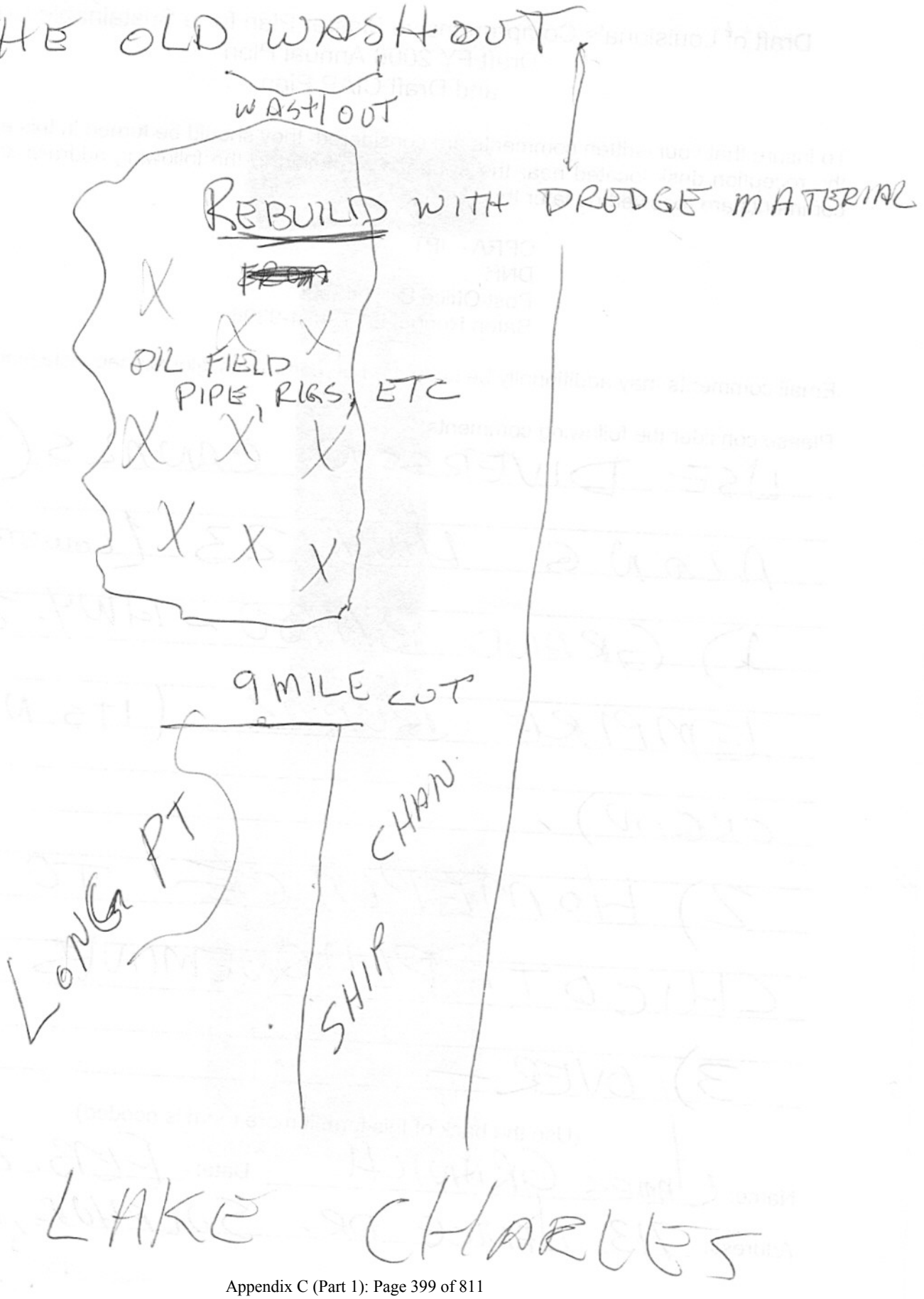
USE DIVERSON CANALS (BAYOU) ALONG HWY. 23 (LOWER PLAQ.)
1) GRAND BAYOU - HWY. 23 TO EMPIRE BURAS (ITS NATURAL ORGIN).
2) HOMEPLACE TO BAY CHICOT PLAQUEMINES PARISH
3) OVER —

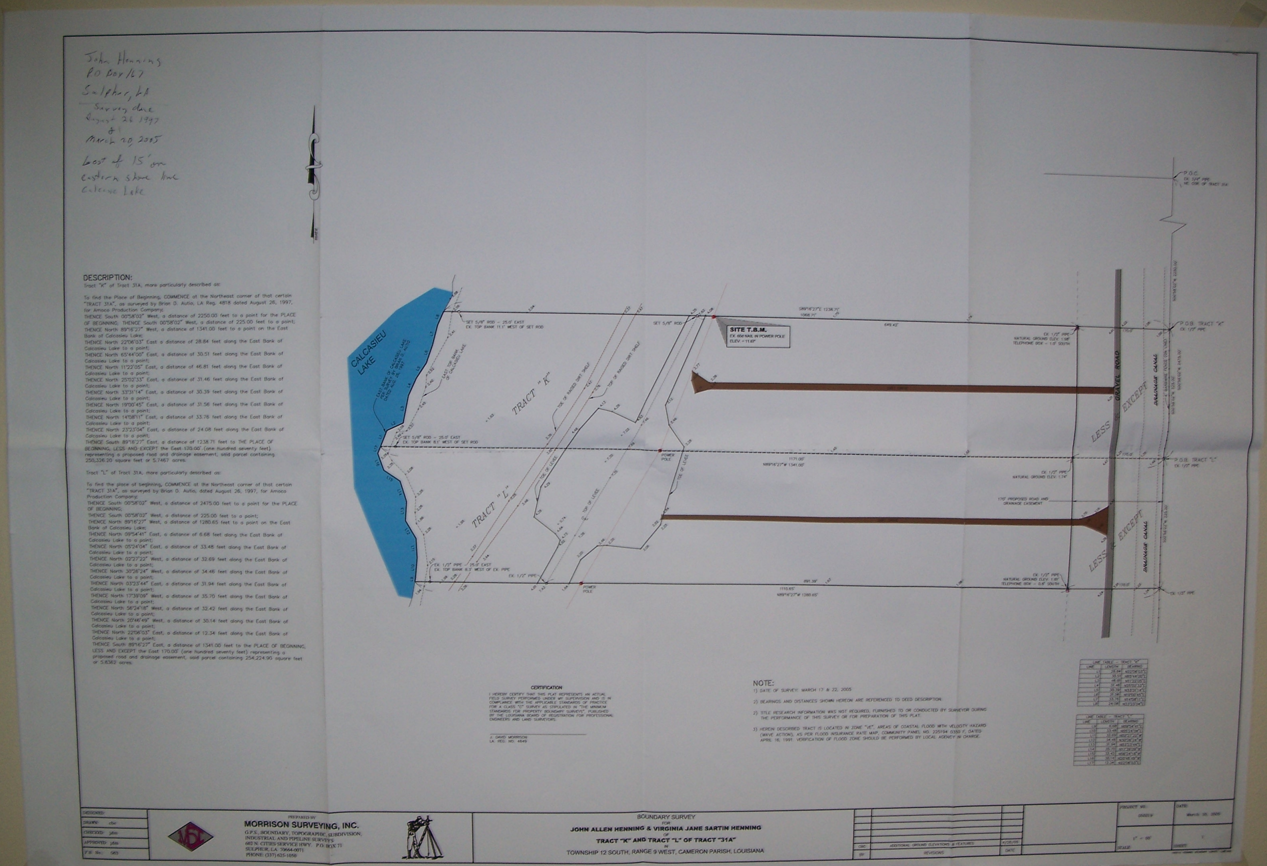
(Use the back of this form if more room is needed)

Name: JAMES GRANICH Date: FEB. 27-7

Address: 713 JANICE DR. SULPHUR, LA 70663

3) BUILD BACK AREA OF CALCASIEU LAKE FROM 9 MILE CUT TO THE OLD WASHOUT.




DESCRIPTION:
Tract "K" of Tract 31A, more particularly described as:
To find the Place of Beginning, COMMENCE at the Northeast corner of that certain "TRACT 31A", as surveyed by Brian D. Autio, LA Reg. 4818 dated August 26, 1997, for Amoco Production Company;
THENCE South 00°58'02" West, a distance of 2250.00 feet to a point for the PLACE OF BEGINNING; THENCE South 00°58'02" West, a distance of 225.00 feet to a point;
THENCE North 89°16'27" West, a distance of 1341.00 feet to a point on the East Bank of Calcasieu Lake;
THENCE North 22°06'03" East a distance of 28.84 feet along the East Bank of Calcasieu Lake to a point;
THENCE North 65°44'00" East, a distance of 30.51 feet along the East Bank of Calcasieu Lake to a point;
THENCE North 11°22'05" East, a distance of 46.81 feet along the East Bank of Calcasieu Lake to a point;
THENCE North 25°02'33" East, a distance of 31.46 feet along the East Bank of Calcasieu Lake to a point;
THENCE North 33°31'14" East, a distance of 30.39 feet along the East Bank of Calcasieu Lake to a point;
THENCE North 19°00'45" East, a distance of 31.56 feet along the East Bank of Calcasieu Lake to a point;
THENCE North 14°08'11" East, a distance of 33.76 feet along the East Bank of Calcasieu Lake to a point;
THENCE North 23°23'04" East, a distance of 24.08 feet along the East Bank of Calcasieu Lake to a point;
THENCE South 89°16'27" East, a distance of 1238.71 feet to THE PLACE OF BEGINNING, LESS AND EXCEPT the East 170.00' (one hundred seventy feet) representing a proposed road and drainage easement, said parcel containing 250,326.20 square feet or 5.7467 acres.
Tract "L" of Tract 31A, more particularly described as:
To find the place of beginning, COMMENCE at the Northeast corner of that certain "TRACT 31A", as surveyed by Brian D. Autio, dated August 26, 1997, for Amoco Production Company;
THENCE South 00°58'02" West, a distance of 2475.00 feet to a point for the PLACE OF BEGINNING;
THENCE South 00°58'02" West, a distance of 225.00 feet to a point;
THENCE North 89°16'27" West, a distance of 1280.65 feet to a point on the East Bank of Calcasieu Lake;
THENCE North 09°54'41" East, a distance of 6.68 feet along the East Bank of Calcasieu Lake to a point;
THENCE North 05°24'04" East, a distance of 33.48 feet along the East Bank of Calcasieu Lake to a point;
THENCE North 02°27'22" West, a distance of 32.69 feet along the East Bank of Calcasieu Lake to a point;
THENCE North 30°26'24" West, a distance of 34.46 feet along the East Bank of Calcasieu Lake to a point;
THENCE North 03°23'44" East, a distance of 31.94 feet along the East Bank of Calcasieu Lake to a point;
THENCE North 17°39'09" West, a distance of 35.70 feet along the East Bank of Calcasieu Lake to a point;
THENCE North 56°24'18" West, a distance of 32.42 feet along the East Bank of Calcasieu Lake to a point;
THENCE North 20°46'49" West, a distance of 30.14 feet along the East Bank of Calcasieu Lake to a point;
THENCE North 22°06'03" East, a distance of 12.34 feet along the East Bank of Calcasieu Lake to a point;
THENCE South 89°16'27" East, a distance of 1341.00 feet to the PLACE OF BEGINNING, LESS AND EXCEPT the East 170.00' (one hundred seventy feet) representing a proposed road and drainage easement, said parcel containing 254,224.90 square feet or 5.8362 acres.
CALCASIEU LAKE
TRACT "K"
TRACT "L"
SITE T.B.M.
GRAVEL ROAD
LESS & EXCEPT
DRAINAGE CANAL
CERTIFICATION
I HEREBY CERTIFY THAT THIS PLAT REPRESENTS AN ACTUAL FIELD SURVEY PERFORMED UNDER MY SUPERVISION AND IS IN COMPLIANCE WITH THE APPLICABLE STANDARDS OF PRACTICE FOR A CLASS "C" SURVEY AS STIPULATED IN "THE MINIMUM STANDARDS FOR PROPERTY BOUNDARY SURVEYS", PUBLISHED BY THE LOUISIANA BOARD OF REGISTRATION FOR PROFESSIONAL ENGINEERS AND LAND SURVEYORS.
J. DAVID MORRISON
LA. REG. NO. 4649
NOTE:
1) DATE OF SURVEY: MARCH 17 & 22, 2005
2) BEARINGS AND DISTANCES SHOWN HEREON ARE REFERENCED TO DEED DESCRIPTION.
2) TITLE RESEARCH INFORMATION WAS NOT REQUIRED, FURNISHED TO OR CONDUCTED BY SURVEYOR DURING THE PERFORMANCE OF THIS SURVEY OR FOR PREPARATION OF THIS PLAT.
3) HEREIN DESCRIBED TRACT IS LOCATED IN ZONE "VE", AREAS OF COASTAL FLOOD WITH VELOCITY HAZARD (WAVE ACTION), AS PER FLOOD INSURANCE RATE MAP, COMMUNITY PANEL NO. 225194 0350 F, DATED APRIL 16, 1991. VERIFICATION OF FLOOD ZONE SHOULD BE PERFORMED BY LOCAL AGENCY IN CHARGE.
PREPARED BY
MORRISON SURVEYING, INC.
G.P.S., BOUNDARY, TOPOGRAPHIC, SUBDIVISION, INDUSTRIAL AND PIPELINE SURVEYS
602 N. CITIES SERVICE HWY. P.O. BOX 71
SULPHUR, LA 70664-0071
PHONE: (337) 625-1050
BOUNDARY SURVEY
FOR
JOHN ALLEN HENNING & VIRGINIA JANE SARTIN HENNING
OF
TRACT "K" AND TRACT "L" OF TRACT "31A"
IN
TOWNSHIP 12 SOUTH, RANGE 9 WEST, CAMERON PARISH, LOUISIANA

4.2.6 Abbeville Public Meeting Transcript

Drafts of Louisiana's Comprehensive Master Plan for a Sustainable Coast, FY 2008 Annual Plan, & CIAP Plan

STATEMENT CARD

Name LOLAND BROUSSARD

Street or Box 646 CASUIDOME BLVD

City LAFAYETTE State LA Zip Code 70506

If you would like to present your views orally at this meeting, please fill out and submit this Statement Card at the reception desk located near the entrance. When called by the meeting moderator, please come to the microphone to make your comments.

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STATEMENT CARD

Name DONALD SAGRERA

Street or Box 20227 LA. Hwy 82

City Abbeville State LA Zip Code 70510

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STATEMENT CARD

Name Ross C. Hebert

Street or Box 15815 Hwy 330

City Albany State LA Zip Code 70510

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STATEMENT CARD

Name Alfred Broussard

Street or Box #06 Cheau Rd.

City KAPLAN State LA Zip Code 70548

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STATEMENT CARD

Name Etta Charles Broussard

Street or Box 23604 S. La Hwy 82

City Kaplan State La Zip Code 70548

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STATEMENT CARD

Name Senator Nick Gautreaux & Rep. Don Trahan

Street or Box STATE of LA

City _____ State _____ Zip Code _____

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STATEMENT CARD

Name Jim Chesnee

Street or Box 10703 LA Hwy 82

City Abbeville State LA Zip Code 70510

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STATEMENT CARD

Name R. Ernest Girouard

Street or Box 8209 Hwy 13

City Kaplan State LA Zip Code 70548

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STATEMENT CARD

Name Roger Lemoine

Street or Box 5730 Veteran Magnolia Dr

City Abbeville State LA Zip Code 70510

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Additionally, comments may be submitted by email to: comments@louisianacoastalplanning.org

---

Elemore Morganija
P.O. Box 428
Maurice, LA 70555

> May want to make a comment.

COASTAL PROTECTION AND RESTORATION AUTHORITY

INTEGRATED PLANNING TEAM

TRANSCRIPT AND PUBLIC COMMENTS

OF

PUBLIC MEETING

FOR THE

DRAFT OF LOUISIANA'S COMPREHENSIVE MASTER PLAN FOR A SUSTAINABLE COAST, DRAFT FY 2008 ANNUAL PLAN AND DRAFT CIAP PLAN

HELD AT THE

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6:30 P.M.

P R O C E E D I N G S

MS. DESHOTELS:

I want to very much thank everyone for coming this evening. We really appreciate the turnout. We also appreciate the fact that this is not the first time that we have been invited to Abbeville, and we love coming here. Thank you again for asking us back.

Before we go a little -- any further into the program tonight, I want to introduce some of the people who are here this evening.

We have elected officials tonight: St. Martin Parish President, Guy Cormier is here. Thank you for coming, sir. From the St. Martin Parish Council, we have Carol Delahoussaye and Mike Huval. From -- we have Wayne Tujague here. Sir? Thank you, sir, for coming this evening.

Excuse me. David, would you go and bring the lights back up, please? The pretty lady wants to see her notes.

From Kaplan, we have Mayor Linda Hardee. Thank you. And we have from the Vermilion Police Jury David Maynard. Thank you, sir. And Representative Mickey Frith.

REPRESENTATIVE FRITH:

Thank you. Welcome to Vermilion and Abbeville.

MS. DESHOTELS:

Thank you, sir. We're delighted to be here.

Also here this evening -- do I have any other elected officials here this evening who would like to be acknowledged?

Yes, sir. Would you state your name for the record, please?

MR. CHERINE:

Maxwell Cherine, Restore Sabine Parish.

MS. DESHOTELS:

Thank you, sir.

MS. HARTWELL:

Charlotte Hartwell, Mayor, Gueydan.

MS. DESHOTELS:

Thank you, ma'am.

From the -- we have several representatives of federal agencies here this evening. From MMS, the Minerals Management Service, we have Bruce Baird. From the Corps of Engineers, we have Julie Morgan. With our CIAP Program here this evening, we have Dave Fruge and Greg Grandy. And Greg's going to later give the presentation on the CIAP Program.

The CPRA Integrated Planning Team, members present tonight are Larry Ardoin, Jean Cowan. I believe Jean's outside with -- at the moment with some newspaper reporters, and Andrew Beall, who is going to give the State Annual Plan information.

And we're going to go ahead and get started, maybe.

We have three plans to discuss this evening: The Master Plan, the Annual Plan, the CIAP Plan. The Master Plan lays out the overall vision for the future of coastal Louisiana. And it's very important to note, though, that the Annual Plan and the CIAP Plan are going to be our first step to begin implementation of that Master Plan. This is the draft report that we have out now on -- it's available on the Internet at www.louisianacoatalplanning.org. It's also available here in this library.

The Master Plan has four objectives: To reduce risk to communities; to restore sustainability to the coastal ecosystem; to maintain a diverse array of fish and wildlife habitat; and to sustain Louisiana's unique heritage and culture.

The team who put together this Master Plan was formed in February of 2006, a year ago, and today this is where we are. We're very close to being able to

submit a completed plan to the Legislature in two months.

I want to talk for a few seconds about three major planning efforts that are going on now in Louisiana. Our Master Plan, the Corps' LACPR Plan, and the LRA Regional Planning, Louisiana Speaks. And what I want to emphasize about these plans, I'm not going to go into details about the Corps Plan or -- or Louisiana Speaks, but what I want to emphasize is that all three plans' efforts are working together. We have worked with the Corps' project, including working with the Dutch and Dutch input. In fact, in two weeks, the Dutch will again be visiting Louisiana and be working with the Corps and the state of Louisiana.

With Louisiana Speaks, that community growth is the emphasis of their planning, but that planning is based on our foundation work for protection and restoration. And we are all sharing input, data, and resources. We want to make it very clear that all the effort that this community has put into the planning process through the Louisiana Speaks Program, that we are aware of it. And that has been incorporated into our process as well.

Our Preliminary Draft Plan was released in November of last year, and we went out and we asked for

not only public and state voter input, but we subjected it to scientific and technical review.

There were two scientific panels that looked at this preliminary draft: The Louisiana Coastal Area, or LCA, Ecosystem Restoration Science Board, and then the Science and Engineering Review Team for this master planning process. And both are composed of distinguished scientists from throughout the United States.

We had nine public meetings on that draft plan across the coast. And I'm going to go over a little bit tonight about what we heard.

First, people really liked the look of the plan. They liked the layout. They liked the fact that we were very clearly and bluntly put out what it was about. Everyone has praised the concept of integrating ecosystem restoration and hurricane protection. And we were told that we're making real progress towards solutions.

We were -- also heard that protection and restoration expectations may not always be achievable; that protection and sustainable restoration may not always be compatible; that the scale of necessary restoration action are going to shift natural resources distribution. We recognize that there's a great need

for rapid advances in science and technology. We always recognize through this project that there's a great need for enhanced dialogue between scientists, planners, and the public.

We understand and recognize that there are technical challenges that are going to require particular focus in the future as well as now, but there is with climate change sea-level rise and changes in rainfall patterns that are going to occur. There is a great deal of discussion on what are the effects of levees on hydrology, what are the effects of river diversions on hydrology, and just how effective is marsh creation by dredging.

We heard concerns that there were no priorities expressed in the Preliminary Draft Master Plan. That was intentional. But various reviewers have asked that we establish priorities and we prioritize not only the systemic projects and the quick-fix projects, but that we also look at those policy, legislative and institutional issues that are just as important to have resolved, putting constructible projects on the ground.

There was concern that ecosystem restoration might be a secondary priority in the Preliminary Draft and some stakeholders were concerned that plan implementation, specifically, large river diversions,

would affect their livelihood.

Some reviewers said the report described many features with too much certainty. Some reviews were concerned the plan as presented might not be technically feasible; that climate change challenges the concept of sustainability; that cost might be too high for what we wanted to do; that some strategies may not work as intended; and that some targeted protection levels may not be achievable.

We also heard that the level of protection might be too low in some parishes, and we heard that from Terrebonne Parish, Plaquemines Parish, and Lafourche Parish.

We also had good input, but on project-specific issues, that can be utilized at a later date, we would get to planning, designing specific projects.

Many reviewers commented on the plan management framework. They wanted us to maintain integration and program management, define the decision-making processes, and define an adaptive implementation program. So what did we do with all this comment? How did we address and incorporate it?

At the beginning of February, we released the Draft Master Plan. It consists of a main report, the Executive Summary, of which was a handout at the

desk this evening, and 11 appendices. The main report and all 11 appendices are on-line. Some of those appendices are over a 1,000 pages long, which is why we don't have them all printed out.

In that report, we clarified the message. We added a chapter to more explicitly acknowledge scientific and technical challenges inherent in the plan. We revised maps and texts to better convey the levels of certainty we had about certain measures. We added a discussion of the prioritization process. However, I point out that the project specific priorities are defined in the Annual Plan. We also worked with CIAP to assure priority focus and agreement with the overall Master Plan objective. We clarified the relationship between action to achieve a sustainable landscape and sustainable hurricane protection, recognizing that both are needed. And we added a discussion of long-term management needs, utilizing an adaptive management framework. And we recognized that restoring sustainability to the coastal landscape is the foundation for all the additional work that needs to be done. And to do this, we have to maximize the use of the river and its resources. That includes restoration of the system hydrology and land-building diversions as well as land-sustaining diversion.

We recognize that it is critical to sustain certain land forms; that we have to take control of navigation channels; that marsh needs to be created using dredge material; that we need to look immediately at various shoreline restoration, ridge restoration, and shoreline stabilization.

And the Delta -- and let's see. Some of this is going to show up better in the handout that you received. You'll have that mapping and the colors. They kind of fade a little bit on here.

But the green are areas of marsh creation. And you can see here shoreline and various stabilization, shoreline stabilization around the lake.

The blue are areas where we need to manage water. These small blue areas indicate diversions, some smaller, some larger, most for land-sustaining purposes, and a major diversion at the lower end of the river.

We also look at moving water along the GIWW and stabilization of that navigable channel.

For the Chenier plain, we're also looking at stabilization of the navigable GIWW and those channels that are out there. We're looking at shoreline stabilization in these areas. We're looking at moving water along these channels. And we recognize that this area in here needs to be able to be managed more

effectively to not only control the water going in and also the water going out. It is that flow that is important. And to do that will also require management of this area up here for water. We're looking at water management in these areas over here. We're also looking at marsh creation in these areas in here. And, again, those details are in your handout.

Reducing risk to communities deals on that first process. We need to restore ecosystem with a sustainable landscape. We also need to look at nonstructural measures. That means elevating homes and businesses, improve building codes, evacuation planning, land-use planning. It means being able to acquire affordable insurance, hazard mitigation plan implementation. And levees and flood gates are a key component of that overall reduced risk.

In the Delta plain, we're looking at -- the solid line indicates existing levees. But we're looking here at a greater than a 100-year protection and in this area a 100-year protection. In this area, we're looking at maintaining an authorized protection. Over here, we're showing the Morganza to the Gulf in a solid line, because even though that is waiting for authorization in WRDA, the alignment has been chosen. And as a couple of weeks ago, the first phase of the first project is

complete on that through state and parish funding.

In this area, we recognize that there are two urbanized areas that are going to require greater than a 100-year protection. And that's what these blue lines here and here indicate. What -- those lines are conceptual. They do not indicate where that protection may be or exactly what it may be. In this area, this red line here indicates that we need to look at a 100-year protection for the very large population that lives in this area, although it is a dispersed population.

We're also looking at improvements to LA 82 and 27 to preserve their efficiency as evacuation routes, and also in raising those and armoring those roadways in helping, using them as a tool to help control inflow and outflow in the Mermentau Basin area.

On -- everyone here has heard about MRGO. We are recommending that we immediately close it with an earthen plug and then deal with the economic issues resulting from that. Plaquemines Parish has difficult issues dealing with just how do you handle this diversion down here. And I might add that we regard the issues with the Mermentau Basin as also one of the difficult issues that we're going to be facing, and that's simply because of the knowledge basis there.

The implementation process needs to be -- to

include establishing a process by identifying priority actions within the annual planning framework. We need to develop an adaptive implementation framework to focus scientific and technical advances and to promote program learning, and need to develop standard processes for revising the Master Plan in a deliberate manner to remain relevant into the future while maintaining its focus.

We know that there are going to be key policy legislative and institutional issues that need to be resolved; that we have to develop the structure for Master Plan implementation. We must focus federal involvement and plan implementation, including process modification to speed up the process.

We need effective mechanisms for land-use regulation. Building levees does not mean that everyone behind the levee is safe nor does it mean that you can build up to a levee. There will continue to be unsafe areas. We must develop fair, equitable and expedient methods for acquiring surface land rights for project implementation and we must establish a strategy for preserving and managing our coastal forest.

We expect the total Master Plan cost will be in excess of 50 billion. The typical cost share would require that the state match be at least 20 billion, and

existing state funding sources total approximately 150 to 200 million a year. The OCS revenue-sharing estimates would increase this by about 20 million a year until 2017, then by approximately 400 to 600 million a year every year thereafter. Existing and projected state funding sources can be utilized as matched for authorized federal funds. However, we know that additional funding sources will be needed.

So what this means, that we're going to be challenged to maximize and leverage existing funding sources, and that's being looked at now, to seek additional funding sources, and to prioritize appropriately.

Part of that prioritization process is identifying urgent early action. Those are measures that reduce key uncertainties for future plan implementation. It includes operational modification for existing projects that may deliver rapid improvements, measures that deliver the highest priority outcomes. That's hurricane protection for the highest asset, highest risk areas, landscape features that sustain or restore hydrologic regime, measures that restore natural processes to an area of high projected land loss, and measures that sustain or improve processes that are critical to the socioeconomic

viability of an existing community.

So sequencing these early urgent actions needs to recognize that some objectives can be achieved quickly and in a balanced manner; that there are objectives that interact with one another. In some cases, there's a measure that needs to be implemented before another measure in order for that next measure to be successful, and that the actual time scales are dependent on resource availability. And a large part of that resource availability is funding as well as manpower. So how do we begin?

I'm going to turn the program over to Andrew Beall, and he will talk about the State Plan, which is our first step to implementing the Master Plan.

Andrew?

MR. BEALL:

Thank you, Michele. As Michele indicated, what I would like to talk to you about next is the Fiscal Year 2008 Annual Plan.

Every year we go to the coastal zone, throughout the coastal zone, and describe the activities that are required by the two implementing agencies for protection and restoration, DNR and DOTD, as to how they're going to expend, make expenditures from the trust fund. We have that issue and we're going to talk

to you briefly about this year -- that this year. But in addition to this year, we also have the priority outcomes from the Master Plan that Michele was talking to you about briefly. This is a short presentation I have to give.

You have in your handout packet the -- the Annual Plan in its entirety, but it's the entire draft itself. It has much more information in there than I could hope to go over in -- in this amount of time.

Specifically, the urgent early outcomes, as Michele talked to you through this prioritization process, we took all the measures in the Master Plan and tried to identify those synergies that exist and what outcomes they can reach on a -- on a completed manner. In those categories we found are things that need to be done with large-scale planning. This is for the Mississippi River Delta Management, that big diversion at the end of the river that Michele was talking about, and also the completion of the Chenier plain and water and sediment resource allocation.

There are coastwide programmatic measures that have to be taken. This is a very large program that needs to be accomplished in a complete manner. So we need to make sure we ramp this program up in a responsible manner and get to construction as quickly as

possible on as many measures, as critical measures as we can. This also focused research and monitoring and -- and developing through the LCA Program, Beneficial Use Program.

There are nonstructural and evacuation planning that have to -- that have to happen quickly. Hurricane protection, early working to concentrate on the highest assets in the highest risk areas, specifically, the closure of the MRGO and ecosystem restoration, restoration of the critical land forms, land bridges, marsh creation barrier shoreline in the Chenier plain and in the Delta plain, operation and sizing diversions. The Mississippi and Atchafalaya River water are the greatest resources this state has for restoring the coast. We have to make sure that we use that in a balanced and equitable manner. And, finally, watershed management in those areas Michele was talking about in blue. We need to make sure that water is moving to the benefit of restoration and not affecting people.

The -- the -- the Master Plan has not been finalized yet. We're still in a draft plan. It needs to go to the Legislature for its approval. So for the funding request by both agencies, they had to not only provide opportunities to support the elements of the

Master Plan, but as well carrying forward with the existing activities. So what we tried to do is look at that 50 million dollars, in excess of 50 million dollars that we know it's going to cost to implement the -- the measures of the Master Plan and see how we can get to construction as quickly as possible as many of these activities. And this just gives you a brief, three-year synopsis how we think we can do that through those outcomes.

And if you look very, very quickly at the bottom, for the fiscal year, this upcoming fiscal year, it's going to take the 126 million dollars, and that very quickly ramps up to 575 million dollars in 2 -- 2010. And that's getting to construction on those critical measures as quickly as we can.

Real quickly, I wanted to talk to you about some -- some -- some of the project specifics that are in those numbers. For engineering design on -- on projects, we have for ecosystem restoration, again, the closure of MRGO. The CIAP Program is -- is moving forward. And Greg's going to talk to you a little bit more briefly about that. The LCA Program is -- is moving forward with a lot of engineering and design activities, construction as well as the CWPPRA and, finally, the Bayou Lafourche reintroduction.

For hurricane protection, the metro New Orleans and north shore of Lake Pontchartrain. Like Michele mentioned, Morganza to the Gulf is completing E&D as well as Donaldsonville to the Gulf.

For construction activities in this upcoming fiscal year, the CIAP Program and the CWPPRA Program are moving forward very aggressively for ecosystem restoration; for hurricane protection, Grand Isle, Westbank of New Orleans, and, again, Morganza-Gulf, as Michele mentioned to you.

Operations and maintenance, there are already things that are built out there in the state, and we have to make sure we maintain them and they function in a good manner for -- for ecosystem restoration. Again, this is relying heavily on the CWPPRA Program, Caernarvon and Davis Pond diversions. They're state-only projects that have been built over the years, and these need to have maintenance as well as the Barrier Islands and Hurricane Protection Levee Inspection Program.

Finally, the last two elements of this, the first year, science and technology, we need to make sure we're investing in decisions into the future for future D&D on activities that aren't in the first two, three years. We need to make sure that we can improve the

technology and improve the science behind those construction activities so we're getting the best effective projects on the ground. And in state-only programs, these are things that prepare both agencies for emergency response, beneficial use of dredge material in a small dredge program, and as well as public outreach activities that need to go on.

With that, I'd like to turn it over to Greg, who's going to talk to you in more detail about the Coastal Impact Assistance Plan.

MR. GRANDY:

Good evening. Before I get into the Coastal Impact Assistance Plan, I'd like to recognize the folks with the parishes who worked extremely hard with us in putting together the parish portions of the Louisiana Coastal Impact Assistance Plan.

In Vermilion Parish, Mr. Clay Maynard; in St. Martin Parish, Parish President Guy Cormier; in Iberia Parish, Mr. Jim Anderson; in St. Mary Parish, Mr. Bo LaGrange; in Cameron Parish, Ms. Tina Horn; and in Calcasieu Parish, Ms. Pam Mattingly. Those were the local folks. There were 19 coastal parishes. And I won't go through all the ones in the east, just the ones that are local to this area.

The Coastal Impact Assistance Plan is part

of the Energy Policy Act that President Bush signed in August of 2005. The funds that are coming to Louisiana and the five other states through this program aren't a result of the hurricanes. This was money that was dedicated to Louisiana and other coastal states to help deal with problems associated with offshore continental shelf production and with wetland loss in the five states.

Louisiana and our coastal parishes will receive an estimated 523 million dollars over the next four years. The state will receive 65 percent and the 19 coastal parishes will receive 35 percent of those funds.

There were five authorized uses in the Act. The first three mainly deal with conservation, restoration, and protection of coastal areas. The fourth and the fifth deal with planning assistance and administrative cost of complying with the CIAP legislation, and the fifth one deals with mitigation of impacts of OCS, Offshore Continental Shelf, activities through funding of onshore infrastructure projects and public service needs. The fourth and fifth items are capped for a total of 23 percent for either the state or the parish for the total four years and for each individual fiscal year.

The funding requirements, each state must submit a Coastal Impact Assistance Plan. And this -- we've got the Draft Plan, is what we're presenting tonight. The plan must include how the state will spend their 65 percent and how each of the parishes will spend their portion of the 35 percent.

The projects included in the plan are the state, the parish plans, and also projects that the state and the parish are going to cost-share. The plan that we've developed for Louisiana is for all four years of funding. We will have the opportunity to revise this annually or as needed.

The plan development, actions to date, we established the guidelines early last year, in early 2006. The objectives and the ranking criteria, we held five public meetings. I believe February 17th we met at the Louisiana Cooperative Extension in Abbeville last year to describe the CIAP Program to the public. We also met with all 19 parishes. We briefed the federal agencies, state agencies, the Coastal Protection Restoration Authority, the Governor's Coastal Advisory Commission, and anybody else Dave Fruge and I could find that would sit still long enough to listen to the CIAP presentation.

We worked with all 19 coastal parishes on

putting their proposals together. We solicited proposals. The due date for that was May 22nd of last year. We placed all of the proposals, 337, on the DNR website, and they're still there today. We discussed those at two regional open-house meetings in June, one in Lafayette and one in Baton Rouge, to get the public's comment on those so that we could take the comments into consideration.

We evaluated the proposals and selected projects for CIAP funding for the state and then communicated that back to the parish so that they could revise their list for the CIAP Plan.

We ensured that the CIAP projects were consistent with the Draft Coastal Master Plan that was being developed at that time and is being presented today.

The two goals that we'd have for the state were to implement support and accelerate coastal restoration in the state, divisions that were articulated in the Coast 2050 Plan, the LCA plan and other collaborative restoration planning efforts. We didn't want to go out and reinvent the wheel and figure out what the problems were or what the strategies needed to be to address those problems. We accepted the identification of the problems and identification of

those strategies in Coast 2050, and we moved right to the next stage by identifying projects that would help implement those strategies.

Particularly after the storms, after Katrina and Rita, we realized the connection between coastal restoration and coastal protection. We wanted the projects to help reduce coastal flooding impacts, projects that work in synergy with other restoration and protection projects, and projects, some of which can be implemented in the near term.

The second goal was to implement support and accelerate coastal infrastructure projects that mitigate onshore OCS or offshore continental shelf-related impacts, especially those that directly benefit OCS oil and gas exploration and production and those that work in synergy with restoration and protection projects and that can be implemented in the near term.

The evaluation process on May 22nd of last year, DNR received 337 proposals for CIAP funding. Two hundred and fifty-three of those proposals involved funding from the state share. Eighty-four involved funding from the parishes' share of CIAP funds. And including overlap, there was approximately 3.8 billion dollars of state funds that were requested. That's 10 dollars for every dollar that we have to spend on CIAP.

So there was a tremendous amount of competition for the funds that were requested from the state. So how do we go through that process?

The Department of Natural Resources, we had some external science advisors. We worked with the CPR Planning Team, representatives to evaluate proposals.

First, we reviewed proposals to make sure that they met the five uses listed in the law. If they didn't meet one of those five uses, they went off to the side and the others went on and continued the review process.

DNR went through a review process. We recommended a list for projects to a project selection committee. That committee selected the Draft Project List that we'll present to you today. We released the Draft Plan on February 6th at the Coastal Protection and Restoration Authority meeting in Baton Rouge, and we're here at one of the public hearings tonight. DNR will prepare a final plan. We'll submit that to the CPRA Authority for their approval and then submit that to the Minerals Management Service for their approval as is required by the law.

The -- as we went through the selection process, we had a team of external review of 66 of the proposals as we continued through the review process.

We ended up with 66. And those were reviewed by an external science team led by Dr. Robert Twilley at LSU.

After that review, there was a DNR technical review in-house that looked at the science review, that looked at other information that we had in-house on projects, and we -- we recommended the preliminary list of projects for funding to the CIAP Selection Committee. The selection committee was composed of members from the Governor's Office of Coastal Affairs, DNR, the Department of Environmental Quality, the Department of Wildlife and Fisheries, Department of Agriculture and Forestry, and DOTD. That selection meeting also included DNR staff, members of the CPRA Integrated Planning Team, and Dr. Robert Twilley to communicate the results of the external science review. This committee selected the final projects that are in the list tonight. I'll go through a review briefly of the projects that are in the plan.

As we sort of looked at all the projects, there are 18 projects that the state is recommending funding for, and that comprises 80 percent of the state's funds, which is 272 million dollars. In addition, seven parishes are putting up 37 million dollars of their own money to cost-share on some of these 18 projects. They're also five infrastructure

projects, which is approximately 20 percent or 68 million dollars of the state's CIAP fund. In addition, parishes are putting up 16 million dollars of cost share of their own money for those five infrastructure projects. We'll take a look at the restoration projects first and the infrastructure projects second. We grouped these under headings, and we'll go ahead and move through the five or six different headings.

The first one is Enhanced Management of the Mississippi River Water, Nutrients and Sediment. The first project, the Violet Diversion Project in St. Bernard Parish, this is a 5,000 CFS diversion that will benefit the central wetlands in St. Bernard Parish.

The second project, the Mississippi River Long Distance Sediment Pipeline, this is a pipeline project that would go from the Mississippi River to approximately Bayou DuPont to Myrtle Grove area. It would build a long distance pipeline across Plaquemines, across Jefferson and into Lafourche Parish. It would be able to do marsh creation on a long distance scale. And we would also do some marsh creation as part of that project.

The third project, the Blind River Siphon, is in St. James Parish. This would take water from the Mississippi River, siphon it into the Blind River. And

eventually that water and the nutrients would go into the upper end of the Maurepas Swamp Basin.

The fourth project, the Bayou Lamoque Flood Gate Removal, this is a floodgate that was built on the lower Mississippi River in Plaquemines Parish in the 1950s. It's about a 12,000 CFS project. This flood gate has not been operated for -- for purposes it was designed for about the last 30 years. We want to go in, either remove the flood gates or rehabilitate the flood gates, dredge the channel out, put some gaps in the levees, and let this -- let this 12,000 CFS diversion start to flow again.

The last project on here, the Delta Management Strategic Planning Effort, is an initiative to further the use of the lower Mississippi River to maximize the environmental benefits, economic benefits of the lower Mississippi River.

The next two are barrier shoreline restoration and protection projects, the East Grand Terre Island Restoration Project. This is a project that was designed, engineered permits and land rights were received through the CWPPRA program. It just doesn't have construction funding. It's ready to go. It's ready to be built. We want to put money into this and go build it as soon as possible.

The next project, the Rockefeller Refuge Shoreline Demo, again, this is another project that CWPPRA did the design for, they've got the land rights for, they've got the permits for. It just needs money to build. We're going to put money in to build this project in the very near term.

The protection and restoration of critical land bridges, they're two projects: The first one, The Orleans Land Bridge and Shoreline Protection and Marsh Creation. Along the northern rim of Lake Borgne, there are high shoreline erosion rates along here. From Alligator Point all the way to Bayou Bienvenue, the shoreline protection and approximately 200 acres of marsh creation in the Golden Triangle area in the bottom left-hand corner of this slide. Orleans Parish is putting up all 15 million dollars of their parish funds to assist the state in building this project.

The Barataria Land Bridge Dedicated Dredging Project is a 18 million dollars. This is a marsh creation project in Jefferson Parish. It's part of the Barataria Land Bridge Protection Project. There have been a number of projects along there. CWPPRA is putting up approximately 40 percent of the funds to build marsh creation in this area. CIAP will put up the additional 60 percent to build this project.

There are four interior shoreline projects, kind of two categories here. The first two are federally -- are federal navigation channels: The Fresh Water Bayou Shoreline Protection Project in Vermilion Parish. This is along the fresh-water bayou to do shoreline protection, primarily on the west side, but a little bit on the east side as well to prevent breaches from -- to allow water from fresh-water bayou to move into the fresh-water marshes of the Mermentau Basin.

The second one, GIWW critical areas of Terrebonne Parish, this is part of the CWPPRA project that is designed, it's permitted, it has land rights, and it's ready to be built. We will take four critical areas along the Intracoastal Waterway in Terrebonne Parish where there are currently breaches in the Intracoastal Waterway. There's some very fragile flow top marshes behind those breaches, and the erosion rate is pretty high back in there right now.

The third project in here, and the third and fourth are sort of interior lake and shoreline protection projects. The Grand Lake Shoreline Protection Project, again, this is another CWPPRA project that has been designed, it has permits, it has land rights. It's more or less ready to go. The CIAP Program is going to build 80 percent of this project.

At the CWPPRA Task Force meeting last week, the task force voted that they would authorize construction of the other 20 percent of this project and pick up the long-term operation and maintenance of the entire reach. So we were very excited about that.

The fourth project along here, the Lake Salvador and Shoreline Protection Project, this is the third and final phase in St. Charles Parish of shoreline protection along the western end of Lake Salvador. And the parish is cost-sharing with us on this project. And I might note that on the Fresh-Water Bayou Shoreline Protection, Vermilion Parish is cost-sharing with the state on that project as well.

Two more projects: Marsh Creation with Dredge Material, Beneficial Use of Dredge Sediment for Federal Navigation Channel Maintenance, this is when the Corps of Engineer dredges the federal channel. We want to make sure that those sediments, those resources that are the state of Louisiana's resources get used to help rebuild and protect our marshes. So the state's putting up 20 million dollars.

We think we have three fantastic opportunities in the very near term along the Calcasieu Ship Channel to do some significant work through this program. And we're looking for other opportunities

throughout the state to do -- to do beneficial benefit use of dredge material.

The next one, Fringe Marsh Repair, dedicated dredging in lower Plaquemines Parish, Plaquemines Parish is putting up the majority of funds for this and the state is cost-sharing a little bit to rebuild the marshes that were torn up along the toe of some of the levees. These marshes protect the toe of the levee from erosion, and the parish wants to go back in and rebuild some of those marshes that were destroyed in the hurricanes.

The next is the Coastal Forest Conservation Initiative. This is to acquire conservation easements from willing land -- willing land sellers on coastal forests. And this includes Cypress Tupelo Swamp, other bottom land hardwood forest as well as maritime forest chenieres that -- that you might find in Cameron or in the Caminada-Fourchon area.

In addition, some of these funds can be used for restoration projects, to improve the hydrology in some of these coastal forest areas or for vegetative planting.

In addition, where possible, if a coastal forest can be acquired so that a wetland assimilation project could be built next to it so that secondarily

treated water from wetland, from sewerage treatment sites could be used, that resource of fresh water or nutrients could be used to improve the health of some of these coastal forests.

Then the last two restoration projects, the first one is the Central Wetlands Assimilation Project. This is in Orleans and St. Bernard Parish where they have sewerage treatment plants where right -- currently, the water from those sewerage treatment plants is treated. It goes through four treatment systems and goes back into the Mississippi River. What -- what the plan is, is to take that water, have it go through secondary treatment, and then the water and nutrients would go into Bayou Bienvenue and central wetlands area and the water would help freshen up some of those areas where saltwater has intruded in some of those areas from the MRGO and from the Lake Borgne areas over the years.

The last area is Performance Evaluation and Science Monitoring. We want to evaluate these projects as we build them and in the short-term after we build them to see if they're meeting the biological and engineering standards that we designed them to. We want to do that so we can learn from these. Hope we get even better as we build more projects.

The last five projects on the list are

onshore infrastructure projects that mitigate OCS impacts. The first project is the Agency Lock, which is part of the Morganza to the Gulf system over in Terrebonne and Lafourche Parish. The second project is the LA 1 Improvement. This is that part of the LA 1 system from Fourchon to Leeville. Currently at Leeville they're rebuilding the Leeville Bridge. This -- this phase of work will pick from the Leeville Bridge up and go all the way down to Fourchon.

The last three projects are basically road improvement projects where OCS activity from trucks have damaged those roads. The first ones, Acadiana Airport Road in Iberia Parish; the second one, Morgan City Industrial Road in St. Mary Parish; and then the third one, Trosclair Road in Cameron Parish. I'll briefly go through some of the project synergies.

This one project sort of in the middle, kind of the little V, Chevron in the middle, that's the East Grand Terre Project that we talked about. And you can see a number of the other projects: The ones in red that are CWPPRA projects and the ones in sort of the gold colors that are some LCA projects. One of the red projects (Inaudible) was constructed -- we finished construction on -- on it in January of this year.

We have two other projects, (Inaudible) to

Grand Bayou Pass in red and the Pelican Island Project in red that we hope to put out to bid later this year.

In addition, the other projects in gold, the -- the Caminada headland and the Shell Island, Department of Natural Resources and the Corps of Engineers hopes to have the feasibility study complete on that this year so we can submit it to WRDA next year for funding. And you can start to see that this whole area will eventually get protection measures, and hopefully the whole will be greater than the sum of the parts when they're all built within the system.

We've seen a similar sort of reaction system-wide when we did work on a number of the Isle Dernier projects, East Whiskey and Trinity Island. They all performed better than we expected when they were built together.

Other projects that have this sort of synergy, Freshwater Bayou Project I talked about earlier and Vermilion Parish has a project in the Schooner Bayou area in addition to other CIAP and CWPPRA projects in the area. The Maurepas Swamp has these synergies, Orleans Land Bridge and Central Wetlands, and the Barataria Land Bridge as well.

Early action projects, Secretary Angelle directed us that when we submit the plan to the Minerals

Management Service in May that we need to get started on a select group of these projects with state funding, that we're not going to wait to start all the projects until the grants come back to us from the Minerals Management Service. We're going to use some of the state funding that's available to us. So these are seven of the projects that we're looking at.

The first three are construction: East Grand Terre Island, Barataria Land Bridge Dedicated Dredging, and the Grand Lake Shoreline Protection, the Coastal Forest Initiative and the Land Acquisition. And then the last three are engineering and design, the Violet Diversion, the Mississippi River Sediment Delivery Pipeline, and the Bayou Lamoque Diversion.

Now, based on comments we received earlier this week at meetings in Houma, Lake Charles and New Orleans last night, we're looking at potential of maybe adding two more projects to this list. One is the Freshwater Bayou Shoreline Protection Project and the other is the Orleans Parish Shoreline Protection and Marsh Creation Project.

Just very briefly, projects to be supported with parish and CIAP funds, 86 percent of the money is -- is dedicated to projects and restoration and conservation and 14 percent for the infrastructure,

public service or planning administration of the projects.

And just a quick look, some of the projects, barrier shoreline protection, interior shoreline protection, marsh creation, vegetative plantings, and, of course, the OCS-related roadwork that I referred to earlier.

And actually the -- we have one of the handouts that was on the table out front. It's the draft, Louisiana Coastal Impact Assistance Plan, Executive Summary. This has a list in the back of all the state projects and all the parish projects. So if you want to look at what Vermilion or Cameron or Calcasieu or Iberia has, you can take a look at this later on. If you want to see the full plan, the full CIAP plan is about 400 pages, which is why we didn't make a copy for everyone tonight. But you're more than welcome to see it. On page 10, it has where you can access it via the website. If you have problems accessing it via the website, you can call me or you can e-mail me, you can see me after the meeting, and we'll get you a copy of it.

The timeline we're working on with the CIAP Plan, we released the Draft Plan, as I said earlier, February the 6th. We've had public hearings this week

in Houma, Lake Charles, New Orleans, and tonight in Abbeville. We've already briefed the CPRA and the select Legislative committee on coastal areas. We hope to brief the Governor's Coastal Commission next month. The deadline for comments on CIAP and the other plans tonight is April the 2nd, Monday, April the 2nd. Once we receive those comments, we'll work to resolve those. We hope to submit the final CIAP plan to the Minerals Management Service May the 1st, and we hope 90 days later we'll receive approval from the Minerals Management Service in late August of this year.

This is the website. It's listed on page 10. If you don't have a copy of this and if you can't remember that website, you can Google "Louisiana CIAP," and that will bring you right to it.

And with that, I'll turn it back over to Michele.

MS. DESHOTELS:

Thank you, Greg.

So what's next? Well, this is our current schedule. As Greg told you, we are out this week from coast to coast, talking to people. And in conjunction with Greg's presentation on the CIAP Program, the Master Plan is also presented to the select committees on coastal restoration and protection and also to CPRA. We

also have made arrangements to meet with Cameron Parish next week, I believe. Arrangements, we're going to be meeting with Plaquemines Parish. So we're out there showing the plan off and listening to what people have to say. And that's because this is the comment period. And we are taking comments this evening. We will also take your comments by e-mail. We'll take your comments by mail mail. There's a comment form on the desk outside that has our mailing address on it as well as our e-mail address. All that we ask is that all comments be provided to us by April the 2nd. And the sooner, the better. We prefer it sooner. But you have until April the 2nd. And we'll promise that we'll take a look at it and consider it in this process. But we're on a very tight time schedule.

We hope to present to the CPRA the final draft of the Master Plan, the final Master Plan in the middle of April, April the 12th -- excuse me -- and then to submit to the Legislature for the end of that month. Again, the close of the comment period is April the 2nd.

And with that, we will start taking comments this evening. Representative Mike Frith has already provided us with his written comments. So I thank you very much for that, Representative Mickey Frith.

Our first, my first, card I have this

evening is for Charles Broussard. Would you please come to the mike and state your name for the record? We are transcribing the statements this evening.

MR. BROUSSARD:

I'm Charles Broussard, a member of the Vermilion Parish Coastal Advisory Committee.

The first presentation which you made, ma'am, you almost sounded like you were part of our committee. Basically, we've been saying this, what you've covered, for several years. I will address a different area, and that's the economy of Vermilion Parish.

I saw the second speaker protected the eastern part of the state with some of the projects, which helped him recover their economy. Vermilion Parish was part of the Mermentau Basin. And the Intracoastal Canal was dug in 1929, which gave us protection against saltwater intrusion in 1932. It's created by an Act of Congress, who created the Mermentau Basin, building Calcasieu locks, Vermilion locks, Catfish Point's structure, and Schooner Bayou structure. That protected us, because the Intracoastal Canal had a levee on it and North Prong had a levee on it. And about 12 years ago, and we've been talking to the DNR and the Corps of Engineers for 12 years about this

problem. Because of Rita, it's -- it's literally washed away now.

But in the last eight years, the Corps of Engineers has the records, we've had salt rot water intrusion six times in the last eight years. In 1999, we couldn't plant 40 percent of our rice crop. Also affected because of saltwater intrusion, cattle industry. Vermilion Parish also leads in the cattle industry and the crawfish farming in the state of Louisiana. Saltwater affects all three of those industries. We couldn't flush our pastures because the water was salty, because that levee from Leland Bowman Canal to 7th Ward Canal eventually disappeared. There's very little left. And the same thing with North Prong. North Prong now is completely circumvented. Tugboats can go in and out of the Mermentau Basin without even going through the structures because of the washout they had, so enormous washout in that area. And economists will tell you, agriculture turns over, dollar turns over seven times in a community. So can you imagine the loss that Vermilion Parish experienced because of those two levees that we've lost? And the -- the Corps of Engineers have addressed it. They came in and put a little patch in one area and put rock in that area, but that wasn't enough because it's further deteriorated.

And from Leland Bowman Locks to the 7th Ward Canal, also, that levee has to be rebuilt in order to protect it. Of course, we get a southeast wind, the water goes right around Leland Bowman Locks. So why have the locks? They spent hundreds of millions of dollars to build those structures, and yet they're not serving the purpose as intended because of these two problems I'm addressing.

Another thing, the levee you said would be along the Intracoastal Canal, that's great. But you need some protection for the Mermentau Basin.

Louisiana leads the nation, in the continental United States in number one tonnage of fish harvested. At Intracoastal City and Vermilion Parish leads the state with the highest tonnage of fish, seafood harvested. When you lose that wetlands, you lose the fish industry. I'm sure you're aware of that. The reason why Louisiana has a fish industry it has is because of the wetlands we have, like the Mermentau Basin. Other states don't have that. That's why they don't have the fish industry we have. All of this impacts the economy of Vermilion Parish. So please give consideration to do something about that on a short-term basis, which you would be doing precisely what you're doing on the east end of the state. We need this done

now.

Several of the rice farmers in Vermilion Parish will not even be able to borrow the money from the banks because the bank knows that they do not have protection against saltwater intrusion to plant their crops, and if we're getting close to planting season. Next month's planting season. But who's going to loan you money to plant with no protection against saltwater intrusion? So, ma'am, please take this into consideration, that something has to be done now, not far down the road. And we like -- as I said, I'm sure the committee likes everything that you said on the long-term, but this is something that needs to be done now for the economy of Vermilion Parish.

Thank you.

MS. DESHOTELS:

Thank you, sir.

MR. BROUSSARD:

By the way, there's a picture that was in day-before-yesterday's newspaper about Schooner Bayou and the story along with it, and I'd like to submit it as part of the comments for this hearing.

MS. DESHOTELS:

Thank you, sir.

MR. BROUSSARD:

The structure's been there for years, but it's not serving any purpose because the workers are there. The investments there. But it's circumvented by the washout. So we need something done now, not later.

Thank you.

MS. DESHOTELS:

Thank you, sir.

Alfred Broussard? Good evening.

MR. BROUSSARD:

I'm ain't too good of a speaker.

MS. DESHOTELS:

Would you come to the mike, please, sir?

MR. BROUSSARD:

I'm not too good of a speaker. But I'm from Pecan Island. I wound up having to move to Kaplan because Pecan Island is almost not livable anymore. And things has to be done. So that it will finally get to Kaplan if -- if things ain't done. Water will be all the way to Kaplan and in Abbeville. Where I lived, we have some -- some levees around the area. And, right now, this is how long after the storm I still have water on my property, which was high land. And the levees that was put around, I'm sure, was probably helped out with federal dollars, but no drainage was put in those levees. And I don't know if it was required to have

them, but I think it was required to have them. So that's my comment. And -- and Freshwater Bayou itself, I was -- I worked on that, on that project when -- when they dug that. I was a surveyor's helper. And they had large levees on both sides of the bayou, which protect Pecan Island, Forked Island. There's no levees there no more. They got -- they put a few rocks. But if you have a high tide, water runs through the rocks and washes through the marshes. So you don't have no protection there. So I think -- I think if they -- if the Corps would build the levees and maintain what they done, we wouldn't have the problem that we have now.

Thank you.

MS. DESHOTELS:

Thank you, sir.

Ross Hebert?

MR. HEBERT:

My name is Ross Hebert. I'm the president of Vermilion Rice Growers. And I'd like to add a few comments to what Mr. Charles said.

At one time Vermilion was the largest rice-producing parish in the state, over a 100,000 acres, and last year, in '05, with Rita, with the saltwater intrusion, Vermilion had only 33,000 acres of rice, the lowest amount in -- since the 1900s, when they started

producing rice.

All the comments Mr. Charles made about the saltwater intrusion, we're losing farmers and guys can't really plant because they don't know if they're going to have fresh water to supply a crop, crops with, and also with the cattle, crawfish industry. So we'd like to expedite these projects as fast as we can to ensure that the fresh-water supplies that we used to have can stay here.

Thank you.

MS. DESHOTELS:

Thank you, sir.

Donald Sagrera?

MR. SAGRERA:

My name's Donald Sagrera with (Inaudible) District Number 2 in Vermilion Parish. And I'm glad that we had these speakers that spoke before me because they're speaking on the same topic that I am.

We have a lot of volunteers in Vermilion Parish that have served on the committees. And I know that they have attended numerous meetings since Hurricane Rita. I made a few of them, but not a fraction of the meetings that the committees, our coastal restoration committees and those volunteers made to put together the plan that you presented tonight.

And our drainage district depends very much on the carrying out of this plan, because we're not only involved in drainage, but also for assuring that the farmers within our district have a good salt, good fresh water to pump on their rice crops.

One of the -- one of the things that we have done, and we have spoken with many of the elected officials in our parish and at the state level and at the federal level, and many of them are here tonight, and all of them that are here have supported and they all want to have this Mermentau Basin shored up so it can be a dependable supply of fresh water again. Our drainage board has adopted a resolution in support of all of their efforts, and we hope that they continue with these efforts to get it shored up as quickly as possible.

I have some photographs. Mr. Charles submitted one a while ago that was in the paper. And I have some papers, some photographs of the actual cuts. I drove my boat through two of them at the Schooner Bayou Bypass. The Corps has these photographs and I have contacted them. And at least these, these cuts, they feel that it's their responsibility and they intend to get them done. However, the funding could be a problem. And we're asking everyone, all of the agencies

here, to work with them in getting these cuts closed up as soon as possible. We have not had rain for a month or so. It hasn't been enough for runoff. If this continues for another month, we're going to start getting enough saltwater in the bay to be harmful for rice production. This water's going to come right through these cuts into the Mermentau Basin. So we'd like to put this in the record as something that our drainage district would like done.

MS. DESHOTELS:

Thank you, sir.

Loland Broussard?

MR. BROUSSARD:

My name's Loland Broussard. I'm a landowner here in Vermilion Parish. I'm also an employee with NRCS.

Comments I'd like to make is on behalf of the CWPPRA Program. I've seen where a lot of the projects, or I should say some of the projects so far that have been mentioned that's been included in the CIAP Plan are projects which are -- what we refer to as Phase II Approval. The engineering design, land rights, permits, everything has been provided on these projects, except for construction funding. The projects I've heard tonight, there are still several, 11 and 12,

projects that are on this Phase II list, CWPPRA. They are not included in the CIAP Plan. Which I would encourage those committee members or selection committee members to take a close look at.

On several of the slides I've seen so far in the presentations, they emphasize near-term -- near-term implementation. I cannot think of any other coastal, restoration-type projects that would be as near term as these several CWPPRA projects. They're already Phase II Approval. Some of those projects impact not only southeast Louisiana, but also southwest Louisiana. So they're pretty much spread across the state.

Another point I'd like to bring out is, I've not seen on CWPPRA or state plan, and I haven't read both plans in detail, but I'd like to emphasize the importance of maintenance of the projects that are built.

In the early 1990s, when we began coastal restoration in this part of the state with state-only projects, one particular is the Pecan Island Diversion Project, was built with state-only funds. But, again, that project was not and the law did not state that O&M funds would be available for those state-only projects.

I see where several of the state projects that were built under that state-only program have

basically fallen by the wayside because of the lack of maintenance. So I would highly encourage both in the CIAP Plan and the State Master Plan that some maintenance of these projects concerned. It's great to build these projects, but as we all know in coastal Louisiana, there's so many variables that you just can't build a project that will be a 100 percent effective a 100 percent of the time. And without maintenance, some of these projects could again really go by the wayside. And I think it's critical that both these programs identify perhaps or set aside some funding source for the maintenance of these projects.

Thank you.

MS. DESHOTELS:

Thank you, sir.

Roger Simon? Roger Simon, or Simon? Simon?

Ernest Girouard?

MR. GIROUARD:

First of all, I'm a retired farmer because of Hurricane Rita. After 39 years and salt inundation on the land that I farm, I could not farm last year and I probably won't farm this next year. Therefore, I'm retired and I'm a full-time employee with LSU. I'm also chairman of the Vermilion Soil and Water Conservation District.

I want to hit on one of the most important things that has been neglected all these years: Maintenance. Don't build anything unless you can maintain it. I submit to you, and I have photographs of all the damage in the Vermilion Mermentau, Grand Teche-Mermentau Basin, the damage from the hurricane. I also submit to you that the projects that you are planning to do are worthless unless you go in and protect the basin first and take care of the basin. Maintenance, maintenance, maintenance.

MS. DESHOTELS:

Thank you, sir.

Elemore Morgan, Jr.?

MR. MORGAN:

I'll just pass.

MS. DESHOTELS:

Tim Creswell?

MR. CRESWELL:

My name's Tim Creswell. I'm vice president of the Abbeville Harbor and Terminal District.

First of all, I'd like to thank you and the rest of the committee for all the long hours you've put in manufacturing this document. I see in the draft that you are supporting the Ag-Mack Channel, which is good. And I see the three items which weren't in there before:

The rock barrier along the coast, the elevation of 82, and the levee on the GIWW. Give us three barriers of protection and hopefully give some protection for the Mermentau Basin.

Like the other speakers, I want to emphasize that we need to do something at Schooner Bayou, that structure now. We can't wait on that.

I just have two questions. And, number one, you're probably not going to be able to answer this one. But once you submit this document to the Legislature and the Legislature approves it and you get with the Corps, how is this document going to mesh with the Corps' LACPR? Does anybody know that or are we optimistic that it's going to mesh?

MS. DESHOTELS:

We're always optimistic, sir.

MR. CRESWELL:

I used to be, also, yeah, but I'm a realist now. I beat my head against that stone wall for six years on the Ag-Mack channel. The only thing that got it done was -- was Rita, unfortunately.

My second question is -- is for O'Neal Malborough. I understand he just got back from Washington today, and he can give us an update on Ag-Mack.

MR. MALBOROUGH:

Well, Tim, as I mentioned before, you were there today, yesterday, and Tuesday, Wednesday, and Thursday, met with our delegation, all three of our congressional delegation folks, and all of them are committed to the Ag-Mack. The good news is that we're hearing that it will be (Inaudible) sometime before the summer. Everybody is confident that that's going to happen. And we were -- we received what we think is a positive report on the solicitation for the million and a half dollars, money for the Corps to begin the engineering the project.

Just so you'll know, the Corps has right now 800 million -- 800 thousand dollars to begin the engineering on Ag-Mack, and they're actually beginning the engineering on the project. We were soliciting for them to get another million and a half, which would give them half of the money they need for this year. And we received what we think is favorable comments to do that. Unfortunately, the president put any money in the budget, Ag-Mack. So our delegation is going to have to carry that money into the process.

The state, our delegation of the state, Mr. Frith here, last year, they approved four and a half million dollars for the Ag-Mack project. So the state

is way out front beginning engineering on that portion they're going to do. So the project, even though it's not authorized, is moving forward in the engineering phase. And, hopefully, that authorization is received. And the language that you-all convinced the delegation to put in, what they're talking about, that we were guaranteed again that that's going to be in there, it was in there last year. And Senator Vitter sits on a committee and says that it will be in that language again. So everything was positive. We have to wait for the meeting. (Inaudible).

MR. CRESWELL:

That's as far as we've been in six years.

Once again, Michele, thank you-all for all the work you've done.

MS. DESHOTELS:

Thank you.

You-all will notice that there's one person here that I didn't have to ask to come up to the mike in order for the transcriber to hear him.

In my hand, I have a joint card. I'm going to ask Senator Nick Gautreaux and Representative Don Trahan to the mike, please.

MR. TRAHAN:

I'm Don Trahan. I represent District 31,

which is part in Vermilion and part in Lafayette. The Vermilion part, basically, it's a straight line between the communities of LeBlanc in this part of the parish. I'm going to fuss at you a little bit because I worked very hard in the Legislature to get those people outside of Acadiana to pronounce my name correctly. It is Trahan, not Trahan or Trahan.

MS. DESHOTELS:

You'll have to forgive me, sir, because I've been too long away from home.

MR. TRAHAN:

That's okay. I do that respectfully.

Just to make a couple of comments, my district is 82 percent in Lafayette and 18 in Vermilion, and I want to echo what Mr. Charles Broussard said and what Mr. Sagrera just told me puts me in a position in some of these issues about who gets protected first, Vermilion or Lafayette. But I have a hard time convincing my constituency in Lafayette, is that -- and this has been a -- a bone of mine before even the hurricanes, is that Lafayette sometimes thinks what's good for Lafayette is good for Acadiana. Lafayette needs to believe that what's good for Acadiana is good for Lafayette, which it's never been clearer than tonight, as saltwater intrusion, whatever the causes to

the decline in agriculture, from commerce is a detriment to Lafayette. It's a detriment to the state of Louisiana, and not only Vermilion Parish. I think Charles said that economic dollar rolls over seven times. Well, three of those rolls are in Lafayette from Vermilion Parish. So I'm going to support Nick's position and Nick's position on these projects. It's my pleasure to do so. Because the economy of Vermilion Parish in my belief below Highway 14 is in great danger.

In my district up in the northern part is closer and closer to Lafayette, we don't relatively suffer the same things. However, we do have a lot of rice farmers who have that problem. But you can rest assured that I will support the efforts of Nick and Mickey and Troy, the four representatives from Vermilion Parish.

There was some concern when the district was split up four times, that it would hurt the representation of Vermilion Parish. I think Nick can tell you that. That has not been the case. It has fortified the representation in Baton Rouge.

So thank you.

MS. DESHOTELS:

Thank you, sir.

Sir?

SENATOR GAUTREAUX:

Well, I'm going to be one of those that don't need a mike. This is a normal voice for me. I'll raise my voice.

First, I'd like to start off talking about -- we're talking about Schooner Bayou. And the experts spoke. You have all the people from our parish who live it, breathe it every single day. You have young farmers like Ross who want to stay in farming. But, once again, they have a problem with fresh water. And what I suggest to you today is that you-all make the comments, that you heard the comments. I'm suggesting and I guess I'm basically demanding is that the Schooner Bayou Project be funded. You heard it's urgent request, because, once again, without the economy, without the farming that we have here today, you just heard it. Without the farming, the crawfish, the cattle, that's the southern portion of our parish, that's what built our country, first of all. We fed the country, okay? Now we're feeding the rest of the world. Now the rest of the world are importing rice, killing some of our farmers. Now is the time for us to fix our problems so that we can have young farmers like Ross and generations beyond Ross that continue to farm. So I would, like I said, demand that it be funded.

But, second of all, if it's not funded, I would suggest that we have tobacco sales. We're going to have a settlement with the tobacco sales. And approximately 200 million dollars is going to go to coastal erosion, which we dedicated. You, the people, voted on that constitutionally. That's our commitment as the Legislature. So we're going to put the money where it belongs. But in that 200 million dollars, there's no way we can't find a million or two million (Inaudible) a million dollars to fix that, that particular project, to help do that. I would think it's relevant. I would think it's very important.

Even more important is something I said in committee to your group, Michele. And I think all the people here need to know we have people from southwest Louisiana, southeast Louisiana. We have a parish president. The parish president from southeast Louisiana, his whole parish was underwater.

But, more importantly, we have to realize, when we're doing the coastal erosion projects in their area, they're very, very costly. Am I correct, Michele? Very costly, right? We need to realize that it's a lot cheaper to protect than have to restore. And so you have a lot of stuff in southwest Louisiana that we can put money to and get things fixed for our

economy. But, even more importantly, we all have insurance problems. We need to fix those problems so the insurance companies can feel even more comfortable to come in our areas. That's a battle we continue fighting. I continue fighting in Baton Rouge. All of us, our whole delegation fights that. And, you know, our people are suffering. But one thing about southwest Louisiana and Vermilion Parish. We work on our own and we move forward and we don't ask very much from the government. But I think this is not much to ask, a million or two million dollars to get that on the urgent list as a priority. So I would suggest that. I'm also going to present a resolution urging you-all to do that, also submit letters from our delegation. I think it's very important.

But, first of all, look at the people that turned out here. That's how important it is. And I wanted to let the people of Vermilion know, every place I go and talk about coastal erosion and wherever it's at, they talk about the turnouts in this parish. And that's what makes this parish great. But that's what makes southwest Louisiana and Acadiana great, is the people like this.

And I would suggest that you-all continue your fight. Some of you-all been fighting for many

years, probably before I was born, right, Sheriff? But it's very important for our economy. And, like I said, the farming issue is an issue. And I think that's something you can add to your urgent list. We're not talking about much money, guys.

And other than that, I just want to thank all of the people for coming out here today because it really shows your concern about our community. And I would think, I hope you-all take that into consideration, all the people that showed up.

So thank you for having me here today.

MS. DESHOTELS:

Thank you, Senator.

I have no more cards in front of me. Is there anyone else who would like to make a comment this evening. If not, thank you very -- oh, oh, oh.

MR. LEBLANC:

I've been in emergency management system --

MS. DESHOTELS:

Sir, you need to -- your name for the record.

MR. LEBLANC:

I'm going to get to you.

For 50 years, this is the first time that we've had 60 percent of Vermilion Parish flooded, 6,000

homes and businesses flooded. And I've seen this deteriorate for the past 50 years. Hurricane Audrey, we had some protection. We suffered in Henry. We suffered at Pecan Island. But only 200 houses were flooded.

What was brought out here tonight is very, very true. Poor maintenance has left these people and these farmers in Vermilion Parish at the mercy of the weather and at the mercy of the sea.

And in the 85 years I've been on this earth, I've seen seven billion dollars spent on the Red River. I've seen I don't know how many billions spent in New Orleans. When are we going to be served with a little bit of this service? What they've brought out to you tonight is exactly true. If we don't get the fresh water and get that canal built, we're going to have a worse situation in the future. If we don't protect the coast, you're going to have the entire Freshwater Basin, that's going to look like New Orleans south. Because without protection, you can throw all the marsh grass you want out there. The next hurricane is going to wash it away. And I can bring you out there right now and show you the millions that's been spent down there. And where are they? They're in the sea. So you have to start with a barrier that will stop that water from coming in before you can do all the rest of this stuff.

And I realize there's a lot of ideas about what's necessary, but what is necessary is protection.

Thank you and I thank you for coming.

MS. DESHOTELS:

Sir, we need your name for the record.

MR. LEBLANC:

Robert LeBlanc, the Vermilion Parish Office--

UNIDENTIFIED SPEAKER:

General, General LeBlanc.

MR. EDWARDS:

I'm Judge Edwards. I'm the chairman of the Parish Coastal Restoration Advisory Committee.

Nick, you're right on. And I want to thank all the public officials -- the public officials for coming tonight. And I really want to give a hand to the -- to the farmers who showed up here tonight. A lot of them didn't even get up and speak. There's a lot of people here that didn't. (Applause).

Earlier in the audience, I saw our fire chief, one of our fire chiefs, here in Abbeville, an old classmate of mine. And, Nick, if you fixed it last month, it probably only cost a million or two million dollars. What's it cost to clean up from a fire? If the fire department gets there right away, you know, you

got a little water damage, you got a little smoke damage. If they don't get there for 30 minutes, there's nothing but ashes. And that's the situation today.

What I saw here was that MMS should get the plan in August. Or are they going to approve it in August? Approve it in August. My experience with government plans like this is, if we see MMS approve it in October, we'll be lucky. And then we have to do engineering and design on the project, and then we have to let the project for bid. If the project is put on the fast track, we'll be lucky to see it built next summer, very lucky next summer. That means we lose this growing season and you lose next year. And I don't think you guys can afford that.

My recommendation to the Vermilion Parish Police Jury and to our elected representatives is that they find the money somewhere and they hire a contractor and they go out next week and plug the gap. Because Donald said he could run his boat through two holes. Last time I was there, there was one. If you don't fix it soon -- not too many of you understand what's happening here.

You've got a 100-yard-wide canal that's got a levee that's as wide from me to Mr. Broussard. It's about six feet wide. It's got two holes in it right

now. The tide exchanges twice a day from Vermilion Bay to White Lake passing through those two holes. How much longer you think those are going to stay there? It's going to wash out. And if you wait until the project gets going, it's going to cost 10 million dollars to fix. I would rather take my tax dollars and have it plugged with a million dollars. But the idea is this. If we can allow the Police Jury to plug it, to find the funds, maybe to borrow the money, funds from the state, and then maybe the jury could get reimbursed when this CIAP project finally gets built. Because you will save CIAP nine million dollars. I know that's too much common sense for most government to absorb. But I'm serious when I say that. If we go out there and plug those holes next week, we can do it for not a lot of money. But if we wait the full-time that it's going to take, you're looking at a project that's going to cost a lot more than what we're estimating it's costing today, because we're not talking -- the whole project is the reach from the GIWW to the Schooner Bayou Locks. That's what we think we can do for one or two million dollars today. But it will take a million or two or three or four or five just to plug that hole if you wait too long.

Let me say I'm thrilled to say looks like

Freshwater Bayou might happen. But seeing is believing.

You guys have a terribly difficult time. I think we're on the right track. We're seeing some progress. We're moving in the right direction. I'm serious when I say this. I think we need to do something in the near term, in the next month or two. If you don't do something in two months and we get a dry spring, every rice farmer from Gueydan, and there's some of them that can testify that, I think, you know, from Forked Island to Gueydan is going to have salt water because this is a big hole in the levee. You just as soon open the locks. If we don't do something, the economy of the parish is devastated if we have a dry spring and summer.

Thank you.

SENATOR GAUTREAUX:

This is for Judge Edwards, and this is actually for everybody.

What I was going to suggest -- first of all, when you talk -- and I had already been working on something. I was actually in Baton Rouge earlier today, because everybody knows that I don't normally wear a suit and a tie. But when I talk to you, I directed you to our chairman. I'm the vice chair of the Coastal Committee. And on the way back from Baton Rouge, I was

talking to him concerning this particular issue, about Schooner Bayou and about stopping up.

What we're looking at doing, first of all, if we can find emergency money to do it, we'll do it. I don't think emergency money, we qualify for emergency money. But, more importantly, I think what we can do is maybe do -- I sit on the state revenue, fiscal committee, we have capital outlay. We've been very fortunate in this parish to bring home money from the capital outlay program. And I would suggest that -- I'd have to first get with the state to see if we can get engineering cost of exactly how much that project's going to cost us. And from there, we still have to the beginning of May to actually get the money to put it in, then by the time we get it authorized will be October. You know, that would be the soonest if we go that route.

Now, the other route, if we could do the emergency money, we could probably get the money within probably 30, 30 to 60 days. So, you know, that's the best route. But if it's not possible, then we always have to have alternatives to it.

MR. EDWARDS:

You better go the emergency route, because it's such a dynamic situation. By the time your engineers go out there and study it and come back and

design something, it will have changed. You need to hire a big dredge and go plug it up. And that's a stop gap. That's not, you know, no engineering design. You just put dirt in the hole. Once that's done, then you've got time to engineer and design and build.

SENATOR GAUTREAUX:

And, Judge, you know I understand all that. And if I could go get the dredge and do it myself, I would do it. But, unfortunately, I'm like you and everyone else. We have to cut through the bureaucratic. We have to cut through the state and the red tape. Sometimes we're fortunate, too.

I don't know if we have anybody represents USDA, because I think that's another issue that USDA could be involved in. If they're not here today, I'll make sure I contact them tomorrow, because a lot of times they have money that's, you know, a lot quicker to get.

MR. EDWARDS:

You know, and the Corps -- I know the Corps has told us. And just a little history for some of those of you who may not know. The Corps straightened out the North Prong, built a levee on the east side, and for many, many years the Corps of Engineers would plug the holes as they appeared in the levee under routine

maintenance. When they'd send a dredge down to work in Schooner Bayou Locks, it would plug the holes. And then along came the Clean Water Act, and somewhere along there, somebody in the Corps said, You know, we might need a permit to do that. We could get in trouble. And they quit doing it. And when they quit doing it, the holes started showing up and they got bigger and bigger. And now they spend their money mowing the grass and taking care of the locks while the water passes around. And they're not doing us any good. So perhaps the Corps of Engineers might have some emergency funds. Don't leave that stone unturned.

SENATOR GAUTREAUX:

I'll talk to the Congressmen.

MR. EDWARDS:

Okay.

MS. ZAUNBRECHER:

I'm Linda Zaunbrecher.

We appreciate very much that you've come and you've explained what you've explained. You talked -- one presentation said something about the river, and General LeBlanc reminded me that there is another river. There is the Red River. And if at all possible, in my vision, we could bring water from the Red River down into the Vermilion Basin and get fresh water. And have

to evacuate it, though. We sure don't want to drown out Pecan Island. But it is a vision that we have that we would have enough fresh water to come into this area to rebuild the marshes and do those things. And all of us could grow rice again.

Thank you.

MS. DESHOTELS:

Thank you, ma'am.

I want to thank everyone.

MR. BROUSSARD:

What she just addressed, I was the one involved in getting this engineering done to do exactly what she just said. And the -- the Vermilion Parish Police Jury has a copy. I gave them a copy of all the engineering has already done, about that thick.

MS. DESHOTELS:

Thank you, sir. Would you identify yourself for the record, please?

MR. BROUSSARD:

Charles Broussard.

MS. DESHOTELS:

Thank you, sir.

I want to thank everyone for coming this evening. We really appreciate it. As usual, we have wonderful input in Abbeville and Vermilion Parish.

Thank you so much. Good night.

(Meeting concluded.)

* * * * *

LOUISIANA HOUSE OF REPRESENTATIVES

407 Charity Street • Suite 102
Abbeville, Louisiana 70510
E-Mail: larep047@legis.state.la.us
Phone: 337.893.5035
337.643.2381
1.800.259.5035
Fax: 337.898.1160

Agriculture
Commerce
Natural Resources

MICKEY FRITH
State Representative ~ District 47

January 10, 2007

The Honorable Kathleen Babineaux Blanco
Governor of Louisiana
P. O. Box 94004
Baton Rouge, LA. 70804-9004

Dear Governor Blanco:

On behalf of our cattle, rice and crawfish industries in Vermilion Parish, I am asking for your help concerning a matter of grave importance.

Vermilion Parish's economy is being adversely impacted by saltwater intrusion, and, in this case, a problem that can be resolved easily. A clay dirt levee that was erected in 1929 lasted until about ten years ago when it began to disintegrate. Now, the levee has literally washed out. There is a section of a little over three miles long that needs to be rebuilt. It needs to be built at a settled height of six feet and with a ten foot crown. The original levee lasted for 70 years without any problems, but now, its gone. Also, saltwater is coming in by circumventing the Leland Bowman Locks, north and west of the locks, pushing that saltwater into the Intracoastal Canal. Another area being inundated with saltwater is the north prong. The north prong waterway goes from the Gulf Intracoastal Waterway up to Schooner Bayou Control Structure, which is approximately four miles long. The areas being poisoned with saltwater are the state's rice belt area and the crawfish belt area! In just one year, more than forty per cent of the rice in Vermilion Parish could not even be planted because of the salinity level. Counting Rita makes four out of six years that our rice industry was a disaster. Our cattle industry involves 750 producers with approximately 139,000 beef cows, generating $15 million to our economy annually. I have seen for my self that the canals no longer have fresh water for our livestock to drink. The U. S. Army Corps of Engineers has verified that samples taken at the Leland Bowman Locks contain 482 grams of salt per gallon.

On behalf of our rice, crawfish and cattle farmers, I am requesting that at least $1 million from the $800 million surplus be set aside to rebuild the levee along the north prong - just a simple levee similar to the one that lasted for more than 70 years. Please help us, Governor Blanco, eliminate saltwater intrusion now with the surplus that presently exists.

Please allow me to discuss this matter personally, I am available at any time. My district office number is (337) 893-5035 or (337) 643-2381 or my cell (337) 652-6166. Thank you, as always, for your help.

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ABBEVILLE, LA

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Voice of Vermilion Parish since 1856

STATE

After years of delay, Odom's trial thrown out

BATON ROUGE, La. (AP) - A state judge threw out all remaining criminal charges against Louisiana Agriculture Commissioner Bob Odom on Monday just as jury selection was to have begun in a case that has dragged on for more than four years.

Bob Odom

The move by Judge Don Johnson could signal the end of a case that started with a 21-count indictment in August 2002. Prosecutors objected to Johnson's dismissal but didn't say

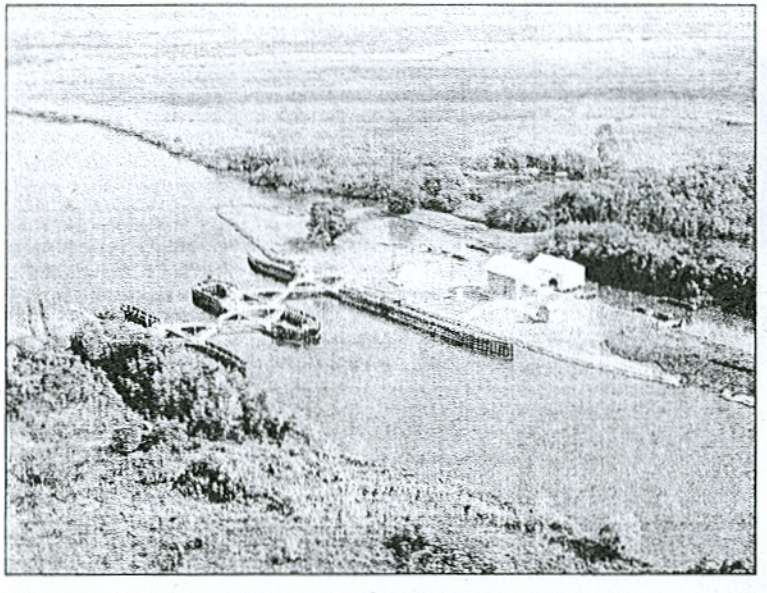
Trouble at Schooner Bayou

By Brooke Broussard
News Editor

While momentum is high for coastal restoration efforts, some locals are pushing for the closure of breaches near the Schooner Bayou Control Structure, sometimes called the Schooner Bayou Lock, located on the old Intracoastal Waterway south of Kaplan. Residents and officials are in agreeance that the function of the 'Lock' as a preventative device is futile because of holes in levees -- some say the salt water is infiltrating freshwater basins, affecting agricultulure and killing off coast-sustaining plant life.

According to Tracy Falk, operations manager at the Schooner Bayou structure for the U.S. Army Corps of Engineers, the 'Lock' is only a control structure, with one set of

(See BAYOU, Page 3)



While this structure at Schooner Bayou was built to keep salt water *out* of freshwater basins, some feel it is doing the opposite.

LOCAL

Disaster farm aid program continues

Sign-up for seven supplemental disaster programs to assist eligible farmers and ranchers in Louisiana who suffered losses due to Hurricane Katrina or Rita in 2005 continues throughout the state.

According to Larry Thibodeaux, County Executive Director in the Vermilion Parish Farm Service Agency Office, signup for these supplemental disaster programs was extended to

(See ODOM, Page 3)

'Hometown' boy makes it in the Big Apple

By Rachel Cherry
Staff Writer

Although Milutin Nikodijevic isn't a native of Vermilion Parish, or even the United States, he started what has become a successful career here in Abbeville.

Originally born in Yugoslavia, Nikodijevic first came to Abbeville in 1999 to visit

back.

"It was cold and not for me," he recalled about Wisconsin.

At that point Milutin stayed with Mr. and Mrs. Francis Plaisance of Abbeville until he made the decision to attend college in Texas at the University of Texas at Austin where he achieved a degree in Finance.

Bayou

From Page 1

gauges as opposed to two. The current structure was built in the 50's to prevent saltwater intrusion and relieve high levels of water in the freshwater Mermentau Basin.

Falk said the Corps is seeing the lowest levels of salinity around the structure since Hurricane Rita.

"We're letting any water that has salinity out," said Falk.

She *is* aware of the concerns voiced by locals -- particularly farmers -- and said the structure is doing its job.

Tim Creswell of the Vermilion Parish Office of Emergency Preparedness, an advocate for coastal preservation, said that water has done damage to the system.

"The water coming in has eroded the land around the control structure so there's nothing to keep salt water from entering the Mermentau Basin," said Creswell.

The project to close up holes around the waterway is mentioned in the final draft of the plan the Coastal Restoration and Protection Assocation (CPRA) has created, to be presented at the Abbeville public library Thursday night. However, Creswell thinks the problem should be addressed before CPRA funding kicks in.

"That's going to be down the line," said Creswell. "It needs to be done now.

"They don't need to wait for this funding. You're looking at years."

So why isn't the Corps taking care of the alleged breaches?

Sherrill Sagrera, a 65 year old Esther farmer, said he and others have tried to get the Corps to take responsibility for the holes.

"We say it's a maintenance issue, and try to get them to take responsiblity," said Sagrera. "They say it's not a maintenance issue."

Sagrera has a little over 300 acres of farmland in Esther and Chenier au Tigre -- land that, because of salt water inundation, is no longer farmable. Sagrera also serves on a Vermilion Parish Coastal Advisory board. He, too, sees the problem at Schooner Bayou.

"When you have a southeast wind blowing, the tide comes in and goes right around the lock," said Sagrera.

T.J. Prejean, a Vermilion Parish Police Juror living amongst and representing southern Vermilion, said he has been fighting for help for about 10 years. He said he has been to several legislators -- including Chris John, Mickey Frith, Nick Gautreaux and Charles Boustany -- asking for help.

"We've been to the Corps, they say they're going to help, and nothing ever happens," said Prejean.

"It's a critical point for the farmers."

Farmers shouldn't be the only ones worrying, according to Ernest Girouard.

Girouard is a retired rice farmer and serves as chairman of the Vermilion Soil and Water Conservation District (SWCD).

"All the salt water that comes in kills the plant life that sustains our marsh and barrier island, and our coast," said Girouard. "Without those plants, we would be as vulnerable as eastern Louisiana which doesn't have anything protecting it now but levees."

Saltwater intrusion is a visible problem, and getting worse, said Girouard.

"It's our land, it's our coast. We all have to live and work in this environment, and we need to all work together to come up with a plan."

At its Wednesday meeting the Vermilion Parish Police Jury as a whole passed a resolution supporting a project to close breaches around the Schooner Bayou Control Structure, and talks have begun with legislators to take action.

Microsoft donates $1.7 million to lure workers back to Gulf

GRETNA, La. (AP) - Microsoft CEO Steve Ballmer on Monday announced a $1.7 million donation designed to help lure workers back to the hurricane-ravaged Gulf Coast by offering technology training.

The donation is being by Delgado Community College. It is one of several workforce training centers in the region that help support displaced residents with technology skills training.

Apple

From Page 1

visiting friends and some places that mean a great deal to him.

One of his stops was at the Louisiana Technical College where he caught up with some of his old teachers.

"I just wanted to go back and see where it all began -- back to see my humble beginnings."

start of the trial and said he expected jury selection to proceed as planned Monday afternoon.

With part of the case missing, prosecutor Tony Clayton said he had been instructed not to move forward with the trial while the East Baton Rouge Parish District Attorney's Office appealed the dismissal of the money laundering counts. He said continuing with the trial pending the appeal would harm the case by forcing prosecutors to try it in a piecemeal manner.

"You don't want to try this case more than one time. I don't want to try it more than once time," Clayton told the judge.

Johnson refused any delays. "This has been going on for four-plus years. It needs to be over," the judge said.

When prosecutors said they would not grand jury investigation, and the case then got mired in legal maneuverings and arguments, including disagreements over which judge should preside, which charges should be included and whether one prosecutor should be allowed to participate.

During the legal disputes, many of the charges had been whittled away. Prosecutors dropped 11 of 21 charges on their own -- including all counts of extortion, obstruction of justice and malfeasance in office _ saying they wanted a more manageable case.

Johnson then threw out other charges, and in 2005, he tossed all the remaining counts, saying prosecutors took too long to bring the case to trial. The Louisiana Supreme Court, however, reinstated them.

Fish

From Page 1

gion, and are the largest cuts in the 11-state region.

"As much as we may hate it, we might have to scale back on our educational programs," Gautreaux said. "We may not attend as many public events, host as many kids' outings, curtail some maintenance work, scale back on our environmental education programs or cut back on the time our centers are open."

After receiving a high of $391 million from Congress in 2004, the refuge system has had to do more with less. Its funding levels for the past three fiscal years have been about $9 million to $15 million below the 2004 amount as other priorities such as the Iraq war and hurricane relief took precedence.

Meanwhile, the agency estimates it needs about $16 million a year in additional funding to meet increases in salaries, energy and other inflationary costs. It also says there is a $3 billion maintenance backlog.

To cope with the deficit, the agency has cut about 10 percent of the jobs at refuges in the Northeast and about 20 percent in the Southeast and Midwest. More cutbacks are expected later this year in those regions and in the West.

Crack

From Page 1

Keith Rice, 19, of 704 S. St. Valerie St. was in possession of a concealed and loaded .45 caliber automatic pistol.

Upon further search of Rice, officers found 21 rocks or 2.3 grams of suspected crack cocaine and $150. He was booked into the Vermilion Parish Correctional Center for possession with the intent to distribute cocaine, possession of a firearm in the presence of a controlled dangerous substance and illegal carrying of a weapon.

In an unrelated incident that same week, a citizen's complaint led to the arrest of Lester Todd Collins, 21, of 306 Robie Circle, for possession with the intent to distribute crack cocaine and possession with the intent to distribute marijuana.

According to Sheriff's deputies, they responded to the area and conducted a short-term investigation of the illegal drug activity in the area of Kibbe and Martin Luther King Jr.

When they arrived at the Live Oak Manor Apartments, Task Force agents exited the vehicle and Collins, who was wearing a black New York baseball cap and white T-shirt ran. He was apprehended in Apartment 201 without further incident.

Aid

From Page 1

March 30, 2007.

These seven programas are administered by the Farm Service Agency on behalf of the Commodity Credit Corporation (CCC). Additional information related to the programs may be found online at http://www.fsa.usda.gov, by "clicking on" Disaster Assistance Programs.

Thibodeaux reminds interested producers that they must apply by the deadline date of March 30,2007, as there are no late-filed provisions for any of these programs; however, eligible producers will be allowed two additional weeks after the end of sign up to provide supporting documentation, such as farm plan documentation and highly erodible wetland compliance determinations. Interested producers are reminded that to receive benefits, they must meet other eligibility requirements, and producers may not receive payments made under other federal programs for the same losses.

Thibodeaux encourages all producers interested in any of the supplemental disaster programs to contact the Vermilion Parish Farm Service Agency Office located at 1049 West Summers Drive, Abbeville, LA or telephone the office at 337 893-5781.

DESORMEAUX'S

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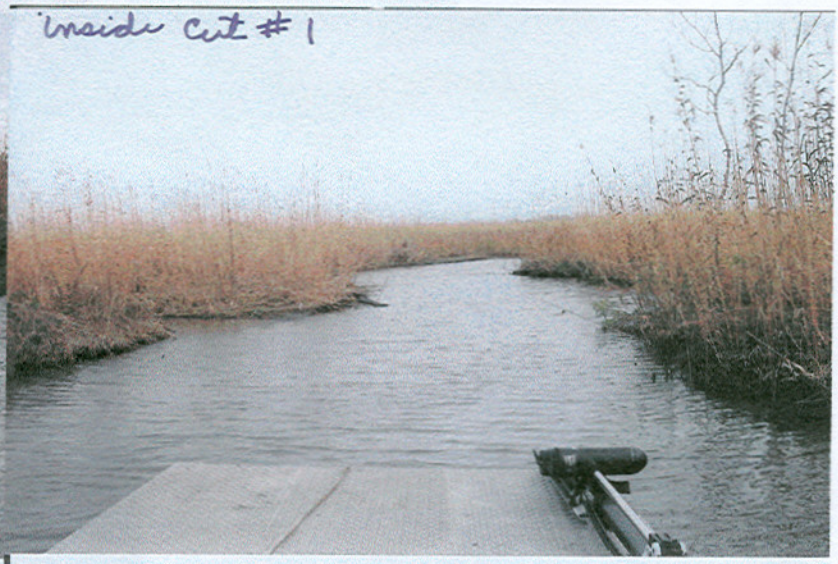
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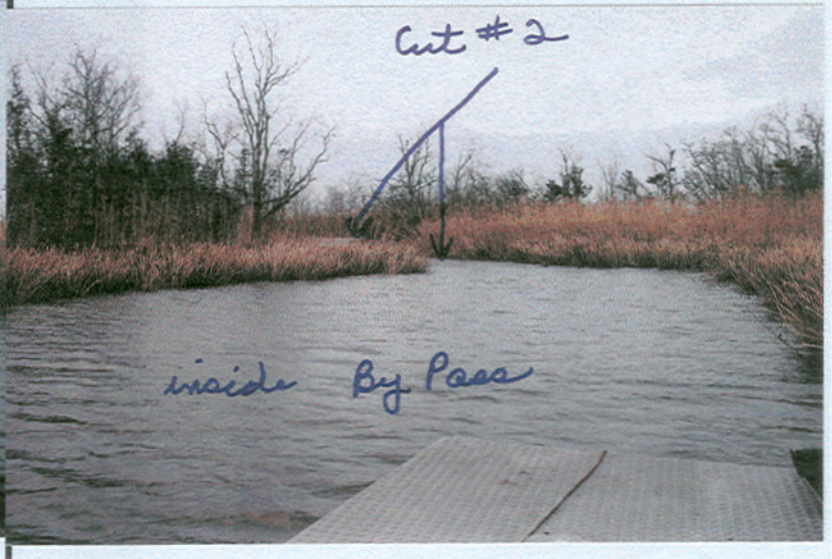
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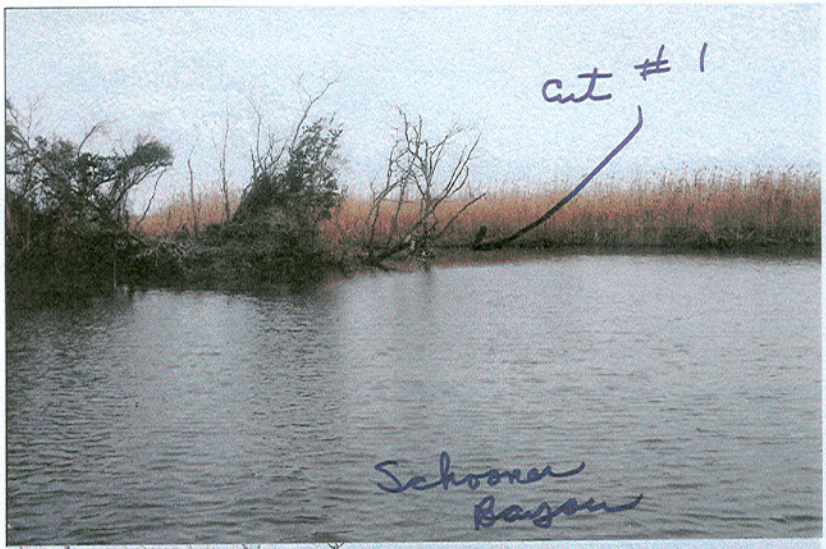
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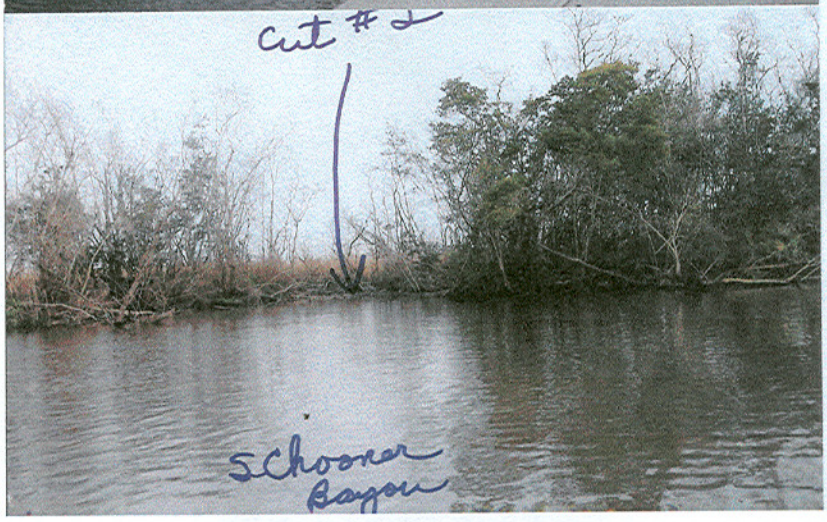
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Schooner Bayou

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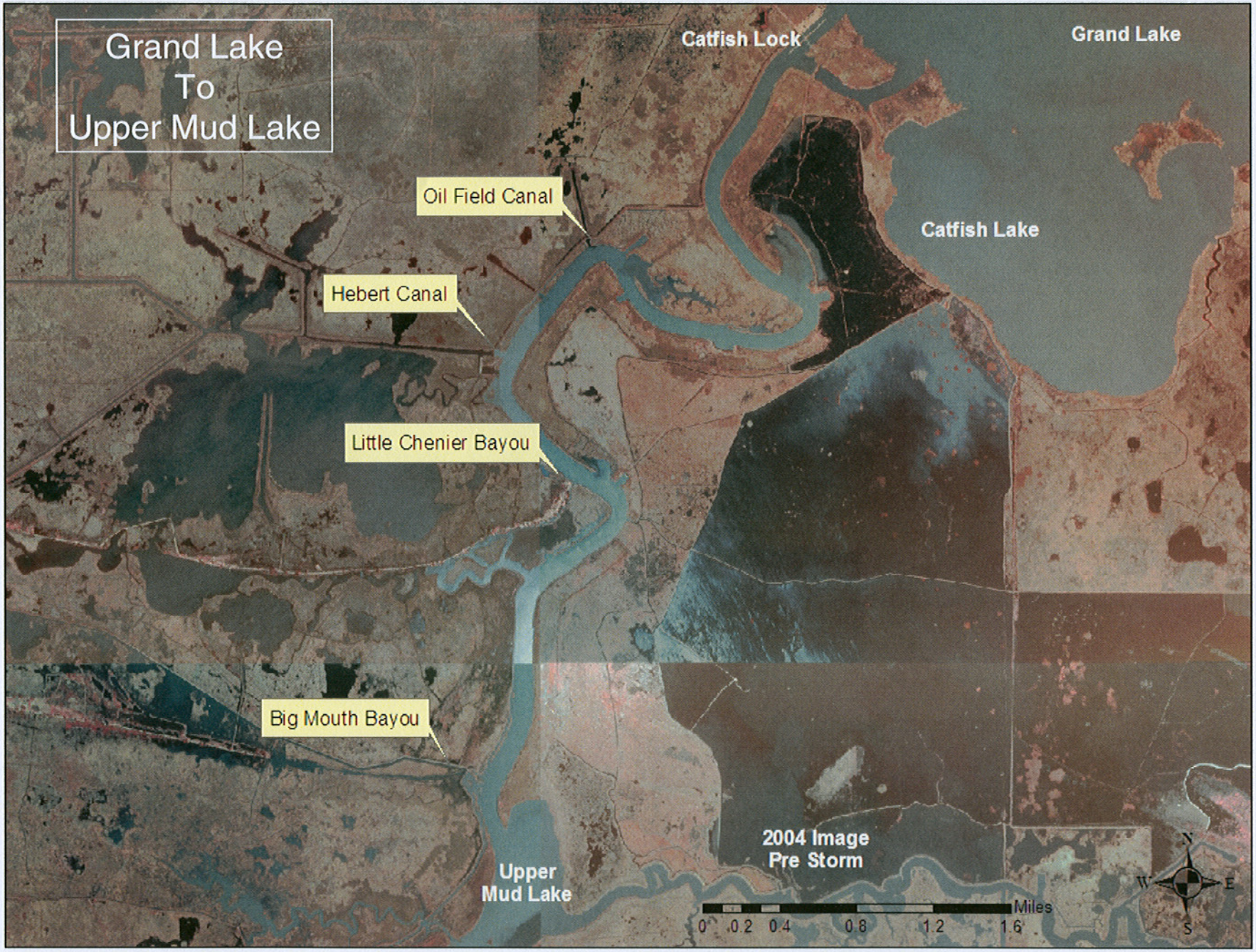
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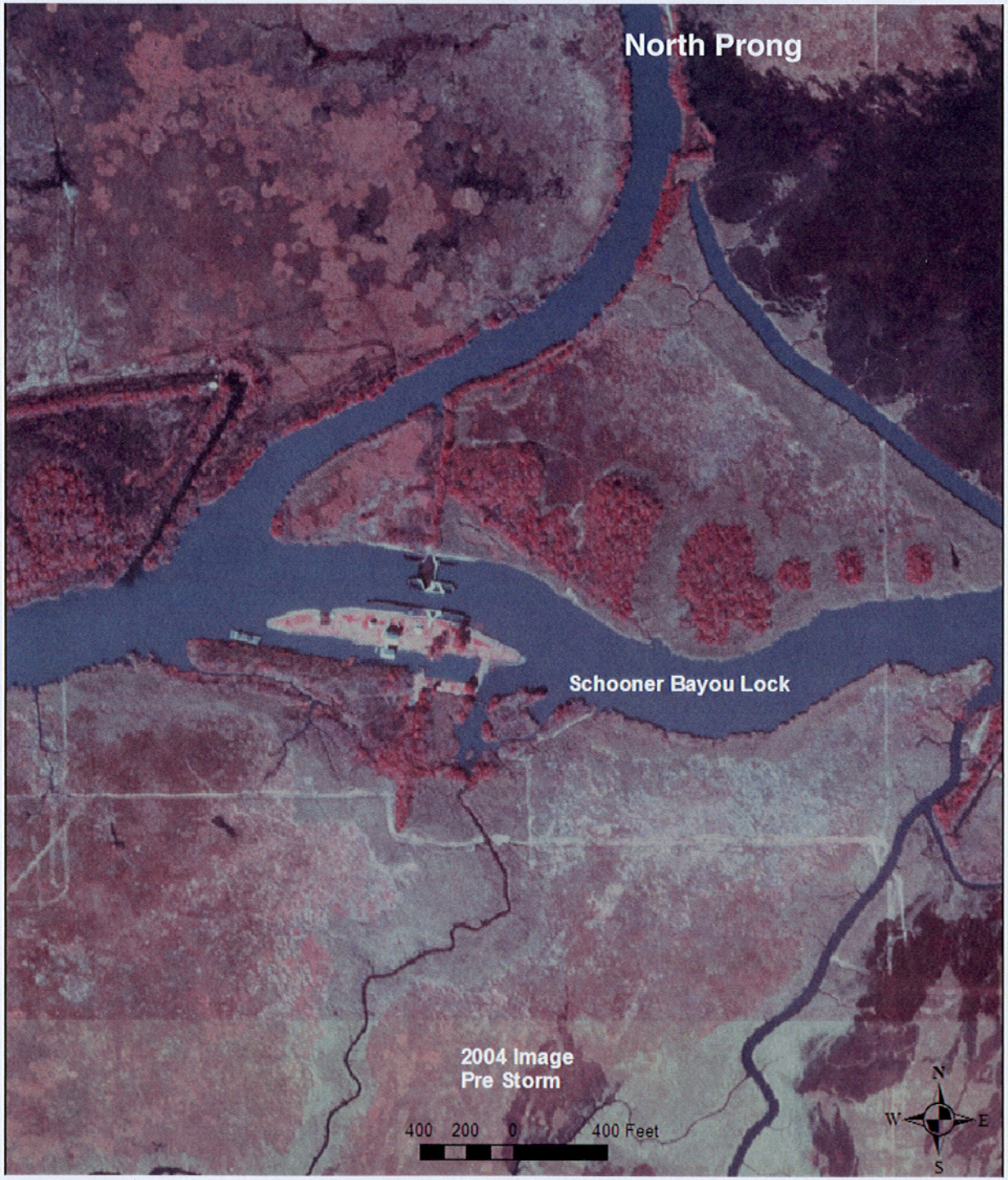
Hebert Canal

Little Chenier Bayou

Big Mouth Bayou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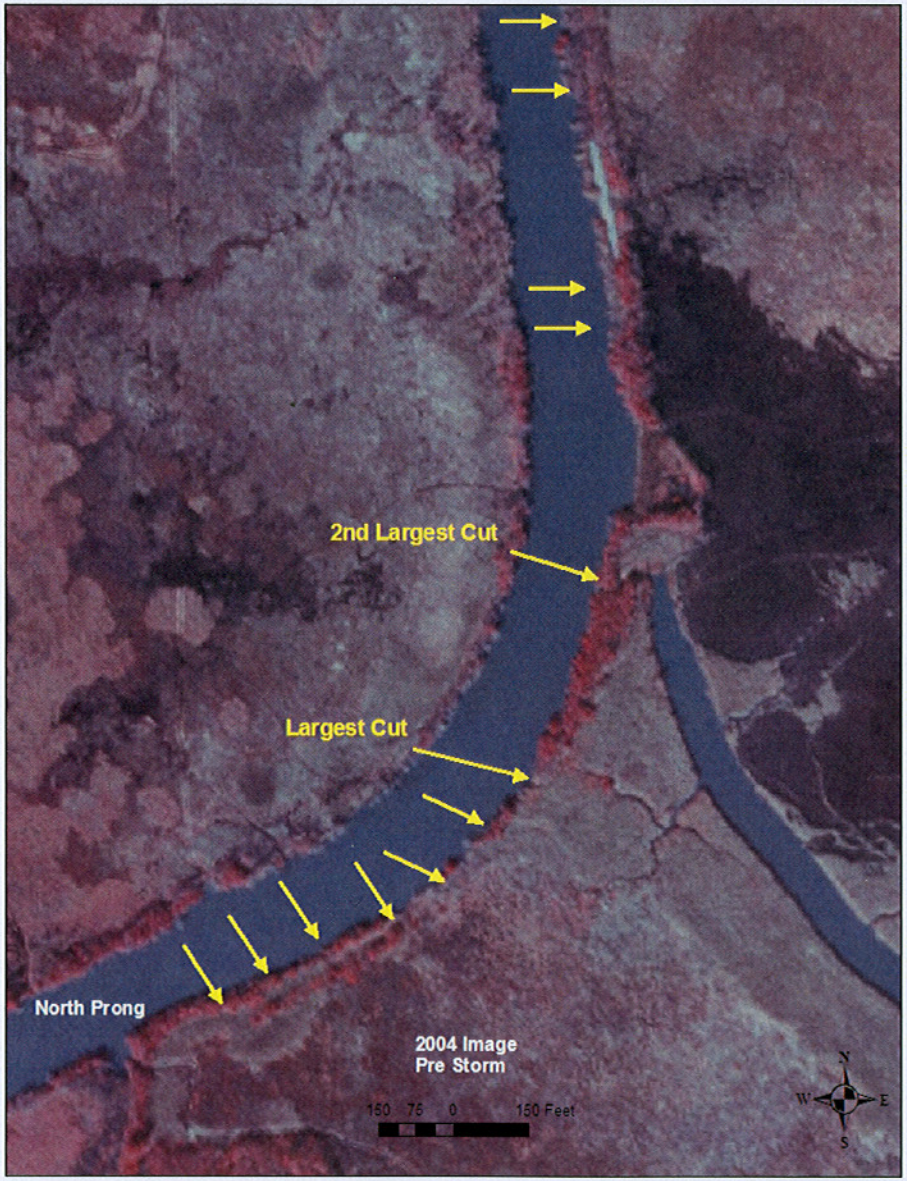
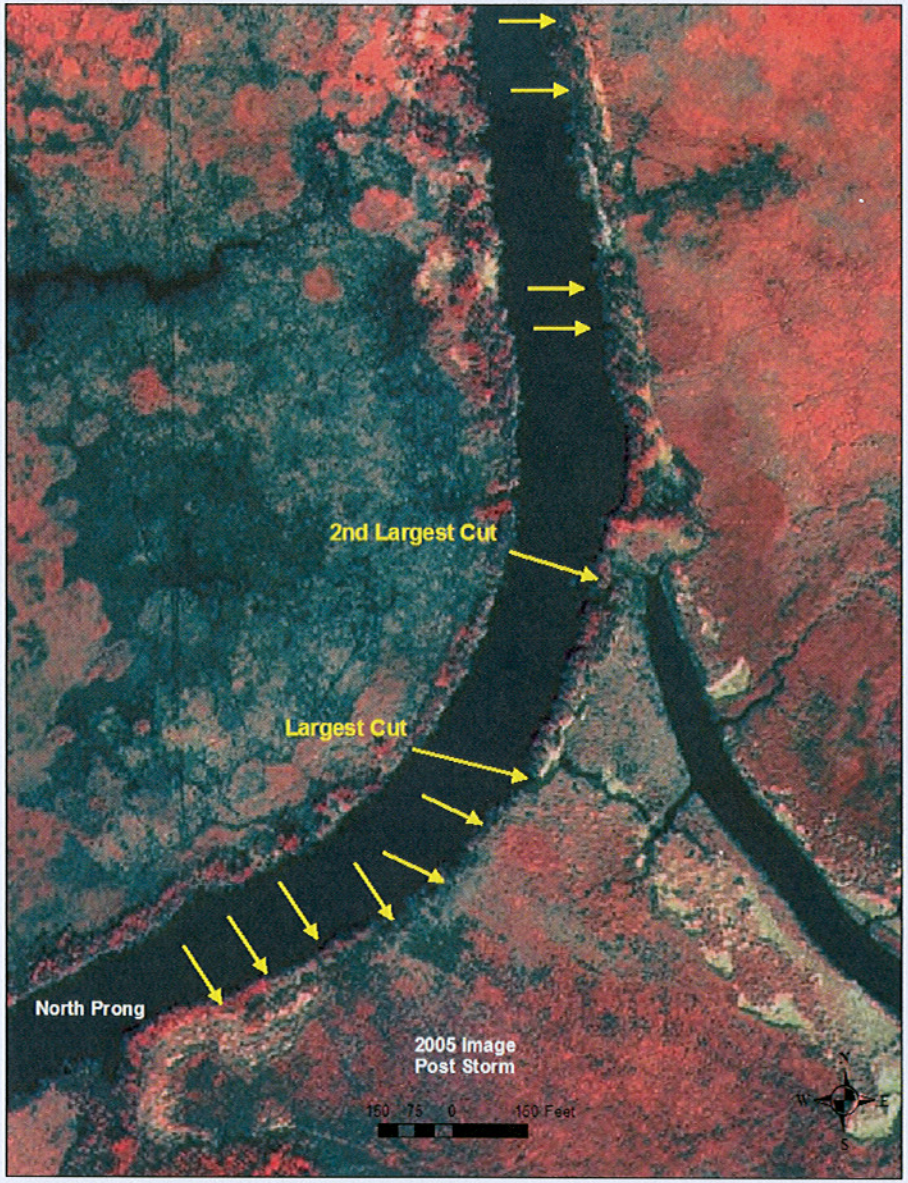
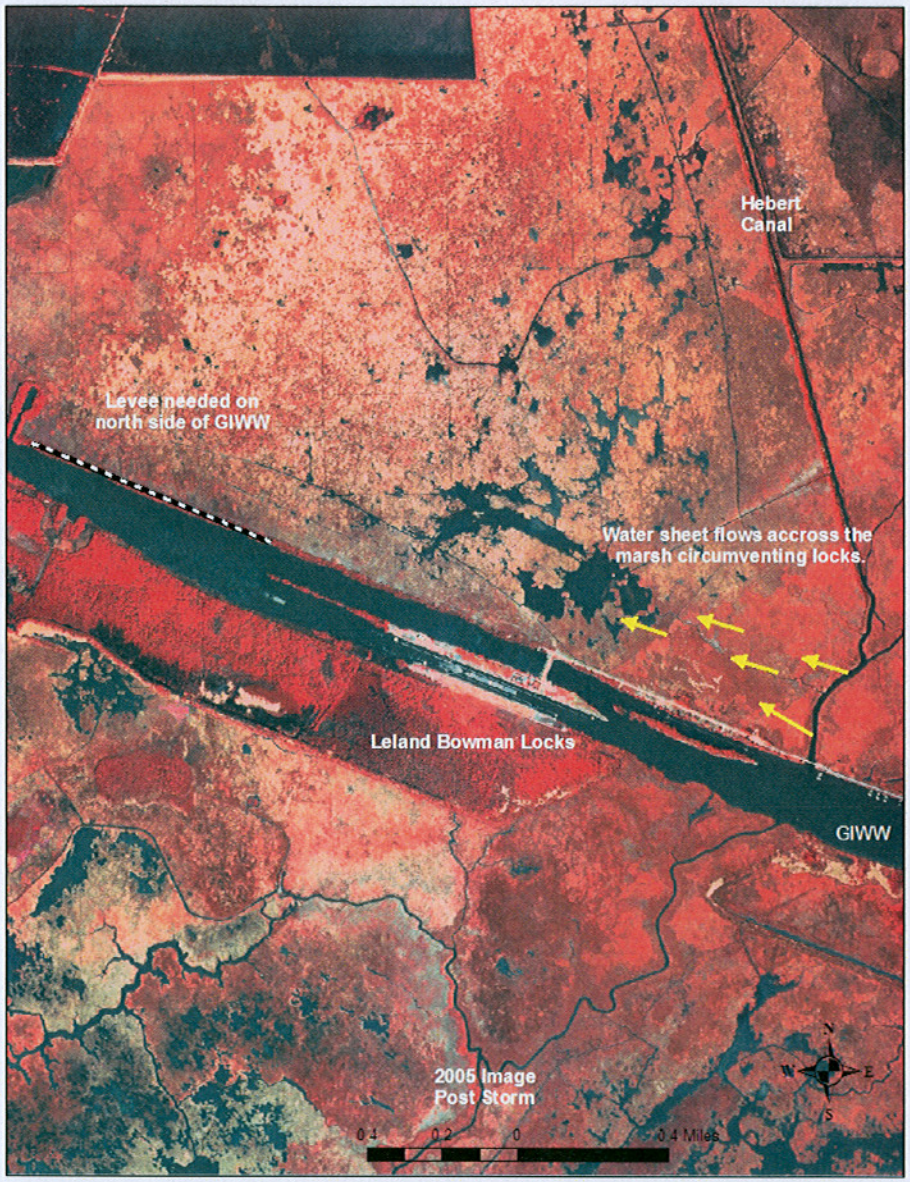
North Prong (Lower Area)





Leland-Bowman Locks Area



4.2.7 Cameron Parish Police Jury Sponsored Public Meeting Notes

The public meeting held in the Court Room of the Courthouse at Cameron, Louisiana was scheduled to begin at 5 PM and commence at 6:15 PM. Approximately, 100 people attended. Andrew Beall presented the Master Plan. He stressed the fact that the public had until April 2nd to submit their comments on the plan. He stressed that the state was very interested in having their comments, and that the public could submit their comments directly over the Internet or deliver them by mail. For the Police Jury, he brought copies of the Master Plan and told the audience that additional copies were available at the Parish Library.

The audience was very vocal about the Master Plan and many spoke. By 6:15pm, the discussion had not yet ended. Further discussion, however, was cutoff by the moderator who explained that the court room was reserved for another meeting at 6:30. The moderator let the people know that the Police Jury had heard their concerns and would take action on their behalf.

The following list is a summary, and not a transcript of the speaker's comments. Notes on speaker's comments are included within parentheses.

A. We think Coastal Restoration should begin at the coast line. Protect the entire coastline with rock breakwaters. Second, place sand behind the rock. That combination - rock breakwaters and sand, saved Highway 82 during Rita. Thirdly, create marsh. No long term studies are needed to do this. We already have these kinds of structures at places along the coastline. We just need more of them. (This was voiced by several speakers.)

B. Do not raise Highway 82 or 27. Raised highways will just make bowls and trap water once the roadway was overtopped. The water cannot get out, and we could not live in it. It would kill Cameron. (This was voiced by several speakers.)

C. There is no need to raise the roads if evacuation and return are the issues. The existing roads provided good access for leaving and returning during Rita. The only problems were power lines that had to be removed from the roadway. (This was voiced by several speakers.)

D. There are only three cheniers in the world. This is the only chenier in the United States. No one seems concerned that we are about to lose ours.

E. There is not enough space on the chenier to raise the highway 10 feet. Raising the highway is a plan to allow the state to take people's property. (A big cheer arose for the speaker who alleged "he did not plan to go anywhere." –several speakers expressed, "Moving is not an option.")

F. Several speakers were concerned over whether or not the state would be allowed to take their property to make a protection plan. Even if paid, they knew of no place else where they could go and acquire more property like that they have now.

G. No levee is needed. A levee would create a bowl same as a raised road bed, and that would keep water from running off the land. Not even rainwater could run off. "I returned to Grand Chenier three days after Rita."

H. A couple of attendees spoke of erosion of their beach due to the day-in and day-out forces of the currents from tides and vessels. They pointed out that 50 years had passed since the last hurricane, and their shoreline was eroding all during those years.

I. An attendee familiar with the Parish Library told the audience that the library was up and running with computer access to the Internet, and they would assist anyone wanting to make comments over the Internet. (Andrew gave her a copy of the Master Plan for the library.)

J. What is the priority for this work? (Some had conflated the priority in the Louisiana Speaks planning initiative with the state's Master Plan.)

K. What is being done for Hackberry? It was damaged by Betsy, Audrey and Rita. There is no space to raise Hwy 27 through Hackberry.

L. The representative from Rockefeller Refuge spoke. They have been working to protect their shore from erosion since 1992. There is no foundation on which to place rock over much of their coastline. The depth to a suitable foundation is 90 feet. A rock structure would simply sink out of sight. They have just developed four alternatives designs to rock structures for shore line protection and are ready to test them. Also, they have levees that were damaged by Rita and need to be repaired.

M. Continue to dredge the Ship Channel and the GIWW to create marsh.

N. I live on the coast near the ship channel. They are predicting 400 LNG ships per year. These are very large vessels and their waves tear up the banks. Rock is needed.

O. Coastal property is prime property everywhere except in Louisiana. Why is it not given prime consideration in our state?

P. I did not know there was a Master Plan until last night. I learned about this meeting by accident. How did the state announce public meetings?

4.2.8 Written Public Comments

4.2.6.1 Public Comments

From: Ronald Coco [mailto:rjcoco@bellsouth.net]
Sent: Saturday, April 14, 2007 9:29 PM
To: Michele Deshotels
Subject: Coastal Restoration Plan

Michele:

I have just recently reviewed the coastal restoration plan and noticed that the use of "mangrove forests" was not mentioned in the final draft. After reading an article on these "trees" in the February Issue of National Geographic Magazine, I am firmly convinced these would be very beneficial to several areas of South Louisiana.
They are extremely effective in preventing "storm surge," as the islands struck by the 2004 Indian Ocean tsunami discovered. (Where mangrove forests were intact, they served as natural breakwaters, and the governments are in the process of planting more mangroves to become barriers for future tsunamis.) Hence, they could prevent hurricane storm surge also. Additionally, these "trees" can grow, and in fact "thrive" in salt water. Their root system is even greater than the fabled Louisiana Cypress, and also are very effective in helping to collect soil in order to re-establish the land area. Wouldn't this work great in those areas where we are proposing to divert river sediment? In addition to helping prevent storm surge, growing in brackish salt marshes, helping to capture soil deposits, etc. these trees are some of the "best" at capturing Carbon Dioxide, thereby reducing "greenhouse gases." Please contact the appropriate persons for review of this National Geographic article and possibly contacting the environmentalist involved in order to gain their perspective in this very important subject, which may be much more effective than "Manmade" barriers in re- establishing the precious coast of South Louisiana.

Thank you very much for your time and for the consideration of this valuable natural alternative for helping re-build our coast.

Ron Coco
Retired Director of Internal Audit
BellSouth Corporation

From: CRYSTAL ALEXANDER [crystal70631@hotmail.com]
Sent: Wednesday, March 14, 2007 9:01 PM
To: comments@louisianacoastalplanning.org
Subject: comment-NO ELEVATED ROAD

I LIVE IN CAMERON PARISH AND I AM AGAINST AN ELEVATED ROAD AS A PLAN FOR HURRICANE PROTECTION. I THINK IT WOULD ONLY HURT CAMERON PARISH IN MANY WAYS. I KNOW SOME ONE THAT LIVED IN PLAQIMINES PARISH WHEN HURRICANE KATRINA HIT. BECAUSE OF THE LEVEES IT WAS 3 MONTHS BEFORE THEY WERE ABLE TO GET BACK INTO THERE TOWN SO THEY COULD SEE WHAT WAS LEFT OF THEIR PROPERTY. FROM MY POINT OF VIEW I LOST EVERYTHING I HAD IN HURRICANE RITA. YOU THINK YOU KNOW BUT YOU HAVE NO IDEA AT ALL HOW IT FELLS TO LOSE EVERYTHING. COMING BACK TO THE TOWN WHERE WE LIVE IS SOMETHING THAT IS FAMILIAR AND THAT MEANS A LOT. WE HAVE ALL BEEN DOWN A VERY LONG ROAD AND ARE STILL TRAVELING IT IN A LOT OF WAYS. WE ARE FINALLY ABLE TO CALL SOME THINGS NORMAL. PLEASE GIVE THIS SITUATION ANOTHER OPTION. WE HAVE IDEAS OF MAKING WATER BREAKERS THAT HAVE BEEN KNOW TO WORK. WE DON'T WANT TO LOSE OUR HOME AGAIN WITH NO CHANCE OF COMING BACK THIS TIME IF THE ROAD IS BUILT.

CRYSTAL ALEXANDER
CAMERON PARISH RESIDENT

From: CRYSTAL ALEXANDER [crystal70631@hotmail.com]
Sent: Wednesday, March 14, 2007 9:15 PM
To: comments@louisianacoastalplanning.org
Subject: ELEVATED ROAD

I AM AGAINST THE ELEVATED ROAD AS A HURRICANE PROTECTION PLAN. I THINK IT WOULD HURT LOWER AND UPPER CAMERON PARISH AS FOR AS LETTING THE WATER IN AND OUT. HURRICANES ARE A CLEANING MACHINE IT IS PART OF MOTHER NATURE AND BY STOPPING THIS PROCESS YOU WOULD BE HURTING THE ECO SYSTEM. IF THE WATER WAS TRAPPED HERE IT WOULD HOLD ALL THE POLLUTANTS IN. WHEN NEW ORLEANS FLOODED I HAD SOME FRIENDS THAT LIVED THERE. WHEN THEY WERE ABLE TO GO BACK MONTHS LATER THE POLLUTANTS WERE HORRIBLE NOT TO MENTION THE STANDING WATER THAT HAD CREATED EVEN MORE HEALTH RISKS TO THE PEOPLE. THIS WOULD ALSO IMPACT THE ECONOMY OF CAMERON PARISH. OUR ECONOMY IS VERY IMPORTANT RIGHT NOW AND IT IS COMING BACK, WE WANT IT TO STAY THAT WAY. WE HAVE ALWAYS HEARD THAT THE FUTURE PLANS FOR OUR PARISH WAS CONVERTING IT INTO A BIG REFUGE AND BIRD SANCTUARY. IT THIS COMING TRUE.

PAUL ALEXANDER
CONCERNED CAMEORN PARISH RESIDENT

From: CRYSTAL ALEXANDER [crystal70631@hotmail.com]
Sent: Wednesday, March 14, 2007 9:25 PM
To: comments@louisianacoastalplanning.org
Subject: CONCERNED IN CAMERON PARISH

I AM AGAINST THE ELEVATED ROAD AS A HURRICANE PROTECTION PLAN. I WAS LOOKING AT YOUR LIST OF PAST MEETINGS AND PUBLIC HEARINGS. NONE OF THEM TOOK PLACE IN COASTAL PARISH TOWNS. FOR CAMERON PARISH THEY WERE HELD IN LAKE CHARLES WHICH IS IN CALCASIEU PARISH. THEY STAND EVERYTHING TO GAIN AND NOTHING TO LOSE BY A LEVEE SYSTEM PUT IN PLACE IN CAMERON PARISH. I THINK THE NEXT MEETINGS AND PUBLIC HEARINGS THAT NEED APPROVAL SHOULD BE HELD IN THE TOWNS THAT ARE DIRECTLY AFFECTED BY THESE DECISIONS AND MAYBE WE WOULD NOT HAVE SUCH A BAD TASTE IN OUR MOUTHS ABOUT DECISIONS BEING MADE FOR OUR BEST INTEREST.

PAUL ALEXANDER
CAMERON PARISH CITIZEN

comments

heavy.3@juno.com <heavy.3@juno.com> **Mon, Apr 2, 2007 at 10:35 PM**
To: comments@louisianacoastalplanning.org

to whom it may concern:
i do not believe that a levee system from Slidell to Morgan City is a good way to protect the environment & the people.

2/13/2007 12:39	anonymous	recommend collaborating with Dutch engineers with reference to relevant projects-i.e. coastal floodgates.

3-8-07

CPRA-IPT
DNR
P.O. Box 94396

Dear Sir,

I am a Vermilion Parish land-owner, a geologist, and retired farmer. I like your proposed hurricane protection plan for La., but more is needed. We need a front-line protection plan to protect your proposed plans. A barrier reef offshore, in the Gulf of Mexico, would do that. It would also build up new land and shoreline. Without such a reef, the Gulf of Mexico, will be knocking at the door of your third line of protection, the 100 year protection levee, in very short order.

Regards,
Albanie Bonin

master plan

JVbarry@aol.com <JVbarry@aol.com> **Fri, Mar 30, 2007 at 1:55 PM**
To: comments@louisianacoastalplanning.org

First, I would like to commend the conceptual framework that the plan lays out.

However, given that the scientific basis for certain proposals in the most recent draft has not yet been established or the engineering worked out, and given how critical it is to the future of the state that these projects perform as desired, I urge you in the strongest way possible to present to the legislature a plan that lays out the conceptual framework but that includes an absolute minimum of specific projects, and I also urge you to recommend to the legislature that it write no list of projects into law. I do think the law should stipulate that CPRA uses outside peer review in an expedited way, perhaps in the same way the IPET team integrated outside peer review. Indeed, many of us in Louisiana are demanding that the Corps of Engineers use outside peer review. So should the state.

It is essential that CPRA have maximum flexibility to adjust and improve the plan as the science and engineering becomes better known.

John M. Barry
Secretary
Southeast Louisiana Flood Control Authority East
504 988-3949

however at this point I am speaking for myself only. Given the time frame, it may not be possible for SLFPAE to pass a resolution prior to the close of comment.

From: David Basco [dbasco@odu.edu]
Sent: Friday, February 02, 2007 3:20 PM
To: comments@louisianacoastalplanning.org
Subject: Coastal Protection Master Plan - Preliminary Draft

CPRA

My concern is with the Protection Levels for storm surge.

1. How were the "... levels of protection" determined?
2. In New Orleans (and Lake Charles), the plan proposes a level of protection from storm surge at the 0.2% chance (500 year recurrence interval) occurring in any one year. Why?

In the Netherlands, the Delta Plan provides protection from flooding at the 0.01% chance (10,000 year recurrence interval) level. This is 20 times greater. How can the Dutch people afford this level of protection? Why can't the state of Louisiana and the US government provide this level of protection from flooding for the City of New Orleans?

Looking forward for your response.

Best regards,
Dave Basco

David R.Basco Ph.D., P.E.
Professor of Civil Engineering
Director,the Coastal Engineering Centre
Old Dominion University
Norfolk,Virginia 23529 USA
757.683.3223 (voice mail)
757.683.5354 (facimile)
basco@cee.odu.edu
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3/13/2007 11:09	Dinah Billings, , 112 Billings Lane, , Cameron, LA, 70631, Cameron, dinah_billings@camsch.org	I'm concerned about the plan to elevate Hwy 82/27 in Cameron Parish between Oak Grove and Cameron. I live just south of Hwy 82/27 and north of Trosclair Road (parish road). Seems to me it would be better to elevate Trosclair Road instead of Hwy 82/27 in my area. It would save more homes because it would be south of all the homes currently in this area, would not leave any home unprotected by the change, save money since it is a much shorter route between two points (Oak Grove and Cameron) and since your project already includes the resurfacing of Trosclair Road ($2 mil) it is already included in your project.

03/29/07 11:01 AM	Wendy Wilson Billiot, Wetland Books, 2715 Bayou Dularge Road, , Theriot, LA, 70397, USA, wwbilliot@wetlandbooks.com	I live in lower Terrebonne Parish. The fact that my home, which is 4 feet off the ground, flooded for Rita, tells me there is no healthy marsh left to protect us from a 7 foot tidal surge or higher. The solution is simple for the Barataria-Terrebonne Estuary: IMMEDIATELY put sediment back into the marsh. Plug dead end canals, and push the spoil banks back into the canals. Without healthy marsh/wetlands in front of any levees you propose, South Louisiana as we know it will cease to exist. The seafood industry, oil industry, shipping and commerce will suffer tremendously. The people who depend on this "working wetland" in which we live, will have to be relocated, reeducated, and basically become a very large financial burden on the government. This simple plan would allow us to stay here and help ourselves. It is not difficult: Put sediment back into to the marshes the quickest way possible--pipeline sediment delivery. WE don't have time to wait, Governor. It's past time for planning. Call on the experts in restoration and let the implementation begin.

Comprehensive Coastal Master Plan for Louisiana

Allyson Bourriaque <arbourriaque@camtel.net> **Fri, Mar 30, 2007 at 1:56 PM**
To: comments@louisianacoastalplanning.org

Carla H. Richard
262 Beach Road
Cameron, La. 70631
337 842 0159
chrichard7071@yahoo.com

As a resident of lower Cameron Parish I am appauled at your plan to save Louisiana. Why don't you stamp "Pawn for the North" on our foreheads and drown us in the Gulf. Your plan would only do harm to our Parish. If you want to make a difference and save all of Louisiana go to the beach or out in the Gulf and build rock levees - it's a proven plan to save the coast and you wouldn't even have to study it! We will oppose this plan as many times as we have to. Thank you.

3/3/2007 14:42	Curtis Bowers, , 107 Park Drive, , Belle Chasse, LA, 70037, USA, cbowers@cmaaccess.com	Due to saltwater intrusion, the marsh has continued to die off in Plaquemines Parish. The cause of this problem started once levees were built to protect communities that started to develop along the Mississippi River delta. There are at least 3 major projects that can reverse this damage: 1. Examine old river maps, before the levees were built. Place river diversion projects in canals and bayous that once ran between the river and the marsh. Mother nature got it right once before, let nature restore it back, like it was before. These projects do not need to be large projects, but small channels that can carry the fresh water 24 hours a day, unrestricted. The current diversions have their flow restricted, why? Just let them flow, full force! The oysters and fish were there before the levees were built, they will be there after these projects get going. 2. Place large boulders and/or rocks along the coast, along the beaches, where the marsh meets the Gulf of Mexico. With openings only in locations that existed before coastal erosion started. Just as nature had done. This will slow the large amounts of saltwater entering the marsh. Rocks or boulders would last longer, than dredging sand to make a shoreline. Sand will just wash away with the next storm or when large waves start pounding on it on a windy day. 3. Dredge sand from the river and Gulf of Mexico to speed up the build up of land and marsh. Simple project, speaks for its self. Stop studying and wasting money on studies and get to work.

March 14, 2007

Honorable Members of Cwppra:

We the citizens of lower Cameron Parish live in a very unique region of the Country, the Chenier Plain, and we want to maintain it in its original state. The Cheniers are very narrow ridges with majestic Oak Trees lining its edges.

Highway 82 was built on the south side of these Cheniers so it would not take up the valuable land used by the residents to live and to make a living by farming and raising cattle. Even the federal government recognized the importance when it did the original Government Surveys of Cameron Parish. In the 1850's it divided the Chenier Ridges into Irregular Sections so that the homesteaders would have equal amounts of property located on the high ground to grow crops.

On first glance the raising of Hwy. 82 seems to be a good plan but when a plan defeats the very purpose it was intended for, the plan has no merit and must not be implemented. The raising of Hwy. 82 would expropriate the property and displace the citizens that this project was intended to protect. People must be the number one priority of any project proposed. The raising of Highway 82 project would destroy the unique culture, the communities way of life and the beauty of the Chenier Plain region of Cameron and Vermilion Parishes.

An alternative plan would be to utilize the existing infrastructure located on the south side of the Cheniers. You could start on the East end of Pecan Island and continue on to the West end of Johnson Bayou. You could achieve the same purpose by raising the existing canal levees, continue on through Rockefeller Refuge again raising the existing canal levees, raise the North Bank of Hog Bayou South of Grand Chenier, put in a locks system at the Mermentau River Cut entrance at the Gulf, raise the levee on the North Side of the Mermentau River South of Oak Grove and open the original entrance of the Mermentau River to its original State and continue on using the existing infrastructure to the Texas Border.

The only time that Cameron Parish floods is during a hurricane. Any proposed project must make the evacuation of excess flood water after any disaster a high priorty.

Sincerely,

Carl

Carl Broussard

No land expropriation

Neil S. Carter <caveman@camtel.net> **Fri, Mar 30, 2007 at 9:51 PM**
To: comments@louisianacoastalplanning.org

Your plan of a levee along Highway 82 and 27 in Cameron Parish are no good. The reason the oak trees survived the water was because the high water drained off very quickly. A levee would leave a giant saltwater lake north of the levee killing all the trees you want to take our land for. We planted and take care of our oak trees. Why punish us for taking care of our land? We live and raise cattle on the little bit of high land along highway 82. Your buffer zone would finish what Rita couldn't do. It would take the entire ridge. The loss of wetlands is caused by the jetties along the Mermentau and Calcasieu river. Why not put breakwaters in those areas?

Thanks; Neil S. Carter, 841 Oak Grove HWY, Grand Chenier, LA 70643; 337-542-4025; caveman@camtel.net

2/24/2007 7:35	Carl A. Chauvin, , 145 Louviere Lane, , Golden Meadow, Louisiana, 70357, USA, cchauvin11@yahoo.com	By placing Cat 5 levees no lower than the Intracoastal Waterway, your plan, as currently written, abandons communities such as Bourg, Buras and Cut Off. Does the state's plan make provision for compensating the property owners for the devaluation of their property once the plan is finalized? How much money have you set aside for the massive "taking" lawsuits which will ensue if your current plan is adopted? How do you propose to place a Cat 5 levee on the Intracoastal in downtown Houma?

03/30/07 07:37 AM	Paul Constance, , 1278 School Street, , Hackberry, Louisiana, 70645, USA, pconstance@camtel.net	The raising of HWY 27 and HWY 82 in Cameron Parish to a height of 10 feet will only add to the problem. This will allow for a small surge to top over and then remain trapped within the impound. To be affective, the hwys would need to be raised to 30 feet. Taking Oak trees from residents will not help you either and will only start a fight. Also, by including a 600' to 1000' buffer area on both sides of the hwys you will in condemn a lot of property owners. Something you have failed to realize is that almost every resident in Cameron Parish owns property along one or both hwys. A better alternative is to back off of the coast about a mile and throw up a 30' high rock break. Then come back approximately a 1/4 of a mile North and begin jettying up levees to form pits. Run a permanent pipeline from different points on our ship channels with booster stations and pump our dredge material into these impoundments forming an artificial island that is protected from errossion by the rock levees. This would naturally promote the coastline to grow back, minimize storm damage to communities, minimize damage to highways and other infastructures, minimize debris on our beaches therefore enhancing tourism and would not upset as many residents of the state.

1/24/2007 8:33	charles c culotta, atty, pobox 2300, , patterson, la, 70392, , charlesculotta@gmail.com	First, I received the printed material in the newspaper TODAY and your site says that comments are accepted thru Jan 5. Excellent planning. I inspected the flood plans at the library and found that the name of the INTRACOASTAL canal is mispelled. Good planning. Is the money for this project going to be spent as the state has spent the Highway money? That is on ports and airports and the like? Why is highway money spent on such as that and on projects like the theater in Franklin? The business people with whom I have spoken have NO CONFIDENCE that this project will be any different. What assurance do you give?

3/14/2007 19:35	brian doxey, , 116 cypress st, , cameron, louisiana, 70631, , briandoxey02@msn.com	i am a resident of Cameron Parish.I do not think the ideas for our area have been thought out. please consider the breakwater project that was used in the hollybeach area, this works . take a look at it . thank u

3/14/2007 20:00	marcus, , 116 Cypress St., , Cameron, Louisiana, 70631, United States, m_doxey_116@yahoo.com	In order for you to stop erosion and keep Cameron Parish residents here in their hometown, you really need to consider putting up breakwater rocks. It appears that the rocks in Johnson Bayou are doing an awesome job. If you are wanting to build up the roads, then this will just cause for more problems within the community. Thank you for all your concerns at saving Cameron Parish from being underwater.

3/15/2007 6:24	Ina Duhon, , P.O. Box 244, 113 Ann St., Cameron, La., 70631, Cameron, None	I am 78 years old and have been in Cameron, La,. most of my life. I think we should work on the coastal erosion before we do anything else. I was at the meeting last night and heard a suggestion of rocks in the Gulf and pumping in sand to build up the coast line. I agree with that. I do not want to sell my property. I plan to be buried here. Thanks

3/15/2007 6:30	Joseph E. Duhon, , P.O. Box 244, 113 Ann St., Cameron, La, 70631, Cameron, none	I am 85 years old. I was born and raised in the Cameron area all my life. I think we should put some rocks in the Gulf and pump in some sand. It's working in Holly Beach and I think it could work for us. My land is not for sale. Please let us rebuild our lives. Hurricane Rita took everything but my land. It is all I have left. It would be a shame if we have nothing left at all! Because of a road. At least we can do something for this.

Coastal Protection and Restoration Authority

PUBLIC HEARING COMMENT FORM

Draft of Louisiana's Comprehensive Master Plan for a Sustainable Coast,
Draft FY 2008 Annual Plan
and Draft CIAP Plan

To insure that your written comments are considered, they should be turned in this evening at the reception desk located near the entrance or mailed to the following address so that the comments are received no later than Monday, April 2, 2007:

CPRA – IPT
DNR
Post Office Box 94396
Baton Rouge, LA 70804-9396

Email comments may additionally be submitted at: comments@louisianacoastalplanning.org

Please consider the following comments:

(1) Repair and reenforce the levey on the South end and East side of Big Lake. This is a levey that is already there, permited and ready to be repaired. This levey is essential to cut down on the amount of Water that comes into Calcasieu Parish and would protect Cameron parish from the backwash from the lake.

(2) Build reefs off the coast to protect the only usable beach in the State of Louisiana. These reefs would have to be built out of rock to be substantial enough to withstand the waves year around. If you notice highway 82 did not wash away during Hurricane Rita due to the fact that rock was laid on the South side of the road to reenforce

(Use the back of this form if more room is needed)

Name: Louis M Estes Date: 3/14/07

Address: 3701 Mossycup, Lake Charles La 70605

the road.

(3) Be careful of building a levee down intracoastal canal as it may cause Calcasieu Parish more problems of flooding.

(4) Locks built across the Cameron end of Calcasieu River would cause serious flooding in Calcasieu Parish during storms.

3/19/07

To whom it may concern:

On 3/14/07 I sent in a Public Hearing Comment form and on item (1) I named the wrong lake. It should be Calaveras Lake instead of Big Lake -

Sorry for the error

Lori M Estes
3701 Monument
Lake Charles, La 70605

From: Johnny Franklin [johnnyf1974@yahoo.com]
Sent: Tuesday, February 27, 2007 12:21 PM
To: comments@louisianacoastalplanning.org

With all this talk of making Lousiana a safe place after the storms.
In my opinion the best thing that the people of La. can and should do is take clam to what they know is there property, clean up the mess and not wait for the state or government to do it for them.

2/28/2007 16:28	wayne gros, , , 1409 hilma st. , westlake, la, 70669, usa, mewgros@yahoo.com	while i don't live in cameron any more, i still take an interest in it. my boyhood days are well remembered w/ my brothers, an excellent place to grow up. i have seen first hand what hi winds and hi tides can do in 24 hrs. we need to put rock barriers approx 1 to 1.5 miles off the coast, this would cause the closed up area to fill and block effect of storm surge and at the same time provide extra fishing grounds for sport fishing, and shrimping. the barrier could be staggerd to prevent tunneling by hi seas. the jetties helps keep the sand and mud out of the ship channel, and the barrier could fill in the area all along the gulf coast. we don,t need people from wash. telling us what we need, we already know what we need. thanks. wayne gros

From: Holly Hendrix [holly_h_64@yahoo.com]
Sent: Friday, March 16, 2007 10:20 PM
To: comments@louisianacoastalplanning.org
Subject: Cameron Parish

To Whom It May Concern:

I live in Creole, LA and I am still recovering from Hurricane Rita, just like 100's of other residents. You are suggesting raising Hwy 82, 10 feet, I do not support this action. This will affect us residents who are struggling to meet all FEMA criteria for rebuilding, and then you want to trap us in by this action.

I, along with numerous others, suggest you use this money to place rocks and dirt along the coastline to prevent coastal erosion. It worked during Hurricane Rita along Hwy 82 in Johnson Bayou, this is actual facts. This statement is not just an opinion. This is the kind of action that needs to be implemented, not trying to flood us in. We, in lower Cameron Parish, have been fighting to return to our home town.

I love living in Creole, Cameron Parish. I have lived in two other parishes in western Louisiana, and I returned to Creole, because of the lifestyle.

So please, instead of ruining our hometown, please promote the Coastal Resortation by using rocks and sand to restore our coastline. This idea is good for the entire coastline, not just Cameron Parish.

Sincerely,

Holly Hendrix
219 Chad Lane
Creole, LA 70632

3/16/2007 7:36	John Hoffpauir, , 4323 Hearth Street, , Lake Charles, LA, 70605, USA , jrh7@suddenlink.net	I understand that the levee around Big Lake did much to preserve Lake Charles during Hurricane Rita. I also understand this levee incurred much damage due to the hurricane. Why is nothing included in the coastal restoration plan for restoring this levee that worked. It seems to make much more sense to repair something that worked than to build something (a new levee closer to Lake Charles) that has the potential of causing more devasation than preventing it.

2/27/2007 11:27	Bonnie S. Hollier, , 257 Cactus Road, , Duson, La, 70529, USA, Bonnie.Hollier@BakerPetrolite.com	I have family and property in Vermilion Parish and I am very disturbed at the comments that they want a levey north or along the Intracoastal canal. What becomes of families south of the Intracoastal? Are they suppose to stand by and lose everything they have and worked all their lives for? I can't believe people are actually considering this Barbaric suggestion. Why not build a levey below Hwy 82. It's a funny thing, when Galveston, Tx had their Huricane they built a wall which still stands today. And by the way, not 10-20 miles inland. It also didn't take them decades to accomplish this task. The Dutch have a much worse problem than we do, yet they have preventive measures in place. You never see them flooded out or drowning. It's shame that we can't come up with something efficient, effective, productive & safe without people losing their homes, especially when other people can get this done. Are the people in charge that incompetent?

Dewey J Hymel

7575 Bishop Ott Drive, #207 *Baton Rouge, LA 70806*

February 10, 2007

Louisiana Speaks
Dr. Norman Francis, LA Recovery Authority
Governor Kathleen Blanco
Col. Richard P. Wagenaar, District Engineer, Army Corps of Engineers
Congressman Richard Baker
Senator Mary Landrieu
Senator David Vitter

Gentlemen & Madams:

It is obvious that all of your priorities for the Recovery of Louisiana are important! But, you seem to disregard the most important item, which should be a resolution to the problem of "Storm Protection" for the State. The State has no secure future without it!

Everyone seems to want to perform MAJOR activities and MAJOR expenditures to achieve partial and unpredictable amounts of protection from storms. Why not consider simple methods with lower expenditures and greater protection possibilities?

If the Coast of Louisiana was protected from High Winds and Water Surges caused by Storms, many of the problems described in your LA Speaks literature would be solved and much expense would be eliminated.

Please refer to the attached drawing of my proposal to do just that. I propose that the State make arrangements with any and all Construction and Demolition Companies, from across the entire Nation, to acquire and accept donated demolished concrete salvage from their projects, and haul it to the coast of Louisiana. ***Transportation could be by river barges, rail cars, and other large volume methods with costs paid by Louisiana. The material should be free because Contractors usually have to pay to have it hauled off and discarded in some way. It is possible that costs would be shared by the Federal Government.***

I further propose that this material be used to construct a massive Rip Rap "Sea Wall" 20 miles from the Louisiana coast land into the gulf. If this limit is not allowed by our Government or by International Maritime Laws, then decrease the limit to Louisiana's jurisdiction. The Sea Wall should be curved to follow the coast line and should be constructed 200 feet high. with a base of 400 to 600 feet or as per engineering calculations.

Phone: (225) 925-3019 *E-Mail: abcd2460@aol.com* *Fax: (225) 930-0231*

Navigational Lights should be installed & spaced according to International Navigation Requirements.

Navigational Passes should be allowed where necessary and should be kept to a minimum opening width. Navigation Charts be modified for Sea Going vessels. Future Flood Gates might be installed in the Passes.

This single item system would not impact the natural flow of marshes, and wildlife habitats within the 20 miles zone. Salt water flow would still be maintained through the Navigational Passes, only without the constant power of water washing away our shores.

This Sea Wall would halt erosion of our coast line and would give us more time to develop restoration programs. It would completely halt flood surges from storms, and would immediately diminish the wind speeds of storms. As mentioned previously, Flood Gates could be installed at later dates to close off the navigation passes for 100% storm surge protection.

Yes, this would take years to achieve, but it would be better than re-building after every storm and the continued loss of coastal lands. In addition, it would help protect our ports, coastal fishing areas, our inland fisheries, and especially our water related industries.

And, it is an opportunity for us to do something beneficial for our children and grand children and the future of our State and Country.

We would not need stronger levees along the Coast, nor would we need to add to construction costs by modifying the way we build our homes and commercial buildings. We would probably have more development in Flood Prone Areas.

All Insurance premiums should be drastically reduced. And costs of recovery after storms should be minimized.

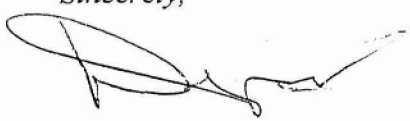
Most of the problems of the people, the businesses, and the wildlife of our State would be solved if this proposal was initiated.

There should be many savings and benefits to the State and to the people who live and work, or own businesses in the coastal areas. And our State might become more attractive to industrial development.

The savings realized from elimination of many conditions and planned construction would surely be obvious when compared to the economical construction costs of a Sea Wall such as this.

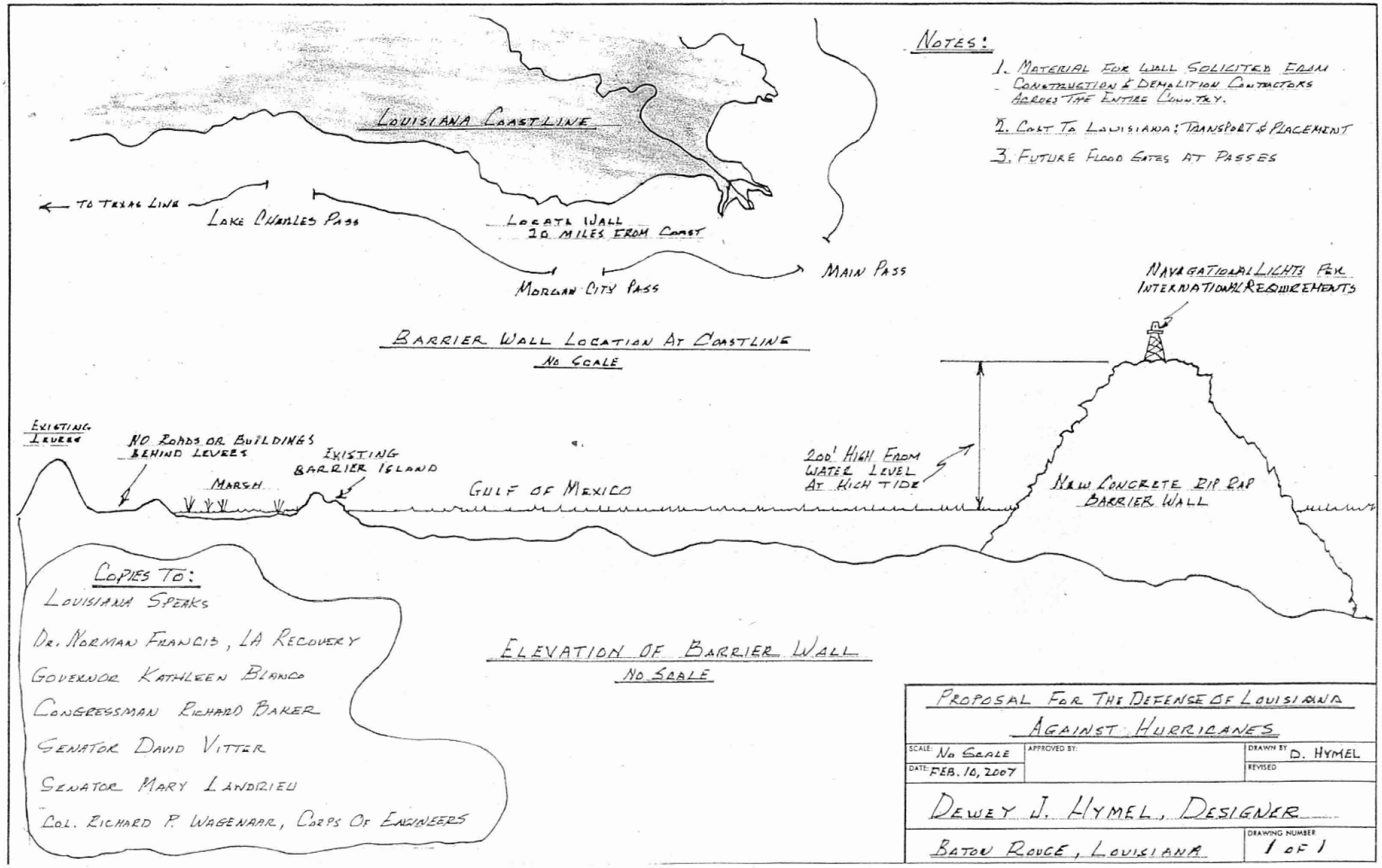
I agree with what you are doing and the reasons you are doing it. I just think that a permanent resolution of protecting the people, the environment, and the land should come first! Then development will follow in more economical terms.

Sincerely,



Dewey J. Hymel

CC: WBRZTV



Notes:

1. Material For Wall Solicited From Construction & Demolition Contractors Across The Entire Country.
2. Cost To Louisiana: Transport & Placement
3. Future Flood Gates At Passes

Copies To:

Louisiana Speaks

Dr. Norman Francis, LA Recovery

Governor Kathleen Blanco

Congressman Richard Baker

Senator David Vitter

Senator Mary Landrieu

Col. Richard P. Wagenaar, Corps Of Engineers

Proposal For The Defense Of Louisiana Against Hurricanes

SCALE: No Scale	APPROVED BY:	DRAWN BY D. Hymel
DATE: Feb. 16, 2007		REVISED

Dewey J. Hymel, Designer

Baton Rouge, Louisiana

DRAWING NUMBER 1 of 1

From: JECSSE1014@aol.com

Sent: Tuesday, March 06, 2007 7:19 AM

To: comments@louisianacoastalplanning.org

Subject: Coastal Planning

I say use of all plans that are done with precision and BALANCE will be the best plans. Most things in nature are balanced and if we do the best to emulate Mother Nature monitoring things like salinity levels, cost levels, and what projects will give us best protection for future Hurricanes.

We can also do research in finding ways to reduce surface sea temperatures to help us reduce the severity of storms. Somehow I feel like if we repair the coast it will lend a hand in lowering coastal sea surface temperatures! We might look at ways to use bottom COOLER waters to somehow be brought to the surface to cool the waters! Maybe using WINDMILL technologies! This all sounds crazy, but it is an IDEA!

3/16/2007 12:34	Jennifer Jones, Jones Law Firm, P. O. Box 1550, , Cameron, LA, 70631, USA, jenjones@camtel.net	I recently attended the public meeting at the Cameron Parish courthouse and would like to thank you for coming to provide us with information on proposed projects for Cameron Parish. I am now aware that the plan has two basic components - coastal restoration and hurricane protection. The consensus of the citizens of Cameron is that we are all in favor of much needed coastal restoration projects; however, there was much dissatisfaction expressed with regard to the hurricane protection project. This project consisted of elevation of La. Hwy. 82. This is a problem because 1) It provides no protection for homes and businesses located south of Highway 82 and 2) the majority of homes and businesses are located ON Highway 82. Elevation of the highway would presumably require expropriation of our property to obtain the land for necessary approaches. While I feel that Cameron is in dire need of hurricane protection, it appears clear that this particular project is not favored by our citizens. Would it be possible to locate a levee on the coast itself. Thank you again for your concern. Jennifer Jones

From: lanjoseph@bellsouth.net
Sent: Monday, March 12, 2007 3:25 PM
To: comments@louisianacoastalplanning.org
Subject: Church builden near road

What will happen to this location in the future? Someone said that the new road would take the property. Address:
2005 Trosclair Road, Cmaron,La. 70631

Rev. Lannis Joseph
(337) 802-4411

3/15/2007 6:49	kirk lebleu, , 1585 oak grove, , grand chenier, la, 70643, cameron,	We need to fix the coastline first. Maybe some rocks and sand.

From: A .M. [oceanlady46@yahoo.com]
Sent: Tuesday, March 27, 2007 1:25 PM
To: comments@louisianacoastalplanning.org
Subject: Raising La 27 & 82

First of all my property is along Hwy 82 . To raise this HWY would mean taking my property. HELL no !!!!

You want my property you will for sure pay me for it . We have two lots .

You want to raise this HWY we want 10,000.00 a lot !!!!!

You can't just take it. It is not yours. We pay taxes on these lots and if goverment think they can just come in and take it . There will be a court fight this I promas you !!!!

Patrick & Audrey Marks
P.O.Box 81
Breaux Bridge, Louisiana 70517

Friends Are A Blessing.
God Bless

Coastal Master Plan

Lillian Miller <lillian@sw.rr.com> **Thu, Mar 29, 2007 at 3:58 PM**
To: CPRA <comments@louisianacoastalplanning.org>

COMMENT ON MASTER PLAN

Although it is wonderful that the state finally has a Master Plan, I was stunned to see how much had changed since it was first unveiled late last year.

I hope you will consider aggressive rebuilding of coast and marsh through pipeline sediment delivery. St. Mary Parish has mountains of sediment waiting to be used beneficially. Terrebonne Parish is starving for sediment not just for restoration but also for Morganza-to-the Gulf. We are talking moving sediment only 20 to 30 miles in this case and pipelines could lie on the banks of Gulf Intracoastal Waterway rather than waiting for right always.

The same technology was used by Corp of Engineers at mouth of Mississippi River and the project proved with flexible pipe sediment could be transported from bottom of the river through a dredge and placed where needed in Plaquemines Parish. See PAST pages on CORP website New Orleans District. March 11, 2003. It should also be transported into Barataria and Terrebonne Basins.

We need medium size diversions. We need to start with Bayou Lafourche at Donaldsonville. The Bayou Lafourche Reintroduction Project. Additionally it would only take about 300 feet of pipe to bring fresh water from Bayou Lafourche in Thibodaux into Bayou Terrebonne. The state said this project would happen without the Corp. It needs to begin immediately.

We need to focus on projects that will not destroy fisheries and the lives of the people who live in lower Plaquemines, Lafourche and Terrebonne.

We do not need a CAT 5 wall across Louisiana. Morganza was designed to go around the ridges where 50% of the people in this parish live.

Donaldsonville to the Gulf should follow the Highway 90...I-49 alignment. Elevate the highway and let water flow underneath. Do not destroy wetlands to south from Larose to Lafitte.

When Louisiana Speaks came to speak to Terrebonne Parish Council in February the spokesman said Lake Charles does not want a 500 year levee. They want coastal restoration in Vermillion and Cameron Parish. I can tell you that many of us in Terrebonne, Lafourche and Plaquemines feel the same way. The people of lower Plaquemines should have the same protection they had BEFORE Katrina.

During the previous 16 years it has been demonstrated that stakeholders can live with medium diversions but even Davis Pond did not ever flow at the rate it was built for and a channel that starts out at 20,000 cfs with the intention of building to 200,000 cfs is going to alter the Sportsmen's Paradis that this state is famous for and destroy our culture and communities. It will be quite a boon for the ship builders who could use another channel from the Mississippi River.

Post Katrina and Rita we cannot gamble on the huge diversions that will wipe out the future of so many people when using a combination of pipeline sediment delivery with medium and small diversions is proven to work and achieve results within the ten year window scientist say we have to accomplish land building success.

The 16 scientists who are against the master plan should be willing to visit the people who live in lower Terrebonne before you plans are made to leave them with no protection. Most of these scientists either live on "the sliver by the river" in Uptown New Orleans or in Baton Rouge or another states and countries.

I would like to suggest if you truly want to understand the people and the hydrology of the Barataria-Terrebonne

basins, sign up to paddle one more days on BTNEP's Paddle Bayou Lafourche Trip. During the day you can experience the bayou and in the evenings you can get to know the culture and taste the food from different regions of the 52 mile journey. www.btnep.org

LillianMiller
200ZieglerAvenue
HoumaLa70360
985-876-1810

As the hands on the clock near midnight 4 2 07

Lillian Miller <lilym@internet8.net> **Mon, Apr 2, 2007 at 10:16 PM**
To: CPRA <comments@louisianacoastalplanning.org>

A message to Coastal Protection and Restoration Authority:

Tonight more than 50,000 residents who reside below the Intracoastal Waterway in Terrebonne Parish are pondering the future of their families and communities. There are thousands of others in Venice, Buras, Port Sulphur, Cut Off, Leesville who along with the residents of Theriot and Bayou Dularge, Dulac, Chauvin, Cocodrei, Montegut and Pont Aux Chenes sit in silence tonight.

We are watching the minute hand marching toward midnight, the cut off point of public comment on the CPRA Master Plan. Many of us are too distressed to look at TV or even read. The destiny of 2 million people are at stake.

Since the very first CAT 5 scoping meeting in Thibodaux in the spring of 2006, the people of the bayou have pleaded not to be cut off the map. How many public meetings does it take. How many eloquent South Lafourche cheerleaders does it take to hear the impassioned plea of the young people whose very future is at stake. In addition to the coast we have had Louisiana Speaks. and MMS scoping meetings. not to mention all the parish council and coastal zone meetings. For those of us who survived the storm, it is beginning to look like we might be in danger of dying by public meetings!

According to the article in Friday's Times Picayune, the CORP wants to have more public meetings.

Since 2000 the Corp has been having public meetings. And when they came to Terrebonne in September 2006 their presentations were a bit more high tech. The handout folder in glossy four color print must have cost a small fortune.

The Corp needs to actually read the studies they have already completed. For instance, the 2,719 page LCA 2004 report.

If you really care about our nation's energy coast or the seafood or the culture, it is critical that sediment start moving in huge amounts in months not years.

When I read the latest version of the CPRA Master Plan I noticed protection of large cities is weighted heavier than protecting the communities that service the oil and gas industries and the fishing communities.

We need to begin implementing projects that have been proven to work and that can provide the quickest salvation for everything below I-10.

Shea Penland suggested in 2003 that unless the people of the bayous came together to cry for help, they would not survive. For the last 19 months in the wake of flooding from Rita they have been coming together in greater numbers.

There is no one on the CPRA board who does not know about pipeline sediment delivery and this EPA study demonstrates that.

Mike Tidwell came to Nicholls State University in April of 2005 and said that unless the people of Louisiana unite and speak with one message, one voice and with one mission, we are all going to drown. WE still have a chance for the clocking is running out. And we are less than 60 days from the next hurricane season.

And until you can make Davis Pond work and get water into Bayou Lafourche, please go easy on big diversions that will take 50 years to build and go with smaller and medium ones that people want and with other solutions we have the workforce to create. There is no state on earth with as many pipeline welders and specialists as Louisiana.

Use common sense. The time for democracy is over. I applaud King Milling for what he told the Corp on Friday. We really do have to implement the restoration methods that are acceptable to greatest number of citizens.

I have spoken to so many people during the last four weeks that have said they would like to write a letter but they are not good with words and many have tried to plow through all the appendixes online at the library computers. It is difficult to skim thousands of pages on line. Much easier to print them out but at what cost for money and in trees! Many of us do not trust the CLEAR models and for thousands of others, they do not even know what "CLEAR model" means.

However, this Master Plan has a 500 hundred year line that they understand the meaning of quite well. It spells death to their communities.

Most people do understand that unless action is taken immediately life as they know it will be history and memory only.

How many people have to die in storms like Katrina and Rita for projects to be implemented?

They would like to invite you to visit Chauvin on April 15th for the Blessing of the Fleet and many other events with music, art and food.

As I was reading public comment of the Master Plan, I noticed a quote at the bottom of one letter.

The Lord does not call the qualified, He qualifies those He calls.

At this point I am not qualified but am hoping with the Lord's

guidance that my words might connect to the hearts of those who read this.

I am speaking tonight for the blue collar workers who have made this a rich blue collar coast. The people who labor in the seafood and the oil patch do it because they love the sea and the oil field.

They know lines are going to be drawn and now that the state has some funding their future is in greater peril by decisions that will be made in next two weeks than by Mother Nature. Or the lack of decision. It is impossible to know which to fear the most:action or inaction. And who would have ever guessed we had more to fear by lawmakers and agencies than from Mother Nature?

These people cannot understand why the oil canals cannot be plugged, the barrier islands restored and the swamps and marshes restored while we are waiting for Morganza-to-the-Gulf. And I cannot believe that the group of scientists waited nearly ten years to find fault with Morganza-to-the-Gulf.

America's Wetlands and Governor Blanco came to Terrebonne High School on August 24th, 2005 to kick off a letter writing campaign. While the lights were still out from Hurricane Katrina (we had a generator but no radio or TV) I wrote a letter to President Bush. I wish I could take the letter back now. In the desperation of the moment, I asked for CAT 5 levees. It would take eight months for me to realize the folly of that request. I wrote that Louisiana had scientists who had the knowledge and technology. I did not know we had scientists that do not care about the people of the bayous.

It is strange because I had come to believe those very people cared about saving Louisiana and now they have united to make sure the coastal parishes are not restored or protected.

L..R. Espinoza-Gala

512 Stevenson Street
Lafayette, Louisiana 70360
337-232-4648

I grew up on Bayou Black and while people talk about what it means to miss New Orleans, i know what it is like to miss the Good Earth, the good earth that is rapidly turning to salt water.

http://www.epa.gov/Region6/6wq/ecopro/em/cwppra/b_dupont/bdupont_proceedings_10_14_03.pdf

From: Darciel Netherland [dnether1@dss.state.la.us]
Sent: Tuesday, January 30, 2007 3:12 PM
To: Louisiana Speaks; comments@louisianacoastalplanning.org
Subject: RE: Louisiana's Recovery

Louisiana Coastal Planning: Please read through entire email. I was referred to your organization by Louisiana Speaks and my question or concern does not appear to have been answered.

Mary (laspeaks@c-pex.org)
I visited the website you suggested. I found one reference to global warming/climate change and sea level rise in a paragraph at this location:
http://www.louisianacoastalplanning.org/news/SERT_recommendations.html.

I did a search in the "Comprehensive Coastal Protection Master Plan for Louisiana Preliminary Draft (with Appendixes A-K)", dated 11-29-06. Searched through most of the appendices. Most of the plans appear to deal with 50-year, 100-year, and 500-year storm surges and levee protection, but does not appear to address the possible larger threat of enormous increases in sea levels regardless of projected time frames.

If all the doomesday predictions about global warming are realized, I doubt our great-grandchildren will be overly concerned with coastal restoration and levee protection.

>>> On 1/29/2007 at 3:10 PM, "Louisiana Speaks" <laspeaks@c-pex.org> wrote:
> Darciel,
>
>
>
> Thank you for your insightful comments. We rely upon the Coastal
> Protection and Restoration Authority's Coastal Protection Master Plan
> for all coastal issues addressed in the Louisiana Speaks Regional
> Vision. Please visit their website to see their plan and ask any
> questions concerning this issue:
>
>
>
> http://www.louisianacoastalplanning.org/
>
>
>
> We've documented your email message, and it will be taken into account
> as our consultants synthesize the results of the Regional Vision Poll.
> Please don't hesitate to contact us with further comments or questions,
> and thank you for your interest in Louisiana Speaks.
>
>
>
> Sincerely,
>
>
>
> Mary
>

>
>
>
>
> Mary Talbot
>
> Center for Planning Excellence
>
> 402 N. Fourth Street
>
> Baton Rouge, LA 70802
>
> T 225.267.6300
>
> F 225.267.6306
>
> marytalbot@c-pex.org
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>
> -----Original Message-----
> From: Darciel Netherland [mailto:dnether1@dss.state.la.us]
> Sent: Tuesday, January 23, 2007 10:32 AM
> To: Louisiana Speaks
> Subject: Louisiana's Recovery
>
>
>
> In all of the discussion regarding Louisiana's Recovery, there has
been
>
> no mention (to my knowledge) of the effects of global warming on low
>
> lying areas of the state.
>
>
>
> I understand the need for Louisiana to recover; however my question
is:
>
>   Are there any long term plans for low-lying areas of Louisiana in
>
> relation to the effects of global warming?.
>
>
>
> It would appear to be defeat all purposes to develop short-sighted
>
> plans, if at the end of the century or thereabouts, rising
sea-levels
>
> would necessitate the wholesale northern migration of south
Louisiana.
>
> To be fair, there hasn't been much discussion at the national level
of
>
> what the nation as a whole would face, but should that be reason not

to
>
> explore the probabilities of such an event? Fortunately, there would
be
>
> more than a week's notice.
>
>
>
> Granted the effects of global warming may never come to pass, but
can
>
> recovery plans really be envisioned and developed without this
>
> consideration? We live the nightmare of the shortsightedness of
>
> building permanent levees on the Mississippi in the 1930's, as
>
> disappearing delta lands attest to everyday.
>
>
>
> Since rising sea levels may or may not be so far distant, global
>
> warming/climate change monitoring should be a permanent state
function.
>
> If events warrant, a knowledgeable and prepared state can direct
>
> well-established plans for Louisiana's low-lying coastal areas and
areas with elevations less than 200 feet.
>
>

3/15/2007 6:18	Elaine Picou, , P.O. Box 455, 131 Pierre St, Cameron, La, 70631, Cameron, epicou@hotmail.com	If we do not take care of the coastline before a highway is redone the erosion will be eating at the new road before you know it. I think we need to put some rocks and pump sand in the area to build up the coast. It's working in Holly Beach and Johnson's Bayou. A new road of 12' will make everyone move from Cameron Parish. There won't be a safe place left from flooding. Cameron, La. is vital to the USA. We supply oil and gas, seafood, menhaden, trapping, farming and cattle. Please don't put a nail in our coffin. We just lost everything to Hurricane Rita and our land is all we have left. The Governor of La is begging people to come back and now it looks like ya'll are trying to push us out. I was born and raised right here 58 years ago and I'm not going anywhere. I'm here to live and work. My land is not for sale. Thanks.

Comments for Master Plan

Allison Prendergast <allicat1214@cox.net> **Mon, Apr 2, 2007 at 4:47 PM**
To: La Coastal Planning Comments <comments@louisianacoastalplanning.org>

There are so many duplicative efforts regarding coastal restoration.... who's in charge? The Corps of Engineers, CIAP, CWPPRA, etc. It's an alphabet soup of commissions. It's time for action!

And while all of these groups are meeting and seeking public comments, the wetlands keep getting destroyed.

There should be a moratorium on CUPs for residential development in wetlands. While your group began touring the state to present the master plan, public comments were opened on a public notice from Willowridge Estates LLC to develop Phase VI (WR6) of the neighborhood. This would destroy 80 acres of wetlands and put an additional 200 homes in low-lying areas near coastal lakes **in an area where there has been a decade-long fight on levee alignment and is still without any hurricane protection levee.**

Willowridge Estates LLC: CUP#P2006-372 and MVN#2006-3898-EFF

Public Notice - http://www.mvn.usace.army.mil/ops/regulatory/pdf/2006-3898JPN.pdf
Drawings of neighborhood layout, subsurface drainage, etc. - http://www.mvn.usace.army.mil/ops/regulatory/pdf/2006-3898%20dwgs.pdf

Levee and subdivision CUPs intertwined
This area is involved in a decades long dispute on placement of a hurricane protection levee for the west bank of St. Charles. The parish submitted its most recent permit request (see attached - wr20042101 St Chas Levee.pdf) 3 years ago to the Corps for the Willowridge 6 “ring levee alignment” allowing the development of WR6. It’s been three years and no permit has been issued. In fact, Roger Swindler (Roger.D.Swindler@mvn02.usace.army.mil), Corps of Engineers' manager for this project, said recently, there is “no accepted alignment for this levee.” At a COE public meeting Tuesday on its comprehensive levee protection for the New Orleans metro area, St. Charles Parish President Albert Laque expressed continued frustration at the ongoing dispute between the parish and COE on the west bank levee alignment. In fact, there was no levee protecting the west bank of St. Charles illustrated on any on map displayed at the meeting at all. The maps did not even indicate either the parish nor the corps' alignment for the long-discussed west bank levee which has already begun construction at the western end. Mr. Laque expressed frustration about this at those hearings. He apparently is now abandoning the parish’s ring levee requested alignment and told Corps officials: **"Tell us where you want it, and we'll build it.”**

Rathborne CEO: Cat 5 levees in Jefferson/flood protection top priority ??
Another key figure in this issue is Willowridge developer Rathborne’s CEO Cokie Rathborne, who also apparently believes hurricane protection is a top priority. As president of the Jefferson Business Council, he signed a letter to Governor Blanco in December 2005 which stated:

> **Protecting the lives and property of our citizens from flooding must be this State's highest priority. … Louisiana needs to send an immediate, powerful, and unequivocal signal to the nation that politics-as-usual is over. (http://www.allamericanpatriots.com/m-news+print+storyid-13966.html)**

Rathborne also said in a *Times-Picayune* article last June (http://www.nola.com/news/t-p/frontpage/index.ssf?/base/news-5/1149487051100370.xml&coll=1) that Katrina made everyone more aware of our vulnerability. The article also said he is chairman of Jefferson Parish’s committee to investigate **Category 5** hurricane protection for that parish, which already has levees. While studying cat5 levees for Jefferson residents, Mr. Rathborne can actually help make **basic** hurricane levee protection a reality for St. Charles residents, sooner rather than later. His company owns much of the land necessary to locate the long-discussed Willowridge section of the west bank levee. And his post-Katrina actions indicate he is very

concerned about hurricane protection ….surely this concern extends to St. Charles Parish, where his companies have *already been* **very** profitable. Someone needs to hold Mr. Rathborne accountable to his statements.....what's good for Jefferson Parish is good for St. Charles!

With the key players getting on the same page regarding the levee, maybe it's time for a hurricane summit with key players involved in the levee! It's definitely **NOT** time to place a new subdivision in this area.

NO Metro vs. St. Charles?
One of The Corps' self-described "most urgent projects" may protect Orleans and Jefferson Parishes, but will potentially harm other parts of the Barataria Basin. The West Bank and Vicinity Hurricane levee project – which essentially builds a wall of protection across the west bank from Avondale to Algiers – will prevent storm surge coming up from the Gulf through the Barataria Basin from moving north and east. Therefore, this surge will flow west into St. Charles and Lafourche parishes. New residential development without hurricane protection should not be placed in the path of this surge.

Public Notice to adjacent land-owners was incomplete; public comment details omitted
The second page of the joint public notice on WR6 was not included in the packet mailed to adjacent land-owners. This page explains in detail how to make a public comment to each of the agencies involved and the deadlines for doing so, as well as stating the fact that anyone has a right to call for a public hearing on this matter during the 30-day public comment period which began 2/17/07. The General Counsel to the DNR said in a letter to me (see attached - dnrlettome.doc) that this wasn't a problem because it was only a **courtesy copy** of the official public notice and there was a paragraph about public comments included. In a state that is consumed with coastal restoration efforts, it is disappointing a. that only adjacent land owners are required to be notified about this type of project and they apparently don't need to know the entire public commenting process; and b. there appears to be no concern to ensure that residents are aware of a wetlands destruction project in their back yard. It would appear that the state and corps of engineers is continuing its "business as usual" approach to granting CUP permits, rather than ensuring that all coastal activities get full scrutiny.

Business as usual in Louisiana?
Again in this post-Katrina environment with the numerous public campaigns to restore wetlands and improve hurricane protection, and **asking for billions of tax dollars to do so**, it is just outrageous, and frankly embarassing, that this proposal to destroy 80 acres of wetlands for a private residential development is even being considered. This is outrageous and indicative of Louisiana's old-time politics. And that is not what we need while asking for billions of federal dollars for our state.

WR6 to impact federally protected areas
The proposed neigborhood is slated to be placed immediately adjacent to a Preservation Area described in a federal Consent Decree. Willowridge Estates and Rathborne Land Company were fined $620,000 in civil penalties for illegally clearing and filling wetlands for the Willowridge subdivision Phases IV and V - as part of Civil Action No. 99-3489 (USA vs. Willowridge Estates and Rathborne Land Co.). The mitigation for illegally filling in wetlands in Phase IV-V was creation of the "Preservation Area" which includes 373 acres of high quality forested wetlands adjacent to Willowridge Phases V and VI. The Consent Decree states, "Defendents [Willowridge Estates, LLC and Rathborne Land Company] shall not take any action inconsistent with the preservation of the area covered by the conservation servitude . . . in perpetuity in its natural condition, and shall not mow, cut, clear, cultivate, dredge, excavate, farm, fill, dewater drain or otherwise disturb the Preservation Area in any matter whatsoever." (Civil Action 99-3489, Sec G, Mag. 1.) The Consent Decree was signed by the Corps, EPA, Dept of Justice, and the Defendants and ordered by the Court on Feb. 11, 1999. The Consent Decree is quite clear that any leveeing or change in hydrology would be in violation of the court order. WR6 development must be 5' elevation, much higher than the elevation of the Preservation Area, thus runoff from the development will no doubt impact these federally protected wetlands.

The LA DNR and the Corps of Engineers are the agencies charged with protecting our coast and our

residents from flooding. We need to keep them to their charge, stopping them from permitting this neighborhood development and encouraging them to permit their alignment of the levee which will provide much needed protection to St. Charles residents!

Sincerely,
Allison St. Pierre Prendergast
623 Willowdale Blvd
Luling, LA 70070
985-331-0596

2 attachments

dnrlettome.doc
278K

wr20042101 St Chas Levee.pdf
256K

State of Louisiana

KATHLEEN BABINEAUX BLANCO
GOVERNOR

SCOTT A. ANGELLE
SECRETARY

DEPARTMENT OF NATURAL RESOURCES
OFFICE OF THE SECRETARY
March 27, 2007

RECEIVED
2007 MAR 28 PM 3:31
COASTAL MANAGEMENT
DIVISION

Allison J. Prendergast
623 Willowdale Blvd.
Luling, Louisiana 70070

Subject: Coastal Use Permit Application, P20060372
Willowridge Estates, LLC
Proposal to develop 83.8 acre subdivision
St. Charles Parish, Louisiana

Dear Ms. Prendergrast:

Thank you for your letter (via fax) of March 13, 2007. We are also in receipt of a copy of your faxed letter to Governor Blanco dated February 26, 2007.

The Department of Natural Resources appreciates the efforts of concerned citizens such as yourself in helping us meet our mandate to develop and implement a coastal program which is based on consideration of Louisiana's resources, the environment, the needs of the people of the state, the nation, and of state and local government.

I apologize if your copy of the public notice did not include the page describing the public comment process. However, the information you received was not the official public notice but a courtesy copy of the public notice which we routinely send to persons listed as adjacent landowners in permit applications. However, the fourth paragraph of the first sheet provides information concerning the official public notice period:

> The official date of the beginning of the public comment period for Coastal Use Permit and Water Quality Certification applications begins on the date of publication of the notice in the official state journal (The Advocate), in accordance with the Rules and Procedures For Coastal Use Permits, §723.C.5.c. The Coastal Management Division will inform interested parties of the exact date of publication on request.

I can assure you that the application for this proposed subdivision will undergo a thorough evaluation of the activity's conformance with the Louisiana Coastal Resources Program's coastal use guidelines. A component of that review will be a complete review

LEGAL DIVISION
P.O. BOX 94396 • BATON ROUGE, LA 70804-9396 • 617 N. THIRD STREET • 12TH FLOOR • BATON ROUGE, LA 70802
PHONE (225) 342-2614 • FAX (225) 342-2707 • WEB http://www.dnr.state.la.us
AN EQUAL OPPORTUNITY EMPLOYER

and evaluation of the benefits and impacts likely to occur as a result of the proposed activity.

Should you have additional comments or concerns about this proposal, please continue to coordinate with Mr. Jay Pecot at 225/342-0884, 1-800-267-4019, or Jay.Pecot@la.gov.

Sincerely,

Isaac Jackson
General Counsel

IJ/RH/rh

c: Cheryl Shuffield
Jay Pecot

JOINT PUBLIC NOTICE
July 26, 2005*

DEPARTMENT OF THE ARMY
NEW ORLEANS DISTRICT
CORPS OF ENGINEERS
REGULATORY FUNCTIONS
BRANCH
PO BOX 60267
NEW ORLEANS, LA 70160
Phone: (504) 862-2041
Fax: (504) 862-2117

COE REVIEWER:
Barry Obiol

COE NUMBER:
EBB-20-040-2101

STATE OF LOUISIANA
DEPARTMENT OF ENVIRONMENTAL QUALITY
OFFICE OF ENVIRONMENTAL SERVICES
PO BOX 4313
BATON ROUGE, LA 70821-4313

Phone: (225) 219-3018
Fax: (225) 219-3156

DEQ REVIEWER:
Win Webb

WQC NUMBER:
TR-040503-02

STATE OF LOUISIANA
DEPARTMENT OF NATURAL
RESOURCES
COASTAL MANAGEMENT DIVISION
PO BOX 44487
BATON ROUGE, LA 70804-4487
Phone: (225) 342-7953
Fax: (225) 342-9439
Email Timr@dnr.state.la.us

CMD REVIEWER:
Tim R. Robertson

CUP NUMBER:
P20040453

Interested parties are hereby notified that the Coastal Management Division of the Department of Natural Resources has received the following application for a Coastal Use Permit in accordance with the State and Local Coastal Resources Management Act of 1978, as amended, (Louisiana R.S. 49, Sections 214.21-214.41), and the rules and regulations of the Coastal Resources Program.

Additionally, interested parties are hereby notified that an application has been received by the District Engineer for a Department of the Army permit to authorize the following pursuant to: [X] Section 404 of the Clean Water Act (86 Stat. 816; 33 USC 1344), [X] Section 10 of the Rivers and Harbors Act of 1899 (33 USC 403).

Application has also been made to the Louisiana Department of Environmental Quality, Office of Environmental Services for a Water Quality Certification in accordance with statutory authority contained in the Louisiana Revised Statutes of 1950, Title 30, Chapter 11, Part IV, Section 2074 A(3) and Provisions of Section 401 of the Clean Water Act (P.,O. 95-217).

NAME: St. Charles Parish Department of Public Works
c/o Shread – Kuyrkendall and Associates, Inc
16000 Justice Ave., Suite 16
Baton Rouge, LA 70816
Attn: Frank R. Stagg

LOCATION: **St. Charles Parish, LA:** Lat. 29-53-24N, Long. 90-21-06 W; Secs. 5, 4, 9, 10 and 3, T14S-R21E and Sec. 40, T13S-R21E; Willowridge Subdivision.

DESCRIPTION: Proposal to construct a 22,080 linear foot hurricane protection levee to provide community protection against heavy rainfall and storm surge events. The levee base width will be 60' along two sections of the levee and 64' along one section of the levee. Approximately 403,274 cu. yds. of material will be excavated from a 70' or 82' borrow canal, to be used for the construction of the levee. The operational structures are as follows: 1) a 495 cfs pump station; 2) Basin Eastside Structure (ten 3'X5' gated culverts); Basin Westside Structure (ten 3'X5' gated culverts); Basin Equalizer Structure (four 48" gated culverts); Peterson Canal Structure (two 36" gated culverts); Levert Pond equalizer Structure (one 36" culvert); Levert Pond Drainage Structure (two 36" gated culverts). The total work area for the levee will be 190' and the work area for the berm will be 40'. Also, proposal to upgrade and refurbish an existing 2,800' berm, consturction of a new 2,700' berm and the degrading of 15,300' of existing levee and 6,900' of existing levee. Approximately 52,622

cu. yds. of material will be displaced during the degrading of the two existing levee sections. The following is the proposed Operations Plan:

I. NORMAL OPERATIONAL CONDITIONS

Normal operational conditions are considered to be a rainfall storm up to a 25 year event and tides below elevation +2.0 NAVD88.

Subdivision

Normal Water Level (minus) -2.00' NAVD88

Allowable High Water (25 year storm) +0.0' NAVD88

Allowable High Water (100 year storm) +0.5' NAVD88

Basin

Average Annual Tide (normal) +1.0' NAVD88

Average Annual High Tide (plus)+2.0' NAVD88

Pump Station – Operational (pump off elevation) (minus) -2.0' NAVD88

Basin Eastside Structure – Closed

Basin Westside Structure – Closed

Basin Equalizer Structures – Open

Peterson Canal Structure – Closed (opened at discretion of DPW)

Levert Pond Equalizer Structure – Open

Levert Pond Drainage Structure – Closed

II. Emergency Operational Conditions

Emergency conditions must return to normal conditions when conditions for operation cease.

Notification and Documentation to USACOE-NOD

Subdivision

Normal Water Level -2.0' NAVD88

Allowable High Water (100 year storm) +0.5' NAVD88

Basin

Allowable High Water (Tide) +0.5' NAVD88

Emergency Drawdown Level +0.0' NAVD88

A. Surge Event -

1. National Weather Service Notice: Hurricane/Tropical Storm Warning for Barataria Basin.

   Pump Station – Operational (Subd: el. -2.0'; Basin: el. 0.0')

   Basin Eastside Structure – Open

   Basin Westside Structure – Open

   Basin Equalizer Structure – Closed

   Peterson Canal – Closed (Open at discretion of DPW)

   Levert Pond Equalizer Structure – Closed

   Levert Pond Drainage Structure – Open

2. High Tide greater then elevation +2.0' NAVD88 w/o NWS notice

   Pump Station – Operational (Subd: el. -2.0'; Basin : el. +2.0')

   Basin Eastside Structure – Closed

   Basin Westside Structure – Closed

   Basin Equalizer Structures – Closed

   Peterson Canal Structure – Closed (Open at discretion of DPW)

   Levert Pond Equalizer Structure – Closed

   Levert Pond Drainage Structure – Closed (Open at Discretion of DPW)

B. Rainfall Event –

1. National Weather Service Notice: Projected rainfall event of 100 year storm for Barataria Basin

   Pump Station – Operational (Subd: el. -2.0'; Basin : el. 0.0')

   Basin Eastside Structure – Open

   Basin Westside Structure – Open

   Basin Equalizer Structures – Closed

   Peterson Canal Structures – Closed (Open at discretion of DPW)

   Levert Pond Equalizer Structure – Closed (Open at discretion of DPW)

   Levert Pond Drainage - Open (Closed at discretion of DPW)

C. Special Operational Event –

1. Events deemed necessary by public works director.
2. Notification and Documentation must be provided to USACOE-NOD

Pump Station – Operational (Subd: el. -2.0'; Basin: el. 0.0')

Basin Eastside Structure – Open/Closed

Basin Westside Structure – Open/Closed

Basin Equalizer Structures – Closed/Open

Peterson Canal Structure – Closed/Open

Levert Pond Equalizer Structure – Open/Closed

Levert Pond Drainage Structure – Closed/Open

IV. Documentation

A. Monitoring of the basin water levels, gate closures, and pumping operations is necessary to insure that wetland habitat values of the basin will not be compromised. A record of each emergency operation is to document the event by storm name, and type, date and time of operation, duration of operation, and lowest interior water levels of the basin.

B. Failure to submit required reports or operate the pumps and structures in accordance with the terms and conditions of this operational' plan could be grounds for permit modification, suspension, and/or revocation.

C. Operations Plan to be administered under Parish Council Ordinance.

Approximately 123.87 acres of bottomland hardwood and cypress tupelo swamp habitat may be directly impacted by this project and approximately 393.55 acres of bottomland hardwood and cypress tupelo swamp may be indirectly impacted by this project.**

Approximately N/A acres of Essential Fish Habitat utilized by various life stages of red drum and penaeid shrimp would be altered or destroyed by this project. This information is provided to initiate federal consultation requirements pertaining to Essential Fish Habitat (EFH) under the Magnuson-Stevens Fishery Conservation and Management Act.

*This date represents the beginning date of the Corps of Engineers public notice period. The official date of the beginning of the public comment period for Coastal Use Permit and Water Quality Certification applications begins on the date of publication of the notice in the official state journal (The Advocate), in accordance with the Rules and Procedures for Coastal Use Permits, §723.C.5.c. The Coastal Management Division will inform interested parties of the exact date of publication on request.

THE APPLICANT MUST SECURE A STATE COASTAL USE PERMIT PLUS A DEPARTMENT OF THE ARMY PERMIT OR A GENERAL PERMIT AUTHORIZATION FROM THE CORPS OF ENGINEERS. INDEPENDENT EVALUATIONS AND DECISIONS WILL BE MADE BY THE COASTAL MANAGEMENT DIVISION AND THE CORPS OF ENGINEERS.

State of Louisiana Coastal Use Permit Criteria

Plans for the proposed work are now on file and may be inspected at the Office of the Coastal Management Division, Department of Natural Resources, State Land and Natural Resources Building, 617 North 3rd Street, Room 1048, Baton Rouge, LA . Written comments, including suggestions for modifications or objections to the proposed work and stating the reasons thereof, are being solicited from anyone having an interest in the matter. Comments to the State of Louisiana, Coastal Management Division must be received within 25 days of the date of official journal publication of this notice. Comments may be faxed to us at (225)342-9439 or may be emailed to us at the email address listed above. All comment letters should contain both the applicant's name and the appropriate application number and should be mailed to the Coastal Management Division, Louisiana Department of Natural Resources, P.O. Box 44487, Capitol Station, Baton Rouge, Louisiana 708074-4487.

The decision on whether or not to issue a Coastal Use Permit will be based on an evaluation of the probable impacts of the proposed activity in accordance with the state policies outlined in R.S. 49:214.22. The decision will reflect the national concern for both protection and utilization of important resources. The decision must be consistent with the state program and approved local programs for affected parishes and must represent an appropriate balancing of social, environmental and economic factors. All factors which may be relevant to the proposal will be considered; among these are flood and storm hazards, water quality, water supply, feasible alternative sites, drainage patterns, historical sites, economics, public and private benefits, coastal water dependency, impacts on natural features, compatibility with the natural and culture setting and the extent of long term benefits or adverse impacts.

Certification that the proposed activity will not violate applicable water and air quality laws, standards and regulations will be required before a permit is issued.

State of Louisiana Water Quality Certification Criteria

In accordance with the Joint Public Notice Agreement between Coastal Management Division and the Office of Water Resources, notice is hereby given that the applicant has applied to the Louisiana Department of Environmental Quality, Office of Environmental Services for a Water Quality Certification in accordance with statutory authority contained in the Louisiana Revised Statutes of 1950, Title 30, Chapter 11, Part IV, Section 2074 A(3) and provision of Section 401 of the Clean Water Act (P.L. 95-217).

Comments concerning this application can be filed with the Office of Environmental Services within ten days of this notice to the following address: Louisiana Department of Environmental Quality, Office of Environmental Services, P.O. Box 4313, Baton Rouge, Louisiana 70821-4313.

Additional information is on file with the above office, and may be inspected at any time between 8:00 a.m. and 4:30 p.m. weekdays. Copies may be obtained upon payment of cost of printing. A final decision on this application will be made within 60 days after publication of this notice.

Corps of Engineers Federal Permit Criteria

The decision whether to issue a permit will be based on an evaluation of the probable impacts including cumulative impacts of the proposed activity on the public interest. That decision will reflect the national concern for both protection and utilization of important resources. The benefits which reasonably may be expected to accrue from the proposal must be balanced against its reasonably foreseeable detriments. All factors which may be relevant to the proposal will be considered including the cumulative effects thereof; among those are conservation, economics, aesthetics, general environmental concerns, wetlands, historic properties, fish and wildlife values, flood hazards, floodplain values, land use, navigation, shoreline erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food and fiber production, mineral needs, considerations of property ownership and, in general, the needs and welfare of the people.

The Corps of Engineers is soliciting comments from the public, Federal, state and local agencies and officials; Indian Tribes; and other interested parties in order to consider and evaluate the impacts of this proposed activity. Any

comments received will be considered by the Corps of Engineers to determine whether to issue, modify, condition or deny a permit for this proposal. To make this decision, comments are used to assess impacts on endangered species, historic properties, water quality, general environmental effects and the other public interest factors listed above. Comments are used in preparation of an Environmental Assessment and/or an Environmental Impact Statement pursuant to the National Environmental Policy Act. Comments are also used to determine the need for a public hearing and to determine the overall public interest of the proposed activity. Comments to the Corps of Engineers must be received up to and including 30 days from the date of the public notice and must be addressed to the Regulatory Functions Branch, U.S. Army Corps of Engineers, Post Office, Box 60267, New Orleans, LA 70160-0267. All comment letters should contain both the applicant's name and the application number.

This notice initiates the essential Fish Habitat (EPH) consultation requirements of the Magnuson-Stevens Fishery Conservation and Management Act. Our initial determination is that the proposed action would not have a substantial adverse impact on EFH or federally managed fisheries in the Gulf of Mexico. Our final determination relative to project impacts and the need for mitigation measures is subject to review and coordination with the National Marine Fisheries Service.

No properties listed in the National Register of Historic Places are near the proposed work. The possibility exists that the proposed work may damage or destroy presently unknown archaeological, scientific, prehistorical, or historical sites or data. Copies of this notice are being sent to the State Archaeologist and the State Historic Preservation Officer.

Our initial finding is that the proposed work would neither affect any species listed as endangered by the U.S. Department of Interior nor affect any habitat designated as critical to the survival and recovery of any endangered species.

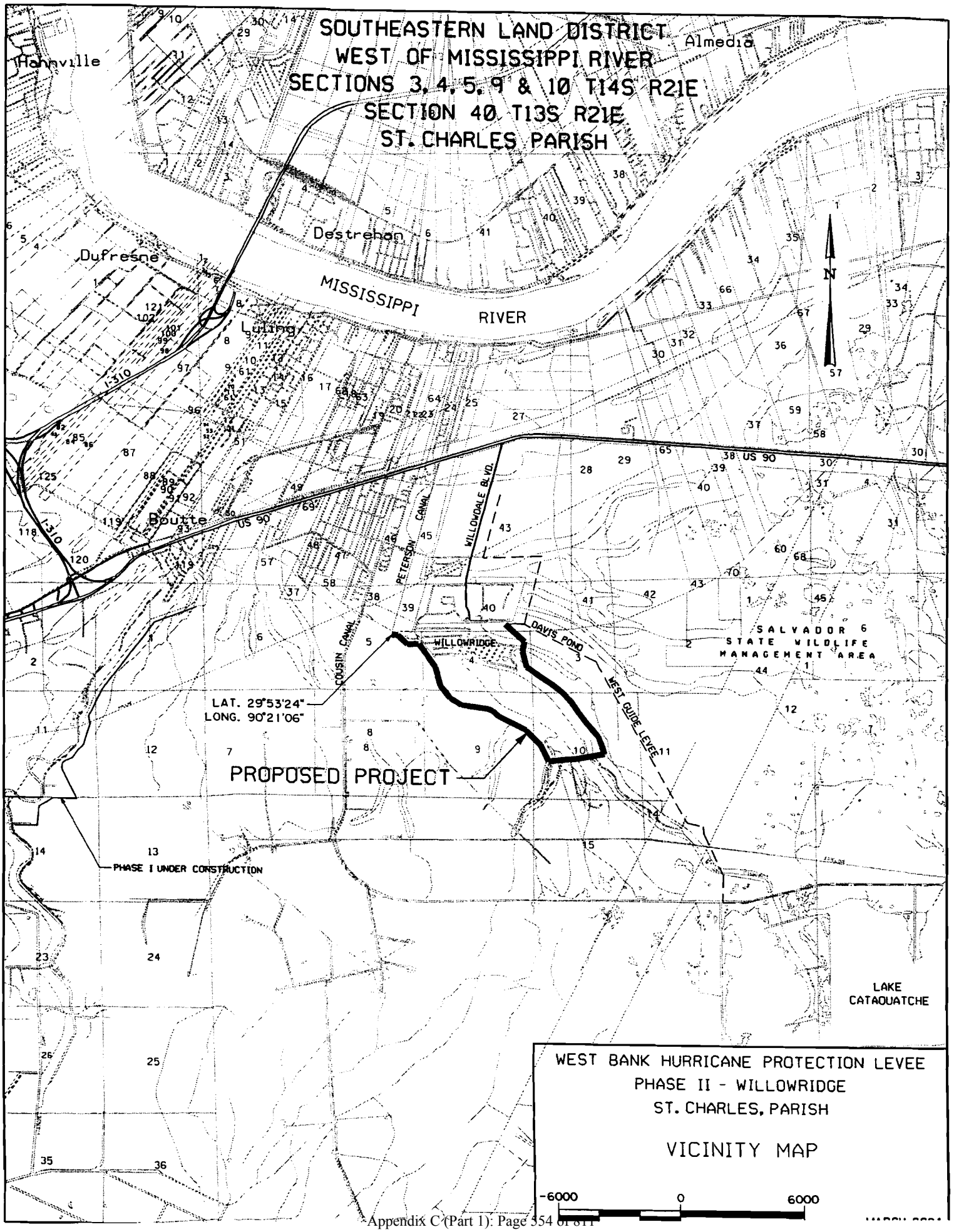
The applicant has certified that the proposed activity described in the application complies with and will be conducted in a manner that is consistent with the Louisiana Coastal Resources Program. The Department of the Army permit will not be issued unless the applicant receives approval or waiver of the Coastal Use Permit by the Department of Natural Resources.

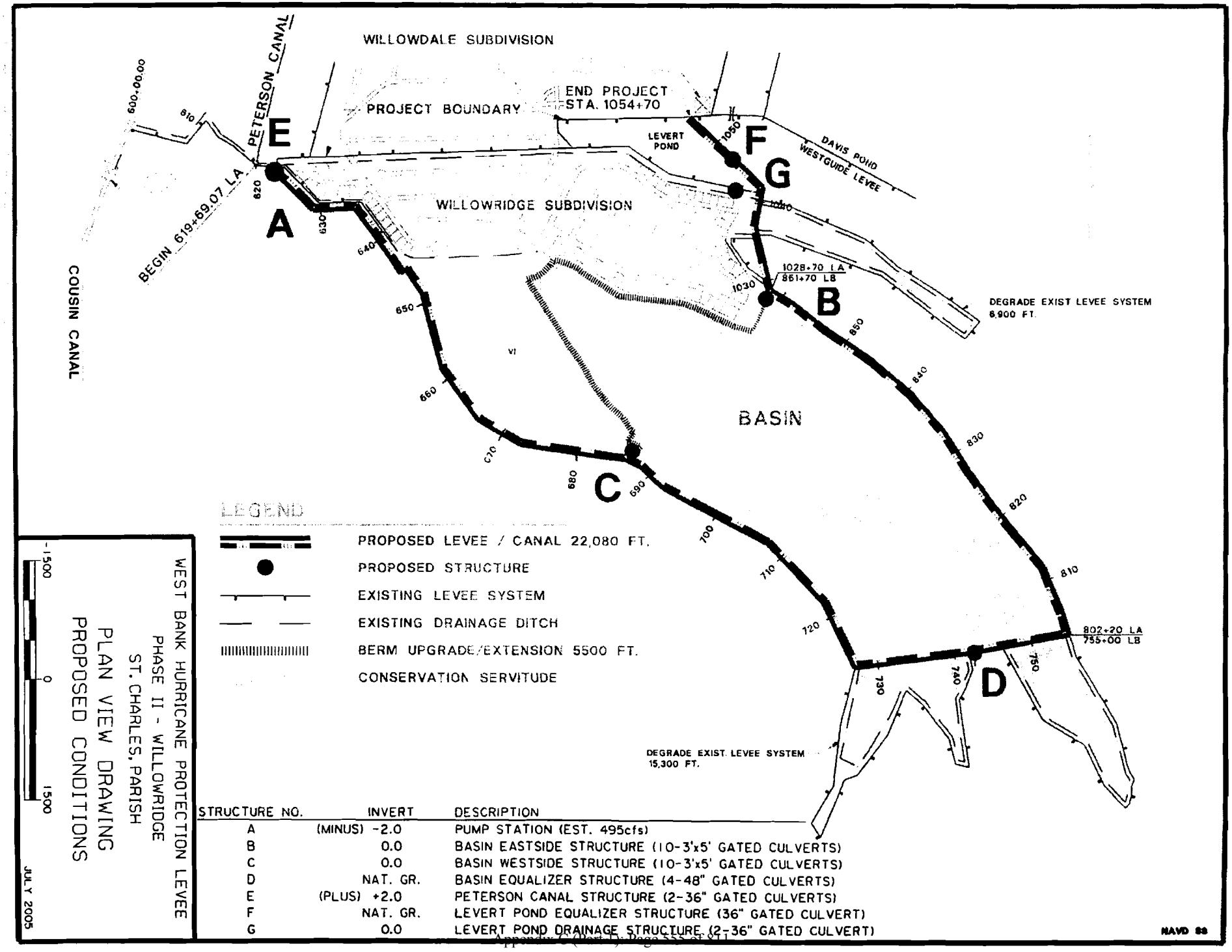
If the proposed work involves deposits of dredged or fill material into waters of the United States, the evaluation of the probable impacts will include the application guidelines established by the Administrator of the Environmental Protection Agency. Certification that the proposed activity will not violate applicable water quality standards will be required from the Department of Environmental Quality, Office of Water Resources before a permit is issued.

You are requested to communicate the information contained in this letter to any other parties whom you deem likely to have interest in this matter.

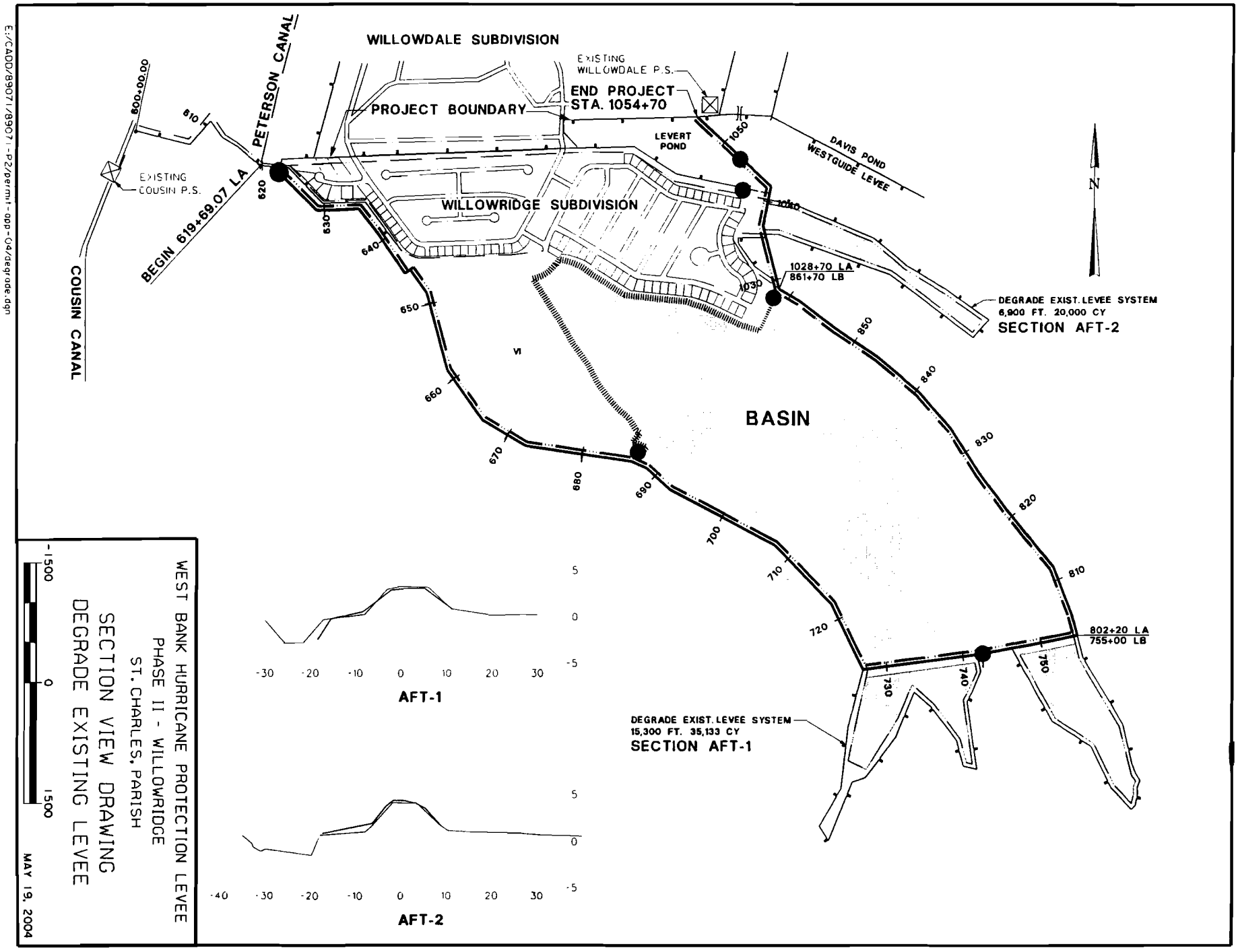
Public Hearings

Any person may request, in writing, within the comment period specified in this notice, that a State or Federal public hearing be held to consider this application. Request for public hearings shall state, with particularity, the reasons for holding a public hearing.


SOUTHEASTERN LAND DISTRICT
WEST OF MISSISSIPPI RIVER
SECTIONS 3, 4, 5, 9 & 10 T14S R21E
SECTION 40 T13S R21E
ST. CHARLES PARISH
Hahnville
Almedia
Destrehan
Dufresne
Luling
MISSISSIPPI RIVER
Boutte
I-310
US 90
WILLOWDALE BLVD.
PETERSON CANAL
COUSIN CANAL
WILLOWRIDGE
DAVIS POND
WEST GUIDE LEVEE
SALVADOR STATE WILDLIFE MANAGEMENT AREA
LAT. 29°53'24"
LONG. 90°21'06"
PROPOSED PROJECT
PHASE I UNDER CONSTRUCTION
LAKE CATAOUATCHE
N
WEST BANK HURRICANE PROTECTION LEVEE
PHASE II - WILLOWRIDGE
ST. CHARLES, PARISH
VICINITY MAP
-6000
0
6000



STRUCTURE NO.	INVERT	DESCRIPTION
A	(MINUS) -2.0	PUMP STATION (EST. 495cfs)
B	0.0	BASIN EASTSIDE STRUCTURE (10-3'x5' GATED CULVERTS)
C	0.0	BASIN WESTSIDE STRUCTURE (10-3'x5' GATED CULVERTS)
D	NAT. GR.	BASIN EQUALIZER STRUCTURE (4-48" GATED CULVERTS)
E	(PLUS) +2.0	PETERSON CANAL STRUCTURE (2-36" GATED CULVERTS)
F	NAT. GR.	LEVERT POND EQUALIZER STRUCTURE (36" GATED CULVERT)
G	0.0	LEVERT POND DRAINAGE STRUCTURE (2-36" GATED CULVERT)

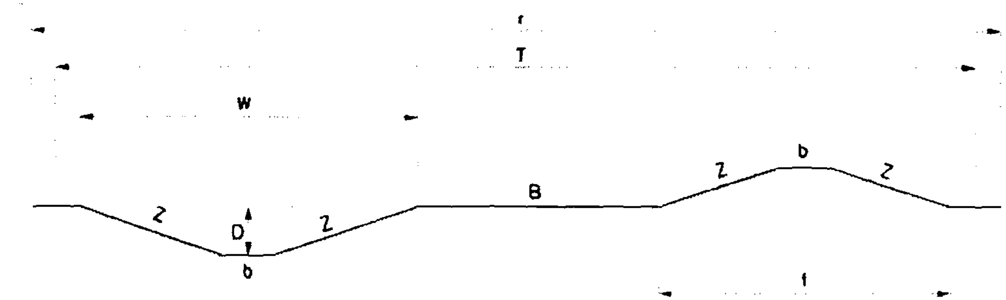

E:/CADD/89071/89071-P2/permit-dgn-04/degrade.dgn
WILLOWDALE SUBDIVISION
EXISTING WILLOWDALE P.S.
END PROJECT STA. 1054+70
PROJECT BOUNDARY
LEVERT POND
DAVIS POND
WESTGUIDE LEVEE
PETERSON CANAL
800+00.00
810
EXISTING COUSIN P.S.
BEGIN 619+69.07 LA
COUSIN CANAL
620
630
640
650
660
670
680
690
700
710
720
730
740
750
WILLOWRIDGE SUBDIVISION
1028+70 LA
861+70 LB
1030
1040
1050
DEGRADE EXIST. LEVEE SYSTEM
6,900 FT. 20,000 CY
SECTION AFT-2
850
840
830
820
810
BASIN
802+20 LA
755+00 LB
DEGRADE EXIST. LEVEE SYSTEM
15,300 FT. 35,133 CY
SECTION AFT-1
N
5
0
-5
-30 -20 -10 0 10 20 30
AFT-1
5
0
-5
-40 -30 -20 -10 0 10 20 30
AFT-2
WEST BANK HURRICANE PROTECTION LEVEE
PHASE II - WILLOWRIDGE
ST. CHARLES, PARISH
SECTION VIEW DRAWING
DEGRADE EXISTING LEVEE
-1500
0
1500
MAY 19, 2004

E:CADD/89071/89071-P2/permit-app-04/prop-levee-sec.dgn

PROTECTED SIDE — COASTAL SIDE

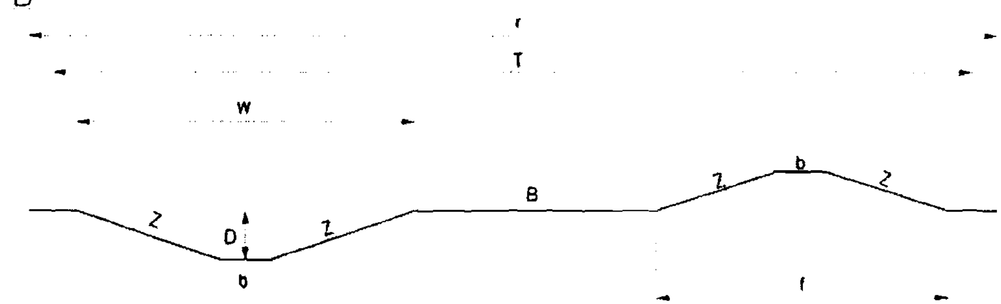
PARAMETERS	A	B
DESIGN GRADE	EL. 7.0	EL. 8.0
OVERBUILD	EL. 8.0	EL. 9.0
r = LIMITS	200 ft	250 ft
W = WIDTH OF CHANNEL	70 ft	82 ft
D = DEPTH OF CHANNEL	10 ft	12 ft
Z = CHANNEL / LEVEE SIDE SLOPES	3h:1v	3h:1v
b = CHANNEL BOTTOM / LEVEE TOP	10 ft	10 ft
B = BERM	50 ft	50 ft
f = LEVEE BASE	60 ft	64 ft
H = HEIGHT OF LEVEE	8 ft	9 ft
T = WORK AREA	190 ft	206 ft

A



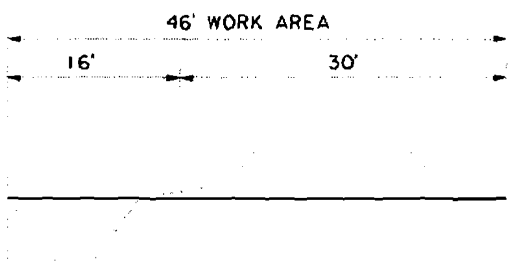
STA. 619+70 TO 686+50
STA. 1028+70 L.A. TO 1054+70

B

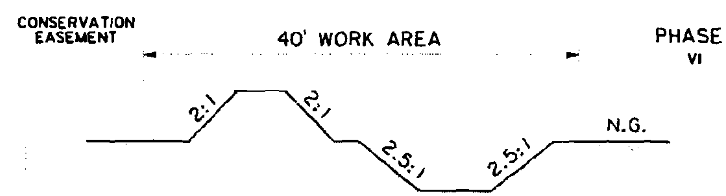


STA. 686+50 TO 861+70 L.B.

TYPICAL LEVEE SECTION



TYPICAL LEVEE DEGRADE



TYPICAL BERM EXTENSION

WEST BANK HURRICANE PROTECTION LEVEE
PHASE II - WILLOWRIDGE
ST.CHARLES PARISH
CROSS SECTION DRAWING
PROPOSED LEVEE SECTION

JUNE 2005

From: Helen Ragas [hragas@cox.net]
Sent: Thursday, March 01, 2007 7:09 PM
To: comments@louisianacoastalplanning.org
Subject: Public Comments
Attachments: CAT 5 REVISION.doc

Please include the attached in your public comments.
Thank You, Kenneth Ragas
1311 Holiday Place
New orleans, La. 70114

On March 9, 2006 I attended the scoping meeting for the Category 5 Louisiana Coastal Protection & Restoration Project (LACPR). The following is an edited version of the items that I submitted by email for inclusion in the study. All of the maps on display at the meeting suggested levee designs excluding lower Plaquemines Parish.

(1.) Construct free flowing spillways from the river to the marsh along the entire west bank of the river in Plaquemines Parish. The spillways would be sized and spaced to accommodate tidal surge created by storms and act as relief valves to prevent over toping of our present CAT 3 levee system. They would be contained by side levees constructed using the material taken from the river and back levees when they are removed. The spillway floor would also be used as a borrow source requiring no truck transportation of borrow. They would by similar to the Bonne Carre spillway without the dam structure on the river end. These spillways would be of great benefit by serving as large river diversions during high river thereby aiding coastal restoration. The present borrow pits being dug to restore the levees to CAT3 status could be sites for the spillways if they fit into the design criteria. These spillways may also be designed to utilize the present drainage pump system. Elevated highways would have to be built across the spillways. The Myrtle Grove Diversion project is in the funding stage and material that is being dug from that channel is presently being used to raise the levees. A bridge spanning the diversion canal is included in that project. A widened version of the proposed channel at that location may fit into the spillway concept and a portion of the money for it has been already allocated. A planned diversion below Fort Jackson may also be converted into a large spillway. Now is an excellent opportunity to do this. Buyouts or relocations will have to be done in those areas chosen for a spillway site. The property value of the remaining inhabited areas may increase if this plan works. As we all know the sport fishing industry is rebounding and Venice will remain to be the center for that industry as well as seafood and oilfield related activities.

(2.) Enhance the present approved CWPPRA projects for the restoration of the barrier islands from Sandy Point to Grand Isle by increasing their height, utilizing rock armoring for erosion prevention, and restricting the number of access channels. This would form a surge barrier from the Gulf of Mexico. The proposed method of obtaining the necessary material for this project is via pipeline from the river. This method should be used wherever possible since it is the quickest way of restoring our coastline and an endless supply of material can be dredged from the bottom of the river. Dredging holes in the river forms sediment traps that continuously fill with new material. The volume of trapped sediment does not have to be dredged out of the river passes at its mouth thereby reducing the cost of that operation.

(3.) Reconstruct the east bank river levee from Bohemia to Baptiste Collette Pass; this would serve as surge protection from the Breton Sound area where Katrina surge emanated. The present approved CWPPRA river diversion project south of Ostrica needs to be canceled and funds for that project used to rebuild the east bank levee. The area on the Breton Sound side of the new levee should be filled with dredged material from the river to further buffer storm surge.

Kenneth Ragas

From: Ken [Kjramagost@cox.net]
Sent: Wednesday, February 21, 2007 7:04 PM
To: comments@louisianacoastalplanning.org
Subject: Possible addition to Master Plan
Attachments: lf1.JPG

I believe an important addition in underlined blue to an excerpt listed below should be:

Because of the increased velocity of the river above the diversions what erosive effects and undercutting of river bank will be realized?

Or a similar statement that is not so dramatic.

I believe the above statement is *critical* because Donaldsonville north will be affected by the higher velocities. The total added flow rate of about 21 diversions listed at Donaldsonville and below is a drop in resistance of the river flow and the energy that would be absorbed by present river flow downstream of Donaldsonville will be partially transferred above Donaldsonville increasing chances of undercutting levees above Donaldsonville. About a mile south of White Castle there is a whirlpool the size of a football field during flood conditions. The undercutting has almost reached the levee and will it continue? I know the CORPS is filling in the undercut with large rocks but is this the answer to stop higher velocities with even larger whirlpools? Please see link to 3 pictures of whirlpool near White Castle location but whirlpool may not be present because picture may have not been taken during flooding.

http://members.cox.net/pfsfst/White%20Castle%20whirlpol.doc

Also attached a picture taken about 20 years in Darrow when the levee fell in.

Ken Ramagost

****

....What questions remain? We need to know more about the effects of coordinated use of diversions. How much sediment can we expect to move? What effects will this have on habitat? Will we take too much water out of the Mississippi River and make it difficult to meet flood control, navigation, and water supply needs? Twenty-five years from now, after we have seen the results of climate change on such factors as sea level rise, what size diversions will we need to meet the sediment and water resource needs of the coast?...

Integrated Ecosystem Restoration and Hurricane Protection:

Louisiana's Comprehensive Master Plan for a Sustainable Coast

http://www.louisianaspeaks.org/cache/documents/28/2823.pdf

Please see page 48 for a list of diversions

Please remember ***I am not an expert*** and this is ONLY my thoughts which may be INCORRECT. Experts in the subject mentioned above can conclude if part or all of my thoughts or rough calculations are correct.

From: Ken [Kjramagost@cox.net]

Sent: Sunday, February 25, 2007 8:57 AM

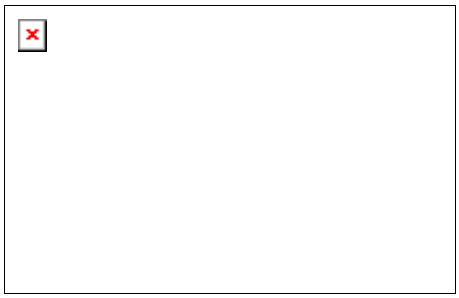
To: laspeaks@c-pex.org; Julie.T.Morgan@mvn02.usace.army.mil

Cc: comments@louisianacoastalplanning.org; Teague.Kenneth@epamail.epa.gov; Heidi Hitter

Subject: Fw: Change wording from 'flows' to 'velocities', Re: One solution stopping flows off the Continental shelf Re: Possible addition to Master Plan

Attachments: Hydraulic stability Major diversions.JPG

Hello,
Revised wording from 'flows' to 'velocities'.
Regards
Ken Ramagost
http://members.cox.net/pfsfst/Hydraulic%20stability%20Major%20diversions.JPG



From: Ken [Kjramagost@cox.net]

Sent: Tuesday, March 06, 2007 8:04 PM

To: laspeaks@c-pex.org; Julie.T.Morgan@mvn02.usace.army.mil

Cc: ldoiron@ibervilleparish.com; comments@louisianacoastalplanning.org; Teague.Kenneth@epamail.epa.gov; Heidi Hitter

Subject: Removal of unwanted past Mississippi River dynamics

Attachments: Hydraulic stability Major diversions.JPG

I read the Draft Master Plan and want to review some thoughts. Allowing the Mississippi river to bring settlement to South Louisiana as done in the past is very good and I am excited about the plan. The land building, nourishment for fishing, removing the deadzone ...etc. is a needed and can be accomplished. One needs to also review all of the effects of the Master Plan. A complete reversal to the past before there was levees also needing review. The diversions may allow complete reversal and there is one aspect to past river dynamics that, I believe, will follow this reversal. Past river dynamics also created undercutting of peak meander points on the river with oxbow lakes eventually being formed. The Master Plan may bring this unwanted river dynamic along with the diversions and the intent to bring the river to past conditions must be tempered with some variables held constant at values close to present values. One variable is river height associated with a flow. If the river height is allowed to drop too much then river velocities above Donaldsonville will increase and follow past conditions with this unwanted river dynamic (Undercutting of peak meander points) coming to pass.

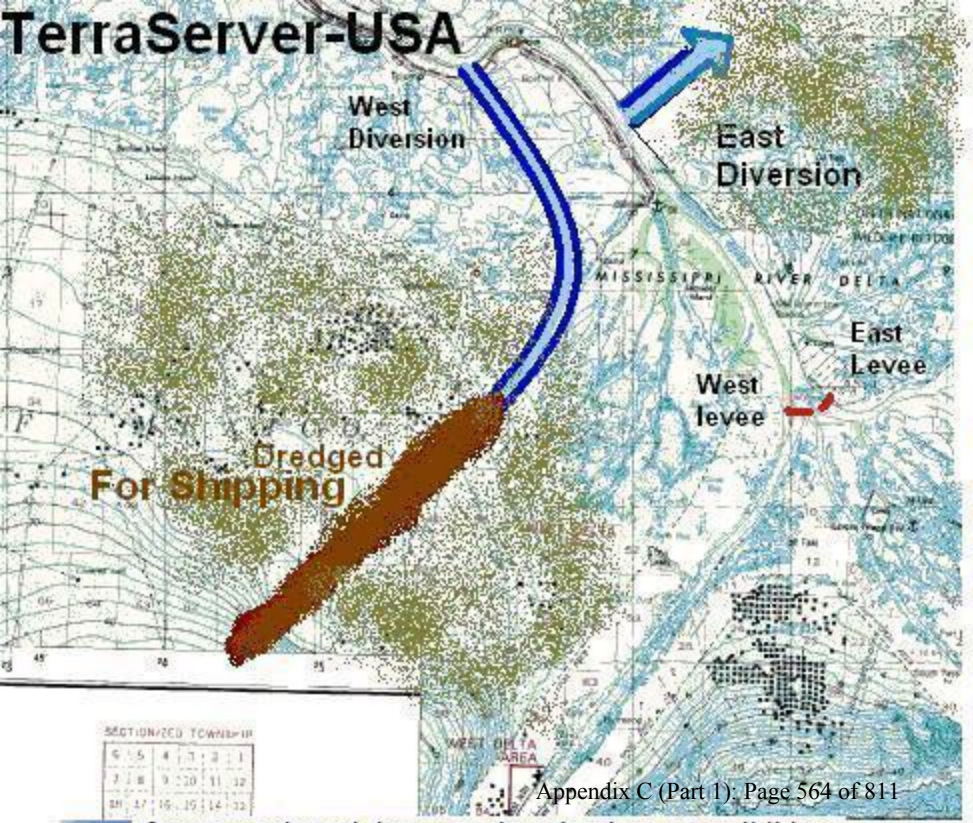
How can this unwanted river dynamic be controlled? In effect how can the river height be held about constant to present conditions. Attached is one way to do this and I have shared other methods in the past but the attached example seems to me very promising.

Essentially, I believe, we need a river with Hydraulic pressures (Height) at Donaldsonville that does not change from present to future Master Plan diversions. This can be accomplished by the Hydraulic Stable (HS) attachment because:

- The HS has essentially no change in river pressures upstream of HS installation
- The HS shuts off present river flow of the Bird Foot Delta allowing diversion flows to flow the amount being shutoff.
- The two Bullets above will essentially accomplish post Master Plan river height at Donaldsonville equal present river height for same flow conditions.

Thanks
Kenneth Ramagost

Please remember to expand the attachment and it will be readable.



Hydraulic stable diversions
Sequence of installation:

1, Install West diversion and East levee and commission at same time to keep upstream of West diversion with essentially same hydraulic water level.
2. Allow West diversion to transition for shipping.
3. After shipping has stabelized with 100% on West diversion proceed with step 4.
4. Install East diversion and West levee and commission at the same time.

Full shutoff of river flow to the Continental shelf and this will allow for all 16 river diversions with same hydraulic river height below Donaldsonville with no concern of faster river velocities above Donaldsonville and faster errosion of meander points.

One example and there may be other better possiblities

From: Wade Rathke [chieforg@acorn.org]
Sent: Saturday, March 10, 2007 8:22 PM
To: brad@olivierproductions.com; info@nolanrp.com; CWLewis@cityofno.com; OMThomas@cityofno.com; AFielkow@cityofno.com; chmorrell@cityofno.com; SHead@cityofno.com; SMidura@cityofno.com; JCarter@cityofno.com; laspeaks@c-pex.org; micheled@dnr.state.la.us; comments@louisianacoastalplanning.org; comments@louisianarebuilds.info; sbingler@concordia.com; benj@gnof.org; cshea@rockfound.org; romigm@peteramayer.com; kayla@cabl.org; erwin@cabl.org; desselle@cabl.org; info@cabl.org; alan@thinknola.com; laacornno@acorn.org; websen@legis.state.la.us; info@louisianarecoveryauthority.org; larep091@legis.state.la.us; larep058@legis.state.la.us; larep101@legis.state.la.us; larep028@legis.state.la.us
Cc: Beth Butler
Subject: Re: Problems with Road Home Rental program -I am kicking out my tenants

What a mess! We will take a look and see what makes sense

Wade Rathke

Wade Rathke, Chief Organizer
1024 Elysian Fields Avenue, New Orleans, LA 70117
504-943-8864/0044x101 -- 944-3157 fax

-----Original Message-----
From: "brad@olivierproductions.com" <brad@olivierproductions.com>
Date: Sat, 10 Mar 2007 20:12:13
To:info@nolanrp.com, CWLewis@cityofno.com, OMThomas@cityofno.com, AFielkow@cityofno.com, chmorrell@cityofno.com, SHead@cityofno.com, SMidura@cityofno.com, JCarter@cityofno.com, laspeaks@c-pex.org, micheled@dnr.state.la.us, comments@louisianacoastalplanning.org, comments@louisianarebuilds.info, sbingler@concordia.com, benj@gnof.org, cshea@rockfound.org, romigm@peteramayer.com, kayla@cabl.org, erwin@cabl.org, desselle@cabl.org, info@cabl.org, alan@thinknola.com, chieforg@acorn.org, laacornno@acorn.org, websen@legis.state.la.us, info@louisianarecoveryauthority.org, larep091@legis.state.la.us, larep058@legis.state.la.us, larep101@legis.state.la.us, larep028@legis.state.la.us
Subject: Problems with Road Home Rental program -I am kicking out my tenants

Hi ,
 I am a small business trying to come back. The way the Road Home Rental Program is designed, i must KICK OUT my tenants to qualify, (per the application). If there are hundreds (or thousands ?) of people in my position, kicking out dozens (or more) tenants each, this will create (another) housing fiasco ! Below is my story... I own a few multi family properties i had purchased before the hurricane. In reading the small rental program, the application says that the property must be VACANT. To be able to get money from the Road Home program, i have to "KICK OUT" my tenants ? I called and got 2 different answers from the Road Home people. Then, i am still not sure if i will be excepted, or get grant money, so i will loose thousands of dollars a month until someone decides if i am eligible ? AND, i have to kick out all my tenants to the street ? First, this is not legal, i can be sued, i have to give them advance notice. This makes no sense at all. But, i am kicking out 20 people on the street in hopes i will get some money from the program. If hundreds of others do this, i foresee another housing problem for the city. To make this MORE confusing, there is an application to give my "TENANTS" ! How can i have tenants if the property must be VACANT to apply ? If I DO NOT get money from the road home program, i will be selling everything and leaving the state! You can find the reference to the term VACANT here on page 16 (third button) http://www.road2la.org/rental-docs/applicationbook.pdf: <http://www.road2la.org/rental-docs/applicationbook.pdf> The "NOTICE" I am supposed to give my "TENANTS" is on page 32 This is from their FAQ...
---------- Am I eligible if my rental property is already

repaired and occupied? All units from small owners and nonprofit organizations must be vacant at the time of application. Owner occupants may have tenants and we will work with them to ensure that any displacement which occurs is adequately addressed. http://road2la.org/Rental/faqs.htm: <http://road2la.org/Rental/faqs.htm> ------------------------------ I hope this can be addressed, the way it is written is absurd. thank you, Brad Mayeux Urban Renovations Inc. 504-469-2833 504-905-1681

3/15/2007 6:41	Ronald D Rhame, ERA Helicopers llc, 429 Catfish Hut Rd., , DeRidder, La , 70634, Vernon, rdrhame@beau.lib.la.us	I have worked in Cameron parish from 1970 off and on till today-I have seen many changes-The beaches go away people come and go. I've made several storm evacuations and people always came back our beaches don't. Why can't rock reefs be put up as in johnson beach seems to hold the sand better and the picket fences seem to work well also--Look at Miss. coast they pump sand and clean the sand looks real good.

04/03/07 07:09 AM	Leo Richardson, Lake Catherine Civic Assn, CERM Bldg Room 252, 2000 Lakeshore Dr., New Orleans, LA, 70148, USA, lfrichardson@cox.net	We believe that the area bounded by I-10, MR-GO, Rigolets and Chandeleur Is. should be classified as the first and highest priority for fast-track implementation of coastal protection and restoration because of its role in the attenuation of storm surge entering Lake Pontchartrain and the threat thereof to the highest concentration of lives and community infrastructure in Louisiana.

PROPOSALS to the COASTAL PROTECTION AND RESTORATION AUTHORITY; the LOUISIANA STATE GOVERNMENT; the UNITED STATES GOVERNMENT AND OTHER INTERESTED PARTIES

by: MAURICE ROBICHAUX
REVISED: 04-02-07

At the DECEMBER 11th, '06 meeting in HOUMA, LA. during the open house segment of the CPRA's PRESENTATION, I WAS talking to RICKY BROUILLETTE, A MEMBER of the INTEGRATED PLANNING TEAM (C.P.R.A.) when I suggested (at the beginning of my learning experience) the MISSISSIPPI RIVER levees FROM ABOUT MYRTLE GROVE to VENICE BE DISMANTLED, he SAID, if I UNDERSTOOD CORRECTLY, WHEN A PROJECT IS PROPOSED CONCERNING the M.R. BASIN, MEMBERS of the MISSISSIPPI RIVER COMMISSION MUST BE CONSULTED, I SUPPOSE TO MAKE SURE ANY PROJECT PROPOSED FOR the BASIN NOT ADVERSELY effect ANY of the MEMBERS RESPECTIVE STATES. DURING the SAME open house meeting, I later spoke to another MEMBER of the I.P.T. (CPRA), JON PORTHOUSE. He SAID behind the dams of one STATE (ILLINOIS), I think, is YEARS WORTH of SEDIMENT GATHERING. I REALIZED later if the PURPOSE of the M.R.C. is TO SEE NO M.R. BASIN STATE is ADVERSELY effected BY ANY PROPOSED OR built project FOR SAID RIVER BASIN, then CONGRESS'S AUTHORIZATION to have FUNDED AND built the locks AND dams in the RED RIVER, the MISSOURI RIVER, upper MISSISSIPPI RIVER, AND I SUPPOSE other M.R. TRIBUTARIES (AND MAKING the DISTRIBUTARY of the RED RIVER, the ATCHAFALAYA RIVER, A DISTRIBUTARY of the M.R.) has all ADVERSELY effected the M.R. DELTA. WITH ALL these locks AND dams the SEDIMENT load of the M.R. has been REDUCED, leaving INADEQUATE supplies of SEDIMENT to MAINTAIN the HISTORICAL GREATEST EXTENT of the DELTA. IN ADDITION to those WATER CONTROL STRUCTURES, the FUNDING AND

building Also of levees and the condemnation of Bayou Lafourche by the U.S. Congress in 1904 has contributed to the major destruction of the M.R. Delta, obviously making Congress liable for the costs of restoration. Congress was always in the position to refuse to close Bayou Lafourche even if demanded by the inhabitants thereof; much like a medical patient asking a Doctor to assist with the patient's desired Suicide, the doctor must refuse because of his hypocritical oath. As every year, probably, Congress appropriates money to repair and maintain thousands of miles of Inter-State Highways, so too must Congress appropriate monies for the extraction, transportation, and deposition - and return trips, and every few years thereafter - of sediment accruing behind those locks & dams for the restoration of the M.R. Delta. This is why I suggested to the CPRA at the 12-11-06 meeting in Houma, Louisiana, to inquire about getting law professor Jonathan Turley's assistance who represented the U.S. Government employees employed, formerly, at the U.S. military base known as Area 51.

A formula should be proposed establishing a certain percentage of sediment for the M.R. Delta and a certain percentage of sediment for the States thru which the M.R. passes, once the soil is captured by the M.R. System and its entire drainage basin. Since eventually most of the sediment ends up at the delta, and also, because of the ecological processes that occurs with the numerous species dependent on such an eco-system the overwhelming majority of sediment (including that accruing behind the locks and dams) should be allocated to the Mississippi River Delta.

In addition to previous proposals submitted to the parties mentioned above, I think the Gulf Intracoastal Waterway should be

Restored to its originally designed width, all along its length, thereby restoring to the land owners, all along the length of the G.I.W.W, their properties destroyed by the gross negligence and indifference of the U.S. Governments Refusal to maintain said waterway; to restore, also, because boat traffic severely disrupts respective lake habitat, by building artificial rip-rap shorelines thru naturally occurring lakes thru which the G.I.W.W passes; for restoring the habitat of these lakes to their original state before these bodies of water were violated by the penetration of the G.I.W.W. (Please refer to diagrams provided)

And in reference to my proposal of an elevated two-lane highway and elevated two-lane railway track from Venice to approximately Cedar Groves as mentioned in my previous proposal to the above mentioned parties regarding Red Pass, the elevated structures would be occupying the same Rights-of-way as the M.R. levee and highway 23 so as to not require any additional land. Land developers are proposing an idea in the State of Texas so insane, so unbelievable, the only way to describe it is a word Allan Eckert uses in the title of his book Silent Skies: the Incredible Extinction of the Passenger Pigeon incredible. They desire a swath of land a quarter of a mile wide and about 600 miles long. The proposed corridor probably follows a now, obviously, extinct flyway of that unfortunate species. I can't be unfair to the State of Texas by signaling out them alone. The Louisiana State Legislature has passed a resolution a few years ago just as insane; that no town be more than one-half hours drive from any limited access roadway. Just how many square miles of land would this take? They behave as though there is an unlimited amount of land on earth. And

the Roadway demanded is always for the same reason - hurricane evacuation; even people living in Shreveport might want a Roadway built all the way to Montana for hurricane evacuation. But do people ever listen to their own instincts about when to leave their buildings? No, they listen to government officials when the evacuation recommendation is made at the eleventh hour - then everybody is on the highway at the same time. This insane suicidal lust to want to destroy land probably has not been surpassed since the ancient Romans, the Nazis and the Brazilians.

Also, I must reconsider proposals regarding the maps of river diversions I sent to the CPRA. Initially I had the reintroduction of the M.R. into Bayou Lafourche through a man-made channel just east of Donaldsonville and connecting to B.L. just South of this city in order to by-pass the city; and at Thibodaux, by passing this city just east to connect B.L. to Bayou Terrebonne just south of this city. The reason for my reconsideration is due to an article in the Daily Comet Newspaper of 3-30-07 regarding Interstate 49. What's being proposed is just numbing. Here you have the Southern third of Lafourche Parish, Southwestern Jefferson Parish and the eastern half of Terrebonne Parish subsiding and eroding away because of an arrested silt deposition process due to the damnation of B.L. by Congress in 1904, and what does the state legislature propose? A $5.3 billion elevated Roadway. In 1904 a Hurricane Katrina or Rita would most likely have done no damage due to the miles and miles of marsh buffer that once existed. The $5.3 billion for the proposed elevated I-49 must instead be used to rebuild all the marshes as they once were. U.S. Highway 90 was in no way negatively affected (from Raceland to New Orleans) by hurricanes Katrina or Rita. Like I told

Michelle Desjoteis, Jon Porthouse and Senator Reggie Dupre' when it comes to governments expropriating land to destroy land, for example road-building (once a roadway is built, where the actual road is, that land is destroyed for purposes of farming or for wildlife, etc.; in fact much wildlife is destroyed each year from motor vehicles riding on highways) governments salivate at the prospect; however, when it comes to governments expropriating land to actually make or restore land (in this case the restoration of the M.R. Delta) there is an unbelievable amount of timidness. And then you have the placement proposals for I-49 (this attitude is probably the same throughout the state for other highway proposals). To have an individual so cavalierly and with such aloofness request of the various governments for $5.3 billion to build a highway on virgin land, pasture, farmland, forest land because he does not like the amount of traffic near his driveway is just unconscionable. That Americans can be consumed with such arrogance and hubris is a gross understatement. And the crowning perversion of this ethic is the irony that a person could have absolutely no regard for the preservation of what undeveloped land that is remaining but when he owns himself a parcel of land he demands all sorts of property rights-rights. Unbelievable. No, incredible. Does this individual - for a moment, step out of the "America is the center of the universe" mantra - say, "Well, I suppose the D.O.T.D. could make this current highway a limited access highway, that way the legislature would not have to destroy more land for a new highway - land being used by what's left of God's wildlife." No, he doesn't. He probably gave not the least consideration for the remaining undeveloped land, swamps & marshes. So, you have the C.P.R.A. proposing ideas to restore marshes & swamps and what does the

LA. Legislature propose? Building an highway that's going to destroy marshes & swamps or at the very least destroy the solitude that now exists there. Have you ever been in Winona Subdivision (near U.S. 90 & LA. hwy 1, Southeast of junction) when there's just the slightest, and I mean slightest, North wind. The unrelenting noise from motor vehicles. Anyone, I mean anyone, who would want new highways built where there are currently no roadways or highways (or conveyences) is insane and should be committed to an insane asylum. I've said for years we new roadways should be built (many are not even adequately maintained) To compound this you have the state in the spectacle of not wanting to be percieved as an agent of force and compulsion (however, all governments, wherever, are agents of force and compulsion - all come into existance and stay in existance by coretous means (a very violent emotion). ALL governments in the U.S., it appears, would rather build a new highway on land where there's essentially nothing, instead of just relocating (maybe it's because of what President Andrew Jackson did to the Cherokee Indian Tribe and the resulting "Trail of Tears") people or businesses already along an existing highway to widen it or enlarge it. The Amount of land required to relocate these individuals to already developed areas is probably a fraction of the total amount of land wanted for a new highway. This is why I must change my initial proposals of by-passing Donaldsonville and Thibodaux to instead using the original (nature's) complete Route of Bayou's Lafourche and Terrebonne and passing thru Donaldsonville and Thibodaux. I implore Congress please do not, I Repeat, do not provide any funding for the I-49 corridor.

About the man-made lakes idea and their surroundings, mentioned in my first letter to the

aforementioned parties. What I failed to take into consideration when I first proposed this idea was the very thing I would routinely criticize about public parks and the consequences of man yet again destroying what used to be some pristine creation of God (Salton Sea, Owens Lake, the Black Sea). For example, several months ago there was a TV news story documenting the abuse being done to Yellowstone State Park by the hoards of people who trample there. I can only imagine those parks are becoming like John Candy's rental house in the movie Summer Rental when those beach comber passers-by assumed use of the house and subsequently did to the house what all sorts of strange men do to a prostitute's womb. I've never been there to that park, but isn't there all sorts of things: hotels, golf courses, shopping centers, military and industrial complexes, high rise buildings, billions of passenger pigeons, steel mills, nuclear power plants, windmills, oil refineries, thousands of miles of interstate highways; did I say billions of passenger pigeons? Gah, Lee! Just think, if those once magnificent herds of 60 million plains bison did that sort of damage the Great Plains would never have been there (along with the Rocky Mountain Grasshopper and that poor little Eskimo Curlew). What's the use of going to those parks when it's going to be like any other city experience-alot of noise, traffic, pollution, oh, and yes, hoards and hoards and hoards and hoards and hoards and hoards of people? Aren't those parks meant to be experienced as wilderness? But I guess when those parks were made 100 years ago, perhaps those sorts of problems did not exist because there were 200 million FEWER people. To all land developers-or, should I say, professional passenger pigeon hunters-the operative word here is FEWER-200 million FEWER people. A one-child-per family law is decades and decades and decades past due.

The American people must be incredibly stupid not to see land developers as wanting to build

humans right into the RAPA NUI cave and right out of existence. That's why I must retract some proposals I made earlier regarding man-made lakes idea. That NO, absolutely NO, provisions for motor vehicles and in all fairness, NO provision for "primative" camping either. The only structures that should be built in the vicinity of the man made lakes are restrooms; and because of the presence of migratory waterfowl during the fall, winter and spring months, motorized boating should be prohibited.

After the CPRA's meeting of 12-12-06 in New Orleans, I spoke to Mohan Menon, a consultant for the CPRA. When I suggested, pointing to a map, in the event B.H. is reopened to the Mississippi River, instead of going thru Donaldsonville, why not cut a channel (which this idea has been subsequently rendered moot, refer to previous paragraphs) to the M.R. just east of McCall, LA.; to travel that route, he said, would be "straightening" the bayou, and by "straightening" increasing the speed of M.R. water traveling thru B. Lafourche. It was then I was reminded it is slow-traveling water needed for optimum delta building processes. It later occurred to me if with the presence of more meanders in a river system the slower the water travels, what would happen if several meanders are taken out of the river system - as is the case now. Would the increase speed of water in the river make it possible for the river bottom to be cut deeper and deeper? If so, with the river bottom deeper could that make possible a catastroptic failure of the river's natural levee somewhere along its length? If that could occur, what if it happened along the crescent near New Orleans? What could the cost be of not doing anything? Which is why I'm putting to your consideration the reintegration of several "ox-bow" lakes into the M.R. system. (Examples are in maps I've provided) The reintegration of some "ox-bow" lakes would most

likely provide for the states of Louisiana, Mississippi, and possibly Arkansas, Tennessee and Missouri hundreds of billions of jobs for all the flora and fauna that could benefit from such projects. Oh, and yes, humans could benefit from these projects, also. An example of an embankment failure is the big drainage ditch parallel to Airline Hwy. near Zephyr Stadium in Metairie, La. and along Little Bayou Black parallel to Hwy. 311 near Barrow St. in Houma, La. The gradient is so steep the soil can't support its own weight in some locations, I am aware of the concrete sheeting placed along the banks of the M.R.; however, that concrete sheeting does not and cannot go all the way down to the bottom of the River because of the obvious threat this would pose to River marine life along the River bottoms and dependent thereof.

Should some "ox-bow" lakes be reintegrated into the Mississippi River System, marine life currently in these lakes would have to be captured then relocated to a holding pond until the reintegration process is complete. As indicated in the maps provided, a man-made lake can be constructed within the area of the old "ox-bow" lake and later be stocked with the indigenous flora & fauna that was in the old lake.

And about that River marine life, whether a type of diversion being used at Carrollton or the design I propose, shouldn't there be some type of device at a distance of about one half mile to one mile from the exit of each diversion to safely capture marine life passing thru diversions then returning them to the Rivers? Because whichever diversion is to be used, I doubt flood waters, before the construction of levees by the whiteman, ever went as high above the natural levees - bringing with the flood waters the marine life - as the River waters coming

out of the current diversion now in place goes effectively below the natural levee. There is currently being used a device at the entry point of pumping stations in New Orleans that "catches" or "sieves" debris from the drainage canal water as the water approaches the pumps. It is a type of "conveyor belt" which brings the accumulated debris to the top of the sieve and then on another conveyor belt laterally deposits the debris on each bank of the drainage canal, saving impellers from damage. I suppose a modification of this system could be used to safely capture marine life and return these creatures to their natural river environs.

In response to my proposal of opening Bayou Lafourche to the Mississippi River unfettered by any pumps or dam at the headwaters, some people have said in so many words the Bayou does not carry enough water for the amount of work required to justify reopening it; however, how can those individuals account for the achievements of those Bayous: Lafourche, Terrebonne, DuLarge, Petit Caillou, Grand Caillou, Black, Little Bayou Black and Penchant prior to Bayou Lafourche being condemned by the U.S. Congress in 1904. Prior to 1904, for about 600 years, those Bayous were responsible for sustaining all those Ridges, natural levees, marshes (fresh & saline) swamps and not to mention all of those forests, of what became known as Southwestern Jefferson Parish, lower St Charles Parish, all of Lafourche Parish, the eastern half of Terrebonne Parish, all of Assumption Parish and lower Ascension Parish - and for good measure all of California State, too! That is mighty impressive for such tiny, tiny, tiny, tiny, tiny, tiny Bayous, and for 600 years!!!

Please help bring about the undoing of a terrible mistake our ancestors made when they decided to condemn the aforementioned Bayous. Upon looking at a map you'll find

that each of these Bayous are wonderfully and strategically located to deliver sediment to the swamps and marshes. When I look at the conditions of these waterways - essentially on a form of medical life support - I think of James Stewarts character George Bailey in the movie It's a Wonderful Life, when after his sojourn with the angel Clarence, he proclaims (to himself on the bridge) crying with the realization of the gift that's been given him by him that he "wants to live again." It really would be truly wonderful to see these waterways brought back to life again, for centuries to come they would be delivering the nutrients necessary to a part of Gods magnificent and mysterious creation, upon which possibly hundreds or thousands of species depend. As far as getting a complete financial return on the expenditures for this project that is unlikely. What is assured though is a smile upon the face of a child, the glee within the heart of an individual, the ecstasy of giving witness to a portion of God's creation- instead of the bereft human emotion one feels upon learning what our ancestors have done to those what must have been wonderful creatures: passenger pigeon, Eskimo Curlew, Labrador duck, Heath hen, Ivory Billed Woodpecker, Great Auk, Carolina Parakeet, et. al. The profound sadness is for me inexplainable. Any attempt for me to put into words these emotional experiences I feel what our ancestors have done to these species and ourselves would just be utterly inadequate; and, also, leaving their own descendants left without what should have been justly ours. What scorn they must have had for themselves, those bastards.

In the CPRA's preliminary draft they make an observation on page 11 for providing, restoring and preserving habitat indispensable to migra-

tory birds (but, I think, also for non-migratory birds and other wildlife and bats). I am so glad they included these statements; although it is only three sentences, these three sentences speak volumes; because the CPRA recognizes the pivotal importance habitat plays in preserving these remaining species and others. I recommend the following, to be treated as inclusive of a holistic approach in conservation. If we do not want to do the following for ourselves, then I suggest the following be done on behalf of God and His remaining species dependent almost exclusively upon man, now.

I propose laws mandating the planting of indigenous flora in existing subdivisions or developments (residential, commercial, industrial or military) and also around housing and other structures in the "country." I sincerely believe man does not have the right to live off the fat of God's earth, and in the process suffocate out of existence any of His other creatures. "E Pluribus Unum," one of many. We are but one species of many - not the species. Since "no man is an island" unto himself, I suggest as part of this law, for example, homeowners as a group living within a subdivision hire a wildlife landscape architect - and as per the wildlife landscape architects recommendations based on the wildlife landscape architects qualifications be bound thereby to as closely as possible replicate the planting of species of flora that flourished there before man's presence; however, if there are non-native species of flora beneficial to indigenous fauna while at the same time not a danger to other native species of flora, it would be up to the wildlife landscape architects plant biologists and animal biologists to determine when in promulgating these laws with legislatures whether are not those non-native species of flora are

suitable for planting in a respective area.

You would think with trees being net consumer of large amounts of carbon dioxide, the gas responsible for global warming which is intensifying hurricanes, homeowners or other structural owners would be obsessed with the planting of tens of millions, hundreds of millions of trees. But, no, they're so terrified a tree might damage their precious house, that object they think is the "be all and end all of human existence" to quote Matthew Broderick in Ferris Bueller's Day Off, that thing government officials refer to as the Great American Dream the attainment at all costs - even at the expense of entire species and numerous extirpations of species from vast areas that there's essentially no trees in many subdivisions; in fact, around many homes, no, I mean buildings there's literally nothing growing around those structures except grass the "home" owners now collect to burn as fuel to cook their food. If you want to give witness to many idiot "home" owners, just come to Lafourche Parish or Terrebonne Parish and watch them load all those bags of cypress mulch into their motor vehicles - where they then take it to, I assume, mulch their gardens. The thing is though, that cypress mulch, much of it, was made from Cypress trees in a forest that once served as a natural hurricane buffer. When I look at those buildings, I muse to myself the occupiers must essentially be "dead-headers" - in other words spiritually dead. If having the choice of being a dead-head or a pot-head, I'd rather be a pot-head any day. And, also, about that carbon dioxide, it's not just coming from carbon based fuels, but, I think, also, on a 24 hour a day basis from the lungs of all 8 billion 5 hundred million humans.

The precedents established acknowledging man's obligations to God and His other Creatures are the conservation laws of the early 20th century

and the environmental laws of the 1970's. A practical application of the environmental laws is the mandatory installation of catalytic converters in all motor vehicles operating in the U.S.; and the Migratory Bird Treaty Act (which must also include migratory mammals, non-migratory birds* and bats [wind turbines and cat predation, from domestic and feral cats violate the "spirit and intent" of this Treaty]) as an example of the conservation laws of the 1920's. The Land Reclamation Act is inclusive of the aforementioned.

Some people have said, "But, Maurice, property owners should have the liberty to decide what to plant if anything at all on their property." Why are there child-support-payment laws, I ask? Someone may say, "To take care of a child whose parents have divorced." Yes, but why are there child-support-payment laws, I ask again; the man and woman chose to get married, form a union and chose to have a baby - and if the pregnancy was unplanned the man and woman are aware of the risks of such behavior from sexual intercourse - pregnancy. So, again I ask, why are there child-support-payment-laws? Then they respond by saying, "Maurice, the child never asked to be born." Exactly, the child never asked to be born. When someone or a group of people clear land to build something, the trees never asked of God to be created; the birds, mammals, insects, reptiles and all other flora and fauna never asked of God to be created. Because of this humans are obligated to take care of all species and see that they prosper. Hence, my proposals of planting-indigenous-flora laws.

Could someone please explain to me the reason for the presence of levees on the east bank of Bayou Shaffer and on the west bank of Bayou Chene. And, also, why has the Pentagon been ordering the Corps of Engineers to dump for the last several decades millions and millions

of tons of sediment (M.R.) off the continental shelf of the Gulf of Mexico? To me, to be culpable in the destruction, deliberately, of an ecosystem rivals such crimes as that of war and against humanity.

Please forgive me if the following comments are rather inflammatory; but you see if the U.S. Congress is going to authorize a construction project, for example, Cheramie River Diversion, and authorize it in 1965 but not have it built until more than 25 years later, all the while subsidence and erosion taking place, it makes one wonder if there is any desire to restore this land at all. It is fair to say any reasonable person could make the same assumptions. To all those people who truly desire to restore the M.R. Delta, there is no reason for you to take offense to my comments.

There once was a time, not long ago, about 15 years before I was born, a place on earth where certain humans were looked upon as "life not worthy of living." Of the several classifications put forth as "life not worthy of living" by the leaders of that country, one was retarded people. The reason I mention this story is because of articles I've read in the Times-Picayune News (N.O.) regarding the Restoration of the Mississippi River Delta. In the articles there is a rationale used by government officials to justify expenditures of this endeavor. The rationale, I think, is called cost to benefit ratio - the benefit derived from expenditures upon a certain project. There are some people who cannot imagine spending such amounts of money on wetlands. Those individuals are trying to calculate the amount of economic "benefit" derived from an acre of marsh or swamp as compared to the amount of money spent on restoring and maintaining that acre of marsh or swamp. There must be some people who think wetlands and the flora and fauna, also, are retarded. I can relate to this story because I have a

Relative who is retarded. If someone would like to get strictly economical about the cost to benefit ratio of raising a child, I suppose this story about my retarded relative and any retarded person would be very apropos. Now, I have no idea what a "normal" person of comparable age with a college education is capable of earning, but suppose that dollar amount is, say, $50,000.00 per year. I guess you can say the costs incurred by the parents of the normal child until the day on which that child earns that first paycheck (after all those years growing up, medical bills, and other bills, bills, bills, bills, bills, elementary school, middle school, high school and college graduation) can be recouped. But for obvious reasons parents can never expect their child to repay them for costs incurred in raising that child, now, could they. (On a side note, when the founders revolted against the English in 1776, the Colonial Revolution was cultural and social as well as political. One of their fundamental beliefs is an individual can never be a subject or child of the state.) When you consider the circumstances of a retarded person all the costs incurred by the parents all the life of the child and until the child's passing, you can see obviously that a retarded person quite likely would never be able to recoup all costs incurred caring for him or her. But, yet our Society insists, and justly so, these impaired individuals have all the opportunity to live as full a life as possible. If I were a relative, of which I am, or a friend of, or a retarded person myself, and I learned of the rationale being used to justify these costs for the restoration of the M.R. Delta, I would be very concerned. Because, you see, this cost to benefit ratio ethic as applied here is similar to those values of the people and government officials of the Society represented in the Charlton Heston movie, Soylent Green - the female investigative committee member saying

"the evidence is overwhelming" and "there is work" to describe such behavior, "experience, I believe." Another example would be the values of the people and government officials of the Society represented in the Bruce Dern movie Silent Running when government officials ordered the astronauts to destroy the biospheres containing the earth's last remaining living remnants of its flora and fauna (this movie and the music accompaniment makes me so sad I'm near tears writing this). Upon the astronauts being ordered to perform this deed, A Reporter later says, "May the Lord have mercy on our souls." What I say is to hell with the souls of the people of that Society. Should God ever summon me and ask of me, "Maurice, what should the fate of your kind be?" - should we ever become like the people of that Society in Silent Running, I would paraphrase to God of our speak what Al Pacino's character told Keanu Reeves character in the Devil's Advocate when he says "your wife?!, you could have saved your wife any time you wanted to; perhaps you loved someone more than your wife, yourself maybe?" Our earth, our mother earth, we could have saved earth any time we wanted to; perhaps we loved ourselves more than we loved God, I would say. I would then ask God to send me back as a meerkat.

We could have saved the Dusky Seaside Sparrow[1] any time we wanted to; just what type of life forms are those Lunar Scientists hoping to find on the moon, the Dusky Seaside Sparrow? Just what type of life forms are those Martian Scientists hoping to find on Mars, the Dusky Seaside Sparrow? It is an eternal test of gratitude the Disney World[2] for taking in the last five male Duskies when all hope of reconstituting the Duskies population was lost? I think not. I'm sure Disney World was suffering from pangs of guilt of there own - what with, what is

it, ten square miles of concrete and asphalt parking lots? What reason could Disney World possibly have had for taking in those five males (no remaining females were ever found)? Not to let the Duskies feel as though they weren't wanted? But that's just it. The Duskies were not wanted. Disney World did not even allow the Duskies the dignity to live their final days on earth wild and free.

Jesus Christ once said he was sent to man by God to give testament to the word of God and to die for man's sins; if by sins Jesus Christ meant man's scorn for himself or self-hatred, then what amount of scorn in that society and for one's self must it have taken to do what was done to the Passenger Pigeon? It is as though Jesus Christ or even a story or a parable of such an individual never even existed or occurred. Where was Jesus Christ when all this destruction was, and still is, taking place? No where to be found. Why? Americans wanted Jesus Christ far enough out into the Universe that their consciences would not be bothered in the least. And the list of extinctions is incredible (Please Refer to partial list and email provided by web site) †

A quick review of this list of extinctions and any reasonable person can see that, well, to quote Charlton Heston's character in the movie Ben Hur, "God could not have meant this to be." There's just absolutely no way that God would have created all these species and more, all of whom who faithfully lived according to God's laws and for each to carry out each's duty as prescribed by God, for hundreds of thousands, millions, and hundreds of millions of years, only to have man come along and wipe out species after species. There's just no way.

Take, for example, a typical child who enjoys exploring the outdoors. Judging by the expression on a child's face the child may feel, I suppose, subconsciously, intuitively or instinctively everything

that was ever created by God since man (who himself was created by God) is available to that child and that child's generation; however, knowing what I now know, how do you convey to that child what our ancestors have done to that child? The only person in all the world I know of who is most qualified to inform that child and that child's generation what our ancestors have done is the character Montgomery Clift portrays in the movie Judgement at Nuremburg. In particular, the very poignant scene when Montgomery Clift's character is on the witness stand during the trial and begins to reveal his emotional trauma about...

That what our ancestors have done to that child and ourselves is very emotionally traumatic must still be told to children.

In light of the things I have just said, the American people being responsible for the extinctions of possibly hundreds of species, and then, to be associated for all eternity with the infamy of the extinction of the most numerous ever vertibrate species, the Passenger Pigeon, some Americans still think the American people are the greatest people that have ever lived. I think that observation is the furthest thing from the truth. In Reality, when you peruse thru the pages of the extinct species by our hand, you might conclude, as I have, that Americans are probably some of the ~~creulest~~ people to have ever walked the earth.

Should some devil's apologist attempt to say, "Oh! But Maurice, there was another population of Duskies along the St. Johns River in Florida." I guess they would be saying, to again paraphrase Al Pacino's character in The Devil's Advocate, NASA's "vanity was justified" to extirpate the Duskies from Merritt Island; however, I'm sure the land developers along St. Johns River thought if NASA's "vanity was justified" to do what they did

to the Duskies on Merritt Island, their "vanity is justified" to do what they would like to do to the Duskies Along the St. Johns River. Just think, the American Space Program built upon a foundation of extinction. Hmmm. I wonder what Cajuns would think of this story. For those failing to make the connection between the Duskies and the Cajuns, Dusky Seaside Sparrows were one of the Rarest North American bird species with one of the most restricted ranges. Aliens from outer space would be interested in this story, for upon learning of our history as a people they may interpret our overtures for them to visit here like someone may interpret an invitation by Dick Cheney to go hunting with him. Those extraterrestrials just might use the first-strike doctrine on us. The people of earth should heed Stephen Hawkings' words by ceasing to send out those overtures.

Gee Whiz! All these ideas I've proposed - I recently purchased a used book entitled The Last Extinction by Les Kaufman and Kenneth Mallory. Shouldn't man take great care when applying to Nature any idea of man? Also, you might want to read in their book the 2nd sentence of the last paragraph on page 2 and, also, on page 3 you can read the 8th and the 10th lines. That it's taking so long to address the problems of the M.R. Delta is just unbelievable and unforgivable. For the U.S. Congress not to authorize and fully fund the Restoration of the M.R. Delta would be but an expression, al beit, piecemeal, of the sentiments expressed by the people and government officials of the societies in the stories Soylent Green and Silent Running.

I'm taking an enormous risk in proposing these ideas because of Jesus Christ's words to me when Jesus Christ said "Maurice, don't ever speak words of wisdom to fools or throw pearls after swine." I suppose I'm giving the

benefit of the doubt to those who read these pages that they're neither fools NOR Swine.

Revised
04-02-07

MAURICE ROBICHAUX
412 FIR STREET
RACELAND, LA. 70394
985-537-6210

READERS: IN Some Sentences I use ~~facetiousness~~, I think that's the correct term, to underscore the seriousness of the feelings I have being expressed in that idea, OR for the purposes of alluding to some ABSURDity in regards to the idea being expressed.

† Center for Biological Diversity; cbd@biologicaldiversity.org

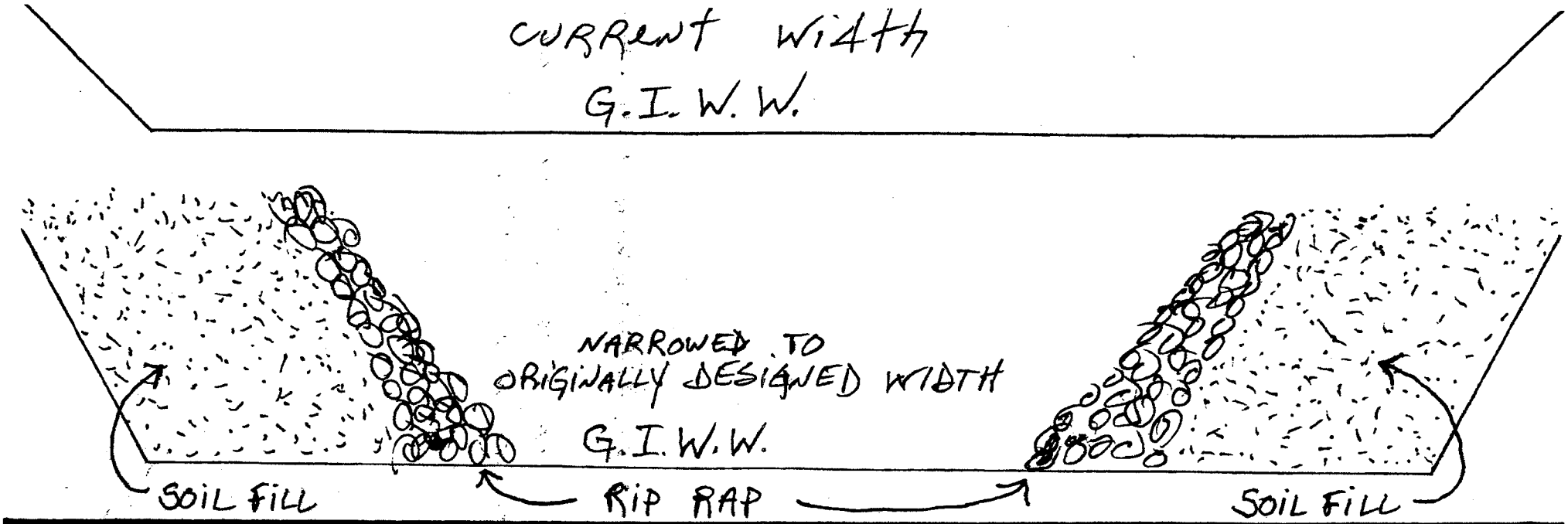
* AND other indigenous wildlife that's beneficial to other indigenous wildlife; also, refer to American Bird Conservancy's cat-predation web site.

1 The Last Extinction, edited by Les Kaufman and Kenneth Mallory 1986 MIT PRESS

2 Earth Witness Community, web site: http://www.earthwitness.com/ORANGE%20BANDit

3 The inspiration for this story * is from the photograph, by John Huet, on the front cover of National Audubon Society's 2006 Annual Report. To Really Appreciate this story, please ask Audubon to send you a copy ~~of~~ of this Report to See the photograph. Because Audubon cannot grant permission to copy the photographs, I could not include it in this letter, SORRY.

21-024



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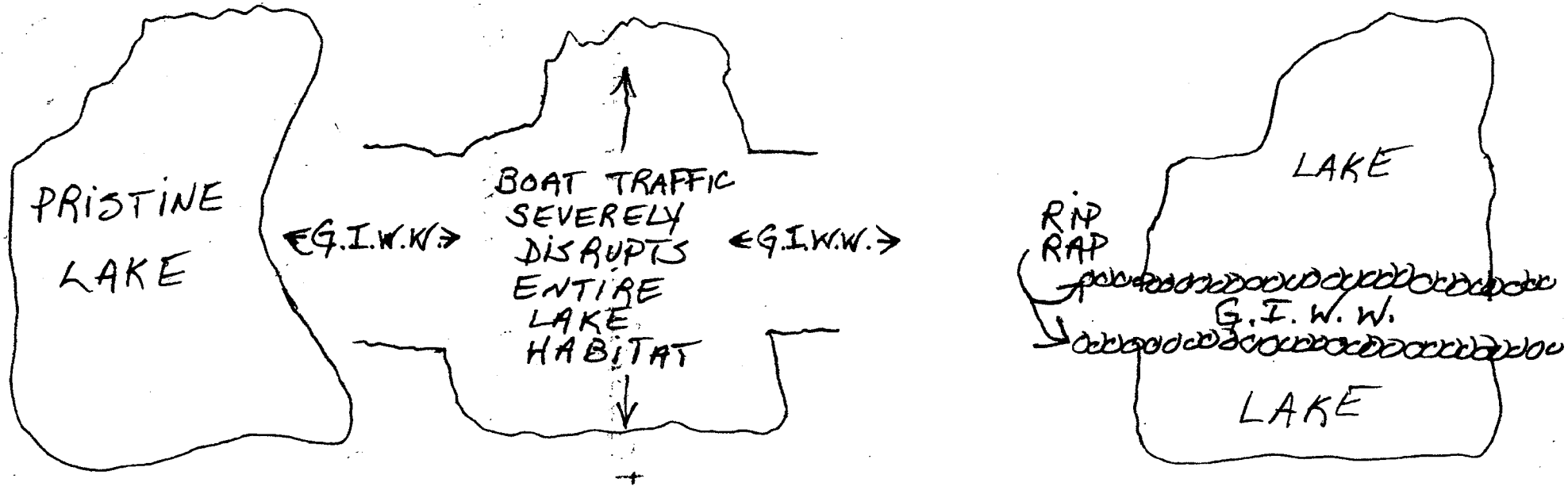


BEFORE VIOLATION OF THE G.I.W.W.

VIOLATION CURRENTLY IN PROGRESS BY THE G.I.W.W.

LAKE AFTER PARTIAL RESTORATION

Post-Script to Revised letter of 04-02-07 to the C.P.R.A. etal interested parties:

To my horror, as I was outdoors listening to that unrelenting noise coming from U.S. 90 Highway towards Winona Subdivision, it occurred to me in an instant- the Dutch Storm Surge Barrier, that storm surge barrier with the two-lane highway I referred to in my initial letter ~~to~~ the C.P.R.A.

Imagining my self at those bays and bayous marshes and swamps along the Miss. River Delta, I could hear that solitude, that wonderful solitude being shattered by motor vehicle noise - that unrelenting noise like that coming from U.S. Hwy. 90; but its the same noise - regardless of the roadway. Then I said to myself: absolutely not.

Should a storm surge barrier (like that section in the Netherlands with the highway on top) or any other type) ever be funded and built along the Mr. R. Delta, the barrier would have to be built without, I Repeat, without transportation lanes.

While in Baton Rouge delivering the revised version of maps with proposals for River diversions and other information, I took the E. I-10 Dalrymple exit. Not knowing what was at the end of this exit, it led me directly to a lake. While there I decided to get out of the motor vehicle and take a test sampling of the noise coming from the motor vehicles traveling on I-10 which passes directly over the lake. The noise

WAS APPALLING OR AS Dudley Moore's character in ARTHUR SAYS IN A SCENE, horrible!, horrible!!! I feel SORRY for the people who use the lake AND have to contend with the noise AND for the children who grow up thinking this is NORMAL.

Yes, it's absolutely imperative, should this storm surge barrier project ever be built it be built without transportation lanes of any kind.

Thank you very much,

Maurice Robichaux

Maurice Robichaux
412 Fir Street
Raceland, LA. 70394

985-537-6210

631 EXTINCT NORTH AMERICAN SPECIES IDENTIFIED AS OF 6-29-01

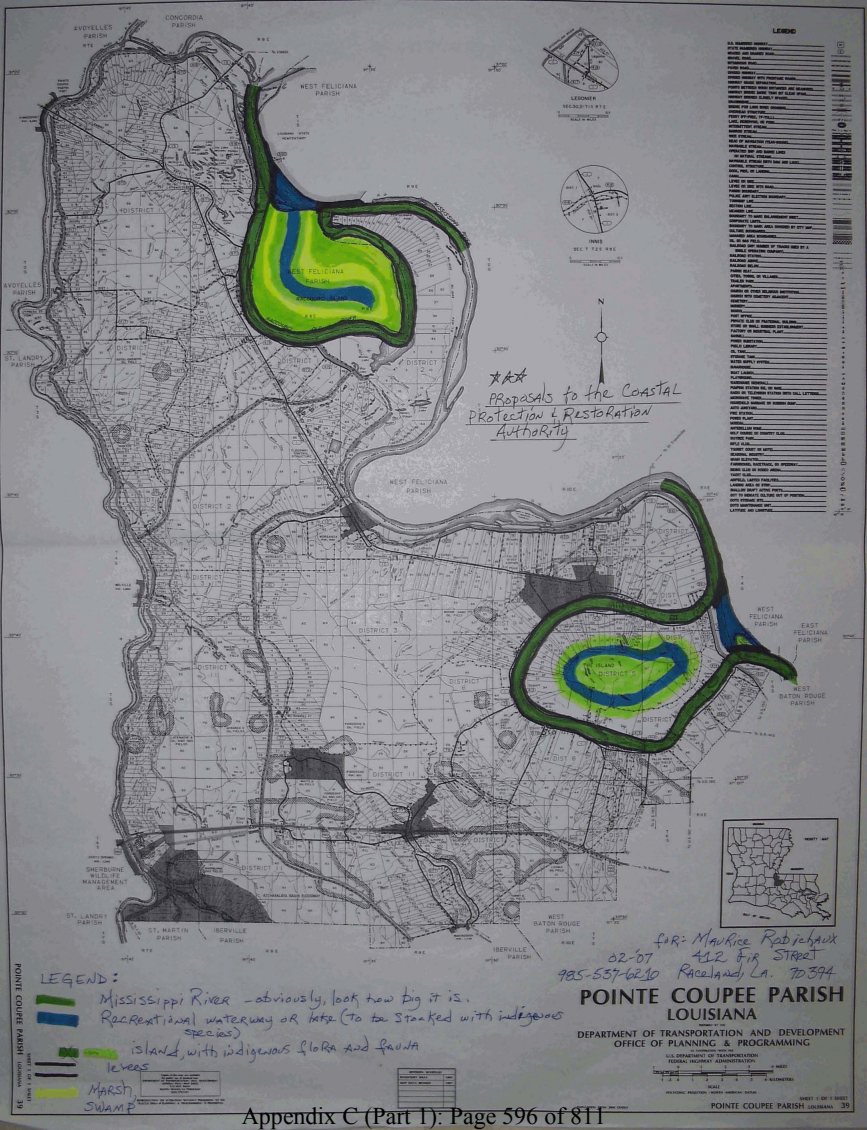
The Center for Biological Diversity has identified 631 North American species and subspecies which have been driven extinct since 1642. This ongoing research project will eventually identify well over a thousand extinct species.

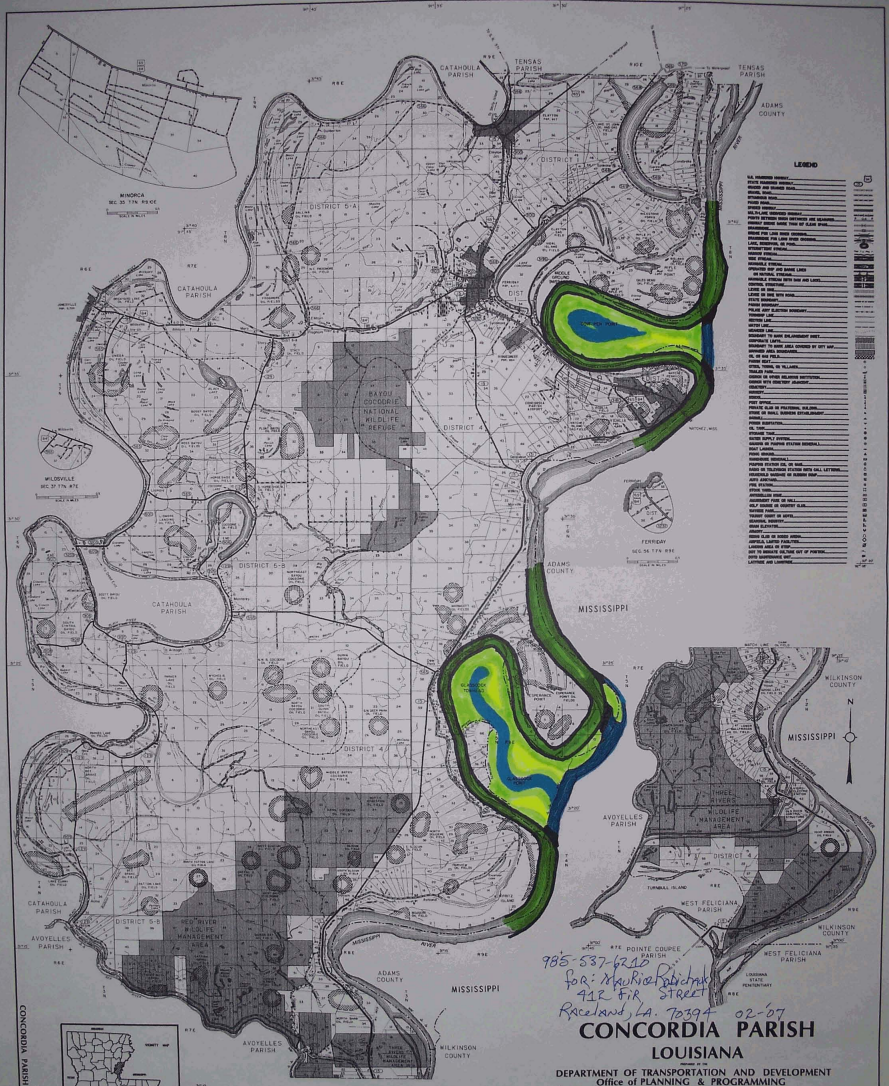
If you have comments, corrections or suggestions, please contact us: cbd@biologicaldiversity.org

Chadwick Beach cottonmouth	Peromyscus gossypinus restrictus	FL
Texas red wolf	Canis rufus rufus	OK, TX
Florida red wolf	Canis rufus floridanus	Southeastern United States
Southern California kit fox	Vulpes macrotis macrotis	CA
Atlantic gray whale	Eschrichtius gibbosus gibbosus	Atlantic Coast
Greater Puerto Rican agouti	Heteropsomys antillensis	Puerto Rico
Lesser Puerto Rican agouti	Heteropsomys insulans	Puerto Rico
Puerto Rican paca	Elasmodontomys obliquus	Puerto Rico
Puerto Rican hutia	Isolobodon portoricensis	Puerto Rico
Kenai Peninsula wolf	Canis lupus alces	AK
Gull Island vole	Microtus nesophilus	NY
Giant deer mouse	Peromyscus nesodytes	CA
Pallid beach mouse	Peromyscus polionotus decoloratus	FL
Goff's pocket gopher	Geomys pinetis goffi	FL
Tacoma pocket gopher	Thomomys mazama tacomensis	WA
Penasco chipmunk	Eutamias minimus atristriatus	NM
Puerto Rican ground sloth	Acratocnus odontrigonus	Puerto Rico
Puerto Rican long-tongued bat	Phyllonycteris major	Puerto Rico
Puerto Rican long-nosed bat	Monophyllus plethodon frater	Puerto Rico
Puerto Rican shrew	Nesophontes edithae	Puerto Rico
Louisiana vole	Microtus ochrogaster ludovicianus	LA, TX
Merriam's elk	Cervus canadensis merriami	AZ, NM, OK
Sherman's pocket gopher	Geomys fontanelus	GA
Newfoundland wolf	Canis lupus beothucus	Newfoundland Island
West Indian monk seal	Monachus tropicalis	FL
Merriam's elk	Cervus elaphus merriami	NM, AZ, OK
Hot Springs cotton rat	Sigmodon fulviventer goldmani	NM
Queen Charlotte caribou	Rangifer tarandus dawsoni	British Columbia
Eastern elk	Cervus canadensis canadensis	Central and eastern North America
Steller's sea cow	Hydrodamalis stelleri	AK
Wisconsin cougar	Felis concolor schorgeri	North-central United States
Mogollon Mountains wolf	Canis lupus mogollonensis	AZ, NM
Banks Island wolf	Canis lupus bernardi	Banks and Victoria Islands
Badlands bighorn	Ovis canadensis auduboni	MT, NB, ND, SD, WY
Northern Rocky Mountain wolf	Canis lupus irremotus	Alberta, ID, MT, OR, WY
Sea mink	Mustela macrodon	New Brunswick, New England
Texas gray wolf	Canis lupus monstrabilis	NM, TX

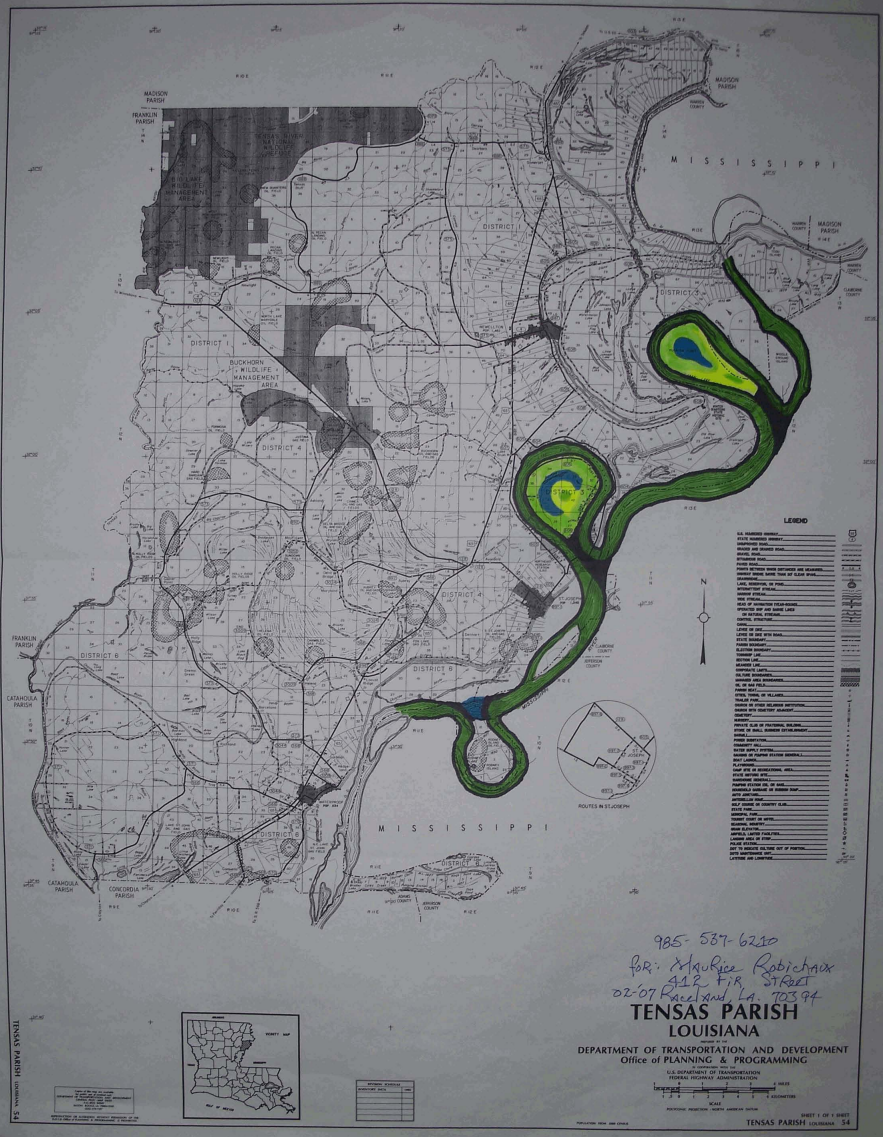
ST. JAMES PARISH
LOUISIANA
ST. JOHN THE BAPTIST PARISH
LOUISIANA
ASCENSION PARISH
LOUISIANA
ASSUMPTION PARISH
LOUISIANA
ST. CHARLES PARISH
LOUISIANA
ST. MARTIN PARISH
LOWER SECTION
LOUISIANA
ST. MARY PARISH
LOUISIANA
LEGEND:
LAFOURCHE PARISH
SOUTH SECTION
LOUISIANA
TERREBONNE PARISH
SOUTHEAST SECTION

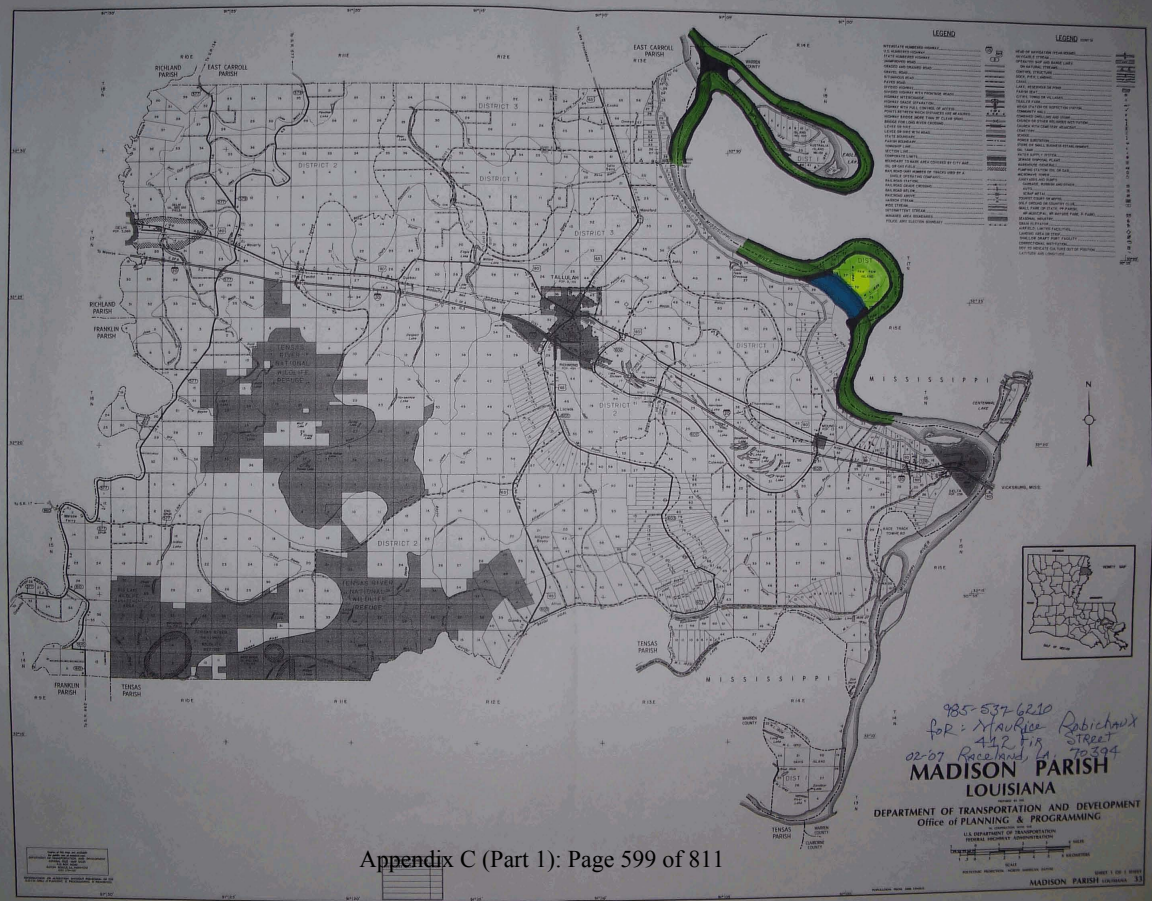
ORLEANS PARISH
LOUISIANA
DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
Office of PLANNING & PROGRAMMING
ST. BERNARD PARISH
MIDDLE SECTION
LOUISIANA
DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
Office of PLANNING & PROGRAMMING
LEGEND :
JEFFERSON PARISH
LOUISIANA
DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
Office of PLANNING & PROGRAMMING
RED PASS
PLAQUEMINES PARISH
SOUTH SECTION
LOUISIANA
DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
Office of PLANNING & PROGRAMMING

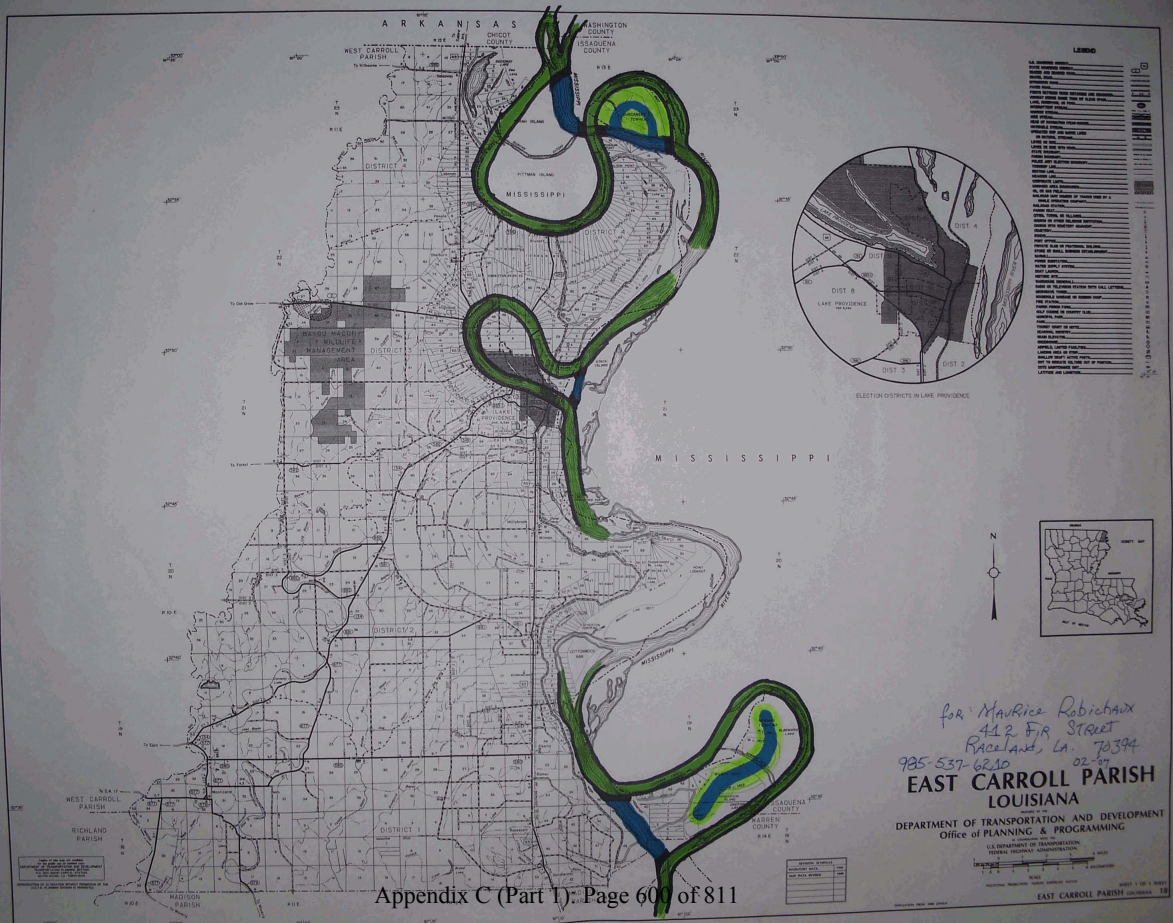

AVOYELLES PARISH
CONCORDIA PARISH
WEST FELICIANA PARISH
EAST FELICIANA PARISH
ST. LANDRY PARISH
ST. MARTIN PARISH
IBERVILLE PARISH
WEST BATON ROUGE PARISH
SHERBURNE WILDLIFE MANAGEMENT AREA
LEGEND
LESSER
INNIS
LEGEND:
Mississippi River - obviously, look how big it is.
Recreational waterway or lake (to be stocked with indigenous species)
island, with indigenous flora and fauna
levees
marsh
swamp
★★★ Proposals to the Coastal Protection & Restoration Authority
for: Maurice Robichaux
412 Fir Street
Raceland, La. 70394
985-537-6230
02-07
POINTE COUPEE PARISH
LOUISIANA
DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
OFFICE OF PLANNING & PROGRAMMING
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
SCALE
POINTE COUPEE PARISH LOUISIANA 39



985-537-6218
for: Maurice Pelichak
912 Fir Street
Raceland, LA. 70394
02-07


MADISON PARISH
FRANKLIN PARISH
MISSISSIPPI
DISTRICT 1
DISTRICT 2
DISTRICT 3
DISTRICT 4
DISTRICT 5
DISTRICT 6
DISTRICT 7
DISTRICT 8
DISTRICT 9
BUCKHORN WILDLIFE MANAGEMENT AREA
TENSAS RIVER NATIONAL WILDLIFE REFUGE
CATAHOULA PARISH
CONCORDIA PARISH
JACKSON COUNTY
ROUTES IN ST. JOSEPH
LEGEND
N
985-537-6210
FOR: Maurice Robichaux
412 Fir Street
02-07 Rayland, LA 70394
TENSAS PARISH
LOUISIANA
DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
Office of PLANNING & PROGRAMMING
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
SCALE
SHEET 1 OF 1 SHEET
TENSAS PARISH 54


LEGEND
RICHLAND PARISH
EAST CARROLL PARISH
FRANKLIN PARISH
TENSAS PARISH
MISSISSIPPI
DISTRICT 1
DISTRICT 2
DISTRICT 3
TALLULAH
VICKSBURG, MISS.
N
985-537-6210
for: Maurice Robichaux
412 Fir Street
02-07 Raceland, LA 70394
MADISON PARISH
LOUISIANA
DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
Office of PLANNING & PROGRAMMING
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
MADISON PARISH LOUISIANA 33



for: Maurice Robichaux
412 Fir Street
Raceland, La. 70394
985-537-6210 02-5m

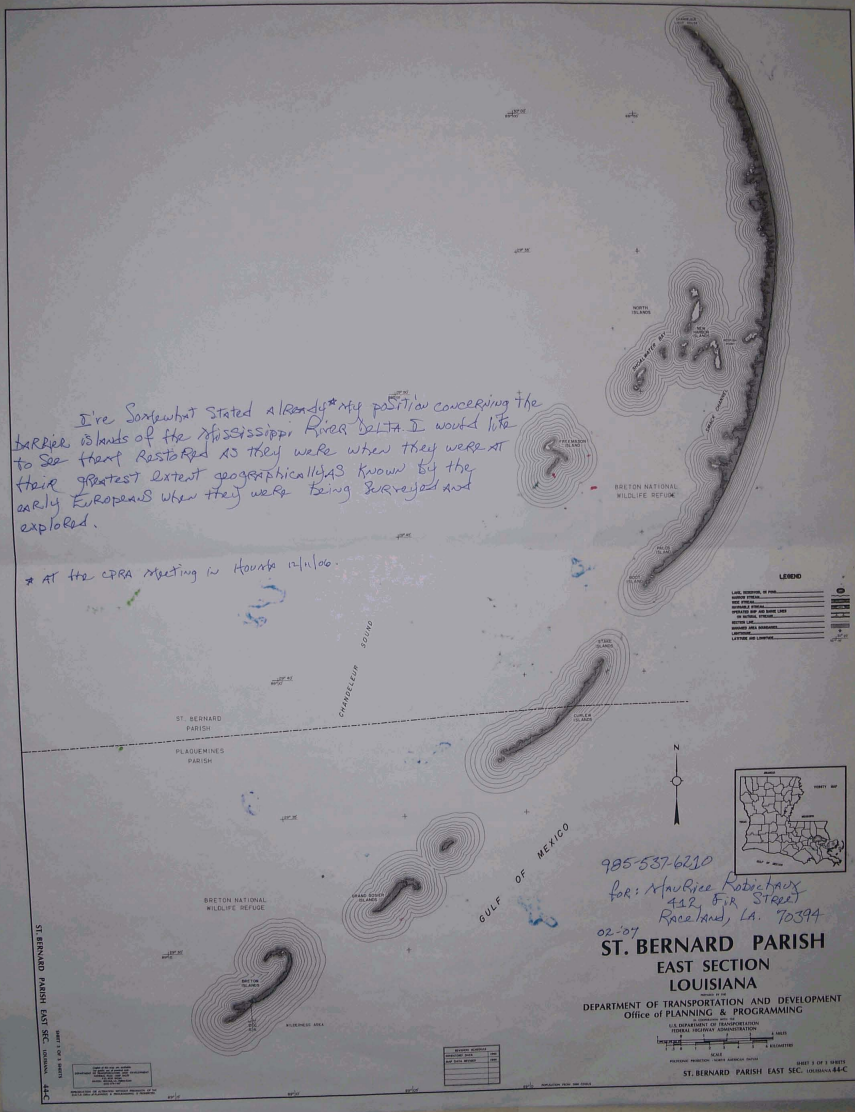
EAST CARROLL PARISH
LOUISIANA

DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
Office of PLANNING & PROGRAMMING

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

SCALE 1 MILE

EAST CARROLL PARISH LOUISIANA


I're Somewhat stated already* my position concerning the barrier islands of the Mississippi River Delta. I would like to see them restored as they were when they were at their greatest extent geographically as known by the early Europeans when they were being surveyed and explored.
* At the CPRA Meeting in Houma 12/11/06.
LEGEND
ST. BERNARD PARISH
PLAQUEMINES PARISH
CHANDELEUR SOUND
GULF OF MEXICO
BRETON NATIONAL WILDLIFE REFUGE
985-537-6210
for: Maurice Robichaux
412 Fir Street
Raceland, LA. 70394
02-07
ST. BERNARD PARISH
EAST SECTION
LOUISIANA
DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
Office of PLANNING & PROGRAMMING
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
SHEET 3 OF 3 SHEETS
ST. BERNARD PARISH EAST SEC. LOUISIANA 44-C

From: James Rutherford [jayr33t@camtel.net]
Sent: Friday, February 16, 2007 10:24 AM
To: comments@louisianacoastalplanning.org
Cc: Congressman Charles W. Boustany, Jr., M.D.; cppjury@camtel.net
Subject: Public Feedback from Cameron Parish
Importance: High

Many people in Cameron Parish are not aware of this plan at all. Please find a way to set up a public meeting at the Cameron Courthouse to get real feedback from the people who will be directly impacted by this plan before it is implemented. Please allow ample lead time (at least 1-2 weeks) and provide public media announcements to KYKZ radio, KPLC TV, and the Cameron Pilot newspaper. Please contact Tina Horn, Cameron Parish Administrator at ccpjury@camtel.net to set up a public meeting at the Cameron Courthouse.

From my perspective as a Cameron Parish resident concerned about overregulation/restrictions, this entire plan should disturb everyone in all of Cameron Parish...

As a native born resident of coastal Louisiana and a military veteran, I strongly oppose any attempts to force the residents of Coastal Louisiana off our family land. If you review the LCP Master Plan, the details come to light.

Please take action to prevent this abuse of power based on junk science and rationalized risks. The people of Cameron Parish choose the risk and deserve the freedom keep our land and our way of life in Coastal Louisiana. We are struggling to rebuild through all the red tape and restrictions in the wake of Hurricane Rita, and we choose the risk of our own accord. Our decision to stay and rebuild on our own soil is made. We do not need or want more restrictions.

Rerouting rivers and playing God is a dangerous game. Raising Hwy 82/27 will result in huge losses in "usable" land due to setback buffer zones on the landward side north of the road. Due to the topography and orientation of the chenier ridges, many landowners (including my parents) could lose *all* of their property to the setback buffer zone. Businesses, homes, schools, churches, hospitals, and historic foilage would also be severly impacted. Depending on the setback buffer zone requirements, up to 900 feet (on a ridge only 300 feet deep) could be affected if the 1V:100H slope method is used. Levees adversely affect natural drainage and worsen flood conditions, resulting in the need for pumping stations, maintenance budgets, and higher taxes. How would you react if your family land and way of life is potentially facing eminent domain / expropriation in the near future?

The only option viable to all of Coastal Louisiana is the offshore breakwater rocks, nothing more.

Here are some references which I find very disturbing...

Chapter 3, Page 53.
Prohibit development in wetland areas.
Require buffer zones near levees.
Wetlands need to remain undeveloped.
Local governments must enforce appropriate land use and zoning regulations.

Chapter 4, Page 78.
Improve land use planning, zoning, and permitting.
We must avoid development in low-lying areas. Land use planning and zoning are potential means to achieve this goal.
The Louisiana Coastal Zone Management Plan and LCRP should be strengthened.
Zoning actions by local governments are a means of protecting coastal wetlands.
State legislation should provide incentives to local governing bodies to enact region-wide land use zoning.

Chapter 4, Pages 79-80.

Processes to acquire land rights.
Expropriation. Title 19.
Quick Take.
These options must be available.
Passage of legislation to allow DNR and DOTD with quick take authority...is necessary.

Appendix A, Pages 41-43.
Land Use Planning/Zoning/Permitting
Wetlands should be protected from residential and commercial development.
Land use planning and zoning are urgent policy/legislative actions that need to be addressed.
Future development should be strongly discouraged in high risk coastal areas.
These high risk areas require land use restrictions.
Look for ways to provide incentives to local governing bodies to enact region-wide land use zoning.
Louisiana Sea Grant and the Coalition to Restore Coastal Louisiana are currently working on a review of land use planning tools.
The first course of action would be to acquire the necessary easements to construct the project.
Expropriation (Eminent Domain) is an option.
Another choice for acquiring the necessary land rights is an authority known as quick take.
These options must be available to both implementing agencies (DNR and DOTD).
Passage of the needed legislation to provide DNR and DOTD with quick take authority is a necessary early action in the Master Plan.

Appendix I, Page 63
Implement a plan to elevate and/or relocate assets located outside the hurricane protection plans.
(Assets include residents and businesses.)

I have also read in the plan that quick take measures are not planned, but should be an available tool. Cameron Parish's greatest fears are now in this plan under serious consideration. Please change course to respect the wishes of the people of Cameron Parish. There are ways to reduce coastal erosion without forcing any person off their land.

Sincerely,
Jay Rutherford
Cameron Parish Resident
jayr33T@camtel.net

From: James Rutherford [jayr33t@camtel.net]
Sent: Friday, February 16, 2007 12:28 PM
To: comments@louisianacoastalplanning.org
Subject: Correction: Public Feedback from Cameron Parish

Correction.
Tina Horn's email address is cppjury@camtel.net (not c**c**pjury). Sorry for the typo error.

Sincerely,
Jay Rutherford
Cameron Parish Resident

----- Original Message -----
From: James Rutherford
To: comments@louisianacoastalplanning.org
Cc: Congressman Charles W. Boustany, Jr., M.D. ; cppjury@camtel.net
Sent: Friday, February 16, 2007 10:24 AM
Subject: Public Feedback from Cameron Parish

Many people in Cameron Parish are not aware of this plan at all. Please find a way to set up a public meeting at the Cameron Courthouse to get real feedback from the people who will be directly impacted by this plan before it is implemented. Please allow ample lead time (at least 1-2 weeks) and provide public media announcements to KYKZ radio, KPLC TV, and the Cameron Pilot newspaper. Please contact Tina Horn, Cameron Parish Administrator at ccpjury@camtel.net to set up a public meeting at the Cameron Courthouse.

From my perspective as a Cameron Parish resident concerned about overregulation/restrictions, this entire plan should disturb everyone in all of Cameron Parish...

As a native born resident of coastal Louisiana and a military veteran, I strongly oppose any attempts to force the residents of Coastal Louisiana off our family land. If you review the LCP Master Plan, the details come to light.

Please take action to prevent this abuse of power based on junk science and rationalized risks. The people of Cameron Parish choose the risk and deserve the freedom keep our land and our way of life in Coastal Louisiana. We are struggling to rebuild through all the red tape and restrictions in the wake of Hurricane Rita, and we choose the risk of our own accord. Our decision to stay and rebuild on our own soil is made. We do not need or want more restrictions.

Rerouting rivers and playing God is a dangerous game. Raising Hwy 82/27 will result in huge losses in "usable" land due to setback buffer zones on the landward side north of the road. Due to the topography and orientation of the chenier ridges, many landowners (including my parents) could lose *all* of their property to the setback buffer zone. Businesses, homes, schools, churches, hospitals, and historic foilage would also be severly impacted. Depending on the setback buffer zone requirements, up to 900 feet (on a ridge only 300 feet deep) could be affected if the 1V:100H slope method is used. Levees adversely affect natural drainage and worsen flood conditions, resulting in the need for pumping stations, maintenance budgets, and higher taxes. How would you react if your family land and way of life is potentially facing eminent domain / expropriation in the near future?

The only option viable to all of Coastal Louisiana is the offshore breakwater rocks, nothing more.

Here are some references which I find very disturbing...

Chapter 3, Page 53.
Prohibit development in wetland areas.
Require buffer zones near levees.

Wetlands need to remain undeveloped.
Local governments must enforce appropriate land use and zoning regulations.

Chapter 4, Page 78.
Improve land use planning, zoning, and permitting.
We must avoid development in low-lying areas. Land use planning and zoning are potential means to achieve this goal.
The Louisiana Coastal Zone Management Plan and LCRP should be strengthened.
Zoning actions by local governments are a means of protecting coastal wetlands.
State legislation should provide incentives to local governing bodies to enact region-wide land use zoning.

Chapter 4, Pages 79-80.
Processes to acquire land rights.
Expropriation. Title 19.
Quick Take.
These options must be available.
Passage of legislation to allow DNR and DOTD with quick take authority...is necessary.

Appendix A, Pages 41-43.
Land Use Planning/Zoning/Permitting
Wetlands should be protected from residential and commercial development.
Land use planning and zoning are urgent policy/legislative actions that need to be addressed.
Future development should be strongly discouraged in high risk coastal areas.
These high risk areas require land use restrictions.
Look for ways to provide incentives to local governing bodies to enact region-wide land use zoning.
Louisiana Sea Grant and the Coalition to Restore Coastal Louisiana are currently working on a review of land use planning tools.
The first course of action would be to acquire the necessary easements to construct the project.
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Sincerely,
Jay Rutherford
Cameron Parish Resident
jayr33T@camtel.net

From: James Rutherford [jayr33t@camtel.net]
Sent: Wednesday, February 28, 2007 11:16 AM
To: comments@louisianacoastalplanning.org
Cc: Mark Herbert; Sonny McGee; cppjury@camtel.net
Subject: Michele Deshotels-CPRA Public Feedback
Attachments: CPRA Comments.pdf

Public Meeting Comment Form attached.

Cameron Parish business owners and residents look forward to learning more about Planning Area 4 (Cameron/Calcasieu/Vermillion) at the March 14 meeting in Cameron.

Questions for CPRA concerning raising Hwy 82/27:

1. How high will Hwy 82/27 be raised? ft MSL? relative increase above grade?

2. What is the easement/setback/buffer zone distance ? 50 feet? 100 feet? 200 feet? 500 feet? 1000 feet?

3. What is the slope on the landward side? 1V:30H? 1V:100H?

4. What will happen to existing structures located within the easement/setback/buffer zone (landward side)?

5. What will happen to existing structures located on the seaward side?

Note: Almost every structure (church, school, business, and residence) along Hwy 82/27 is well within 150 feet of the road, which makes additional easement/setback/buffer zones impossible without dislocating all "assets" including historic Live Oak Tree forests. Relocation is not an option.

Sincerely,
Jay Rutherford
jayr33T@camtel.net

Coastal Protection and Restoration Authority

PUBLIC MEETING COMMENT FORM

Draft of Louisiana's Comprehensive Master Plan for a Sustainable Coast,
Draft FY 2008 Annual Plan
and Draft CIAP Plan

To insure that your written comments are considered, they should be turned in this evening at the reception desk located near the entrance or mailed to the following address so that the comments are received no later than Monday, April 2, 2007:

CPRA – IPT
DNR
Post Office Box 94396
Baton Rouge, LA 70804-9396

Email comments may additionally be submitted at: comments@louisianacoastalplanning.org

Please consider the following comments:

Asset Relocation is NOT an option for Cameron Parish.
Expanding the authority for expropriation, eminent domain,
quick take, Land grabs (acquisitions) and all other "tools" of this nature
undermines individual property Land rights.
1. Raising Hwy 27/82 will dislocate virtually all Cameron Parish residents along this highway. Relocation of assets is NOT an option. Neg. impact on flooding. (Holly Beach, Johnson's Bayou, Cameron, Creole, Oak Grove, Grand Chenier)
2. Rerouting the Achafayla River Basin to the Mermentau River basin will negatively impact flooding in Little Chenier and East Creole.
3. Leveeing the Intracoastal Canal ICWW will negatively impact flooding in Grand Lake, Sweet Lake, and Hackberry.
4. Rerouting the Mississippi River to Houma is an extreme undertaking, not recommended to attempt to play God and hijack nature.
There is alarming and growing concern in all of Cameron Parish that all churches, schools, businesses, and residents will be severely and negatively impacted by (see comments 1, 2, and 3 above.
The only effective means to enhance coastal Louisiana is the offshore breakwater rocks.

(Use the back of this form if more room is needed) (over →)

Name: Jay Rutherford Date: 2/27/2007

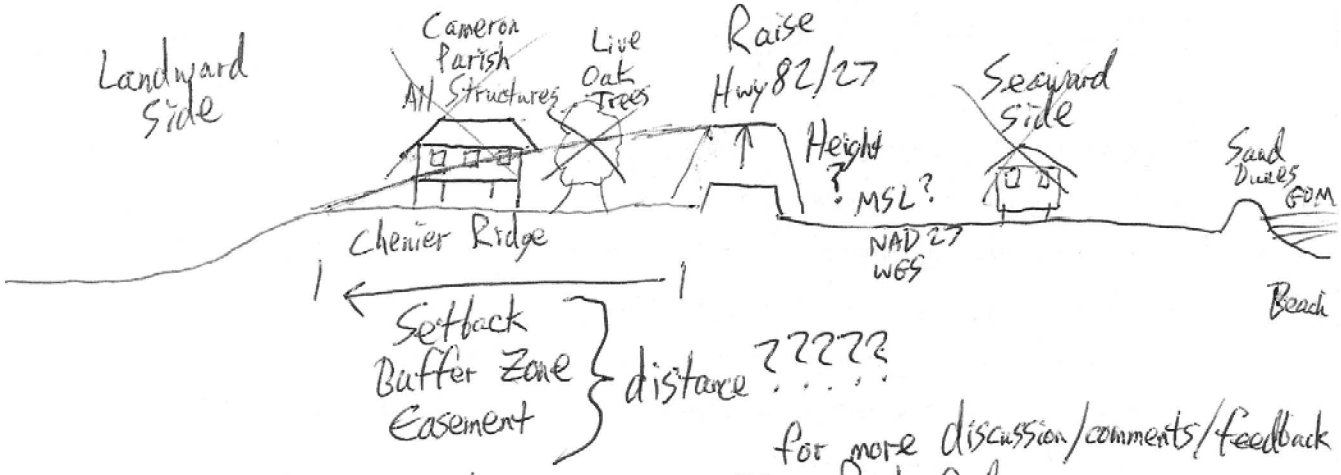
Address: P.O. Box 247, Creole, LA 70632 jayr33T@camtel.net

comments continued...

The Hwy 82/27 setback/buffer zone/easement requirements will result in massive "relocation of assets".
Relocation in Cameron Parish is NOT an option. Extreme resistance.

The cost overruns will be enormous, and very little if any of this Master Plan will be successfully implemented.

slope?
1V:100H
1V: 30H
1V: 10H
1V: 3H



for more discussion/comments/feedback

Jay Rutherford
P.O. Box 247
Creole, LA 70632
jayr33T@camtel.net

LDAF quick take NO!
LDNR quick take NO!
DOT quick take NO!
Involuntary Land Acquisition NO!

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Baton Rouge, LA 70804-9396

Email comments may additionally be submitted at: comments@louisianacoastalplanning.org

Please consider the following comments:

1) As submitted previously, the Bayou Sigre watershed should be included in the plan. The watershed plan has a lot of phases required for engineering and design. Completed.

2) Also submitted was the Hebert Canal watershed. All engineering and design are complete. This component would protect all areas from the Vermilion River to the 7th Ward Canal below LA. Hwy. 82.

3) Storm buffering systems, oilfield/navigation canals that run parallel to the coast could be used as buffering systems, raising these banks could mimic lost ridges, wetlands and cheneires that have →

(Use the back of this form if more room is needed)

Name: Sherrill Segura Date: 3-4-07

Address: 12139 W. LA. Hwy. 82 Abbeville, LA. 70510

been lost [redacted] through erosion/subsidence the footprint that exists eliminates losing additional wetlands.

— These three concepts were submitted, but do not see them in the plan. We would like a reason for ommitting or are they incorporated into other measures?

Southwest Louisiana needs storm protection. Hurricane Rita indicated that need. As we go through the prioritizing process, we need to focus some attention on Southwest Louisiana's needs.

Chandeleur Islands

Louise6677@aol.com <Louise6677@aol.com> **Sun, Apr 1, 2007 at 8:48 PM**
To: comments@louisianacoastalplanning.org

I think it's wonderful to have an overall plan to repair our coast, in particular one that emphasizes the first lines of defense. But I was very surprised that you didn't have more focus on the Chandeleur Islands. I know they were heavily damaged from Katrina, but hey need to be repaired to protect the southeast side of New Orleans.

Thanks.

Louise Saik
211 Mulberry Dr
Metairie,LA
504-831-3246

2/13/2007 6:39	Rudi Schnur, , 5098 Pecan Lane , , Jarreau, LA, 70749, USA, rudischnur@mindspring.com	The plan seems thoughtful and it recognizes in principle the difficult trade-offs and mutually exclusive objectives including recognition of the possible effects of global warming. The devil will be in the details with inevitable political compromise carrying the seed of longterm failure. Diversion of Mississippi and Atchafalya water to the marshes is a good thing and it will resume the process of building the Delta which was interrupted by levees to protect developments. But the building of more and higher levees to protect coastal developments is improbable to succeed. Katrina was far from being a category 5 storm when it hit New Orleans. It showed that one small initial breech in a levy quickly widens to cause effects that are tantamount to a failure of the entire levee. To protect against this would require extensive compartmentalizing of the levee system similar to principles used in shipbuilding. While this is doable it seems highly impractical and not cost effective. It has been popular to blame the USACE for just about everything but the popular call to bypass the Corps misses the point. What I miss in your plan as well as in the Louisiana Speaks campaign is a formal consideration of the obvious option to deliberately retreat from the coast to the extent possible and to rebuild on higher ground further inland. We have a historic opportunity to use smart development principles to create model communities suited for the challenges of the 21st century and attracting people and businesses to Louisiana. To create the infrastructure for such a developments would be a better investment into the future of Louisiana than spending megabucks for a system of defense against nature that will at best have marginal chances for success.

From: bobsell [sellar_r@bellsouth.net]

Sent: Tuesday, February 27, 2007 5:36 PM

To: comments@louisianacoastalplanning.org

Cc: rkitchens@kplctv

Subject: Public Hearing at Lake Charles on costal planning

How can anyone be so inconsiderate to the citizens of the Lake Charles area to hold a public hearing at a gambling facility. Who ever made this decision is not very competent and a replacement should be strongly considered. Public Hearings should be held at civic facilities. I don't know that any christen people with any morals will attend.
Bob Sellars
Westlake

3/14/2007 17:17	don soileau, , 207 hebert st, , lake charles , la, 70607, , soildon@aol.com	please make a rock levee in the gulf of mexico to protect lower cameron parish and so we can keep our beaches. i would also be for elevating hwy 82 and 27 about a foot to help with evacuations and reenty to our great parish after the next storm. i am 100% against any levee other than one in the gulf.. it makes no sense to have a levee on the north side of the intercostal waterway. all this will do is cause flooding in areas where flooding is not a prolbem. it would not help rebuild the marshes because the marshes are south of the intercostal. please use some common sense and help the people of cameron parish. thanks, don

03/28/07 12:21 PM	frances, CES, 50295 Creekside Dr, , Loranger, LA, 70446, USA, fjcreek@yahoo.com	We need to make decisions based on real science. Our wetlands are in serious trouble. we have exploited our precious wetlands for long enough. Oil companies have devistated how water moves through marshes and swamps. Delicate processes that took thousands of years to evolve have been drastically altered in the past 100yrs. What we are seeing is a trickle down effect from top level alterations. The canal/pipeline digging has to stop or we at least need to adopt a much more eco friendly approach. If Louisiana really wants to save the wetlands then some serious regulations need to be put into place and actually enforced. It's quite possible that it's too late to truly save what is left. I have seen ecosystems totally change in a very short time. To fix a problem you must first understand it. There is lots of good research out there to show what is happening to our wetlands. Unfortunately most of that good knowlege gets railroaded by big corporations or political agendas. Why is that? One simple solution to save our wetlands: PUT ASIDE BUSINESS AND POLITICAL INTRESTS AND REALLY LISTEN TO THE FACTS TO GET A LEGITIMATE UNDERSTANDING OF WHAT'S GOING ON!! Is that so much to ask? Sincerely, Frances StCyr wetland biologist

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Post Office Box 94396
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Please consider the following comments:

I am from Forked Island, La. The nearly forgotten "Rita" victims. We are not fully acknowledged yet. Nothing [illegible] has been done to help us in the near future yet. Rice farmers can't plant no crops because of saltwater, can't flood the cattle pastures because of salty canals "Bleh" uk. Do you really see it as "bad" as it really is? Hope so. We are all tax payers, but see nothing being done. It's very discouraging. If you all think we will get used to the situation you are dead wrong. We are not cattle that you can drive to the sale and get rid of us.

(Use the back of this form if more room is needed) over

Name: [illegible] Date:

Address: 27225 S. La. Hwy 82
Kaplan La - 70548

If you think we want to give our land and homes to higher up you are wrong - If you think we will leave our country home to move in town or city into hate and crime you are very wrong -

I please look ahead and quickly and do what's right -

You talk and move to have 3" coast line - You have used millions or billions of dollars to study coastal protection and Restoration but never did anything about it - I am talking a lot of years back - planting grass what a joke - you gave jobs a few people to plant the grass but that as far as it went - no help to us - the people crops, and cattle of Kenai Island - Forked Island Cajun Island - and the rest of the coast line - You talk well + have nice drafts, but you do no work - dirt work -

To tell you the truth I don't think you ever will - If your heart and mind were with the people you would have build a levee a long time ago - Hope you read this but I am sure you will file it in your waste basket - as you do with all letters that go straight to the core of the real situation -

I hope you do the right thing and do it or start something this year 2007 -

From: shane [s_shane@bellsouth.net]

Sent: Wednesday, February 28, 2007 11:20 PM

To: comments@louisianacoastalplanning.org

We have live On highway 82 for over 45 years, five west of Holly Beach and five miles east of Johnson Bayou We have seen probably 20 different attempts to save the road and beaches from erosion. From Big Huge concrete blocks to
telephone poles place with tires around to staggering the poles. None have worked. But the system in place already
there is working greatly. Staggered rocks, pumped in sand and the fences to make dunes and planting the sea oats to hold
to sand. Although I don't agree with how the fences was put back because it took all the beach. But this works. I think with a
little improvement to this system, it's a big start to saving the coastline. The only suggestion or improvement I would make
is to place rocks between the rocks already there about other 50 feet out front and higher. Pump the sand back again.
The road is still there with very little damage from Rita. " **IT WORKED"**

Karen J. Stidham
4008 and 4004 Gulf Beach Hwy(Peveto Beach) Actually **PALM BEACH SUBDIVISION**
Cameron, LA
(337)433-8697
Mailing Address:
229 W. Sallier St.
Lake Charles, LA 70601

04/02/07 08:16 AM	Capt.John G.Verret jr., Airboat Charters, Inc., 2253 Brady rd., , Theriot, LA., 70397, USA, captjverret@hotmail.com	Barrier Islands? I continually hear this is our first line of defense. I know this is true, but if we do not spend the money to restore our Marshes there will be nothing to protect. No levee will withstand a storm surge alone. It must have a healthy marsh outside the levee system to protect it. The analogy of a speed bump in speaking of the islands is a joke. The water where I live starts to rise 3-4 days before a storm comes ashore. These storms have no problem crossing those islands by the time the storm gets close the islands are already under water! We should prioritize the money so it is spent on getting back that 30-50 miles of heathly marsh ASAP. We as a state keep saying to the rest of the country "we are losing football fields of land everyday", but all they hear is talk of rebuilding some Islands! At the pace we are going the Islands will still be there...Only thing is there will be no land between them and Donaldsonville. We better get behind the pipeline slury idea that Mr Kerry St.Pe' is suggesting we incorporate ASAP! This land was built with silt. We can rebuild land with silt from the Rivers around here. Dont even get me started on these crazy water diversion projects that some want to implement. Water and flooding is the problem. Do we really want more of that? Sincerly, Capt. John Verret

(1)

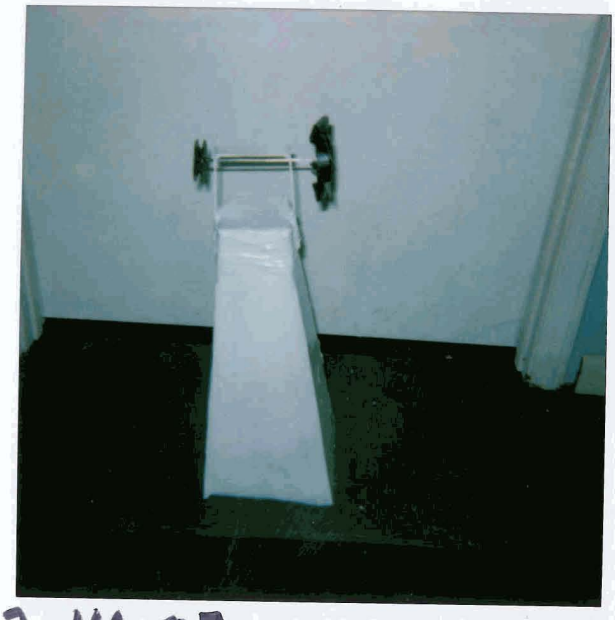
2-26-07

What is in the box?
In this box is one of the oldest devise known to man. It can create a lot of power, energy and fuel.
We have three mayor resources of super powers, we have electricity, wind and water.
We can use this to help build levees, diverse water from one place to another and many other things can be done with this. If it is use properly.
I hear people are looking for new sources of fuel other than gas and oil.
Maybe this would be a good project for Vo-tec to work on, too see what can really be done with it. Once the devise is made, there is no fuel cost.
I can demo right for you right here and now if you like to see what I am talking about.
So This is what in the box.

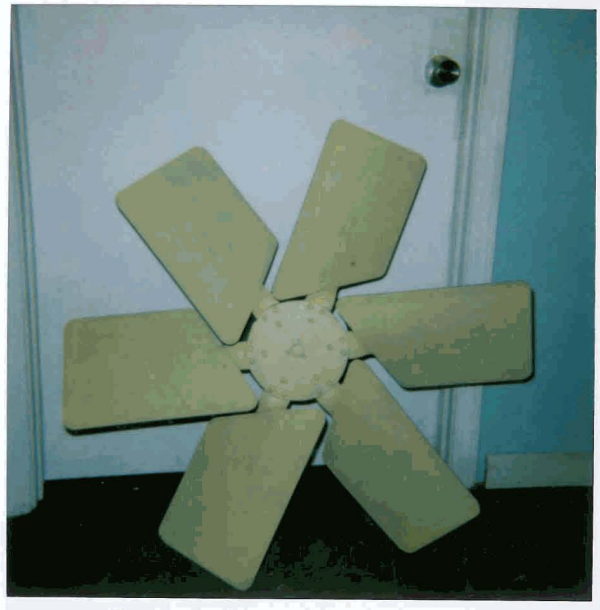
Preston Verret

But it can help in many ways.
But it can not do it all,

(over)



2-14-07
PRESTON VERRET



2-21-07
Preston Verret

(2) 2-25-07

Resources

1 air
2 Rain
3 water
4 wind
5 mud
6 Sand
7 oil
8 gas
9 air space
10 machinery
11 Technology
12 water bottoms
13 Mountains
14 rocks
15 sun light
16 heat

and more

Suggestion (3)

Instead of creating floods by digging more channels

We can do a melt down of mud to make levees and land

This will make bigger and stronger levees, and probably faster, I think you will find a different in the cost of this project

I am talking about recycling mud

There is to much water, we have lots of it

This is one way to use water to make less water

This is one way to use two Resources at one time

Turn liquid into a solid

(4) 2-25-07

Questions

What will you do with the water? any plans?

What are you doing to use some of the water after you dig

Do you have a plan to get rid of the water?

How do you get rid of the water?

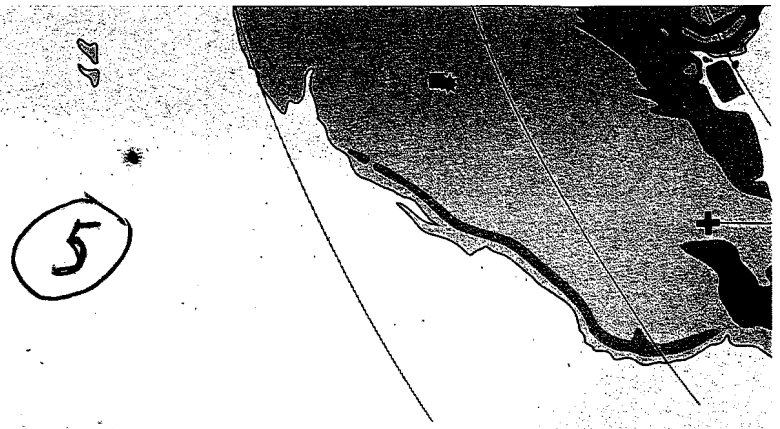
~~Heat~~ How much water is put on the earth every day in one way or another?
ice, snow, rain, ~~fog~~ high tides sleet, fog

the world environment, protecting the topsoil, governing the even flow of rivers, and, on a global scale, helping to maintain a balanced climate.

But the forests are under pressure. As many as 100 acres (40 hectares) of tropical forest are being destroyed every minute — a total of over 83,000 square miles (210,000 sq km) a year. Perhaps twice that area is being seriously degraded. Timber harvesting and cattle ranching play their part in the destruction, but just as significant are the slash-and-burn

of the Zaire Basin, where the population pressure is not so intense, can be sure to survive at least partly intact. But in west Africa, southeast Asia, and the Himalayan watershed, most of the unique and irreplaceable forest will soon have gone forever.

The only real solutions to the destruction of tropical rain forest lie in the control of population growth; increasing yields on good land; planting alternative sources of timber and fuelwood; and ecological sensitivity in development projects.



KEEPING THE DESERT AT BAY

About one-third of the earth's surface, fringing the great deserts, is arid, often subject to prolonged drought. Natural ecosystems here are adapted to long dry spells and can take them in their stride. But when such areas are put under pressure by rising populations and the demand for food, their ability to spring back to productiveness after drought is severely reduced. The rains, when they come, rather than soaking into and feeding the land, can wash away the soil, extending the limits of the desert. Every year about 47,000 square miles (122,000 sq km) of agricultural land are made worthless in this way.

This process of "desertification" is probably worsened by the increasing levels of carbon dioxide and other gases in the atmosphere, produced by the burning of fossil fuels, which are likely to raise global temperatures within the next century by up to 8°F (4.5°C).

Unchecked, desertification tends to be self-sustaining. The destruction of vegetation by overuse of the land makes the surface of the soil more reflective and less absorbent. Both evaporation and rainfall decrease, and regrowth becomes less likely.

PINNING THE DUNES. Sand that threatens to encroach on farmland in Tunisia is stabilized with palm seedlings.

A problem of such vast proportions is not easily dealt with. A reduction in carbon dioxide emissions from the industrial countries will help. Keeping animals and vehicles off certain areas can reestablish vegetation. The deliberate planting of forest and shrub stands — in the Soviet Union, India, and China — reduces erosion on a local scale.

(6) 2-28-07

By mixing water with sand will create a liquid and by piping will make land. ~~Too~~ Through piping it can be put where ever you want it. This will make levees with out dregging. By cutting more holes in the earth surface will not stop flooding. We must find a way to use the water and worthless land combind them together. There is already to much water. We need to find a way to use as much water as possible. Because there is much more water coming in the next hundred years.

To this place the land is worthless, to the coast it is like gold. This would create more surface.

By piping will create jobs, land, revenues, taxes and more.

In one hundred years, just think how much land can be built along the coast line, where it is needed very - very much.

(7) 2-28-07

This is just my way of thinking. I would like you to think about it.

By dregging to build a levee how much more land will be lost along the coast line. And then what do we do?

By using this technic there might be other things to watch for, such as mineral, gold, rubys, diamonds and gems and maybe other revenues. I don't know what you might find. The main thing is to watch for it. It would be like paning for gold. No matter what, to the coast line soil would be gold.

I will stop for now. This is just a thought.

Preston Verret

3/18/2007 4:01	Denton C. Vincent, , 3097 Grand Chenier Hwy., , Grand Chenier, La., 70643, Cameron, DVin104456@aol.com	Hello, my name is Denton Vincent. I was born and raised in Cameron Parish. I reside in Grand Chenier and my family has been living in Grand Chenier since the early 1800's. I choose to live here because of my heritage and also because my work as a outside sales rep. for an oilfield environmental company has me working between Intracoastal City, La. and Galveston, Tx. I think raising La. Hwy. 82 will not help with stopping the huge tidal waves or storm surges that close to the chenier ridge. I feel as my grandfather did 35 yrs. ago that a levee between 15-18 feet high would very much decrease the impact of a large hurricane on the communities, wildlife and century old trees and the ridges. My grandfather has said many times that a high levee should be built inland a mile or two from the coast. I feel the same way but I think it should be built on the south side of Hog Bayou from the deep channel leading to the Gulf on the western end of Grand Chenier to the southern most levee on Rockerfeller Refuge eastward towards Rollover Bayou in Vermilion Parish. There will still be outlets at the Mermentau River, Josephs Harbor and Rollover Bayou. Also floodgates could be installed at the various sites where smaller bayous enter the Gulf to allow quicker outages for the water after the fact. I am speaking for the Grand Chenier area only and not the other communities since they will also have their ideas for own areas. The idea of raising La. 83 would destroy the century old magestic oak trees should not even be considered. I want to thank you for the opportunity to voice my opinion. Please do consider my option. Thanks, Denton

coastal master plan

peterwolfe <peterwolfe@bellsouth.net> **Mon, Apr 2, 2007 at 10:52 PM**
To: comments@louisianacoastalplanning.org

Protecting south Louisiana from the flooding and tidal surge that occurs after a hurricaine is the goal. It seems to be a given that wave action plays a large part in coastal erosion and loss of the wetlands. to build levees and flood gates at the coast would stop wave action but also prevent the flow of water into the marsh that the nurseries need for the development and growth of shrimp, crab, oysters, and other sea life. What would be the feasibility of placing two rows of large rocks 20 + feet high with alternate openings every half to quarter mile to allow boat traffic to use this as a shipping channel. Build this close to shore of barrier islands start at pearl river and end at Texas line. In the future this could be used as an alternate to the intracoastal waterway. Thereby not having dangerous cargo in downtown Houma, Morgan City,and other cities. These rocks would slow down the storm surge and the current of the tidal flow, but would not stop the flow of water into the marsh as the limited openings of flood gates. There would be very little maintance except for the digging out the channel. The reef formed by the rocks would serve to enhance oyster production and inprove habitat for fish and other sea live. Old timers from this area tell of tidal action 40 to 50 years ago that did not reach the area of Chauvin . Now the tide floods almost to Houma. The small passes and large barrier islands slowed the tidal flow. These rocks may work the same way. Save our fisheries. Save our coastline, and our way of life.

Peter Wolfe
6757 Hwy 56
Chauvin, La 70344

985-594-4312

3/15/2007 7:30	Bruce K. Woods, Era Helicopters, 4056 Adell Lane, , DeQuincy , La., 70633, Calcasieu, bwoods@erahelicopters.com	Calcasieu Parish is a beautiful part of southwest Louisiana which needs to be protected by our State and our Country. We need to have some fencing along all the coast from Holly Beach to Fresh Water City just like the fence that was installed from Holly Beach to Johnson Bayou that really helped with the lose of our coast. The sand really started to build up after the fence was installed but it was messed up after the Hurricane. I also think that the coastal erosion needs to be addressed and leave the Highway issues put on the back burner. The Rivers, bayous and canals need to be left alone and not relocated, straightened or tampered with in anyway other than what that is natural already. This Community needs to be preserved for the residents and not only for businesses and Tourism. PLEASE DON'T RUIN THIS PART OF THE STATE .

From: Abby Gotte [cppd_abby@camtel.net]
Sent: Friday, March 23, 2007 3:31 PM
To: comments@louisianacoastalplanning.org
Cc: Amanda Evans; Kennedy, Nancy
Subject: Cameron Parish Submission
Attachments: La Coastal Planning website letter of submission.pdf

On behalf of the citizenry of Cameron Parish, we have attached our official submission opposing the Integrated Ecosystem Restoration and Hurricane Protection Comprehensive Masterplan. A hard copy is also being forwarded. Thank you for this opportunity.

Sincerely,

Abby

Abby Gotte & Amanda Evans
Executive Assistants
Office of Planning & Development
Cameron Parish
(337) 598-5206 phone
(337) 598-5258 fax

CAMERON PARISH PLANNING & DEVELOPMENT

District 7
Darryl Farque
President

Ernest Broussard, Jr., AICP/CEcD
Executive Director

District 1
Magnus "Sonny" McGee
Vice President

March 22, 2007

Mr. Andrew Beall, Department of Natural Resources
Coastal Protection and Restoration Authority
Integrated Planning Team
P.O. BOX 94396
Baton Rouge, LA 70804-9396

Dear Mr. Beall,

Subsequent to your recent public discussion regarding the Integrated Ecosystem Restoration and Hurricane Protection Comprehensive Master Plan, I take this opportunity, on behalf of the designated agency that is involved with the parish's short and long-term recovery initiatives and its comprehensive planning and development program, to forward our established position to you regarding this matter.

As digested below, we would like to originate our points of contention with regret as there does not seem to be much substantive science that has been generated on these alternatives so that the leadership as well as the public can ascertain for themselves the direct and indirect impact from these alternatives. The issues are numerated as follows:

1. We are somewhat surprised that as you go forward to memorialize these discussions, there has not been true evidence given as to the placement implications and the objectives of these levees whether or not they be placed along the coast or along the inland waterway of the Intracoastal.

2. If in fact your objective is coastal protection, then inserting a levee system midway through the parish debases half of this community, especially since the parish has a strong socioeconomic and industrial base in the way of its fisheries, maritime, and petro-chemical sectors

3. We would firmly like to establish the fact that our primary interest in protecting the coast is the continuation of the breakwaters and sand nourishment, (i.e. rock jetty formations) that has proven so effective in protecting the coast of Cameron Parish while at the same time allowing natural drainage to subside as naturally intended.

4. Having no evidence of substantive reasoning or cost benefit at this time, the parish is unilaterally opposed to the placement of a levee system anywhere until sufficient hydrologic, geographic, and socioeconomic implications have been studied as well as a series of alternatives, given the basis of this development. The protection of floodwaters intruding into the Mermentau, Calcasieu, and Sabine River basins would only be compromised as floodwaters recede if there is not sufficient evidence to facilitate departing waters. The natural flotation system that the open marshes and the cheniers play in this should be undertaken before a costly and potentially detrimental undertaking be pursued.

5. We are equally uncertain without the submission of direct impacts regarding needed acquisitions or expropriations regarding the raising of LA 82, LA 27 or other state or federal highways that could significantly result in displacement of the current citizenry. There is an underlying concern throughout Southwest Louisiana given the slowness of recovery dollars that there is some covert action or conspiracy to dissuade individuals from relocating back into

P.O. Box 8864 Lake Charles, LA 70606 Phone (337) 598-5206 Fax (337) 598-5258

District 2
Steve Trahan

District 3
Charles Precht III

District 4
Douaine Conner

District 5
Scott Trahan

District 6
James Doxey

the parish. These types of studies that have not been fully disclosed and substantiated tend to play into that argument.

6. There has also been no evidence revealed in the litany of public and private discussions establishing communication between other environmental and coastal protection groups and or programs that do not reflect the conflict in this drafted master plan.

7. This initiative should also involve other agencies that are involved in coastal protection, maritime transportation, economic development, and other coastal barrier issues.

8. We would like to underscore that Cameron Parish is now formulating and engaging its independent recovery initiative and is currently considering land use, transportation, housing and basic infrastructure in order to determine its collective future. We are astonished that this plan does not capture the gentrification efforts of lower Cameron, its development pressures experienced in the northern part, and its resilience in the current efforts to protect both wetland and improved areas for both environmental and urban development for future development needs.

In summary, it is clear to us that while this parish is very pro-active in pursuing its long- term community needs and would like to be a partner in this program, there is significant animosity toward the series of presentations presented to us, given the absence of substantiated science and/or logical alternatives associated with such a massive undertaking. We clearly would like to maintain active in this program as Cameron Parish seeks to advocate its viability and livability as a signature Louisiana community that is very sensitive to these impending generational projects that do not demonstrate the best interest of the immediate community. We stand, however, to continue this dialog, and we would like to interface our efforts with you as we continue our journey to recovery.

Thank you for the opportunity of this submission.

Sincerely,

Darryl Farque
President
Cameron Parish Police Jury

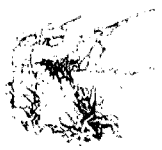
Ernest Broussard, Jr. AICP/CEcD
Executive Director
Office of Planning & Development
Cameron Parish

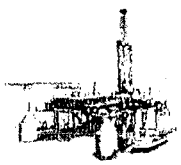
Cc: Cameron Parish Police Jurors
Mrs. Tina Horn, Parish Administrator

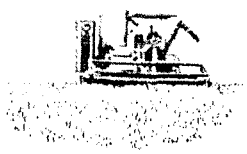
DARRYL FARQUE
PRESIDENT
MAGNUS McGEE
VICE PRESIDENT
EARNESTINE T. HORN
ADMINISTRATOR
BONNIE W. CONNER
SECRETARY-TREASURER

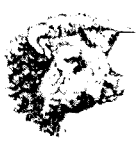
POLICE JURY
PARISH OF CAMERON
P. O. BOX 1280
CAMERON, LOUISIANA 70631
(337) 775-5718
(337) 775-5567 Fax
cppjury@camtel.net

DISTRICT 1
MAGNUS "SONNY" McGEE
DISTRICT 2
STEVE THAIAN
DISTRICT 3
CHARLES PRECHT III
DISTRICT 4
DOUANE CONNER
DISTRICT 5
SCOTT TRAHAN
DISTRICT 6
JAMES DOXEY
DISTRICT 7
DARRYL FARQUE









RESOLUTION

STATE OF LOUISIANA
PARISH OF CAMERON

WHEREAS, the Coastal Protection and Restoration Authority of Louisiana (CPRA) has drafted a Comprehensive Coastal Protection Master Plan for the purposes of providing future storm protection, shelter for spawning grounds for fisheries and habitat, and assurances of the continuation of a unique Louisiana culture; and

WHEREAS, the plan will guide how money is allocated to protect and restore the coast of Louisiana, as well as, influence future land use decisions; and

WHEREAS, the plan will have both short-term and long-term effects on all citizenry of Cameron Parish; and

WHEREAS, CPRA is soliciting public input regarding the Comprehensive Coastal Protection Master Plan;

NOW, THEREFORE, BE IT RESOLVED, by the Cameron Parish Police Jury, that CPRA maintain close coordination with Cameron Parish leaders and agencies by hosting local public meetings to ensure that all of Cameron Parish and all Cameron Parish citizens are adequately protected by the Comprehensive Coastal Protection Master Plan.

ADOPTED AND APPROVED this 1st day of March, 2007.

APPROVED:

DARRYL FARQUE, PRESIDENT
CAMERON PARISH POLICE JURY

ATTEST:

BONNIE W. CONNER, SECRETARY

DARRYL FARQUE
PRESIDENT
MAGNUS McGEE
VICE PRESIDENT
EARNESTINE T. HORN
ADMINISTRATOR
BONNIE W. CONNER
SECRETARY-TREASURER

POLICE JURY
PARISH OF CAMERON
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(337) 775-5567 Fax
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DISTRICT 1
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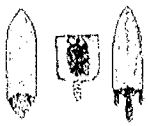
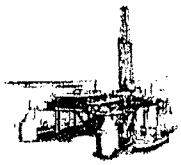
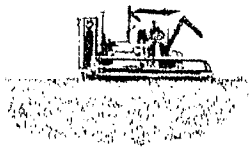
DISTRICT 7
DARRYL FARQUE

RESOLUTION

STATE OF LOUISIANA
PARISH OF CAMERON

WHEREAS, any expansion of eminent domain, expropriation and quick take beyond current law would weaken land ownership property rights; and

WHEREAS, the Cameron Parish Police Jury opposes any expansion of eminent domain, expropriation, and quick take beyond current law;

NOW, THEREFORE, BE IT RESOLVED, by the Cameron Parish Police Jury, that the Louisiana Legislature is hereby urged and recommended to oppose any expansion of eminent domain, expropriation, and quick take beyond the legal limits currently set forth by Louisiana statutes.

ADOPTED AND APPROVED this 1st day of March, 2007.

APPROVED:

DARRYL FARQUE, PRESIDENT
CAMERON PARISH POLICE JURY

ATTEST:

BONNIE W. CONNER, SECRETARY

I CERTIFY THAT THE ABOVE AND FOREGOING IS A TRUE COPY OF A RESOLUTION ADOPTED AT A Regular MEETING OF THE CAMERON PARISH POLICE JURY HELD ON THE 1st DAY OF March, 2007.

CERTIFIED THIS 9th DAY OF March, 2007.

BONNIE W. CONNER, SECRETARY

From: Doug Chance, Phd. [doug_chance@camsch.org]

Sent: Friday, March 16, 2007 4:42 PM

To: comments@louisianacoastalplanning.org

Subject: Meeting In Cameron

March 16, 2007

To: Members
The Coastal Protection and Restoration Authority's
Integrated Planning Team

Re: Meeting In Cameron Parish on Wednesday, March 14, 2007

Greetings:

Mr. Loston McEvers, President of the Cameron Parish School Board, attended your meeting in Cameron on March 14th. As a lifelong resident of Cameron Parish and as President of the Cameron Parish School Board, he asked me to e-mail the TEAM pursuant to his concerns relative to elevating Highway 82.

His reservations involve the location of school facilities and properties along Highway 82. Starting on the eastern section of the parish, Cameron Parish Schools owns seven school locations between 4095 Hwy 82 (Grand Chenier Hwy), Grand Chenier through 6304 Hwy 82 (Gulf Beach Hwy), Johnson Bayou. All seven of these facility locations would be impacted by the proposed elevation of Highway 82.

Again, Mr. McEvers ask that I e-mail you pursuant to his concerns relative to the negative impact on school locations should Highway 82 be elevated all along the coast.

Submitted as requested,

Doug Chance
Cameron Parish Schools

Comments on Draft Master Plan

MWinter <MWinter@jeffparish.net> **Fri, Mar 30, 2007 at 9:24 AM**
To: comments@louisianacoastalplanning.org
Cc: micheled@dnr.state.la.us

See attached.

Marnie Winter, Director
Environmental Affairs
4901 Jefferson Highway, Suite E
Jefferson, LA 70121
Phone: 504-731-4612 Fax: 504-731-4607

"Provide the services, leadership, and vision to improve the quality of life in Jefferson Parish."

A.Broussard re CPRA
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JEFFERSON PARISH
LOUISIANA

OFFICE OF PARISH PRESIDENT

AARON F. BROUSSARD
PARISH PRESIDENT

Our Mission Is:
"Provide the services, leadership, and vision to improve the quality of life in Jefferson Parish."

March 29, 2007

Mr. Randy Hanchey, IPT Team Leader
Coastal Protection and
Restoration Authority of Louisiana
CPRA Integrated Planning Team
P.O. Box 44027
Baton Rouge, Louisiana 70804-4027

RE: Draft February 2007 Report: **Integrated Ecosystem Restoration and Hurricane Protection: Louisiana's Comprehensive Master Plan for a Sustainable Coast**

Dear Mr. Hanchey:

Our staff has been involved with on-going planning efforts of the CPRA Integrated Planning Team and it was our understanding that increased hurricane protection to the 100-year level for Lafitte and Barataria is part of the Plan. However, after carefully reviewing the Executive Summary of the February 2007 draft report, we are concerned that there is no specific reference that would confirm the inclusion of Lafitte and Barataria within the proposed 100-yr protection levee for Barataria Basin and the West Bank.

Although we have been given verbal assurance that the map on page 60 of the Draft, February 2007 Report depicts increased levee protection for the Lafitte and Barataria areas of Jefferson Parish, the language provide under the "Barataria Basin and West Bank" heading on page 58 does not specifically include Lafitte or Barataria. Therefore, we are requesting that the language be modified to read "The project would provide a 100 year level of protection to Lafourche Parish and the communities in the central Barataria Basin, including Lafitte and Barataria."

We appreciate this opportunity to provide comments on the draft master plan and thank you in advance for your attention to this matter which is of utmost importance to the residents and businesses of the Lafitte and Barataria area of Jefferson Parish.

Sincerely,

Aaron F. Broussard
Parish President

cc: Hon. Timothy P. Kerner, Mayor, Town of Jean Lafitte
All Jefferson Parish Council Members
Marnie Winter, Director, Environmental Affairs

SUITE 1002 - 1221 ELMWOOD PARK BOULEVARD - JEFFERSON, LOUISIANA 70123
P. O. BOX 10242 JEFFERSON, LOUISIANA 70181-0242 - (504) 736-6400

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(no subject)

MWinter <MWinter@jeffparish.net> **Fri, Mar 30, 2007 at 12:51 PM**
To: comments@louisianacoastalplanning.org
Cc: micheled@dnr.state.la.us

Please see attached comment letter.

Marnie Winter, Director
Environmental Affairs
4901 Jefferson Highway, Suite E
Jefferson, LA 70121
Phone: 504-731-4612 Fax: 504-731-4607

"Provide the services, leadership, and vision to improve the quality of life in Jefferson Parish."

C.Roberts Comments re Draft Feb 2007 Report-IERHP LA Master Plan.033007.pdf
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CHRIS ROBERTS
COUNCILMAN, DISTRICT 1
JEFFERSON PARISH

P.O. Box 9
GRETNA, LOUISIANA 70054
PHONE: (504) 364-2607
FAX: (504) 364-2615

March 30, 2007

Mr. Randy Hanchey, IPT Team Leader
Coastal Protection and
Restoration Authority of Louisiana
CPRA Integrated Planning Team
P.O. Box 44027
Baton Rouge, Louisiana 70804-4027

RE: Draft February 2007 Report: *Integrated Ecosystem Restoration and Hurricane Protection: Louisiana's Comprehensive Master Plan for a Sustainable Coast*

Dear Mr. Hanchey:

I would like to thank all of the members of the CPRA Integrated Planning Team for their efforts towards development of a comprehensive master plan for a sustainable coast. We also appreciate the opportunity to provide input into both the process and the draft report. The multiple lines of defense strategy that combines coastal restoration with both the existing West Bank and Vicinity Hurricane Protection Levee and the proposed Donaldsonville to Gulf Hurricane Protection Levee provides a comprehensive approach to protecting people and infrastructure in west Jefferson.

However, I am concerned that the report does not provide specific assurance that the proposed hurricane protection levee for the Barataria Basin and the West Bank includes 100 year level of protection for all of the currently developed areas of Jefferson Parish, particularly Lafitte and Barataria.

Although some of our staff have been given verbal assurance that the map on page 60 of the Draft February 2007 Report depicts increased levee protection for the Lafitte and Barataria areas of Jefferson Parish, the language provide under the "Barataria Basin and West Bank" heading on page 58 does not specifically include Lafitte or Barataria. Therefore, I am requesting that the language be modified to read "The project would provide a 100 year level of protection to Lafourche Parish and the communities in the central Barataria Basin, **including Lafitte and Barataria**."

Thank you in advance for your attention to this matter which is critical to protecting our residents and businesses in the Lafitte and Barataria areas of Jefferson Parish.

Sincerely,

Christopher L. Roberts,
Councilman, District 1

cc: Hon. Aaron F. Broussard, Parish President
All Jefferson Parish Council Members

From: Randy Trosclair [rtrosclair@charterinternet.com]

Sent: Wednesday, March 28, 2007 4:44 PM

To: comments@louisianacoastalplanning.org

Subject: GIWW Allignment

With regards to hurricane protection, we were informed that the GIWW Allignment may have been removed from the master plan. We would like to see that it be re-instated back into the plan as it was originally .The GIWW protects an area of 1,171 square miles, It the shortest alignment 22.7miles, it protects three Hurricane Evacuation Routes-(LA 308, US 90, and the I-49 proposed corridar), the population protected is 356,000, and the residential homes protected is 125,900. This alignment also provides multiple levels of hurricane protection.

Randy Troscalir
Lafourche Basin Levee District

The League of Women Voters of New Orleans

1215 PRYTANIA SUITE 224 • NEW ORLEANS LA 70130 • (504) 581-9106

March 26, 2007

CPRA-IPT
DNR
P.O. Box 94396
Baton Rouge, LA 70804-9396

RE: Comments on Coastal Protection and Restoration Authority Draft Master Plan

The League of Women Voters has long held positions on the identification, regulation and preservation of fragile lands, particularly coastal wetlands. The Coastal Protection and Restoration Authority along with the Louisiana State Legislature deserve our thanks for drafting this plan with real goals and timely implementation measures to address the most important issue facing Louisiana today and for the future. Thank you for the opportunity to submit our thoughts and comments.

One important feature for effectively implementing the final plan is missing in this draft. There must be a plan for constant, accurate public information dissemination over the entire time frame from now going forward. This means going way beyond stakeholder participation in the planning stages and public meetings and hearings. The general public, if informed continuously of the progress including successes and failed projects, goals and reports, will be supportive on a continuing basis.

As southern Louisiana recovers from Rita and Katrina and those events become more distant, the sense of urgency will fade from the everyday lives of many people. In addition, as redevelopment occurs new citizens will move to Louisiana and they need to be educated. This plan, whatever the final form, calls for state legislative approval on a regular basis. As other needs clamor for pieces of the state's budget, legislators will be less eager to fund coastal protection unless their voters demand the expenditure for the coast. This means that the citizens and legislators from all areas of the state need to be well informed and committed. The same principle applies to our federal congressional delegation.

The public education component must focus on the entire plan and how all the parts are necessary for success. Otherwise, parochial interests will erode the effectiveness. A sense of unity needs to be conveyed to both the public and public officials. The stream of information should be constant and citizens should become accustomed to anticipating the information on a regular basis.

The methods needed can be borrowed from other successful media venues. For example, the public looks for the weather box in their newspapers on a daily basis to plan their activities. They also rely on a weather report in all the newscasts via all television and radio stations. It is the reliability and consistency that make these venues so successful. This is the type of public information dissemination that should be established. Occasional news releases or program specials alone will not be sufficient to establish a solid base of public support. We recommend calling a summit of all the media executives in Louisiana to brainstorm an effective public information plan.

We also have a second concern. We encourage you to hold fast to all the components of the final plan being implemented. The list of urgent projects should not be whittled away by other interests. Hard decisions made now will prevent much human distress and economic loss in the future. Tackling the coastal ecosystem component will also further the other three goals in the draft plan.

Sincerely,

Lea Young

Lea Young, President

Executive Committee

Jake Trewin
President
Plano, Texas

Kermit Coulon
First Vice President
Houma, Louisiana

Allan B. Ensminger
Second Vice President
DeRidder, Louisiana

Denis Murrell
Secretary-Treasurer
Bayou Goula, Louisiana

N. Buckner Barkley, Jr.
Marrero, Louisiana

Vic Blanchard
Plaquemine, Louisiana

Robert J. Kinler
New Orleans, Louisiana

Alex J. Plaisance, Jr.
Golden Meadow, Louisiana

David M. Richard
Lake Charles, Louisiana

Rudy C. Sparks
Patterson, Louisiana

George A. Strain
New Orleans, Louisiana

Directors

Tim Allen
Houma, Louisiana

P. Albert Bienvenu
New Orleans, Louisiana

Merleen Burdin
Lafayette, Louisiana

David Cagnalotti
Baton Rouge, Louisiana

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Thibodaux, Louisiana

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New Orleans

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Bayou Goula, Louisiana

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Lafayette, Louisiana

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Harvey, Louisiana

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Lockport, Louisiana

Claude V. Perrier, III
Houston, Texas

Michael Plaisance
Golden Meadow, Louisiana

William B. Rudolf
Metairie, Louisiana

John F. Schneider
Ponchatoula, Louisiana

Cyrus Theriot
Dulac, Louisiana

Gordon Wogan
New Orleans, Louisiana

Louisiana Landowners Association, Inc.
8982 Darby Avenue
Baton Rouge, Louisiana 70806
Telephone: (225) 927-5619
Fax No.: (225) 928-7339

Newman Trowbridge, Jr.
General Counsel
Lafayette, Louisiana

Directors Emeritus
Hugh C. Brown
G. Wade Burdin
Charles LeBlanc, Jr.
L. P. LeBourgeois, Jr.
Stanley Stockstill

March 27, 2007

CPRA-IPT
DNR
P.O. Box 94396
Baton Rouge, LA 70804-9396

Re: Comments to February 2007 Comprehensive Master Plan for a Sustainable Coast

Ladies and Gentlemen:

The following comments are submitted in connection with the February 6, 2007, release of the referenced draft and your request for comments thereon on or before April 2, 2007.

Louisiana Landowners Association ("LLA") represents members owning in the aggregate in excess of three million acres of land in Louisiana, a significant portion of which lies in the coastal areas of the state. LLA and its members have long been engaged not only in discussions concerning and efforts to implement a coast-wide restoration program but also in efforts to maintain their own properties. LLA members have, without the need for expropriation, made their land available for such early projects as the Davis Pond Freshwater Diversion Project and the Isle Denier Barrier Island Restoration Project. In April 2002, LLA published its position paper titled "Coastal Restoration in Louisiana: Striving For A Higher Level," following which LLA members and officers met with numerous state and federal officials to discuss the paper and the need to focus the coastal restoration effort on solutions that have the best chance for success. In June 2006, Biloxi Marsh Lands Corporation, an LLA member, at great expense, developed and published an authoritative document titled "The Biloxi Marsh Stabilization And Restoration Plan." Representatives of that company then met at length on multiple occasions with members of the CPRA Integrated Planning Team and much of the information developed by Biloxi Marsh Lands Corporation has been utilized in development of the Draft Master Plan.

The point of the foregoing is to emphasize that LLA and its members have been engaged in this process for a very long time. LLA's members have not been forced into this participation. For that reason, LLA and its members are saddened and dismayed by a Draft Master Plan that, in our view, loses focus on coastal restoration, proposes unworkable, if not damaging, measures in the name of protection and restoration, omits

2007 MAR 30 AM 9:29

consideration of features which are obviously critical to the restoration and protection process and appears to erroneously focus on land use planning and expropriation of private property rights as a short term remedy to a long term problem. At best, the Draft Master Plan is a hastily concocted document that lacks any real substance. Clearly, the state has put this document together in an effort to seize some control over what will ultimately be a federal planning process. Our fear is that the lack of substance will, when reviewed by federal officials, the scientific community and the public, have the opposite effect.

The Draft Master Plan ignores what, in our view, are three critical features to any restoration and protection plan, Old River Control Structure, a Third Delta Conveyance Channel (Lafourche Conveyance Channel) and restoration of the Chandeleur Islands.

With respect to the Chandeleur Islands, those islands act as the primary line of defense protecting southeastern Louisiana from hurricane waves and storm surge. The failure to ensure the continued existence of those islands will mean that hurricane protection measures at the shoreline intended to be the last line of defense will be the first and only line of defense. Ignoring restoration of the Chandeleur Islands is an absolute unforgivable recipe for disaster.

River water, with its associated sediment and nutrients, is the most important raw material for building a sustainable coastal Louisiana. One of the more obvious sources of that river water is the Old River Control Structure. Not only would a reallocation of flows at that structure provide a source of sediments and nutrients for the marshes but would also benefit the Atchafalaya River Basin and its enormous coastal forest resources by reducing chronic flooding. The Old River Control Structure's capability to precisely allocate flow distributions can and should be utilized to create a more controllable system that would take advantage of seasonal changes in sediment transport to route sediment-laden water to the areas in which those sediments are most needed. River diversions are major restoration tools which must be incorporated into the coastal restoration effort. Reallocation of flow at Old River is an essential component to any restoration plan but has been ignored in the Draft Master Plan.

Of course, the diversion of water and sediment at Old River requires a conveyance channel to move that water and sediment to the areas where it is most needed. The Third Delta Conveyance Channel is the largest of the river diversions initially proposed in the Coast 2050 Plan. As envisioned by Coast 2050, the channel would effectively replace the historic Bayou Lafourche distributary system. The construction of such a channel would not only introduce river water, sediment and nutrients into wetlands that have been starved, the channel would reduce flood elevations on the Mississippi River, reduce maintenance dredging in the Mississippi River, reduce anaerobic conditions (dead zone) in the Gulf of Mexico and reduce back water flooding in the Lake Verret and Penchant Basin areas. The conveyance of reallocated flow at the Old River Control Structure through the Third Delta Conveyance Channel is a critical component to restoring and enhancing both the Atchafalaya region and the Lafourche region that has also been ignored in the Draft Master Plan.

What the Draft Master Plan does appear to focus on is land use planning. It is interesting to note that the task of reviewing land use planning tools, including an assessment of state land use planning authority and practices, has been delegated to Louisiana Sea Grant Program and the

Coalition to Restore Coastal Louisiana. Where is the input in that process from the landowner and development communities? Even the working group contemplated by the CPRA which includes representatives of parish governments, legislators and agency personnel, wrongfully excludes developers and landowners. In Louisiana, to suggest, as the Draft Master Plan does, avoiding development in low-lying or wetland areas and emphatically state that wetlands need to remain undeveloped, is to severely impact economic development. Under current wetland definitions, the vast majority of the remaining undeveloped land in coastal Louisiana is wetland. Many of these lands may not be wet and may be totally appropriate for development but they are nonetheless defined as jurisdictional wetlands. Louisiana's Coastal Resources Program and Coastal Zone Management Plan have been developed in recognition of the fact that Louisiana must both protect its wetlands and provide for sustained economic growth. Nowhere in the Draft Master Plan's discussion of land use planning and zoning is there any mention of economic development.

While recognizing that DNR and DOTD have expropriation authority under Title 19 of the Louisiana Revised Statutes, the Draft Master Plan concludes that this long recognized procedure for balancing the needs of the public against constitutionally protected property rights is a long and contentious process which is clearly unacceptable. As an alternative, the Draft Master Plan suggests that the best interests of the public are served by enacting additional "quick take" authority. The use of the word "quick" in connection with a process that has taken and will take as long as coastal protection and restoration will take is ludicrous. The apparent goal of quick take authority is to avoid the debate over whether the rights to be taken are excessive or even necessary. The enactment of quick take procedures in the context of coastal restoration and protection is offensive to LLA and its members who have devoted so much time and effort for so many years to the coastal restoration effort. More importantly, quick take procedures in this context are wholly unnecessary and will do nothing to provide a single restoration or protection project one day earlier than might otherwise occur, even in the unlikely event that Title 19 expropriation procedures are required.

Thanking you in advance for your consideration of these comments, we are

Very truly yours,

LOUISIANA LANDOWNERS
ASSOCIATION, INC.

By: _____
James H. Trewin, President

Plaquemines Parish Government

BILLY NUNGESSER
Parish President

8056 Hwy. 23, Suite 308
Belle Chasse, LA 70037

(504) 392-6690
(504) 274-2462
1-888-784-5387
Fax: (504) 274-2463

March 22, 2007

Mr. Jon Porterhouse
Louisiana Department of Natural Resources
Coastal Protection and Restoration Authority
P. O. Box 44027
Baton Rouge, LA 70804-4027

Re: Coastal Protection and Restoration Authority and Plaquemines Parish Government Meeting of March 19, 2007

Dear Mr. Porthouse:

I would like to personally thank you and the rest of the CPRA team for visiting with us earlier this week to discuss developments in the Master Plan as they relate to project features in Plaquemines Parish. I have received a lot of feedback about the various proposals and feel that the proposed features will help to enable and sustain our recovery and growth.

However, I remain concerned about the language describing the standards by which levees will be constructed and maintained, especially in the Myrtle Grove area. As we discussed, I would like to see the language in the plan changed to specify the standard of federal levees that will be constructed. I am hopeful that making these adjustments will ensure that any future levee construction will meet basic minimum standards.

I enjoyed our meeting and discussions. If I can be of any further assistance in supporting the development of the Master Plan, please do not hesitate to contact me or Mr. Andrew MacInnes in our Coastal Zone Management Department.

With regards, I remain

Very truly yours,

Billy Nungesser
Parish President
Plaquemines Parish Government

WHN:jha

SOUTH LAFOURCHE LEVEE DISTRICT
BOARD OF COMMISSIONERS

P.O. Box 426 • Galliano, LA 70354
Telephone 985.632.7554 • Fax 985.632.7555
Email slld@mobiletel.com • Web www.slld.net

Ronald Callais, *President*

Windell Curole, *General Manager*

February 9, 2007

DEPT. OF NATURAL RESOURCES
FEB 1 2 2007
OFFICE OF THE SECRETARY

DEPARTMENT OF NATURAL RESOURCES
ATTN: RANDY HANCHY
PO BOX 94396
BATON ROUGE LA 70804-9396

Dear Mr. Hanchy,

Due to the strategic protection the U.S. Army Corps of Engineers' Larose to Golden Meadow Hurricane Protection System provides for the support and success of Port Fourchon, we believe that an increased level of protection is justified using the criteria in the draft plan. This project directly affects the road access and waterborne traffic which is critical for the function of Port Fourchon.

For these economic reasons we believe that a higher level of protection is justified. We estimate that to construct a system to a slightly improved level above the present authorized level will cost $150,000,000. To raise the system to a significantly higher level of protection is estimated to cost $348,000,000.

We ask that the report state that because of the economic importance of the LA 1 corridor that a higher level of protection is justified for the Larose to Golden Meadow Hurricane Protection project.

Sincerely,

Windell A. Curole
General Manager

WAC/mcp

Ronald Callais	President	Lula Auenson	Vice President
Roy Gisclair	Commissioner	Robert Eymard, Sr.	Commissioner
Bob Faulk	Commissioner	E.J. Gremillion	Commissioner
Clarence Marts, Jr.	Commissioner	Richard P. Guidry	Commissioner
Monty Vegas	Commissioner	Windell Curole	Executive Secretary

Attached comments to master plan

admin@ejld.com <admin@ejld.com> **Fri, Mar 30, 2007 at 5:43 PM**
To: comments@louisianacoastalplanning.org

Please see attached comments on the Master Plan from the Southeast Louisiana Flood Protection Authority – East.

Jonell Blowers

East Jefferson Levee District

203 Plauche Ct., Harahan, LA 70123

(504) 733-0087

(504) 733-2255 fax

admin@ejld.com

comments-master plan.pdf
39K

On the motion of Mr. Doody ,
Seconded by Mr. Barry, the following resolution was offered:

RESOLUTION #03-30-07-003 - CPRA – MASTER PLAN

"Whereas the master plan developed by the Coastal Protection and Restoration Authority is one of the most important documents affecting hurricane protection in Louisiana, and specifically in part of the region for which the Southeast Louisiana Flood Protection Authority - East is responsible, and
Whereas drafters of the master plan and critics agree that the scientific basis for certain proposals in the most recent draft has not yet been established or the engineering worked out, and
Whereas it is critical to the future of the state that these projects perform as desired, and
Whereas public comment closes April 2, 2007 and the plan goes to the state legislature soon after CPRA's April 12, 2007 meeting, and
Whereas it behooves this authority to state its position on this plan,
Resolved
That the Southeast Louisiana Flood Protection Authority - East endorses the conceptual framework laid out in this plan and urges that the final plan as presented to the legislature includes a process for outside peer review of proposed projects, and that this peer review be integrated into the planning process so as not to delay work. Further, that this Authority urges the state legislature to give maximum flexibility to the Coastal Protection and Restoration Authority so that it may continue to improve the plan, so as to best protect the citizens of, and enhance the economy, culture, and environment of, the State of Louisiana.."
The foregoing was submitted to a vote, the vote thereon was as follows:
YEAS: Mr. Barry, Mr. Doody, Mr. McKee, Mr. Goins, Mr. Barnes, Mr. Wittie
NAYS: None
ABSENT: Ms. Sutherland, Mr. Pineda, Ms. St. Vincent, Mr. Losonsky

This resolution was declared adopted this 30th day of March, 2007.

I hereby certify that the above and foregoing is a true and correct copy of a resolution duly adopted by the Southeast Louisiana Flood Protection Authority - East at its Emergency meeting of March 30, 2007, at which a quorum was present.

John M. Barry
Secretary

This 30th day of March, 2007
Harahan, LA 70123

From: Al Levron [allevron@tpcg.org]

Sent: Friday, March 09, 2007 2:56 PM

To: gerryd@dnr.state.la.us; 'David Fruge'; 'Kirk Rhinehart'; comments@louisianacoastalplanning.org; 'Dupre, Sen. (District Office)'; lasen21@legis.state.la.us; 'Dove, Rep. (District Office)'; 'Rep. Damon Baldone'

Cc: 'Gregory DuCote'; 'Gregory Grandy'; Leslie Suazo; 'Steve C. Smith'; Barry Blackwell

Subject: Bush Canal Shoreline and Stabilization Project

Attachments: Schwab Letter to Angelle.doc; Bush Canal CPFR FACT SHEET.doc; CIAP Shortfall Budget.xls

Hard copy will be forwarded shortly.

<<...>> <<...>> <<...>>

If you have any questions, please contact me at 985-873-6407.

Al Levron

Director of Public Works

Terrebonne Parish Consolidated Government

allevron@tpcg.org

From: Al Levron [allevron@tpcg.org]
Sent: Monday, March 12, 2007 11:21 AM
To: gerryd@dnr.state.la.us; 'David Fruge'; 'Kirk Rhinehart'; comments@louisianacoastalplanning.org; 'Dupre, Sen. (District Office)'; lasen21@legis.state.la.us; 'Dove, Rep. (District Office)'; 'Rep. Damon Baldone'
Cc: 'Gregory DuCote'; 'Gregory Grandy'; Leslie Suazo; 'Steve C. Smith'; Barry Blackwell
Subject: RE: Bush Canal Shoreline and Stabilization Project
Attachments: Scott Angelle.pdf

<<...>> If you have any questions, please contact me at 985-873-6407.

Al Levron

Director of Public Works

Terrebonne Parish Consolidated Government

allevron@tpcg.org

DON SCHWAB
PARISH PRESIDENT

OFFICE OF THE PARISH PRESIDENT
TERREBONNE PARISH CONSOLIDATED GOVERNMENT
P. O. Box 6097
HOUMA, LOUISIANA 70361

(985) 873-6401
FAX: (985) 873-6409

March 9, 2007

Mr. Scott Angelle
Secretary
Louisiana Department of Natural Resources
P.O. Box 44027
Baton Rouge, Louisiana 70804-4027

Dear Mr. Angelle,

Several years ago, Terrebonne Parish and the Louisiana Department of Natural Resources entered into a cooperative endeavor agreement for the funding and construction of the Bush Canal Shoreline and Stabilization Project. Both agencies' funding was derived from the first Coastal Impact Assistance Program, which was administered by NOAA.

Project planning commenced in 2001, but due to issues related to oyster lease impacts, the project was stalled. Since 2004, DNR has been working diligently with the Legislature to resolve oyster lease impediments to restoration activities. We truly applaud your efforts in this regard.

Project bids were received on March 7, 2007 to coincide with DNR's timeline to extinguish the oyster leases that have long impacted the start of the project. Unfortunately, due to project delays, and post-Katrina construction pricing, project bids exceed available funds by $1,000,000. A breakdown of project funding is attached for your review. According to CIAP guidelines, if the project is not complete by November 30, 2007, all state and local funds will be subject to de-obligation by NOAA.

Therefore, Terrebonne Parish requests additional financial assistance from the FY 2007 Coastal Protection and Restoration Fund budget, or other funds as determined by DNR. In the alternative, we request that the FY 2008 Annual Plan: Ecosystem Restoration and Hurricane Protection in Coastal Louisiana, be amended to include a $1 million line item to supplement funding for this important project. This project is consistent with the State's Comprehensive Master Plan for a Sustainable Coast. A complete Project Fact Sheet is attached.

Time is of the essence. The construction bids received on March 7, 2007 are valid for 45 days, or until April 20, 2007. The contract must thereafter be awarded, and contractor must mobilize no later that the end of May 2007, to start the six month construction contract. Failure to complete the project by November 30, 2007 will result in the de-obligation of approximately $2.7 million earmarked for coastal restoration.

We look forward to your favorable consideration of our funding request.

Sincerely,

Don Schwab
Parish President

Attachments:

Senator Reggie Dupre
Senator Butch Gautreaux
Representative Damon Baldone
Representative Gordon Dove
Representative Carla Dartez
Sidney Coffee, Chairperson CPRA
CPRA-IPT
Randy Hanchey, DNR
Gerry Duszynski, DNR
Kirk Rhinehart, DNR
David Fruge, DNR
Greg DuCote, DNR

COASTAL PROTECTION AND RESTORATION FUND
PROJECT NOMINEE FACT SHEET

1). Project Title:

Bush Canal Shoreline Protection and Stabilization Project

2). Entity/Individual Nominating Project:

Terrebonne Parish Consolidated Government

3). Contact Information:

Mr. Al Levron
Terrebonne Parish Consolidated Government
P.O. Box 2768
8026 Main Street
Houma, LA 70361
(985) 873-6405
(985) 873-6409 (fax)
allevron@tpcg.org

4). Total State CPRF Funds Requested:

Total 2007 CPRF Funds Requested: $1 million

5). Infrastructure Funds Proposed:

There are $0 infrastructure funds proposed for this project.

6). Description and Location of Project: Bank Stabilization Along Bush Canal– This proposed project is located along the south bank of Bush Canal from Bayou Petit Caillou to Bayou Terrebonne.

This project consists of dredging material from Bush Canal using the material to rebuild the eroded bank line. The rebuilt bank line will diminish some storm surges as well as reduced saltwater intrusion. Approximately 1.5 miles of bank stabilization is included in this project, with an estimated project budget of $3.7 million. Terrebonne Parish has already dedicated its direct allocation of 2001 Coastal Impact Assistance Funds to this project (Approximately $900,000) and the State has allocated $1,805,586. Unfortunately project bids received on March 7, 2007 resulted in a project shortfall of $1,000,000.

This project is consistent with the legislation because it will provide protection to a highly eroding area of the Louisiana Coastline. By restoring the Bush Canal ridge, this project will protect the wetlands in the area, the Bush Canal hurricane protection levee, and the 4,300 acre LaCache Marsh Management area from the highly erosive forces of the Gulf of Mexico, and will retard salt water intrusion into fresher areas of the Terrebonne Marsh.

The U.S. Army Corps of Engineers, in the Draft Environmental Impact Statement for the Morganza to the Gulf Hurricane Protection Project, noted the many studies on coastal land loss in Louisiana, and more specifically, Terrebonne Parish (pgs. 93 – 123 of that report, August 2000). These studies document the

impacts of coastal erosion on Terrebonne Parish. Over time, subsidence, wave action, and canal dredging have combined to cause severe deterioration to the major ridges in Terrebonne Parish. The Bayou Terrebonne/Bush canal ridge is one of these, and as it has deteriorated, so has the protection for areas further inland.

This project represents implementation of a strategy detailed in the State's comprehensive restoration plan (Coast 2050).

This project has been discussed and endorsed by the Terrebonne Parish Consolidated Government's Coastal Advisory Board members, the Terrebonne Parish Council, and the Terrebonne Levee and Conservation District, and with the Terrebonne Parish Legislative delegation.

7). Project Type: 1, 2, & 4

The Bush Canal Shoreline Protection and Stabilization Project will be implemented for the conservation, restoration and protection of coastal areas including wetlands, for mitigation of damage to fish and wildlife and natural resources, and the implementation of a federally approved marine, coastal, or comprehensive conservation management plan.

8). Project Justification:

The shoreline of the Bush Canal is suffering from severe erosion due to tidal action, wave action caused by wind, vessels navigating the channel, and subsidence. If this erosion is allowed to continue, the entire area will be devastated by salt-water intrusion allowing the Bush Canal hurricane protection levee to be exposed to the direct impact of storm surge. This will eventually lead to the destruction of the entire 4,300 acre LaCache management area. This project proposes restoring the southern bankline of Bush Canal, and placing a rock stabilization along between Bayou Petit Caillou and Bayou Terrebonne. Dredged material will be placed behind the rock dike, to create a marsh platform, which will be planted with smooth cord grass, *Spartina alterniflora.*

The goal of this project is to restore the Bush Canal ridge. The project will protect the wetlands in the area, and the Bush Canal hurricane protection levee, from the highly erosive forces of the Gulf of Mexico, and will retard salt water intrusion into fresher areas of the Terrebonne Marsh.

Preliminary Project Benefits

1) This project will protect, at a minimum, the structural integrity of the Bush Canal hurricane protection levee, and the 4,300 acre LaCache marsh management area contiguous to the project area.

Preliminary Estimated Construction Costs:

$3,700,000

Coast 2050 Strategy:

. It is consistent with the following Coast 2050 strategies for Region 3:

- Shoreline protection
- Protection and restoration of habitats in area

The project is also consistent with Action Plan EM-6, (Shoreline Stabilization and Induced Deposition) of the Comprehensive Conservation Management Plan (CCMP) of the Barataria-Terrebonne National Estuary Program. In addition, this project also meets the restoration goals identified by the Strategic Plan for Coastal Restoration adopted by the Terrebonne Parish Coastal Zone Management and Restoration Advisory Committee and supported by the Terrebonne Parish Council.

9). Project Cost Share:

$1 million

Attachments

1. Project Budget

BANK STABILAZATION ALONG BUSH CANAL AND BAYOU TERREBONNE
Parish Project 03-CIAP-11
Account Number 659-351-8929-63

TOTAL PROJECT BUDGET (as per 2007 budget book)	$2,700,000.00	Contractor	Base	Alt 1
Engineering Contract Amount (w/ Amd 2)	$344,000.00	Bertucci	$3,333,750.00	$1,855,50
Basic Fees	$150,000.00	CERES	$4,345,500.00	$2,492,16
Additional Services	$190,000.00			
Gore	$4,000.00			
Other	$7,777.37			
TOTAL PROJECT COST	$351,777.37			
AMOUNT LEFT FOR CONSTRUCTION	**$2,348,222.63**			
PROJECT SHORTFALL-BASE BID	<$985,527.63>			
	Round to $1 M			

Alt 2

$1,470,750.00
$1,063,400.00

From: Al Levron [allevron@tpcg.org]

Sent: Tuesday, March 27, 2007 1:53 PM

To: comments@louisianacoastalplanning.org

Cc: Leslie Suazo; 'Gregory Grandy'; 'David Fruge'; 'Beck, David A MVN'; 'Creef, Edward D MVN'; 'Gregory DuCote'

Subject: CIAP Plan Comments

On behalf of Terrebonne Parish we are requesting that a portion of the $20,000,000 proposed to be allocated to the Beneficial Use of Dredge Material Program, will be used in conjunction with scheduled maintenance of the Houma Navigation Canal, which is a Federal Waterway

RESOLUTION NO. 1294

WHEREAS, the U.S. Army Corps of Engineers' Larose to Golden Meadow Hurricane Protection project is crucial to the communities of South Lafourche; and

WHEREAS, the future of Port Fourchon is directly affected by the success of the Larose to Golden Meadow project in protecting the people and infrastructure which is critical to Port Fourchon's operations; and

WHEREAS, the access to Port Fourchon by barge traffic will become more dependable with the conversion of the Leon Theriot floodgate into a lock; and

WHEREAS, the lock will also allow our fishing fleet and tow boat fleets to enter the protection system during high tides prior to a hurricane; and

WHEREAS, LA 1 will be better protected with increased levee elevation to allow for critical road access; and

WHEREAS, the elevated LA 1 will be at 22 feet above sea level; and

WHEREAS, 50% of goods shipped to the port, access the port through the Leon Theriot floodgate.

THEREFORE, LET IT BE KNOWN that the Town of Golden Meadow supports any and all efforts to fund by the State or Federal government, the building of the Larose to Golden Meadow Hurricane Protection project to the highest level possible and that the funds

needed by the State or Federal government to convert the Leon Theriot floodgate into a lock be made available for the critical support of Port Fourchon.

THUS DONE AND PASSED this 19th DAY of March, 2007 by a motion presented by Councilman David Adams and seconded by Councilman Gwen Threiot

Voting was as follows:

YEAS:	**NAYS:**	**ABSENT:**
Councilman David Adams		
Interim Councilman Mike Billiot		
Councilman Frank Boura	**None**	**None**
Councilman Jody Cheramie		
Councilman Gwen Theriot		

Mayor Joey Bouziga

Attested:

Jamie Liner, Town Clerk

comments on Master Plan

MWinter <MWinter@jeffparish.net> **Fri, Mar 30, 2007 at 4:27 PM**
To: comments@louisianacoastalplanning.org
Cc: Michele Deshotels <MicheleD@dnr.state.la.us>

See attached letter.

Marnie Winter, Director
Environmental Affairs
4901 Jefferson Highway, Suite E
Jefferson, LA 70121
Phone: 504-731-4612 Fax: 504-731-4607

"Provide the services, leadership, and vision to improve the quality of life in Jefferson Parish."

T.Kerner comments re Integrated Ecosystem Restoration Letter.033007.pdf
514K

TOWN OF JEAN LAFITTE
OFFICE OF THE MAYOR

TIMOTHY P. KERNER
MAYOR

YVETTE CRAIN
TOWN CLERK

MARY JO HARGIS
CHIEF OF POLICE

2654 Jean Lafitte Blvd.
Lafitte, Louisiana 70067
Office: (504) 689-2208
Police: (504) 689-3132
Fax: (504) 689-7801

COUNCIL MEMBERS

SHIRLEY GUILLIE
MAYOR PROTEM

ELAINE BADEAUX
CHRISTY CREPPEL
VERNA SMITH
CALVIN LEBEAU

March 29, 2007

Mr. Randy Hanchey, IPT Team Leader
Coastal Protection and Restoration Authority of Louisiana
CPRA Integrated Planning Team
P.O. Box 44027
Baton Rouge, Louisiana 70804-4027

RE: Integrated Ecosystem Restoration and Hurricane Protection
Louisiana's Comprehensive Master Plan for a Sustainable Coast
Draft, February 2007 Report

Dear Mr. Hanchey:

First, I would like to thank all of the members of the CPRA Integrated Planning Team for their hard work and dedication in developing a comprehensive master plan for a sustainable coast, and for allowing the public the opportunity to provide input into both the process and the draft report. The report is indeed comprehensive and provides a blue print for the future. However, on behalf of the citizens of the Town of Jean Lafitte, I would like to see more specific language in the report stating that the proposed hurricane protection levee for the Barataria Basin and the West Bank includes 100 year level of protection for all of the currently developed areas of Lafitte.

Although I have been given verbal assurance that the map on page 60 of the Draft, February 2007 Report depicts the desired increased levee protection for Lafitte, the language provide under the "Barataria Basin and West Bank" heading on page 58 does not specifically include Lafitte. Therefore, I am requesting that the language be modified to read "The project would provide a 100 year level of protection to Lafourche Parish and the communities in the central Barataria Basin, *including Lafitte.*"

Thank you in advance for your attention to this matter, which is of utmost importance to the residents of Lafitte.

Sincerely,

Timothy P. Kerner

Timothy P. Kerner
Mayor

cc: Hon. Aaron F. Broussard, Parish President
All Jefferson Parish Council Members

VERMILION SOIL & WATER CONSERVATION DISTRICT
1049 W Summers Drive Suite B Abbeville, LA 70510
Phone: (337) 893-7772 ext 3
Fax: (337) 893-9225

March 20, 2007

Vermilion SWCD Board

Chairman
Ernest Girouard

Vice Chairman
J.C. Griffin

Secretary-Treasurer
Patrick Hebert

Board Member
Roy Baker

Board Member
Sherrill Sagrera

Associate Board Member
Don Menard

Associate Board Member
Don Vallot

Coastal Protection and Restoration Authority of Louisiana
Michele Deshotels
CPRA Integrated Planning Team
P O Box 44027
Baton Rouge LA 70804-4027

Dear Ms. Deshotels,

The Vermilion Soil and Water Conservation District (SWCD) would like CPRA to consider the importance of both the Bayou Tigre Watershed Proposal and the Hebert Canal Resource Plan and to consider adding both of these plans to the State Master Plan. Although the sizes of the projects are small, the benefits to both the agricultural community and the homeowners in these proposed areas are considerable.

Had the Bayou Tigre Watershed Proposal been implemented prior to Hurricane Rita, we feel the impact to not only the city of Erath but also the residential homeowners and agricultural producers outside the city limits of Erath would have been reduced greatly.

Including the Hebert Canal Resource Plan in the State Master Plan would protect all areas from the Vermilion River to the 7th Ward Canal below LA Hwy 82. The Hebert Canal Resource Plan offers storm buffering systems. The oilfield/navigation canals run parallel to the coast would be beneficial as a buffering system also. Raising these banks could mimic lost ridges, wetlands and chenieres that have been lost through erosion/subsidence. The wetland footprint that exists would eliminate losing additional wetlands while protecting homeowners and agricultural producers.

In conclusion, Southwest Louisiana needs storm surge protection. Hurricane Rita indicated that need. As we go through the prioritizing process, we must focus

some attention on Southwest Louisiana's needs, and SWCD feels that the Bayou Tigre Watershed Proposal and the Hebert Canal Resource Plan would help to address some of the needs of Southwest Louisiana.

If you have any questions in regards to either the Bayou Tigre Watershed Proposal or the Hebert Canal Resource Plan, please contact me at 337-788-7570 or 337-852-3986.

Sincerely,

Ernest Girouard

Ernest Girouard
Vermilion SWCD Chairman

md

cc: Rickey Brouillette

Vermilion SWCD Board

Chairman
Ernest Girouard

Vice Chairman
J.C. Griffin

Secretary-Treasurer
Patrick Hebert

Board Member
Roy Baker

Board Member
Sherrill Sagrera

Associate Board Member
Don Menard

Associate Board Member
Don Vallot

Air Products and Chemicals, Inc.
14700 Intracoastal Drive
New Orleans, Louisiana 70129
Telephone (504) 254.1590

06 March 2007
Certified R/R 7006 2150 0000 9086 7782
CPRA-IPT
Louisiana Department of Natural Resources
P.O. Box 94396
Baton Rouge, LA 70804-9396

Re: *Integrated Ecosystem Restoration and Hurricane Protection: Louisiana's Comprehensive Master Plan for a Sustainable Coast*

To whom it may concern:

Air Products and Chemicals, Inc. appreciates the opportunity to provide comments to the Coastal Protection & Restoration Authority of Louisiana regarding the latest draft (February 2007) of *Integrated Ecosystem Restoration and Hurricane Protection: Louisiana's Comprehensive Master Plan for a Sustainable Coast* (Draft Master Plan).

As background, Air Products serves customers in technology, energy, healthcare and industrial markets worldwide with a unique portfolio of products, services and solutions, providing atmospheric gases, process and specialty gases, performance materials and chemical intermediates. The company has annual revenues of $8.1 billion, operations in more than 30 countries, and more than 20,000 employees around the globe.

Our New Orleans facility is a leading supplier of much-needed hydrogen produced in the United States, providing liquid and gaseous hydrogen to a number of industries critical to the domestic economy. Liquid and gaseous hydrogen from our New Orleans facility are used as a fuel propellant for the Space Shuttle, by oil refineries to make cleaner transportation fuels, and by electronic, steel, chemical, public utility and food processing customers, among the more than 500 customers that we serve.

Air Products is one of two major North American suppliers of liquid hydrogen, and the New Orleans facility alone represents more than 30 percent of the liquid hydrogen produced in North America. Unfortunately, the New Orleans facility sustained extensive flooding and wind damage from Hurricane Katrina as a levee failure near the site was responsible for up to 8 feet of flooding in the plant.

Thankfully, we have restored our facility to full operations with a re-investment of $80 million and the hard work of many employees and contractors. We have also witnessed the massive amount of restoration work that occurred on the levees around our New Orleans facility. We applaud the U.S. Army Corps of Engineers and its contractors and recognize the State of Louisiana and the Coastal Protection & Restoration Authority have been tireless advocates for levee repairs, coastal restoration and hurricane protection.

In the 4th Emergency Supplemental Appropriations bill (Public Law 109-234) passed by Congress and signed by President Bush on June 16, 2006, there is $350 million "to improve protection at the Inner Harbor Navigation Canal." In addition, the Senate Report (Senate Report 109-230) includes language for using the $350 million "to construct navigable closures, one near Seabrook on the

Industrial Canal and the other on the Gulf Intracoastal Waterway west of its confluence with the Mississippi River-Gulf Outlet."

We are closely monitoring this appropriation. From a couple of meetings with Corps representatives to discuss this project, we understand the Corps believes an alternative to the report language would provide more protection for the area — installing two gates on the Gulf Intracoastal Waterway, one to the east of Pump Station 15 and one to the south of the mouth of Bayou Bienvenue connected by a floodwall. In addition, the de-authorization of the MRGO would further improve protection of New Orleans East.

In the state's Draft Master Plan (Figure 9, Chapter 3, page 60), it appears the Coastal Protection & Restoration Authority has an even more elaborate plan for New Orleans East (installing several gates on the Gulf Intracoastal Waterway and raising levee heights beyond the 100-year protection height). While we salute the state for its ambitious plan, we are concerned about its feasibility and potential cost. **Given limited federal and state resources, we believe the Corps' alternative approach is the most immediate opportunity to provide enhanced hurricane protection for our facility and New Orleans East overall.**

Again, Air Products is appreciative of all of the governmental assistance received in the immediate aftermath of Hurricane Katrina as well as the impressive work that has already been done to provide a greater level of flood protection to the citizens and businesses of south Louisiana. Air Products is committed to the New Orleans facility and Louisiana as evidenced by our own actions and reinvestment to restore operations and remain in the state.

We believe our facility provides a vital product (liquid and gaseous hydrogen) to several strategically important components of the U.S. economy. We further believe our facility, the industrial neighbors around us and the residents of New Orleans East are worth protecting. In the longer term, we hope that funding will be secured for a category 5 upgrade that would serve as the ultimate barrier to protect the life and property of the citizens and businesses in the New Orleans area.

Thank you for the opportunity to comment on the state's Draft Master Plan, and if you should need any further clarification, please do not hesitate to contact me.

Sincerely,

Brian A. Gebbia
Louisiana Manufacturing Manager

Copies:
Sidney Coffee, Executive Assistant for Coastal Activities
Governor Kathleen Blanco, State of Louisiana
1051 North Third Street
Capital Annex Building, Suite 138
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Michael Olivier, Secretary, Louisiana Economic Development
P O Box 94185
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State Senator Ann Duplessis
6600 Plaza Drive, Suite 211A
New Orleans, LA 70127
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State Representative Ken Odinet
127 Highway 22 East, Suit 211A
Madisonville, LA 70447
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Mayor Ray Nagin
City of New Orleans
1300 Perdido Street, Room 2E04
New Orleans, LA 70112
Certified R/R 7006 2150 0000 9086 7836

Biloxi Marsh Lands Corporation
Lake Eugenie Land & Development, Inc.
1605 Airline Drive, Suite 103
Metairie, Louisiana 70001
Phone: (504) 837-4337
Fax: (504) 837-1889

March 8, 2007

CPRA Integrated Planning Team
Department of Natural Resources
P.O. Box 94396
Baton Rouge, LA 70804-9396

RE: Biloxi Marsh Lands Corporation and Lake Eugenie Land Development Company
St. Bernard Parish, Louisiana
Comments concerning Comprehensive Coastal Protection Master Plan for Louisiana – Draft

CPRA Integrated Planning Team,

The Biloxi Marsh Lands Corporation (BMLC) and Lake Eugenie Land Development Company (LELD) (owner of 150,000 acres in St. Bernard Parish) appreciate this opportunity to comment further on the following:

1. *Draft* - Coastal Protection and Restoration Authority of Louisiana - Integrated Ecosystem Restoration and Hurricane Protection: Louisiana's Comprehensive Master Plan for a Sustainable Coast (**CPRA**);
2. *Draft* - Fiscal Year 2008 Annual Plan: Ecosystem Restoration and Hurricane Protection in Coastal Louisiana (**Annual Plan**); and
3. *Draft* – Louisiana Coastal Impact Assistance Plan (**CIAP**).

On February 28, 2007, Randy Moertle presented our comments concerning the CPRA, Annual Plan, and CIAP draft plans at the public hearing held at Lindy Boggs Conference Center in New Orleans, LA. We would now like to present these comments in written form as follows and in the order of our greatest concerns:

1. ***Mississippi River Gulf Outlet (MRGO) closure with earthen plug*** – In the draft CPRA, there is a whole section concerning the MRGO (Chapter 3, Pages 41and 44). In this section, it states:

> "Construct a closure structure at Bayou LaLoutre that will restore the integrity of the Bayou LaLoutre ridge. This will affect both the shallow-draft and deep-draft navigation industries, and it **may have unintended consequences for adjacent landowners**. A comprehensive closure plan should include mechanisms to mitigate the economic consequences for

users that rely on the channel, and it should prevent shallow-draft and recreational vessels from circumventing the closure structure."

Although it does not state that this closure structure is an earthen plug in the CPRA plan, it does state that the closure will be accomplished with an earthen plug in the Annual Plan (2.1.3.1. Closure of the MRGO and Ecosystem Restoration, Page 17). Should there be a closure with an earthen plug; BMLC & LELD believe that any plugging of the MRGO must have an ***accompanying*** **ecosystem restoration and protection plan**. We fully ***support*** closure of the MRGO and a large Violet Diversion to help sustain the marshes in the vicinity of the MRGO and the Biloxi Marshes as stated in the Annual Plan. However, we believe it is imperative that the ecosystem impacts from the closure are analyzed and mitigated appropriately, just as it is being done for the economic impacts. This would reduce the chances of "**unintended consequences to adjacent landowners.**" Ecosystem restoration coupled with closure of the MRGO is consistent with the recent 2004, Louisiana Coastal Area (LCA) Study which contained five priority projects for immediate implementation. One of those five priority projects was the MRGO Environmental Restoration Features (Annual Plan, pg. 8).

One ecosystem restoration and protection component we support would be armoring of the bank lines of Bayou LaLoutre to compensate for the anticipated marine vessel traffic increase associated with the closure. Due to wake erosion, the waters from Bayou LaLoutre have breached the ridge into adjacent wetlands in some areas. In other areas, the ridge has been completely eroded away and boat wake erosion is now effecting the adjacent marshes. If bankline armoring along Bayou LaLoutre is not addressed, the increased marine vessel traffic diverted into Bayou LaLoutre will exacerbate an already existing problem.

RECOMMENDATION

A. ***CPRA*** – Chapter 3, Page 41 – Wording at the end of page should read as follows:

> "A comprehensive closure plan should also include mechanisms for the analysis and mitigation of ecosystem impacts that could occur from the closure structure."

B. ***Annual Plan*** - Page 17 – Wording should be added to 2.1.3.1 Closure of the MRGO and Ecosystem Restoration line 5 as follows:

> "The economic and ***ecosystem*** impacts of this closure need to be analyzed and mitigated appropriately."

2. ***CIAP Violet Diversion***

According to the Draft – CIAP, the State of Louisiana (State) and St. Bernard Parish proposes to dedicate $47,350,000 to the Violet Diversion. This freshwater diversion from the Mississippi River is targeted for the "Central Wetlands" within

the Hurricane Protection system of St. Bernard Parish at a maximum of 5,000 cfs. Larger proposed freshwater diversions are proposed in:

1. **CPRA** - Chapter 3, Page 38, Mississippi River Diversion at Violet;
2. **Mississippi River Gulf Outlet Deep-Draft De-Authorization Interim Report to Congress** – Freshwater Diversion into MRGO and Surrounding Marshes, Page 38;
3. **Biloxi Marsh Stabilization and Restoration Plan**[1] – Pages 6-11;
4. **Comprehensive Habitat Management Plan for the Lake Pontchartrain Basin** – Pages 99-100;

We support any freshwater introduction into the system; however, we believe that 5,000 cfs is insufficient to meet the overall goals of the Planning Unit 1 of the CPRA. If approximately $50M is spent on a freshwater diversion that has benefits limited to the Central Wetlands, we believe that it will be extremely difficult to secure additional federal funding for a larger freshwater diversion. We do not need to be precious monies on an inadequate freshwater diversion that will not benefit and sustain wetlands outside of the hurricane protection levee. We must coordinate our efforts and target getting marsh sustaining freshwater, nutrients, and sediment to the Biloxi Marsh complex which has been identified by the Louisiana Coastal Protection and Restoration (LACPR) as a critical land mass to the protection of the St. Bernard/New Orleans metropolitan area.

RECOMMENDATION

The Louisiana Department of Natural Resources (LDNR) needs to open dialogue with the U.S. Army Corps of Engineers (COE) LACPR group, the landowners, St. Bernard Parish, and other stakeholders as soon as possible to be sure that any monies spent on a freshwater introduction is coordinated and consistent with other regional planning efforts. The CIAP monies for a Violet Diversion can be used to plan and design a freshwater diversion large enough to sustain marshes outside the Central Wetlands and to begin construction of a more regional freshwater diversion. A freshwater diversion larger than 5,000 cfs is the only hope for sustainability of the Biloxi Marsh complex.

3. ***Shoreline Stabilization of Lower Biloxi Marsh*** – In the Annual Plan, it states "that an essential part of the strategy for reversing the current trends of land loss within the coastal wetlands is the stabilization of critical landforms to improve the structure and integrity of the landscape." (Annual Plan – 3.4.2.3 Restoration of critical land forms, Page 43). Under Measures included 1-24, it states "Maintain and Restore Biloxi Landbridge and Barrier Reefs." The ***CPRA*** addresses some portions of the Biloxi Landbridge, however, it ***leaves out a critical portion of the Biloxi Landbridge***. On December 14, 2006, BMLC sent in written comments concerning shoreline stabilization on the seaward shoreline between Christmas Camp Lake at the end of Bayou LaLoutre southeast to the MRGO. This area has been left out of the CPRA Preliminary Draft and Draft. If this area continues to be left out of the State's Master Plan, it will make it very difficult to dedicate any

[1] http://www.biloxmarshlandscorp.com/BMLC%20Stabilization%20and%20restoration%20plan.pdf

type of funding toward this critical area because this area will be viewed as unimportant or a low State priority. Leaving this area out of the Master Plan is inconsistent with the Annual Plan as stated above.

RECOMMENDATION

The aforementioned area between Christmas Camp Lake and MRGO needs to have shoreline stabilization added to the CPRA plan and all planning area maps.

4. ***Multiple Lines of Defense***

We are fully in support of this strategy and believe that implementation of this strategy within the coastal wetlands should begin on the most seaward line of defense and work inland.

Conclusion

Overall we are very pleased with the CPRA Draft Plan, the Annual Plan, and CIAP. We believe that those recommendations we've mentioned are consistent with Coast 2050, LCA, and now the CPRA and the LACPR. We would greatly appreciate careful consideration of our comments. Thank you for your attention in this matter.

Sincerely,

Will Rudolf
President & CEO, Biloxi Marsh Lands Corporation
Vice-President & General Manager, Lake Eugenie Land Development, Inc.

From: Jim Boudreaux [jboudr1@bellsouth.net]

Sent: Tuesday, February 13, 2007 11:25 AM

To: comments@louisianacoastalplanning.org

Subject: We punish our kids for not listening. When we grow up, we chose not to listen and no one punishes us.

Why hasn't Jim Boudreaux's Flood Levee and Barrier Protection System was not even mention. George Halford Public Affairs HQ, U.S.Army Corps of Engineers "Thank you for your interest in our work. I have forwarded your information to the team working on the levees in Southern Louisiana". "This is a Customer Contact Message sent through the HQUSACE website. This message requires a response. Please do not ignore this message"."Sender is expecting to be contacted, Thank you". Dated 11/03/2006.
No Response. Why? Because they already had their minds made up. Just going to the public to satisfy the rules. So it does not do any good to contact the Corps of Engineers. They believe they are above the law. They do want they want period. They ignore their own HQ. My invention caught the eye of George Halford in Washington Public Affairs HQ. Why didn't it catch the eye to anybody in Southern Louisiana? Because they have their own agenda. Weather it works or don't work. Same old system. Mud levees breaking, and people dieing. Losing property and business. And the same people making money on more studies. My invention solves the main problem. The liquefied Zone. It also solves the surge problems on the Barrier Islands by containing the sand in and between my boxes so that the storm surges does not wash away the land and sand back into the sea and gulf. It also solves the problems of land restoration along the Coast line by forming a solid barrier against storm surges and salt water intrusion. My system can be in place in 1 to 3 years while giving Cat-5 hurricane protection while being installed. But that is the problem, it is to simple. One design to solve 99% of the problems related to storm surges and land restoration. Saving Billions of dollars of tax payers money. People forgot that. That have been spending tax payers money for so long, they think that is the normal way to do business. They can't think any other way. I have emailed you all the information you needed. Tim Black has done his part as for as given to my website. George Halford done his part by giving you the information. But what excuse do the engineers in New Orleans has as for as not listening. We punish our school kids for not listening. But when we become grownups we don't care. What a message we send to our kids. No wonder our kids don't care.

In case you forgot my website is below. The letter the George Halford can be found on my website.

http://jboudreaux.page.tl/

From: Jim Boudreaux [jboudr1@bellsouth.net]

Sent: Tuesday, February 13, 2007 12:53 PM

To: comments@louisianacoastalplanning.org

Subject: Thomas Edison did not get an invitation either. After all, he had no education.

The same professionals, engineers, and etc. are invited to give their solutions. Year after Year, generation after generation. Same principles thought in school but with new faces. The common person is left out period. Just those with credentials matters. So you would think after 50 years of not solving the basic problem (liquefied zone) that common sense says something has to change before we run out of land to study. But the human race has become wish in it's own eyes. Until the box is broken, life goes on. The same people getting paid even though they did not come up with a solution. And don't take any responsibility for what they build and installed. They simple steel property from innocent people who is powerless to fight them, and say they need their property to protect them from storm surges. And take what we decide to give you for your property or else. Russia has taken over the United States of America and did not fire a single shot. Their way of thinking has taken control of common sense. If Katrina didn't change the system, it will only get worse. Man has a hard head and is full of pride.

I'll just keep my patents on the books and see how much property will be eroded away. How much business will be ruined. And sadly, how many innocent people will die in the name of Studies with no hope of a solution. When the solution has been given in the year 2005 by the Lord to a nobody in the sight of the world, but who is important in the eyes of the Lord. History will reveal the errors of man and the ignoring of the Lord's solution to the levee problems of the world. Till the next Katrina comes and does much more damage than before, God help us all.

From: Jim Boudreaux [jboudr1@bellsouth.net]

Sent: Saturday, February 24, 2007 12:20 PM

To: comments@louisianacoastalplanning.org

Subject: Waiting too long for protection. You were offered INSTANT Protection. But chose to GO LONG TERM.

$10 million dollars for over 8 ft high X 1 1/2 mile of mud levee. (wait 1 to 2 years for mud to settle,
NO protection from storm surge while waiting)

VS,

$10 million dollars for 10 ft high X 6 miles of Jim Boudreaux's Steel Armored Flood Levee Protection System.(no waiting for mud inside of boxes to settle, boxes protects mud inside boxes
from storm surges while mud settles inside of the boxes. By using surrounding mud, money is saved to build longer miles of levees for protection.

What's wrong with this? Is the Federal and State Government getting it's monies worth? They would rather settle doing what they are comfortable doing, rather than to change. That is what I meant. My system cost half of what a mud levee cost and is 100 times stronger
and built in months.

So as for as I can see, the Corps of Engineers is not interested in saving money.
The Corps of Engineers COULD have advised Congress on my invention as for as being stronger and saving tax payers millions and billions of dollars and gave Congress the choice. But the Corps of Engineers does not answer to no one. Not even Congress. Know matter, who comes up with any type of idea or invention, they have to approve it. Who gave the Corps of Engineers that Power? So the Corps chose to look the other way when it came to my invention. Even when NO faults where found.
If you are not an engineer, you are not important. People in government all refer to the Corps of Engineers to come up with all solutions. They can't. But that makes no difference. That is their job.

So people past the buck by saying " I have no authority in this area. That belongs to the Corp of Engineers ", and they are 100% right. But does not solve the levee problems. This has been going on for over 50 years. Until people break out of their comfort zone and speak out and make Congress aware of a solution to solve the levee problems and that they need to tell the Corps of Engineers to look into it and build it. Until then, it is just business as usual. People will die this hurricane season knowing that there is a solution to protect them quickly. But was told that " I have no authority in that area". In other words I'll keep my mouth shut.
I can only speak on what I am PAID to do, Sorry.

Engineers rule over the United States of America. If they can't come up with a solution,

keep doing what they have been doing for the past 50 years of building mud levees. Keep coming up with quick fixes, until they can come up with a permanent solution. Katrina was their first test of durability and the mud levees failed. Just build the mud levees higher. Storm surges destroy mud levees at any height.
Mud levees are mud levees. Water Liquefies Mud, pure and simple. Be it clay or any other type of mud. But, that's all they know how to do. Pride will not let them change. Even at the expense of human lives that they know will not survive the wrath of another Katrina. Engineers are school smart and common sense smart.
But they have chosen the school smart over their common sense. May God help us all.

Jim Boudreaux (inventor of Jim Boudreaux's Flood Levee and Barrier Protection System)
P O Box 4414
Houma, La. 70361
(985) 868-6270
Website: http://jboudreaux.page.tl

Article published Feb 13, 2007
Feb 13, 2007

Morganza section finished ahead of schedule
By NIKKI BUSKEY
The Courier

HOUMA -- With its hefty price tag and uncertain federal funding, Morganza-to-the-Gulf has proved to be an uphill battle for everyone involved. But local levee officials finally have something to get excited about.

The first section of the sprawling $886 million storm-protection system is finally finished, said David Smith of T. Baker Smith Inc. during the Terrebonne Levee and Conservation District board's Monday meeting. The work was finished seven months ahead of schedule, Smith said, and that got board members smiling.

"I think that's amazing," said Stevie Smith of T. Baker Smith Inc. "You can't even build a house in half the time."

The one-and-a-half mile, $10 million stretch of levee was paid with local sales taxes and matching state money.

Officials are still waiting on approval of Morganza, which has been tied up in Congress for nearly half a decade. Jerome Zeringue, executive director of the Terrebonne Levee and Conservation District, said Monday he expects Morganza to be discussed in a Congressional committee meeting by late March.

"It does appear that there is a very strong push to get (Morganza) passed this year," Zeringue said.

The new section of levee, called "Reach J1-B," is off Aragon Road in Pointe-aux-Chenes, and runs parallel to one of the parish's old levee systems. Comparing the two, it's easy to see why Smith is so excited.

Reach J1-B is a grassy mammoth more than 8-feet high and three times as wide as the older system, and it's only going to get bigger. Contractors must let the levee sit for one or two years to allow the dirt in the levee to compact, and then come back to add another layer, eventually building J1-B up to a height of 22 feet.

The project broke ground in March, and officials estimated it would take 18 months to complete.

"The contractor had some good motivation," he said. "He had a tremendous business opportunity in New Orleans and accelerated his schedule to accommodate it."

Zeringue said the dry weather helped contribute to the levee's quick finish. Also, because dirt at Reach J1's location was not suitable for construction of the levee, materials were hauled in to J1-B from another site, and that process didn't take as long as officials thought it would, Zeringue said.

J1-A, the second half of the project, is expected to wrap up in September, though Zeringue said work on J1-A has also been going well.

"Obviously we want to get as much protection in as soon as possible. We do what we can," he said. "Barring any unforeseen consequences, (J1-A) may be done early."

Since money obviously helped get J1-B finished quickly, Smith believes that economic incentives for developers might help get Terrebonne its levee sooner. Offering extra cash for a quick finish is a common practice in other large-scale projects such as road construction, he said.

"(With incentives) it's always a tradeoff," Zeringue said. "You get the contractors to build with less disruption, and people get the levees faster, but at the same time that money could be used to build another levee."

Zeringue said the board would weigh the benefits of incentive pay in the future but probably not during the first phase of the project when money for Morganza is still tight.

"We'll do whatever needs to be done to get the levees in place," he said.

Courier staff writer Nikki Buskey can be reached at 857-2205 or nikki.buskey@houmatoday.com.

From: Jim Boudreaux [jboudr1@bellsouth.net]
Sent: Wednesday, March 21, 2007 3:52 PM
To: comments@louisianacoastalplanning.org
Subject: Which Protection System will you build to protect against storm surges?

If the Fed. Gov't. would pay 1 Billion dollars to build a Cat-5 Hurricane Flood Levee Protection System, which system would be used?

Click on the website below to view your choices.

http://www.youtube.com/v/nSfju-L_MSI

Or go to my website
http://jboudreaux.page.tl

The price to build this system is the same. You build as you go. But at lease you would have Cat-5 Hurricane Flood Levee Protection right from the very first day of installation. You have the solution to 99% of the levee problems not only in Louisiana, but also all over the world. Louisiana can set the pace as to how levees are to be built to withstand storm surges. It is time for Louisiana to become a leader as a State. And by doing so, people will be drawn to our State, not begging them to come. When you go to the public for ideas, what exactly are you suppose to be looking for? There is just so much you can do with, Mud Levees, Sheet Pile Levees and Rock Armored Mud Levees. They all have the same problems. "The Liquefied Zone". My design solves this problem. And my design cost half of the current mud levees. So what is your excuse for not at lease building a small section of this design to see for yourself how the benefits of this design would wash away those doubts you have in your head.

By visiting my website, you have a plan. A design to complete the plan. A time line of how long to build and install this design. A cost. A purpose of solving the basic problems. (Liquefied zone)(Seepage). Low repairs. Low maintenance. And the most important benefit of all. "This is the only design in the world that let's you know what is happening on the BOTTOM, by simply watching the TOP of the levee. And more

important that the problem is being corrected. Does any of your propose plans offer all of the benefits my design offers? If so, why is it not being built? And if not, why is not my design being built?

Jim Boudreaux
P O Box 4414
Houma, La. 70361
Email: jboudr1@bellsouth.net

My Website is my presentation and my proposal. If you feel this can help you, please contact me. If not, Thank you for your time.

04/02/07 07:04 AM	Jim Boudreaux, , P O Box 4414, , Houma, LA, 70361, USA, jboudr1@bellsouth.net	The Flood of 1927. Same Problem Then. Same Problem Now. What did we learn? Or, will we continue building just what we "know how to build" and not change design no matter what. New designs comes from different people with a different view of the problem and has the solution as to how it can be done. A plan to stop storm surges and at the same time restoring the land with the same design. Never been done before and yet can be built and installed in half the time or less than what is currently being proposed. Without this design to stop storm surges, any other form of land resoration will be washed away with the next hurricane. The people all worked together back in 1927 trying to build the levee Higher as quickly as possible. They could not see the damage coming from under the levee. The "Liquefied Zone". When it happened all they could do was just to watch the destruction. View a video of what they went through in 1927. Did we learn anything from that experience? "http://www.youtube.com/v/6Icmy7_-wuA" They used the principle of a box. The box protects the contents (mud, sand, etc.) from the surge. But does nothing to correct the "Liquefied Zone" which destroys levees. Small levees and Big levees. Pressure from storm surges pushes against the levee. My design conteract that pressure by forcing a continueous downward pressure to meet the farward pressure of a storm surge. My design has NO BOTTOM. So why isn't anyone interested in saving peoples lives, property and business? We all know the answer. Why keep looking for solutions, when the solution has been given to us. Just build it. The website for information about the video of The Flood of 1927 http://www.pbs.org/wgbh/amex/flood/sfeature/sf_footage.html For more details: http://jboudreaux.page.tl

CL&F RESOURCES LP
CONTINENTAL LAND & FUR CO., INC.
111 VETERANS MEMORIAL BLVD., SUITE 500
METAIRIE, LOUISIANA 70005-3099
TELEPHONE 504/378-9378 TELECOPIER 504/378-4398

March 29, 2007

FAX:225-342-4313

Coastal Protection & Restoration Authority
Integrated Planning Team
Department of Natural Resources
P. O. Box 94396
Baton Rouge, LA 70804

Re: Supplemental Comments on CPRA Master Plan

Gentlemen:

Continental Land & Fur Co., Inc. ("CL&F"), which has owned and managed 127,000 acres of wetlands in northwest Terrebonne Parish for over 75 years, previously submitted comments on the Master Plan on December 28, 2006.

CL&F is submitting additional comments due to our concern over CPRA's proposal to enact "quick take" legislation to ensure large scale restoration projects are built on time.

As noted in the Master Plan, DNR has built strong working relationships with most of the major landowners who own 80% of coastal Louisiana, including CL&F. This should come as no surprise, as most major landowners want to restore and protect their holdings. The success of the coastal restoration projects to date can in no small measure be attributable to the cooperation from these major coastal landowners.

Based on CL&F's own experience, there is nothing "quick" about coastal restoration. We have participated with the agencies in TE-34 (Penchant Plan) since the early 1990's and TE-43 (GIWW Bank Stabilization) since 2001. Although both of these projects have been funded to certain levels, construction has yet to begin. If the "quick take" option had been selected, our property located in TE-34 would have been in limbo for over 15 years without a shovel of dirt having been turned.

We request that CPRA does not pursue "quick take" legislation for large scale coastal restoration projects, which by its own admission will take decades. As a possible alternative, we request that CPRA consider "quick take" legislation only for tracts of land located in a restoration project which is owned by more than ten (10) individual or entities.

Thank you for the opportunity to allow CL&F to submit these supplemental comments. If you have any questions, please do not hesitate to contact me at 504-378-9378.

Sincerely,

George A. Strain

George A. Strain
Vice President

GAS/crd
cc: Greg Linscombe

HESCO Bastion U.S.A. comments

Stephanie Szymanski Victory <svictory@hesco-usa.com> **Mon, Apr 2, 2007 at 7:08 PM**
To: comments@louisianacoastalplanning.org

Stephanie Victory
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PRODUCT REPORT
FLOOD CONTROL, COASTAL PROTECTION, WETLAND CONSERVATION
STATE OF LOUISIANA

March 27, 2007

Prepared for the
Louisiana Coastal Protection and Restoration Authority
Integrated Planning Team

London Avenue Levee Breach, Hurricane Katrina
U.S.A.C.E. Emergency Installation of HESCO Concertainer® Units

Prepared by:

HESCO BASTION USA

HESCO Concertainer® Units

HESCO Bastion USA, LLC
Hammond, Louisiana

March 27, 2007

PREPARED FOR THE LOUISIANA COASTAL PROTECTION AND RESTORATION AUTHORITY
INTEGRATED PALNNING TEAM

1.0 INTRODUCTION

Over the past 15 years, Hesco Concertainer® units have become the system of choice for applications as varied as land reinforcement and field fortifications, erosion control and perimeter defenses, flood prevention and ammunition compounds. Since the first Gulf War, Concertainer® units have provided life saving force protection for U.S. and allied forces around the world.

Understanding the United States' need for a rapidly deployable flood protection and erosion control product, HESCO Bastion USA began manufacturing in Hammond, Louisiana for the North America civil industry. Having an extensive working relationship with the U.S. Army Corps of Engineers and an order from Congress transpired into numerous testing procedures conducted at The Engineering Research and Development Center, in Vicksburg, Mississippi.

The key to this versatile product lies in the simplicity of the patented design.
Hesco Concertainer units have a galvanized steel mesh framework, lined with non-woven polypropylene material, with integrated cells to provide internal structural integrity. The vertical joints are made from helical coils, to form 360° hinges. As a result the units fold flat when empty, so that several can be carried on a standard pallet or skid, making transportation efficient and rapid. On site, Concertainer units can be quickly installed, since they are fully assembled during manufacturing. They can be filled with locally available material, with minimal manpower and using standard backhoe loaders or similar equipment.

HESCO Concertainer units are a proven product in stopping storm surge, rebuilding beaches and barrier islands, stabilizing water body shorelines, re-creating wetlands, rebuilding dune systems, as well as other engineered applications involved in the Protection and Restoration of Louisiana.

Fig.1 - 9th Ward, New Orleans, LA

Fig. 2 - The Middle East

Fig. 3 – Lakefront, Metairie, LA

2.0 Flood Protection

HESCO Concertainer units can be applied within existing levee systems or can be used as a niche product to accomplish a very unique protective task. Some of the more popular uses are **armoring**, **elevating**, and **new construction**. Numerous levee systems in Louisiana utilized Concertainer units prior to Hurricane Katrina. Every Concertainer levee structure withheld Katrina's storm surge and winds, prompting the U.S. Army Corps of Engineers and local levee districts to install miles of Concertainer units in the emergency breech repairs.

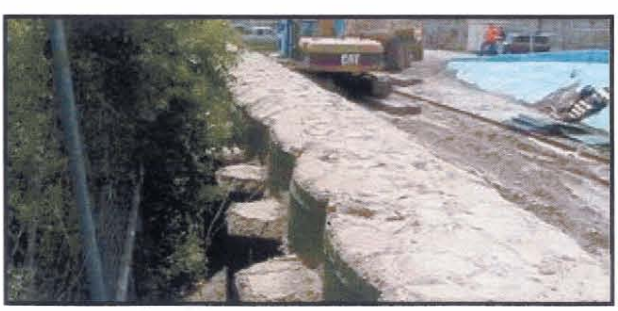
Levee Construction

Individual buildings or structures can be quickly protected from floods by the installation of the HESCO Concertainer flood control system. A required protective elevation can be reached without sacrificing space for a wide base. 100' of a three foot tall flood barrier can be constructed in less than 40 minutes.

South Lafourche Levee District Project

Levee Armoring

One major cause for flooding during Hurricanes is the fact that levees are not armored and are susceptible to erosion and ultimately structural failure. Additional protection is now being applied to the existing levees that have previously failed. HESCO Concertainer Units are being used to support existing sheet piles that extend from earthen levees. By adding HESCO Concertainer Units, much needed support is added – over 1,000 lbs. per linear foot.



9th Ward, New Orleans – Army Corps of Engineers Project

Levee Elevating

In many instances levee systems subside over time. HESCO Concertainer units can be applied atop an existing levee to quickly add height of earthen protection. This particular application was used by the East Jefferson Levee District prior to Hurricane Katrina. During the brunt of the storm, Lake Pontchartrain rose more than a foot against the units, which held and protected the property and lives behind it.

East Jefferson Levee District Project

3.0 WETLAND RESTORATION

HESCO Concertainer® units simply contain fill material and provide wetland protection against everyday wave fetch and erosion. By providing a natural sediment barrier, the Concertainer units allow wetlands and marshlands the opportunity to revitalize.

This very unique application is a durable source for re-creating wetlands that have been lost over the years. Concertainer units can also be planted with aquatic vegetation to help capture passing sediment and provide habitat for wildlife and fisheries.

Concertainer units are currently being specified into restoration projects across the state. Some site locations such as Lake Catherine, Weeks Bay, Vermillion Bay, and the Intra-coastal waterway will begin construction summer 200HESCO Bastion USA has worked closely with representatives from federal, state, and private agencies such as USDA, NRCS, LA DNR, USACE, and CRCL. A small pilot project built prior to Hurricane Katrina in the Lake Catherine area shows how Concertainer units can provide the vital protection to Louisiana's marshes and estuaries.

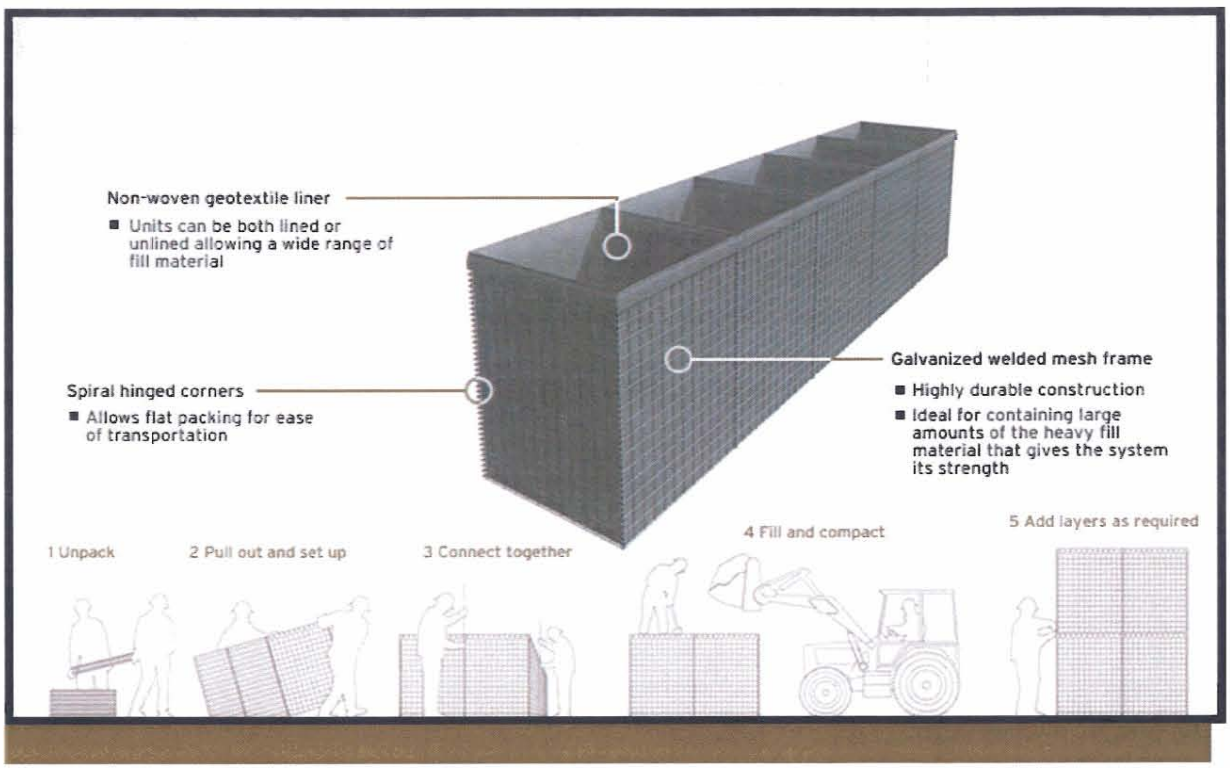
In October 2004, Dr. Joseph Suhayda inspects the pilot project, which consisted of *Concertainer units filled with dredged material. The protective structure was built 8' from the* eroding shoreline.

This photo was taken two years after installation in October 2006. Despite Hurricane Katrina devastating the East Orleans Landbridge, the Concertainer units survived, stabilized the shoreline allowing the continuing growth of new marsh.

4.0 BEACH AND DUNE STABILIZATION

Louisiana's first line of defense is washing away and blowing away. Barrier islands and coastal beaches such as Fourchon Beach can be rebuilt with Concertainer units. A backbone of Concertainer units acts as a fortification rampart to large waves and high winds. The Florida Panhandle including the beaches of Destin has turned to Concertainer units to protect properties and lives. The techniques used to stop bombs and bullets in the Middle East, is now Florida's first line of defense against hurricane storm surge.

5.0 PRODUCT DESCRIPTION



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4.2.6.2 Environmental Organizations and Natural Resource Agency Comments

From: Micah Walker Parkin [mwalker@all4energy.org]
Sent: Monday, April 09, 2007 11:42 AM
To: comments@louisianacoastalplanning.org
Subject: Alliance for Affordable Energy Comments

Attachments: AAE comments on coastal plan.doc

AAE comments
n coastal plan.d

To Whom It May Concern:
Please find our comments attached.
Thank you,
Micah

Micah Walker Parkin
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Thomas Milliner, J.D.

A new program of the Alliance

April 2, 2007

CPRA-IPT
DNR
P.O. Box 94396
Baton Rouge, La. 70804-9396

To Whom It May Concern:

The following comments are being submitted by the Alliance for Affordable Energy on the February 2007 Draft of the "Integrated Ecosystem Restoration and Hurricane Protection: Louisiana's Comprehensive Master Plan for a Sustainable Coast". Achieving the sustainability of Louisiana's coast is a matter of direct concern for our organization and its members, most of whom are located in the New Orleans metropolitan area. Our organization has worked for a number of years to provide Louisiana's residents with energy that is both economically affordable and environmentally sustainable. We have also been actively involved in the rebuilding process in New Orleans, and have worked to make sure the city and state take advantage of the opportunity provided by that process to implement sustainable energy systems in homes and businesses.

One of the major issues that the Alliance has focused on has been global climate change, which has significant implications for Louisiana's coast. The February Draft of the Coastal Plan is strengthened by the inclusion of a new section on climate change in chapter 2. However, while anticipating the projected rise in sea level and integrating that into planning is an important step, it leaves out the other key component of the current problem of climate change, which is human impacts from greenhouse gas emissions. Louisiana will need to address this key component of the issue as well.

One reason for doing so is political. A growing number of states (North Carolina, Florida, South Carolina, New Mexico, Connecticut and many more) are developing their own policies on climate change in the absence of federal leadership on the issue for the past 6 years. These states are initiating their own efforts to reduce greenhouse gas emissions because of the harmful effects of global warming on their economies and environments. In some cases, they are coastal states who will face the impacts of sea-level rise without the benefit of the 2 large river deltas that Louisiana can utilize for coastal restoration.

It seems untenable for Louisiana to insist that the collapse of our coast, much of which is due to oil and gas extraction, is a national priority, while not taking steps to reduce its own emissions of greenhouse gases.

The state should take this step on its own, rather than being forced to by national political pressure. While such policies may still be outside the comfort zone of Louisiana's political leadership, we need to remind ourselves that the storms of 2005 effectively removed that comfort zone for all residents of the state.

There has been some valuable groundwork laid for such an effort. The Alliance organized a legislative study commission on climate change in 1996, and was a co-author of the report this group completed in 1999, *Danger & Opportunity: Implications of Climate Change for Louisiana*. The recommendations of this report were never implemented, but still serve as a valuable reference point for next steps in this area.

Subsequently, the Alliance helped pass legislative resolutions calling for the establishment of an official state commission on climate change policy (in the Regular Sessions of 2002 and 2003), which would have established a stakeholder process of involvement with state agencies. These resolutions were not carried out, but could provide the basis for moving climate change policy forward in Louisiana. The Louisiana Department of Natural Resources has had ongoing programs promoting energy efficiency for a number of years, and there are also efforts in the private sector aimed at increasing the efficiency and diversity of Louisiana's energy systems.

Expansion of these public and private efforts can help Louisiana meet another global trend that will impact our economy and way of life – rising energy prices and the approaching "peak" of global oil and gas production. The necessity of dealing with both trends – climate change and rising energy prices – will also provide an opportunity for Louisiana to protect and improve the quality of life for its citizens. These considerations should also be part of the effort to achieve sustainability for Louisiana's coast as the state's most vulnerable area. Concerns about the costs of achieving environmental sustainability should be measured against the costs of merely reacting to the status quo: cost estimates for the Comprehensive Coastal Master Plan have now been put at $50 billion.

The importance of Louisiana as a domestic energy source of oil & gas as global supplies constrict will help provide additional resources to make the investments in diversified, efficient, and sustainable energy systems for the state's economic sectors. At the same time, the savings from increased efficiency are a source of increased resources and revenues, which can be re-invested in communities to improve their quality of life. We urge the state and its federal partners not to miss this opportunity.

Respectfully submitted,

Micah Walker Parkin

BTNEP Revised Comments on CPRA Draft Plan

Kerry St. Pe <kerry@btnep.org> **Tue, Apr 3, 2007 at 1:47 PM**
To: comments@louisianacoastalplanning.org

The BTNEP comments on the State Master Plan dated March 29, 2007 should be replaced with the attached comments (dated April 2, 2007). This April 2, 2007 version provides clarification on our position.

Kerry M. St.Pé, Program Director

Barataria-Terrebonne National Estuary Program

1-800-259-0869

http://www.btnep.org/

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100K

Barataria-Terrebonne National Estuary Program
Final Comments on the Draft
CPRA Comprehensive Coastal Protection Master Plan for Louisiana

April 2, 2007

General Comments

The BTNEP Office would like to express our acknowledgement and appreciation for the efforts of the CPRA IPT in putting together a Master Plan. We are intimately familiar with the daunting process of assembling a coherent coastal protection plan, as we went through a similar process in the early 1990s. Our planning process, begun in 1991 with the federal recognition of the Barataria-Terrebonne system as an estuary of national significance, took five years to complete and resulted in the BTNEP Comprehensive Conservation and Management Plan (CCMP). In 1996, the CCMP was approved for implementation by both the state and federal governments. It is through the lens of the CCMP, a plan forged with a high degree of public involvement and multiple stakeholder consensus, that we now view the CPRA's Master Plan. Speaking on behalf of the agreement represented by the CCMP and the BTNEP Management Conference, we offer the following comments.

As with previous drafts of the Master Plan, our most general concern is that it contains restoration measures that do not have broad, multi-sector support. At a minimum, lack of public and agency support will delay restoration progress. Since we obviously do not have the luxury of time, we believe that it is of the utmost importance that the strategies in the state's restoration plan have a broad level of support.

The people of Louisiana have seen too many plans fail to be properly implemented, most often due to the failure to incorporate the "human factor." The best-laid plans of research science and academia have repeatedly struck the impenetrable wall of political and public acceptance. Therefore, finding common-ground solutions and forging stakeholder agreement is absolutely vital to the future success of any plan to restore and protect coastal Louisiana.

The BTNEP approach to ecosystem level restoration is based on a belief that science must be the foundation upon which restoration begins. But science is only the first of a multi-step process. The restoration plans that have been developed since 1996 have failed to take into account the undeniable reality of agency and public acceptance. The reason we find ourselves in a cycle of constant re-planning is because the more recent restoration plans, whether from government, business and industry, or academic science, have thus far failed to understand socio-political reality. We urge the CPRA to avoid this minefield by focusing on the implementation of coastal restoration measures for which there is known consensus among agencies and other stakeholders.

Delta Management

As a specific example, we refer to the so-called "land building diversions" in Plaquemines Parish. The BTNEP has repeatedly questioned this measure's inclusion in the plan. Considering the diminished sediment load in the river over the years, its capacity to build land in a reasonable time frame is highly questionable. But the ecological and socioeconomic impacts associated with introducing such massive quantities of fresh water into the estuary would be severe. Our people are willing to accept some change and to modify their behavior. They are not willing to suffer drastic ecological disruptions, or to sacrifice their interests entirely for what is perceived to be the good of the rest. All stakeholder interests should be considered, and none should be entirely marginalized. This measure runs completely counter to the BTNEP CCMP and to the spirit of participation and agreement, which is the only path to implementation.

Page 36 of the plan states that very large land-building diversions are "the only way to sustain large areas of southeastern Louisiana." This assertion presents a false dichotomy. There are other ways to accomplish this goal, and with fewer impacts to navigation, fisheries, and current use of natural resources. Page 37 discusses some of the "trade-offs" necessary to achieve delta sustainability. What are some of these tradeoffs? Along with the extremely high volumes of fresh water introduced into the Barataria basin, we most likely, will sacrifice many of the current uses of some fishery resources that have sustained a way of life for generations. But will we achieve any meaningful land building with the ancillary protection from storm surges in a time frame that is within reason? Most of the BTNEP restoration community would agree that meaningful land building from any sized diversion, even those of the magnitude proposed in the draft plan would not occur in a time frame that would meet with the public's current expectations. Additionally, even these proposed enormous water diversions would have no land building effects in the Terrebonne basin where there is a critical and immediate need.

The BTNEP recognizes that diversions of freshwater into the wetlands have been shown to be effective strategies for sustaining marsh by introducing nutrients that spur vegetative growth and by countering saltwater encroachment. We believe diversions are an essential component of comprehensive restoration and overall sustainability. However, diversions must be sized and located appropriately to maximize the benefits and minimize the impacts. Very large or uncontrolled diversions, considering current resource use and ecological change, simply have too great an impact for too little near term benefit and have questionable long term benefit.

CLEAR Model

Regarding Appendix G of the Master Plan, the BTNEP has reservations about the results of the CLEAR model runs that show questionably generous land gains in surprisingly short spans of time for many of the diversions modeled. We question some of the inputs to the CLEAR model, such as total suspended sediment estimates, and we question many of its outputs as well. We feel that the model should not be heavily weighted when making ultimate decisions on restoration measures.

Levees

Regarding levee alignments, the BTNEP has two main areas of concern. First, in the Barataria system, we feel strongly that any levee placed on or south of the Gulf Intracoastal Waterway (GIWW) would result in the unnecessary impounding of vast acreages of internal wetlands. Page 59 of the plan discusses some of these issues. The planners seem to be suggesting that improving water flow to help maintain upper basin wetlands can be compatible with a levee along the GIWW. Perhaps this could be so, but on page 32 of the Master Plan in regard to the interaction between proposed levees and future restoration projects, the planners ask the question, "How can we size and operate (landward) diversions to achieve sheet flow over the marsh?" The obvious answer is that it is not possible to have levees crossing directly over marshes without impeding sheet flow unless they somehow are levitated over the marsh. Current sheet flow will be eliminated or severely restricted unless new levees are carefully places along existing hydrologic barriers. Although a "leaky" levee system is proposed in wetland areas where there are currently no existing levees, we feel that there can never be enough exchange to properly maintain healthy hydrologic connectivity. All flow will be channelized through gap structures, and thus non-laminar. Therefore, in the Barataria basin, an alignment along Highway 90 is preferable, as a hydrologic barrier already exists there. Although unfortunately not mentioned in the plan, a Highway 90 alignment would enclose less wetland, increasing flexibility in future restoration plans, and maintaining the hydrologic functionality of the systems to the south.

The BTNEP Management Conference is comprised of representatives of many different federal, state, and local agencies as well as representatives of business and industry, agricultural and fishery interests, environmental groups, educators and scientists. While our CCMP is firmly based on science and the realization that placing levees across open marsh can be detrimental, our multi-stakeholder approach to restoration compels our program to incorporate the reality of a more holistic picture. Our coastal landscape is collapsing around us and has created a condition of severe vulnerability to our communities and infrastructure. We can not ignore this. It is clear to us that there are areas that are in need of levee protection from hurricane storm surges. Our CCMP allows us to address seemingly conflicting principals through the application of common ground solutions to these complex issues. When levees are needed for community protection, they should follow existing hydrologic barriers such as road beds or natural ridges and they should allow for maximum ingress and egress of fisheries organisms. The Morganza to the Gulf levee system was designed with these principals in mind and, as it was originally designed to follow existing hydrologic barriers, is an excellent example of a community protection system that the BTNEP's Comprehensive Conservation and Management Plan can support. We can not support, however, an over-reliance on artificial levees stretched across open marshes in our basins, nor can we support an artificial levee network constructed without an equal effort to rebuild the protective coastal landscape features on the Gulf side. Our communities and our culture can not survive with levees alone, neither can any human-constructed levee.

Our second concern is with the proposals for Plaquemines Parish levee protection, described on page 62 of the plan. Although there may now be fewer residents of the west bank from Myrtle Grove to Venice, the interests of the remaining residents are no less important. There are still businesses, industries, and people attempting to rebuild lower

Plaquemines Parish. It seems that the state, by increasing the standard of what constitutes 100-year protection while proposing to maintain the existing levees as they are, has effectively removed the level of certified protection that residents have had for decades. In other words, "maintaining existing levees" does not equate to "maintaining existing protection" as the protection was 100-year and now no longer will be. In no other area of the state have residents been asked to accept a decrease in their level of protection. This proposal is unfair to those residents who are currently rebuilding their lives and businesses, only to just discover that they may no longer enjoy the protection they assumed would continue. The proposal seems to constitute a "retreat" strategy, and as such, should proceed only with a careful and deliberate dialog with the Parish.

Restoration Measures

With the exception of the very large diversions, the BTNEP agrees with the vast majority of the coastal restoration measures in the Master Plan, and sees much agreement with the CCMP. We fully support the use of pipelines for the delivery of dredged sediment for marsh creation. Indeed, we see this strategy as the best alternative for timely land building, and we feel it is underemphasized in the Master Plan. Pages 33 and 34 of the plan discuss the limitations of sediment pumping:

> "The wetlands that are built may not function in the same ways as wetlands built through natural processes. In addition, the technique is not sustainable and requires periodic renourishment. Finally, pumping in sediment is expensive, and doing it on a large-scale will require that the state make long-term investments in infrastructure."

Each of these concerns has a counterpoint not discussed in the plan. Although the functions and values of historic and created marshes may not be identical, the immediate introduction of sediments will, at the very least, provide a platform for vegetation, turn open water back to wetland, and improve protection from storms. Sustainability can be achieved with minimal freshwater input from small diversions of the Mississippi River as well as from other sources such as the Atchafalaya River, the GIWW, Bayou LaFourche, or even storm water redirection. Periodic renourishment with additional sediments will only be necessary when and where it is deemed to be necessary. All coastal restoration projects are expensive. By comparison with other restoration measures, the cost of pumping sediments is not great, considering that it can achieve the reconstruction of landforms so quickly with minimal ecological disruption. There is no other tool in the toolkit that can achieve this -- none. The mechanical delivery of harvested sediments, whether from navigational or dedicated dredging, is an extremely flexible strategy. It can be used not only to create marsh, but also to restore remnant ridges and barrier islands, both essential landforms for habitat as well as hurricane surge protection. Long-term investment by the state in infrastructure to support this strategy would be money very well spent.

The FY 08 Annual Plan Draft and Urgent Early Actions (UEAs)

The Master Plan on page 71 presents six criteria for selecting UEAs for fast-tracking. One of these, "Projects that maintain or reestablish a landscape feature…for restoring or sustaining the flow of water in a given area…" seems suited to selecting marsh creation, ridge reconstruction, and barrier island restoration projects. The BTNEP would like to strongly emphasize that these types of projects will provide habitat and storm protection benefits almost immediately upon construction. As the technology for dredging and pumping is already well developed in state, and the need to reconstruct landforms as soon as possible is so obvious, these projects should be placed at the top of the list of UEAs. We were extremely disappointed to see that a CIAP-approved project for the long-distance transport of sediments by pipeline to sites in three cooperating parishes was not identified for implementation in the FY 08 Annual Plan. We urge the CPRA to reevaluate its selection criteria and to prioritize restoration measures that will provide immediate benefit and visible results.

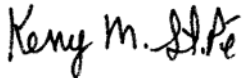
Additionally, there seems to be an emphasis on "natural" and "sustainable" processes in the criteria. That may be a good guiding principle for long range planning, but the CPRA should not overlook mechanical processes that can satisfy immediate needs. The desire to rely on "natural" processes seems to be blinding the planners to the possibilities afforded by techniques that will quickly build land and provide immediate protection from storms.

Basic Assumptions

The Master Plan proceeds from three basic assumptions, presented on page 23. These principles form a good starting point, but the BTNEP sees room to go further in our expectations of how we should move forward and what we can accomplish. Stopping wetland loss is an obvious and critical goal, but we believe it is possible, by properly allocating resources, to reconstruct some of what has been lost. It should be our goal to reclaim the protection once afforded us by the wetlands. Maintaining what we have left is simply not good enough, as so painfully demonstrated by the storms of 2005. But all this must be accomplished in a way that respects the positions of all stakeholders. The plan's basic assumptions make reference to understanding the impacts of proposed restoration actions with the acknowledgement that "seemingly small alterations can have big long-term effects." Here, again, there is room to go a step further. We must not only recognize and understand the impacts of our actions on the people who live here, but we must do our level best to limit those impacts wherever and whenever we can. In doing so, we will discover more and more public support for restoration actions. This will be the path toward implementation. True consensus is a powerful thing and should be the utmost goal of the CPRA.

The BTNEP greatly appreciates the hard work of the CPRA IPT and the opportunity to comment on the Master Plan. Thank you for the opportunity to provide comments.

Sincerely,



Kerry M. St.Pé
Program Director

Chandeleur Islands

Louise6677@aol.com <Louise6677@aol.com> **Sun, Apr 1, 2007 at 8:48 PM**
To: comments@louisianacoastalplanning.org

I think it's wonderful to have an overall plan to repair our coast, in particular one that emphasizes the first lines of defense. But I was very surprised that you didn't have more focus on the Chandeleur Islands. I know they were heavily damaged from Katrina, but hey need to be repaired to protect the southeast side of New Orleans.

Thanks.

Louise Saik
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Metairie,LA
504-831-3246

Coalition to Restore Coastal Louisiana

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(225)767-4181 • (225)768-8193 fax • (888) LACOAST • crcl.org

April 2, 2007

To: Jon Porthouse
CPRA Integrated Planning Team

RE: Comments on the Preliminary Draft Comprehensive Coastal Protection Master Plan

Dear Mr. Porthouse:

The Coalition to Restore Coastal Louisiana wants to thank you for the opportunity to comment on the State's Draft Integrated Ecosystem Restoration and Hurricane Protection: Louisiana's Comprehensive Master Plan for a Sustainable Coast (Draft Master Plan). With the current collapse of the Mississippi delta and the constant deterioration of our coast, there is urgency in all of our actions. The State has acted upon this urgency in the release of the Preliminary Plan followed by the Draft Master Plan with a quick turnaround to submit the Plan to the state legislature. The Coalition encourages the State to continue to act with urgency in the planning, design, implementation and funding of coastal restoration and protection projects. The Coalition is committed to working with the State as we proceed into a more sustainable and safer future.

Public Review
The Coalition appreciates the level of public involvement in the preparation of the Preliminary Plan and the Draft Master Plan. The Coalition feels that some of the comments made on the Preliminary Plan were addressed within the Draft Master Plan, however there are still many concerns. The Coalition understands that numerous edits may be made to the Draft Master Plan prior to submittal to the legislature. We want to ensure that the public will have the opportunity to review and comment on any substantial edits to the Final Plan prior to submittal to the legislature. Although the public has been very involved in the process to this point, the level of changes that may be occurring will require an additional public review period. We are also concerned that once the Final Plan is approved by the Louisiana State Legislature, the State will be reluctant to make substantive changes to the plan without reauthorization by the legislature.

Establishing a Goal
The four stated objectives and key assumptions described in Chapter 1 and Chapter 2 offer a solid base for the development of the Draft Master Plan. We understand that the objectives and assumptions will guide the process, however an end goal needs to be identified. The goal of a "sustainable coast" is exactly as it's stated within the plan, a "conceptual vision", and does not offer any definition or quantifiable elements that would allow the plan to be reviewed and modified for effectiveness in reaching the set goals. What is a sustainable coast? Is it at a point where accretion rates are equal or greater than subsidence rates? Is it when the delta is growing

instead of collapsing? Is it when the habitats reach a historical delineation along the coast? Is it when a Category 5 storm hits the Louisiana coast with reduced or minimal damage to critical assets, infrastructure and wetlands? Is it when protection in coastal Louisiana will reduce the need for mass evacuations when faced with an approaching storm? The Draft Master Plan needs firmly established and measurable goals. Ultimately, those goals should include a return to the historical wetland habitat delineations along the coast since the turn of the century. If the ecosystem fails, the flood protection benefits it supplies will also fail, and increase the stress on engineered flood protection measures.

In connection with the habitat goals, hydrology is one of the main driving forces in reestablishing a healthy and sustainable coast. Humans have altered hydrology for centuries for our own personnel gain. A sustainable coast must balance human needs with environmental concerns. Restoring hydrology is an ambitious and complex task. We need to strive to restore the natural hydrology and emulate natural processes. In addition, intact natural hydrologic processes must be considered when planning hurricane protection. The Coalition strongly supports the use of the current levee system and "footprint levees" which would consist mainly of back levees bordering the developed areas and leaving the natural areas of the coast hydrologically connected and functioning as basins. One of the main goals of the planning and implementation of this Draft Master Plan should be to preserve the natural hydrological connections and restore historical functions of areas with altered hydrology.

Multiple Lines of Defense

The Coalition supports the Multiple Lines of Defense strategy but would like to emphasize the importance of wetlands as a buffer to flood protection structures as a key line of defense. In addition, the role of barrier islands as the first hurdle within the lines of defense is underappreciated within the Draft Master Plan. It is imperative that Chandeleur Island be protected as a line of defense. It is unacceptable to rely on another agency with limited expertise in flood protection and restoration to complete such an important project. Without the Chandeleur Islands, two lines of defense are lost (the barrier island and the sound) and the Biloxi Marsh would be even more exposed to the influences of the Gulf of Mexico, including wave action and salinity regime. This will lead to an increase of deterioration of the Biloxi Marsh and is not a sustainable option.

Levee Protection

As mentioned in the Executive Summary and then again on page 23, one of the assumptions states that a "healthy landscape is essential to achieving both a sustainable ecosystem and reliable flood protection." A healthy landscape is not a landscape riddled with long, linear levees and flood control structures. The sole reliance on these structures for protection is neither natural nor healthy and inhibits the natural processes that historically allowed for the sustainability of the coast. The Draft Master Plan needs to acknowledge that the levee system proposed is unnatural and will lead to further degradation in many areas. We need to look at a flood protection system that does not impound our disappearing wetlands. Levees should be built to protect critical assets and should not disconnect wetlands from the natural processes and hydrology of the region. Our experience, specifically with the taming of the Mississippi River, demonstrates that a heavy reliance of levees leads to a rapid deterioration and collapse of the ecosystem. Levee alignments, such as the Gulf Intracoastal Waterway (GIWW) alignment and

the Morganza to the Gulf alignment, will both provide false security and substandard protection while causing wide-range deterioration of wetlands.

The use of "leaky levees" is conceptual and untested. The Draft Master Plan appears to rely upon this concept as a way to construct levees without altering hydrology. There is a grave concern among the independent science community that this concept will be unsuccessful. It is not feasible to assume that disconnected wetlands will remain a healthy part of the ecosystem. Any potentially beneficial effects will be isolated to the close vicinity of the structure. Currently, we have neither the time nor money to effectively investigation the complexities of the leaky levee concept. Hurricane protection needs to happen now. We can not wait 10 years for hurricane protection while we examine the use of leaky levees. It is the Coalition's position that leaky levees, specifically levees that are planned to bisect basins, such as the Gulf Intracoastal Waterway (GIWW) alignment, would cause further degradation of the ecosystem. The Coalition believes the concept of leaky levees should not be relied upon as a current technology and any proposed levee alignments should rely on the best known science and engineering. In addition, all planning for levee placement should include scientists specialized in the proper functioning of an estuary, including but not limited to hydrologists, geologists, biologists and wetland scientists.

When evaluating alternatives for levee alignments, the cost considerations should not only compare construction and maintenance concerns, but also include the cost to the environment and the potential costs to repair environmental damage in the future. The Coalition strongly supports the strengthening of the current levee system, with possible inclusion of interior levees, controlled overtopping and compartmentalization for additional flood protection, and providing Category 5 storm protection. Any new levee placement should be at the upland/wetland interface and should encompass minimal acreage of wetlands. Since much of the coast is developed along old distributary ridges, traditional back levee locations along the ridges are, in general, a preferred location for hurricane protection levees. Levees located along old distributaries are located closest to the assets that need protection. These "footprint levees" would allow natural areas to stay connected and continue functioning as an estuary, while providing storm surge protection to most communities. In addition, although the length of levee required may be longer, the soils are better suited, thus the construction and maintenance costs are reduced. In addition, these levees would provide a more reliable level of protection for the presence and into the future. All wetlands included on the landward side of the levees should be prohibited from induced or secondary development.

There is also the question of who will be responsible for operation and maintenance of these levees and the water control structures. Will it be the Corps of Engineers? The State? Or the Parishes? Historically, levees in Louisiana with water control structures have failed and due to cost constraints have been left non-functioning. We need to ensure that is this will not occur with the leaky levees, which could result a solid line of levees with no water exchange. This possibility needs to be addressed within the State Master Plan.

Additional Flood Protection
The Draft Master Plans's description of protection is mainly concerned with storm surge. However, Louisiana has historically experienced flooding from large rain events, including heavy precipitation during hurricanes. The use of extensive levee systems will further impact drainage issues in many of our communities. Heavy rain events can also overload a freshwater diversion system and cause back flooding. Wetland areas on the landward side of the levee system should be prohibited from development and utilized for their storm water storage capabilities. In addition, wetlands outside of the levee system can also be utilized for storm water storage and assimilation which is also beneficial to the health of the wetlands.

Modeling
Within the planning and implementation of these projects, the State needs to better address the issues of sea level rise and water quality. Modeling needs to collectively include all of these variables and should be conducted from the initiation of the project, rather than step by step.

We understand that the Saffir-Simpson scale is based solely on wind speeds and is not an adequate scale for future storms that could impact the coast of Louisiana. However, when producing a level of protection that the public needs to comprehend, the State should use their modeling capabilities and attach storm surge levels to the scale that is very familiar and understood by the general public. As described on page 27 of the plan, the levels of storm surge protection as 1% and .2% do not give the local governments, planners, insurers or the general public a straightforward idea of how protected their communities and homes will be in the next Category 3, Category 4, or Category 5 storm. A public education component needs to be added to the plan so that the general public understands their risk and can use this knowledge in their decision making process related to their homes and businesses.

Management of the Plan
The Coalition is pleased that the State is committing to using an adaptive management strategy. Given the ever-changing nature of our coast and eustatic sea level, it is imperative that the State be able to modify and adapt the Master Plan and any planned projects for the benefit of hurricane protection and restoration. The Coalition is concerned on the processes that will be instilled to function under this title of adaptive management and its effectiveness. Clarification of the adaptive management strategy needs to be included in the plan. In addition, information on prioritization and implementation needs to be identified thoroughly in the Draft Master Plan, not only the Annual Plan.

There is no clear indication which state agency/agencies will be responsible for implementation and oversight of the restoration and flood protection projects. When multiple agencies are involved, there should be a process to identify the collaborative effort or the lead agency. With multiple projects in multiple planning units vying for funding, potentially being managed by different agencies, there needs to be a concise method for prioritizing projects. Operation and maintenance responsibilities have also not been defined.

The Coalition would also like to recommend that the State address emergency situations will be handled under the plan. For example, two breaks have occurred in the Schooner Bayou levee system and are causing damage within the Mermentau Basin. Since no assets are in direct threat, the breaks remain open until the state and federal governments can analyze the situation, acquire permits, etc. All the while, more and more saltwater destruction is occurring. There needs to be an emergency plan for such situations that will allow the State to act just as quickly as they would if there were communities in danger.

Numerous federal, state and local regulations, including the National Environmental Policy Act (NEPA), the Clean Water Act (CWA) and the Endangered Species Act (ESA) will need to be adhered to for the Draft Master Plan. There is concern that the Programmatic Environmental Impact Statement (PEIS) being acquired by the USACE will only cover the flood protection aspects of the Draft Master Plan, and additional work will need to be completed to finalize any restoration projects. The State needs to identify the procedure that will be used to remain in compliance with all local, state and federal regulations on such a complex plan.

The role of the Draft Master Plan within the U.S. Army Corps of Engineers (USACE) Louisiana Coastal Protection and Restoration (LaCPR) Report is still unclear.

Smart Growth

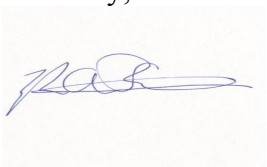
We also strongly support the recommendation for smart growth. The Draft Master Plan articulates well the causes of land loss, as well as the implications of this loss in the future. We need to emphasize the actions that led to our current situation and increased vulnerability and that the ill-conceived and unregulated methods of development that has happened for years is unacceptable. The plan discusses smart growth as an issue for local governments to address. Not only does the State need to take a more active role in assisting local governments with resources, management and enforcement of zoning laws, but the State needs to take the initiative and abide by its own plan. The State has authority over the Coastal Zone and any developments within wet areas. It is contradictory to the Draft Master Plan that the State continues to issue Coastal Use Permits for non-sustainable projects. In addition, the Coalition would like to encourage the State to take jurisdiction of all projects within the coastal zone, including those deemed as fastlands.

We understand that the Draft Master Plan faced numerous challenges from its inception and tradeoffs and tough decisions were made along the way. We concede that due to time and cost constraints, some high risk communities with a lower level of protection when compared to larger communities. There needs to be a slow withdrawal from some of the areas where the risk is too high. As a culture, we have moved away from the building techniques used by our ancestors and it has cost us dearly. We strongly support the inclusion of a formal recommendation to assist local governments with the management and enforcement of the stringent building codes within the coastal zone, whether protected by levees or not, to reduce the risk to these assets. Evidence of the effectiveness of building codes can be witnessed within Florida, where properties built after Hurricane Andrew and the utilization of strict building codes faired well compared to their counterparts in the 2004 and 2005 hurricane seasons.

Comments concerning project specifics are attached.

It is time that we start having a positive impact on our environment for future generations.

Sincerely,



Mark A. Ford, Ph.D.
Executive Director

Project Specifics on the Draft Integrated Ecosystem Restoration and Hurricane Protection: Louisiana's Comprehensive Master Plan for a Sustainable Coast

Submitted by the Coalition to Restore Coastal Louisiana

Historical Ridges

More coordination of projects is needed to ensure that the restoration of ridges does not interfere with the effectiveness of planned projects, as well as the further deterioration of coastal habitats. For instance, the restoration of the Bayou L'Ours ridge, in collaboration with other planned projects in Planning Unit 2, may isolate the wetlands west of the ridge from the influences of the estuary. Another concern is the Bayou Grande Chenier ridge which may impact the effectiveness of the planned large diversion at West Pointe a la Hache. In general, the Coalition supports the restoration of historical ridges, especially the Bayou LaLoutre Ridge, which will have tremendous positive impacts on storm surge reduction, limiting salt water impacts and allowing for the restoration of the associated ecosystems.

Shorelines

Shoreline stabilization is a necessary strategy is the fight against erosion, however the use of armoring and ripwrap are not natural features in our landscape and do not lead to a sustainable coastline. Shoreline protection should be considered in areas of high erosion rates, unlike the shoreline project planned at the Maurepas Landbridge, and not in areas where the potential biological impact can be too severe, such as areas of marsh along the Lake Pontchartrain northshore. In general, the Coalition supports the use of shoreline protection measures to reduce or eliminate the high rates of shoreline erosion.

Land Sustaining Diversions/Land Building Diversions

Over the long term, diversions, or river reintroductions, though a structure at the river or pipelines will provide benefits for keeping the wetland ecosystems healthy. It is evident from the damage sustained to the wetlands south of the Caernavon Diversion, that the processes to build healthy and durable wetlands require an extended period of time. Older, established wetlands, such as the Biloxi Marsh, were able to sustain the brunt of Hurricane Katrina more effectively. It is imperative that we realize the effectiveness of these young wetland areas for storm protection for the near term. In the long-term, the diversions and wetland areas will create sustainability and flood protection.

The Coalition recommends that the size of the diversion structures be planned and built with a larger capacity than what may be anticipated. As we can learn from Davis Pond and Caernavon, all planning and documentation should be completed for oversized diversions due to the uncertainties of the future, such as sea level rise, potential droughts or impacts from large-scale hurricanes.

In addition, the use of one of the Mississippi Delta Management diversion near the bird-foot as a continuous source of sediment for beach nourishment of our fragile barrier island chains and

would allow the natural processes of longshore sediment migration and overwash to occur and lead to increased sustainability of our first line of defense.

The Coalition supports the operation of all diversions for optimal impact, including maximum flow in the spring and other river high water flow events.

MRGO
We strongly support complete closure of the Mississippi River Gulf Outlet (MRGO) at Bayou LaLoutre as a top priority.

It was noted that the project description in Appendix A (D 1-15), which states that shallow-draft navigation interests will be considered, does not correlate to the closure statement on page 41. The Coalition strongly encourages the State to recommend full closure with an earthen plug at Bayou LaLoutre and restoration of the historic ridge. Bankline stabilization is no longer necessary, however we support the additional constriction of the channel for restoration and storm surge protection. The Coalition supports the restoration of the Central Wetlands with the potential to restore this area to its historical habitat of cypress swamp. In addition, the Coalition supports restoration of the Golden Triangle, however this project could be impacted by one of the proposed alignments for the Lake Pontchartrain Barrier Plan. We encourage that the levee alignment does not impound the Golden Triangle which will lead to further wetland loss.

Evacuation Routes
The Coalition supports elevating the evacuation routes and recommends that the new roadways have the highest possible level of protection for the safety of those who live in coastal communities. Restoring hydrology should be a top priority when evaluating these roadways and every attempt should be made to preserve hydrologic function. For older roadways, such as Highway 90, which impedes water flow and causes impoundments, the improvements to the roadway will also allow for improvements to the altered hydrology of the watershed.

Barataria Basin
The Coalition feels that the restoration and protection projects planned to impact the Barataria Basin are inadequate, vague and centered on the proposed GIWW alignment for the Donaldsonville to the Gulf project. The basin is one of the most productive estuary systems in the state, as well as experiencing some of the highest rates of land loss. The economic and environmental consequences for mismanagement of this basin are astronomical. As stated before, the Coalition strongly opposes the GIWW alignment, and all additional levee projects based on that alignment. The Coalition also opposes managing the upper basin as a water management area. The lack of detailed information on the Watershed Management Plan for Upper Barataria Basin leaves it questionable on numerous levels, including feasibility. Prior to selecting an alternative that impacts approximately 1,100 square miles of wetlands, the State needs to analyze all the impacts, including economic and environmental.

It is generally accepted knowledge that the great rate of land loss in Louisiana is to a large extent due to man's separation of the river from its floodplain. This idea was further supported in a March 23, 2007 article in Science. The authors stated that "the river is now almost completely leveed, preventing over bank flooding and crevasse formation, so most of its discharge is into the

deep Gulf of Mexico." In this knowledge is also the acceptance that returning the ecosystem to its natural form and function, to the best of our abilities, is key to reducing land loss, restoring wetlands and providing effective storm protection. It is deplorable that the levee alignments, such as the GIWW alignment, which will severely alter the natural processes of the Barataria Basin and put another "human stamp" on our sensitive coast, are even being considered.

Reference: J.W. Day et al., *Science* 315, 1679 (2007).

Southwestern Louisiana

Restoration and protection plans for Southwestern Louisiana is a major component is the stabilization of the entire coast. Although this area is not experiencing the intense rates of land loss as Southeast Louisiana, and in fact the Atchafalaya Delta is growing, this area is still in grave danger within the next 100 years. As Hurricane Rita demonstrated, this area is vulnerable to storm surge for great distances and the intrusion of saltwater has serious impacts on not only the environment, but the cultural and economical stability of the area.

The long, linear levee system stretching across the state is beneficial in being located in a more upland habitat, for the most part, and allowing for protection of important assets, communities and farmlands. Problems with these levee alignments include the reliance on the leaky levee concept, cost constraints and the plan to manage watershed without any foresight into how this is going to be accomplished.

Shoreline protection of the numerous lakes and bayous is very important to this area to prevent further saltwater intrusion. In addition, stabilization of the gulf shoreline is also of great importance. Both of these issues appear to be addressed in the Plan with multiple projects.

Freshwater resources are an integral part of the restoration plan for the Chenier Plain. Saltwater intrusion into our freshwater wetlands will start to cause a change in habitat type and eventual degradation of the coastline. In addition, the high salinity is causing grave problems with our agricultural farmers in the region. Numerous diversions and conveyances of freshwater are being proposed from the Atchafalaya River, the GIWW, Sabine River, Red River and others. The Atchafalaya River has limited water and sediment resources, so we need to be sure the water and sediment budgets are sufficient to achieve the goals of the plan. The Coalition supports the re-authorization of Old River Dam to allow additional water and sediment to flow down the Atchafalaya River.

We would like to caution that there is limited space within the water budget of many of these areas and the addition of freshwater could overload the system and cause back flooding. In general, the Coalition is in support of the freshwater management to control saltwater intrusion, however the Plan needs to be more holistic on how they plan to manage the water resources, while avoiding back flooding throughout Southwest Louisiana. The use of pipelines to transfer sediments can produce the same beneficial impacts to sinking wetlands, while limiting the influx of freshwater and using small diversions to sustain the ecosystem.

Coastal Forests
On page 81, the Draft Master Plan states that "Louisiana has had best management practices for coastal forests since 2000." This statement is misleading, as Louisiana has not had BMPs for coastal forests since 2000. The State's BMP manual does not specifically address our coastal forests and the issues they are facing. The Coalition supports the inclusion of stronger recommendations to preserve our coastal forests and the inclusion of the recommendations made to the Governor by the Advisory Panel on Coastal Forests and Use, of which the Coalition participated.

Additional Projects
Additional projects and issues that need to be addressed in the Draft Master Plan include:

- The Plan has almost no emphasis on restoration of structural reefs, which often means oyster reefs. Shellfish, in particular, are recognized to have tremendous benefits throughout the estuary including providing shoreline protection of marshes. Once the hydrology is restored, oyster reefs can be re-built within a few years and provide highly sustainable benefits. Structural reefs should be targeted for specific historic sites or along submerged remnants of distributary ridges. Artificial near shore barriers, such as those near Holly Beach, offer tremendous wave reduction and shoreline retreat benefits.

- Numerous canals and navigations channels that traverse our precious coast have been abandoned. Even though most of them have not been dredged for years, they still contribute to the deterioration of the adjacent wetlands and are a conduit for storm surge to impact our coastal communities. These abandoned canals and channels should be surveyed and plugged both for the restoration value and storm surge protection.

- There is concern that the floatant marsh in Northern Terrebonne will be impacted by the extremely high levels of nutrients in the Mississippi River through the planned diversions. There is also concern that the high loading levels could cause eutrophication within the wetlands and lead to further degradation. The Coalition recommends that the State include a plan to target and educate other states within the Mississippi River watershed to reduce nutrient loads to more manageable levels. We cannot fix all of our problems on our own.

- Global warming and sea level rise could have a negative impact on our efforts to protect our coastline. Louisiana should strive towards a carbon neutral economy and promote development that minimizes the production of greenhouse gases.

KATHLEEN BABINEAUX BLANCO
GOVERNOR

State of Louisiana

BRYANT O. HAMMETT, JR.
SECRETARY

DEPARTMENT OF WILDLIFE AND FISHERIES
OFFICE OF SECRETARY

April 2, 2007

Ms. Michele Deshotels
Coastal Protection and Restoration Authority – Interagency Planning Team
Louisiana Department of Natural Resources
P.O. Box 94396
Baton Rouge, La. 70804-9396

RE: Comments on the draft Integrated Ecosystem Restoration and Hurricane Protection: Louisiana's Comprehensive Master Plan for a Sustainable Coast.

Dear Ms. Deshotels:

The Department of Wildlife and Fisheries (LDWF) staff has reviewed the February 2007 draft Comprehensive Master Plan for a Sustainable Coast for Louisiana and offers the following comments to avoid and minimize long-term impacts to wetlands. Our comments have not changed since our last review of the November 2006 preliminary draft Comprehensive Protection Master Plan and are included here again.

As stated in the Master Plan, Louisiana wetlands are currently experiencing rapid changes associated with a wide range of natural and anthropogenic influences. Rates of wetland loss are higher in Louisiana than anywhere else in the U.S., and efforts to reduce these losses have only begun to be implemented in the last decade or so. Per Act 8 of the 2005 First Extraordinary Session of the Louisiana Legislature, the Coastal Protection Master Plan (CPR) is intended to provide for "comprehensive coastal protection, including the encouragement of multiple uses of the coastal zone and to achieve a proper balance between development and conservation, restoration, creation, and nourishment of renewable coastal resources." These wetland changes have the potential to reduce populations of a wide variety of recreational and commercial fishery production as well as less known non-commercial species of fish and invertebrates that are dependent on these habitats for some portion of their lifecycle.

Being the state agency charged with responsibility for the conservation and management of wildlife and fish resources, the Department's goal for the Master Plan is the replenishment, protection, and enhancement of Louisiana's renewable coastal natural resources. LDWF manages coastal wildlife and aquatic species including fur-bearers, fish and shellfish and game species as well as approximately 500,000 coastal wetland acres on refuges and wildlife management areas and approximately 1.6 million acres of public oyster grounds. We lease another 398,000 acres for oyster cultivation. With that being said, our understanding and

commitment to this plan and implementation of the plan will ensure LDWF's goals and vision are reached.

LDWF understands the importance of protecting coastal property and the citizens of the state during environmental storm events (hurricanes, floods, etc.). At the same time we have seen the effects some measures to control these events have had on wetlands. The Department does not oppose the proposed protection system, but feel certain alignments would have a detrimental effect on our states fish and wildlife resources. Changes in coastal morphology due to large levee systems may also exacerbate flooding and infrastructure problems.

As stated in our December 27, 2006 letter, again we recognize the injuries done to Louisiana's coast when watersheds and estuaries are de-coupled; fresh water flow with its important sediment and nutrient components is lost to the wetlands, and the important role that wetlands play as nursery grounds for estuarine species is diminished. The preliminary plan contains conceptual levee alignments that will reduce the linkage between watershed and estuary. We refer specifically to the so-called Perimeter plan along the East Orleans land bridge and the gates on the Rigolets and the Chef Menteur (PD1-1), the GIWW alignment in the upper Barataria basin (PD2-1), the dogleg off the Morganza to the Gulf levee west of Miner's Canal and the "Twin Pipeline" alternative (PD3a-1), and potential closing off of the Verret basin (PD3a-2). LDWF is committed to working with its state and federal partners to maximize that linkage between watersheds and estuaries, and protect Louisiana's coastal ecosystems and dependent species.

The timing and sequence of construction of the proposed measures will rely on using the state's "Annual Plan: Ecosystem Restoration and Hurricane Protection in Coastal Louisiana" for funding. By doing so, our concern is that there are no assurances that funding will be available for both protection and restoration. It is extremely important that hurricane protection levee features and the wetland features designed to protect those levees are constructed together. There may be a desire to see the levee features constructed first, and then to construct the wetlands protection but this would not provide the dual protection for property envisioned by the Master Plan. In addition, priorities may change from one year's state Annual Plan to the next preventing the available funding to complete both features. Mitigation for the wetland injuries sustained as a result of levee-building should also be scheduled simultaneously with the construction of the levees themselves for the same reason. This makes sense both ecologically and logistically.

To reiterate from our first letter, the draft plan has a paragraph discussing trade–offs between fisheries and use of extensive freshwater and sediment diversions in the southeastern part of the state. The models used to develop CPR basin salinity scenarios use average annual discharge rates to determine the salinity of receiving basins. However, in nature, seasonal salinity gradients are critical to maintaining viable and productive fisheries. It may be possible to plan for areas with sustainable estuarine fisheries by imitating natural seasonal flows and manipulating deltaic landbuilding. LDWF has expertise and data to aid in developing future

discharge scenarios, and we are committed to working with state partners to find ways to maintain Louisiana's estuarine fisheries and rehabilitate her coast.

As it is now, the Master Plan does not provide any cost/benefit analyses in regards to the economic value of the estuaries and wetlands that will be impacted if the measures set forth in the Master Plan are implemented. Louisiana's commercial coastal fisheries rank second in the U.S. behind Alaska, and first in the lower 48 states. Louisiana's commercial marine fisheries, which are dominated by estuarine-dependent species, had a dockside value of $285,954,170 and a total economic effect of $2,535,375,795 in 2005 (Southwick, 2005). Southwick (2005) also reported that Louisiana's saltwater recreational fishing industry generated $435,324,520 in retail sales and a total economic effect of $792,578,882. Recreational hunting (Southwick 2005) generated $599,474,791 in retail sales with a total economic effect of $1,023,913,412. In the same report non-consumptive fish and wildlife recreation accounted for $175,157,058 in retail sales with a total economic effect of $317,435,573 and the state's alligator harvest retail sales were valued at $37,933,078 (Southwick 2005).

We appreciate the opportunity to comment on this extremely important plan, and we look forward to working with our state sister-agencies to benefit the Louisiana public and the trust resources that we manage. Should you have any further question, please contact Heather-Warner Finley at 225.765.2956 or hfinley@wlf.louisiana.gov.

Sincerely,

Bryant O. Hammett, Jr.

Bryant O. Hammett, Jr.
Secretary

mjr

c: LDWF-Ortego
LDWF-Balkum
Governor's Special Assistant for Coastal Activities-Coffee
Secretary, Louisiana Department of Natural Resources-Angelle
EPA
NOAA
USACE
USFWS

Literature Cited

Southwick Associates, Inc. 2005. The Economic Benefits of Fisheries, Wildlife and Boating Resources in the State of Louisiana. Developed for the Louisiana Department of Wildlife and Fisheries. Baton Rouge, LA 38pp.

Draft plan comments

Paul Harrison <PHarrison@environmentaldefense.org> **Tue, Apr 3, 2007 at 4:49 PM**
To: comments@louisianacoastalplanning.org, Randy Hanchey <randyh@dnr.state.la.us>, "Sidney Coffee (GOV)" <coffees@gov.state.la.us>, rmilling@whitneybank.com
Cc: Jim Tripp <jtripp@environmentaldefense.org>, Susan Kaderka <kaderka@nwf.org>, pkemp@audubon.org, agromnicki@audubon.org

Dear friends:

Please find attached an updated version of our state plan comments. Audubon and National Wildlife have joined us in their submission. Please use the comments attached hereto as our official comments.

Also, please note a few substantive changes.

First, I inadvertently transposed a number in a formula and thus found that 61% of Annual Plan funding was going to Morganza and Donaldsonville funding. The correct number is just shy of 39 percent. My apologies.

Second, we have added some analysis to the global climate change section (#11) and separated that from the energy challenges section (#12).

Third, we edited the MRGO section to drop the assertion that the plan was advocating accelerated completion of the IHNC lock. Another look at the text showed that was unfair, and we changed the text to simply request that the plan make clear that progress on the MRGO not be linked to progress on the IHNC lock.

Finally, in the "land sustaining diversions" section we noted that CIAP plans for a sediment pipeline may be meeting our concerns raised there.

Thank you for considering our comments, and my apologies for the errors.

Best,

Paul

<<second comments state master plan ed nas nwf.pdf>>

From: Paul Harrison
Sent: Monday, April 02, 2007 9:54 PM
To: comments@louisianacoastalplanning.org
Cc: Jim Tripp; 'Randy Hanchey'; Sidney Coffee (GOV)
Subject: Draft plan comments

Dear friends:

Please find attached our comments to the Draft Master Plan. We have raised most of these concerns before, and we understand that you are working to address them. As stated within, we look forward to working with you toward a funded and implementable set of projects.

We have not yet been able to confirm whether National Wildlife or National Audubon will be able to join our

submission, but we may again ask you to accept an updated version once we have heard back from them.

As always, please let me know if you have concerns or if I can be of further assistance.

Best,

Paul

<< File: second comments state master plan.pdf >>

Paul Harrison
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Comments on Louisiana's Draft Comprehensive Master Plan for a Sustainable Coast

Submitted By
Environmental Defense
National Audubon Society
National Wildlife Federation

April 2, 2007

The February, 2007 revised draft of the Louisiana Comprehensive Master Plan for a Sustainable Coast is a significant improvement over the Preliminary Draft Master Plan. As is no surprise given the scope, political challenges, and scientific complexity of the task at hand, much remains to be done. As is intended by the triple-revision process set forth by the CPRA, we suggest additional changes and look forward to discussing these challenges with the CPRA. The stakes are high, challenges substantial, and time short. Nevertheless, no one can contest that the officials, scientists, nonprofits, and regular citizens involved in this process are all dedicated to creating the best coastal restoration and protection plan possible. We remain confident that this process of back and forth will continue to improve the plan finally presented to the state legislature.

1. Systematic Reversal of Land Loss Must Precede New Levees

A disconcerting disconnect between the principles set forth in the Master Plan and the funding priorities laid out in the draft Annual Plan remains and must be addressed. As has become abundantly clear, if coastal Louisiana's communities, culture, economic assets, and ecosystem are to survive and thrive into the future, the state and federal governments must jump start an aggressive program of coastal restoration on a ten-year timeline with a severely constrained budget. Less than 100 years ago, we began an aggressive program of engineering the ecosystem that coastal Louisiana depends upon. While some of the results of that engineering were as intended, for example the ability to extract off-shore energy deposits and efficiently move oceangoing commerce, the larger result has been to send the system into cardiac arrest. More engineering may extend the ability to live and work on the delta but it will only hasten the eventual decline.

If we want the patient to survive, we must restore the natural functioning of the system. This will, in large part, require de-engineering what we have done to this ecosystem over the past century. We must make maximum use of the forces of the Mississippi River to once again nourish and build protective wetlands and coastal forest. Only then can we turn to deciding where and how communities and economic infrastructure fit in.

For this reason we support the program for identifying "Urgent Early Actions" set forth on pages 71-72. To paraphrase, this suggests:

- Moving forward study and design of major sediment and freshwater reintroduction projects;
- Modifying operation of existing structures to maximize restoration benefits;
- Moving forward with projects that provide better-than-100-year protection to densely-populated communities;
- Constructing projects that "maintain or reestablish a landscape feature that is a linchpin for restoring or sustaining the flow of water in a given area," for example closure of the MRGO at Bayou La Loutre;
- Building projects that "restore natural processes in an area of high projected land loss;" and
- Sustaining natural processes that protect existing communities.

In the sections below we further discuss our ideas about how best to implement such a program. We are, however, particularly concerned about the way the CPRA proposes to initially move forward. As the executive summary of the draft points out, engineered structures "must be integrated into the landscape in such a way that it does not destroy the viability of the ecosystem or encourage unwise development in high risk areas." The draft annual plan, however, spends almost 40 percent of funds available in the next three years on a series of levee construction projects that coastal scientists agree are likely to damage the wetlands through which they will cut. Moreover, without a fully developed wetlands restoration program in place, it will be impossible to "integrate" projects like Morganza to the Gulf and Donaldsonville to the Gulf with coastal restoration. There is also little support for the assertion that either of these projects will provide greater than 100-year protection, that said protection is limited to densely populated communities, that the proposed earthen-levee design of these structures can withstand attack during a serious hurricane, and that construction of these systems will not repeat the deadly development-inducing mistakes made in developing the New Orleans East levee system.

We must, therefore, withhold our support of this overall plan until it is made clear that new engineered hurricane protection projects for Houma/Thibodaux and the New Orleans' West Bank will only proceed once they are:

1. integrated into projects for systematic restoration of the Barataria/Terrebonne wetlands; and,
2. limited to provision of .02% protection around areas with greater than 250 people-per-square-mile density.

We need to make it absolutely clear that we do not object to engineered hurricane protection for densely populated communities like Houma, Thibodaux, Larose, Raceland, or the West Bank of New Orleans. We simply believe that a program of pile-supported ring levees, and subsidy for storm proofing and elevation (and possible relocation of particularly vulnerable properties) of properties in less dense areas is much more likely to be effective, sustainable, and efficient. Such a program is also much less likely to stand in the way of the ultimate storm protection system – active restoration of the Barataria-Terrebonne wetlands.

2. The Plan Needs To Present A Clearer Road to Systematic Reversal of Land Loss

In general, the draft Plan does a good job of describing the magnitude of coastal wetland degradation in coastal Louisiana while explaining the national importance of oil and gas, navigation, fishery, and urban/cultural resources that historically have depended on the vast Delta of the Mississippi River.

Page 13 of the introduction explains that "when one considers the human cost, the risks to infrastructure, and the danger to wildlife and landscape, it is clear that we must take bold action." This would suggest that the State Plan would put forward a set of wetland restoration proposals that would effectively deal with high rates of land loss. Unfortunately, the Plan still lacks a compelling vision of a restored coast and restoration processes. It may be because Plan drafters did not feel able to step back and first conceptualize what a de-engineered system would look like, and then determine how best to place communities and infrastructure within that repaired system. Given the advanced damage already done to the system and challenges presented by global sea level rise, however, anything short of such an analysis will continue to fall short.

As for now, the levee protection and wetland restoration proposals do not appear to be integrated at all (except through graphic juxtaposition on p. 49), and it is not clear how the levee proposals comply with the five bulleted guidelines presented in the box at the top of p. 40. The entire levee program and therefore much of the draft Plan does not appear to be the outcome of a systematic scientific and engineering assessment of what wetland restoration and hurricane protection measures can work effectively together at a cost that is feasible and on a time line that will be genuinely useful. If the CPRA has this information it needs to work on better presenting it. If not, the CPRA should clarify when the discussion relates not to concrete proposals but instead more of an identification of needs and issues.

It is clear that restoration and protection concepts are better developed in some areas than others, and the Plan can be of enormous public use if it makes the situation clear to the public and does not propose that there are projects ready to go when many years of effort remain before us.

Proposals for the area East and South of New Orleans are most developed, including: various barrier island rebuilding measures; restoration measures east of the River in the greater MRGO region; and, the outline of a major lower river diversion coupled with more modest measures such as the Myrtle Grove diversion and sediment pipeline into the Barataria Basin. However, the description of the Mississippi River Delta Management project, incorporating one or more major sediment diversions below Myrtle Grove, does not get us much beyond what COAST 2050 proposed. The Master Plan should go further, describing the purpose and expected scope of the Delta Management Project's results while also explaining that communities and individuals impacted by any eventual diversion will receive storm-proofing, elevation and relocation assistance as requested. As discussed below, if the whole region is to survive this project must not be hamstrung by parochial concerns – nevertheless, those whose lives will be most directly impacted deserve straight talk about how the State will help them.

As to the central portions of the coast, it is unclear what the Plan is proposing to address "extreme rates of land loss", let alone restoration. Greater use of the GIWW as a conveyance channel does not do this. The draft Plan does not look at effective use of Atchafalaya River water and sediment as a strategy for large-scale protection and restoration in central and eastern Terrebonne Parish via a third outlet through the east guide levee; nor does it consider some kind of large diversion or sediment conveyance strategy for the central coast on either side of Bayou Lafourche beyond the very small, 1000 cfs Bayou Lafourche project. If the CPRA is going to consider such options, it should identify them in the Plan.

The western part of the coast, without an obvious source for freshwater and sediment, is discussed below.

3. The MRGO Proposal Is an Excellent Example of a Major Restoration Program Near Ready For Implementation

We certainly support the proposal for total closure of the MRGO and restoration of wetlands on the east side of the River together with some set of levee structures. Our own report on MRGO closure incorporates these features. This would include rebuilding the Bayou La Loutre ridge and constructing an appropriately-sized diversion at Violet that will provide significant amounts of freshwater, as well as some sediment, into this sub-basin, with the hopes of restoring the coastal swamp forest and other wetlands that MRGO decimated.

However, we have two specific concerns with the bullets on p. 39. As our MRGO report states, the MRGO channel should be restricted in specific locations in terms of its width and depth. This would not entail completing filling in the channel – there is not enough sediment to do that anytime soon – but redesigning the channel to retard the flow of freshwater from Violet and elsewhere. Second, the bullet regarding completion of the IHNC lock once again seems to be linking that project with MRGO closure. If that is not the intent of the State Plan, it should be explicit that MRGO closure should proceed immediately, not linked in anyway to the IHNC lock project. The IHNC lock project is very expensive and will take a long time to build even if the Congress appropriates the requisite funds. MRGO closure should proceed on the fastest possible time schedule in light of Katrina experience, and the Plan should make it clear that MRGO closure and the Violet diversion are very high priority projects that should be completed within three years. Delay is inexcusable. This sense of urgency for MRGO closure should be emphasized in the Plan.

4. Shoreline and Ridge Restoration Needs to Support Restoration, Not Focus on Locking in Current Conditions

The plan needs further discussion of how the navigation channel bank stabilization program fits into the wetland restoration program. Will it have any impact on it? There is no question that navigation channels are economic necessities that have often changed the hydrology of the surrounding areas, but a discussion of how those changes can be managed and/or adjusted would be helpful. Also, it is unclear from the draft Plan what is being proposed for the ridges colored in orange on p. 32.

5. Maximize the Impact of Land Sustaining Diversions

As you know from numerous earlier comments, we consider the Myrtle Grove diversion and sediment conveyance to be very high priorities for any restoration initiative in the Barataria Basin. The draft Plan proposes a Myrtle Grove diversion with a capacity of 5000 to 15,000 cfs (p. 35). At the Lafayette meeting, we discussed Myrtle Grove options at far higher capacity. The Corps in the text of the LCA report describes a Myrtle Grove diversion of only 2500 cfs, apparently to prevent any significant change in the salinity regime of Barataria Basin. Even at 15,000 cfs Myrtle Grove would have capacity only 50% greater than the Caernarvon Diversion. Why not provide for a sediment diversion at or near Myrtle Grove (perhaps at a bend that would maximize opportunities for sediment capture) with capacity in the range of 25,000 cfs or higher with the understanding that the diversions would be pulsed – designed to take advantage of high River flows. In our view, furthermore, a sediment pipeline should be designed to convey sediment towards the western part of Barataria Basin (we recognize that the 20-mile CIAP proposed sediment pipeline might be such a project)". The State Plan should set a time schedule for the design and implementation of this project.

The State Plan should consider a far more ambitious Bayou Lafourche project. The current 1000 cfs project was designed primarily to augment fresh water supplies in the Bayou for urban use. It is not clear that the engineering team evaluating this project has conceived it as a potential wetland restoration project. Bayou Lafourche would provide by far the most efficient way of conveying significant amounts of Mississippi River water and sediment into the central coast. It would not entail destruction of thousands of acres of wetlands such as one version of the Third Delta might entail. An enlargement of Bayou Lafourche as a restoration project would have an impact on the urban communities that have encroached on its floodplain. The Plan talks about the need for trade-offs. This part of the coast has become extremely vulnerable to storm surge as a result of massive wetland loss. A creatively designed Bayou Lafourche project, perhaps with a channel that skirts part of the most heavily urbanized areas, combined with relocation and/or elevation of vulnerable properties, should be presented as a real option for central coast restoration. We would urge an assessment of the impacts on central coast restoration and the urban communities in this corridor of a Bayou Lafourche diversion with up to a 10,000 cfs maximum capacity and an even larger one with a capacity in the 50,000 to 100,000 cfs range during high flow pulsing. Otherwise, the Plan has no proposal for reintroduction of water and sediment into the central part of the deltaic plain that has been suffering very high subsidence and wetland loss rates.

6. It Is Time to Accelerate Design and Construction of Land Building Diversions.

An ambitious Myrtle Grove diversion project can prove to the citizenry of coastal Louisiana that sediment diversion and conveyance can be a reality on an accelerated time schedule. However, the potential for large-scale wetland protection and restoration will not have reality until the large Lower River diversion described at pp. 36-37 proceeds. If this project is not ready to proceed until 2017, there is much reduced justification for seeking a major additional infusion of OCS funds for wetland restoration between now and 2017.

A driving trip from New Orleans to Venice on the west side of the River and back on the east side reveals how few people and facilities are evident below Myrtle Grove in the narrow corridors between the River levee and hurricane protection or bay levee on either side. The draft Plan, while talking about trade-offs, proposes maintaining these existing levees at current height. This should be reconsidered. Existing communities that are still inhabited and are important for oil and gas servicing industries or fishing can be protected to a similar degree by pile-supported ring levees, coupled with provision for evacuation. This would allow for consideration of a lower River management plan that would include dismantling of large stretches of levees so that River overbank flooding and sediment dispersal could be accomplished cost-effectively. As the draft Plan states, "In order to allow the river to create new land, science tells us that we must turn the river loose and let it resume doing what it did for thousands of years; spread water and sediment into broken marsh and shallow water to create new delta lobes." Redesigning the whole levee system below Myrtle Grove would be a start for reconnecting the river

and its surrounding wetlands. The Plan should set forth a process and schedule, perhaps including appointing an internationally renowned group of experts to design the basic parameters of such a strategy for letting the river "loose" while providing for navigation. Following the adoption of basic parameters for the redesigned levee system, diversion, and navigation structure, a design competition or design-build RFP process could be used to expedite progress. The major engineering firms must be engaged if this hugely challenging and exciting restoration program is to move forward over the next five years with construction underway in time to give everyone confidence that large-scale restoration is becoming a reality.

7. Using the Resources of the Atchafalaya Should Be a Top Priority

The CPRA will be missing a major opportunity and failing in its job to plan systematic restoration of the entire coast if the final Plan continues to say so little about the potential for effective use of Atchafalaya Basin water and sediment to restore portions of the central coast in Terrebonne Parish that have suffered "extreme" wetland loss. We have submitted a proposal for a third outlet through the east guide levee. Since this outlet would be north of Morgan City, it provides for much more restoration potential than relying just on expanded flows through the GIWW. The Atchafalaya River has built a huge amount of land in the Basin and in the Bay through the Lower Atchafalaya River and Wax Lake Outlet over the last 30 to 40 years. A third outlet would allow for the land building capacity to be broadened in a manner that might enhance the unique ecological features of the Basin at the same time and protect Morgan City.

In addition, it is critical that the State Plan address the operation of the Old River Control Structure with a view to optimizing the distribution of flows between the Mississippi and Atchafalaya Rivers for coastal restoration as well as flood control purposes. The Corps is not apt to investigate this issue on its own. Increasing the distribution of flows down the Atchafalaya River would create angst in Morgan City and provide limited restoration benefits without a third outlet designed to take advantage of this extra water and sediment.

8. Hurricane Protection for the Delta and Chenier Plains Still Lacks Strategic Design

On the protection side of the Plan, the rationale for both a 0.2% and 1% levee protection alignment for major parts of the coast is unclear. The plan should establish a set of criteria for why an area would receive one level of protection over the other. Having these criteria set out would also assist with prioritization decisions.

The dual levee alignment program that is proposed for the entire coast of Louisiana from the Mississippi River to the Texas border strikes us as environmentally destructive, very expensive, probably infeasible and counter-productive. The draft Plan refers to a strategically designed hurricane protection system, but we see little evidence of strategic

design, except for an attempt to differentiate between 0.2% protection in some places, 1% protection in others, and combinations of the two in yet other places. The draft Plan states, properly, that development incursions into wetland areas that would be "protected" by this vast levee system should not be countenanced, but provides no realistic mechanism whatsoever for controlling such land development that is an inevitable feature of such broadcast protection schemes. Proposing land use controls by local governments is not such a mechanism and has worked virtually nowhere in the country. Any incremental "protection" of wetland areas that would induce development must be preceded by a comprehensive program of purchase of development easements, backed with a credible financing scheme. Land use controls will not work.

Major urban areas in coastal Louisiana can and should be protected through a ring levee system combined with an aggressive and accelerated wetland restoration diversion and sediment conveyance program.

The draft plan has not convinced us that the destructive impacts of historic levee construction will not be repeated because of reliance on leaky levee technology. The draft Plan describes "leaky" levees as an innovative technology that would allow for linear levees to co-exist with wetland restoration projects. There is simply no scientific evidence that periodic placement of water control structures that will, when open, allow for the passage of flows of water and sediment will substitute for more open flows of water and sediment. Levees will serve to impound water and block the exit of salt water following storm events a la the Rita experience in the Chenier Plain.

It remains unclear how the Plan addresses what happened to both flood control structures and hydrologic management structures (i.e. "leaky levees) during Hurricanes Katrina and Rita. The single page in the Plan that purports to address these "lessons" provides no specifics about how the plan was informed by the major forensics reports that have been issued in the past year. Those revising the updated Plan will also have the benefit of the official state report on Katrina failures recently released by LDOTD after 3 months of internal state review, and the lessons presented in this report should also be addressed.

We are also very concerned that the Plan relies on bolstering existing levees instead of building new systems from the ground up. The legacy levee alignments are of unknown composition, and there is simply no evidence that the reliability of such composite earth embankments can be assured in the future against the 100+ year recurrence storm surge and wave. One important lesson of Katrina was that earthen levees constructed across soft marsh soils failed catastrophically, and ultimately created death traps for communities that depended on them, (for example Chalmette and Meraux in St. Bernard). In addition, settling of earth levees affects the constructability and ultimately the reliability of these structures. The building of earthen embankments across the soft soils of the inter-distributary basins ("leaky levees") is a job that can never be finished, as the USACE found out, even if relatively good clays are available in sufficient volume. The crown elevations for such structures decline at spatially varying rates between

enlargements. Accordingly, the actual level of protection at the time a particular storm strikes will differ from place to place, but will generally be something less than the design level. Armoring to provide protection of embankments against waves and overtopping scour is difficult for structures that are in continual motion. On the other hand, earth levees that are useless against a storm surge are quite effective in blocking natural hydrologic flows and in damaging wetlands.

One lesson of the storm is that it is necessary that structures and alignments being considered for critical life-support flood protection be analyzed over a 100 year life-cycle that gives the greatest weight, first, to reliability, and, second, to the speed with which the structures can be deployed. No pile-supported structure failed during Katrina, although sheet-pile or I-Wall structures (that again depend on earth levees) failed almost everywhere they were deployed. Pile-supported solid or gated structures similar to those built in the 1930s at Bonnet Carre and Morganza can be used to more quickly provide reliable protection than any project depending on earth levees. In contrast to the familiar overbank river control structures that have served reliably for so many decades, gates on pile-supported hurricane protection structures can cross wetlands, bays or tidal channels because they will be raised out of the way and lowered only on those rare occasions when their protection is needed.

9. Much More Work Needs To Be Done on the Chenier Plain

We must continue to question the viability of the plan for the Chenier Plain. Hurricane Rita brought massive overtopping of levees and introduction of high salinity waters into fresh marshes. A number of these marshes were artificially impounded, which tended to trap this salt without providing any means for flushing. Clearly, we will need to do something different, and this brings into question the apparently accepted approach to freshwater and sediment management in this region. The draft Plan calls for a comprehensive study of freshwater and sediment resources. This must consider the possibility of a different approach rather than maintaining the present system, and the final Plan should set forth a system for developing such an approach. It is quite possible that an approach that advocates maintaining large freshwater wetland areas near the coast is not sustainable, given predictions for global climate change and higher energy costs.

10. The Plan Fails To Explicitly Lay Out a Non-Structural Strategy For Homes and Economic Assets That Will Not Be Protected Within Ten Years

Our initial comments called for consideration of a number of both structural (i.e., ring levees) and non-structural (i.e., raising structures, zoning, etc.). There is no question that a complete restoration and protection program will take decades to construct, and vulnerable properties will remain even then. Although this may require coordination with organizations like the LRA, the plan will be incomplete until a non-structural program is explained and funded.

11. More Explicit Plans for Addressing Climate Change Uncertainties Should Be Included

Global climate change is addressed briefly in the draft plan, but it is unclear how the Plan has been changed, and will be changed in the future, to address climate change. The historical record shows that Louisiana's deltaic wetlands over the past 5,000 years were able to keep up with even fairly sizeable changes sea level by building and accumulating soil. This was possible because the wetlands had the full benefit of Mississippi River sediment and freshwater. A recent Duke University modeling effort shows that healthy wetlands receiving historic levels of sediment can adapt to as much as ten millimeters of sea level rise, but that sediment-starved wetlands will dissipate rapidly in the face of sea level rise (http://www.dukenews.duke.edu/2007/03/marshmodel.html). If coastal Louisiana is to survive the higher sea levels global warming is expected to bring about, the restoration plan must aim to approximate that historic capacity for vertical accretion. This objective should be explicitly stated and its implementation explicitly addressed in the plan.

12. More Explicit Plans for Addressing Energy Cost Uncertainties Should Be Included

In our earlier comments, we pointed out the need for consideration of future cost and availability of energy. This is a topic of controversy and uncertainty, but with enormous implications for a restoration program that has some extremely energy intensive elements (i.e. levee building and maintenance, dredging and sediment transport in pipelines). Some restoration elements might become unaffordable if there are not undertaken early before significant increases in energy costs. Thus, a consideration of energy costs is imperative for delta restoration.

13. Now is the Time to Announce a Design Team and Process For Moving Forward

During the LCA process, the State assembled a remarkable team of scientists and engineers led by Robert Twilley. It is not evident that such a team has been leading the State's planning effort. The Corps has a planning team at work in Vicksburg, but, as far as we can tell, that planning team is focused overwhelmingly on levee system designs. Further, it is not clear that the Corps' storm surge model incorporates wetland features that can affect surge and wave energy. If so, its basic planning tool is incapable of integrating wetland restoration and levee structures as parts of a comprehensive storm protection program. In addition, its process is effectively closed. The State must pursue a process that relies on a team of the best coastal scientists and engineers available and engages the public at the same time in considering the large choices that the State and nation must make as they consider the future of North America's most remarkable coastal ecosystem that actually has the potential to restore and enlarge itself even in the face of global warming and accelerated sea level rise.

The CPRA deserves credit for outlining the scientific challenges facing implementation of coastal restoration and protection efforts. Now is the time to appoint and set in motion a distinguished and independent science team that will answer these questions and keep the projects, altered if necessary, moving toward implementation. This team's first task should be to develop a strong conceptual framework on delta functioning and ensure that elements of the plan do not unnecessary conflict with deltaic functioning.

From: Bill [jbherke@cox.net]
Sent: Monday, March 19, 2007 9:47 PM
To: comments@louisianacoastalplanning.org
Subject: ...Louisina's Comprehensive Master Plan for a Sustainable Coast. Draft February 2007

I am greatly perturbed by the proposal to essentially put a levee across Louisiana's wetlands from Mississippi to Texas. I recognize the Plan says that wetlands landward of the levees must be maintained functionally as wetlands and tidally connected to wetlands gulfward of the levees. The commendable idea is to maintain natural wetland conditions on both sides of the levees. However, I think this is more wishful thinking than technical possibility. It has been my observation that levees always interfere with hydrology and marsh grass ecology.

Since the vegetation of marshes is not my field of expertise, I'll say no more about the above. However, use of the coastal marsh as a nursery for fishes, shrimps, and crabs is my field of expertise. I believe the proposed leveeing of most of the coast will seriously harm Louisiana's commercial and sport saltwater fisheries. Most of our important commercial and sport saltwater species spawn in the Gulf of Mexico, but their very young larvae migrate into the coastal marsh where they remain for a few months or years, grow rapidly, and then migrate back to the Gulf. The term "marsh management" as used in Louisiana usually means levees and water control structures. These levees and other water control structures seriously interfere with organism movements. Consequently, they also seriously interfere with fisheries production. Adaptations to the water control structures traditionally used have been shown to have less detrimental effects, but none have been devised that eliminate the considerable harm to the fisheries. If levees are to be used, there must be studies to determine how do this, or if it is even possible. Also, it must not be assumed that the levees are far enough inland that the area behind them is not important as a nursery for saltwater species. Studies have shown that the young of some species penetrate far inland, some well past the saltwater/freshwater line. Some of the publications documenting statements made in this paragraph are given in the accompanying bibliography.

I also wish to comment on the assumption made in Appendix D that there is not enough sediment in the Mississippi River to begin a net building of land. This assumption seems to have gained acceptance from the fact that the river carries less sediment now than in the mid 1900's. Actually, there are no sediment records before the mid 1800's, so we do not know how much sediment the river carried historically. My contention is that there is probably more sediment now than before the white man put a plow to the prairies. Yet, even before then, the river formed six delta lobes and started the present one. Core and dating studies should be undertaken to determine whether previous delta lobe formation was a relatively steady process, or due to episodic intervals from processes causing

unusual pulses of erosion in the watershed of the Mississippi River. If it was a relatively steady process, the River may well carry as much sediment now as it did historically.

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From: Matt Rota [matt@healthygulf.org]
Sent: Monday, April 09, 2007 3:56 PM
To: comments@louisianacoastalplanning.org
Subject: GRN comments regarding draft Comprehensive Master Plan
Attachments: GRN comments on draft master plan.pdf

Dear Planning Team:

Despite the passage of the comment period, we hope that you will take these comments in consideration. A hard copy has also been sent.

Sincerely,

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April 9, 2007

CPRA Integrated Planning Team
P.O. Box 94396
Baton Rouge, LA 70804-9396

Dear Integrated Planning Team,

I am writing on behalf of the Gulf Restoration Network (GRN), a diverse coalition of individual citizens and local, regional, and national organizations committed to uniting and empowering people to protect and restore the resources of the Gulf of Mexico. While we applaud the State's goal of achieving long-term and comprehensive coastal protection and restoration, we do have several concerns regarding the Integrated Ecosystem Restoration and Hurricane Protection: Louisiana's Comprehensive Master Plan for a Sustainable Coast-Draft (hereinafter Draft Plan). Our concerns include the following:

1. The Draft Plan suggests long, linear, coast wide levees. Such structures will disrupt hydrology in an already compromised landscape. Use of levees to impound large area of wetlands have been used in southwestern Louisiana for decades, and have been shown to accelerate land loss. Much of the proposed levee system, if constructed, could compound our coastal loss problems, not help them.

   Some of the levees envisioned will impound vast acres of wetlands. Coastal Louisiana is an estuarine system, meaning there is a gradient from salt water to fresh. Levee impoundment of productive marsh and swamp will lead to rapid deterioration of the estuary. This is a lesson the Dutch have stressed time and again. Once we lose these precious lands, it will be very hard and expensive to restore them.

2. Currently there appears to be no adaptive management plan to deal with changes to our landscape. In light of current subsidence rates and predictions of sea level rise, the ability to adapt management of protection and restoration projects is critical to their success.

3. The State had not included any real alternatives to what is being suggested in the Draft Plan. For example, would ring levees combined with aggressive restoration of certain coastal areas provided similar protection benefits to many communities?

4. There is an established prioritization system but then the state proceeded to ignore it for political or convenience purposes. Some of Louisiana's protection and restoration needs are immediate and urgent, such as 100 year protection lined out in pages 71-72. However, the Annual Plan suggests Donaldsonville to the Gulf as a priority, a project not meeting the Draft Plans prioritization scheme. It will take years to implement much of what has been suggested and while the Draft Plan provides a guide for how to address priority needs while proceeding with long-term protection and restoration, there appears to be no effort to follow this prioritization guide.

5. It is not clear if there is sufficient consideration of operation and maintenance needs associated with "proper" operation of the contemplated "leaky levee" system incorporated into the Draft Plan. Without sufficient funding to maintain and operate suggested water control structures in the proposed levee system, eventually the system will fail.

6. Also not addressed by the Draft Plan is who will be charged with operating the structures to be sure they remain open until a storm approaches? Will the parishes or the state be responsible and where will the funding for operation come from? Further, state and federal legislation is necessary to insure that there will be no new development in any wet areas landward of any new protection levees. We are very concerned that federal, state, and local agencies do not have sufficient resources to adequately address or implement land use planning and development restrictions in these areas.

7. Very little attention has been given to the southwestern part of the state, other than a levee alignment along the GIWW. The causes of wetland loss and issues associated with restoration are very different in the area east of the Atchafalaya River. Increased attention to the unique issues associated with wetland restoration in the Chenier Plain need to be more fully addressed.

8. We are very concerned that many in the science community have been left out of the planning process. It is true that they were allowed to comment on the Preliminary Draft, but there is an apparent lack of participation by talented local geologists, biologists, hydrologists, and ecologists in the preparation of the Draft Plan. Including scientists in the comment phase of a process simply does not have the same influence as including them within the preparation process.

I want to be clear that we are not simply criticizing the State's Draft Plan. Some elements of the plan, such as connecting the Mississippi River back to the landscape

through river reintroductions, are good and should be implemented as quickly as possible. GRN would appreciate the opportunity to work with the State, the Corps and the CPRA to develop coastal friendly restoration and protection measures that address our concerns. We are confident that working together we can develop a Plan for protection and restoration of Louisiana's coastal wetlands that provides safety for our communities and businesses and sustainability for our coast.

Sincerely,

Cynthia Sarthou
Executive Director

LEAN's Comments on Coastal Master Plan

david@leanweb.org <david@leanweb.org> **Mon, Apr 2, 2007 at 7:08 PM**
To: comments@louisianacoastalplanning.org

DNR CPRA-IPT Staff,
Please see the attached comments from the Louisiana Environmental Action Network.
Thank you,
David

R. David Brown
LEAN Staff Attorney
162 Croydon Ave.
Baton Rouge, LA 70806
ph 225.928.1315

Coastal Master Plan.db.doc
72K

Louisiana Environmental Action Network
Helping to make Louisiana safe for future generations
LEAN

April 2, 2007

Comments
CPRA-IPT
La. Department of Natural Resources
P.O. Box 94396
Baton Rouge, La 70804-9396

***Attn*: CPRA-IPT Team**

Re: Comments on "Integrated Ecosystem Restoration and Hurricane Protection: Louisiana's Comprehensive Master Plan for a Sustainable Coast"

CPRA-IPT Team,

Please consider the following comments on behalf of the Louisiana Environmental Action Network (LEAN), a non-profit organization which has worked for over 20 years to ensure a safe and sustainable state. Our diverse membership includes residents of Louisiana who live in coastal parishes and depend on the coast's resources for their livelihood. Some of these members have been forced to leave their homes, while others have returned to live and work in a situation of increased vulnerability.

The state has a compelling and urgent need to develop the Comprehensive Master Plan for a Sustainable Coast (CMP) in order shape and inform coastal conservation, restoration and storm protection efforts at the federal, state, and local levels. We appreciate that at present, such a plan must be more conceptual in nature to allow for the refinement of the science, engineering, and management processes. The February 2007 draft of the CMP articulates well a set of objectives, policies, and principles that to an unprecedented degree lay a foundation for a program that weds certain levels of storm protection with coastal conservation and restoration and risk reduction actions. The draft CMP has many strengths, including:

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- Acknowledgement that the ecology of coastal Louisiana is unraveling and that it will take an incredibly ambitious and comprehensive public works program to reverse this trend

- Its recognition of the need to maintain and enhance the natural landscape—with an emphasis on promoting natural processes—and reduce risk through development controls as essential compliments to structural storm and flood protection. The premise that a sustainable landscape is a prerequisite for storm protection and ecologic restoration is a significant policy statement and one that marks a clear departure from the policies that largely held sway in the past.

- Appreciation for the reality that not all parts of our state are savable or defendable to the same extent as others.

- Its grounding of the conceptual vision of the CMP in the best available science and engineering. The history of coastal Louisiana over the past 100 years and the recent experience of failures if the region's hurricane protection system reveal the need for a clear commitment to using the best science and engineering to inform and shape alternatives under the CMP.

- Recognition of dynamic nature of our coast and of the need to address the prospective impacts of climate change and sea level rise and nutrient management in the context of the state's future planning.

Public Comment and Revision

We commend the CPRA-IPT Team on responding to the public comments received after the December draft of the "Master Plan" was released. A number of significant issues and questions remain to be resolved in this critical effort to ensure the sustainability of Louisiana's coast. The CPRA Team has stated in public meetings that the Plan does not prioritize actions or options presented, but such decisions will need to be made in the near term, and it is not clear what process will be used to arrive at them. At the same time, some potential actions or options have been left out of the current Draft Plan, giving the impression that some level of decision-making has in fact occurred.

One of the most significant features of this Plan is the firmness and clarity of its recognition of the need to balance and blend coastal conservation and restoration, risk reduction efforts and structural storm protection to produce a coast that is ecologically sustainable and whose communities are physically secure at least to some honestly disclosed level. This conceptual framework is sound and represents perhaps the last best chance for this State to secure its future and preserve its heritage.

Despite the strength of that conceptual framework, a review of the actual elements of the Plan and the Draft Annual Plan reveals a number of provisions and recommendations that do not square with the stated objectives and aims of the Plan. Specifically, the following features of the draft plan raise concerns that a *de facto* policy decision has been made to elevate structural storm

protection projects in priority and to allow local preferences to get ahead of the best science and engineering judgments about what is possible and advisable when it comes to siting major projects.

The apparent bias in the Plan for large linear structures, particularly earthen levees, is demonstrated by the recommendations for the Barataria Basin and the West Bank of the Mississippi River. The plan's recommendation for an outer barrier between Larose and the West Bank and the creation of a "water management area" north of the Gulf Intracoastal Waterway is problematic for multiple reasons.

Levees and Best Available Science

Clearly, an immediate priority is the protection of population centers in the coastal zone. There are coastal cities and communities that still lack effective hurricane protection, in several cases because existing levees need to be raised. These areas include the West Bank of New Orleans and the communities of lower Terrebonne Parish. Raising and/or reinforcing many of the levees that currently protect populated areas is clearly called for.

There is significant doubt in the science and engineering sector about the viability of "leaky levee" being able to either provide adequate storm protection or to accommodate the ecosystem stewardship goals set forth in Plan Objective Number 2. Substantial concerns have been raised by qualified scientific and engineering experts about the wisdom and effect of cross-basin structures and of the projects such as the Donaldsonville to the Gulf project and about the strength of the scientific underpinnings of the "leaky levee" concept. It is difficult to see how a plan that is supposed to be based on the best science and engineering and balance storm protection with ecosystem stewardship (see page one of Executive Summary) could be at the point of recommending, even tentatively such a project or alignment at this time.

The levee proposal is based on an ongoing Corps of Engineers Feasibility Study for the Donaldsonville to the Gulf project, a project whose scope and purpose are radically different from the Master Plan's. The Donaldsonville to the Gulf project study was authorized in 1996 before the State and the Corps were directed to develop comprehensive plans for the restoration and protection of coastal Louisiana without regard to the usual policy considerations (e.g. cost benefit ratios) and it continues to proceed in the traditional non integrated, cost-benefit focused manner. At this time the Donaldsonville to the Gulf study is not considering alternatives to traditional earthen levee construction techniques nor is it considering the broader role of impacts on the ecology and sustainability of the Barataria system.

The proposed Watershed Management Plan for the Upper Barataria Basin reveals no management objective or program. The two sentence summary of the Watershed Management Plan (Appendix A, page 21) for the Upper Basin does nothing to assuage the concern that the viability of the Upper Basin has been left to an afterthought. It states no management objective for the basin, does not identify who the manager will be nor does it indicate where the management resources might come from. Indeed it describes only in the vaguest terms a plan to develop a plan. For such an integral feature of this levee alignment to be so unclear suggests

that the sustainability and function of the landscape is in fact not the equal partner of structural storm protection.

However, the Plan still includes proposals for a massive new levee system that would attempt to wall off entire basins. In addition to questions of the feasibility and funding of such proposals, the time factor involved in their construction concerns us. Projects that take 20 years to complete will not benefit Louisiana in its current state of vulnerability. The environmental impacts of the "leaky levee" proposal on water quality (through drainage disruption) and on wetlands (large areas of which will be destroyed in their construction) appear to be significant, and raise the question of whether such proposals are the best option for Louisiana to pursue.

Coastal Wetland Restoration

The restoration of Louisiana's coastal wetlands is necessary for long-term sustainability and for effective hurricane protection. Chief among these are forested coastal wetlands. Louisiana's cypress swamps are coming under increased pressure from logging at the very time that their importance as storm buffers and stabilizers of the vulnerable coastal landscape is being recognized.

Protection of Coastal Forests

We are pleased to see a section added to the Draft Plan on fostering the sustainability of coastal forests (Chapter 4, p.80). However, we are concerned that this section suggests that there is an effective process at work to protect Louisiana's coastal forests. The state has known about this issue for at least 4 years, but has yet to devise a plan for addressing it. In the meantime, a number of interests, such as the Louisiana Forestry Association, and some sections of state government, such as the Department of Agriculture & Forestry, have been actively promoting the logging of cypress swamps. A key driver of this trend has been the growth of the market for cypress landscape mulch, which is being sold by major retailers (Home Depot, Lowe's, Wal-Mart) at the regional and national levels. Louisiana's commitment to sustainability, not to mention its credibility, is being put at risk by this trend.

Climate Change

The addition of a section highlighting the importance of climate change (Chapter 2, p. 30) is another positive step. Unfortunately, acknowledgement of this trend and its implications for the coast is only part of the picture. Louisiana, like other states, will need to address its role in the climate change issue through reduction of greenhouse gas emissions. The state has been a major national source of such emissions for some time. There have been some attempts to create a state policy (2 legislative resolutions in 2002 and 2003; a legislative report in 1999), but no commitment to carry them through. There are a number of options for reducing emissions that will benefit Louisiana's economy through increasing efficiency and diversifying our energy system. There is also an increased chance that national legislation will pass that creates federal policies to address climate change, and Louisiana would benefit from taking a proactive rather than passive approach to this issue.

Gulf Hypoxia

We are also pleased to see a highlighted reference to the problem of Gulf hypoxia (Introduction, p.9). A number of our members work as commercial fishers and shrimpers, and the spread of Gulf hypoxia is a serious threat to their livelihood, as well as the long-term sustainability of Louisiana's coastal fisheries. While hypoxia is a problem in the Gulf, it originates in the Mississippi River Basin, which means that its solutions will have to come mainly from states upriver of Louisiana. The state has been involved in the national effort to address Gulf hypoxia for over ten years, but this effort has lagged due to lack of funding. In addition to supporting increased federal funding to address Gulf hypoxia, Louisiana should also designate a portion of the coastal restoration funds it is requesting to cover in-state hypoxia work.

Risk Reduction and Smart Growth

One of the most encouraging features of the Master Plan is its recognition of the need to make land use planning, building codes and evacuation planning central features of the State's integrated approach to protecting lives and communities and the culture of the region. The plan makes a number of references to the need to prevent development in wetland areas, foster sustainable coastal forests, and to strictly enforce land use controls (Pages 32, 53, 59, 78, and 80-81. This is particularly well addressed on page 78.

However, this language is largely aspirational and dependent on local governments to enact and "strictly enforce" land use and zoning regulations (See, e.g. page 53). Given that many local governments lack any meaningful land use planning authority or the resources to more aggressively pursue planning and enforcement, it is essential for the Master Plan to take stock of that fact and develop specific recommendations to address it. Another major concern is the absence of a meaningful discussion of what role the State can and should play in preventing inappropriate development and in conserving its wetland resources.

Integrated Hurricane Preparedness

Finally, achieving real sustainability for the coast will require addressing human health concerns, including air and water quality. The report on climate change prepared for the legislature in 1999 ("Danger & Opportunity: Implications of Climate Change for Louisiana") noted that toxic waste sites are scattered across all of Louisiana's coastal parishes. These sites include pits and wells that are at risk of inundation from hurricanes and long-term sea-level rise. Overtopping by storm surge risks dispersal of their contents across the landscape, contamination of ground and surface waters, and increased human contact. The Plan needs to include measures for securing, cleaning up, and removing such sites before inundation occurs, rather than attempting to mitigate the effects afterwards.

We would be happy to discuss any of these comments and recommendations with you.

Sincerely,

Marylee Orr

Draft Master Plan Comments

Randy Lanctot <Randy@lawildlifefed.org> **Tue, Apr 3, 2007 at 8:30 PM**
To: comments@louisianacoastalplanning.org

Please except this late submission due to a computer glitch. Thank you.

Randy P. Lanctot

Executive Director

Louisiana Wildlife Federation

phone/fax 225/344-6707

www.lawildlifefed.org

April 2 Coastal Plan Comments.pdf
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LOUISIANA WILDLIFE FEDERATION
". . . conserving our natural resources and your right to enjoy them."

2 April 2007

The following comments are submitted on behalf of the Louisiana Wildlife Federation by the LWF'S Coastal Restoration and Protection Committee. Thank you again for the opportunity to comment on the draft of the Comprehensive Coastal Protection and Restoration Master Plan for Louisiana (Draft Plan). Considering that the subject Draft Plan is the next iteration of the Preliminary Draft Plan which we and many others commented on, it would have been helpful in developing comments on the Draft Plan if it would have included, in an appendix or other appropriate format, detailed responses to comments we and others submitted regarding the Preliminary Draft Plan. It was unnecessarily time-consuming and sometimes futile attempting to determine if our comments on the preliminary draft plan were tended to, and we have no way of knowing for sure which, or if any, adjustments were made based on the public comments you received. Not only is it helpful to the commenter to have such feedback, but it promotes transparency in the plan development process that is important to the ultimate success of this plan.

The adaptive management/reducing uncertainties chapter has been greatly improved and we commend that effort. What is the limitation (% of plan funds), if any, on expenditures contemplated for adaptive management and related studies?

Regarding the protection and conservation of coastal woodlands and forests that provide important buffering capacity for storm surges (Ref: p. 80 of Plan), the LWF adopted via resolution at its 2007 annual convention the following recommendations:

1) identify all such strategic trees/stands of trees in the coastal zone, and all hydrologically-impaired swamp forests that are degrading due to altered hydrology that results in stressed trees, slow to no growth, premature death and regeneration failure;
2) acquire the necessary land rights or otherwise negotiate to secure the protection and management of strategic coastal trees, woodlands and forests, as well as hydrologically-impaired swamp forests that are integral to potential coastal or ecosystem restoration projects, to sustain their health and presence in the landscape;
3) establish and encourage the application of best management practices for the practice of sustainable silviculture in swamp forests; and, where feasible,
4) restore healthy hydrology to hydrolocially-impaired swamp forests.

On page 79, the Plan discusses land rights and the question of public ownership of surface rights and easements to private lands. In that regard we recommend that a State Coastal Land Trust be established, utilizing the collaboration of existing state land management agencies to acquire, accept and manage coastal lands that are obtained through purchase, donation, exchange or expropriation for the purposes of restoration and protection of coastal lands and waters.

The discriminate use of the words "should" "will" and "must" by the authors of the report, depending on the project being described, demonstrates a bias that suggests a predisposition toward certain types of projects.

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We reiterate our concern with the penchant of the Draft Plan for linear levees to protect wetlands from flooding and urge a balanced alternatives analysis be applied that considers ring levees, elevation, etc. before resources are irretrievably committed to the concept of the Morganza to the Gulf levee as proposed in the Draft Plan.

The Draft Plan overuses and in many cases incorrectly uses the term "sustainable." We urge more precision in use of the terminology.

Finally, a guiding principle of the Comprehensive Coastal Restoration and Protection Master Plan for Louisiana should be to put as much landscape between people and potential storm surge as possible, followed by "set back, elevate and concentrate" regarding structures and developments.

Respectfully submitted,

Randy P. Lanctot
Executive Director
On behalf of the Louisiana Wildlife Federation
& the LWF Coastal Restoration and Protection Committee

Comments on Draft Coastal Master Plan

Doug Daigle <lmrsbc@gmail.com> **Thu, Mar 29, 2007 at 2:05 PM**
To: comments@louisianacoastalplanning.org

Dear CPRA-IPT,

Attached are comments on the Draft Comprehensive Coastal Master Plan from the Lower Mississippi River Sub-basin Committee on Hypoxia. Please let me know if the attachment does not open.

Sincerely,
Doug Daigle
Coordinator
LMR SBC

LMR SBC CPRA Comments.doc
39K

Lower Mississippi River
Sub-basin Committee on Hypoxia
c/o Coastal Ecology Institute
School of the Coast & Environment
Louisiana State University
Baton Rouge, La. 70803

March 28, 2007

CPRA-IPT
DNR
P.O. Box 94396
Baton Rouge, La. 70804-9396

To CPRA-Integrated Planning Team,

I am submitting the following comments on the Draft Comprehensive Coastal Master Plan (February 2007) on behalf of the Lower Mississippi River Sub-basin Committee on Hypoxia. The Sub-basin Committee (SBC) was formed in 2003 under the *Action Plan for Reducing, Controlling, and Mitigating Hypoxia in the Northern Gulf of Mexico* (2001), and includes the states of Arkansas, Louisiana, Mississippi, Missouri, and Tennessee, along with federal partner agencies EPA, USDA, USFWS, and USGS, and supporting member Agriculture Coalition for the Environment. Its key goals are to support implementation of the *Action Plan* in the lower river sub-basin, and to establish a process of communication and coordination between the member states (the SBC's Mission Statement can be seen at our webpage on the Gulf of Mexico Program site, www.epa.gov/gmpo/specialactivities.htm.)

The *Action Plan* represents the national policy vehicle for addressing the spread of hypoxia in the Gulf, a trend that poses a significant risk for Louisiana's productive coastal fisheries (see www.epa.gov/msbasin/taskforce/actionplan.htm.) It builds upon the substantial body of science that has developed since the seasonal hypoxic zone off Louisiana's coast was first measured in the 1980s. The Plan focuses on voluntary, incentive-based programs for non-point source (NPS) pollution, and existing regulatory programs for point sources, and on the recognition that reductions in nitrogen and phosphorus can be achieved across the entire basin, utilizing agricultural management, industrial and municipal systems, and watershed/wetland protection and restoration.

Since the *Action Plan*'s inception, the impact of coastal restoration efforts in Louisiana on Gulf hypoxia has been a topic of interest and discussion. The Hypoxia Task Force has received a number of presentations on Louisiana's coastal restoration program, and recognizes the significance of this process for the functioning of the Mississippi River and its impacts on the Gulf. The restoration and "replumbing" of the Mississippi River active delta will have significant impacts on surrounding wetlands and estuaries. These projects would be undertaken to restore deltaic functioning and rebuild coastal wetlands

where possible. The uptake of nutrients in diverted or reintroduced waters by receiving wetlands could help reduce the total load in the Mississippi River that reaches the Gulf. There are also some remaining science questions about the impacts of diverting large amounts of river water with current nitrogen levels into coastal wetlands.

The SBC organized a symposium in 2006 which included a number of presentations on topics related to this issue ("Nutrient Loading and Removal in the Lower Mississippi River Basin: Data, Trends, and Opportunities," June 1-2, 2006. The symposium presentations can be seen at www.tetratech-ffx.com/lower_miss/). These include the following presentations:

"Suspended Sediment, C, N, P, and Si Yields from the Mississippi River Basin," Dr. Eugene Turner, Department of Oceanography and Coastal Sciences, Louisiana State University. This presentation estimated annual loads of C,N,P, Si and total suspended sediment for six watersheds in the Mississippi River Basin. Total nitrogen loading to coastal waters increased by 150% since the early 1900s, and is now dominated by loads from the Upper Mississippi River watershed. Nitrogen loading in the Mississippi River in New Orleans was found to be moving to a situation favoring N and Si limitation, with likely alteration of phytoplankton communities as a result.

"The Role of Wetlands in Nutrient Cycling," Dr. Stephen Faulkner, et.al, U.S. Geological Survey. This presentation noted that restoration of former forested wetlands in the Lower Mississippi Valley can be an effective tool for improving water quality, but that the response of biogeochemical processes that support ecosystem functioning can vary widely and the controls affecting nitrogen cycling are often overlooked. Natural riparian forests were found to have significantly higher denitrification potential than nonforested wetlands, restored riparian wetlands, and croplands.

"Assimilation of Municipal Effluent in the Coastal Wetlands of Louisiana," Dr. Robert Lane, et.al, Coastal Ecology Institute, Louisiana State University. This paper presented case studies showing the results from several forested wetlands in the coastal zone of Louisiana that are receiving secondarily treated municipal effluent, and the rates of nutrient (nitrogen and phosphorus) assimilation achieved, which were high at several sites showing surface water nutrient reduction. The paper also concluded that the nutrient component of municipal effluent increased wetland plant productivity, and helped offset regional subsidence by increasing organic matter deposition on the wetland surface.

"Effects of Mississippi River Water on Phytoplankton Growth in the Upper Barataria Estuary, Louisiana," Ling Ren, et.al, Louisiana Universities Marine Consortium. This paper examined impacts of the Davis Pond Diversion project, which introduces Mississippi River water into the upper Barataria Basin, and utilized seasonal bioassay experiments in Lake Cataouatche, Lake Salvador, and Lac des Allemands. Additional experiments were done to quantify effects of river water on phytoplankton growth. Preliminary results in Lakes Cataouatche and Salvador showed a 1% replacement by

river water caused 1~7% and 9-16% chlorophyll increase, with data indicating species shifts from diatom to colonial cyanobacteria dominance, including toxic and noxious species.

"Nutrient Dynamics in the Upper Breton Sound Estuary as Affected by the Caernarvon Diversion," Dr. Robert Lane, et.al, Louisiana State University. This study examined the impacts of pulsed riverine inputs into coastal marshes of the Breton Sound. The high river pulse caused nearly 30% of the discharge flowing over the marsh, with most river water transported in channels during low pulse. The study found reductions in most nutrients as water flowed through the estuary, with strong nitrate uptake by sediments and denitrification as a major pathway of nitrogen loss. High pulses leading to over-marsh flow were found to result in rapid temperature increases and higher rates of denitrification.

"Water Quality Restoration in Atchafalaya River Basin Cypress Swamp via Denitrification," Dr. Andy Nyman, School of Renewable Resources, Louisiana State University. This presentation summarized a study being undertaken to examine the effects of pilot projects designed to restore water flow by cutting gaps in spoilbanks in the Atchafalaya Basin, in particular the effects on dissolved oxygen and fish abundance. A major environmental problem in the basin is anoxic water where flow is reduced by spoil banks and natural levees. Unfortunately, data have not yet been collected that would allow estimation of the effects of restoration in the basin on nitrogen loading to the Gulf. The study will determine the denitrification potental of swamp soils and compare denitrification potential between areas with high and low river inflow.

"Current USGS Date on Nutrient Cycling in the Atchafalaya," Dr. Charles Demas, U.S. Geological Survey, Louisiana Water Science Center.

"Atchafalaya River Nutrients: When is a Basin a River?", Dr. Paul Kemp, School of the Coast & Environment, Louisiana State University.

"Climatic Influences on Riverine Nitrate Flux: Implications for Coastal Marine Eutrophication and Hypoxia," Dr. Dubravko Justic, Coastal Ecology Institute, Louisiana State University. This presentation reflects a paper on the coupling between climate variability and coastal eutrophication, and discusses how future changes in climate could affect nutrient fluxes to the coastal zone, nutrient ratios, phytoplankton production, and the severity of hypoxia.

There is a substantial body of science on these issues which the symposium was not able to fully include, but should be integrated into coastal restoration plans. We look forward to closer cooperation between our groups and respective efforts.

Sincerely,

Doug Daigle
Coordinator

Comments Draft Master Plan - Multiple Lines of Defense Assessment Team

John Lopez <johnlopez@pobox.com> **Mon, Apr 2, 2007 at 6:14 PM**
Reply-To: johnlopez@pobox.com
To: comments@louisianacoastalplanning.org
Cc: "Sidney Coffee (DNR) (E-mail)" <Sidneyc@dnr.state.la.us>, "Sidney Coffee (DNR) (E-mail)" <Sidney.coffee@gov.state.la.us>, Randy Hanchey <randyh@dnr.state.la.us>, randy.hanchey@la.gov, Karen Gautreaux <karen.gautreaux@la.gov>, Thomasljackson@bellsouth.net, Windell Curole <slld@mobiletel.com>, "King Milling, Chairman" <rmilling@whitneybank.com>, John Bradbury <Johnny.Bradberry@la.gov>, "Angelle Secy. Scott" <scott.angelle@la.gov>, bspoore@usgs.gov, mford@crcl.org, Bkohl40@cs.com, Bryan Rogers <thgem5@gmail.com>, carlton@saveourlake.org, Ford P Mark <bultongue@yahoo.com>, jamce@uno.edu, Joe Suhayda <josephsuhayda@yahoo.com>, johnlopez@pobox.com, joseph.n.suhayda@mvn02.usace.army.mil, Mark Hester <mhester@louisiana.edu>, moconnel@uno.edu, Natalie Snider <nsnider@crcl.org>, Paul Keddy <pkeddy@selu.edu>, Paul Kemp <pkemp@audubon.org>, Subhash Kulkarni <kcapc@aol.com>

Please accept the attached comments from the Multiple Lines of Defense Assessment Team established by the Lake Pontchartrain Basin Foundation and the Collation to Restore Coastal Louisiana.

If you have any questions or comments, please call or email.

Thanks for the opportunity to comment.

John A. Lopez, Ph.D.

Director-Coastal Sustainability Program
Lake Pontchartrain Basin Foundation

SaveOurLake.org

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SAVE OUR LAKE
LAKE PONTCHARTRAIN BASIN FOUNDATION
P.O Box 6965 Metairie, LA. 70009-6965 - SaveOurLake.org

April 2, 2007

To: Jon Porthouse
LA DNR - Integrated Planning Team
Baton Rouge, La.

RE: Comments on the Draft of Integrated Ecosystem Restoration and Hurricane Protection: Louisiana's Comprehensive Master Plan for a Sustainable Coast

Dear Mr. Porthouse:

Thank you for the opportunity to comment on the State's draft Mater Plan. The comments attached represent views of a select science and engineering Assessment Team representing outstanding experience and knowledge. The task of the Assessment Team was to evaluate the State's Master plan in light of the proposed Multiple Lines of Defense Strategy.

We find there are two systemic flaws in the state's Draft Master Plan that if not corrected may undermine both the goals of flood protection and a healthy estuary.

First, there is a need for explicit habitat goals. These are essential to unify the hydrologic design of coastal projects to result in a functioning and sustainable coastline.

Secondly, there should be more aggressive application and integration of natural ridges in the Master Plan. The historical pattern of bayou ridge development and intervening open estuary is Louisiana's own traditional "Smart Growth". Natural ridges are not just "lines of defense", but are also the historic development corridors between the estuarine basins. The importance of the compatibility of natural ridge corridors with estuarine restoration cannot be overstated. Widespread use of "back levees" provide needed protection to communities while isolating the wetland basins for restoration by diversion pulsing. Widespread use of lower "back levees" may very well be adequate for flood protection without massively high outer barrier type levees or flood gates.

The assessment Team will continue their work and review future plans as they develop and also release other technical reports as they develop.

See the attached document for complete comments.

Sincerely,

John A. Lopez, Ph.D.
Chair – Multiple Lines of Defense Assessment Team
Director - Coastal Sustainability Program - Lake Pontchartrain Basin Foundation
225 294-4998 504 421-7348 cell johnlopez@pobox.com

CC: Sidney Coffee, Chair, Governor's Office of Coastal Activities
Scott Angelle, Secretary, Louisiana Department of Natural Resources
Johnny Bradberry, Secretary, Louisiana Department of Transportation and Development
Bryant Hammett, Secretary, Louisiana Department of Wildlife and Fisheries
Karen Gautreaux, Deputy Secretary, Department of Environmental Quality
Michael Olivier, Secretary, Louisiana Department of Economic Development
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Comments on the Draft of Integrated Ecosystem Restoration and Hurricane Protection: Louisiana's Comprehensive Master Plan for a Sustainable Coast

Submitted by the
Multiple Lines of Defense Assessment Team
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Introduction

The Lake Pontchartrain Basin Foundation formally released an influential paper in 2006 titled the "Multiple Lines of Defense Strategy to Sustain Coastal Louisiana" (Lopez, 2006). This coastal planning strategy was presented prior to Hurricane Katrina, but afterward had greater perceived relevance. The acceptance of the Multiple Lines of Defense Strategy (MLODS) has been significant and has been endorsed by the Coalition to Restore Coastal Louisiana and the Louisiana Wildlife Federation. In addition, both the state Department of Natural Resources and US Army Corps of Engineers have officially embraced the strategy.

The grant by the McKnight Foundation is intended to foster development of the Multiple Lines of Defense Strategy and to promote its best application in coastal Louisiana. The Assessment Team is a multi-disciplinary, professional team that was assembled to address these issues. The first task of the Assessment Team was to review the state's draft master plan considering the Multiple Lines of Defense Strategy. This document summarizes the team's current critique of the state plan. A series of Assessment Team work meetings were held in March, but unfortunately, this was not adequate to review all of the Planning Unit recommendations by the April 2 deadline. Detailed comments are provided for Planning Units 1, 2 and 3a. No detailed comments are provided at this time for planning units 3b and 4.

The Assessment Team will continue its deliberations for at least 2007 and other planning documentation will be forthcoming.

Assessment Team Members

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General Coast Wide Comments

The Multiple Lines of Defense Strategy proposes that there are two primary considerations needed to sustain coastal Louisiana. First are the eleven types of "Lines of Defense" which reduce storm surge and second are the habitat goals which support sustaining a healthy estuarine coast. The state's master Plan does include most, if not all, of the eleven types of lines of defense, but it is vague or does not include habitat goals at all. Furthermore, the lines of defense, although present in the master plan, do not represent the optimum alignments for lines of defense. Without habitat goals, it is impossible to properly design levees, gates, and restoration elements that make up the lines of defense in the master plan and determine whether projects can work in concert to achieve surge protection and sustain the coast. **(see Figure 1)**

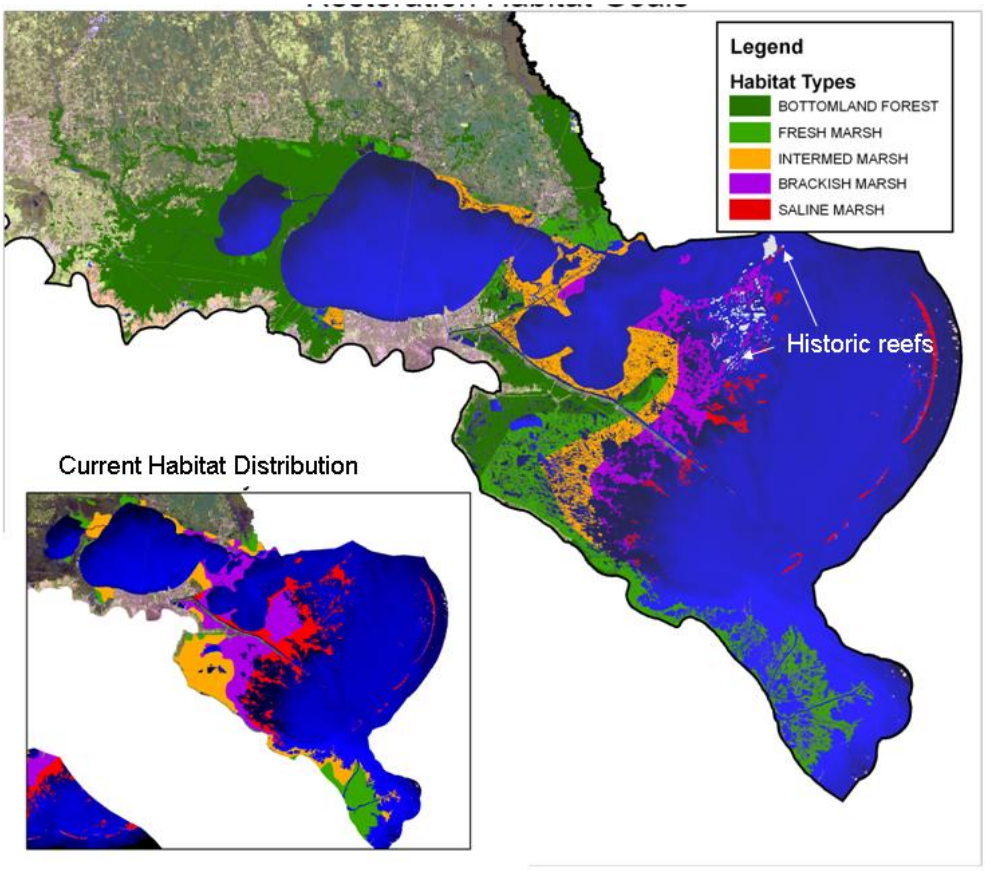

Figure 1: Example of a Wetland Habitat Goal map. Habitat maps will force the integration of hydrologic planning for the array of coastal projects including both coastal restoration and engineered flood protection projects such as levees and flood gates. (Source Lake Pontchartrain Basin Foundation, 2006)

Wetland habitat goals are essential for Louisiana's coastal planning because:

1. They set a target for a sustainable estuary. Clear and measurable targets are increasingly recognized as a fundamental first step in any planning and restoration program.

2. They integrate the consequences of many separate coastal projects, including levees, flood gates, river diversions, and marsh creation.

3. They forecast the natural resource allocation expected for resource users in areas including fisheries and forestry. This allows the state and commercial stakeholders to properly plan for resource use. For example, crawfishers know where there will likely be crawfish after restoration is completed.

4. They optimize use of funding, including fisheries management programs and coastal restoration programs. The LA Departments of Natural Resources and Wildlife and Fisheries can work much more effectively enhancing shrimp and oyster fisheries.

5. They shift the estuary toward a more riverine influence.

An additional critical element to the Multiple Lines of Defense Strategy is the use of natural ridges as both lines of defense and as residential/commercial corridors. (To be clear: natural ridges have low slopes and are vegetated with indigenous trees whereas levees have steeper slopes and have grass vegetation) The state's master plan does propose restoring natural ridges but does not sufficiently use the natural ridge distribution to guide its levee alignments.

Levee alignments which do not follow natural ridges invariably cut across basins and alter the natural hydrology. Such trans-estuary levee alignments are antithetical to an estuary and will likely confound the best intentions and engineering. Non-ridge levee alignments create grave engineering problems. The soft soil will have higher subsidence rates and, therefore, simultaneously weaken levees, increase costs, and require additional maintenance. Trans-estuary levees will promote the same problems that we are now desperately trying to solve; that is, loss of wetlands.

There are other very strong arguments for levee alignments along ridges (often referred to as "back levees"). One is that better soils will reduce compaction/subsidence and therefore reduce costs. In addition, new levee alignments through wetlands will require expensive mitigation, adding to the cost. With ridge alignments, it is more likely that treated waste water and storm water can be diverted to adjacent wetlands to establish robust marsh and wetland forest buffers directly in front of back levees. ***Finally, the Assessment Team strongly suspects that new levee alignments across the estuary, such as the GIWW alignment in the Barataria Basin, are simply not necessary for storm surge protection.***

USACE modeling in the Preliminary Technical Report reported very high surge levels along the Louisiana coast with possible new levee alignments. Modeled surge against these levees was in excess of 30 feet. This extreme surge elevation is the product of the levee alignment itself and is not representative of the surge to be expected in a broad Louisiana wetland landscape. By instead modeling the existing landscape without a hypothetical new "barrier" levee, modelers find that surge such as in the Barataria Basin is dramatically lower (less than half).

Therefore, considering the natural landscape (ridges & basins) and the character of surge on the Louisiana coast, it is very advantageous for levees to flank natural ridges, i.e. back levees. Wetlands should be outside those levees to buffer surge. Levees can directly protect people and assets on ridges. The surrounding basin and estuary reduce surge heights and reduce surge energy. The more area that our levees envelope, the less area that there is left for surge to be

dispersed or attenuated. Conversely, the smaller the areas behind levees, the more area is available to allow natural hydrology and wetlands to flourish. It is important to appreciate that the GIWW alignment approximately cuts the areal extent of the estuary in half -- and in so doing doubles the height of the surge!

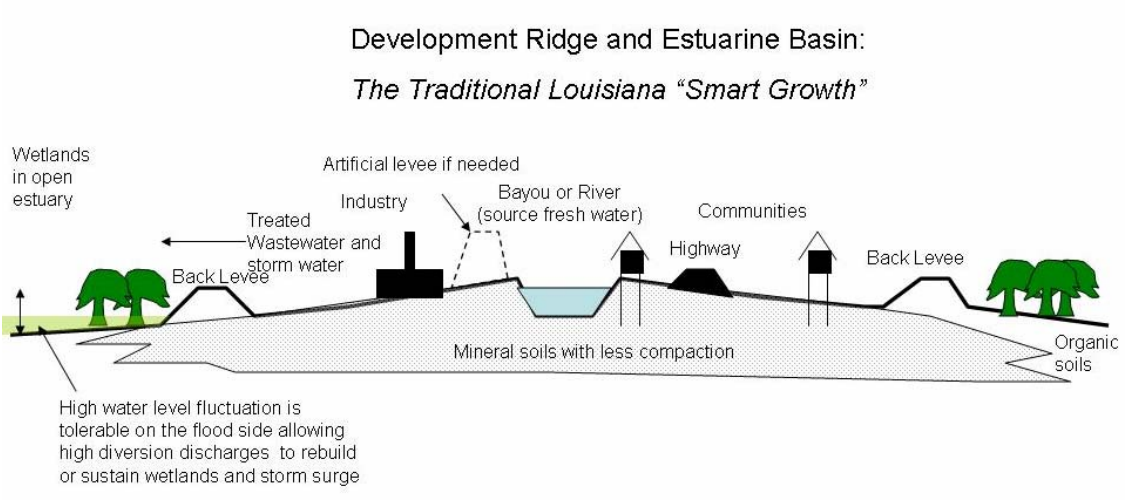

Figure 2: Conceptual profile view of elements of a ridge development corridor and an adjacent estuary. The back levee allows compatibility between the development corridor and an estuarine basin. The estuary on the flood side is subject to storm surge, marine influence and elevated water levels from river diversions. Elevated causeways may connect ridges by crossing the estuarine basin between ridges. Back levees do require management of drainage and will likely require pump stations.

Traditional "back levees" near the outer edges of the natural levees along developed corridors such as the Mississippi River, Bayou Lafourche, Bayou la Loutre, etc. are not just a pre-1900 cultural legacy, they are our own Louisiana style of "Smart growth", i.e. homes on high ground - wetlands in low ground (see **Figures 2 and 3**). The back levees are not just protecting the ridge-based assets but also allow for management of diversions within the wetlands to prevent (backwater flooding). Another important attribute of back levees along the Mississippi River is that the river is a potential source of sediment to build the levees.

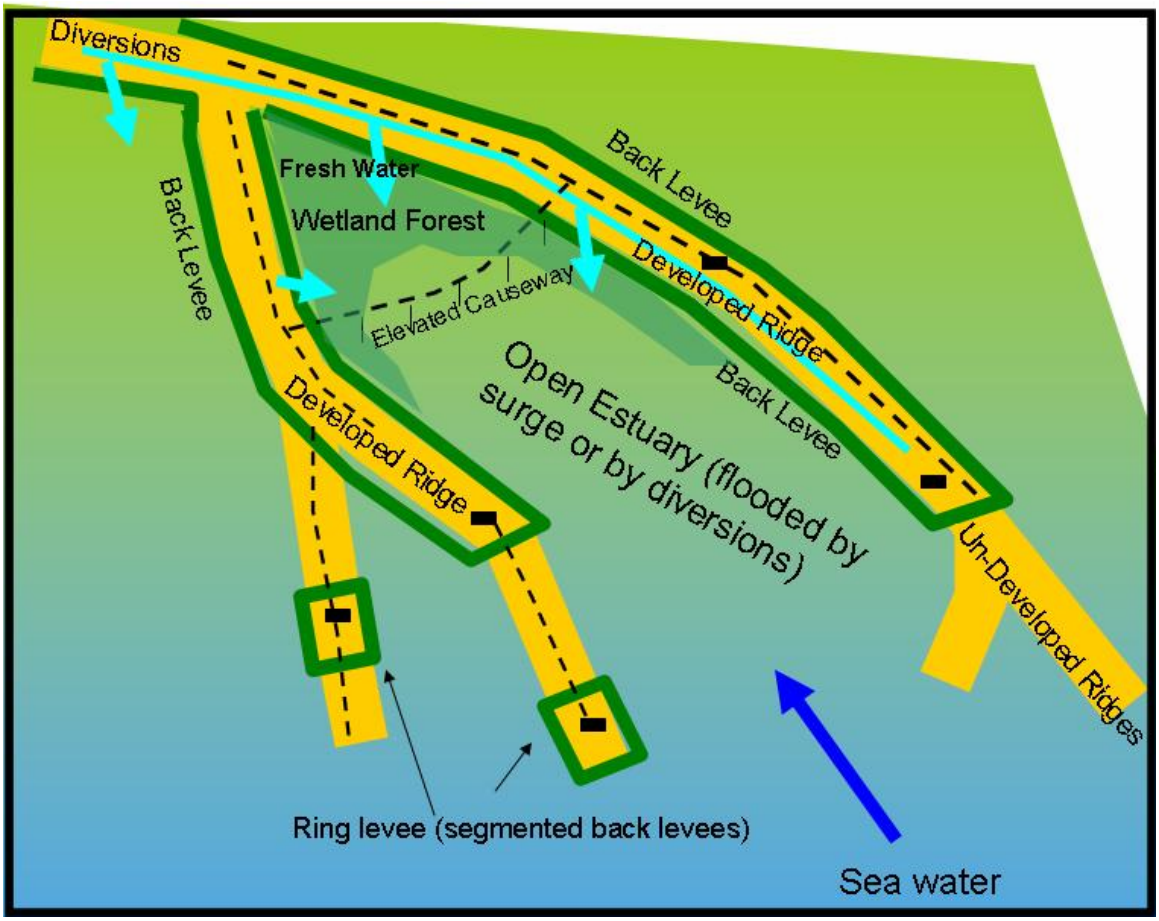

Figure 3: Conceptual plan view of elements of a ridge development corridor and adjacent estuaries. The back levee allows compatibility between the development corridor and an estuarine basin. Ring levees (segmented back levees) may be appropriate in sparsely populated areas or areas in need of direct water access. Trans-estuary levee alignments between ridges are problematic and generally unnecessary.

There is an abundance of scientific documentation of the detrimental effect of impounding wetlands or "structural management" (Sanzone, and McElroy, 1998). These include, at least, reduction in sediment input, reduction of aquatic access for migratory species, alteration of the nutrient budget, increases in subsidence, stranding of salt water leading to salt stress or plant mortality, etc. In Louisiana, there is a legacy of failed reclamation or failed polders such as shown in **Figure 4**. Examples include Delta Farms, The Pen, Guste Island, East New Orleans, Big Mar, Avoca Island, and more.

A particularly disturbing aspect of hydrologic management or reclamation of wetlands in Louisiana is that once the wetlands are brought under management, it seems impossible to hydrologically bring them back into the estuary. Often it is because the land subsides. A casual look at a map of the Louisiana coast reveals many unnaturally "square lakes" which were once wetlands. These historic Louisiana examples are relatively small areas behind levees. The state master plan would include nearly 2000 square miles under hydraulic management west of the river. If flood gates are built on Chef and Rigolets, the total area that would be subject to hydrologic modification would be over 3500 square miles. This area surpasses the entire land loss Louisiana has seen since 1932: 2000 square miles.

Example of wetland loss due to construction of levees and development of "square lakes"

Figure 4: Example of wetland loss due to levee construction around wetlands. Land has subsided due to lack of plant growth creating unnatural "square lakes" along old levee alignments. Note adjacent areas (east and west) without levees are solid wetlands.

Conclusions – Two Systemic Flaws

In general, we see two major systemic flaws in the state's master plan that are contrary to the best Multiple Lines of Defense Strategy.

1. The lack of habitat goals will allow future design and construction to proceed without a specified target. **Therefore, habitat goals need to be adopted or developed.**

2. Extensive development of back levee protection along developed ridge flanks is far more promising than large outer barrier levees and gates. Back levee alignments will be longer, but in general much lower and have less maintenance. The goal of levee alignments should not be to minimize the length of levee, but to minimize the area enclosed by levees and therefore maximize the long term maintainability of the levees and sustainability of estuarine wetlands. **Therefore, the new outer barrier levee alignments are seriously questioned and alternative ridge/back levee alignments must be included in the state's master plan.**

Additional Coast Wide Recommendations

Compartmentalization of Municipalities

The concept of flood compartments within dense development areas (major municipalities such as New Orleans) should be evaluated. Compartmentalization enhances flood protection in the event of overtopping or levee failure by internal barriers within a levee system making internal compartments (polders) which may restrict the areal extent of flooding. This is a recommendation of the original Bring New Orleans Back Committee. It is being further developed for New Orleans by the Flood Protection Alliance. Implementation of any such polder plan must assure flood protection equity amongst all residents.

"River Flood Restoration Action Plan"

The Mississippi and Atchafalaya Rivers inevitably have occasional "great floods". The last great river flood was in 1993 and prior to that in 1973 and 1927. Geological data show that ever larger mega-floods have occurred regularly (Brown and Kennett 1999). The occurrence of these flood events is driven by confluence of high precipitation events in the Mississippi River drainage basin. These events are considered threats for flooding but, in Louisiana, represent rare opportunities to have dramatic restoration of our coastal wetlands because of the volume of sediment-rich water and the abnormal hydraulic head (river stage). The state's master plan should have a recommendation for the state to develop a "River Flood Restoration Action Plan". The plan would be an action plan to be implemented in the event of exceptionally high water on the Mississippi or Atchafalaya Rivers. The goal of the action plan is to maximize restoration benefits to the coast during a major flood event by introducing freshwater, sediment and nutrients into the coastal estuaries. Actions might include maximum use of controlled freshwater diversions in which the normal salinity/habitat targets are not used to limit flow. Other examples might be to use flood control structures to additional advantage for restoration, such as installation of gates on the east and west guide levees in the Bonnet Carre Spillway to flood the adjacent marsh in La Branche or Frenier wetlands. Another example would be to allow flooding of impounded areas such as Bayou Sauvage NWR by Mississippi River water via Lake Pontchartrain during a flood protection opening of the Bonnet Carre' Spillway. The Morganza spillway should be evaluated for restoration advantages in high water. Since the flood river condition will likely create greater maintenance dredging of navigation channels, the action plan could include an emergency beneficial use of dredge material for sites along the Mississippi River.

The use of "pulsing" is well established and has been used with the normal river stages (Day, 1997). Exceptionally high water on the Mississippi River represents a multi-generational opportunity that should be considered within the 100-year planning horizon of the master plan. Since fisheries may experience short-term negative impact, the action plan should include short-term impact assistance for commercial fisheries. Since the flood year can't be predicted and could occur in just the next 12 months, this is a standing plan of action that should be developed as soon as possible. It is likely that such a plan could be utilized several times within the 100 year time frame and have a dramatic influence toward sustaining the coastal wetlands. Other smaller rivers could also have their individual action plans such as the Pearl, Vermillion, Amite and Sabine Rivers.

Re-evaluation of Artificially Maintained Navigation channels
Between the Mississippi River and the Sabine River, there are at least eight commercial navigation channels that are artificially maintained (dredged). These include Southwest Pass, Empire Waterway, Barataria Waterway, Bayou Lafourche (Fourchon), Lower Atchafalaya River, Freshwater Bayou, Calcasieu Pass and Sabine Pass. The maintenance of the navigational channels with dredging, jetties, etc. often has negative consequences to coastal wetlands such as disruption of sediment transport, salt water intrusion, high salinity events, increased storm surge, etc. An array of channels that link the gulf water with coastal infrastructure has developed over the past century from many economic forces including oil and gas, commercial fishing, etc. In light of the coastal crisis, all of the channels should be re-evaluated for justification and, if justified, to determine what if any changes can be made to maintain navigation while reducing detrimental coastal impacts.

Coastal Risk Education Program
The state's master plan should include a recommendation to develop a very strong public education and awareness campaign to educate the public on coastal risks and risk mitigation. Technical risk terminology such as "1% Level of protection", "100 year level" or "Cat 5" are examples of terms commonly used and misunderstood. The language of coastal risk needs to be established by the state and communicated to the public. Describing risk in familiar terms such as the chance your home would be flooded during your 30-year mortgage is more understandable to the public. Just as important is to communicate what individuals can or should do to minimize their personal exposure to storm events. Non-structural approaches must be ingrained into coastal residents and public officials. The public must understand where the public liability ends and personal liability begins. This can only be one through a common language of discussion.

Non-structural Solutions
The state's master plan should aggressively develop education programs, inducements and financial support for non-structural mitigation of flood threat to homes, businesses and other immobile assets. A statewide ban on building finished residential or office space below sea level should be considered. Construction on grade should be discouraged in all of the coastal zone.

Oyster reefs
The draft CCPMP has little emphasis on restoration of structural oyster reefs. Shellfish, in particular, are recognized to have tremendous benefits throughout the estuary including providing shoreline protection for marshes. Once the hydrology is restored, oyster reefs can be re-built within a few years and provide highly sustainable benefits. The historic reefs of the Biloxi Marsh and Mississippi Sound (circa 1930) are targeted for restoration through the proposed freshwater diversion at Violet and through creation of hard structure for reef growth. Other areas of the coast have even greater potential to help sustain the coastal marshes.

Land Use Planning and Risk Reduction
While the Master Plan emphasizes the importance of land use planning, building codes, and evacuation planning, such as the need to prevent development in wetland areas, foster sustainable coastal forests, and to strictly enforce land use controls, it offers little direction to parish and municipal governments on how to do so. Current state law enables local planning and zoning. However, it is not mandated by the state nor do local governments receive guidance to implement such measures. This is particularly concerning given the Master Plan's attention to new levee projects, such as Morganza to the Gulf, which are expected to cause induced development behind them, resulting in further wetlands destruction and compromising the storm

surge protection wetlands provide, and placing life and property in harm's way. In order to uphold the integrity of the Master Plan, it should be revised to incorporate projects and programs that address these issues. Further, the discussion must include the role of state regulatory permitting agencies, like the Louisiana Department of Natural Resources (LDNR), in protecting wetlands and coastal resources. Specifically, there are opportunities through LDNR's Coastal Use Permitting process that can assist in protecting coastal resources and further support the objectives of the Master Plan; such measures should be clearly stated in the Plan.

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Review of Master Plan Objectives

Objective #1: Reduce economic losses from storm based flooding to residential, public, industrial, and commercial infrastructure, making sure assets are protected, at a minimum, from a storm surge that has a 1% chance of occurring in any given year.

Assessment Team Comment: Some key industries not described: Institutions of higher learning, hospitals, medical research.

Objective #2: Promote a sustainable coastal ecosystem by harnessing the processes of the natural system.

Assessment Team Comment: "Promote" is too weak of a word for an essential goal.
We propose:
Objective #2 Achieve sustainable wetland habitat goals through integration of flood protection and coastal restoration by optimizing use of natural coastal and estuarine processes.

Objective #3: Provide habitats suitable to support an array of commercial and recreational activities coast-wide.

Assessment Team Comment: No comment

Objective #4: Sustain, to the extent practicable, the unique heritage of coastal Louisiana by protecting historic properties and traditional living cultures and their ties and relationships to the natural environment.
Assessment Team Comment: The Master Plan does not seem to recognize the commercial aspect of tourism including unique coastal communities and ecotourism.

Proposed Objective #5 -

To demonstrate a sustainable coastal society that does not contribute to global warming and sea level rise.

- **Rising sea levels are a great risk to coastal Louisiana, and will override all the short term solutions. Louisiana should demonstrate that it is possible to have a productive but carbon neutral economy.**
- **The master plan will promote devlopment that minimizes production of greenhouse gases through actions including at least: mass transit, solar power, hybrid cars, energy efficent building codes, etc.**
- **The master plan will include use of cypress forests and river diversions for carbon sequestration.**

Proposed Objective #6

Protect human life and health through a comprehensive coastal maser plan including structural and non-structural approaches to mitigate risk and emphasize public education of risks. Mitigation of risk should include emergency planning and encouragement of low risk-development of the coast.

Planning Unit 1: East of the Mississippi River

D 1-1. Lake Pontchartrain Barrier Plan: Caernarvon to Pearl River Hurricane Protection
Assessment Team Comment: In discussing the outer barrier features such as levees and gates on the Lake Pontchartrain passes in Planning Unit 2 and the GIWW levee alignment in Planning Unit 2, it is worth contrasting the gross geomorphology and the inherent interaction with approaching storm surge. In Planning Unit 1 the angular geometry between the Mississippi Coastline and the Mississippi River creates a large funnel whose angle is roughly 75^0 and with an opening 90 miles wide (Venice to Ocean Springs). The compass direction of the funnel center line is just a few degrees south of east. In contrast, Planning Unit 2 has an angular opening (Mississippi River to Bayou Lafourche) of roughly 25^0 and an opening of 45 miles. The compass direction of the centerline of the funnel is southeast. Since an approaching storm will have its highest wind and surge in the northeast quadrant and pushing the most water from east to west, it seems intuitive that Planning Unit 1 with a larger opening and more funneling effect will inherently have higher risk to extreme surge events compared to Planning Unit 2. If outer barrier features are needed anywhere, it is more likely to be in Sub-Province 1.

It is probably premature for the state to commit to gates and new outer barrier levees. Much more can be gained in the immediate future by repairing and enhancing the flood protection system of the existing levee alignments. Levees on existing alignments should be designed to be overtopped and designed to have very low risk of failure of levees. Complimentary elevations of homes or assets appropriate for the risk/inundation for various assets.

New large barrier type levees or structures will be extremely expensive and are speculative. It may be many years and many hurricane seasons before they would build. Gates on the natural passes may be impossible to design without major changes to the estuary and Lake Pontchartrain. It was noted that 85% of finfish in Lake Pontchartrain migrate to the gulf at some point in their life. Of the 3 alignments proposed, the westernmost alignment is the most acceptable (a) and that the easternmost (open water) is least acceptable (c).

The flood gates at Chef and the Rigolets need to have a proven need and result. Their design and management must be to minimize environmental impacts while providing the needed flood protection. The current CCPMP design suggests a 50% reduction in the pass opening and is of great concern.

In lieu of a new barrier levee plan it was argued that the existing alignment may be adequate with the following: elevating levees and designed for overtopping without failure, Build extensive wetland buffer on the flood side of levees such as Jefferson. St. Bernard and Orleans Parishes, elevating assets within levees to withstand overtopping flooding and lower risk of failure of levees. The state must consider this as an alternative before committing to an outer barrier levee alignment.

D 1-2. Caernarvon to Belair Hurricane Protection
Assessment Team: No Comment
D 1-3. Pointe a la Hache to Phoenix Hurricane Protection
Assessment Team: No Comment
D 1-4. St. Bernard 40 Arpent Levee
Assessment Team Comment: Important redundancy in surge protection for St. Bernard Parish
D 1-5. West Shore of Lake Pontchartrain Hurricane Protection

Assessment Team Comment: Back levee is appropriate but should be located to minimize inclusion of wetlands.

D 1-6. Lake Pontchartrain and Vicinity Hurricane Protection

Assessment Team Comment: Re-evaluation should include the need for a wetland buffer on the lake side of protection levees (as proposed in Jefferson Parish). Consideration should be given to degrade levees around Bayou Sauvage NWR and re-build these wetlands. Degrading the levees would reduce surge in eastern lake Pontchartrain as a hurricane moves inland causing a sloshing effect of the lake toward Slidell. A new levee would be southwest near the Maxtent canal. Also the New Orleans Lakefront Seawall needs to be repaired for protection of the New Orleans' Lakefront levee.

D 1-7. North Shore of Lake Pontchartrain and Lake Maurepas Hurricane Protection

Assessment Team Comment Evaluation is appropriate but ultimately recommendations should maximize use of non-structural means of surge protection. Implementing "smart growth" to concentrate assets and infrastructure as well as minimizing alteration of the hydrology of the flood plain are important steps to be taken now.

D 1-8. Raise/Maintain Evacuation Routes Located Outside the Hurricane Protection Systems

Assessment Team Comment: Complete evacuation routes should be shown on maps within the master plan. Alterations to highways should be considered as threats or potential opportunities to manage the estuary. Evacuation routes are also routes of re-entry after a flood event which are critical to first responders. A guiding principle should be that the flood protection level for an evacuation route within any area should be at least equivalent to the adjacent inland area with a higher level of protection. This is intended to assure evacuees can move from any area to the next level of protection. This would also apply to areas of the coast outside levee systems and therefore provide for complete evacuation for the entire coastal region. All existing evacuation routes should be posted on maps.

D 1-9. Mississippi River Diversion at Hope Canal

Assessment Team Comment: Assessment Team is concerned about the long time before completion. It is currently estimated the design phase alone will not be completed until January 2009. The diversion structure should be 100% overbuilt for potential discharge increase future.

D 1-10. Mississippi River Diversion at Convent/Blind River

Assessment Team Comment: A diversion located at Romeville, LA may be a more suitable location or multiple smaller diversions may be preferable than a single 5000 cfs diversion. Like the diversion at Hope Canal there is great urgency to complete.

D 1-11. Shoreline Stabilization on Maurepas Landbridge

Assessment Team Comment: It is not clear why the state chose these particular reaches of the Maurepas landbridge for protection. The team questioned the suitability and environmental impact of armoring in an area where it may not be needed. Some wave protection may be needed but these structures should be low crested so that they are not destroyed by hurricanes and so that they have minimum environmental damage. Gaps should be designed in to the protection in a similar manner to the structures along the Chenier Shoreline. The team suggested biologic (restoration solutions) to sustain the landbridge such as a westward diversion through wetlands from the Bonnet Carre' spillway, a larger diversion through the Hope canal, and rebuilding the swamp platform with "marsh creation".

D 1-12. St. Tammany Marsh Restoration and Shoreline Protection

Assessment Team Comment: Protection should avoid hard armoring except in areas of very high erosion. The north shore marshes have exceptional diversity and ecologic value and should be protected or restored. Development impact should be minimized. Beneficial use of treated sewage and storm water effluent should be conducted in appropriate wetlands.

D 1-13. Shoreline Protection on South Shore of Lake Pontchartrain
Assessment Team Comment: We are very supportive of wetland buffer. The feasibility of creating a sand beach with groins should be considered to further enhance buffer and recreational value. The Stepped Seawall along LP has been severely damaged by Katrina and Ivan. This is an integral part of the South Shore Hurricane protection in Orleans Parish. It should be repaired as part of the restoration to pre-Katrina protection.
D 1-14. East Orleans Landbridge Shoreline Protection and Ridge Restoration
Assessment Team Comment: We support this proposal .
D 1-15. Close Mississippi River Gulf Outlet (MRGO) at Bayou La Loutre Ridge
Assessment Team Comment: Additional constrictions on the MRGO (in addition to the plug at Bayou la Loutre) should be adopted in the plan to reduce the fetch and energy of surge in front of the St. Bernard levee.
D 1-16. Mississippi River Gulf Outlet (MRGO) Shoreline Stabilization
Assessment Team Comment: The value of this measure should be re-evaluated considering the eminent closure of the MRGO and the elimination of ship wakes.
D 1-17. Central Wetlands Restoration
Assessment Team Comment: The wetland assimilation project should be integrated with the proposed Violet Diversion project.
D 1-18. Marsh Creation at Golden Triangle
Assessment Team Comment: This project is supported but may be contradictory to the potential levee alignments across the Golden Triangle. The potential levee alignments needs to be considered.
D 1-19. Mississippi River Diversion at Violet
Assessment Team Comment: A 50,000 cfs discharge is probably unnecessarily large. The project should be designed to benefit the central wetlands, the Biloxi marsh and Mississippi Sound by maintaining the habitat goals as originally proposed in the 1984 Feasibility study of the Bonnet Carre Diversion Project. Preliminary modeling suggest 10,000 to 15,000 cfs discharge is probably appropriate.
D 1-20. Maintain MRGO – Lake Borgne Landbridge
Assessment Team Comment: Necessary project
D 1-21. Modify Authorization of Caernarvon Diversion
Assessment Team Comment: Recommend operating diversion with max flow in the spring (April May June). Operated to accelerate recovery from Katrina and Rita and increase plant productivity while stabilizing habitats.
D 1-22. Maintain and Restore the Breton Sound Marshes
Assessment Team Comment: Recommendation is vague and does not mention importance as a buffer to the two existing levees in Plaquemines and St. Bernard Parishes
D 1-23. Mississippi River Diversion at White Ditch
Assessment Team Comment: Discharge seems unnecessarily large especially considering the nearby Caernarvon structure is underutilized. The CWPPRA proposed discharge of 500 cfs seems more appropriate.
D 1-24. Maintain and Restore the Biloxi Landbridge and Barrier Reefs
Assessment Team Comment: very supportive
D 1-25. Restore Bayou La Loutre Ridge
Assessment Team Comment: The ecologic value of forested habitat should be emphasized in restoration.
D 1-26. Mississippi River Diversion at Bayou Lamoque
Assessment Team Comment: No Comment
D 1-27. Chandeleur Islands Habitat Management Plan

Assessment Team Comment: Concern that recommendation is weak and does not recognize the unique and important ecologic value of the Chandeleur Islands. Loss of the islands would expose Biloxi marsh to increased wave energy and alter the salinity regime of interior marsh and sounds. Louisiana's Chandeleur Islands contain unique marine habitats that are found nowhere else in the State. While the Islands themselves are part of the Breton National Wildlife Refuge and therefore under federal jurisdiction, the shallow aquatic habitats and vast meadows of seagrasses on the bayside of the island are part of State waters. These habitats are essential to many valuable fishes and fishery resources including commercial species (e.g., blue crabs), recreational species (e.g., redfish), and federally threatened and endangered species (e.g., various seaturtles). Recent fishery research by the Nekton Research Laboratory at UNO provides numerous examples of why these habitats need to be preserved for the sake of fishery resources. For example, larval and juvenile groupers have been collected from seagrass beds throughout the summer and this may be the only place in the State where nursery habitat for these species occurs. There is also evidence that lemon sharks use the Chandeleur Islands as "pupping grounds". If this is confirmed, it means this area is one of the few places on the planet where this shark species reproduces. Federally-threatened Gulf sturgeon are known to feed in shallow habitats associated with barrier islands and there are known occurrences of sturgeon occurring in the Chandeleur region. Should the Islands not be restored and allowed to disappear, Louisiana will lose those unique and valuable fishery habitats that are formed and protected by the Chandeleur Islands.

Additional Recommendations for Planning Unit 1

The Bonnet Carre Spillway should be evaluated to make modifications in the design and management to include introductions of river water directly into adjacent wetlands for the benefit of local wetlands. This does **not** imply the original Bonnet Carre diversion (1984) which targeted 70-mile distant marsh and sounds and used Lake Pontchartrain as a conveyance should be recommended by the state plan.

Planning Unit 2: Mississippi River to Bayou Lafourche

D 2-1. Donaldsonville to the Gulf Hurricane Protection
Assessment Team Comment: The Donaldsonville to the Gulf (GIWW) Alignment is considered unacceptably contrary to coastal restoration and unnecessary for flood protection. The levee would likely cause large-scale hydrological changes in the basin by impoundment of 1,100 mi^2 of wetlands. It would restrict flow of fresh water to the south or salt water to the north resulting in alteration of the distribution of sediment and nutrients. The result may be irreversible damage to the Barataria estuary. This alignment would also preclude the natural inland shift of the estuary with rising sea level.

USACE modeling in the Preliminary Technical Report reported very high surge levels along the Louisiana coast with possible new levee alignments. Modeled surge against these levees was in excess of 30 feet. This surge is an artifact of the levee alignment itself and is not representative of surge to be expected in a broad Louisiana wetland landscape. Without a hypothetical new "barrier" levee and modeling instead the existing landscape, modelers find that surge such as in Barataria Basin are dramatically lower (less than half).

The GIWW levee would also be built on top of subsiding organic soils leading to expensive maintenance costs. An alternative alignment of back levees parallel to the natural ridge or natural levees is highly desirable for the reason described previously. Barataria bay is one of the most productive estuaries along the coast, and the GIWW alignment's cost is greatly enhanced when the loss of economic revenue is considered.

The Assessment Team strongly recommends a back levee alignment (a.k.a. swamp alignment) which would flank the natural levees of the Mississippi River (outside of New Orleans) and Bayou Lafourche in lieu of the GIWW barrier "leaky levee". This alignment should consider not just surge flood, but also the potential for back water flooding from river diversions such as Davis Pond.

D 2-2. Larose to Golden Meadow Hurricane Protection
Assessment Team Comment: The levee height for this region will not need to be so high if the GIWW levee is not built. The Assessment team proposes that back levees be build along the Bayou Lafouche corridor and the west bank of the Mississippi River. We also recommend ring levees be built to protect other outlying communities. Levee heights would be based off of storm surge modeling for the Barataria basin with a GIWW alignment.
D 2-5. Grand Isle and Vicinity Protection and Shoreline Stabilization
Assessment Team Comment: Dune or barrier island modifications should use and be appropriate for native vegetation and promote the ecology of the barrier island.
D 2-6. Raise/Maintain Evacuation Routes Located Outside the Hurricane Protection Systems
Assessment Team Comment: Modification of roads may allow opportunities to manage the estuary appropriately. It is also recommend that all evacuation routes have the same protection level as adjacent inland (higher) level of flood protection.
D 2-7. Upper Barataria Basin Hydrologic Improvements at Highway 90
Assessment Team Comment: The new Interstate 49 should be elevated appropriately for 0.2% surge height to be used as an evacuation route. Interstate should be constructed with end-on-end construction to minimize the wetland impact. The new interstate creates the opportunity to

remove impoundments along Highway 90. This will be to improve the estuarine hydrology and reduce threats of flood from rain events.

D 2-8. Watershed Management Plan for Upper Barataria Basin

Assessment Team Comment: The need for hydrologic management is greatly reduced or not needed without the GIWW levee alignment.

D 2-9. Move Freshwater to Terrebonne Basin from Barataria Basin via GIWW

Assessment Team Comment: This goal of this recommendation suggests that the GIWW levee is not as "leaky" as proposed by the master plan. Fresh water would be blocked from flowing south to achieve this goal and conflicts with the north to south flow of the estuary as suggested by the "leaky levee". The GIWW alignment should not be constructed, but this does not preclude the goal of moving water west across Bayou Lafourche through the GIWW.

D 2-11. Mississippi River Diversions at Strategic Locations in Upper Basin

D 2-12. Modify Authorization of Davis Pond Diversion

Assessment Team Comment: Wetland habitat goals that are consistent with the need of flood protection and a sustainable estuary need to be defined for the Barataria Basin to establish long term fisheries and management of diversions. Authorization needs to be consistent with the habitat goals.

D 2-13. Mississippi River Diversion at Myrtle Grove with Dedicated Dredging

Assessment Team Comment: Wetland habitat goals that are consistent with the need of flood protection and a sustainable estuary need to be defined for the Barataria Basin to establish long term fisheries and management of diversions. Authorization needs to be consistent with the habitat goals.

D 2-14. Mississippi River Diversion at West Pointe a la Hache with Dedicated Dredging

Assessment Team Comment: Wetland habitat goals that are consistent with the need of flood protection and a sustainable estuary need to be defined for the Barataria Basin to establish long term fisheries and management of diversions. Authorization needs to be consistent with the habitat goals.

D 2-15. Marsh Creation in Barataria Basin

Assessment Team Comment: This project relies on a healthy (sustainable) estuary to be effective long-term. Marsh creation should be on marsh land bridges that act as a line of defense and may be inherently more sustainable. Wetland habitat goals that are consistent with the need of flood protection and a sustainable estuary need to be defined for the Barataria Basin to establish long term fisheries and management of diversions. Non-riverine sediment sources should be accessed to reduce cost.

D 2-16. Ridge Restoration in Barataria Basin

Assessment Team Comment: The selection of ridges for restoration either are not completely appropriate or are not properly integrated with other restoration /flood protection features. Natural ridges should be re-forested with native ridge vegetation and provide important upland habitat.

D 2-17. Barrier Shoreline Restoration: Barataria Basin

Assessment Team Comment: Barrier islands provide short-term surge reduction but more significantly provide long-term protection of the estuary which is vital for surge reduction and estuarine health. Barrier island restoration is historically designed on an island by island basis. This may be self defeating approach to sustainability. It is imperative that the larger barrier island reaches have a managed sediment budget that includes all of the gulf shoreline elements influencing sediment transport include the islands, jetties, passes, navigation channels etc.

D 2-18. Bankline Protection for Gulf Intracoastal Waterway (GIWW)

D 2-19 West Bank and Vicinity Hurricane Protection Project

Assessment Team Comment: The existing alignment is close to the ideal of protecting areas on or adjacent to natural levees or ridges. The existing levee alignment with additional improvements should be strongly considered as the primary levee alignment for the New Orleans west bank for 0.2% protection levels without the need for an outer barrier levee at the GIWW. With an open and healthy Barataria estuary storm surge will be widely dispersed and lower. The threat of extreme surge events is not as great as the east bank of New Orleans (see earlier discussion). Working with the existing levee alignment will likely result in more rapid enhancement of flood protection while allowing near complete use of the wetland buffer to diminish surge before it encounters this levee alignment. Enhancement of the existing levee alignment and further back levee development will allow for more aggressive use of diversion to restore the estuary.

Additional Recommendations for Planning Unit 2

The master plan indicates a large diversion to be located on the somewhere on the lower delta in the Barataria Basin. A large diversion south of Venice should be designed to deposit sediment near the gulf shoreline to supply sediment to the gulf shoreline eastward to Quatre Bayou Pass by taking advantage of the natural long shore transport northwestward along this reach. For example, channel improvements to Tiger Pass should be evaluated to increase discharge through this pass. Management of the gulf shoreline should include restoration of sediment transport so that losses are minimized by navigational channels, passes and jetties.

D 3a-1. Morganza to the Gulf Hurricane Protection

Assessment Team Comment: It is inappropriate considering the aftermath of Hurricanes Katrina and Rita including the lessons-learned, the federal financial limitations, and the specter of greater storm surge threats that the Morganza to the Gulf project is effectively "grandfathered" into the state's master plan. Those that might think the hurricanes are de facto proof of the need for Morganza to the Gulf misunderstand the lessons the storms provide. In New Orleans, it was an inadequate flood protection system that resulted in the disastrous consequences of Hurricane Katrina. The recent Team Louisiana report issued by the La DOTD makes this abundantly clear. The Morganza to the Gulf was conceived in another time when less surge and more coastal restoration was anticipated. To the contrary restoration has not been adequate and greater storm surge due to more frequent higher category hurricanes is now anticipated. **Figures 5 and 6** dramatically illustrate the proximity of the alignment to the Gulf, the adjacent historic land loss and the calamitous potential of future land loss. Morganza to the Gulf places a regional levee alignment too far south impounding wetlands and reducing the storage for storm surge. The alignment forebodes a new false security for the region that may well lead to future disastrous consequences. The tax payers who might pay for this project and the residents who might chose to live within this levee alignment deserve more than an outdated and ineffective flood protection system design.

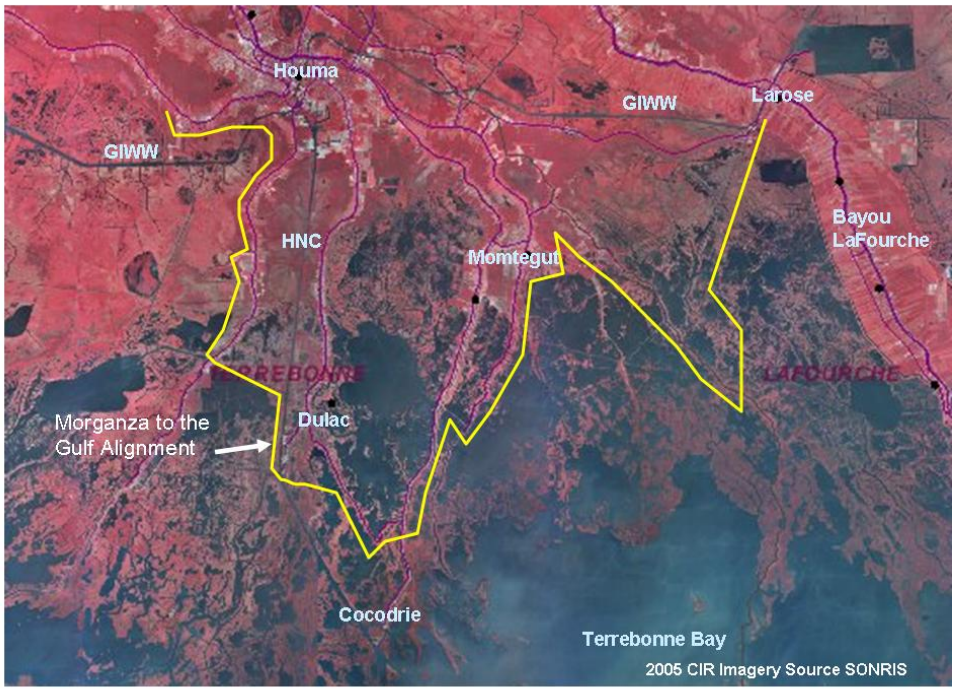
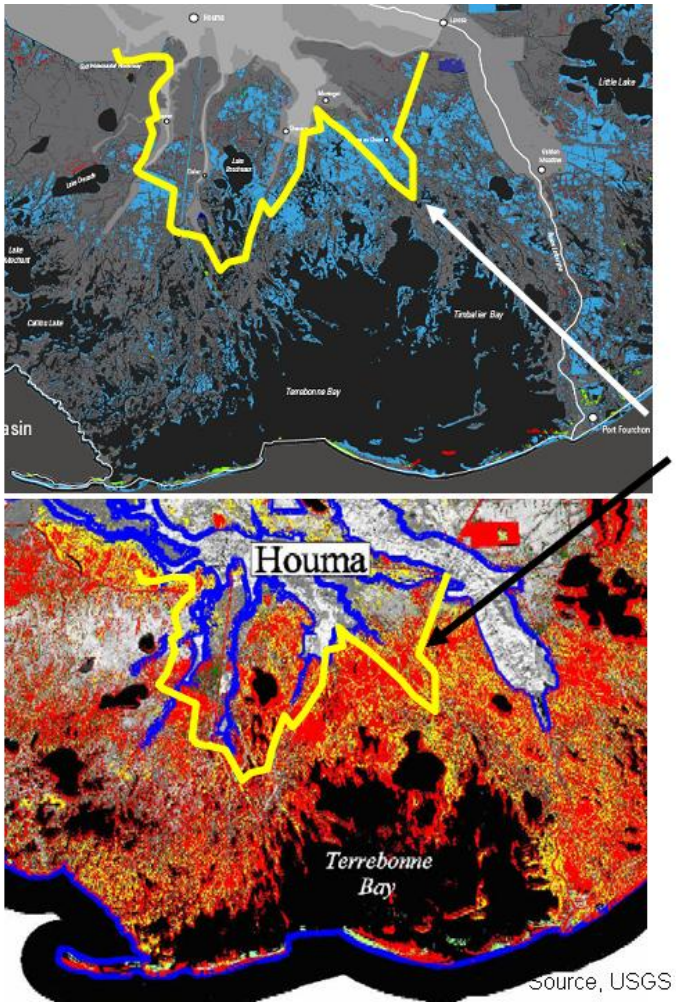


Figure 5: The Morganza to the Gulf Levee alignment on 2005 CIR imagery. Note the thin and fragmented marsh is all that separates the levee from Terrebonne Bay. Also note the inclusion of wetland areas within the alignment.

The Assessment Team recommends an alternative be evaluated using ring levees (segmented back levees) on each of the individual ridges (see Figures 2 and 3). This is consistent with the ridge/ estuary model. This approach in combination with non-structural approaches may actually provide a higher and more reliable flood protection level.



Morganza to the Gulf proposed alignment

Figure 6: The Morganza to the Gulf Levee alignment on a map of historic land loss in blue (upper) and projected land loss in red (lower) (Source: USGS). Note the massive anticipated land loss south of the levee alignment.

D 3a-3. Morgan City to Gibson Hurricane Protection
Assessment Team Comment: Comments: This alignment should be designed to accommodate the East Atchafalaya Restoration Spillway as proposed below.
D 3a-4. Houma and Vicinity Hurricane Protection
Assessment Team Comment: This flood protection system should be designed to be adequate for 0.2% level of protection without the current design of the Morganza to the Gulf levee.

D 3a-6. Bankline Protection for Houma Navigation Canal (HNC)
Assessment Team Comment: This project provides no Flood Protection benefit and very little or no Coastal Restoration Benefits. It does not serve the master plan objectives of flood protection and coastal restoration.
D 3a-7. Multipurpose Operation of the Houma Navigation Canal (HNC) Lock
D 3a-8. Bankline Protection for GIWW
D 3a-9. Marsh Creation in Terrebonne Basin

Assessment Team Comment: The extent of marsh creation is overly ambitious. It should be more selective and incorporate the East Atchafalaya River Spillway concept. Restoration of oyster reefs around Terrebonne Bay should be included.

D 3a-11. Freshwater Introduction via Blue Hammock Bayou

Assessment Team Comment: Restoration and protection of this feature should be incorporated into the East Atchafalaya River Spillway described below.

D 3a-12. Ridge Restoration in Terrebonne Basin

Assessment Team Comment: Many of the ridges targeted for restoration may not be sustainable unless there is extensive marsh creation in the surrounding areas. This approach seems overly dependent and speculative. A more strategic selection of ridges needs to be made.

D 3a-13. Maintain Landbridge between Caillou Lake and Gulf of Mexico

Assessment Team Comment: This is a critical coastal land bridge and may be considered a line of defense. Restoration and protection of this feature should be incorporated into the East Atchafalaya River Spillway described below.

D 3a-14. Barrier Shoreline Restoration: Terrebonne Basin

Assessment Team Comment: Barrier islands provide short-term surge reduction but more significantly provide long-term protection of the estuary which is vital for surge reduction and estuarine health. Barrier island restoration is historically designed on an island by island basis. This may be self defeating approach to sustainability. It is imperative that the larger barrier island reaches have a managed sediment budget that includes all of the gulf shoreline elements influencing sediment transport include the islands, jetties, passes, navigation channels etc.

D 3a-15. Watershed Management Plan for Upper Terrebonne Basin

Assessment Team Comment: A redesign of the Morganza to the Gulf alignment incorporating isolated ring levees would not create the need for significant water shed management for the Upper Terrebonne Basin.

Additional Recommendations for Planning Unit 3a

The proposal to construct a spillway just upstream of Morgan City should be included as an alternative in the state master plan. A proposal referred to as "East Atchafalaya River Spillway" (EARS) was proposed by Dr. Paul Kemp **(Figure 7)** in a report to Environmental Defense (Kemp & Hyfield,, 2006). This proposal is strongly consistent with the Multiple Lines of Defense approach since it emphasizes restoration into an area that can provide as a surge buffer. The project has great potential for long term sustainability of the Penchant Basin and the eastern areas of the Planning Unit 3 a (west of Terrebonne Bay. In light of the post-Katrina strategy to accelerate and maximize coastal restoration the original proposal should be evaluated to higher discharges than originally proposed. It is conceivable that the beast alternative a near complete river diversion through a spillway which captures the majority of discharge through the Atchafalaya Delta.

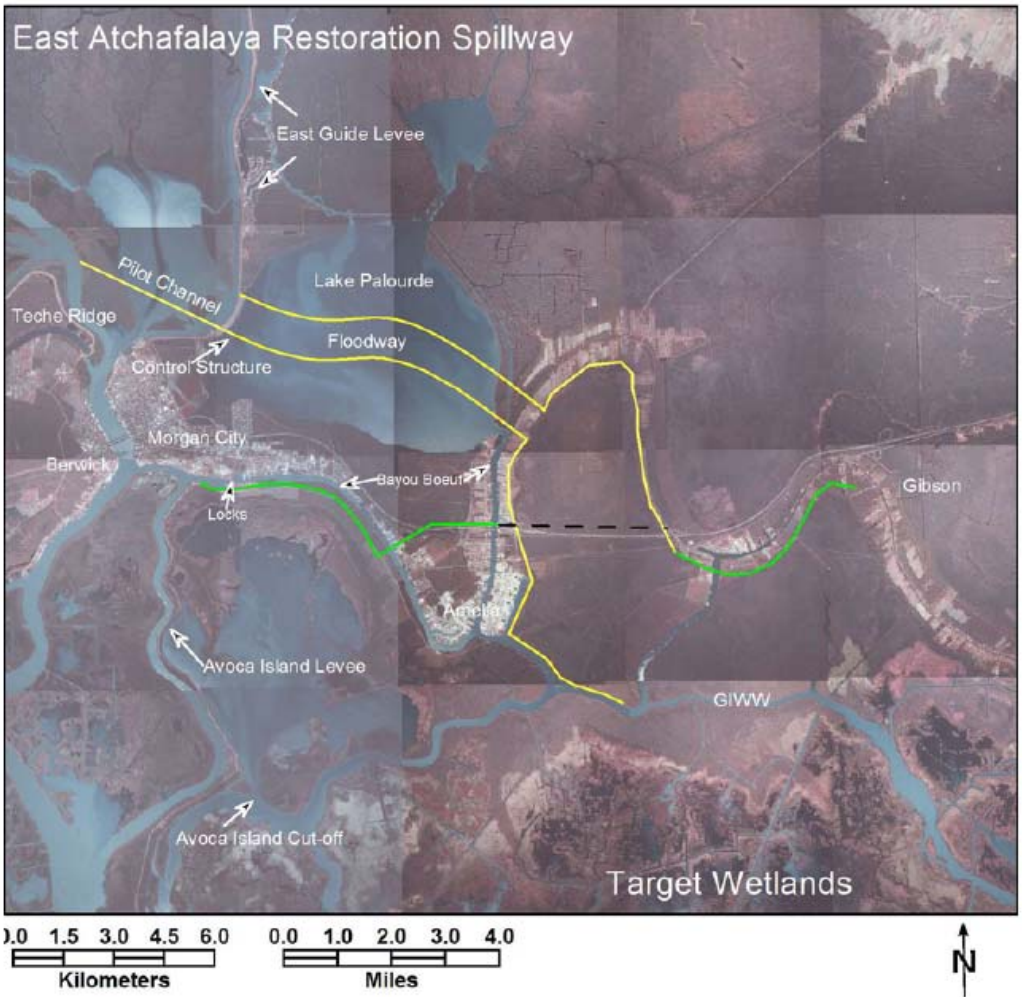


Figure 7: Proposed East Atchafalaya River Spillway that could be used to restore the west side of Planning Unit 3 a (Kemp and Hyfield, 2005)

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Restoration of the Mississippi Delta: Lessons from Hurricanes Katrina and Rita

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Hurricanes Katrina and Rita showed the vulnerability of coastal communities and how human activities that caused deterioration of the Mississippi Deltaic Plain (MDP) exacerbated this vulnerability. The MDP formed by dynamic interactions between river and coast at various temporal and spatial scales, and human activity has reduced these interactions at all scales. Restoration efforts aim to re-establish this dynamic interaction, with emphasis on reconnecting the river to the deltaic plain. Science must guide MDP restoration, which will provide insights into delta restoration elsewhere and generally into coasts facing climate change in times of resource scarcity.

The Mississippi Deltaic Plain (MDP) is a 25,000-km^2 dynamic landscape of water, wetlands, and low upland ridges, formed as a series of overlapping delta lobes. An understanding of how humans and Hurricanes Katrina and Rita affected the MDP in 2005 requires knowledge about the complex processes that formed and sustained the delta for millennia before human impact. The delta emerged about 6000 to 7000 years ago after eustatic sea level stabilized (Fig. 1) (*1*–*3*). A variety of processes formed and sustained the delta and increased its overall size (Table 1) (*4*). Riverine sediments were deposited at river mouths and via overbank flooding, crevasse formation, and older distributaries (*2*, *3*). Crevasses were usually short-lived (<100 years) and formed depositional splays about 10 km wide, as compared to hundreds of kilometers for delta lobes (*5*). Many former distributaries functioned, either permanently or seasonally, at the beginning of European colonization, around 1700. A skeletal framework of distributary ridges and barrier islands (*6*) protected interior fresher wetlands from marine forces and saltwater intrusion (Fig. 1).

To survive, the soil surface of coastal wetlands must grow vertically to keep pace with local sea level. This is critical in the MDP, where geologic subsidence causes a relative sea-level rise (RSLR) of about 1 cm/year as compared to ~1.5 mm/year of eustatic SLR. Plant growth contributes organic soils; the rest of the vertical growth comes from mineral sediments (*7*). Riverine inputs benefit coastal wetlands in several ways: Mineral sediments increase accretion and bulk density, nutrients enhance plant growth, fresh water buffers saltwater intrusion, and iron precipitates toxic sulfides (*8*, *9*). The deposition of older river sediments resuspended from bays and the nearshore Gulf of Mexico or eroded from other wetlands is especially important during winter storms and hurricanes (*7*, *10*, *11*). However, most sediment is introduced directly from the river (*12*).

In the MDP, barrier islands grow and diminish in conjunction with deltaic lobe cycles (Fig. 2) (*13*). Coarser sediments are deposited at active river mouths, and as the delta advances, sand is transported laterally to form beach ridges. After channel abandonment, delta-front sands are reworked to form erosional headlands attached to marshes behind the barrier. Waves and currents rework and redistribute headland sands laterally to form flanking barrier islands, and the islands move landward as sand is transported in wash-

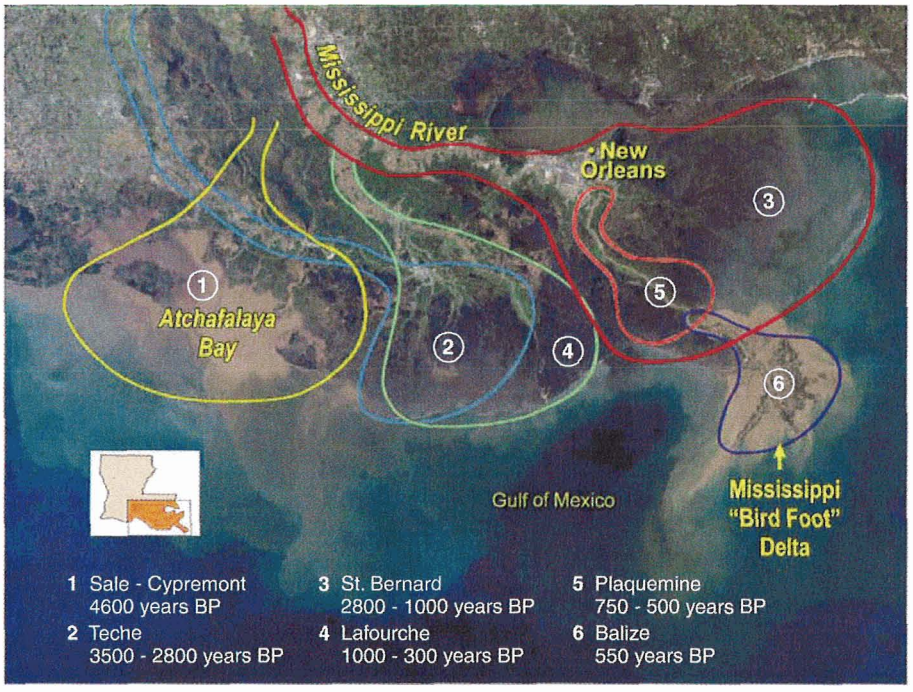

Fig. 1. The MDP was formed by a series of overlapping delta lobes as the river occupied different channels. The delta is characterized by current and abandoned river channels, barrier islands, and extensive coastal wetlands. Currently, about two-thirds of flow is discharged via the lower Mississippi directly to the Gulf and one-third is discharged via the Atchafalaya River to a shallow bay where a new delta is forming. The location of levees is shown on the lower river as well as the location of the MRGO. The turbid plume shown on the right results from a river diversion. BP, before the present. [Modified from (*66*)]

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over fans. As wetlands deteriorate, a barrier island arc is formed. Over time, the barriers fragment into smaller islands, and extensive washover terraces or sandy shoals are formed inshore of the islands, eventually producing a submerged complex of shoals and sand sheets. This process continues until another distributary channel forms and the cycle begins again.

Deterioration of the MDP

Since 1900, about 4900 km^2 of wetlands in coastal Louisiana have been lost at rates as high as 100 km^2/year (*14*, *15*). Wetland loss is much lower on the central coast, where the Atchafalaya River, a distributary that carries one-third of the flow of the Mississippi River, discharges into a shallow inshore bay (*16*). Loss occurs at the wetland edge because of wave erosion and in interior wetlands by submergence as soil accretion fails to keep up with RSLR (*17*). Most loss was initially internal, but as wetlands opened up, wave erosion has become more important (*18*). Although a delta grows and decays as a natural outcome of the delta lobe cycle, the MDP experienced an overall net growth for several thousand years after the sea level stabilized. Human activities during the 20th century reversed this trend (*15*, *17*, *19*).

The main cause of loss was the isolation of the river from the MDP (*17*, *19*). The river is now almost completely leveed, preventing overbank flooding and crevasse formation, so most of its discharge is into the deep Gulf of Mexico (Fig. 1). With the exception of the Atchafalaya River, all distributaries of the river have been closed. The lower Mississippi is prevented from seeking a shorter course to the Gulf via the Atchafalaya by the Old River Control Structure.

Over 15,000 km of canals have been dredged for navigation, drainage, and logging, but mostly for oil and gas development (*17*). This and the construction of impoundments have altered the hydrology that sustains the system (*20*). Spoil banks associated with canals reduce sheet flow of water through wetlands (*21*). Deep, straight navigation canals cause saltwater intrusion and the death of freshwater plant communities (*17*). One of the most notable is the Mississippi River Gulf Outlet (MRGO), a 12-by-300–m canal dredged through the Breton Sound Basin in 1963. Saltwater intrusion via the MRGO killed thousands of hectares of freshwater wetland forests. As Katrina's path crossed Breton Sound, levees along the MRGO were breached and storm surge funneled through the MRGO and into the Gulf Intracoastal Waterway to contribute to the flooding of New Orleans. The withdrawal of oil, natural gas, and formation waters lowered pressures in underlying geologic features, probably causing downfaulting and increasing the rate of subsidence by two to three times during active oil and gas production (*22*).

The construction of reservoirs in the Mississippi basin dramatically reduced the supply of both suspended and bedload sediments to the delta (*6*). Inputs of sand are particularly important for maintaining barrier islands; thus, all barrier islands in the deltaic plain are deteriorating (*13*) because the deterioration phase of the barrier island cycle has accelerated while the development phase has been greatly reduced.

Hurricanes and Mississippi Delta Wetlands

Hurricanes are a regular, if episodic, force in the MDP. Thousands of tropical storms affected the delta as it grew over the past 6000 to 7000 years. Under some conditions, runoff generated by hurricane precipitation introduces fresh water and nutrients that reduce salinity and enhance coastal productivity (*23*). Hurricanes also deposit large amounts of resuspended sediments on wetland surfaces, helping to offset RSLR, and thus are important for the sustainability of marshes (*7*, *10*). Hurricanes Katrina and Rita were the fourth and fifth most powerful storms to strike the MDP since 1893 with respect to maximum wind speed at landfall, but were more remarkable in both cases for the hundreds of kilometers of the coast affected by a storm surge of more than 3 m. As Katrina progressed across Breton Sound and Lake Borgne as a category 3 storm (sustained winds of 194 km $hour^{-1}$), it generated a storm surge that exceeded 10 m on the Mississippi coast and measured up to 6 m southeast of New Orleans, with up to 2 m of additional wave run-up in the most exposed locations (Fig. 3) (*24*). In southeast Louisiana, communities unprotected by levees were inundated, and the storm destroyed levees protecting eastern New Orleans and St. Bernard and Plaquemines parishes to the south and east. Floodwalls failed along drainage and navigation canals connected to Lakes Pontchartrain and Borgne, inundating most of the rest of New Orleans. Because much of this area is below sea level, the floodwaters remained for 3 or more weeks while emergency repairs were made and the water was pumped out. More than 1500 people died as a direct or indirect result of Hurricane Katrina, almost 1100 of them in Louisiana.

Katrina and Rita deposited 5 to 10 cm of sediment over large areas of coastal wetlands (*11*). But about 100 km^2 of wetlands in the Breton Sound Basin lying in the storm path were converted to open water (*25*). Although some of this area is now 1 m or more deep, most of the damaged area is shallow mud flats interspersed with myriad marsh clumps uprooted by the storm. The disturbance of buoyant low-salinity marshes with low-density organic soils often occurs during hurricanes. The Caernarvon river diversion structure is presently being operated to the maximum extent possible to enhance marsh recovery in the most heavily affected area. Initial observations indicate substantial marsh recovery.

Hurricane Rita made landfall near Sabine Pass at the Louisiana-Texas border on 24 September 2005, generating a storm surge of up to 5 m (Fig. 3) and reflooding parts of New Orleans more than 200 km east of landfall. Coastal communities in Cameron Parish were destroyed, and parts of the city of Lake Charles experienced 2-to-3-m–deep flooding associated with surge propagating up a ship channel. To the east, the 30-to-50-km–wide Chenier Plain wetlands reduced surge inland. Because of the lesser storm surge and lower population densities, fewer than 10 people lost their lives directly as a result of Rita's winds and surge. Rita's surge displaced residents from all Louisiana coastal parishes, however, and drove salt water tens of kilometers inland, killing freshwater wetlands in artificially impounded areas (*25*).

Hurricane Rita's highest storm surge was nearly as great as the surge confronting the

Table 1. A hierarchy of forcings or pulsing events affecting the formation and sustainability of deltas. [Modified from (*4*)]

Event	Time scale	Impact
Major changes in river channels	500–1000 years	New delta lobe formation (avulsions), major sediment deposition
Major river floods	50–100 years	Avulsion enhancement, major sediment deposition, enhancement of crevasse formation and growth
Major storms	20–25 years	Major sediment deposition, enhanced production
Average river floods	Annual	Enhanced sediment deposition, freshening (lower salinity), nutrient input, enhanced primary and secondary production
Normal storm events (frontal passage)	Weekly	Enhanced sediment deposition, enhanced organism transport, higher net materials transport
Tides	Daily	Marsh drainage, stimulated marsh production, low net transport of water and materials

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eastern side of New Orleans during Katrina, but had to cross 30 to 50 km of Chenier Plain wetlands before reaching main population centers, whereas Katrina's surge was less impeded as it traveled through large lagoons, degraded wetlands, and artificial channels. Barrier islands, shoals, and wetlands can reduce storm surge and waves, but the full range of these effects is not well captured at present by most numerical models. Although it has been shown that damage from the 2004 Indian Ocean tsunami was less in communities sheltered by intact mangroves (*26*), the existence of an extensive barrier island system off of the Mississippi coast did not protect it from a 10-m surge during Katrina. Observations of water levels indicate that Rita's surge was attenuated at an average rate of 4.7 cm per kilometer of wetland landscape where channels were not present. This is similar to previous hurricanes, including Hurricane Andrew in 1992, indicating storm surge attenuation of 7.9 cm per kilometer for intact wetlands along the central Louisiana coast (*27*–*29*).

Emergent canopies of forested wetlands can greatly diminish wind penetration, thereby reducing the wind stress available to generate surface waves as well as storm surge (*30*, *31*). The sheltering effect of these canopied areas also affects the fetch over which wave development takes place. Shallow water depths attenuate waves via bottom friction and breaking, whereas vegetation provides additional frictional drag and wave attenuation (*32*) and also limits static wave setup (*33*). Extracting energy from waves either by breaking or increased drag reduces destructive wave action on levees. During Katrina, wave-induced run-up and overtopping washed away many miles of turf-covered earthen levees along the MRGO (*24*). Few wetlands or fast lands protected these levees from high-energy surge currents and waves that broke on the levee face. Conversely, other earthen levees nearby that were overtopped by the low-velocity surge, but fronted by extensive wetlands, escaped substantial damage (*34*).

Depending on the rate of RSLR, coastal wetlands maintain a near–sea-level elevation by trapping sediments and forming organic-rich soils. Thus, wetlands play an important role in maintaining elevations near sea level, in contrast to the –3 to –4-m elevations that characterize the equilibrium depth of large bays along the Louisiana coast. Although the relative effects of shallow open waters versus intertidal wetlands on both waves and storm surges from strong hurricanes remain to be fully resolved, it is clear that the intact barrier islands, wetlands, and ridges that once characterized the coastal landscape of Louisiana afforded substantial protection to New Orleans and other coastal communities that cannot be depended on today and must be replaced by more massive levees.

Consequently, maintaining and, where possible, using deltaic processes to increase the area of marshes, mangroves, and swamps in strategic locations would provide a self-sustaining complement to the structural protection of levees. Unfortunately, the physical and hydrologic integrity of the wetlands southeast of New Orleans has been greatly compromised by large navigation channels, which may now also require elaborate gates and other closure structures.

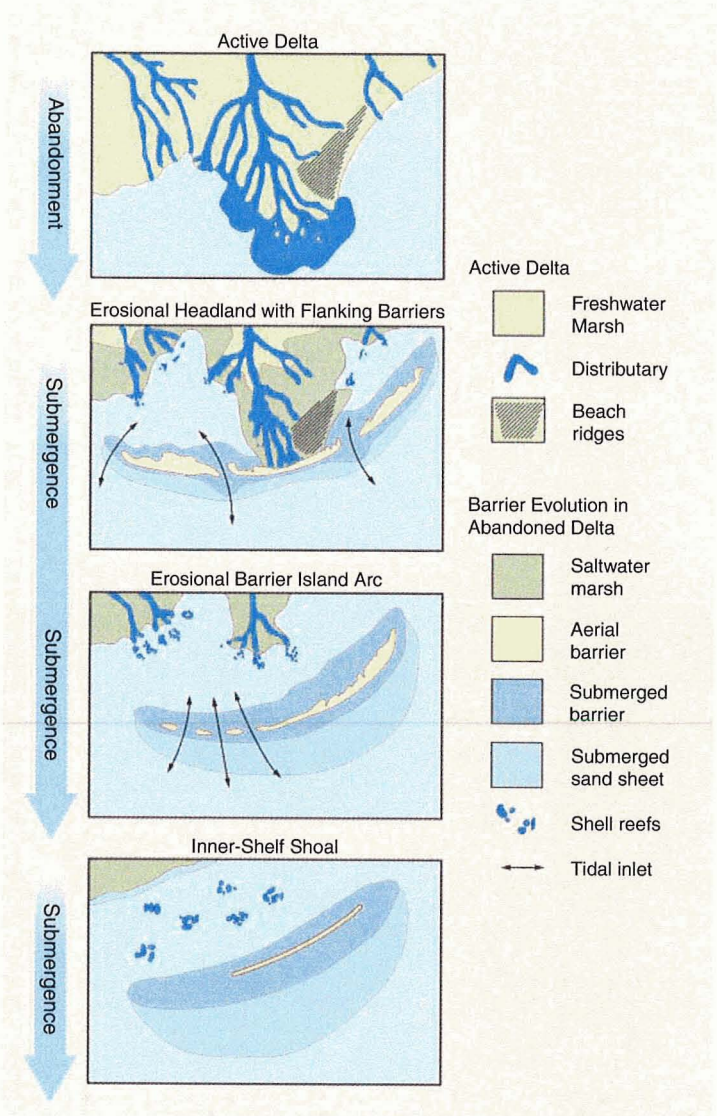

Fig. 2. The barrier island cycle in the MDP. [Modified from (*13*)]

The Evolving MDP Restoration Effort

Planning the restoration of the coastal landscape requires the design of sustainable ecosystems that integrate human society with the natural environment (*35*–*37*) and work with rather than against natural processes. Such ecological engineering approaches rely primarily on the energies of nature, with human energy being used in the design and control of key processes. Because of the dimensions of the delta's problems, traditional engineering approaches such as levee construction and the placing of dredged sediments are also required. An important goal of MDP restoration is the application of the optimum mix of ecological and standard engineering approaches. With this in mind, four general approaches to restoration are being evaluated, planned, or implemented in the MDP:

(1) Reconnecting the river to the deltaic plain via river reintroductions, the reopening of old distributaries, and crevasse-splay development (*35*, *37*, *38*). Over the past two decades, it has become increasingly clear that this will have to be done on a large scale.

(2) Using dredged sediments to create and restore wetlands by pumping them over distances of tens of kilometers. This is expensive, but because dredged sediments can be used to create wetlands quickly, this technique may be useful for restoring wetlands that would soon be lost or quickly creating large areas of wetlands that would then be sustained through river reintroductions (*39*).

(3) Restoring barrier islands by pumping sands from offshore, constructing groins and breakwaters, placing riprap, and using fences and plantings to stabilize sand dunes (*40*, *41*). Because MDP barrier islands do not just migrate but deteriorate over time, restoration will require ongoing maintenance. Restoration and maintenance can be justified, however, because islands reduce waves and storm surge and provide important habitats in the coastal landscape. In the future, the remobilization of sand trapped in up-basin reservoirs may become a source of coarse sediments that will aid in maintaining barrier islands.

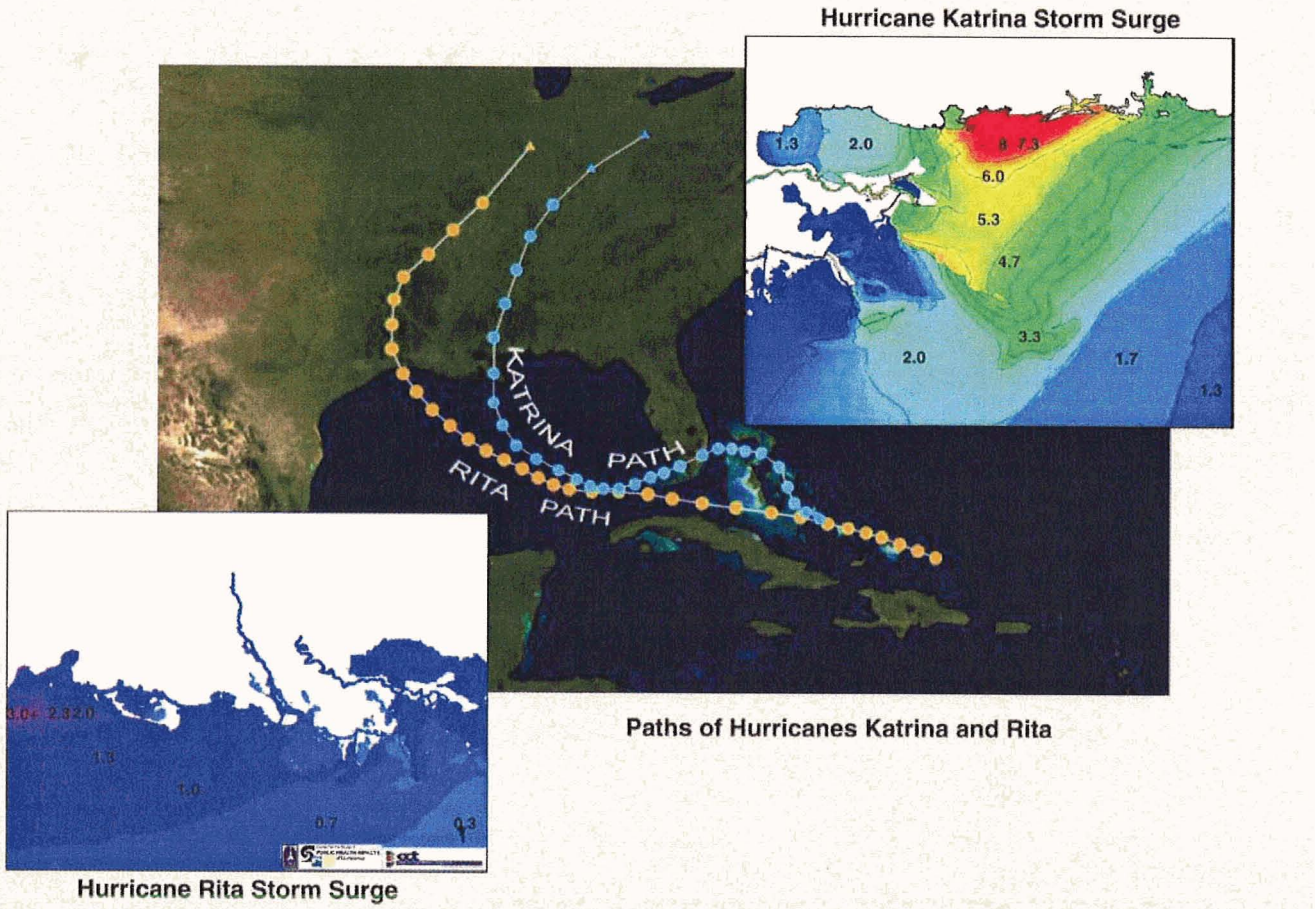

Fig. 3. A composite figure showing paths of Hurricanes Katrina and Rita, surge levels [in meters, as estimated by the ADCIRC model (*67*)], areas flooded, sites of levee failures, and wetland loss due to the hurricane.

(4) Restoring hydrological processes by removing spoil banks, backfilling canals, closing deep navigation channels (such as the MRGO), installing locks (*42*), trapping sediments (*43*), and protecting interior shorelines against erosion. Such restoration generally affects a relatively small area, but can be particularly effective if done in conjunction with diversions so that river water is used most effectively.

Even with its bountiful natural resources, it must be remembered that the MDP is a "working coast" (*38*, *44*), and restoration must be integrated with navigation and flood-protection infrastructure, agriculture, urban development, commercial and recreational fishing, and oil and gas production. In turn, these activities will have to adapt to projects, such as diversions, that seek to return the delta to a more natural state. This is a lesson to be learned regarding most deltas.

Coastal restoration will be more effective if it takes into account changes in fresh water supply, suspended sediment, and nutrient fluxes in the Mississippi River Basin (*45*, *46*). It should work cooperatively with efforts to better manage and restore the resources and environments of the basin, including the restoration of the Missouri and Upper Mississippi Rivers, reservoir management, the reconnection of wetlands and flood plains, and reducing loadings of nutrients from agricultural lands that result in hypoxia in the Gulf of Mexico (*47*–*49*).

Global climate change and the availability and cost of energy have important implications for delta restoration (*50*). Accelerated sea-level rise, changes in precipitation patterns, and changes in the frequency and intensity of hurricanes (*51*–*54*) must be taken into account in designing effective restoration strategies. Less energy-intensive restoration techniques that use the energies of nature, rather than dwindling and costly fossil fuels (*55*, *47*), should be emphasized (*50*).

A New Institutional Framework

For most of the 20th century, public decisions and investments in coastal Louisiana focused on flood protection, navigation, oil and gas extraction, or wildlife management. Growing awareness of the dimensions and consequences of wetland loss has resulted in considerable regional advocacy and planning for substantial public investments for restoration of the MDP. The federal Coastal Wetlands, Planning, Protection and Restoration Act (CWPPRA) of 1990 has provided up to $50 million per year in the United States, but it became apparent that larger-scale restoration efforts were needed (*56*). A more inclusive ecosystem restoration plan, "Coast 2050—Toward a Sustainable Coastal Louisiana," was developed in 1998, which included a diverse amalgamation of projects of various sizes and purposes located throughout the coastal zone (*57*).

To further refine the Coast 2050 Plan, the U.S. Army Corps of Engineers undertook the Louisiana Coastal Area (LCA) Ecosystem Restoration Study (*58*). The LCA Study produced detailed quantitative analyses of various restoration features and of the cost and effectiveness of suites of various features in achieving ecosystem benefits, ranging in total cost from $5 billion to 17 billion. The Office of Management and Budget directed the Corps to prepare a scaled-back LCA Plan that was submitted to Congress in January 2005 (*38*). It recommended authorization of five "near-term critical ecosystem restoration features," a science and technology program, a demonstration program, beneficial use of dredged materials, and further investigations of other near-term restoration features, at a cost of nearly $2 billion. The Assistant Secretary of the Army

requested programmatic authorization for elements totaling $1.12 billion, which currently awaits passage of a Water Resources Development Act or some other statute.

A National Research Council review of the LCA Plan concluded: "although the individual projects in the study are scientifically sound, there should be more and larger scale projects that provide a comprehensive approach to addressing land loss over such a large area. More importantly, the study should be guided by a detailed map of the expected future landscape of coastal Louisiana that is developed from agreed upon goals for the region and the nation." (*59*, *60*). Congress directed the Corps to develop a plan for closure of the MRGO to deep-draft navigation, and in December 2006 the Corps recommended that the channel be permanently blocked and not maintained even for shallow-draft navigation.

Before the hurricanes of 2005, planning and decision-making for delta restoration remained largely separate from that for storm protection and navigation (*33*). In LCA planning, restoration features were evaluated on the basis of ecosystem benefits and financial costs, so that the most cost-effective array of features could be identified. Benefits did not specifically include the value of storm damage reduction, and costs were only financial outlays by governments, even though the features might impose costs or yield benefits to current ecosystem users (such as fishers and oil and gas and navigation interests). These analytical limitations effectively isolated restoration plan formulation from other potential synergies or conflicts with flood protection, storm damage reduction, and navigation.

It has become clear not only to scientists and engineers (*38*) but also to a growing segment of the public and political leadership that sustaining a coastal landscape is necessary to ensure the habitability and economic enterprises of the MDP (*61*, *37*). The implications of this new awareness are twofold: First, activities that could further diminish the coastal landscape have to be adjusted so that they are consistent with that sustainability; and second, ecosystem restoration efforts must now include storm damage reduction benefits as a major consideration in the overall restoration plan (*38*). In the aftermath of the 2005 hurricanes, the Louisiana Legislature created the Louisiana Coastal Protection and Restoration Authority and Congress directed the Corps to undertake the 2-year Louisiana Coastal Protection and Restoration Project (LACPR) in order to identify, describe, and propose a full range of flood control, coastal restoration, and hurricane protection measures for south Louisiana. At this point, the preliminary LACPR report and the preliminary draft State Master Plan (*61*) deal predominantly with hurricane protection barriers, including coastwise levees with floodgates that could diminish the sustainability of the coastal landscape. Much remains to be done to integrate hurricane protection and coastal ecosystem restoration in a compatible manner.

Nonetheless, the 2005 hurricanes have also given new impetus to more comprehensive and aggressive coastal ecosystem restoration approaches than those included in the 2005 LCA Plan proposed to Congress. These include larger-scale diversions, the long-distance conveyance of sediment slurries, and reengineering of the navigational access at the mouth of the Mississippi River so that more of the sediment load of the river is retained in the nearshore zone to contribute to constructive and sustaining deltaic processes. Furthermore, the damage wrought by the hurricanes has lessened some previous social obstacles to these more aggressive approaches by forcing relocation away from the coast, causing losses of resources and/or infrastructure, and lowering public tolerance for obstructions by narrow interests. All of this is evidence that there is a growing recognition that delta restoration and hurricane protection will demand a suite of activities that are much greater in scale and more profound than those considered barely a decade ago.

The Gulf of Mexico Energy Security Act, signed into law in December 2006, gives Louisiana and other Gulf Coast states 37% of the revenues from newly opened oil and gas tracts. Louisiana has constitutionally dedicated these revenues to coastal restoration and protection. Along with other anticipated revenue streams, this could provide approximately $1 billion per year over 30 years for these purposes. Consequently, the state may have the resources to pursue coastal ecosystem restoration on a scale larger than any other U.S. region. This poses a major challenge to science and science-based planning to develop the most strategic and effective strategies, while minimizing the conflicts and maximizing the synergies in achieving multiple social objectives within a sustainable coastal landscape required for the future of the region. At the same time, the substantial uncertainties must be recognized, accepted, and incrementally reduced through adaptive management approaches that promote learning while executing and enhancing the effectiveness of future decisions—for this must truly be a long-term commitment. That will require substantial improvements in science, engineering, planning, and management capacity, operating with a sense of urgency and purpose.

The restoration of the MDP is important not only in its own right, but because it provides understanding needed to contend with the many other deteriorating delta systems around the world. Moreover, it serves as a model for adaptation to future climate change in coastal ecosystems more generally. Because of high rates of subsidence, the MDP presently has a rate of relative sea-level rise equivalent to that predicted for many coasts toward the end of this century. Human impacts have caused both substantial increases and decreases in freshwater inflow to parts of the coast. And the area has one of the highest frequencies of tropical cyclone impacts in the world. The management approaches developed to restore and sustain the MDP in the face of present-day forces will undoubtedly influence future adaptation to climate change impacts elsewhere, especially during a period of resource scarcity. In addition, the experience in the MDP indicates that restoration on such large scales requires long time periods and complex stakeholder engagement.

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68. This work resulted from the authors' participation on the National Technical Review Committee as part of the LCA Project (*58*) and/or the Working Group for Post-Hurricane Planning for the Louisiana Coast (*38*). We thank C. Izdepski for help in the preparation of the manuscript and the reviewers for comments.

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Comments from Restore or Retreat

Simone Maloz <Simone.Maloz@nicholls.edu> **Mon, Apr 2, 2007 at 11:32 AM**
To: comments@louisianacoastalplanning.org
Cc: Simone Maloz <Simone.Maloz@nicholls.edu>

Restore or Retreat Final Draft Comments 03 07.doc
190K

April 9, 2007

Louisiana Department of Natural Resources
CPRA-IPT
Attn: Jonathan Porthouse, Project Director
PO BOX 94396
Baton Rouge, LA 70804-9396

Re: Official Comments on State Comprehensive Master, FY 2008 Annual Plan, and Coastal Impact Assistance Program (CIAP) Plans

Dear Mr. Porthouse:

Restore or Retreat (ROR) is a non-profit coastal advocacy group created by coastal Louisiana residents and stakeholders who recognize that the Barataria and Terrebonne basins are the two most rapidly eroding estuaries on earth. Representing over 200 businesses and individuals, Restore or Retreat would like to respectfully submit the following comments regarding the drafts of the *Coastal Restoration and Protection Authority's Comprehensive Master Plan, the Fiscal Year 2008 Annual Plan, and the Louisiana Coastal Impact Assistance Plan*.

CPRA Comprehensive Master Plan
We would like to again state that our organization supports the planning team's utilization of already existing work, including Coast 2050 and the Louisiana Coastal Area Study. Many projects included in the state's final draft are vital to the future sustainability of our area; however, one major component was not incorporated: the Third Delta Conveyance Channel (TDCC).

Although the TDCC federal feasibility study was incorporated in both plan alternatives presented at stakeholder meetings in the fall and in worksheets handed out during December public meetings, neither the entire project, nor its continued study on the federal level, was included in the preliminary or final draft of the master plan. Our area, the greatest suffering Barataria and Terrebonne basins, is the most deserving of a long term, large scale project that would sustain our area. Modeled from the real-life example of the Wax Lake Outlet, that has experienced its twelve foot depth contour moving out by over 9,000 meters into the Gulf, the TDCC is a concept which conforms to the state's ideology of "fixing the system" for long term sustainability. The project is not simply a near-term fix whose effects would not be realized in future generations, but is the project for the *next* generation, which needs to be planned for now.

The final phase of the state's reconnaissance level study implied that the conveyance of sediment via pipeline would overall be a less expensive and more efficient solution for our area. Now, the state is backing off their own claims on the efficiency and effectiveness of pipeline by not incorporating this method as fully in the comprehensive plan's final draft as it was in the preliminary draft. The unfortunate truth is that our area will never be the same because the loss we have already experienced, but we must continue to do all we can to try to stabilize this area and reduce future effects. The simple commitment by the state to establish "long term pipeline infrastructure and periodic mechanical re-nourishment" or to find "more innovative means of moving river resources to this area" is unacceptable. Our area, one of the richest producers to our state and nation, is deserving of more solid commitment from the state.

On a more positive note, our organization continues to support the following projects incorporated in the final draft:

- Barrier shoreline restoration projects
- Small Bayou Lafourche Reintroduction
- Re-authorization of Davis Pond
- Pipeline Conveyance of Sediment
- Beneficial Use of Dredge Material
- Restore ridges including Bayou Lafourche Ridge
- Use of the Gulf Intracoastal Waterway for Atchafalayla Delivery into Western Terrebonne
- Implementation of Morganza to the Gulf Hurricane Protection System, including the multi-purpose operation of the Houma Navigation Canal (HNC) Lock
- Improvements to the Larose to Golden Meadow Hurricane Protection System

FY 08 Annual Plan

Regarding the CPRA's Annual Plan, which will be submitted to the legislature for approval during the 2007 regular session, there are several projects we would like to underscore our support for.

Project Planning, Engineering and Design

- Morganza to the Gulf: Without a doubt, implementation of the Morganza to the Gulf Hurricane Protection project is imperative to our region, and we support the $34.9 million requested for project planning, engineering, and design.
- Louisiana Coastal Area Study: With LCA's focus on critical large-scale restoration projects, we find it necessary to fund and implement near-term projects that will pave the way for larger projects within LCA such as Third Delta, but not to the detriment of future large-scale projects.
- Mississippi River Reintroduction into Bayou Lafourche: The problems the Bayou Lafourche project has experienced over the past ten years serves as an example of the many bureaucratic challenges coastal restoration faces in the future. It is critical that we find out first hand what effects a mere 1000 cfs can do to combat salt water intrusion and its devastating effects, so we can have a better prediction of the positive effects of a much larger project.

Project Construction

- Larose to Golden Meadow: Because of subsidence, these levees cannot provide for the same level of protection as originally designed. The levees must not only be brought back up to original design level, but increased protection through increased heights must also be made available. Restore or Retreat supports measures necessary to accomplish this.
- Coastal Impact Assistance Program: We support several projects which will begin construction with the first year of funding from the CIAP program, including the East Grand Terre Island Restoration and GIWW Bank Restoration.

Operations and Maintenance

- Davis Pond Freshwater Diversion: Restore or Retreat fully supports the ongoing operations, maintenance, monitoring and repairs for the Davis Pond project. While the project has been largely dysfunctional since its substantial completion at the beginning of the decade, it is essential this project not only operate to its original design capacity, but that it also be primed for future modifications as set forth in LCA. Again, Davis Pond is another example of bureaucratic troubles that the state can, and will, experience during project implementation.
- Barrier Island Maintenance: Spearheaded by local representative Gordon Dove, the program instituted for barrier island and shoreline stabilization and preservation is critical to re-establishing our first line of defense from storm surge.

Coastal Impact Assistance Program
Although our organization's request for funding for the federal feasibility study of the Third Delta was not granted, we are grateful for the funding for other major projects in the Barataria and Terrebonne Basins, including the Houma Navigational Canal Lock, the tri-parish long distance sediment pipeline project, and Louisiana Highway 1 improvements. By including these major regional projects for our area, the state has acknowledged the overwhelming effects of coastal land loss and salt water intrusion to our area, as well as acknowledged the importance of our region to the state and nation.

We would like to again conclude our official comments by stating that it is vital for the CPRA's Master Plan to include both near-term and long-range perspectives and to incorporate already existing and planned structural, management, and institutional components, which has not been truly incorporated in past plans. While there are many worthy projects that can be executed in the near-term for our immediate salvation, concurrent plans for long term projects should also be underway for our future. So much time, effort, and hope has already been dedicated to past efforts that, now, more than ever, the state needs to aggressively and expeditiously implement a comprehensive master plan, in coordination with the federal government and the Louisiana Recovery Authority, for the long term sustainability of our coast, communities, and culture.

Sincerely,

Simone Theriot Maloz
Executive Director

Sierra Club - Delta Chapter comments

Maura Wood <maura.wood@sierraclub.org> **Mon, Apr 2, 2007 at 3:13 PM**
To: comments@louisianacoastalplanning.org
Cc: leslie march <lesliemarch@hotmail.com>

The Honorable Kathleen Blanco
Governor
State Of Louisiana
PO Box 94004
Baton Rouge, LA 70904-90004

Lieutenant General Carl A. Strock
Commander of the US Army Corps
of Engineers and chief of Engineers
20 Massachusetts Avenue NW
Washington, DC 20014-1000

Dear Governor Blanco and Lieutenant General Carl A. Strock:

We are writing to you in reference to the Louisiana Comprehensive Master Plan for a Sustainable Coast. These comments are in addition to the joint letter we signed with other non-governmental organizations.

We applaud the efforts that have been made to pull a plan together that integrates hurricane protection and coastal restoration in a short length of time. However, we are concerned that the current draft is only the skeleton of the eventual plan and that no process has been described for making the major decisions that lie ahead. This is a concern because the draft plan relies heavily on a number of engineering proposals which would radically transform the functioning and management of Louisiana's coast.

Our major policy concerns are outlined below.

Over-reliance on Structures. We support the plan's acknowledgement that coastal restoration is necessary for long-term, sustainable hurricane protection . This leads us to question the prominent role that large structures play throughout the plan. Some of the planned structures, for example the "leaky levees," may result in increased loss of our wetlands. Because the plan lacks specific habitat goals for each basin, there is no way of considering what the impact of proposed new levees across entire basins will be. We are concerned that the science is not there to ensure that the "leaky levee" concept will work.

A key question is how building the proposed cross-basin levees will limit the options for "adaptive management" in the future. Once the hydrology and ecology of a basin have been permanently impacted, our options and opportunities for restoring coastal habitats, both inside and outside the walls, may be severely limited. In a worst-case scenario, we will be helpless to stop the cascade of ecological collapse that could result both inside and outside the levees.

We are also very concerned that a "design-build" approach is subject to political influences and insecure financial resources. The plan can offer no assurance that political will or funds will be available to implement adaptive management, or to remove structures and halt practices if they are subsequently determined to be harmful to coastal habitats.

We recognize the urgency to protect communities affected by past storms, and we support the concept of levees built along wetland/non-wetland interfaces to protect residential and urban areas. Raising levees that currently protect population centers could be an immediate priority. However, we also need to reflect upon the human errors that caused human and property loss and understand that no guarantee can exist that an engineered levee will never fail. We question the wisdom of offering communities a false sense of protection.

Coastal Habitats and Restoration. As previously noted, the plan lacks habitat goals for the various basins that will be impacted. We believe that the plan needs to consider each estuarine basin as an ecological whole, with the goal of restoring habitats to a historical, pre-development condition where possible.

While we support protecting large developed areas with levees, we also believe that non-structural habitat restoration brings with it added benefits, such as hurricane and surge protection, which will also protect the proposed levees and perhaps reduce their required height.

We are glad that the plan acknowledges the importance of sustaining coastal forests. However, the plan fails to note the urgent threat of increased pressure to cut coastal cypress forests. The statement on page 81 that the state has had best management practices (BMP) for coastal forested wetlands since 2000 is erroneous. The current state BMP manual does not mention coastal forests or acknowledge the special set of problems they face. We believe that BMPs for coastal forests should be developed in an open, public process.

While the draft plan urges that the state adopt the "policy recommendations for sustainable management of coastal forests in Louisiana" being written by an Advisory Panel commissioned by the Governor, it acknowledges that this report has not been released and therefore whether those recommendations are adequate or truly protective is unknown. The substantive and detailed recommendations of the Science Working Group appointed by the Governor have not been implemented. We believe that a plan for protection of coastal cypress forests is essential to ensure that we are not spending billions to restore coastal habitats on the one hand, while allowing coastal forests to be cut down for personal profit on the other.

We believe the state needs take action to address the concerns of landowners and to protect remaining cypress forests. The Governor and legislature have been urged by conservation and environmental groups for a number of years to direct state funds protection of coastal forests through purchase of title or conservation easements, but have failed thus far to do so. The federal funds that will be applied to coastal forest protection through the Coastal Impact Assistance Program (CIAP), currently estimated at $18 million, will need to be augmented.

We are glad that the plan mentions climate change, and hypoxia in the Gulf of Mexico, but we believe it needs to address these issues more specifically. Acknowledging that climate change and sea-level rise exist isn't enough. The State needs to follow the example of a growing number of other states and develop effective climate change policies which include greenhouse gas reductions. Likewise, increasing support for the national Action Plan for Reducing Gulf Hypoxia would be a good step towards protecting Louisiana's coastal fisheries in the interim period before a comprehensive coastal plan is funded and carried out.

Community Protection and Land Use. Our coastal communities are looking for immediate protection. In many cases, they need to have existing levees raised. What course does the plan follow that can address some immediate needs? A phased approach could involve protecting community centers first by raising existing levees.

The plan notes that "protection measures, such as appropriate land use laws and improved building practices, are key considerations," and that measures such as smart growth, elevating structures, and implementing building codes are "urgent aspects of making South Louisiana a viable place to live and work." This key component of successful community protection will apparently be addressed by a CPRA working group that will determine a strategy for implementing required actions. It is imperative that this process not be left to chance. Louisiana does not have strong track record of preventing development in wetland areas, particularly in those areas stranded behind the levees. Unless structural solutions are predicated on protective measures to prevent further development in wetlands, both inside and outside the levees, we are putting more people and businesses in harm's way.

We have seen this situation with the Morganza to the Gulf project, a hurricane protection project that will enclose 70,000 acres of wetlands. The Corps in fact identified the wetlands areas to be enclosed as "potentially developable," and there are no constraints in place on development. We believe that the plan must specify that strict land use plans be in place prior to the construction of structural solutions, and that these be enforced by local and state governments, along with federal agencies.

The plan fails to evaluate the effectiveness of various alternatives for accomplishing the goals of coastal restoration and hurricane protection. Although the plan notes difficulties that will be faced in making decisions about priorities, it doesn't provide suggestions on how that is to be done. More analysis is needed on the relative effectiveness and cost/benefit of hard structures vs. non-structural solutions that can help to provide criteria and information for the wise setting of priorities.

Also, an analysis is needed of all of the existing and approved construction projects that have been in the works for many years to determine how they fit in with the goals of coastal restoration and hurricane protection embodied in this plan or whether they are actually contrary to the plan. This includes existing navigation canals and structures, which may be working at cross-purposes to this plan by conducting salt water into coastal marshes and storm surge into coastal communities.

Money. This leads us finally to the question of funding. With the addition of the proposed massive new hurricane levee system, estimated price tags from $29 – 50 billion have been reported. This represents double or triple the $14 billion previously estimated for comprehensive coastal restoration. We have been promised large sums of money in order to make this plan reality, and the state has proposed some creative funding solutions including OCS revenues and CWPPRA and CIAP funds, yet the actual level of funding, and the scope of projects built, remains unknown at this point.

The plan is presented as a comprehensive plan, yet acknowledges that "funding constraints, institutional barriers, and technical unknowns . . . will influence which measures can be implemented first." In spite of the processes described in the plan for using the State's Annual Plan to prioritize projects in five year cycles, many uncertainties remain. Will the plan be effective if only parts of it can be built? What political uncertainties, such as the large federal debt and deficits created over the past few years could impact funding over the life of the project?

Finally, where will the money to operate and maintain the projects come from? The plan, while it

notes the need for inspection of levees, does not seem to address this issue, though we have already experienced the devastation that lack of maintenance can cause.

In conclusion, we ask that the communities, scientists, environmental organizations and commerce be allowed to continue to weigh on these plans. We ask that you consider the issues we have covered in this document, and that you consider the concerns expressed by the LCA Science Advisory Board, as well as the letter issued by local coastal scientists on March 13, 2007. This plan is probably the most important public works effort that will be created in our lifetimes. Let's heed the best science available to us, select the most effective alternatives, and use the most realistic long-range financial planning to make sure that what we can complete a plan that protects our people and our environment for generations.

Respectfully submitted by

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Tulane Institute on Water Resources Law and Policy
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Notes and Recommendations on Louisiana's Comprehensive Master Plan for a Sustainable Coast (February 2007 Draft) and Draft Annual Plan

April 1, 2007

The state has a compelling and urgent need to develop the Comprehensive Master Plan for a Sustainable Coast (Master Plan) in order to shape and inform coastal conservation, restoration and storm protection efforts at the federal, state, and local levels. At this time, such a plan must inherently be more conceptual than detailed to allow for the refinement of the science, engineering, and management process as well as for the dynamic natural and political landscapes. The February 2007 draft of the Master Plan articulates well a set of objectives, policies, and principles that to an unprecedented degree lay a foundation for a program that weds certain levels of storm protection with coastal conservation and restoration and risk reduction actions. The draft Master Plan has many strengths, including most notably:

- Its recognition that coastal Louisiana is in a state of collapse and that it will take a comprehensive public works program as ambitious as any in our nation's history to forestall this collapse.

- Its recognition of the need to maintain and enhance the natural landscape—with an emphasis on promoting natural processes—and reduce risk through development controls as essential compliments to structural and non structural storm and flood protection. The premise that a sustainable landscape is a prerequisite for storm protection and ecologic restoration is a significant policy statement and one that marks a clear departure from the policies that largely held sway in the past that viewed the natural coastal landscape as a separate issue or even as a wasteland.

- Its recognition of the reality that not all parts of our state are savable or protectable to the same extent as others.

- Its grounding of the conceptual vision of the Master Plan in the best available science and engineering. The history of coastal Louisiana over the past 100 years and the recent experience of failures in the region's hurricane protection system

reveal the need for a clear commitment to using the best science and engineering to inform and shape alternatives under the Master Plan.

- Its recognition of the dynamic nature of our coast and of the need to address the prospective impacts of climate change and sea level rise and nutrient management in the context of the state's future planning.

No plan as broad and ambitiously conceived as this one can be complete or so detailed as to be conclusive. Nor can it be without weaknesses. The balance of this report will focus on the aspects of the plan that we feel are problematic or that require additional refinement. Our review of the draft Master Plan was done with the understanding and appreciation of the State's intent to produce a plan that is both conceptual enough to frame a long term undertaking that is subject to many uncertainties and at the same time specific enough to help inform the planning the Corps of Engineers is doing and provide a platform for near term actions on certain policies, programs and projects.

It is beyond the purview of the Institute to comment on the technical aspects of plan itself but where technical questions or concerns have been raised by others, such as the Science and Engineering Review Team members, we feel obliged to take notice where their input sheds light on the policies and programs that shape the draft Master Plan.

With those caveats we offer the following observations and recommendations concerning what we see as the most significant shortcomings of the draft plan.

Provide a clear statement of what the plan is intended to achieve

A critical element of any plan is a clear statement of what it supposed to achieve. As informative and positive as the four objectives of the plan (Executive Summary and Chapter 1, pg 17-18) are, they do not constitute such a statement. With respect to storm protection, the closest statement is on page 52 which suggests that a determination has been made about which areas are vulnerable from storms with a 1% or 0.2 % chance of occurring in any given year. Even then, Appendix F suggests that those levels of protection are rooted in current conditions. There is even less clarity with regard to the outcomes of coastal conservation and restoration aspect of the plan.

The point of this plan, which is reinforced by the four objectives, should be expressed in terms that make clear what the investment of public and private funds and the attendant efforts to minimize risk are buying. Is the goal really protection from events with 1% or 0.2% chance or recurrence? If so, where do those goals come from and what do they mean? Will they ensure the affordable availability of insurance? Will they convince the Red Cross to open evacuation shelters in New Orleans or Houma instead of viewing those as places to be evacuated? In short, how does the draft plan

translate its stated objectives into goals that are meaningful in terms of ecologic, cultural and economic vitality and sustainability? The Master Plan does not say. At best it states that that urban areas such as Houma, New Orleans, and Lafayette need "very high levels of protection" (pg 57) but it offers no discussion or analysis of how or why protection against events with a 0.2 % of recurrence in any given year constitutes a "very high" level of protection. It is critical to link whatever level of risk is being planned for to some benchmarks of sustainability. The one clear metric that is driving much of the planning is the 100 year level of protection that is necessary for National Flood Insurance purposes. That is indicative of the sort of objective benchmarks that should be developed under this plan but it is doubtful that it alone will be sufficient to meet the objectives of property protection, ecologic sustainability and cultural survival.

We understand that both the State and the Army Corps of Engineers are developing risk based approaches to both define and respond to the challenges facing coastal communities. We strongly encourage this. Since neither the Master Plan nor the corresponding effort by the Army Corps of Engineers has yet expressed a clearer risk based standard that identifies and measures the risks that they are managing for, we are compelled to use the, albeit awkward and imprecise, standard that was set out by Congress in authorizing the Louisiana Coastal Protection and Restoration study which is protection against the surge associated with a Category 5 storm. We cannot emphasize enough the importance of developing a clear expression of the risks and levels of risks this Plan is attempting to manage as the foundation upon which this plan must ultimately rest.

With regard to the coastal landscape there is a similar need. While Objective 2 is helpful it provides no real context for setting expectations or measuring success. For example, we understand that, on average, the Louisiana's coast is losing about 6mm of elevation per year due to the combined effects of subsidence and sea level rise. Countering and exceeding that rate of loss is essential to the success of this Master Plan and the survival of the State's cultural, economic, and natural heritage as envisioned in the Master Plan's objectives. Yet there is no mention of this sort of metric nor of how the various recommendations in the Plan would or would not contribute to maintaining those land elevations or determining success. The essence of the landscape aspect of this Plan is the need to maintain elevations where land currently exists, build new land, and maintain or improve estuarine function. In a dynamic coast, particularly one as managed as Louisiana's, that will not always be possible, but if keeping and building land and maintaining elevation is not the aim overall then it is difficult to envision what any version of success might actually look like.

The omission of a clear statement of purpose has been a weakness of prior planning efforts such as CWPPRA and the LCA. It should not be allowed to be a weakness of this plan.

Recommendations:

- **Add a clear statement of purpose of what this plan is intended to achieve. For example: "The purpose of this plan is to achieve a south Louisiana in which people can live, invest, and do business with the confidence that they, their homes and their business are not at undue risk and that the coastal waters, lands and barrier shorelines that have shaped and sustained the communities and cultures of the region and contributed so importantly to the natural heritage and economic well being of this nation will be conserved and rehabilitated to ensure their vitality and sustainability. In the case of major urban centers it is the intention of this plan to provide a system of flood and storm protection with such a degree of confidence and safety that they will places from which it will not be necessary to evacuate even in the case of a Category 5 storm."**

- **Add a clear statement of purpose dealing with landscape maintenance and rehabilitation. At the least this must convey a sense of the degree and urgency of the land building and elevation maintenance efforts that will be necessary for the objectives of this Plan to be realized.**

- **Add a fifth objective of making major population centers safe enough from storm and flood risk to make them safe places to evacuate to rather than places to evacuate from even in a Category 5 storm and places that fit the investment profiles of major lenders and property and casualty insurers. In short, it must be the objective of this plan to honestly inspire confidence that our urban centers will be safe places to live, work, and invest not just next year but for the indefinite future. This may well require more than protecting against risks with a 1-.2% chance of recurrence in any given year. It may well turn out that this objective may not be practicably attainable, particularly in the nearer term and if that is the case then that must be disclosed. This and all the other objectives of this plan must relate directly to the stated purpose of the plan, which is discussed above.**

Ensure that all Master Plan recommendations embody the Plan's objectives

One of the most significant features of this Plan is the firmness and clarity of its recognition of the need to balance and blend coastal conservation and restoration, risk reduction efforts and structural and nonstructural storm protection to produce a coast that is ecologically sustainable and whose communities are physically secure at least to some honestly disclosed level. This conceptual framework is sound and represents perhaps the last best chance for this State to secure its future and preserve its heritage.

Despite the strength of that conceptual framework, a review of the actual elements of the Plan and the Draft Annual Plan reveals a number of provisions and recommendations that do not square with the stated objectives and aims of the Plan.

Since at least November 2006, concerns have been expressed by the Working Group for Post-Hurricane Planning, the Science Board of the Louisiana Coastal Area, an independent group of 16 scientists and engineers, and most recently in an article with 16 coauthors in the March 23, 2007 issue in the journal Science to the effect that the planning to date is dominated by hurricane protection barriers and that there is significant uncertainty about the feasibility and effectiveness of the "leaky levee" concept that is so central to some of the most critical features of the draft Master Plan. (Copies of those comments/articles are attached). Specifically, the following features of the draft plan raise concerns that a defacto policy decision has been made to elevate structural storm protection projects in priority and to allow local preferences to get ahead of the best science and engineering judgments about what is possible and advisable when it comes to selecting alternatives and siting major projects.

The apparent bias in the Plan for large linear structures, particularly earthen levees, is demonstrated by the recommendations for the Barataria Basin and the West Bank of the Mississippi River. The plan's recommendation for an outer barrier between Larose and the West Bank and the creation of a "water management area" north of the Gulf Intracoastal Waterway is problematic for three reasons.

- *There is significant doubt in the science and engineering sector about the viability of "leaky levees" being able to either provide adequate storm protection or to accommodate the ecosystem stewardship goals set forth in Plan Objective Number 2.* As noted above, substantial concerns have been raised by qualified scientific and engineering experts about the wisdom and effect of cross-basin structures such as the Donaldsonville to the Gulf project (the D-G project) and about the strength of the scientific underpinnings of the "leaky levee" concept. It is difficult to see how a plan that is supposed to be based on the best science and engineering and balance storm protection with ecosystem stewardship (see page one of Executive Summary) could be at the point of recommending, even tentatively such a project or alignment at this time. It is troublesome that the "Issues to Consider" box on page 59 frames the issues largely in terms favorable to a Gulf Intracoastal Water Way alignment. It states that it may otherwise be infeasible to raise the existing levees in the west bank of Jefferson Parish but does not mention the potential infeasibility of the GIWW alignment. It posits no other alternatives, nor does it note that the Corps of Engineers has not completed its alternatives analysis, to the GIWW alignment and summarily concludes that the status quo—the only apparent acknowledged alternative—is unacceptable. This clearly appears to be more than a conceptual level of planning.

- In its defense the plan does indicate that further analysis will be necessary but the deference to the Corps of Engineers' Donaldsonville to the Gulf Feasibility Study raises serious questions about the scope and adequacy of that analysis. This concern will be developed in our next point.

- *The levee proposal is based on an ongoing Corps of Engineers Feasibility Study for the Donaldsonville to the Gulf project, a project whose scope and purpose are radically different from the Master Plan's.* The D-G project study was authorized in 1996 before the State and the Corps were directed to develop comprehensive plans for the restoration and protection of coastal Louisiana without regard to the usual policy considerations (e.g. cost benefit ratios) and it continues to proceed in the traditional non integrated, cost-benefit focused manner. At this time the D-G study is not considering alternatives to traditional earthen levee construction techniques nor is it considering the broader role of impacts on the ecology and sustainability of the Barataria system. Indeed, based the language of the study authorization and conversations with study team members it seems clear that one of the main aims of the project is to restrict "salt water intrusion" into the system's estuarine wetlands. The study does not reference any of the more thoroughly developed characterizations of the causes of wetland loss or stress that have been developed in the Louisiana Coastal Area report, the Coast 2050 plan, or that are supposed to underlie this Master Plan. The notion that estuarine wetlands, on a basin scale, need to be protected from marine influence is as myopic as the decisions made following the 1927 flood to divorce, as a matter of policy, the coastal plain from riverine influence. There may be times when that is necessary but the case has not been made for that in this plan. In defense of the D-G study, it is still ongoing and has made no recommendations. This Master Plan however seems to have largely anticipated the outcome of that study and acquiesced to its narrow scope and effectively proposes that it be state policy to abandon the upper Barataria Basin as an estuary.

- *The proposed Watershed Management Plan for the Upper Barataria Basin reveals no management objective or program.* The two sentence summary of the Watershed Management Plan (Appendix A, page 21) for the Upper Basin does nothing to assuage the concern that the viability of the Upper Basin has been left to an afterthought. It states no management objective for the basin, does not identify who the manager (s) will be nor does it indicate where the management resources might come from. Indeed it describes only in the vaguest terms a plan to develop a plan. For such an integral feature of this levee alignment to be so unclear suggests that the sustainability and function of the landscape is in fact not the equal partner of structural storm protection.

- *The Plan's Endorsement of an Alignment for the Morganza to the Gulf Hurricane Protection Project is At Odds With the Objectives of the Plan and the Need to Apply Lessons Learned from Hurricanes Katrina and Rita.* The Morganza to the Gulf Hurricane levee project is separate but related to the D-G project. The Morganza project is much further along in its design and engineering. Indeed the local sponsor has begun construction on some parts of the project. Nonetheless, if this project is to

in fact provide the level of protection envisioned, particularly in the context of an integrated approach to coastal stewardship and risk management, it cannot proceed in a vacuum. The Master Plan recognizes that need on pages 63 and 64 but then seems to undercut that possibility by endorsing the "exisiting alignment" (See page 63). How an unauthorized project (at least at the federal level) can be said to have an existing alignment is problematic. Similarly, the endorsement of any alignment at this time seems to preclude any alignment or design modifications that might flow from sort of reanalysis called for on page 63.

The degree to which these provisions conflict with prevailing scientific and engineering thinking and the stated objectives of the Master Plan and prior coastal plans (e.g. LCA, Barataria-Terrebonne National Estuary Program Comprehensive Management Plan and the Coast 2050 plan) raise significant questions about the how well the planning and decision making processes are in fact grounded in the objectives and principles that are laid out in the plan.

Recommendations:

- **The Master Plan should be revised so as not to make clear that no alignment recommendations are being made for the D-G project or any other specific project alternatives at this time. The issue should be reframed in the broader context of how to provide enhanced storm protection, particularly for the west bank of Jefferson Parish, while facilitating the rehabilitation of the landscape so that it is consistent with the statement in the Master Plan that "a sustainable landscape is a prerequisite for storm protection...." (Master Plan page 23).**

- **All other existing and prospective hurricane protection projects such as the Morganza to the Gulf project, should be revisited to ensure that they not only provided the actual protection envisioned but that they advance the purposes and objectives of this Master Plan. Specific recommendations concerning alignments or design should be avoided until the sort of analyses and integration called for on pages 63 and 64 are completed.**

- **Additional alternatives should be developed that more fully embody the plan's objectives and that look beyond alignment alternatives for a single project.**

- **All alternatives, including the ones described in the current draft, need to consider and discuss the ability of the soils in the project area to bear the weight of the project, the source and cost of construction material, the cost and nature of long term maintenance and operation, the impact on drainage, the impact on littoral processes including sediment delivery, and the ingress and egress of transient species. These issues are recognized, at least in part,**

by the plan (Page 31) but no discussion of them seems to support the recommendations in the draft Master Plan. That needs to be addressed and should be included in the "Issue Boxes" on pages 59 and 64.

More fully develop the risk reduction and "smart growth" provisions in the Master Plan

One of the most encouraging features of the Master Plan is its recognition of the need to make land use planning, building codes and evacuation planning central features of the State's integrated approach to protecting lives and communities and the culture of the region. The plan makes a number of references to the need to prevent development in wetland area, foster sustainable coastal forests, and to strictly enforce land use controls (Pages 32, 53, 59, 78, and 80-81. This is particularly well addressed on page 78.

As strong as this language is, it is largely aspirational and dependent on local governments to enact and "strictly enforce" land use and zoning regulations (See, e.g. page 53). Given that many local governments lack any meaningful land use planning authority or the resources to more aggressively pursue planning and enforcement it is essential for the Master Plan to take stock of that fact and develop specific recommendations to address it. Presently, the plan calls for the state to provide incentives to local governments to enact region-wide land use zoning (Page 78) but does not indicate what those might be or what the state will consider doing if the incentives are not sufficient. The state currently has laws to enable local planning and zoning but they do not mandate it nor provide any guidance as to what the elements of a local plan might be. (See, e.g., Villavaso, Planning Enabling Legislation in Louisiana: A Retrospective Analysis. Loyola Law Review, vol. 45, 1999). If the state wants effective land use planning and zoning to be the basis for preventing future development in harms way or in areas to be newly protected by projects such as D-G as called for on page 59, then much more will be needed. As fundamental as this is a review of the pending annual plan reveals no projects, programs or even discussion of this issue despite the fact that it proposes to commit funds to the Morganza to the Gulf and the D-G projects which have already raised the issue of induced development. This is a critical omission that threatens to undermine the integrity of the Master Plan.

Another major concern is the absence of a meaningful discussion of what role the State can and should play in preventing inappropriate development and in conserving its wetland resources. The only reference to the State's Coastal Zone Management (CZM) Program is on page 78 where it calls for strengthening the CZM program. As necessary as that might be, there is no discussion of what that program can or should be doing now or what improvements might be needed. Surely, the State must have some idea of how both the current and improved programs might help achieve the Master Plan's objectives. It needs to clearly state what those are.

These are not abstract points. Presently there are proposals pending that would convert coastal wetlands to other uses and increase the number of people and homes and businesses in areas still lacking significant storm protection. (E.g. There is a pending request for state and local permits to develop an 83 acre residential subdivision in St. Charles Parish). The manner in which the State and local governments act in such cases will be hugely illuminating as to their ability and willingness to implement what seems to a bedrock tenet of the Master Plan.

The importance of using the State's existing authorities and identifying what more is needed goes beyond the issue of discouraging at risk development or conserving wetlands. It has been made clear in recent jurisprudence that the record of the Department of Natural Resources (and the Army Corps of Engineers) of approving nearly all permit requests for development in coastal waters and wetlands has been a factor against in the State and local levee districts in takings case connected with the provision of vital public services such as hurricane protection. See, State of Louisiana, Pontchartrain Levee District v St. Charles Airline Lands, Inc., Fifth Circuit Court of Appeals, State of Louisiana (2004). Further, continued development of wetland areas, particularly in light of the uncertain and checkered experience with mitigation, could have a direct impact on the State's cost sharing burdens under the Coastal Wetlands, Planning, Protection and Restoration Act (CWPPRA). The State's cost sharing percentage dropped from 25% to 15% under CWPPRA as a result of as Conservation Plan whose purpose is to ensure that there is no net loss of wetlands in the State's coastal zone due to development. The ability to regulate such development is directly tied to the State's pocketbook.

The importance of having a clear set of recommendations and actions dealing with risk reduction cannot be over emphasized. Of all of the features of the Master Plan these are the ones that can begin improving the safety of communities and conserving coastal wetlands and barrier shorelines immediately. No matter how aggressive the State is on enhanced storm protection and coastal restoration it will be years before any, much less significant, positive impacts are seen. The fact that the draft Annual Plan contains no recommendations or discussion on these topics is a serious shortcoming.

Recommendations:

- **Expand the discussion of land use planning, zoning and permitting in the Master Plan to cover the current state of those matters at the State and local level. Include corresponding language in the Annual Plan.**

- **Include a discussion of the sorts of incentives or mandates the State will consider in order to achieve its objectives in the context of land use and development. Include corresponding in the Annual Plan.**

- **Develop alternatives that can be pursued at the State level to ensure that the current CZM program is being used to maximum effect and to improve it as**

necessary. The latter may require legislation or modification of the CWPPRA Conservation Plan. Both will require a clear statement of purpose and will by the State.

Expand and Clarify the Management and Adaptive Management Aspects of the Master Plan

Given the all too static nature of the management of storm/flood protection and coastal conservation and restoration efforts in the past, it is encouraging to see adaptive management being embraced as a tenet of the Master Plan. Most notable is the provision calling for regular review and updating of the Master Plan, including following major unforeseen events. (See Page 85). Coupled with the more robust levee inspection program described on Page 84, the Master Plan offers a distinct improvement over past and current practices.

As welcome as those aspects of the Master Plan are, there is a general over-reliance on what is being styled "adaptive management" when it comes to some of the thornier issues facing the coast, its communities, and people. The Master Plan and the February 2007 issue of the CPRA Integrated Planning Team Newsletter (IPT newsletter) describe in general terms the sorts of monitoring, outreach, modeling, data management, and research that will be used to support adaptive management. As far as it goes this is fine, but in general these merely describe the tools for supporting adaptive management, not a process of adaptive management. In fact, it is an overall weakness of the Master Plan that it does not clearly describe a management purpose (see the discussion above) or a management structure. Adaptive management is fine but it is not a substitute for having clear management goals and a clear management structure up front.

Arguably the CPRA will be the management vehicle but at this time it is more of a confederation (and an incomplete one at that) of agencies with relevant jurisdiction than a management unit with a clear decision making process or the staff and resources to carry out the duties and burdens of management on the scale anticipated in the Master Plan. It is doubtful that as presently composed, staffed, and supported that it can provide the level of program management that will be necessary. Examples of the need for a clearer treatment of the management structure/process can be found throughout the plan. The plan makes it clear that there is an urgent need for a sediment inventory (Page 76), improving land use planning and zoning (See discussion above), strengthening the CZM program (Page 78), expanding the State's powers of expropriation (Page 80), proposing changes to federal laws/authorizations to allow for modifications of existing projects (Page 81) but it is never stated whose job it will be or what the process will be to turn these urgent needs into actual priorities under the State's Annual Plan. The Master Plan needs to significantly improvement in this regard.

Recommendations:

- **Include a section in the plan describing the current management structure the State is using to develop and implement the plan. It would be particularly useful to use the urgent needs mentioned in the preceding paragraph as examples of how that management system would work or how it will need to be revised in order to achieve its intended outcomes.**

- **Include a clear statement of what this Master Plan is intended to achieve. This was discussed earlier in this review and it also demonstrates how the plan might be improved to make it more truly integrated and comprehensive.**

These comments and recommendations are offered in the spirit of assisting the State in its efforts to craft a clear and compelling vision and frame work for achieving a coast whose future is sufficiently bright to produce the confidence that will be necessary to inspire the investment of resources, talent and effort that will essential to the success of any worthwhile plan. We would be happy to discuss any of these comments and recommendations with you and to be of any other assistance that we may be.

Respectfully Submitted,

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March 13, 2007

The Honorable Kathleen Blanco
Governor
State of Louisiana
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Baton Rouge, LA 70804-9004

Lieutenant General Carl A. Strock
Commander of the US Army Corps
of Engineers and Chief of Engineers
20 Massachusetts Avenue NW
Washington, DC 20014-1000

Dear Governor Blanco and Lieutenant General Strock,

We, the undersigned coastal scientists and engineers, are writing to express our concerns over current Army Corps of Engineers and State of Louisiana planning for the restoration and protection of the Louisiana coastal zone. Many of us have dedicated our professional lives to the study of Louisiana coastal systems and have been among the first to recommend responsive measures: together we represent more than 200 years of experience on these issues. In sum, we believe that the current federal and state plans contain several positive elements but, at bottom, rely on an engineering approach that carries high economic, structural and environmental risk, and threatens the sustainability of the very ecosystem we are all trying to save. The purpose of this letter is to alert you to these concerns and to offer to assist in resolving them.

Current coastal protection plans feature large, linear levees across coastal wetlands. Such levees fundamentally alter, and impair, coastal hydrology. The notion that levees this massive can be made coast-friendly contradicts our experience with marsh management and spoil bank projects. At present, little reliable information exists relative to their impacts on hydrology, aquatic life and fisheries, differing water and wetland types, transport of materials from the Gulf to inland marshes, and the acceleration of subsidence in leveed areas. Unless these questions can be answered positively, these levees may undermine billions of dollars of effort towards coastal restoration.

Large linear levees across coastal systems also present risks of stability and maintenance over time. The larger the levees in this environment, the greater the danger of failure. Caution would indicate placement of levee alignments along interior ridges. Greater caution is indicated in the Louisiana coastal zone because of documented fault zones, some natural and others precipitated by subsurface extraction. Caution is also called for with alignments that could funnel storm surges into coastal communities, as witnessed during Hurricane Katrina.

Some of the proposed levees also invite new development in wetlands, indeed historically such development has been their primary rationale. The current proposals would render nearly 300,000 acres of coastal wetlands vulnerable to development pressures, against which zoning and regulatory

programs have been entirely ineffective. The perpetuation of these same wetlands is the object of state restoration planning. Safeguards against new development, which would be vulnerable to increasing storm pressure and bring calls for yet more heroic structures, remain undescribed and uncertain.

Perhaps of greatest concern, despite the magnitude of the undertaking there appears to be no genuine alternative scenario. The most notable omission is an approach that would prioritize coastal restoration, and propose an appropriate mix of structural and land use measures capable of meeting that priority and sustaining the coast and its people for the next century and beyond. Objective comparison should be made of the total costs of the large linear levees, including materials, transport and perpetual maintenance, and the costs of alternative alignments and approaches.

Lastly, both federal and state plans are currently proceeding on an in-house basis, with occasional public briefings. Limited review is provided by outside experts, but only in reaction to project proposals. This process is inadequate for an endeavor of this scope, impact and risks. Because of the inherent limits of outside review, we recommend amending the existing planning structure to include more independent experts in the relevant disciplines at the planning table itself. .

In closing, we re-emphasize our desire to resolve these concerns in a constructive way. Many projects contained in the current plans should go forward on an expedited basis, with appropriate adjustments as their results are proven. The current emphasis, however, on large, linear coastal protection levees is in our view fundamentally flawed, and requires re-examination. We believe that, given their extraordinary costs and consequences, no irreversible commitments towards such levee systems should be undertaken until this re-examination takes place. We stand ready to assist in this discussion and would be pleased to meet with your representatives at an early time. For purpose of reply, you may contact Dr. John Day (johnday@lsu.edu), Dr. Eugene Turner (euturne@lsu.edu) Dr. Sherwood Gagliano (sgagliano@coastalenv.com), Dr. Robert Bea (bea@ce.berkeley.edu) and Dr. Ivor van Heerden (exnatalia@aol.com).

Respectfully submitted

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cc: Members, Louisiana Congressional Delegation
Assistant Secretary for Civil Works, United States Army
Secretary, Louisiana Department of Natural Resources
Chair, Louisiana Recovery Authority
District Engineer, New Orleans District, United States Army

NRCS comments

Paul, Britt - Alexandria, LA <britt.paul@la.usda.gov> **Mon, Apr 2, 2007 at 5:00 PM**
To: comments@louisianacoastalplanning.org, jonathanp@dnr.state.la.us
Cc: "Steyer, Cindy - Baton Rouge, LA" <cindy.steyer@la.usda.gov>, "Mallach, Troy - Lafayette, LA" <Troy.Mallach@la.usda.gov>, "Kinler, Quin - Baton Rouge, LA" <quin.kinler@la.usda.gov>

The attached letter contains NRCS comments on the coastal plans out for review. A hard copy will be mailed.

Thanks,

Britt

<<Jon Porthouse.doc>>

****

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120K

United States Department of Agriculture

NRCS

Natural Resources Conservation Service
3737 Government Street
Alexandria, LA 71302

April 2, 2007

Mr. Jon Porthouse
CPRA – Integrated Planning Team
LA Dept. of Natural Resources
P.O. Box 94396
Baton Rouge, LA 70804-9396

Dear Mr. Porthouse:

Reference is made to the three draft plans pertaining to Louisiana coastal restoration and protection that are presently out for public review: 1) Integrated Ecosystem Restoration and Hurricane Protection: Louisiana's Comprehensive Master Plan for a Sustainable Coast (Draft Master Plan); 2) Fiscal Year 2008 Annual Plan: Ecosystem Restoration and Hurricane Protection in Coastal Louisiana (Annual Plan); and 3) Louisiana Coastal Impact Assistance Plan (CIAP Plan). The Natural Resources Conservation Service provides the following comments:

DRAFT MASTER PLAN

General Comments

The State of Louisiana should adopt a structured set of restoration and protection principles to guide its assemblage of individual measures or projects. NRCS suggests the following principles:

Principle # 1. Subsidence is the root of the coastal deterioration problem; therefore, we must establish the means and processes to achieve sustainable elevation. Sustainable elevation is the key to countering increased tidal energy and flood water elevations, saltwater intrusion, decreased wetland production and ability to cope with stressors – particularly in the face of accelerated sea level rise. Wetlands must be viewed as "critical infrastructure."

Principle # 2. While new and/or improved levees are a necessary component in many areas, a plan dominated by, or with a primary focus on, large levees that bisect wetland basins will not be sustainable in the long-term and would be detrimental to existing wetlands. Enclosing large tracts of wetlands within levees will increase the difficulty of sustaining those wetlands. Rather than pushing new levees further and further gulfward, the levees should be aligned more inland with extensive sustainable wetlands gulfward from the levees. The gulfward wetlands would serve to stabilize and protect the levees.

Principle # 3. A combination of mechanical applications and natural processes must be used to restore and sustain the coastal ecosystem at a sufficient level and in a timely manner. Mechanical applications are needed to: a) restore critical wetlands, barrier islands, and selected

natural ridges, b) build additional elevated habitats, and c) redirect freshwater and sediment to the receiving wetlands. Natural processes, including river diversions, freshwater distribution networks, and wetland productivity and resiliency are needed for long-term stability and function, and to avoid costly long-term mechanical maintenance. Natural processes alone, including major river modifications, will not solve the problems in a timely manner.

Principle # 4. The long-term vision must be to re-establish a sustainable and functional coast long into the future, and we must identify explicit short-, mid- and long-term actions to achieve that vision. It could take decades to select, design, and construct all the measures necessary to achieve that vision, so the vision and actions must be supported by well-defined goals and terminology, that do not change or "morph" due to convenience. We already see examples of concepts "morphing" in the planning process; for example, the "leaky levee" concept has been described many ways, depending on who the audience is and/or what the presenter wants the audience to hear. We must embark on many measures simultaneously, doing what we can, as we can. Abandoning agreed-to principles or concepts along the way would jeopardize the validity of the vision. The proposed reliance on the "Annual Plan" to guide implementation could promote year-to-year shifts in focus and changes in direction. Before complex measures can be implemented for long-term benefit, "short-term politics" could dictate a change of course.

With those principles in mind, NRCS makes the following specific recommendations:

Recommendation # 1. Immediately maximize the use of existing structures for freshwater introduction. Examples include Davis Pond, Caernarvon, Naomi, West Pointe a la Hache, and Bonnet Carre.

Recommendation # 2. Using mechanical methods, restore and/or construct critical landscape features. These would include: a) wetlands immediately gulfward of existing levees and critical infrastructure that are most threatened by storm surge; b) those historical natural ridges whose restoration would have a significant dampening effect on storm surge; c) in each of the Deltaic Plain basins, a linear elevated landform (up to 8 feet high and 1,000 feet wide) to be generally located just above the heads of the bays and sounds and flanked with marsh and including periodic openings and/or low elevation sections to allow tidal connectivity; and d) barrier islands and shorelines. Sequenced construction of prioritized areas must be done in order to hold the line as quickly as possible and expand from there.

Early in the Master Plan development process, the use of mechanical methods was juxtaposed against the sole reliance upon river diversions. This approach in plan formulation, however, precluded considerations for coupling of these two methodologies to maximize synergistic effects. NRCS supports the shift in approach in the latest Draft Master Plan version, as discussed in the *Marsh Creation* section (Chapter 3, page 40), where combinations of methods are considered for maximum, timely benefits (Principle #3).

Recommendation # 3. In the upper to mid basins, re-connect the Atchafalaya and Mississippi Rivers to the estuaries to provide sufficient quantities of freshwater and sediment to maintain existing and newly restored/constructed landforms. In the mid to lower reaches of the Mississippi River, construct diversions of sufficient size to build new wetlands in fragmented and open water areas, but not so large as to completely eliminate the basins' estuarine gradient and habitat diversity that make these areas so productive and valuable. The "diversions" should be of sufficient size and number to allow rotational, pulsing, or additive use in an adaptive management fashion – it would probably not be desirable to flow the maximum amount of freshwater simultaneously or each and every year.

Recommendation # 4. Enclosing large tracts of wetland within a levee will increase the difficulty of sustaining those wetlands, while placing the levee feature in a position much more vulnerable to storm events. Discussions in the Draft Master Plan's Executive Summary, in the *Basic Assumptions* section (Chapter 2, page 23), in the *Consider the Entire System* section (Chapter 3, pages 52-53, and in the definition of Multiple Lines of Defense (Chapter 2, page 25), all appear to support the above point and the second principle NRCS suggests. Yet, the proposed GIWW levee alignment (*Barataria Basin and the West Bank,* Chapter 3, page 58) in PU 2 contradicts that discussion. By enclosing nearly two-thirds of the Barataria Basin wetland areas, this alignment could severely impact future opportunities to reach wetland sustainability goals, and thereby threaten sustainability of that levee reach itself. Additionally, the brief discussion relating to the selection of the GIWW alignment appears to eliminate, up front, consideration of upgrading the existing west bank levee system and protecting that with significant restoration of the basin's wetlands as a "multiple lines of defense" alternative. NRCS suggests that the Highway 90 Alternative alignment be considered.

Recommendation # 5. A large controversy exists with regard to expected impacts and benefits resulting from significant use of the Bonnet Carre diversion structure. NRCS suggests that the Master Plan include a thorough investigation of this issue, utilizing the ecosystem response information available from the most recent major flood events, and conducting comprehensive data collection throughout the Pontchartrain Basin during future events. In keeping with the desire to coordinate amongst the various coastal programs, a request should be made to the LCA Science and Technology Group to include this as one of its thrust areas to reduce scientific uncertainty.

Specific Comments

Recommendation # 6. NRCS supports installation of salinity control measures at the southern end of the Calcasieu Ship Channel and Sabine River; in this area, there is no Mississippi- or Atchafalaya-sized river to buffer wide salinity fluctuations. Currently, the refuges and many private landowners have established management levees and hydrologic controls at the perimeter

of Calcasieu and Sabine Lakes in an effort to stabilize salinity. However, this has reduced the natural exchange of water and nutrients across the shoreline. With salinity control at the Gulf, management levees and interior hydrologic controls could potentially be reduced. This would benefit very large areas of wetlands by moderating salinity and allowing more natural water, organism, and material exchange.

Recommendation # 7. Install protection measures on critical shorelines where there is insufficient freshwater, sediment, or other resources for those shorelines to maintain themselves in the long term. Specifically, shoreline stabilization must be considered at the heads of Barataria, Terrebonne and Timbalier Bays to immediately arrest enlargement of these bays while up-basin wetlands are being restored.

Recommendation # 8. Address problematic navigation channels such as MRGO, GIWW, and HNC using appropriate measures that might include locks, partial closure, and/or complete closure, and also bank line stabilization in critical areas.

Recommendation #9. Consider utilizing oilfield/navigation canals that run parallel to the coast as storm buffering systems, by raising their existing spoil banks to mimic ridges, wetlands and chenieres that provided a storm drag function but have been lost through erosion/subsidence. Maximize use of existing spoil bank footprints to eliminate/minimize loss of additional wetlands.

Suggestions for Clarification:

It is unclear how the USACE's LACPR report will be integrated into the State Master Plan. It is important to identify the procedure for incorporating recommended projects/ideas from LACPR into the State Master Plan.

A brief description of the overall monitoring and data collection program should be provided in the Master Plan. This should include a discussion of what existing data collection programs would be used, including the parameters they monitor, and how the information would be used to feed-back into assessment and improvement of the Master Plan (i.e., adaptive management, the State Annual Plan, etc.).

Chapter 1, Page 19 Step #4 – The process used to develop the first two alternatives should be clearly described. That process should be well documented and easy to understand in the Master Plan. Also, the plan should clearly define how the two alternatives are different.

Chapter 2, Page 34 – Information about sediment resources is available and could be used to estimate annual marsh creation acreage. Those acreages would be important when evaluating alternatives.

Chapter 3, Page 35 The Draft Master Plan – The goal of the Master Plan should be clearly stated in the first paragraph.

Chapter 3, Page 38, Figure 5 – The large yellow arrow indicating Atchafalaya River introduction directly into the north Penchant marshes in PU-3b should be corrected or clarified.

Chapter 3, Page 39 Land sustaining diversions – River diversions may not prevent further land loss in targeted areas. Diversions may reduce land loss or even offset it, but in areas of floating marsh diversions may temporarily increase land loss.

ANNUAL PLAN

General Comments

Chapter 3 indicates that "… the Annual Plan is intended to represent an incremental step in implementation of this Master Plan". Using the "Annual Plan" for prioritizing and sequencing the implementation of individual measures creates a concern that there could be year-to-year shifts in focus and changes in direction. Before complex measures can be implemented for long-term benefit, "short-term politics" could dictate a change of course.

With the FY08 Annual Plan being the first such plan to "…begin the process of realigning these existing activities toward implementation of the Master Plan," this plan should first define the process of how the listed "Urgent Early Action Measures" were identified/selected. Secondly, because the 54 "Urgent Early Action Measures" cannot be implemented simultaneously, the plan should define the process of how those measures will be prioritized. That way, review of the draft plan would also include review of the selection and prioritization processes.

Specific Comments

Section 2.3.2.1 describes and identifies the state share of funding for Operation of Maintenance of CWPPRA projects. Previous annual plans have specifically identified projects for which the CWPPRA Task Force has approved increased operation and maintenance funding since the previous year's annual plan. Additionally, previous annual plans have reported on the Coastwide Nutria Control Program and identified the state's share of funding for the upcoming year. Through direct communication with DNR personnel (Mr. Andrew Beall, Mr. Chet Fruge, and Mr. David Burkholder), it is our understanding that this Section is already being revised to address the full extent of CWPPRA Operation and maintenance.

Section 2.4.3 describes and identifies the state share of funding for Biological Monitoring of CWPPRA projects. This section should include a description of the Coastwide Reference Monitoring System.

Specific Recommendations:

Recommendation #1. Immediately close the two major cuts at the Schooner Bayou Locks in Planning Unit 4 (PU 4).

Recommendation #2. Initiate planning for the Red River Diversion project. This complex project will take a long period of time to implement; therefore, work at the local level should begin now.

Recommendation #3. Include the Bayou Tigre Watershed Proposal in the Annual Plan for PU 4 to prevent flooding in the Erath area.

Recommendation #4. Include the Hebert Canal Resource Plan in the Annual Plan for PU 4. This component would protect all areas from the Vermilion River to the 7th Ward Canal below LA Hwy 82.

COASTAL IMPACT ASSISTANCE PLAN

General Comment

Consider including funding for Operations and Maintenance into the CIAP program or individual project plans. Citizens are concerned that without built-in O&M, good projects can become ineffective or cause problems.

NRCS appreciates the opportunity to provide comments. Please address any questions or requests for further information to Mr. Britt Paul at britt.paul@la.usda.gov, or (318) 473-7756.

Sincerely,

Donald W. Gohmert
State Conservationist

Integrated Ecosystem Restoration and Hurricane Protection: Louisiana's Comprehensive Master Plan for a Sustainable Coast

Appendix C (Part 2): Public, Stakeholder, and Scientific/Technical Comment and Review of the November 2006 Preliminary Draft Master Plan

Coastal Protection and Restoration Authority of Louisiana

April 2007

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1.0 Coastal Protection and Restoration Authority (CPRA) Public Meetings November 29-30, 2006

The November 2006 Preliminary Draft of the Comprehensive Coastal Protection Master Plan for Louisiana (Preliminary Draft Plan) was released to the public Wednesday, November 29, 2006. The Preliminary Draft Plan was made available to the public on the internet (www.louisianacoastalplanning.org) and at public meetings held in New Orleans, Houma, and Lake Charles by the Coastal Protection and Restoration Authority (Table 1.1). Local officials, residents, and other stakeholders gathered to review and provide comments to the CPRA on the state's first plan to restore and protect the coast

Attendees were also informed about the upcoming meetings/open house workshops to be held in December 2006 by the CPRA's Integrated Planning Team (IPT). Copies of the Preliminary Draft Plan were distributed at all of the public meetings and the website address was provided where the appendices for the Preliminary Draft Plan could be downloaded. Copies of the Preliminary Draft were also sent to parish libraries.

At the request of the CPRA, the IPT attended each of these meetings and was available to answer questions. A summary of the comments received during these meetings can be found in Section 5.1 of this Appendix. Transcripts from each of the meetings can be found in Section 5.3 of this Appendix.

Table 1.1 CPRA November Public Meetings

Lindy Boggs Conference Center 2000 Lakeshore Drive New Orleans, Louisiana	Wednesday, November 29, 2006 9:30 am to 11:30 am
Houma Terrebonne Civic Center 346 Civic Center Boulevard Houma, Louisiana	Wednesday, November 29, 2006 2:30 pm to 4:30 pm
Lake Charles Civic Center 900 Lakeshore Drive Lake Charles, Louisiana	Thursday, November 30, 2006 1:30 pm to 3:30 pm

2.0 Public Meetings/Open House Workshops sponsored by the Coastal Protection and Restoration Authority - Integrated Planning Team (IPT) December 11-15, 2006

Public meetings in conjunction with open house workshops were held during December 2006 (Table 2.1). Attendees had the opportunity to ask questions, voice opinions, and provide suggestions and critical input on the Preliminary Draft Plan to the CPRA Integrated Planning Team (IPT). Public meetings were conducted in New Orleans, Covington, Houma, Abbeville, and Lake Charles, Louisiana. In addition, Plaquemines Parish hosted a public meeting in Belle Chase to provide residents of Plaquemines Parish with an additional opportunity to provide input on the Preliminary Draft Plan.

During the open house, display boards were provided around the room depicting elements of the Preliminary Draft Plan. Displays included maps of proposed measures, maps of 1.0% and 0.2% Storm Surge Attenuation, comments received during interagency technical team (ITT) meetings, science and engineering review team (SERT) meetings, and stakeholder comments received through November 2006. Informational packets were distributed to attendees containing a copy of the Preliminary Draft, a list and map of proposed measures, and comment forms.

During the public meetings, members of the IPT presented the Preliminary Draft Plan and received formal comments on the Preliminary Draft Plan. A summary of the comments received during these meetings can be found in Section 5.2 of this Appendix. Transcripts from each of the meetings and written comments received on the comment forms provided, as well as other written comments, can be found in Section 5.3 of this Appendix. The deadline given for receiving written comments was January 5, 2007.

Table 2.1 CPRA IPT December Public Meetings/Open House Workshop s

Houma Terrebonne Civic Center 346 Civic Center Boulevard Houma, Louisiana	Monday, December 11, 2006 Open House 2:00 pm to 6:30 pm Public Meeting 6:30 pm
Lindy Boggs Conference Center 2000 Lakeshore Drive New Orleans, Louisiana	Tuesday, December 12, 2006 Open House 12:00 pm to 6:30 pm Public Meeting 6:30 pm
Lake Charles Civic Center 900 Lakeshore Drive Lake Charles, Louisiana	Wednesday, December 13, 2006 Open House 3:00 pm to 6:30 pm Public Meeting 6:30 pm
Greater Covington Center 317 North Jefferson Avenue Covington, Louisiana	Thursday, December 14, 2006 Open House 2:00 pm to 7:00 pm Public Meeting 7:00 pm
AA Comeaux Youth, Inc. 300 AA Comeaux Memorial Dr., Ste. 200 Abbeville, Louisiana	Friday, December 15, 2006 Open House 2:00 pm to 6:30 pm Public Meeting 6:30 pm

Table 2.2 Plaquemines Parish Sponsored Public Meeting

Belle Chase Auditorium 8398 Highway 23 Belle Chase, LA 70037	Tuesday, December 12, 2006

3.0 SERT and LCA Science Board Comments

The Science and Engineering Review Team (SERT) and the Louisiana Coastal Area (LCA) Science Board conducted independent reviews of the Preliminary Draft Plan. The purpose of the independent review was to provide candid and critical comments to assist the IPT in making the subsequent draft of the Preliminary Draft Plan as sound as possible. The SERT meeting was held January 9, 2007, from 8:30 am to 5:00 pm, on the campus of the Louisiana State University, and the LCA Science Board meeting was held December 13-14, 2006, in New Orleans. Comments provided to the e CPRA-IPT on the preliminary draft by the SERT and LCA Science Board are provided in their entirety in the beginning of Section 5.3.

4.0 National Environmental Organizations Meeting

At the request of Environmental Defense, Sidney Coffee, Randy Hanchey, and Jon Porthouse met with representatives of Environmental Defense, National Audubon Society, and National Wildlife Federation to discuss the Preliminary Draft Plan. The meeting took place on January 11, from 8:00 a.m. until 11:30 a.m. at the Environmental Defense offices in Washington D.C. and facilitated their understanding of the Preliminary Draft Master Plan prior to their submission of written comments.

The following is a summary of comments from National Environmental Organization members.

4.1 Summary of National Environmental Organizations Meeting

1. The levee protection and wetland restoration proposals do not appear to be integrated.
2. The Draft Plan does a good job of describing the magnitude of coastal wetland degradation in Louisiana.
3. It is unclear what the Plan proposes to address "extreme rates of land loss" and restoration on the coast of central Louisiana.
4. The Plan does not include effective use of Atchafalaya River water and sediment as a strategy for large-scale protection and restoration in central and eastern Terrebonne parish via a third outlet through the east guide levee; nor does it consider some kind of large diversion or sediment conveyance strategy for the central coast on either side of Bayou Lafourche beyond the very small, 1000cfs Bayou Lafourche project.
5. No rationale is presented for having both a 0.2% and a 1% levee protection alignment for major parts of the coast.
6. There has been no analysis showing that such a large complex system of levees is either affordable or technically feasible.
7. State Priorities:
   - Closure of the MRGO
   - The State must reverse the land loss process and restore wetlands. The second priority must be rapid planning and construction of major land-building diversions such as the lower Mississippi River diversion and the Atchafalaya third outlet.
   - Focus levee construction effort on building ring levees around dense urban populations.
   - Those outside of the ring levees must be given real tools to survive and thrive. People can plan for the future if elevation, structural fortification, and relocation into protected areas are made serious and supported.
8. All recommendations of the National Academy of American Society of Civil Engineers should be addressed to show how these recommendations will be followed in the next master planning process.
9. A remarkable team of scientists and engineers should be assembled to lead the State planning efforts and not just serve as a review capacity.
10. Encourage the State to identify remaining steps and uncertainties, while establishing a decision timeline and stakeholder/scientific committees to help resolve details and make effective decisions.
11. The Draft Master Plan must go further to lay out an administrative strategy for accomplishing goals of Act 8, specifically identifying the mechanisms to ensure that restoration and protection actions of

local, state, and federal agencies are effectively integrated across jurisdictional boundaries, and for financing the Plan.

12. The Master Plan does not clearly present an ecologically sound vision of integrated coastal defense and restoration that could garner public support at both the local and national levels.
13. Technical Concerns:
    - The draft does not describe itself as rooted in natural functions
    - Additional restoration alternatives should be discussed
    - Dynamic system change must be addressed
    - Flood protection and the issue of leaky levees should be addressed
    - Long distance conveyance of sediment raises concern. This technique is extremely expensive and consideration should be given to more cost effective approaches.
14. Correct to propose total closure of the MRGO and restoration on the east side of the River with some sort of levee structures.
15. The MRGO channel should be restricted in specific locations in terms of its width and depth.
16. Redesign the MRGO channel to retard the flow of freshwater from Violet and elsewhere.
17. The IHNC lock has no place in the Plan.
18. It is unclear from the Draft Plan what is proposed for ridges.
19. The Myrtle Grove diversion and sediment conveyance to be very high priorities.
20. A sediment pipeline should be considered to convey sediment towards the western part of Bara aria Basin.
21. Consider a far more ambitious Bayou Lafourche Project.
22. Proceed with the lower Mississippi River diversion.
23. Protect communities that are still inhabited in coastal areas with ring levees coupled with provision for evacuation. This would allow consideration for a lower river management plan that would include dismantling of large stretches of levee so that river overbank flooding and sediment dispersal could be accomplished cost-effectively.
24. The Plan should provide a time schedule for convening an internationally renowned group of experts to design the basic parameters of such a strategy for letting the river loose and providing for navigation through some kind of elongated lock structure.
25. Address the operation of the Old River Control Structure for optimizing flow distribution between the Atchafalaya and Mississippi Rivers.
26. The dual levee alignment from the Mississippi River to the Texas border is viewed as environmentally destructive, expensive, infeasible, and counter productive.
27. The management plan for the Chenier Plain should be rethought to consider that change is inevitable. Suspended sediment in nearshore Gulf waters should be considered for rebuilding and maintaining the coastal marsh fringe, especially below and immediately above HWY 82.
28. Freshwater, sediment, and nutrients from the Sabine, Calcasieu, and Mermentau Rivers should be considered as resources for management.
29. A revised Plan should consider management of part of the area in the Chenier Plain that is now fresh to slowly convert it to more saline conditions so that hurricane overtopping will not affect the area as strongly.

30. Levees proposed in the Ponchartrain Basin must be supported with detailed and independent soils and engineering analysis.
31. Diversion structures and sail-through lock structures on the Mississippi River should be considered as ways to shunt water from one side of the River to the other during a storm.
32. The levee alignment for the Barataria Basin should be moved north to just south of HWY 90 and be positioned at the base of the natural levees on the Mississippi River and Bayou Lafourche.
33. Sub-Province 3 seems too heterogeneous. Recommend that these two areas be considered independently.
34. Other options to the third channel from the Mississippi River:
    - Constructing the third channel from the Atchafalaya.
    - Using fluid sediment enrichment with continuing fresh water input from the Atchafalaya of Mississippi.
    - Using slurry pipelines to deliver sediment and freshwater, either for new marsh formation or for nourishment of marshes restored using fluid sediment enrichment.

5.0 Summary of Public Comment

All comments made at the public meetings, as well as those provided by mail or email on the Preliminary Draft Plan were reviewed. The following is a summary of the comments/suggestions given.

5.1 Summary of Public Comment- November Public Meetings

5.1.1 New Orleans Public Meeting

1. Aspire to protection beyond the 500 year protection that is proposed for population centers.
2. Levee alignments must be technically and practicably feasible.
3. Would like to commend the team for the amount of work that was put into this Plan.
4. Commend closure of the MRGO.
5. Physical closure of the Bayou La Loutre Ridge is essential to anything that we do in the future.
6. The use of Bayou La Loutre to move freshwater and sediments to rehabilitate the area is essential to any long-term solution.
7. Restoration of the coast on the east bank of Plaquemines parish should be included.
8. Dividing Plaquemines parish east to west is unacceptable.
9. Sustain and restore the Biloxi marsh.
10. Would like to commend the team for having an open door policy about suggestions/comments regarding the Plan.
11. 17 items /projects were agreed upon at the Stakeholders meetings with the USACE during the meetings in regards to the de-authorization of the MRGO. These items/projects should be included within the plan as they are associated with the MRGO and Lake Ponchartrain Basin Region. (List of consensus items was not provided at this meeting)
12. Alternative of freshwater diversion and sediment pipeline delivery system should replace the Mississippi River diversion east and west just below Myrtle Grove.
13. If channels are placed below Myrtle Grove, locks should be placed within the channels to prevent storm surge from moving up them.
14. The Plan looks wonderful. Can see that a lot of work has gone into it.
15. Push for independent peer review for the USACE.
16. Complete closure of the MRGO is agreed with.
17. 500 year protection for all of Plaquemines parish should be provided.
18. Protection of HWY 23 should be included.
19. Using existing footprints along the east and west banks of Plaquemines parish.
20. Certification of levees must be taken into consideration.
21. Understand that implementation of restoration plans must occur.
22. Agree with sediment pipeline, transport strategy, the harvesting of the river bed, the Mississippi River bed, the Atchafalaya offshore sources, and transport those long distances to create marshes.
23. Small and medium diversions used to sustain created coastal landscapes are essential.
24. Prefer the HWY 90 alignment to the alignment along the Intracoastal.

25. Gates along the Rigolets and Chef Pass must be built to maintain the hydraulic integrity of the Basin.
26. Plaquemines parish, St. Bernard, and other coastal parishes should be represented on the Board.
27. Encourage protection of the East Orleans Landbridge.
28. Wetlands between the shores of Lake Borgne and the Intracoastal Waterway must be strengthened and enhanced as part of the estuary system.
29. A sand ridge comprised of the CSX Railroad should be incorporated into the layering system. It could be protected, elevated, and enhanced. It is a barrier contribution.
30. Levee protection provided for Scarsdale to White Ditch.

5.1.2 Houma Public Meeting

1. Reconsider the levels of protection for the South Lafourche district.
2. Consider a level of protection between 100 and 500 year protection for the South Lafourche district.
3. 500 year level of protection should be further south along the coast.
4. In favor of the saltwater structure between Valentine and Larose to slow down saltwater intrusion.
5. Add freshwater to Bayou Lafourche.
6. Additional pumps should be installed in Donaldsonville.
7. Concerned for Barataria Estuaries.
8. In favor of Morganza to the Gulf.
9. Barrier Islands should be the first line of defense.
10. Barrier Island restoration should be a priority.
11. Disapprove of the entire project.
12. Impact of a levee along the Intercoastal Canal across the state is ludicrous.
13. In favor of narrowing the Passes.
14. Reconsider building levees.
15. Rebuild Wine Island.
16. Would like to thank the CPRA and CPRA-IPT for allowing the public to voice their concerns and give suggestions for additions/omissions from the Plan.
17. Everyone should be protected equally.
18. Marsh restoration should be a priority.
19. Disapprove of the Lafourche levee.
20. In agreement with multiple lines of defense.
21. Need for drainage systems.
22. Reroute the Intracoastal Canal to pass below the highways.
23. After rerouting the Intracoastal canal, place levees along the backside of it for protection and add floodgates at each of the bayous.
24. One-way valves should be installed in the levees to allow freshwater to be supplied to the marsh.
25. Agree with pipeline conveyance of sediment.
26. Rebuild the wetlands into Terrebonne Parish.

27. Move the 500 year protection away from New Orleans to the Rigolets and add control structures similar to the Dutch designs.
28. Disband CWPA.
29. Add maritime ridges to the Plan.
30. Remove regulations that prevent landowners from placing bulkheads on their property.
31. In the South Lafourche area, either add 500 year protection or redundant levees ongoing from Golden Meadow to Terrebonne and one from Golden Meadow to Plaquemines parish.
32. Stress the importance of maintaining the existing footprint for the hurricane levee protection system for Morganza to the Gulf.
33. Infrastructure has to be rebuilt in order to rebuild the marshes.
34. Recommend removing the entire pump system of Bayou Lafourche and reconnecting it to the Mississippi River as it was once.
35. Canals should be utilized for sediment conveyance.
36. Recommend the placement of limestone below the seawall where the marsh is in the Atchafalaya.
37. Rebuild all of the marsh using the sediment deposited in the Gulf. Do the same things for the east side of the Mississippi River and dig a channel connecting it to the Pearl River for more sediment.
38. Would like to commend the CPRA for sharing the Plan/information with the public.

5.1.3 Lake Charles Public Meeting

1. Shoreline protection should be added for Calcasieu Lake and Sabine Lake.
2. Restoration of the Cheniers should be addressed.
3. Hydrologic modifications should be accentuated in the plan for the Southwest. The Cameron Creole Watershed should be used as the model.
4. Incorporate beneficial use of dredge coral from every channel in Southwest Louisiana in conjunction with hydrologic restoration.
5. Repair the damages of the Creole Watershed.
6. Maintenance of projects must she taken into account for these projects.
7. A lock system should be installed on the Mermentau River outlet and the other river should be opened. (Original channel)
8. Beneficial use from offshore should be incorporated.
9. Wetland management through hydrologic restoration should be incorporated

5.2 Summary of Public Comments- December Public Meetings/ Open House Workshops

All comments, including those submitted in writing as well as those comments presented at the public meetings/open house workshops, were grouped according to planning units and comments that do not have specific planning unit affiliation were assigned to planning unit designation based on commenter's location of residence. The comments which deal with document content rather than specific measures

associated with planning units are classified under the miscellaneous/general comments section. Repeated comments/issues are not mentioned.

5.2.1 Deltaic Plain

5.2.1.1 Planning Unit 1

1. Mississippi River diversion should be to the east to help Plaquemines Parish and not to divert to the populated region in the west bank.
2. Non-federal levee on the east bank should be fully rebuilt and over time build to cat 5 protection levels.
3. Inclusion of Wills point Mississippi River levee should be included as part of the hurricane levee system
4. Drainage issues should be addressed for east and west banks of Plaquemines Parish.
5. Shoreline protection is needed from the northeast to southwest for the Biloxi marsh complex.
6. Chandeleur Island restoration to historic conditions including hard structures seaward side.
7. Restoration of La Loutre ridge east of MRGO and bank stabilization along bayou La Loutre.
8. Additional shoreline protection to the seaward shoreline both north and south of MRGO for the Biloxi Marsh.
9. Freshwater conveyance channels should have a saltwater barrier by means of adequate freshwater flow or salinity control structures.
10. Agreement with Violet Diversion.
11. Expand marsh creation between Bayou La Loutre ridge and MRGO.
12. Shoreline protection and marsh creation for MRGO.
13. CPRA plan does not go far enough into Ponchartrain Basin.
14. Seawall/levee/bridge proposal must account for movements to the west and north-south slip should accompany arrangements for fault line movement on the Rigolets.
15. Mississippi River should not be diverted to east and west of Plaquemines Parish. Wetlands should be created using the sand from the River mouth. Back levees of the east and west banks should be certified (?). These levees should be built to 100 yr protection. Protect National Monuments such as Fort Jackson and Fort St. Phillip. Measure- freshwater diversion at Braithwaite should be removed since it will impact wetlands.
16. High priority for restoration and low priority for new levee construction.
17. Priority of Implementation: PD 1-12; Pd 1-24, D-9 (?), restoration of Chandeleur Islands, PD 1-19.
18. Restoration of Chandeleur and natural flow from Crown Point to restore wetlands at minimum cost.
19. Lower Plaquemines Parish should not be left out of the Plan.
20. How does the Plan addresses the buyout/compensation to businesses impacted by the Plan.
21. Wetland restoration as priority.
22. Follow Dr. Gagliano's diversion plan.
23. We fear levees.

24. Alternate route for I-49 from Raceland to the Westbank in Jefferson Parish is to go south of HWY 90. The difference in money could be used mitigation and the build of a parallel highway could reduce building disruptions along a busy corridor.
25. Levee alignments need timelines for completion.
26. Build an elevated highway from Lafitte to Larose alongside the levee alignment.
27. Bonne Carre- outflow management projects should be used to divert water back into the surrounding wetlands.

5.2.1.2 Planning Unit 2

1. South Lafourche levee systems should have more than 1% protection (0.2% protection) (repeated comments).
2. Higher protection is required between Golden Meadow and Point Au Chien.
3. Utilize Donaldsonville to Gulf Alignment (repeated comments).
4. 10th Ward levee height should be equal to new LA1 highway elevation.
5. Use dredges of 100 inch for coastal marsh and barrier island restoration.
6. Consider jetties and barges for shoreline protection as in Grand Isle and Port Fourchon.
7. First line of protection should be the first project completed.
8. Construct the Morganza to the Gulf levee alignment (repeated comments).
9. Fund the conversion of the Larose and Golden Meadow flood gates to operational locks (repeated comments).
10. We do not want 18 ft+ levees.
11. Spent money on non-obstructed spillways to reestablish ecosystem (repeated comments).
12. Development of deep water outlet to avoid spending on maintenance dredging.
13. Support the GIWW alignment.
14. Speed up all levee alignment construction such as Larose to Plaquemines- Mississippi River.
15. No sense to have levees lower than hurricane evacuation routes.
16. The Plan should have a goal to achieve wetland restoration.
17. Oil and Gas industry should implement improvements to minimize future wetland impacts.
18. Targeted engineering should be utilized by the oil and gas industry to minimize impacts.
19. Energy related impacts should be minimized by incorporating mitigation and other incentive measures. The Plan should address this.
20. An objective, “zero net wetland loss”, should be added to the Plan.
21. The State should indulge in radical redesign of the coast, such as Plaquemines Parish.
22. Plaquemines Parish should receive the same level of protection that other communities receive.
23. Balance the natural system from the outside in.
24. River Jetties are detrimental. Address this issue. Appendix A and I. suggest measures to alleviate the problems caused by jetties.
25. Incorporate multiple levels of defense for Plaquemines parish.
26. Suggested Measures:

- Rebuild Breton Island
- Build a ridge from Taylor Pass to the River along Baptiste Collette
- Rebuild critical marshland on the east bank of Plaquemines
- Fill in unnecessary canals, stabilize shorelines
- Beneficial use of dredge material should be a law
- PD-2-14 should be extended further south along Grand Bayou, across the Freeport Sulphur Canal into the existing Grand bayou Shoreline
- Extend measure PD-2-13 to extend from Grand Bayou ridge south of Port Sulphur
- Stabilize shorelines along Barataria Bay, Ecaille, and Lake Washington
- Medium size freshwater diversion at Port Sulphur and one below Port Jackson
- Freeport Sulphur Canal shoreline stabilization
- Redesign/removal of jetties
- D-3 should be moved to an area south of Venice
- Rock jetties located at the bottom of the MRGO should be removed and rocks should be used to reduce the profile at the land end

27. Establish sediment traps for mining.
28. All parishes that were impacted by this Plan should have permanent representation on the CPRA Board.
29. An extensive and intensive vegetative planting should be part of the Plan.
30. Include Lafitte-Barataria, Crown Point area, inside Donaldsonville to the Gulf Levee system.
31. Dredge the River and utilize dredge material to build land on both sides in Plaquemines Parish.
32. Reintroduction of freshwater into Bayou Lafourche.
33. Current pumping system is inefficient in Buras.
34. Focus on Bayou Lafourche freshwater diversion proportionate to the priority that State has given the project.

5.2.1.3 Planning Unit 3a

1. Disagreement with increasing Atchafalaya River influence in Terrebonne marshes through GIWW. Need further analysis to determine the effects on floating marshes and spoil banks.
2. Support 3a-6 (Bankline Protection from GIWW).
3. POI- Bypass flood gate should have a minimum of 200 ft wide and 22 ft deep to accommodate AGMAC.
4. Reconsider the alignment for Terrebonne to include Thompson Road.
5. Callais wishes to sign an agreement with Louisiana to offer his coastal solution.
6. Reroute ICWW further south, which will make a freshwater source.
7. An alternate levee alignment located between HNC lock eastwardly to the bottom of the existing Terrebonne Parish Levee on Lower bayou Dularge.
8. All efforts should be made to keep La-1 open all of the time.
9. Protect the infrastructure for the oil and gas industry.
10. Significance of Lafourche corridor should be recognized.

11. Fully incorporate a second line defense north of the Barrier Island and just south of the community between the Mississippi and Atchafalaya Rivers.
12. Utilize the mined sand from GOM for barrier island restoration.
13. Consider manufacturing super dredges for the restoration of Barrier Islands.
14. Provide freshwater through Terrebonne Bay down to and beyond Houma.
15. It is impossible to move water to the west through the Intracoastal Canal.
16. HNC should be closed and filled; other wise Houma will be lost.
17. Create more diversion out of Atchafalaya River.
18. Promptly begin piping sand slurry. Success depends on an increase of freshwater in the marsh.
19. Land building should be done on all ridges and barrier islands.
20. Freshwater should be put into the upper Barataria Basin, but not in a large delta channel, rather in multiple places to nourish the marshes.
21. US HWY 90 should be raised between Raceland and Des Alemands to allow freshwater to migrate south.
22. Funding for Act 202 (the Coastal Passes Stabilization and Restoration Program and Fund established by Act 202 of the 2005 regular session) must be provided. There is huge local support for this.
23. One management group should be managing all the efforts, such as funding and implementation.
24. Morganza project and the HNC lock should be implemented first.
25. The following suggestions:
    - Five Bayou area drainage levees should be raised to 10-12 ft above sea level.
    - Flood gates for each of the bayous.
    - Morganza to the Gulf project implementation
    - Freshwater and sediment should be reintroduced between the interim levees and north of Morganza.
    - Create saltwater marshes south of Morganza.
    - Rebuild the barrier islands and make the openings to the Gulf narrower.
    - Implementation of lock on HNC.
    - No further dredging allowed until the lock implementation.
26. Extend the 500 yr protection from Point Au Chien to west side of the South Lafourche Levee System.
27. Morganza to the Gulf project should not be rushed ahead of State and Federal plans.
28. Levees do not work. Navigation Canals kill people. Inappropriate over industrialization of the wetlands must stop.
29. There is no such thing as “Leaky Levees”.
30. Levee projects spur more development.
31. Long term restoration should be considered for Barataria and Terrebonne Basins including the continued study of the Third Delta Conveyance Channel.
32. To address saltwater intrusion, increase the flow in Bayou Lafourche by increasing the cross section (by dredging between Donaldsonville and Thibodaux).

33. The weir should be at ICWW and Company Canal instead of west of Lockport.
34. Build breakwater segments offshore (1- 10 miles) from south of the Empire Canal to Galveston.
35. MRGO and GIWW projects are the two of the most disruptive projects.
36. Flood protection and restoration should be led by a civilian organization and not by a military organization.
37. Development should be confined to higher grounds. No ring levees- instead structures should be elevated.
38. Diversion of sediments and water from Rivers.
39. "Build up, not down and out"
40. Channel between HNC and Port Fourchon.
41. Utilize sediments traps (large metal structures with netting in between them) to restore coastal areas.
42. Projects that will require 20 years of implementation should not be considered.
43. Objection to the Morganza to the Gulf project.
44. Objection to mitigation and rehabilitation projects that offer no surge protection.
45. Include Scarsdale to Whites Ditch for cat 5 protection.
46. Lacks near term and long term restoration.
47. Needs large scale projects.
48. Terrebonne Parish needs levees.
49. Dredge Bayou Lafourche and increase water flow.
50. Unhappy with measure 3a-2. Agree that the future development should consider only elevated structures.
51. Happy with the Point au Chien route and believes that gates are needed at Point au Chien and at Bayou Blue.
52. Agrees with USACE $168 million plan to bypass the water problems associated with the Bayou Lafourche Diversion Plan and appreciates the efforts LDNR has committed to expedite the Bayou Lafourche Diversion project design.
53. Believe that new and old gates could be utilized to configure a lock-like operational feature on Bayou Lafourche.
54. Agrees with the 100 year level of protection for the area.
55. The USACE should use similar wording for 1% or 0.2% protection instead of tying it to a specific levee elevation since the elevation I subject to change as storm surge modeling is refined.

5.2.2 Chenier Plain

5.2.2.1 Planning Unit 3b

1. The Herbert Watershed Project –incorporate into the final plan.
2. Levee alignment south of Erath should be incorporated and could be adjusted to follow the existing agricultural land levee systems.

3. For higher levels of flood protections, leaks of North Prong and the stretch between Schooner Bayou control structure and HWY 82 should be repaired.
4. Utilize spoil banks by reinforcing them along with vegetative planting to increase surge protection.
5. Move freshwater from Red River to Mermentau basin.
6. The Rainey Marshes should be included for marsh creation and sediment terraces including constructing a sill in Tom's Bayou.
7. Reduce the opening of the Southwest Pass and re-establish the reef complex from Moron Point to Marsh Island.
8. Construct a levee on the east side of Freshwater bayou and extend the levee from Freshwater Bayou to Pecan Island.
9. Utilize "heavy lifting helicopters" as rapid aid to rebuild coastline.
10. Include the Fort Island community behind the levee on the south side of the ICWW/GIWW.
11. Construct a salinity barrier from Hwy 82 along the old HIWW to the Schooner bayou control structure and then north along the east bank of the North Prong of Schooner Bayou to the GIWW.

5.2.2.2 Planning Unit 4

1. Do not agree with blocking Calcasieu River going into the Calcasieu Lake, instead it is proposed to have a gate/lock/rock barrier to stop saltwater.
2. People should be compensated if they are displaced due to protection and restoration implementation.
3. Mississippi River diversion on a large scale is essential.
4. Rebuild subsiding marshes using dredged spoil.
5. Implement sand pumping project similar to west Holly Beach Project.
6. Shoreline protection from Vermilion Bay to Sabine.
7. Rockefeller Gulf Shoreline Stabilization and PPL 16- SW Louisiana Gulf Shoreline Nourishment and Protection projects should be fast tracked.
8. Support elevating and protecting HWY 82 and 27.
9. Need east-west alignment from Freshwater Bayou Canal and Mermentau River.
10. Move freshwater from Upper Mermentau Basin to Lower Mermentau Basin.
11. Recognize the needs of the Port of Lake Charles.
12. Proposed structure at Calcasieu Channel must meet two criteria: 1. when open must provide minimum width of 600 ft 2. Any part of the structure in the channel should be at a depth not to exceed -50 ft mean low gulf.
13. Better protection for Cameron Parish.

5.2.3 Miscellaneous/General Comments

The comments which deal with document content rather than specific measures associated with planning units are classified under the miscellaneous/general comments section. All comments received from State

Agencies, Local, State and National Organizations, and Stakeholders, were summarized within the Miscellaneous/General Comments section as they usually contained information regarding more than one planning unit. The comments that fall under this section are the following:

1. Water quality issues such as hypoxia and eutrophication and potential linkages to the coastal protection effort are deserving of discussion in the plan.
2. The Atchafalaya Basin and the continental shelf are not included in/as planning units and they deserve additional consideration.
3. In favor of the four objectives and the multiple lines of defense strategy.
4. In favor of "leaky levees".
5. Plan is lacking in priorities and lacks cost estimates necessary to evaluate the Plan effectively.
6. The balance between protection and restoration could be improved.
7. A vegetation barrier is discussed along the levees to increase protection but is not shown on the maps.
8. Dredge material must be used as economically feasible.
9. Enough is not being done to the Atchafalaya Basin to save forested wetlands.
10. The plan falls short of describing necessary landscape restoration features.
11. In favor of closure of the MRGO.
12. Definition needs to be given for the overall restoration of the coastal estuary.
13. Modeling needs to be improved for surge and estuarine function.
14. An additional comment period must be planned.
15. The floodgates at Chef and the Rigolets must be necessary and designed in such a way as to minimize environmental impact.
16. Mimic natural landscape form and function.
17. Navigation concerns should be secondary in a plan for restoration and flood protection. Inclusion of the IHNC Lock is not acceptable.
18. Timelines are necessary project/measure implementation.
19. Title of the Plan must be changed to reflect the stated scope. As of now, it only reflects Objective 1.
20. Restore natural hydrology and emulate natural processes.
21. Levee alignments should limit inclusion of wetlands. Levees should be placed along the backside of old ridges. Also, following the wetland/upland interface is necessary if possible.
22. Major population centers should have the best reduction in flood rate.
23. Do not endorse the concept of "leaky levees".
24. Proposed levee across Lake Borgne is unacceptable. Another is the GIWW alignment from Golden Meadow to Lafitte.
25. In favor of new zoning regulations so that new development does not appear along the levees in the wetlands.
26. Must emphasize the need to raise homes and businesses.
27. Plan does not define a functional estuary.

28. The Plan has no emphasis on structural reef restoration.
29. Restoration of ridges near Fourchon is located on Wisner Donation Property. Wisner Donation has put time, effort, and money into degrading the manmade ridges to restore natural hydrology.
30. Modifications such as constrictions will be useful in reducing surge and fetch along waterways.
31. The figure on pg 34 contradicts the figure on pg. 37. The diversions are located in different places within the figures.
32. Agree with the use of piped sediment.
33. Central Wetlands and the Golden Triangle comments (plans?) must be better developed.
34. The use of reefs along the shoreline has been overlooked.
35. Highways must be raised. This will offer extra protection along with improved evacuation routes.
36. Elevated roadways must include structures to allow for increased tidal flow and be able to be closed to reduce storm surge effects and opened to drain flood waters.
37. Very little attention was given to marsh creation.
38. Budgets must be sufficient to achieve the goals of the plan.
39. The plan needs both long-term and near-term restoration projects.
40. Much more emphasis needs to be placed on input of Mississippi River water into upper basins.
41. Utilize existing structures.
42. There is no presentation of alternatives.
43. An omission was made of an alternative that would make structural improvements to inflow and through-flow from the north without "leveeing" off the zone below (along with ring levees?)
44. Levees are destructive in nature for coastal ecosystems.
45. One group should be responsible for the planning/management while capable of handling the engineering, scientific and land use planning elements.
46. The next draft plan should contain options for both structural and nonstructural approaches.
47. The next plan should present the scientific unknowns and responses to them for the public to view. It should also propose a plan for implementation of the Plan.
48. Alternative alignments along existing route 190 or another non-wetland area.
49. New policy must be implemented by the state for wetland permitting based on no new loss, not mitigated loss.
50. Tear down the wall (spoil banks).
51. Provide a benefit/cost comparison among alternative plans for review and comment.
52. Projects that are supported:
    - Small Bayou Lafourche Reintroduction
    - Re-authorization of Davis Pond
    - Third Delta Study
    - Barrier Shoreline Restoration projects
    - Pipeline Conveyance of Sediment
    - Beneficial Use of Dredge Material

- Restore Ridges including Bayou Lafourche Ridge, etc.
- Multi-purpose operation of the HNC Lock
- Use of the GIWW for Atchafalaya Delivery into Western Terrebonne

53. Found Plan to be unintentionally misleading due to lack of detail.
54. Plan does not give information regarding scientific, engineering, or funding uncertainties.
55. Plan is ambiguous on big river diversions. More emphasis must be placed on utilization of freshwater and sediment to restore and re-nourish coastal landscapes that are essential as habitats and storm buffers,
56. Adaptive Management should be discussed as it relates to the projects.
57. The MRGO should be constricted in strategic places to accelerate shoaling and fill of the channel.
58. Hope Canal and Blind River Diversions should be prioritized.
59. Use of ring levees coupled with effective transportation and infrastructure.
60. Elmer's Island Beach should be reconsidered (to be deleted from the plan). Since this area is naturally accreting, it should fill back in on its own.
61. The elements of the state CCMP should be incorporated.
62. Consider offers such as that from Illinois to convey excess sediment from the Illinois River and other waterways to Louisiana.
63. The New Orleans Sewer and Water Board and St. Bernard Parish Plans to divert a portion of their wastewater into the degraded wetlands south of the 9th Ward should be a new project for consideration.
64. Coastal forested wetlands need greater attention.
65. Existing levees should be raised immediately.
66. Consistency in policy and practice must be a priority.
67. Sea-level rise from global warming should be considered.
68. Some levee alignments will reduce the linkage between watershed and estuary. These include: PD 1-1, PD 2-1, PD 3a-1, PD 3a-2.
69. Mitigation for the wetland impacts due to levee alignments should be scheduled simultaneously with the construction of the levees themselves.
70. We should consider man-made lakes. These lakes could be created in areas where soil is taken for restoration.
71. Red Pass Bayou should replace the MRGO. The marsh on either side could be nurtured by the River. The purpose of this would be to reduce dredging in the Mississippi River and to slow down the water thereby collecting sediment that could be collected and distributed into surrounding marshes. It should terminate at Venice and should not connect to the Mississippi River.
72. All Mississippi River passes should be abandoned and left to naturally build up and overflow their banks to build up surrounding marsh.
73. The Atchafalaya River flow from the Mississippi could be reduced every other year and increased flow in the Mississippi River could then be diverted to other diversions along the river. There should be 5 dedicated diversions to service St. Bernard and Plaquemines Parishes. These

include: the Rigolets peninsula, inland marsh near Chalmette west of the MRGO, the west shore of Lake Borgne, southeast St. Bernard by way of Bayou La Loutre, and the Biloxi diversion.

74. Learn from the Dutch.

75. Dura Vermeer Floating House Method for areas that were devastated from the storm.

76. The list of restoration and preservation sites (approximately 60 sites) compiled in 1977 by the old State Planning Office should be considered.

77. Consider the public desire to live along the coast along with the increasing population.

78. Consider Oliver Houck's list of alternatives provided to the CPRA (published article from Tulane Law Clinic).

79. The following is a list of suggestions for a number of measures:
    - PD 1-2: Extend to include all of the south shoreline of Lake Ponchartrain from the East Guide Levee of the Bonnet Carre Spillway to Jefferson Parish. Install saltwater barrier controls in mouth of Bayou La Branche and the St. Charles-Jefferson Parish Boundary Canal.
    - PD 1-6: Re-evaluate the Hope Canal Diversion and the proposed Bonnet Carre Spillway Freshwater Diversion.
    - PD 1-10: Address shoreline protection along Lake Ponchartrain in St. Charles Parish.
    - PD 1-12: With complete closure, saltwater intrusion will be reduced, but if a navigation structure is used, then a water quality management plan must be incorporated.
    - PD 1-14 and 2-13: Apply to large, open water area within the La Branche wetlands.
    - PD 3a-4: Protection of the bankline of the HNC is necessary with the use of PD 3a-7 to restore freshwater marshland and swamp that has been destroyed.
    - PD 3b3: This goal would jeopardize the marshland in the northwestern and central portion.
    - PD 3b-2: A continuous rip-rap structure is needed to prevent wash around on the exposed ends of the project. Reconnection of Point au Fer Island to Point au Fer Point would hasten the development of land building along the western shoreline of Point au Fer Island.
    - PD 3b-10: Include conveyance of Atchafalaya River water, where it enters into the bay southeast along the natural shoreline of the mainland to distribute freshwater and silt to the North end of Point au Fer Island and to the northern and eastern shoreline of Four Leagues Bay.
    - PD 4-5: Management plan for the water control structures north of Holly Beach.
    - PD 4-7 and 4-8: Protect shorelines of Calcasieu and Sabine lakes.

80. Sediment resources need to be addressed for both protection and restoration.

81. Question the need to vary the proposed plan from the Morganza to the Gulf alignment, the existing project.

82. Concerned that concentrated use of diversions in the Barataria Bay estuary could result in the entire estuary becoming fresh. Recommend instead pipeline slurry of dredge material in combination with diversions.

83. The restoration of some of the ridges would result in damage to large areas of marsh. Include only those ridges that would provide storm surge protection.

84. It is necessary to have a set of water quality, ecological, hydrologic, and storm buffer goals for the Chenier Plain.

85. MRGO closure and the Violet diversion are high priorities along with the Myrtle Grove diversion and the sediment conveyance in the Barataria Basin.
86. Consider a far more ambitious Bayou Lafourche project. A channel that skirts the urbanized areas should be presented.
87. Levees will serve to impound water and prevent drainage following storm events. Water control structures will not substitute for open flows.
88. All ongoing and previously authorized projects must be re-evaluated to make sure that they are consistent with the goals of the Plan.
89. The evacuation routes should have higher levels of protection than the areas being evacuated.
90. Two types of modeling are needed. These are surge models and hydrodynamic models. The CLEAR modeling is not adequate.
91. Build road/speed bumps.
92. The link between the MRGO and the IHNC is of dire importance to the continuous, uninterrupted flow of inland barge traffic to and from many major Gulf Coast as well as inland ports, terminals, and manufacturing locations.

5.3 Transcripts of Public Meetings and Copies of Written Public Comments

The following documents are a compilation of copies of all written public comments received along with the transcripts of the CPRA and CPRA-IPT public meetings held during the months of November and December of 2006 regarding the November 2006 Preliminary Draft Master Plan. A summary of comments made at the Plaquemines Parish Public Meeting is also included.

5.3.1 SERT Review of the Preliminary Draft Plan, January 2007

Report to the Louisiana Coastal Protection & Restoration Authority

Interagency Planning Team

Science & Engineering Review Team

review of the

Preliminary Draft Master Plan

January 2007

Compiled by the Coastal Louisiana Ecosystem Assessment & Restoration (CLEAR) Office

Summary Points of Review

1. **Need to Develop Stronger Comprehensive System Perspective**
    a. Need systems-level considerations to communicate big ideas
    b. Must highlight the importance of the Mississippi River to the sustainability of the coastal landscape
    c. Consider opportunities of the Old River control structure and management of the upper Mississippi River basin
    d. Protection and restoration require the combination of systems-level components
    e. Need to focus on synergistic effects of large scale projects; there is currently too much emphasis on smaller scale projects and features

- Stronger emphasis on the *natural processes of the delta* that people will have to acknowledge to generate the services that a sustainable coastal landscape provides. The PDMP needs to put more emphasis on comprehensive system dynamics, natural processes, and ecosystem restoration. These natural features, along with strategic structural features, are fundamental to reducing risks. No series of structures can replace the value of sustaining the delta landscape. *The word 'restoration' is not even in the title of the Preliminary Draft Master Plan.*

- We have to *think really big* because of the large scale issues at hand (climate change, international trade, etc.). Mississippi River Delta Management will get the attention of the world, not ridge restoration and unsustainable marsh creation as highlighted in the PDMP. The same can be said about the lack of attention paid to the Old River control structure in the PDMP.

- There are too many unconnected and unrelated *small-scale projects* in the plan. Small projects will be the first to be implemented (because they're viewed as the low hanging fruit); they will not likely make significant impacts from a coastal scale, and as a result, the rest of the nation will lose confidence that Louisiana can really address the problems at hand. Louisiana has to move forward in bold terms of how we think about the coast.

- The development of this comprehensive plan needs stronger participation by the *science and engineering community* and better coordination with LaCPR.

- How is *navigation* included? Navigation needs to realize where it fits in and how it will participate with both restoration and protection. Navigation will have several years to plan for how to handle new locks, etc. and adapt to the new approaches to doing business in a sustainable coast.

2. **Unrealistic Expectations of Protection and Stabilization**
    a. Inaccurate use of the term 'stability.' Stabilization is ***not*** restoration and is not achievable.
    b. A dynamic coast should be the message, not the permanence of coastal features, particularly engineering features. Need to capture issues of uncertainty and climate change.
    c. Higher level of protection can not be guaranteed (e.g. 0.2 % protection). This raises an unrealistic level of expectation to the public. The consequences of levee failure are devastating when you inflate the sense of security.
    d. Degree of levee protection is excessive in a dynamic coastal landscape; other approaches should be emphasized with more balance toward restoration.

e. Risk reduction should be the message, not protection; need to discuss residual risk.

- *Problems with presenting fixed solutions for repairing a dynamic landscape*: serious environmental problems exist with constructing structures across hydrologic basins, shoreline stabilization, etc. The Master Plan should emphasize large land building (or at least sustaining) diversions because they offer a dynamic solution to this dynamic landscape.

- What exactly is meant by 'shoreline stabilization?' Why should we try to stop the landscape from changing? We know the *landscape is changing*, and it's not going to be the same in 50 years; therefore, we should NOT stabilize the shoreline or try to provide a 500-year level of levee protection.

- The *extent and level of protection* proposed is not feasible or possible. It is sending the wrong message to the public (i.e., 'you do not have to elevate or evacuate, because you will be protected with levees'). If levees are built that high and they fail, the consequence is much different to life loss and property damage. There is concern among members of SERT regarding the level of protection proposed and the message that it sends to the public. The post-construction residual risk must be clearly outlined.

- Concerns about '*the levee effect'*—levees protect from many small flood events, but when the 'big event' does occur, the loss of life and property is much greater than if there were no levees at all. First, levees may induce new development, and second, those who live behind levees will not elevate their structures to deal with the residual risks they face.

- *Concept of expectation*—the public is going to expect a levee on the ground if you show a levee on the map. Fundamentally, you have to present to the public the hard trade-offs associated with providing protection and sustaining a healthy ecosystem.

- The public does not believe there is a *potential conflict with hurricane protection levees and the natural habitat*. Restoration and protection are presented as being compatible, and the reviewers think the PDMP must be honest by stating, "We want to protect a specific area with a levee, but this means that there may be negative impacts to the environment." If the main goal is providing hurricane protection, then you have to point out explicitly what the negative impacts could be.

3. Assumptions of Features in the Plan

a. Multiple lines of defense
b. Marsh creation
c. Ridges
d. Shoreline stabilization
e. Leaky levees

- Need to build *multiple diversions at a larger scale* than what is needed under present conditions, using adaptive management more explicitly in the future to address uncertainties (e.g., climate change). This gives the plan more flexibility, and it gives the Mississippi River more capability to provide critical resources.

- Marsh creation should only be implemented where *economically feasible* and where the environmental setting will *promote sustainability.*

- Our landscape is already littered with spoil banks, and they are serving the same purpose as the ridges proposed to be constructed. Is there a need to *rebuild ridges*? Is it worth spending $15 million to restore ridges vs. other functions—in terms of priority? How will they be sustained over time?

- *Shoreline stabilization* needs to be represented differently on the maps, because currently it looks like rip rap will be placed along the entire coast of western LA as well as along the shores of White and Grand Lakes. Same thing for Acadiana Bays area.

- *Concern that constructing leaky levees across hydrologic basins will sacrifice wetland areas*: present engineering features are insufficient to guarantee that such structural features will function without causing negative environmental impacts. Is it possible to construct levees that would serve to keep the system connected? Why not just keep levees within specific geologic features around concentrated assets, such as ridges that would form ring levees around municipal landscapes? What assumptions justify constructing levees across hydrologic basins?

- Proposing *water control structures* within the coastal landscape requires more critical operational constraints to ensure that they are operated correctly. Management should come from either the state or federal level. Louisiana would need a large-scale water management system to effectively manage the complex network of water control structures and levee features.

- A key point to consider is *strategic prioritization*. This is the focus on the next version of the Draft Master Plan. It is critical that an honest discussion of expectation and potential conflicts accompany a comprehensive decision making plan that factor in these uncertainties.

- Uncertainties and constraints related to *sediment / sand source* and *volume* needed to achieve marsh and barrier island restoration proposed by the PDMP must be addressed.

4. Process for Priority Setting and Sequencing using Objective Criteria

a. Objective criteria
b. Outline a systems-level decision making process; identify limiting factors and constraints; acknowledges where compromise to ecosystems is likely or predictable; describe process to assess and decide tradeoffs;
c. Engage the public into the process of determining which assets should be protected

- The SERT was confused by the process as identified in the PMDP. Is this plan a wish list or an implementable program? It appears that many stakeholders were brought in and made to feel that they had a blank slate. Are we discussing what should be on the wish list, or a prioritization of the projects already laid out in this plan? The tone of the plan comes across as a levee building, hurricane protection plan, not a restoration plan.

- Although the IPT says that this plan is strategic, page 30 of the PDMP indicates ‘we haven’t sequenced yet, haven’t prioritized yet, etc.’ so the process really has not yet been determined. Setting and sequencing priorities is a major need. What will the process be? Who will participate? IPT needs to describe the process and how the process will be adaptive. How will this become an implementation plan?

- If this is a strategic plan, it shouldn't include such detail about specific projects. It should provide a general approach, not specific locations or projects. Once projects are evaluated, an implementation plan can then be written that identifies specific projects and proposed locations. It appears that these projects are set in stone, and the process will not allow for them to be easily deleted or modified. Applauds IPT for trying to be specific, but is worried that it goes beyond the realm of a strategic plan.

5. Governance

a. Capacity building
b. External peer review and technical oversight; more active participation
c. Adaptive management needs to be central to plan implementation
d. Water management system; joint state federal group

- The SERT is concerned about the level of science and technology that has actually gone into developing the plan to this point.

- Protection and restoration needs to move more toward adaptive management (AM); use AM to set goals/hypotheses and to evaluate the effectiveness of the plan execution.

- Science and engineering expert review of the plan needs to be an integral part of the process. A formal and continuous review process by the science and engineering community must be put into place, and the recommendations provided by the science and engineering community must be inserted at the highest level of decision-making.

- How is navigation included? River resources and the landscape it provides equate the first line of defense for protection, then levees. Navigation needs to realize where it fits in with both restoration and protection. Has the USCOE analyzed how these diversions might affect Mississippi River discharge?

- Louisiana likely needs a 'Louisiana Coastal Management Authority' to help implement the plan. It is not possible to achieve this plan (or any large scale plan) with the agencies that currently exist.

- Concern regarding the reconstruction of extremely vulnerable coastal communities (e.g. Holly Beach, completely destroyed by Hurricanes Katrina/Rita). How is such development incorporated into future coastal restoration/planning? Where are the community and regional planners involved in this large scale program? How will these projects be managed and integrate these projects with the social, economic and infrastructural needs of small, and in some cases, large communities and towns? How does the plan dovetail with integrated coastal zone management aims and state and federal regulations regarding coastal development?

Acknowledgments

The Preliminary Draft Master Plan (PDMP) was reviewed by individuals chosen for their diverse perspectives and technical expertise, in accordance with procedures approved by the Integrated Planning Team (IPT) of the Louisiana Coastal Protection and Restoration Authority. The purpose of this independent review is to provide candid and critical comments that will assist the IPT in making the Draft Master Plan (DMP) as sound as possible. The following individuals participated in the review process (listed alphabetically):

Gerry Galloway, Dept. of Civil & Environmental Engineering, University of Maryland

Robert Gilbert, Civil, Architectural & Environmental Engineering Dept., University of Texas

Wonsuck Kim, Dept. of Geology & Geophysics, University of Minnesota

Shirley Laska, Dept. of Sociology, University of New Orleans

Irv Mendelssohn, Dept. of Oceanography and Coastal Sciences, Louisiana State University

Ehab Meselhe, Center for Louisiana Inland Water Studies, University of Louisiana at Lafayette

Chris Paola, Dept. of Geology & Geophysics, University of Minnesota

Ken Potter, Dept. of Civil & Environmental Engineering, University of Wisconsin

Denise Reed, Dept. of Earth & Environmental Science, University of New Orleans

Lawrence Rozas, NOAA Estuarine Habitats and Coastal Fisheries Center (EHCFC)

Charles Simenstad, School of Aquatic & Fishery Sciences, University of Washington

Fred Sklar, Everglades Division, South Florida Water Management District

Robert Twilley, Dept. of Oceanography and Coastal Sciences, Louisiana State University

Although the reviewers listed above have provided many constructive comments and suggestions, they were not asked to endorse the conclusions or recommendations, nor did they see the Draft Master Plan before its release. The review of the PDMP was overseen by Dr. Robert Twilley (Louisiana State University) and the staff of the Coastal Louisiana Ecosystem Assessment and Restoration (CLEAR) office. Appointed by the IPT, CLEAR was responsible for making certain that an independent examination of the report was carried out in accordance with procedures that allow review comments to be carefully considered. The final content of this review is a compilation of oral and written comments posed by the authoring SERT committee.

5.3.2 Report from the LCA Science Board Meeting December 13-14, 2006, New Orleans, Louisiana

Science Board of the Louisiana Coastal Area (LCA)
Ecosystem Restoration Program
CERM Building, University of New Orleans
2000 Lakeshore Drive, New Orleans, LA 70148

Report from the Science Board Meeting

December 13-14, 2006, New Orleans, Louisiana

Submitted to the Program Management Team, January 5, 2007

Meeting Particulars:

The third meeting of the Science Board for the Louisiana Coastal Area Ecosystem Restoration Program (LCA Program) was held at the Lindy Boggs Conference Center at the University of New Orleans on December 13 and 14, 2006. Nine of the eleven members of the Board (Appendix 1) were in attendance for all or part of the meeting.

The main objectives of the third meeting were to:

- discuss the preliminary draft of the State's Master Plan with representatives from the Governor's Office of Coastal Activities and Department of Natural Resources,
- review the activities of the LCA Program Science and Technology Program Office, and
- conduct a general round table discussion of the "leaky levee" concept included in the preliminary Louisiana Coastal Protection and Restoration Program (LaCPR) and State Master Plan.

The meeting agenda is provided as Appendix 2. In contrast to the first two meetings of the Board, the December meeting consisted principally of discussions among federal and state agency officers, Board members, and invited guests rather than presentations. This report summarizes the outcomes from the perspective of the Science Board. Key points are highlighted in boldface.

State Master Plan:

The Science Board members had been provided with a copy of the Preliminary Draft of the *Comprehensive Coastal Protection Master Plan for Louisiana* approximately two weeks prior to the meeting. This provided ample time to review the main body of the report, but members had not reviewed in any depth the voluminous appendices that are posted on the website www.louisianacoastalplanning.org.

Mr. Jon Porthouse, on assignment to the Louisiana Governor's Office of Coastal Activities, and Ms. Jean Cowan of the Louisiana Department of Natural Resources, both members of the Coastal Protection and Restoration Authority's (CPRA) Integrated Planning Team (IPT) that produced the report, participated in the discussion of the report. Mr. Porthouse stressed the preliminary nature of the report and that input and suggestions from the Science Board were welcome. When asked how the Board could be of assistance, Ms. Cowan replied that they would appreciate input on sequencing and priorities. The IPT was in the

midst of regional open houses and public meetings to receive comments on the report. In January 2007, the team will develop more specifics and cost estimates and prepare a draft plan for consideration by the CPRA in February. It is the understanding of the Science Board that the Final Draft Report will be delivered in April, 2007.

The region addressed in this planning process is very large and set within an area influenced by complex river and coastal process that are incompletely understood. The scientific components of the planning obviously have very real ramifications to the local communities, the local and national economy, and multiple interests. Despite the magnitude of this planning challenge and its implications to the people of Louisiana, the Science Board is very impressed by the progress that has been made since its September briefing and is appreciative of the openness of the IPT to its criticisms and suggestions. The following specific concerns of the Science Board are raised as result of its reading of the draft preliminary report and discussions during the meeting:

1. **The heavy emphasis on hurricane protection and cursory treatment of coastal restoration**. While it is understood that both legislative directive and citizen concerns require attention to hurricane protection early on, the scant attention to coastal restoration, including marsh creation and diversions, gives the impression that coastal restoration is seen as an overlay to hurricane protection strategies rather than an integral part of sustaining both the habitability and resource base of coastal Louisiana. It is important that coastal restoration rapidly catch up in the planning process and that the hurricane protection plans be rigorously evaluated with regard to their compatibility with a sustainable coastal landscape (see the discussion of "leaky levees" below).
2. **Reconciliation between the State Master Plan and the LaCPR plan being developed under the leadership of the Corps of Engineers**. Although there is obviously sharing of analyses and communication, the state and federal processes are moving at different paces and with somewhat different objectives and approaches. As the Science Board observed at its September, 2006, meeting, there does not seem to be a clear process through which the State and Corps will resolve differences or a mechanism for merging the planning efforts of the State and Corps of Engineers.
3. **Outreach to stakeholders not achieved by the regional open houses and meetings, including the regional scientific community, national environmental organizations, and maritime transportation interests**. While, interaction with the affected communities is essential, the Science Board points out that failure to connect with these other stakeholder groups could lead to show stoppers in terms of scientific credibility, the support needed to obtain federal investments, or legal challenges to strategies that are not defendable.
4. **More consideration of community adaptation as part of the Master Plan**. While the Board recognizes community recovery is being addressed by the Louisiana Recovery Authority and these considerations are to be folded into the Master Plan, there are a number of issues not considered in the preliminary draft that should be developed in the ultimate comprehensive plan, including so-called non-structural mitigation (zoning and other property development restrictions, new building requirements, flood-proofing, issues related to insurance, evacuation alternatives, etc.), out-migration and re-location, and cultural preservation.
5. **More explicit incorporation of climate change**. The Board cannot emphasize enough the skepticism on a national level about the success of hurricane protection and coastal restoration in the face of climate change. The comprehensive plan must make the case that potential increases in hurricane intensity are adequately considered and it must more explicitly incorporate the consensus forecasts of global sea-level rise into estimates of local, relative sea-level rise.
6. **Sequencing and priorities**. The plan should include a rationale for project sequencing and prioritization in the face of limited resources. This need will become particularly apparent once

cost estimates are included and the limitation of resources (not only money, but also sediments) is considered.

7. **Threatened and endangered species**. Because of the legal preeminence of the Endangered Species Act it is not too early to bring in evaluation of risks and benefits to threatened and endangered species into the planning.

Responsibilities to the Corps of Engineers:

A discussion was held among the members of the Science Board and representatives of the U.S. Army Corps of Engineers and U.S. Geological Survey concerning the role and responsibilities of the Board to the Corps. The Corps clarified its position that the LCA Program Science Board was not charged with formally reviewing the Louisiana Coastal Protection and Restoration (LaCPR) Plan as there was both internal, independent review as well as external review built into its planning process. Board members expressed their opinion that it was essential to their advisory role and consistent with previous discussions with Messrs. Dan Hitchings and Randy Hanchey that they offer comments and advice on the integration and compatibility of coastal restoration and flood protection. It was mutually agreed that this would continue in the form of regular advice rather than a formal review, especially with regard to the technical aspects of engineering design, which is outside the scope and expertise of the Science Board.

The Science Board appreciates the written feed-back it received from the Corps of Engineers on the report of its September 2006 meeting and encourages both the Corps and the State to respond on an ongoing basis and to charge it with specific advisory tasks where appropriate.

Science and Technology Program:

Dr. Barbara Kleiss of the USACE Engineer Research and Development Center was introduced as the new Acting Director of the LCA Program Science and Technology Office, replacing Dr. Buddy Clairain, who is retiring. The Board thanked Buddy for his long service and cooperation and welcomed Barb. Dr. Kleiss reviewed the procedures for accessing the Science Board's website http://el.erdc.usacd.army.mil//cast/board.html.

It was requested that the Science Board rank the 35 research thrust areas that had been complied from canvassing agencies. Priorities are to be developed for presentation to the Program Management Team on January 24, 2007, after which detailed statements of need would be developed by February 1 and Requests for Proposals issues in the spring, depending on resolution of appropriations for FY 2007.

The Board felt it was more effective if it collectively deliberated on the research thrusts rather than have each member provide separate rankings. Furthermore, it found that numerical rankings were not appropriate given that some "thrusts" were core elements of the S&T Program that had to be maintained and others were very vaguely defined at this point. **Appendix 3 presents the Science Board's evaluations of the 35 research thrust areas in which they are grouped as ongoing essential ingredients, timely priorities, longer-term priorities, lesser priorities, trivial, and too vague to evaluate.**

Leaky Levees

A lively, informative and thought-provoking discussion of multiple issues related to leaky levees was stimulated by perspectives provided by Professors Oliver Houck (Tulane University), John Day (LSU) and Denise Reed (University of New Orleans). Leaky levees are hurricane storm surge protection features designed to allow normal tidally and meteorologically driven flows through gates that can be closed to curtail storm surge. In other words, it is intended that functioning tidal wetlands will be maintained landward of the levee alignment. Leaky levees are a major feature of the Morganza-to-Gulf Hurricane Protection Project in the Terrebonne Basin that has long been in planning as well as many of the 1% level-of-protection levee alignments included in the State Master Plan as well under evaluation in LaCPR planning.

It is beyond the scope of this meeting report for the Board to summarize the discussion, particularly because it would involve interpreting what others said. Rather, the Board offers the following perspectives that should be taken into account as protection and restoration planning advances:

1. **There are large uncertainties about the effects of leaky levees on enclosed tidal wetlands, including the degree of interference with water-level variations, vertical soil accretion and migration of fishery species; entrapment of saline waters if overtopped or breached and fresh waters from storm water runoff; and other water quality issues. Although they are designed to stabilize vertical fluctuations of water level, marsh management schemes have often had deleterious effects on wetland sustainability, fishery habitat value, and entrapment of saline or fresh water.**
2. **Cases where a large portion of the estuarine basin is enclosed by a leaky levee (e.g. the Barataria Basin) are more problematic than where smaller areas of wetlands are so enclosed because of the technical and practical challenges of managing large volumes of water exchange.**
3. **The compensation of diminution of sediments subsidies from the marine side by river diversions into the upper basins, as envisioned in the State Master Plan, is an intriguing but untested concept.**
4. **Strong state laws and policies would be required to prevent development of low-lying areas protected by leaky levees. Otherwise, expanded development in subsiding polders would just bring more disasters.**
5. **Despite the existence of leaky levees, for example along portions of the Morganza-to-Gulf alignment, surprisingly little scientific information is available on their effects on tidal exchange, sheet and subsurface flow, water-level fluctuation, wetland soil and plant dynamics, water quality, and ingress and egress by fishery species. Evaluation of these effects through field research, monitoring, and modeling should be a very high priority.**
6. **In some regions the leaky levees have alignments that take into account physical processes and long-term evolution of the landscape. In others the alignments appear to be determined primarily for human infrastructure or political reasons. Where leaky levees are adopted, the alignments should be based on assessment of how the landscape will evolve around the new obstructions.**
7. **The round-table forum was effective in exploring contrary, sometimes strongly held views in a way that illuminated misconceptions and allowed common concerns to emerge. The LCA Science and Technology Program Office should consider using such facilitated discussions to address other contentious issues in a direct and forthright way.**

Science Board Position on Sediment Delivery

As a follow up on discussions at its September meeting, the Science Board has developed a "position paper" on sediment delivery as a critical component of the LCA coastal ecosystem restoration program. The paper is included as Appendix 4. **The paper states the Board's view that the only possibility for reaching a sustainable net "no wetland loss" objective is through conservation and effective utilization of the sediment load of the Mississippi River by creating major diversions of the Mississippi River sediment laden waters into shallow areas wherein the deposition can offset the relative sea level rise and other deleterious effects. It therefore proposes as a first-order metric of restoration success the volume of mineral sediment placed in shallow water. Further, the Board recommends convening a workshop in which the merits of various designs for large scale diversions are evaluated and undertaking a demonstration project to evaluate the effectiveness of sediment delivery to shallow water**.

The Science Board is contemplating similar brief papers that it would prepare from time-to-time.

Next Meeting

The best window for the next meeting of the Science Board is the **week of March 12**. Board members will be canvassed regarding their availability for a 2-day meeting during that period. **Issues timely for consideration at that time include: (1) comments on the Draft State Master Plan; (2) more in-depth consideration of the protection and restoration planning east of the Mississippi River, including the future fate of the Mississippi River Gulf Outlet, the Lake Borgne-Lake Pontchartrain barriers, and recovery response of the Caernarvon diversion area; and (3) outcome of LCA Science and Technology Program research prioritization.**

Appendix 1

LCA Program Science Board

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Appendix 2

Agenda
LCA Program Science Board Meeting
University of New Orleans
December 13-14, 2006

Meeting Location:

Room 256, Lindy Boggs Conference Center, University of New Orleans, New Orleans, LA

Meeting Purpose:

The main objectives of this third meeting of the Science Board are to discuss the State's Master Plan with representatives from the State of Louisiana, to review the activities of the LCA S&T Program Office, and to have a general round table discussion of the "leaky levee" concept.

Agenda:

Wednesday, December 13

1:30 pm	State of Louisiana Master Plan	Jon Porthouse, LA DNR
3:30 pm	SB working session with the USACE	Buddy Clairain, Barbara Kleiss

Thursday, December 14

8:30 am	S&T Program Office Status &Activities	Buddy Clairain, Rick Raynie
10:00 am	"Leaky Levees" Round Table	Oliver Houck, John Day, Denise Reed
12:00 pm	Lunch Break	
1:00 pm	Science Board working time*	
2:30 pm	Adjourn	

*This is an open meeting except for the slot listed as Science Board working time

Appendix 3
Comments by the LCA Program Science Board on FY 2007 LCA Program Science & Technology Program Thrust Areas

At the request of the Science and Technology Program Office, the Science Board collectively reviewed a listing of 35 proposed thrust areas during its December 13-14, 2006 meeting in New Orleans. While it was requested that Science Board members individually provide numerical rankings, the Board elected to discuss and evaluate the thrust areas collectively. It thus proved impractical to provide rankings 1 to 35; furthermore because of the incomparability of many of the thrust areas as well as their overlap such an approach made little sense. Rather, the following commentary is provided that summarizes the perspectives of the Board.

Ongoing Essential Ingredients

Some of the thrust areas describe essential components of the S&T Program that have to be developed and maintained over the length of the program. Consequently, they really cannot be ranked in comparison with shorter-term tasks.

Thrust Area	Potential Projects	Comments
1	Continuation of adaptive management	Important to put in place, build on CWPPRA
2	Develop and maintain data management	Emphasize turning data into information into knowledge; consider new data management models
5	Summary reports that synthesize state of understanding	S&T Program Office should budget resources for this purpose on an ongoing basis

Timely Priorities

Several thrust areas are highly relevant to integrated restoration-protection design and can completed in the near term.

Thrust Area	Potential Projects	Comments
3	Relative sea level rise position paper	Important assessment from perspective of national credibility; should include projections based on new IPCC report
4	Develop information on vertical datum	Subsidence rates a key controversy that should be resolved; but isn't IPET doing this?
9	Evaluation of pass closure alternatives	Evaluation of large diversions and Birdsfoot abandonment should be advanced
11	Adding experimental features to CWPPRA projects	Seize good opportunities to extract information and adaptive learning
12	Wetland assimilation, alteration and function	Potentially valuable "meta-analysis" at this point
17	Influence of wetland on storm surge levels and wave patterns	This issue is critical to integration of restoration and hurricane protection and the 2005 hurricanes provide new insights and data that should be evaluated.
19	Source and characteristics of sediments in Regional Sediment Model	Important for optimizing conservation and utilization, esp. for diversions & barrier islands

Longer-Term Priorities

These thrust areas seem relevant but require refinement, sorting out among them, or longer time frames for completion. Not all of them are of equal priority and most require more focus before committing to their execution.

Thrust Area	Potential Projects	Comments
6	Environmental benefits	These four thrust areas broadly overlap in objectives and purpose, but seem to take different approaches. More specific prioritization of physical-ecological-landscape responses analysis is required.
10	System-wide restoration priorities	
15	Continue refinement of desktop models	
16	High-fidelity landscape evolution and ecological model system	
20	Restoration project interactions with endangered species	Should address opportunities as well as conflicts
22	Role of wetland vegetation in erosion control	Important to integrate this with 17
26	Sediment trapping	It is unclear which project this refers to; nonetheless means to trap river sediment bed load should be evaluated
27	Pipeline conveyance	Seems like there is already much knowledge on this; should focus on practical application and be coordinated with 19
30	Geotechnical engineering of settlement rates	Could be very important the use of dredged sediment for restoration
31	Barrier island assessment	The description is extraordinarily sketchy, but improved design is undoubtedly required in barrier island restoration.

Lower Priorities

While not unimportant, several thrust areas seem less critical to the success of the LCA Program.

Thrust Area	Potential Projects	Comments
21	Assessment of environmental impact of rock armoring deployment	In general, the Science Board favors rock armoring of marshes only in very limited circumstances.
23	Coastal forests	This could be more important if focused on establishing trees to protect levees in LaCPR
24	Assessment of effects of restoration projects on fisheries and shellfish	Seems like still wanting your cake and eating it too. Effective restoration will require substantial changes that might preclude the status quo.
28	Chenier restoration	Needs more justification in order to determine its relative importance and urgency
32	Verification of project performance with WVA predictions	WVA approaches are old way of thinking, need to design to optimize sustainability of landscape

Trivial

One thrust area addresses what the Science Board considers a trivial concern.

Thrust Area	Potential Projects	Comments
29	Potential for introduction of invasive species using sediment from outside sources	This is unlikely to be significant

Too Vague to Evaluate

Several thrust areas were unclearly defined or too all encompassing such that the Board is unable to evaluate their importance.

Thrust Area	Potential Projects	Comments
7	Risk assessment	Risks of what, for what?
8	Assessment of unique coastal Louisiana stressors	Too scattered an approach; requires focus on most critical stressors and most important unknowns
14	Enhance utilization of conceptual ecological models	No concepts.
18	Further fund monitoring workgroup	Monitoring is an essential ingredient, but the description seems all over the map and requires strategic focus
25	Further develop comprehensive approach for priority data analysis	Vague and unfocused
34	Marsh creation in areas with poor sediment	No description
35	Indirect benefits from barrier shoreline restoration	No description

Appendix 4

LCA Science Board Position Paper on Sediment Delivery and Utilization

1.0 Introduction

The rapid loss of wetlands in Southern Louisiana is a result of several causes, including extensive construction of river levees leading to sediment diversion off the shelf into deeper waters, canals which tear the wetland fabric and provide access for vessels that generate waves, and channels which allow penetration of salt water into formerly fresher water environments, among others. Additionally, significant wetland losses have occurred as a result of severe weather events, for example that due to hurricane Katrina being close to 220 sq. miles (vis-à-vis the total loss from 1932 to pre-Katrina 2005 of 1900 sq. miles). Similar to the diversity of causes of wetland losses, a range of remedial measures has been proposed, some of which have been implemented. Given the growing consensus that future hurricane damage reduction plans for the Louisiana coast must include sustenance or enhancement of wetland-dominated landscape, a rigorous evaluation of wetland reconstruction options is required. The purpose of this document is to present the position of the LCA Program Science Board (SB) on the issue of sediment delivery and utilization as a first step toward shaping meaningful approaches.

It is well known that the present wetland system is largely the product of channel switching processes that occurred on a timescale of approximately 1,000 years. Periodic abandonment of former long channels in favor of new shorter channels to the Gulf resulted in natural alteration of the sediment delivery system: new channels delivered the sediment load of the Mississippi River into shallower waters where they contributed to wetland construction, while the coarser sediments remained in more gulfward positions thereby nourishing the barrier island systems. Taking a cue from this natural process, it is our conclusion that the only possibility for reaching a sustainable net "no wetland loss" objective is through conservation and utilization of the sediment load of the Mississippi River by creating major diversions of the Mississippi River sediment laden waters into shallow areas wherein the deposition can offset the relative sea level rise and other deleterious effects. This same conclusion was reached in the NRC (2006) report and in the British Petroleum sponsored workshop of 36 scientists and engineers held in New Orleans in April, 2006 (Reed et al. 2006).

2.0 A Recommended Metric of Project Effectiveness

While realizing that the delivery of sediments must be accomplished with reasonable care, it is also noted that wetlands are opportunistic and will develop if given appropriate quantities of mineral sediments to form substrate on which vegetation can prosper. Placement must consider the existing salinity regime, nutrient (especially organic) loading and the best available assessment of the types and growth rates of landforms that these sediments will develop. It is useful to define a metric for quantifying success of projects intended for wetland generation. As a first order metric, which may be fine tuned later, it is suggested that the metric be the volume of mineral sediment placed in shallow water.

3.0 Next Steps

Effectiveness in countering the current wetland losses will require river diversion(s) at scales that have not been attempted. Any long term approach should use natural processes to the degree possible in order to be sustainable with increasing scarcity of hydrocarbon energy and other resources. Several designs of large scale diversions have been proposed at the conceptual and more detailed levels (e.g. www.lacpr.usace.army.mil). Such large scale diversions may cause concern among various stakeholders,

perhaps most notably the shipping industry which may be the stakeholder that would experience the greatest potential impact. A second concern may be the effectiveness of this approach in constructing wetlands and barrier islands. The SB supports the design of projects, initially at the demonstration level, to both establish the best designs for large scale diversions by natural forces and to demonstrate the effectiveness of the approach. Two such projects are described below.

3.1 Screening of Existing and Possibly New Conceptual Designs

The SB suggests convening a workshop at which the merits of various designs for large scale diversions would be evaluated and refined into one or more recommended designs. Selection criteria would include: (1) minimizing adverse impacts to stakeholders, (2) minimizing use of fossil fuels, (3) maximizing best estimates of wetland and barrier island development, (4) long term sustainability of the coastal ecosystem, and (5) minimize storm and flood damage to public and private infrastructure. This workshop would represent a logical step in the progression toward an optimal design.

Participants in the workshop would include potentially affected stakeholders, wetland scientists, and engineers and geologists capable of evaluating the feasibility of the designs.

3.2 Demonstration Project to Evaluate Effectiveness of Sediment Delivery to Shallow Water

This demonstration project would evaluate the effectiveness of sediment delivery to shallow water from natural processes in terms of their ability to construct wetlands and barrier islands. The project could entail the placement of one or more large dredges in the lower Mississippi River to deliver sediment laden water to the west of the present channel. Design variables would include the rates and locations of the placement and the mix of fine and coarse sediments. Although the sediment quantities are yet to be determined, they should be large, probably on the order of 10s of millions of cubic yards. Perhaps one dredge could pump primarily relatively coarse sediments from the channel bottom and the other concentrate on the finer fractions from the water column.

4.0 References

National Research Council. 2006. *Drawing Louisiana's New Map: Addressing Land Loss in Coastal Louisiana*. National Academies Press, Washington, DC

Reed, D.R. et al. 2006. *Envisioning the Future of the Gulf Coast*. Final Report and Findings from the Technical Group, New Orleans, LA. http://www.futureofthegulfcoast.org/files/finalreport.pdf

5.3.3 National Environmental Organizations Meeting: Comments on the Preliminary Draft, January 17, 2007

See Section 4.0, for meeting notes from the National Environmental Organizations Meeting.

Comments on the Comprehensive Coastal Protection Master Plan for Louisiana Preliminary Draft

Submitted By
Environmental Defense
National Audubon Society
National Wildlife Federation

January 17, 2007

Recently, Louisiana secured a share of future royalty revenues from Outer Continental Shelf oil and gas drilling, which will provide significant new funding for wetlands restoration and hurricane protection. When President Bush signed the bill, however, Senator Vitter made an important comment. According to the *Times Picayune*, Senator Vitter said that the onus was now on Louisiana to make sure the money, limited by a state constitutional amendment to wetlands and coastal restoration, hurricane protection, and other environmental projects, is spent wisely.

"With this enormous opportunity comes great responsibility," Vitter said. "We need to have vision and discipline in Louisiana, starting with our leaders."

Senator Vitter is correct. The money provided through OCS revenue sharing will be substantial, but it pales in comparison to the amounts needed to protect Louisiana's citizens, culture, and communities. Hard decisions must be made, and there is little time to make them and less time to take wrong turns.

The state has begun to make the difficult decisions in the preliminary draft Coastal Protection Master Plan, but serious changes are necessary before this plan is presented to the legislature. We appreciate the opportunity to comment on a draft before the master plan is finalized, and hope that you will accept these comments on the Louisiana Comprehensive Coastal Protection Master Plan Preliminary Draft in the spirit of constructive criticism – we remain committed to working with the State toward developing the best possible master plan.

Overview

In general, the draft Plan does a good job of describing the magnitude of coastal wetland degradation in coastal Louisiana and the national importance of oil and gas, navigation, fishery, and urban/cultural resources that historically have depended on the vast Delta of the Mississippi River. The Preliminary Draft in the Preface at page 7 points to "extreme rates of land loss compounded with inadequate hurricane protection measures" that now threaten south Louisiana. This would suggest that the State Plan would put forward a set of wetland restoration proposals that would effectively deal with high rates of land loss.

However, while the draft Plan proposes various barrier island rebuilding measures and restoration measures east of the River in the greater MRGO region and outlines a major lower river diversion, coupled with more modest measures such as the Myrtle Grove diversion and sediment pipeline into the Barataria Basin, it is unclear what the Plan is proposing to address "extreme rates of land loss," let alone restoration, in the central portions of the coast. Greater use of the GIWW as a conveyance channel does not do this. As presented, the draft Plan does not look at effective use of Atchafalaya River water and sediment as a strategy for large-scale protection and restoration in central and eastern Terrebonne Parish via a third outlet through the east guide levee; nor does it consider some kind of large diversion or sediment conveyance strategy for the central coast on either side of Bayou Lafourche beyond the very small, 1000 cfs Bayou Lafourche project. In addition, the description of the Mississippi River Delta Management project, incorporating one or more major sediment diversions below Myrtle Grove, does not get us much beyond what COAST 2050 proposed. More generally, the current draft does not present a compelling vision of a restored coast and restoration processes.

For example, on the protection side of the Plan no rationale is presented for having both a 0.2% and 1% levee protection alignment for major parts of the coast, although this is clearly a policy decision of tremendous import. We have yet to see serious analysis showing that such a large and complex system of levees is either affordable or technically feasible. It is unclear how the surge modeling presented in Appendix D was used to optimize the levee alignments suggested to provide the best configurations from a protection standpoint. Further, the levee protection and wetland restoration proposals do not appear to be integrated at all, except through graphic juxtaposition on page 49, and it is not clear how the levee proposals comply at all with the five bulleted guidelines presented in the box at the top of page 40. The draft simply does not provide evidence that the plan is the outcome of a systematic scientific and engineering assessment of what wetland restoration and hurricane protection measures can work effectively together at a cost that is feasible and on a time line that will be genuinely useful.

Although there is understandable pressure to submit the plan to the state legislature at the beginning of the next session, it is not too late to remedy these shortcomings. The plan's authors must take the time necessary to get the plan right, and the revision opportunity presented by the master plan process provides the opportunity. Our comments below are detailed, but they do set forth a clear plan of action that the CPRA should adopt through its ongoing prioritization process and revisions to the draft master plan.

1. Closing MRGO and restoring the damage caused by it is doable and should be the State's first priority. Because the Corps has dragged its feet too long, the State must take the lead while ignoring historic distractions like the IHNC lock issue.

2. No matter how many levees are built, coastal Louisiana will be lost unless we reverse the land loss process and restore the wetlands. The state plan's second priority must be rapid planning and construction of major land-building diversions like the lower Mississippi River diversion and the Atchafalaya third outlet.

3. Healthy tidal wetlands are not, in general, compatible with levee construction, and without healthy wetlands land loss will continue. In addition, the Corps' failure to provide even 1% levee protection for New Orleans, despite being given almost 40 years to do so, shows that plans to build continuous 1% and .02% levees across the state will be impossibly expensive, technically infeasible, and doomed to failure. The State plan must therefore focus levee construction efforts on building ring levees around dense urban populations – where they are most needed but will do the least harm. Ring levees can be complemented with pile-supported structures for vital reaches that are closed only during storms, but this approach should only be used to complement wetlands restoration and ring levee plans, not substitute for it.

4. Those outside the ring levees must be given real tools to survive and thrive, not promises that can never be fulfilled. People can plan for the future if elevation, structural fortification, and relocation into protected areas are made serious and supported options.

An updated, prioritized plan, following the four principles of close MRGO, reverse land loss, build reasonable levees, and allow people to plan for the mid-term future, can be implemented and will give Louisiana hope.

Our more detailed comments follow and are divided into three categories: comments about the way the plan was created, technical concerns, and local concerns.

Plan Formation Concerns

Symbolism matters. First, therefore, we would suggest including restoration in the title: Comprehensive Coastal Protection and Restoration Master Plan for Louisiana.

1. Participation.

The State must pursue a process that relies on a team of the best coastal scientists and engineers available and engages the public at the same time. The State and nation will need this input as they consider the future of North America's most remarkable coastal ecosystem that actually has the potential to restore and enlarge itself even in the face of global warming and accelerated sea level rise. During the LCA process, the State assembled a remarkable team of scientists and engineers led by Robert Twilley. Such a team must lead the State's planning effort for the Master Plan, and not serve just in a review capacity. Their work, currently contained in an appendix that is little referred to in the main report, should be integrated into the main body of the report and be the guide to whether individual hurricane protection projects will complement, not detract from a systematic program of land loss reversal and wetlands restoration.

While the state plan will soon be "issued," many complex scientific decisions and details will remain to be determined. We encourage the State to identify remaining steps and uncertainties, while establishing a decision timeline and stakeholder/scientific committees to help resolve details and make effective decisions.

2. Mandate Challenge

We must rely on the State, not the Corps, to plan a systematic and sustainable coastal restoration and protection plan. The Corps has a planning team at work in Vicksburg, but, as far as we can tell, that planning team is focused overwhelmingly on levee system designs. Further, it is not clear that the Corps' storm surge model incorporates wetland features that can affect surge and wave energy. If so, its basic planning tool is incapable of integrating wetland restoration and levee structures as parts of a comprehensive storm protection program. In addition, its process is effectively closed. The State Coastal Protection and Restoration Authority, the author of the state master plan, was given the power to assert leadership on this issue free from the traditional baggage of the Corps of Engineers.

One goal of Act 8 was for the State to supply "aggressive leadership and direction" with a strong emphasis on ensuring public safety. A second was to lay out administrative and financing strategies. A third was to provide a vision of the careful integration of coastal restoration and defense. The draft Master Plan has yet to effectuate these goals.

Perhaps the most important consideration for the citizens of Louisiana with respect to hurricane protection is what different proposed levels of protection will mean to them. If

they are to plan for the future, to live safely, to rebuild and insure their businesses and homes, they must know. Also, they need to have confidence in what the various agencies and experts tell them about the capabilities and reliability of protective structures. However, the preliminary draft does not assert "aggressive leadership and direction" on this topic because it does not explain why it has picked the standards it has, nor does it provide clear guidance to citizens as to when they can expect a certain level of safety. Instead, it appears that the state has adopted two standards for protection apparently developed outside of the state Master Plan process, perhaps by the USACE ERDC team that contributed the un-reviewed hydrologic model output presented in Appendix D.

Outsourcing the technical analyses to this group further removes the basis for the planning from public scrutiny. Why pick 0.2 % protection for New Orleans, Lake Charles, and Houma, and 1% protection elsewhere? The 1% protection level makes some sense because that is the minimum required by FEMA for the federal flood insurance program. Of course, the USACE in the past certified unengineered spoil banks as providing 1% storm protection for FEMA purposes. Using an independently developed standard, rather than a historically flawed Corps standard, would address this. These standards should be explained in terms of real world impact. For example, does a city with 0.2% storm protection evacuate, and, if so, under what circumstances? Do citizens from more vulnerable areas receiving 1% protection evacuate to the city? This is a key prioritization discussion of vital importance both from public safety and long-term economics standpoints, but there is no mention of how the standards were arrived at, and the tradeoffs countenanced in that decision.

Further, the draft Master Plan must go further to lay out an administrative strategy for accomplishing the goals of Act 8, specifically identifying the mechanisms to ensure that restoration and protection actions of local, state and federal agencies are effectively integrated across jurisdictional boundaries, and for financing the plan. While it is stated that the Louisiana Recovery Authority and the USACE are 'using' the State Master Plan (page 4), there is no explanation of how the pre-publication document has influenced the work of both organizations. If the Master Plan is to guide state implementation and financing of the Master Plan, it must be refined to address these deficiencies.

The draft Master Plan also does not clearly present an ecologically sound vision of integrated coastal defense and restoration that could garner public support at both the local and national levels. While there is considerable discussion of various ecological principles and objectives, it is not clear how, or if, they were followed in developing the list of proposed projects, and how the ecology and engineering were factored together into the prioritization. The problem statement in the Preface provides an indication of what is lacking (page 3).

> "What had been a crisis has now turned into a bona fide emergency: extreme rates of land loss compounded with inadequate hurricane protection measures now the threaten the viability of south Louisiana's communities and infrastructure."

Clearly, the viability of the *environment* as well as "*communities and infrastructure*" is threatened by continued mismanagement, and the irreproducibility of the environment at risk will provide much of the national rationale for including restoration with levees.

A section entitled "Lessons from the Storms" (p. 8) draws attention to the fact that the most important lessons that have been reiterated in numerous reports on the levee failures must inform this document, but there is no discussion about how we can be certain that we have learned the right lessons. We suggest that all of the recommendations of the National Academy and American Society of Civil Engineers, at a minimum, be addressed explicitly at this point to show how these recommendations will be followed in any next generation of this master planning process.

For example, it is important to remember that much of the loss of life and property damage occurred because protective structures did not perform as intended, and because no provisions were made for overtopping. How will the designs for the "Innovative Technologies" discussed in passing (page 26) in the Master Plan be reviewed and how will reliability be assessed? New Orleans supposedly had 0.3% storm protection before Katrina and structures failed at +6 feet. There were no "innovative technologies" involved, just unreliable, old ones. What is the strategy that the State will use to ensure that designs and levels of protection proposed by the USACE are credible?

It appears to be taken as a given in the draft Master Plan IPT that the USACE group providing the technical information now knows what it is doing, unlike in the past. However, the rest of the state remains unconvinced, particularly concerning the storm return frequency statistics. The final state master plan must include an IPT strategy for rebuilding credibility, and as stated above we suggest starting with outside and independent review teams. They are available and awaiting the State's beck and call.

Technical Concerns

1. The draft Plan Does Not Describe Itself as Rooted in Natural Functions

There needs to be a conceptual framework about deltaic functioning and management early on in the plan and this framework should help guide the development of the State plan. It is known that major shifts in the location of the river channel, many functioning distributaries, crevasses, overbank flooding, redistribution of sediments by storm events all played important roles in the development and maintenance of the delta. The plan should describe how different elements of the plan either mimic and enhance, or reduce, these forcings. In addition, conceptual approaches for restoration should be described. For example, restoration ecology, ecological engineering and the concept of self design should be used as much as possible because these approaches are energy efficient and tends to work with delta functioning. The multiple lines of defense strategy is discussed but this is an emergent property of delta functioning. It should be shown how natural deltaic functioning enhances the multiple lines of defense.

2. Additional Restoration Alternatives Should be Discussed

There are a number of restoration alternatives that are not considered in the draft plan. These include permanently open large spillways, use of all freshwater resources, details about using cypress wetlands to protect levees, not allowing people to live below sea level, raising structures, and using ring levees rather than linear levees. Comments received from scientists and the public will likely include other suggestions. These should be addressed in the plan.

3. Dynamic System Change Must be Addressed

The Master Plan has a 100-year planning horizon, but the draft plan does not sufficiently address major trends that will affect the formulation and implementation of the plan over this time period. There is a near 100% consensus in the scientific community that global climate change is taking place and that it will have severe impacts on coastal ecosystems. These include increases in temperature, accelerated sea level rise, changes in freshwater input, and probable increases in the frequency and intensity of hurricanes. These climate changes may make some elements of the proposed plan difficult, if not impossible, to implement. For example, if drying occurs, as is predicted by some global model, the plan for the Chenier Plain, which is essentially a continuation of past management, will not be possible.

The Empirical Simulation Technique (EST) used by the USACE to develop the storm return frequency "assumes that future events will be statistically similar in magnitude and frequency to past events." This, of course, cannot be assumed if global warming changes storm characteristics and tracking significantly over the 100 year planning horizon. Similarly, if it is assumed that the ADCIRC model is doing a good job of simulating storm surge in marshes -- not true 6 months ago -- then it will be important to recognize that storms arriving at different years into the future will produce higher surges inland as the marshes continue to subside except where major river diversions are quickly inaugurated. So both the storm characteristics and the landscape withstanding the surge may well be quite different in the future. It is not clear how these predictable changes were factored into the analysis summarized in Appendix D.

Energy cost and scarcity will likely have important impacts on implementation of the Master Plan during this century. While not at certain as climate change, there is growing evidence that society is entering a period when energy will become significantly more expensive and scarce. Whether State and Federal planners agree with this or not, the precautionary principle suggests that at the very least the implications of energy be considered. Some elements of the Master Plan are extremely energy intensive to implement and maintain. These include construction and maintenance of levees and long distance conveyance of slurried sediments.

Finally, the issue of population retreat is not considered in the plan. People have been retreating from the lower coast for decades and after hurricanes Katrina and Rita, retreat became massive. Continued retreat should be considered as a given in the future. This would affect the degree of hurricane protection that is required and would also perhaps allow more aggressive coastal restoration approaches.

4. Flood Protection and the Issue of Leaky Levees.

The leaky levee idea is proposed as a way to provide flood protection while minimizing the impacts of levees on wetland and estuarine ecosystems. The Morganza to the Gulf (MG) levee system south of Houma incorporates leaky levees. There are a number of issues that need to be addressed related to leaky levees and the proposed levee protection system in general.

A. Are levees in general, and leaky levees in particular, consistent with a 100-year planning horizon? As indicated earlier, global climate change and energy scarcity will become increasingly important factors affecting coastal restoration in the 21st century. There is a substantial likelihood that global climate change will make a leaky levee system increasingly less effective over time. It is quite probable that increasing energy costs will make it impossible to finish the levee system much less maintain it. Parts of the proposed MG levee system will be 9-15 feet high. Levee subsidence will result in less protection over time. This means that there will be massive overtopping during strong

hurricanes. A serious feasibility analysis should be carried out to examine the impacts of these two issues on leaky levee systems.

B. The environmental impacts of a leaky levee system need to be carefully examined. A leaky levee system is, in effect, marsh management on a grand scale. There is abundant scientific literature showing structural marsh management does not work and has a number of serious environmental impacts. Hurricane Rita led to massive over-topping of levees surrounding managed impoundments in the Chenier Plain. The salt water led to widespread death of fresh marshes despite the fact that some of the largest water control structures in the State are located on managed impoundments of the Chenier Plain. There will likely be similar problems in the MG project and other areas where levees are proposed. One of the major problems with marsh management is that the cross section area for water exchange is drastically reduced. Studies have shown a reduction of water exchange, a reduction in sediment input, and reduced organism exchange. In the MG and other elements of the plan, environmental structures (6 x 6 foot culverts) are proposed to enhance water exchange. The MG levee system is 72 miles long. A one foot water level change along this 72 miles would have a cross section area of nearly 400,000 square feet. Even dozens of environmental structures would be only a small fraction of natural water exchange.

   The environmental impacts of a leaky levee system will also mean that input of re-suspended material from fronts and storm passages will be reduced. If levees overtop or fail during hurricanes, saltwater intrusion could lead to death of fresh and low salinity vegetation. A leaky levee system will similarly make diversions upstream of the levees more difficult. Landward of the levees, the reduced ability to drain water will likely limit the quantity of water that can be diverted. At Caernarvon, for example, large diversion pulses have become part of the operational plan for the diversion. These large diversions are necessary to ensure maximum over marsh flow so that there will be high retention of sediments and nutrients. These pulses raise water levels 1-2 feet or more even though the area downstream from the diversion is completely open. Enclosing large areas of wetlands in downstream receiving areas in the Barataria and Terrebonne basins will limit the flexibility of using diversions into these basins.

C. As stated earlier, retreat is taking place across the lower coast. And this is likely to increase as global climate change impacts become more severe. Are we building a large flood control system for a population that is leaving? Or, will a perception of improved flood protection lead to development in flood prone areas? The later case would further limit the flexibility of management upstream of levees.

5. Long Distance Conveyance of Sediments Raises Concerns.

Marsh creation proposals often involve dredging sediments and pumping slurried sediments in pipelines for the purpose of creating marshes. Sediments would come from the river, offshore, or from deep holes in the bottom of inshore water bodies. There are a number of strong reservations about this approach. This technique is very expensive and careful consideration should be given to more cost effective approaches. It may well be that within a decade or two, this approach will become cost prohibitive due to increasing energy prices.

Accelerated sea level rise means that marshes created by dredge spoil will have to renourished soon if they are to survive, but there will be competition for funds for different management techniques. There will be pressure to quickly create marshes using pipeline transported sediments, but this should only be done in combination with the diversions that will provide nourishment to the new marshes.

Local/Project Specific Concerns

1. MRGO.

The draft master plan is correct to propose total closure of the MRGO and restoration of wetlands on the east side of the River together with some set of levee structures. Our own report on MRGO closure incorporates these features. This would include rebuilding the Bayou LaLoutre ridge and constructing an appropriately-sized diversion at Violet that will reinject significant amounts of freshwater, as well as some sediment, into this sub-basin, with the hopes of restoring the coastal swamp forest and other wetlands that MRGO decimated.

However, we have two specific concerns with the bullets on page 39. As our MRGO report states, the MRGO channel should be restricted in specific locations in terms of its width and depth. This would not entail completing filling in the channel – there is not enough sediment to do that anytime soon – but redesigning the channel to retard the flow of freshwater from Violet and elsewhere.

In addition, the draft plan inexplicably lists completing the IHNC lock as a project. The IHNC lock is an economic development project, not a coastal restoration or protection project. No one claims otherwise. The IHNC lock has no place in this plan and must be removed.

This is not simply a matter of semantics, as it is critical to the safety of New Orleans and St. Bernard Parish that closure and remediation of MRGO not be linked to final decision on the lock, and its possible construction. The IHNC lock project is very expensive and will take a long time to build even if litigation is resolved and Congress appropriates the requisite funds. MRGO closure should proceed on the fastest possible time schedule in light of the Katrina experience, and the Plan should make it clear that MRGO closure and the Violet diversion are very high priority projects that should be completed within three years. Delay is inexcusable. This sense of urgency for MRGO closure should be emphasized in the Plan since the Corps MRGO proposal provides no sense of urgency.

2. Shorelines and Ridges.

The question is how the navigation channel bank stabilization program fits into the wetland restoration program. Will it have any impact on it? Also, it is unclear from the draft Plan what is being proposed for the ridges colored in orange on page 32.

3. Land Sustaining Diversions.

As you know from numerous earlier comments, we consider the Myrtle Grove diversion and sediment conveyance to be very high priorities for any restoration initiative in the Barataria Basin. The draft Plan proposes a Myrtle Grove diversion with a capacity of 5000 to 15,000 cfs (page 35). At the Lafayette meeting, we discussed Myrtle Grove options at far higher capacity. The Corps in the text of the LCA report describes a Myrtle Grove diversion of only 2500 cfs, apparently to prevent any significant change in the salinity regime of Barataria Basin. Even at 15,000 cfs Myrtle Grove would have capacity only 50% greater than the Caernarvon Diversion. Why not provide for a sediment diversion at or near Myrtle Grove (perhaps at a bend that would maximize opportunities for sediment capture) with capacity in the range of 25,000 cfs or higher with the understanding that the diversions would be pulsed, and designed to take advantage of high River flows. In our view, furthermore, a sediment pipeline should be considered to convey sediment towards the western part of Barataria Basin. The State Plan should set a time schedule for the design and implementation of this project.

The State Plan should consider a far more ambitious Bayou Lafourche project. The current 1000 cfs project was designed primarily to augment fresh water supplies in the Bayou for urban use. It is not clear that the engineering team evaluating this project has conceived it as a potential wetland restoration project. Bayou Lafourche would provide by far the most efficient way of conveying significant amounts of Mississippi River water and sediment into the central coast. It would not entail destruction of thousands of acres

of wetlands such as one version of the Third Delta might entail. An enlargement of Bayou Lafourche as a restoration project would have an impact on the urban communities that have encroached on its floodplain. The Plan talks about the need for trade-offs. This part of the coast has become extremely vulnerable to storm surge as a result of massive wetland loss. A creatively designed Bayou Lafourche project, perhaps with a channel that skirts part of the most heavily urbanized areas, should be presented as a real option for central coast restoration.

4. Land Building Diversions.

An ambitious Myrtle Grove diversion project can prove to the citizenry of coastal Louisiana that sediment diversion and conveyance can be a reality on an accelerated time schedule. However, the potential for large-scale wetland protection and restoration will not have reality until the large Lower Mississippi River Diversion described at pages 36-37 proceeds.

The state has a major interest in expediting this project, perhaps through a design-build RFP to major international engineering companies. If this project is not ready to proceed until 2017, there is much reduced justification for seeking a major additional infusion of federal funding for wetland restoration between now and 2017. And, frankly, given continuing land loss and hurricane danger problems, Louisiana cannot wait ten years to start major efforts on the Lower Mississippi River Diversion.

Moving the Lower Mississippi River Diversion forward will involve giving the people of Lower Plaquemines and Lower St. Bernard real information and real choices. For example, lower Plaquemines Parish is lightly populated. In many places it is stunning how few people and facilities are evident in the narrow corridors between the Mississippi River levee and hurricane protection or bay levee. The draft plan, while talking about trade-offs, proposes maintaining these existing levees at current height. The question is why.

Members of this community are disturbed by the suggestion of maintaining the status quo, and rightly so because it neither relocates them to safety, or promises them engineered safety. Given existing resources, the draft plan correctly notes that engineered safety for the entire area is impossible. However, existing communities that are still inhabited and are important for oil and gas servicing industries or fishing can be protected by ring levees, coupled with provision for evacuation. This would allow for consideration of a lower river management plan that would include dismantling of large stretches of levees so that river overbank flooding and sediment dispersal could be accomplished cost-effectively.

As the draft plan states, "In order to allow the river to create new land, science tells us that we must turn the river loose and let it resume doing what it did for thousands of years; spread water and sediment into broken marsh and shallow water to create new

delta lobes." What is the proposal to do this in the draft plan? Redesigning the whole levee system below Myrtle Grove would be a start for reconnecting the river and its surrounding wetlands.

The Plan should provide a time schedule for convening an internationally renowned group of experts to design the basic parameters of such a strategy for letting the river "loose" and providing for navigation through some kind of elongated lock structure. We have also proposed (following the adoption of basic parameters for the redesigned levee system, diversion, and navigation structure) to encourage a design competition through an RFP process. The major engineering firms must be engaged if this hugely challenging and exciting restoration program is to move forward over the next five years with construction underway in time to give everyone confidence that large-scale restoration is becoming a reality. This large-scale diversion program is a key to restoration. Moving it forward to design and implementation on a fast-track should be the highest priority for the plan.

5. The Atchafalaya Basin.

The draft Plan misses a major opportunity to advance effective use of Atchafalaya Basin water and sediment to restore portions of the central coast in Terrebonne Parish that have suffered "extreme" wetland loss. The Atchafalaya River carries about one third of the flow of the Mississippi River and offers great potential for wetland conservation and restoration in coastal Louisiana. LCA committee members felt that the potential for restoration using the Atchafalaya River was under represented in the LCA plan.

We have submitted a proposal for a third outlet through the east guide levee. Since this outlet would be north of Morgan City, it provides for much more restoration potential than relying just on expanded flows through the GIWW. The Atchafalaya River has built a huge amount of land in the Basin and in the Bay through the Lower Atchafalaya River and Wax Lake Outlet over the last 30 to 40 years. A third outlet would allow for the land building capacity to be broadened in a manner that might enhance the unique ecological features of the Basin at the same time and protect Morgan City.

The Atchafalaya River, the largest Mississippi River distributary, will play a major role in restoring the coast by building its own deltas and through spillways yet to be constructed to the east into the Terrebonne basin. What is often neglected, however, is that the Atchafalaya will be used to provide reserve water to supply diversions on the mainstem Mississippi. This future must be kept in mind as regional hurricane protection systems are brought online. It does not appear in this preliminary draft Master Plan.

The Atchafalaya River flows through the 600,000 acre Atchafalaya basin before reaching the coastal zone. Much of the flow of the river in the basin is channelized due to human modifications such as levees and canals and there is relatively little sheet flow of wetlands. One estimate is that at high flow only 12-16% of river flow is overland in the lower fifth

of the basin. The State Plan should consider management to facilitate a much greater overflow of the basin, perhaps as much as 20%. This would result in a much greater retention of nitrogen in the basin and reduce nitrogen export to the nearshore Gulf of Mexico where it contributes to the Gulf hypoxia problem. Such management should attempt to take water with a minimum of sediments so that the maximum amount of sediment flows to the coastal area where it is needed.

In addition, it is critical that the State Plan address the operation of the Old River Control Structure with a view to optimizing the distribution of flows between the Mississippi and Atchafalaya Rivers for coastal restoration as well as flood control purposes. At present, the 30/70 split at Old River is mandated. The State Plan should consider various scenarios where more than 30% of the flow is directed down the Atchafalaya River. This could be done in conjunction with other management to spread Atchafalaya sediments over a greater portion of the coastal zone to enhance coastal marsh preservation and restoration. The Corps is not apt to investigate this issue on its own. Increasing the distribution of flows down the Atchafalaya River would create angst in Morgan City and provide limited restoration benefits without a third outlet designed to take advantage of this extra water and sediment.

The management of the Lower Atchafalaya River below the Teche Ridge should be considered as a mechanism to deliver sediments to a much greater area of the central Louisiana coast. Plans should be developed to enhance the movement of sediments eastward to the western Terrebonne marshes and further east. This could be done either by a diversion of water through Lake Palourde or south of the Teche Ridge. It may be less expensive to move water from the Atchafalaya to eastern Terrebonne than through the "third delta" channel. The potential for movement of Atchafalaya water west to the eastern Chienier plain should also be considered

6. Hurricane Protection for the Delta and Chenier Plains.

The dual levee alignment program that is described for the entire coast of Louisiana from the Mississippi River to the Texas border strikes us as environmentally destructive, very expensive, probably infeasible, and counter-productive. The draft Plan refers to a strategically designed hurricane protection system, but we see little evidence of strategic design. In addition, the draft Plan states, properly, that development incursions into wetland areas that would be "protected" by this vast levee system should not be countenanced, but provides no realistic mechanism whatsoever for controlling such land development that is an inevitable feature of such broadcast protection schemes. Proposing land use controls by local governments is not such a mechanism and has worked virtually nowhere in the country. Any incremental "protection" of wetland areas that would induce development must be preceded by a comprehensive program of purchase of development easements, backed with a credible financing scheme. Land use controls will not work.

7. Restoration in the Chenier Plain.

The draft plan for the Chenier Plain appears to largely keep intact the historical water management plan for the region and ignore the importance of resuspended sediments from the Gulf and lakes that was responsible for the formation and maintenance of the area. The draft plan also pays inadequate attention to the lessons from Hurricane Rita. Rita caused massive overtopping of levees in the Chenier Plain which led to widespread death of fresh vegetation due to salt water. It is impossible that the levees of the area can be built to stop this from happening again. A main lesson from Rita is that a water management plan that maintains extensive freshwater marshes close to the coast is not sustainable. This is especially the case given predictions of global climate change. Despite having some of the largest water control structures in the coastal zone, it was not possible to drain salt water quickly from the area. This has important implications for leaky levee plan.

During its tenure, the NTRC made a number of recommendations for the Chenier plain. The NTRC had strong reservations about the sustainability of the management plan for the Chenier Plain, and this was before Rita. A revised version of the plan should consider and address these recommendations. The plan presented then is essentially the plan presented now, essentially a defensive plan aimed at controlling salinity and maintaining a largely freshwater system. We suggest that the planning team reconsider this approach. The combination of accelerated sea level rise and subsidence (relative sea level rise - RSLR) will likely result in unsustainable management for a number of reasons. RSLR will make it more difficult to drain water from the area using drainage structures. These conditions will make the area more vulnerable to a catastrophic hurricane event when barriers are overtopped, as happened in Rita. It seems only a matter of time before the proposed management would become very unsustainable. The management plan for the Chenier Plain should be rethought to consider that change is inevitable. Suspended sediments in nearshore Gulf waters should be considered for rebuilding and maintaining the coastal marsh fringe, especially below and immediately above highway 82. It has been shown that resuspended sediments leads to high accretion rates in unimpounded coastal marshes in this area. Impounded marshes have accretion rates that are much lower. In addition, freshwater, sediments and nutrients from the Sabine, Calcasieu, and Mermentau Rivers should be considered as resources for management. Atchafalaya River water is also an important source of sediments and nutrients, both via the nearshore Gulf of Mexico and via the Intracoastal Waterway.

A revised plan should consider management of part of the area that is now fresh to slowly convert it to a more saline conditions so that hurricane overtopping will not affect the area so strongly. Suspended sediments in nearshore Gulf waters should be considered for rebuilding and maintaining the coastal marsh fringe below and immediately above Highway 82.

8. Pontchartrain Basin.

The Lake Pontchartrain Basin Foundation, together with other stakeholders, have issued a plan for ecological restoration of this area that should form the basis for a post-MRGO future. From a flood protection standpoint, we are pleased to see an alternative for a straight structure alignment from Mississippi River-Caernarvon-Verret to the Pearl River, the easternmost alignment that does the best job of destroying the surge enhancing characteristics of the MRGO-GIWW funnel. We assume that this would consist primarily of pile-supported causeway structures constructed through open, though shallow water (<15 ft), with gates that can be lowered in the event of a storm, like a smaller-scale Oostersheldt structure. As John Lopez pointed out in the LPBF's comments, such a cross-lake element would raise serious concerns if it were simply a leaky, or even very leaky, levee.

We have not seen evidence that any earthen levee structure that is suitably armored for overtopping can be reliably maintained in this area, and if such levees are proposed said proposals must be supported with detailed, independent soils and engineering analysis.

9. Mississippi River.

The Mississippi River east and west bank levee systems are important anchors to the Greater New Orleans hurricane protection system. They also tend to produce some of the highest storm surge levels anywhere on the coast. Diversion structures and sail-through lock structures that will be needed to create sustainability for the coast can also play important roles in hurricane protection, and should be considered as ways to shunt water from one side of the river to the other during a storm.

10. Barataria Basin.

The levee alignment for the Barataria Basin should be moved north to just south of Highway 90 and be positioned at the base of the natural levees on the Mississippi River and Bayou Lafourche. The large wetland area between the GIWW and Highway 90 would then become part of the wetland buffer against hurricanes. Placement of the levee at the GIWW would complicate the use of the Davis Pond diversion. Limiting the outlets for diverted water will likely limit maximum discharges from the diversion. Placing the levee further north would allow a swamp to be maintained in front of the levee further protecting it from hurricane generated waves on top of storm surge.

11. Sub-Province 3 Issues.

Sub-Province 3 seems too heterogeneous. The western part of this sub-province in the Atchafalaya outfall region is the only area of the coast where there is active land building. By contrast, in the Eastern Terrebonne area, there are high levels of land loss, similar to the Barataria Basin. We recommend that these two areas be considered independently. The Planning Targets and Alternatives document states that the third channel from the Mississippi River is the only feasible alternative to restoration of this area. There may be other options. These include: 1) Constructing the third channel from the Atchafalaya. 2) Using fluid sediment enrichment with continuing fresh water input from the Atchafalaya or Mississippi. This freshwater would control salinity, provide nutrients to stimulate below ground productivity, and Fe to lower sulfide toxicity). 3) Using slurry pipelines to deliver sediment and freshwater, either for new marsh formation or for nourishment of marshes restored using fluid sediment enrichment.

5.3.4 Houma Public Meeting Transcript, November 29, 2006

STATE OF LOUISIANA

PUBLIC MEETING

* *

COASTAL PROTECTION AND RESTORATION

HOUMA, LOUISIANA

NOVEMBER 29, 2006

* *

The public meeting of the COASTAL PROTECTION AND RESTORATION COMMITTEE, given in the above-entitled cause, before Bridget Duplantis, Certified Court Reporter, authorized to administer oaths of witnesses pursuant to Section 961.1 of Title 13 of the Louisiana Revised Statutes of 1950, as amended, was held at the Houma Terrebonne Civic Center, 346 Civic Center Blvd., Houma, LA 70360, on Wednesday, November 29, 2006, commencing at 2:40 P.M.

APPEARANCES:

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King Milling Chairman of the Governor's Advisory Commission on Coastal Protection, Restoration, and Conservation

Scott Angelle Secretary of Natural Resources

Sidney Coffee Chairperson, Governor's Office of Coastal Activities

Johnny Bradberry Secretary of Transportation and Development

Benny Rousselle President, Plaquemine Parish

Windell Curole General Manager, South Lafourche Levee District

Steve Wilson President, Pontchartrain Levee District

John Porthouse Project manager

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Reporter:

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BRIDGET DUPLANTIS, CCR, CVR

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REGGIE DUPRE:

I want to thank everybody for coming. I think I know about most of ya'll here. My name is Reggie Dupre. I am the State Senator for District 20. I represent the majority of Terrebonne and Lafourche Parish in the State Senate. I want to welcome the C.P.R.A. Board here. It looks like we have a forum. Several of them are here.

One year ago on the first session after Katrina and Rita, Governor Blanco, Sidney Coffee, the chairwoman tonight, Secretary Angelle, the Secretary of C.P.R.A., and Mr. Johnny Bradberry approached me about the possibility of handling some legislation to create a master board for Coastal Restoration and Hurricane Protection called the C.P.R.A., Coastal Restoration and Protection Authority. That began the center piece legislation for the November, 2005 session, the first time we went into session and after the hurricane.

We also passed in that same session, unanimously,

both bills passed unanimously, a constitutional amendment which was just approved by 82% margin throughout the State on September 30th, which both this bill and the creating the C.P.R.A. Board and the constitutional amendment consolidates and integrates coastal restoration and hurricane protection projects.

So for all - for many, many years we've seen restoration and hurricane protection board in separate directions and people had blinders on, especially from different agencies from Federal and State levels. This being the center piece of legislation right after hurricane we saw the need finally to integrate them under one master planning stage.

What is being done now is the first unveiling and the presentation of the C.P.R.A. master plan. I was on the radio channel at K.L.R.Z. in Larose earlier today and I made the statement, you know, they say if you like sausage or you like the law, never see it made, if you like a master plan, don't look at the process of seeing it made. You know, one thing that I reviewed on this preliminary plan that I really like and I think speaking to most people here, we like the redundancy, we like the multiple phase process, Barrier Island protection, restoring wet lands south of hurricane levees, hurricane levees and the finally your

parish drainage systems so that we realize that to protect ourselves, we need multiple speed bumps.

You know, a lot of you think these brick walls of Louisiana, we don't know if he can be built or if it will ever be built. I think the multiple phases seem to be the better approach. A few weeks ago, some

of ya'll where with me at St. Bernard Parish and St. Bernard and Placqumines presented what they considered their regional master plan and it is very, very similar, the same thing that we need here in the Barateria and the Terrebonne Basin.

Now, one concern I want to warn the commitee members is the one thing that we don't like, is knowing that it's cutting out so many people of category five or our level of protections and I'm going to refer to the purple line on the map. We already have a plan for hurricane protection in this area, it is call Marganza to the Gulf. We already have a South Lafourche system with Larose and Golden Meadow that exists, Donaldsonville and Gulf on the east of Bayou Lafourche and the southern line will provide the best of level of protection from the areas of the Mississippi to the Achafalaya rivers.

And using barrier lands from the west of Houma connecting to Morgan City. But you may here some

objections today to that proposal, to run some kind of levee alignment pattern near the Intercostal Canal, cutting out thousand and thousands of South Louisiana citizens. With that, it is probably unacceptable and we can asked that that be removed from future planning. Again, welcome Ma'dam chairman and

I'm very, very pleased for ya'll to come to Houma and present this preliminary draft.

MS. SIDNEY COFFEE:

Thank you, Senator Dupre and I'm just going to stay right here as we get started. You know, a lot of hard work is put into this plan and I think that we are sort of at a jumping off place right now and it is a good jumping off place. This is the first time that you are going to have the opportunity to comment on this plan. This is not the last time. This is a process that is going to take place.

We were in New Orleans this morning, we are going to be, of course we are here this afternoon, and tomorrow we are going to be in Lake Charles. And we felt that these were the three most critical areas that we wanted to unveil on this preliminary draft to accept your comments on the front end and then let you know what the process would be from here.

What we are going to do is as we take these

comments and if you don't want to talk at the mic today, you don't have too, we are going to give you total access to e-mail, phones, you know, by mail, however you want to do it, we are going to be steadily taking your comments and your concerns and your suggestions all the way through the process.

In December, the team will go back out and they'll have a serious of workshops and these are going to longer sessions and much more in depth and we are really going to have a chance at that point to get a little bit more down and dirty with the details of some of this plan. After that the team is going to take those comments that have been made from across the State throughout all South Louisiana, put them together into what will be closer to a final plan.

We are going to address your concerns, we address your suggestions. We are going to all get a response one way or the other about them, and then we are going to come back in March and they are going to show you what is going to be very close to the final plan and ask for those final comments before they present it to the legislature, before the C.P.R.A. then accepts then and present it to the legislature in April.

So, this is the process, but this is the beginning of it. And we are very excited to see the

turnout today and we really look forward to your comments and we are taking all of those very much to heart I can assure you.

I want to remind you before we get started, that the State of Louisiana has really stepped up to the plate I think on coastal restoration, especially

since hurricanes Katrina and Rita. As Senator Dupre was explaining about the creation of the C.P.R.A., we have levee boards reformed in the New Orleans area which was a major piece to get done. That was done and ratified by the public in September and as you know by 82% vote, the citizens of Louisiana, statewide voted that if we get and we are keeping our fingers crossed, if within this session of Congress, if they give us a bill that shares offshore revenues with us then 100% of those revenues are going to be dedicated to hurricane protection and coastal restoration. And I think that and for loudest and strongest and important statement the citizens of this State have ever made.

Another big event that happened this year and happened very recently was the settling of the lawsuit that the Governor filed against the Federal Government. She held to her guns and she forced them to do the proper environmental assessment and take into account what happened to us during Katrina and Rita, to

take into account the accumulative effects of supporting the offshore industries. What effect it has had on this coast and has backed down the Federal Government and said, you got to do the proper environment assessment, you can't just give us anymore cookie cutter assessments of the impacts on our coast.

So we had a series of very powerful important things that Louisiana has spoken out strongly about and I think we told the nation, we know what we need to do with this money and where this money needs to be spent. And now, we are going to get along with it, for complete immigration of hurricane protection and coastal restoration through this master plan, and we look forward to hearing your comments.

John Porthouse is the project manager for the plan. He is going to come before you today and he is going to present the plan to you. It is going to take about 40 minutes. He at that point, after that, we are going to be able to ask or comment as much as you would like and he and Randy Hanchie is the team leader of the compliments of planning. He'll be happy to answer those questions as well as anyone before you today. I would like to compliment the Department of Nature Resources and the Department of Transportation here on this day to come together and provided us just

unbelievable team that has worked night and day, weekend, holiday and everything else to try to get this ready for you at this point.

And Secretary Bradberry and Secretary Angelle, represent the two lead agencies of this safari and these are going to be the agencies that actually

implement this plan. And I would like for you at this time for the record and we do have a Court Reporter here for each member who is here today, actually it is a 16 member board authority, but those that had come here today, I'd like you to state your name and who you represent for the Court Reporter. Thank you.

King Milling, Chairman of the Governor's Advisory Commission on Coastal Protection, Restoration, and Conservation;

Scott Angelle, Department of Nature Resources;

John Bradberry, Transportaion Department;

Benny Rousselle, Placquemines Parish President representing the Louisiana Police Jury Association.

Windell Curole, General Manager, South Lafourche Levee District;

Steve Wilson, President, Pontchartrain Levee District;

I'm Sidney Coffee, Chairwoman of C.P.R.A.

I would like for John Porthouse to come forward and show us the plan. Oh, and I do. Please

introduce the team.

MR. PORTHOUSE:

Good afternoon, I'm John Porthouse. I'm the C.P.R.A. project manager. I'd like to introduce Mr. Randy Angelette our team leader and from there on down, we have Roland Johnson, Mary Heartman, ----,

Andrew Bell, Ricky Prejeant, Michelle Angelle --------
Tad Falcon.

These are the folks that have been really working to this plan together. I also want to acknowledge there is a lot of familiar faces in the audience who has been with us with one on one meetings- and there are planning workshops that we have held. This plan is as much about you have already have in the process as it is where we are today and where we come from there, so I do want to thank those of you in the audience who have helped us out earlier this morning.

We hope what you see today reflects the input that you have already given us and we hope that this is a good starting part to help us finish out the levee. I will say that the booklet that you have been handed today do not represent the totality and the effort, there has been a lot of technical documents produced and are available on the internet. That information is scattered throughout that booklet and on the public

information contact sheet, so if you are looking for more details that you don't see in that booklet, you can check the internet and look for those technical documents and gets some answers to your questions.

Your questions aren't still answered, give us a call, we have phone numbers, e-mail address and so on

that website. So with that comment, I don't want you to think that I'm going to go through the entire process, where we started back in February, putting this thing together, everything we've done at this point. I very much want to keep this down just to a very quick tour through the planning to give you a few of the projects that we are proposing and what level of certainty we have. That is the point of today.

As Ms. Coffee mentioned, we'll be back in Houma in a couple of weeks for an open house, all afternoon workshop, format and a formal public meeting at night to get more detail comments after you had a chance to look through all the documents you want, get all the information you want and then we are going to come back and have a more in depth conversation.

So, with that what we are going to cover here today, we are going to cover some very, very basics. We still have a lot of questions about how this master plan relates to the core of engineers recovery efforts

with the Louisiana Recovery Authority. We are going to go over that a little bit.

What are we trying to achieve? What are the objectives of this plan? What does the status of this plan? You've seen this booklet before, what does it really mean, what is left to do? Obviously there has

been quite a bit of time I'm going to show you what's in the plan. As we all know there are significant amounts of legislature policies and institutional things to keep us from being successful in putting projects on the ground very quickly, so this plan as directed by an Act 8 mandates that we look at those issues and make sure not only that we got a good program to implement, but that we can implement the program. And what comes next. We are going to do from here until we submit the plan to the authorities and onto the legislature.

So, how does this relates to other efforts. As you all know immediately post storm, Congress passed two appropriation bills directed the Corps of Engineers to put together a comprehensive hurricane protection coastal restoration plan. That is called the LACPR effort and if your familiar with it. But is a basically a technical plan. What are the projects, that provide protection for coast of Louisiana?

We are really not going to get into the guts of how they implement that program. This is really a program implemented through the normal legislative policy process which is the main difference between their efforts and our efforts, C.P.R.A. master plan effort we are here to talk about today. Again, not

only dealing with the technical guts of what we need to build, but how do we need to build them, dealing with future policy and we'll stress on those issues.

It is important to note we have a very strong cooperation with the Core of Engineers right now, hopefully or probably in all likelihood, not end up with two separate plans. What comes out is the corps plans and the states plans and and we will get them as close as they possibly can be. Strong colaboration, will make that happen.

In contrast to the Louisiana Recovery Authority who has been cast by Governor Blanco to oversee the large scale of development in south Louisiana. Manage patterns, transportation and all those kinds of issues that caused the quality of life that exist behind this protection restoration systems. The input that this plan represents is submitted to Louisiana Recovery Authority. It is participating in the Louisiana speaks initiative. This frames a lot of

those issues in the Louisiana Recovery Authority is taking on. So they are all related.

A significant amount of effort to keep it coordinated and hope your guys who are participating in the all of the processes, see that they are well coordinated. So what are the master plan seeking to

achieve, basically there are some big picture issues. There are very basic picture here that we don't have a healthy landscape. It is not going to be very easy to have a healthy eco system for protection. The basis for this plan is a healthy landscape to provide more eco system services, fisheries and flood protection.

This plan is based on a multiple line of defense strategy as Senator Dupre mentioned. Barrier Islands, restoration , levees, evacuation routes. All of these things come into play on the plan.

And more importantly, we look at the hurricane protection strategies and we define those based upon the fact that we will be successful in restoring a healthy eco system.

And lastly, I'm glad to see such a large turnout here. The plan will not be successful without serious public involvement and input. To this point we have been given a very specific both the State Boards, but we have not been out to the public at large and

that's why we claim this a preliminary draft plan. We think it is a good plan and we think we made a lot of sound decisions, but we have not checked with the public to see what the public advised to make sure it meets your expectations.

Although it is built on a lot of planning efforts

that you are participating in all of those things are wrapped up into this plan. We also have some very basic science and engineering issues out there to help guide this plan as it is put together.

One of them is, it doesn't matter what we do. If we do a restoration project, marsh creation, diversion, it is going to change the hydraulic eco system. If we put a levee project up in all likelihood it is going to change the hydraulic eco system. And that will influence the type of eco system you have. What kinds of fish you are going to catch where, those kinds of issues. But that doesn't mean it's bad. That means it is going to be different.

Because, the key point here is, we can't fixed this problem if we don't change. We are trying very hard to put you a restoration protection projects out there and that don't really have much an impact on the system. We are trying to preserve small areas and we're trying to make sure the levees don't impact

hydrology in any kind of way, but if we don't change the system it is going to be the same system. The processes that are interrupted have to be restored in some way.

And lastly, as we are seeing in South Louisiana especially, if you know change is coming and

you can anticipate it and there is support and basic services, hospitals, grocery stores and things like that, we think that communities can adapt, it happened over the last several hundred - couple of hundred years in South Louisiana. Things have changed. The environment has changed, but we have adapted first. We are relying on that because it is going to be the key in how this plan is implemented.

We used all the info we received from previous planning efforts, from the meetings we have had from the Corps of Engineers and used to develop the set of principals. More largely framework on what we want the program to accomplish. How we want it to work. And it deals with things like the necessity, the rational behind integrating protection and restoration. The fact that we must have State program with public interaction involved this process to make it work. The fact that this plan that exist today will exist when submitted to legislature is probably not what ends up

on the map 30 years from now.

Every big plan of the United States, the Mississippi River, the Interstate highways do not look like they were initially conceptionalized all of those years ago. This is the same kind of efforts that take a while to implement. We have to be able to learn and

bring knew knowledge into the process and make sure the plan stays focused on what it is trying to do and it always get better with better decisions. We need to acknowledge those constraints out there that make these decisions that are also related to this that are detailed on the internet.

We also have a series of four coast line objectives. We do not have a single flood protection objective. We do not a single restoration objective. We have four objectives in this whole plan is attempting to balance. That does not mean that we are simply maximizing achievement of all of these objectives. We must have all of these objectives to be successful.

Our four objectives basically the first one is hurricane protection, which could be accomplished which might be a levee in front of a highly populated area. Or a situation like this one, houses are raised. They are off the ground. Flood water can flow

underneath the house still preventing from damage.

Hurricane protection is obviously important. There are parts of this coast, which in all likelihood, will have to rely some sort of a combination of levees and raised structure to achieve the maximum protection that they need.

The second objective deals with the sustainable ecosystem. This is all under the cornerstone of the restoration program. Putting the levee back to work, using the sediments and fresh water between the rivers. Distributing it to our working levees. Now specifically the Barateria Terrebonne and our estuaries who have the highest rate of land loss. How do we get those river processes back where they belong to work for us. But not only is it about building land, it is about having a diverse way of having economic activity. - salt water species and fresh water species or agriculture.

There is an array of economic activities supported by this coastal zone. And for the plan to be successful we have to recognize that and we have to make allowances coast wide for those activities to continue.

And the last one, we have the very rich and textured history in coastal Louisiana and we have to

recognize that. A lot of it, the history of Louisiana is, and a lot of the community development is tied to the landscape. People live where they live because the land is there. How they can derive their living from the landscaping. Their ties to landscaping is what makes those community unique and we have to recognize

that and preserve that as best we can.

So what does this plan represent? It is a conceptual vision of our future coastal Louisiana. You will see lines on this map. Please do not take them, being in all instances the absolute footprint of what we are looking at. The context illustrates at this point a good representation of how we are looking to achieve these objectives.

It is an integrated approach. It does rely an integrated restoration and protection scheme. We cannot just take it apart. We can't take on only for flood protection to be successful. We just can't see restoration having it be successful to a certain extent, we have to keep it integrated and keep them with the norm at the same time to be successful.

As I said, this does strive to balance the objectives. We think it does balance the objectives fairly well and there is further review to define the strategies we are presenting and they might be better

off if there were additional opportunities to balance the objectives. It is primarily a starting point to for conversation . Again we have a lot of agency interactions, a lot of scientist interactions, a lot of state board interactions, but no real public interaction. That is what we are starting here today

with this plan, the draft plan.

So, what is in the plan, four or five tier is going to be basically statewide landscaping developing plan followed by the hurricane protection scenarios and then the statewide positionary plan scenarios. Just so you know what is coming. I do not want you think that by the order we are presenting this that we have assigned any priority or sequence here. We are just trying to communicate the layer of defensive systems of the planning, put it out there. No decisions have been made. We are trying to get you the whole plan. Something that is easy to digest. So, it all does start closest to the Gulf, the shoreline, you see that we have marked on here all of the barrier islands and headland in Barataria and Terrebonne estuaries. And also significant restoration and interior portions of the estuaries.

These Barrier Islands and rivers are extremely important in the first line of defense. They do

redirect surge from winter cold fronts and small tropical storms. They are a important part of the system. From a flood protection and eco system point of view. Their unique habitats. We need to restore them. Also we do have some critical shoreline, such as the back shoreline of Grande Isle and some other land

forms east of the river which we are important and to make sure that those land forms don't disappear.

Stabilizing those landscapes and making sure those ecosystems and protection plans are viewed. In this case we also have navigation channels which exist. A lot of the environmental folks look at navigation channels as bad. We can turn them into opportunities. If we stabilize the banks of these navigational channels, we can prevent further erosion in the sensitive areas such as, we have a lot of floaton marsh here in the Terrebonne estuaries. Stabilizing these navigation channels can prevent more damage to these sensitive areas.

But we can also, as you all know, between the Gulf Intracoastal Waterway and Houma Navigational Canal we have a significant opportunity to move river water from the Atchafalaya River to areas in Terrebonne Parish that don't have a very ready source of river water. So this is all about making sure the navigational channels

are there and available in terms of the best advantage we can. Land sustaining diversions. These are diversions ya'll are used to hearing us talk about between "Canarva and Davis ponds". They are not land building diversions.

They are not designed to build large bodies of

land in open water. They are designed to maintain existing landscapes. And that is what these diversions are. They are targeted in the upper and central portions of these basins using the whole navigational canal. Again targeted areas to make sure the landscaping does not disappear. Does not continue to disintegrate because it is always easier and quicker to make sure you don't lose what you still have.

So having said that, there are areas we would like to rebuild landscape if we can. See there are only two real ways to do that if you see those right now. One of those that has been talked about extensively lately is marsh creation with dredge material. Go offshore drill a river, a navigational channel, find some sediment, pump it in and creating new land physically. The issue with marsh creation, number one, is this is a lot of marsh creation. It is very expensive and doesn't mean it's back.

It just means that when you create this land

you've got to keep it protected, again, you've got to find a way to make it sustainable. So again we find ways to get river water. Sediments and nutrients can be created by it. If not we are looking at some substantial investments if we continue along this path. Substantial investments of pipelines, pumps, those

kinds of things to renourish the marsh because we will not have reversed any of the processes which caused the land to disappear to begin with.

The other way to do this is by marshland building diversion. Please do not take this representation as any degree of certainty. This is very highly conceptualized. Going back to the Coast 20 50 plan, with the Delta management and making sure we don't loose the sediment that is in the navigational channel and deep gulf waters. Going back to June 1st of this year when they had a panel of 35 or so scientists from around the world and say if you are serious about restoring this coast you must put the river back to work. You must use those sediments and fresh water if you can to rebuild the landscape. This is a very conceptual representation of that.

To put the river back to work obviously recognizing there are some significant issues in terms of the estuary grading. Some significant issues in

terms of navigation. Those are the kinds of concerns we have to work through if we are going to implement this kind of a plan. We do have a series of special focus, one of them being the Mississippi River Gulf outlet which you continue to hear about. Just to state once and for all this plan does call for a total

closure but not a closure of the "Emargeio" to deep route navigation at the Bayou Lafourche bridge.

As opposed to the recent public meetings that have occurred and the citizens were requesting that the channel be filled in to marsh level, we are not proposing that. We are proposing that we turn this channel imparticular into a conveyance channel for fresh water. Putting a large diversion off the Mississippi River into this channel and distributing it out her in the Biloxi marsh areas where we know we need it.

It is very critical landscape in terms of storm surge. To be more specific about the Delta Hurricane Protection I think I have three slides here and they all have the same sort of concept. Redundant levees. There are areas in each of these next three slides that we are suggesting require a very high degree of protection.

Metro New Orleans, the Westbank, and Houma are all

on that list of needing a high degree of protection. And they all rely on the system of two levees. As you know we have conceptualized here. So both scientists and engineers say that you might guess your first line of defense is not your last line of defense. You do not want one wall between you and the storm surge and

that wall fails. Then you're in trouble. That's what this multiple line of defense is all about between your barrier islands, marsh restoration, and as I'm going to show you multiple levees in some places.

Longer, more complex protection systems are more prone to failure. Lots of moving parts, longer levees, more miles. Anything you can do to make a system longer and more complex just increases the probability of failure unless you engineer it with fairly serious engineers to make sure that doesn't happen. You must give water room to move because a levee will not dissipate a storm surge. It stops it, it redirects it, it puts it somewhere else.

You've got to find someplace to put that water where it will not damage our homes. And again, if we put levees out there, if we do any of these restoration projects, it will change the hydrology. Let's make sure we are accounting for those changes and lets turn them to our advantage the best way that we can. For

example, east of the Mississippi River we have a system on the Lakefront we have conquered in the last 15 months. This is a system that exists right now that is very complex with a lot of moving parts.

It is very difficult to retrofit that system and get the level of protection we are looking for in New

Orleans. So what we are suggesting is an outer barrier from the North shore across somewhere in here. These are three conceptual alignments. But basically don't make this first line your last line with the outer barriers in there to make sure you provide additional protection for Metro New Orleans, St. Bernard Parish, and some protection for the North shore. In Barataria Basin and Plaquemines Parish are recommending these levels of protection for Plaquemines Parish.

The northern most area being the highest part of Metro New Orleans, the highest level of protection levee between Oak Grove and Myrtle Grove at a (100) one hundred year level of protection. And then below Myrtle Grove had the existing level of protection. Plaquemines Parish, lower Plaquemines Parish, if this plan is conceptualized needs to rely on a combination of levees that are in place and maintained and some of those non structural measures we are considering.

Raising houses to achieve the (100) one hundred year level of protection.

We are also calling as many of you, especially from the Lafourche side, from Donaldsonville in the Gulf Visibility Study. This is basically the GIWW line of that levee. We think it is important to work with

that line there because we are using this to provide a higher standard of protection for the Westbank. Other alignments that have been looked at that are more northerly than this do not provide a redundant line to the Westbank. It relies on being able to retrofit that system to be the highest degree of protection.

We think this is a better angle putting an outer barrier to the Westbank to give them a higher degree of protection. For Terrebonne Parish, Atchafalaya, Delta area - This red line you see right here is the existing Morganza to the Gulf Hurricane Protection project alignment. One hundred (100) year protection, we are recommending that move forward. We all had discussions on whether or not that is advisable to modify the eastern most section of the alignment to reduce this kind of a funneling situation.

That would provide even more of a outer barrier for this area and more of a line of defense in this area Larose to Golden Meadow. How we conceptualize

that we are also recommending similar maps to a interior levee. This one, I believe, happens to depict the GIWW line. It's just a concept. We know that Terrebonne Parish talked about different alignments. We would want to talk about those. If we are going to provide a dual line of levees, which would be Morganza

line or somewhere else entirely.

Where does it make sense to put that levee so that Houma would receive a higher degree of protection. And they're looking across to the barrier plan of Morgan City. Even with all our flood protection in place there will be residual risks. There will be areas that are outside the levee systems. There will be areas inside the levee systems but not the highest degree of protection. There will still be some vulnerability to flooding.

Things like elevated structures, maintaining evacuation routes so people can get out as long as possible before the storm approaches. Raising them, maintaining them so even after the storm passes you can make sure you can get back to your house, back where ever you need to get back to very quickly in the recovery.

We also have some here on the North shore and Pontchartrain. Even with Old Monticello levees in

place here we have to reevaluate whether or not we need additional protection for the North shore to protect against lake water moving around. There are also other issues like compartmentation, rather than having one large metropolitan area protected by one levee around it. If you have failure in that one area and the

entire city gets flooded. We are suggesting that all metropolitan areas probably should look at the compartmentation type scheme.

Look at your existing roadways. Look at your existing railways. Anything you can find with an elevated structure within the metropolitan area. How can we turn that to our advantage so if we do have a catastrophic breech in one area the entire city doesn't get flooded. This map we got from the Bring New Orleans Back Commission, but as you can see it starts north of the Jefferson Parish line. Catastrophic failure here, flooding here, no flooding here. I think it's a good idea for all area to look at that.

The last bit, again, putting a levee up could have effects on the systems hydrology we have. But again it does not have to be bad. The northern areas of Barataria-Terrebonne estuaries, through our meetings, the only thing we heard is everything north of the GIWW needs to be fresh water systems. It's swamp or marsh.

Putting the levee here does not preclude that to be a fresh water system. What it does is poses an additional challenge.

How do you get the freshwater sediments and nutrients from the river, into the basin, onto the marsh rivers and out of the basin at the population you

wanted. You can use these as opportunities to increase the health of this system and potentially move water to areas that have been considered way to low. Can we put water in Davis pond have it filter down into the GIWW to link it down to Terrebonne Parish. These are the kinds of things we need to look at and that we are proposing with this plan.

The Chenier Plan is very similar. Again the line or multiple lines of defense starting at the gulf. The shoreline stabilization via a barge or sand restoration. It's a little bit different out here. Your evacuation routes of the interior are Highway 82 and Highway 27 were actually suggested due to a number of factors that these need to be the first real structural lines of defense and elevate those highways and make sure that they're there. Not only provides evacuation routes but the first attempt after the gulf shoreline to knock down the storm surge.

We also have significant opportunities by

navigational channels in the Chenier Plan between, especially this area here, which is proposed for channel deepening here we can not only remove fresh water and sediments down these channels but we can rebuild shorelines. Not to be levees but to provide some sort of a barrier when a storm surge is

approaching inland. Unlike the Delta Plan however, the Delta Plan most of the Chenier Plan does not have a river running through it.

It is not available for sediment introduction to build the land. For the Chenier Plan, if we are going to create marsh we have to rely on navigation channels like the Calcasieu, the Sabine, and the Atchafalaya Navigation Channel. Using beneficial use to create new marsh were we can. It's about the only landfill process we're going to have with the situation here. There is again opportunities to optimize the fresh water sediment to have a system. Optimize the flow of the Atchafalaya River and the Penchant basin areas.

Sending water down the GIWW this way, having fresh water from the northern portions and southern portions managing influence over here. There is significant opportunities to manage the existing fresh water sediment to make it a better mix with the existing marsh that is out there. In this particular instance,

we also recommend, especially in the Calcasieu ship channels, salt water control structures as depicted here conceptually could interact with the (4) four to (5) five to provide storm surge protection can become more weakening than Calcasieu Lake.

Hurricane protection is sort of a different system

than we saw with the Delta Plan. The outer lines of defense really are the Gulf shore lines, the highways, and soil banks. We have identified the Lake Charles and Sulfur area, especially due to the population density, oil and gas development and the refineries that are out there require a higher degree of protection. The Lafayette, Abbyville, New Iberia segment of the state all require a higher degree of protection of a (500) year level of protection.

What we are also saying here is due to the unique nature of sediment out here with a highly dispersed population, several (10's) tens of (1000's) thousands of people that compose real large towns if these highways these do not provide (100) one hundred year level of protection this spoil banks that we're looking and find in the GIWW might need to be elevated and turned into a levee. So we all know what these are. They are the policies that legislature and institutional issues that keep us from being

successful. I do not have suggestions on how to fix these right now.

We've cataloged it. We are going to have to put our heads together and find out how to make these programs work. The top (5) five or so issues that we've identified though are land use planning for

development. The last thing we want to do is build a levee and then have houses go up right in front of the levee which puts them in an increased risk to enable us to - but also in the future we might have to raise these levees. If there are houses right up the base of these levees it make it very difficult to retrofit the system.

There are issues we have to do here to make sure that the land around the protection systems are developed appropriately to make the protection systems work as we intend them to work. We also know that the majority of the coastal zones and ecosystem is privately owned and the same issues and mineral royalty issues that have been with us for the restoration program and is still there. We need to take a look at those and see if there is anything we can do to facilitate the implementation of those. As I mentioned, this is a large program that will take many years to implement.

We want to make sure that if this plan does have to change it changes only in a way that we can stay focused on the objective. Having rebuild this plan is a set process that allows us to change in a reasoned and informed manner to keep it focused on the objective to make sure it continues to be successful. It is going to

be an expensive plan. We don't know how it is going to turn out because we don't have all the details we need to put a cost estimate on it but it will likely involve a level of partnership of Federal money.

So we have to keep mindful of that we have a partnership, possibly the Federal Government, including finding ways to make the governmental system work to solve problems instead of dragging problems out. These decisions aren't going to get any easier in the future. We need to find a way to get these things done faster. Much as the coast 2050 Plan have been used for the last (8) eight years or so, this master plan used to be the basis by which we evaluate everything else from the C.W.P.A project to permit decisions to development activities of the coast to make sure it is consistent. And lastly on this slide, priorities specifically as indicated by dedicating plans.

If we find this is important and we want to make sure this is taken care we want to get the priority

dedicated funding to them so that we are not in a position every single year to look at what is going on out there and figure out how this fits in to everything else. With the dedicated funding we find a way to get these things on the ground with some sort of capability. What comes next? Public discussion which

started about 9:30 this morning and this one started at 2:30.

This plan is the starting point for discussion. Conceptually if you like what is in the plan, there are lines you can move somewhere here or there. Let us know about that and we have a tremendous amount of technical information given to us about where people live, where industries are. We can go back and look it up. Whatever comments you have, whatever suggestions you have to make this plan better. Let's talk about them and see if we can make them work with the framework we have. We do have significant refining and define layers to do. There are things out there we know we have. Shoreline protection, we really don't need to protect shorelines because it's stable or premature. Things like that.

How much marsh creation we need. How high do the levees really have to be. That's all work that is going to be going on for the next several months to

develop cost estimates which we really don't have any detailed cost estimates at this point. Also develop implementation sequence which you saw was very large plans with no sense of priority and no sense of what comes first. We know we have to do that and we know we have to do that in the next couple of months.

Start sketching out what does come first and how long does all of this going take to implement. We will be doing this public discussion process through our ongoing scientific and technical process. There may be some revisions to this plan based on what we hear from you folks, based on continuing analysis, and the feedback we get from our reviews. We do have again, significant opportunities for you to come back. I hope ya'll got a handout in the back of the room which explains the public meetings. Your Houma, first up, 6:30 on December 11th. That afternoon we will be here informally to discuss this plan to take your input and take your comments and figure out how we can make this plan better.

Followed by another formal presentation and we want to give you a variety of opportunities to discuss this plan with us. The handout we have back there has additional in details, if you don't have one let us know and we will get one to you. And lastly, as I

mentioned, there is more information out there. It is available on the internet. This is the website. I will leave it up there for the remainder of the day. Louisianacoastalplanning.org has not only this booklet that we handed out today but it has the technical information to back it up.

Including our state boards concerns and comments that you have heard and addresses. So if you have any questions that weren't answered today in the brief time we have together, if you can't find your answers to this on this website please come see us on December 11th. Ms. Coffee I believe that's it.

MS. COFFEE:

Thank you John. If you don't mind staying or standing there, I'd like to ask you and come and sit up here. There might be some questions directed to you, the team leader.

At this time I'd like to ask for comments and questions and you don't have to raise your hand, just come on up to the mic and it would be probably be best if you could start forming a line, if you would, it worked really well in New Orleans that way. Thank you. As for as the Court Report, please say your name. If you are a private citizen that is coming as a private citizen or say that or if you are representing an

organization tell us what that is, thank you.

MR. ARY BOULLAIN:

Good afternoon and thank ya'll for coming to Houma. I guess that I'd like to start off by saying I see a tremendous amount of work went in here. My name is Ary Boullain, I am the director of the LA 1

Coalition. Most of you know me well up there. You know as a community as worked along side a DOTD in trying to get an elevated highway within place of south of Golden Meadow and we basically have a plus 17 feet foot elevation. I would like to ask you to consider the levels of protection that are planted to South Lafourche district.

Windell says were very close to the (100) one hundred year protection level right now and that basically tops out I guess about (14) fourteen feet above sea level at some point and down to (10) ten feet above sea level in Larose. My request is to be consider something in between the (100) one hundred year protection and (500) five hundred year protection. Thereby bringing that system up possibly up to (16) sixteen or (17) seventeen feet of protection to match our elevated highways.

It certainly wouldn't do us much good to have the elevated highway if we can't access it because the

South Lafourche system was inundated with water and we couldn't get through it for several weeks, but there are very good parts of this plan. I want to thank you for your hard work on that and ask you to consider that for the LA 1 community. As you know this entire corridor is feeding about 20% of the nations energy

supply. As an economic look at it's function, I think the State needs to look at the importance of this, not only to the nation but to the State's economy. Thank you.

MR. NATHAN TROSCLAIR:

My name is Nathan Trosclair and I'm a private citizen from Dulac.

I thank ya'll for coming out here and sharing this information with the public. But, there is only one thing that I'd like to address here is that these meetings scheduled at this time 2:30 to 4:30, it is kind of rough on the working people. I know that ya'll are planning on doing some more meetings, but I know ya'll pleased with the outcome here as far as the turnout and stuff, but I really believe that this room would be too small if you would let everybody into it. You have a great program and we have very crucial decision that we have to make in peoples lives, you know.

The thing is, I would like to see some of those lives where the defense would be stronger in my area, because we are excluded out of that stronger area. We are not excluded out of the Morganza but we are excluded out from the higher greatness of protection, the purple line. Come more down south. So, I just

want to thank you again whoever is doing this scheduling. Think about the working class people, the living people, the people that have to work these long hours, eight and nine hours a day.

And I really believe you would have a far better turnout and more input to these issues that are very critical to our lives. Thank you.

MS. COFFEE:

Thank you.

MR. TOM BINGHAM:

Good afternoon, my name is Tom Bengler. I'm the General Manager for the Valentine Paper in Lockport, Louisiana. First of all, I would like to thank you for this meeting and for all of us to have a chance to stand up and voice our concerns to ask questions and I guess the first question that I would have and then I would like to make some comments is what kind of time frame do you envision for this master plan, this very ambitious plan that we'd love to see it

all implemented.

What time of frame are we looking at? Is that really scoped out or we don't know yet?

MR. JOHN PORTHOUSE:

We really haven't looked at pretty detail at this point. It really does depend on what goes into

the plan and we do have enough in that will be in least 10 years or 20 years that your looking at to put the entire thing on the ground. Of course, I would likely depend on the level of funding on the project.

MR. TOM BINGHAM:

Twenty years, a lot of problems that we have we going to have become totally destructive to South Louisiana. In that time frame to plan will be useless. One of major issues that I see and I've been riding the heart of this, the coastal erosion saltwater intrusion problems for 15 years and I've been listening to meetings like this and I have been to them and I have supported all sort of efforts and today very little has been done to resolve the problem.

It just continues to get worse. Now, this is a good start, but it can't take 20 years. It just cannot. I represent the employees of Valentine Paper. They are looking today to try to push this stuff for them, there are 85 people over there that contribute a

great deal to the local community and in this past fall and into the winter and is still discovering saltwater intrusions for over a month now at levels of up to 5000 parts per million plus. Sea water is about 30,000.

We are running there so high they are catching red fish in lakes north of Lockport. Now, the saltwater is

what is destroying the coastal areas.

MR. CUROLE:

You might want to mention what happened to your plan.

MR. TOM BINGHAM:

I'll get to that. The saltwater is what is destroying the whole coastal area. It destroyed the vegetation, the land mass that has been built up for centuries, it eroding away and you have nothing but saltwater. It is great saltwater fishing, but first thing you know they'll have saltwater fishing north of Thibodaux. That is the way it is coming. In four years I would expect that might happen.

So, you know, one of the things that could be done immediately to at least say on the time, a step was taken four years ago, I believe, five years ago, well a saltwater structure was built just west of Lockport. There has been some discussion recently on the second saltwater structure to the south of

Valentine Paper. Between Valentine and Larose to slow down the saltwater intrusion. That will benefit several things.

First of all huge public health concerns. The Fresh Water District in Lockport, north of Lockport was drawing saltwater last year, this year, I'm sorry,

a month ago, trying to make fresh water for the drinking water system. Kids in school were instructed by their teachers to bring a bottle of water to have some water to drink. It sounds like a third world country. You know, it is embarrassing to be a part of it. If I'm very emotional, please bear with me, because this means a lot to me. I see my company, okay, let's go back.

The year of 2000, we had a horrendous problem, almost as bad as this one. We estimated that it caused Valentine Paper between a half a million and one million dollars. A couple of years later we are facing bankruptcy. We went through bankruptcy and we came out of it last year. That was a significant blow in the step that led us to bankruptcy for loss that we sustained. We lost customers, we lost a lot of money. We have just began to recover.

We got bought out by a company, almost a year ago, it will be a year ago December 6th. The new owners are

investing in the company and they are trying hard to make it viable and they have succeeded and we if continue to fight these kinds of problems Valentine Paper will ultimately disappear and they is 85 people who will lose their job.

I sat down and figured up the other day the

impact of Valentine Paper in a small local community, we estimated we pay our payroll, taxes, property taxes, sales taxes and material that we buy in the South Louisiana community is in the range of twenty million dollars. When you spend, when a company spends that kind of money in a community it turns between three and five time. You are talking about 60 to 100 million dollar impact that Valentine Paper has in the local community.

Now, are we going to let all of that go away. You are devastating Lockport and Lafourche Parish. The impact would be huge. There are some solutions that could be put in place. Another saltwater construction below us and put in some dam water in the bayou in Donaldsonville.

You don't even run on the pumps that we have. They aren't big of enough, if we don't run, what do we have. We want two of them or three of them and to me it's a lack of political will of all the parties

involved to do what has to be been done and I'm saying get some political will to do the right things. It is crucial, it is not just Valentine Paper. The bridge is built, you know, Bayou Lafourche is an essential part of this whole problem and it hasn't had enough fresh water put down in 100 years to save the coast line and

now we are going to take 20 years to come up with a plan to get some water down there.

MR. PORTHOUSE:

Sir, if I could just clarify that was 20 years for the entire plan. We could start implementing it next year if it could be designed.

MR. TOM BINGHAM:

I hope next week. I appreciate that. We are still struggling right now, we still got the - to high to make the grades of paper we need to satisfy our customers and we just can't do it. And I've talked to - for an hour trying to persuade him to that we are still a viable supplier for him. If I can't do something for him by next week he is going to go elsewhere. He may be just the first of many. Thank you.

MS. COFFEE:

I want to thank you and I just want you to know and you can take this any way you want. You are

not the only one who is frustrated. We are frustrated too, and we're frustrated and I can only speak for myself having worked with this over the last two administrations, but I would tell you that if you want to make some noise, get out there next week and let the Bush administration and let the Congress of the United

States know that we've got to have this legislation bill and if we don't we can't pay for this.

It is going to be almost impossible if we don't have that kind of - well, it will be possible to get this plan implemented and done. If we don't have that OCS revenue sharing and if Congress won't step up to the plate and decrease the length of time it takes for the Corps of Engineers to get a project on the ground for us and if the Federal partners that we have now and quicker process and quit worrying about the process and start worrying about what we need and to work with the State to get these things expedited and done, we will all be in a better shape. But, we are going to have to all stand up and demand it and keep demanding it and let them know how serious we are.

MR. TOM BINGHAM:

I agree. I appreciate that kindly. About two weeks ago I wrote a letter that was for River Parish to State agencies supporting this saltwater

structure below the bill and as an effort to try to gain additional support I copied both your Senators, my U.S. Congressman, my State Representative, my State Senator and several other folks and to date I've gotten a letter back only from the Governor.

MR. MILLING:

Can I ask you a question? How far above the Lockport water plant do you have to go before you got above the saltwater intrusion?

MR. TOM BINGHAM:

I'm sorry, I didn't understand it.

MR. MILLING:

Now, you go north of Lockport plant to get to some point to where the water reaches fresh, the salt hasn't gone that far up river, how far are you from that?

MR. TOM BENGLER:

They had salt water, this fall there was saltwater above the intakes, Water District Number 1 and I don't know how far it went. It went some distance above there, quarter or a mile, a half a mile. We have saltwater all the way to Raceland.

MR. Milling

Thank you.

MR. ROUSSELLE:

Can I ask a question also? The saltwater that comes in, there is a chance to back the saltwater up by letting more fresh water down the bayou?

MR. TOM BINGHAM:

Yeah. More fresh water.

MR. ROUSSELLE:

And what would it take to get that done?

MR. TOM BINGHAM:

There was a great plan, which I understand that has been abandoned, but that is my understanding. To put a larger pumping in the system in Donaldsonville that would raise the flow and the volume from about 300 feet per second to 1000 is it. At one time they talked about 2000 and they decided that was too ambitious and they back down to 1000. From that and that involved a serious of whole set of new pumps and much larger capacity. It involved dredging the bayou of Donaldsonville down quite some distance. Everybody talked about it was a great idea and nothing ever happened.

MR. MILLING:

Mr. Bingham, let me just say this. It really hasn't died. What has happened here recently is the double agencies collectively form this task force and decided that the cost for that project escalated toward

four hundred fifty million dollars ($450,000,000.00) and that they could no longer build that project out a program that only got about fifty (50) to sixty (60) million dollars a year. Now the State at that point and stepped up and Secretary Angelle made a statement to the legislature, to pick up the cost of the project

so that could be built.

The State still remains committed to the project, unfortunately This project that is being pushed with the Corps of Engineers, the Corps of Engineers got this very complicated process for developing the studies and reviews and so on. A lot of resource development has gone on this year. You authorize something based on a report and then construction. Obviously, I think the first thing you would do should be look at that pumping capacity as you've indicated that was not being used now. If you dredge the channel you could use the existing pumping stations to pull the fresh water out of the bayous.

The plan is that to replace that existing pumping station with a modern pumping station, 1000 cubic feet per second capacity with a provision to extend that if in fact it turns out you could put more water down the bayou then that. Unfortunately it doesn't solve the salt water intrusion. We are talking about something

that could be built stages, dredging would be the first stage, but even that would probably be in several years from now.

MS. COFFEE:

Sir.

MR. HAROLD LAPEYRE:

Thank you, thank your for the opportunity to be here today and thank you for coming. My name is Harold Lapeyre. I'm an elected official here in Terrebonne Parish. I represent District 6 in Terrebonne Parish. Most all the central theme and point I would like to make is basically to try to make everyone in this room and you understand that time is of the essence. We have been discussing our Barateria estyaries for at least 20 years. We have watched the Barrier Islands wash away.

We've debated whether to use rocks, whether or not they used rocks. We've come to a series of debates and I think that time for debate should be at least reduced down to a minimum and we start to get down on to concrete factor on what we need to do. And basically that is where we are. We as a community, the whole room, represents probably a small micro thousand of what has happened, to not only Terrebonne, Lafourche, Jefferson, St. Bernard, Placquemine, all the way to

Cameron, our whole entire State.

Our coastal system which produces, I think, and you could correct me if I'm wrong, about 40 percent of all the marine life that exist in the Gulf of Mexico. Basically emanates from the Barataria estuary system.

My plea with you is, is that we have a project

here in Terrebonne that is very important. It has been engineered, it has been discussed, it has been debated, it is called the Morganza to the Gulf. We ask that you all support that position, which I think you've already stated that you will. But, it is important that we energize that system and get it built. This is just one part of a tier system that I am particular interested in. The Barrier Islands of course is our first line of defense.

We watched those basically wash away. We need to get as much money and as much engineering and technical capability on how to restore those islands. We need to get Morganza built and if you want to build another line system further north, that is fine with me. The tier system is a good idea. When you got a 40 foot tidal wave, which Mississippi and New Orleans just experienced with Katrina and to our west we had Rita. When you have that kind of energy coming in out of the Gulf, we need all the protection that we can possibly

muster.

Terrebonne has zero. Okay Terrebonne and Lafourche, Lafourche has a little more protection than we do because it was in their wisdom, they took it upon themselves to tax themselves and we have taxed ourselves locally but we don't have the financial will

to create the kind of magnitude to the protection that we need. We need your help. We need Federal help, we need State help. The question is, is we need to accelerate the process because, this gentlemen stood before me, they don't have 20 years.

We have been talking about this problems for the last 20 years. We are washing - we are watching our community, not only this community, but Lafourche and all of the communities to the west along the Gulf and all the communities to the east. We are another St. Bernard waiting to happen. Another Placquemine waiting to happen. I guess I made my point there. My other question is, you said put the Mississippi River back to work.

What has been done physically done or we now allowing more river sediment and water to be diverted at the lower end of the river or we are still just talking about it?

MR. JOHN PORTHOUSE:

Aside from the river diversion projects we have already did in the Westbank and some of the smaller ones up there, we have one or two more in the works through the C.W.P.A. Program. The large scale, using a bulk of the Federal - using a majority of those resources. We are just now begin to work on how

that would work.

MR. HAROLD LAPEYRE:

We have an example, a natural example in place of what mother nature can do, all you've got to do is look at the Atchafalaya River and look what it has done. And I know that it presents physical problems for navigation, but we have to learn how to compliment. The government and people have to learn how to compliment our region, blend in with our nature with what is on this planet. And basically we have screwed it up to a large extent when we pardoned off the Mississippi River. I think the problems we have a correctable.

The idea and I think this board is going in the right direction, we just need to accelerate some of the well thought out plans that are already on the table. We need to fund them and we need to hopefully Congress to go along with them. If we can finance wars all over the world, we certainly can finance a war against the

Gulf of Mexico and certainly (applause.)

We're talking about money, I mean, would could what, throw out money all over the world. It is important that we start taking care of our own people here because we are talking about our survival. Thank you.

(Applause.)

MR. ERNEST NEIL:

Thank ya'll for being here. My name is Ernest Neil. I'm am a cattle rancher. I lived in the oil field for 28 years. We've lived in Terrebonne Parish for several generations. My parents were sent here from Nova Scotia and I guess we are going to go back. We came here because we had land, we had fur industry, fishing industry. Our government decided they want to put damn at Donaldsonville. Ya'll working on projects now, 100 years level. We had at least 100 years with that . Look what happened.

While ya'll are studying for it, 100 years, what is going to happened to the Gulf, storm protection levee along the Intercostal Canal. I total disapprove of this project that ya'll are planning. Already mapped and line, it's taking from the problem. This is my fault and my opinion alone. It is diverting, ideas and discussion, meetings like this on proposals that

will probably never get done because of the money.

The environmental impact hasn't even been started yet. It might take 10 years for that alone. The impact of a levee along the Intercostal Canal, east or west, across the whole State of Louisiana is ludicrous. Straight line is the Barrier Islands. Look at the map

you had a while ago and follow on how we need to do. That is the Gulf of Mexico right there. That is not peoples houses or estuaries being carded off with a proposed levee.

This levee, if it's built, everything south of it will be left along after. Once this is built and the - is protected, the people behind it will be left behind forever. You can believe this is going to happen, I've seen it many, many time. When you protect a certain group of people the rest mean nothing to you. We don't need to live there if we don't have farms, estuaries to fish, if we can't use the land. You just a soon move to Arizona or Arkansas or whatever. Hopefully it will finally freeze up there.

Cutting off our estuaries makes no sense. The Barrier Island is what has protected us for years. One hundred year thought, it wasn't thought 100 years ago what would happen when you damn off the river and now it is too late. And again we are going in the wrong

direction.

I heard the gentlemen with Valentine Paper Mill problem with the saltwater. The saltwater don't come from Bayou Lafourche, it comes from the Gulf of Mexico. So, if you get out there and narrow up the passes, rebuild the Barrier Islands, stop thinking about all

those levees in between and even our parish is talking about building. (Applause.) Makes no damn sense to me. When the problem is the water. This is not rain water. The water is coming from the Gulf of Mexico. Lets leave the Gulf in the Gulf. You do that in the Barrier Islands.

You can't go damn of a river when that's The river flows into Bayou Terrebonne, Bayou Ponite-Aux-Chenes, Bayou Blue, Dulac, all of the bayous benefitted from the silk. We dammed it off to plant more cane out there. There was very little communities, maybe just the Houma Indians. Just ask the Houma Indians or any Indians in this country. They damned it off but we developed anyway down here. Give me stuff with results of what happened (100) one hundred years ago, we are still talking about building levees with (100) one hundred year plan.

One hundred (100) years will come, but not me. My great-grandchildren will come. Their going to say how

long have they been talking about this. One hundred years is not long enough. The only thing I see that is going to last is the sand. It is the same and at that Barrier Island. The Barrier Islands needs to be the first line of defense, not second line, not third line, and you are not going to stop it. All the projects

ya'll have, I think, is an admiral talk, but with the Gulf of Mexico pushing the water up and the river pushing water down, who suffers, the people in the middle.

Water in their yard, water in their businesses and we are trying to buck the current and the high ties from the Gulf. We already know it subsided, the tides are getting higher from Gulf water. This is stupid, if we don't go out there and stop the saltwater from coming in and in the lakes and rebuild the Barrier Islands and then introduce water to flush some of this stuff out. You don't do this before, you don't go out and start pumping water down these bayous and don't know where it's going to go.

We didn't rebuild our Barrier Islands, we are trying to flush the Gulf of Mexico, you know. It ain't going to work, you can't flush the Gulf of Mexico with a couple of pipes coming out of the river or ditches, it ain't going to happen.

We can't handle the water that's coming down the Mississippi from God knows what parts of the world is draining through the Mississippi, but that's what it took, that whole river to build over many of years. what about this, what about that. We don't get out there and spend our money on the Barrier Islands,

everybody needs to be in the same line. We are all got to be thinking the same way. Not everybody is going to think like you do. I see ya'll have been going around in circles like a dog looking at a fire hydrant to see what's going on after (50) years.

So why don't we rebuild our Barrier Islands, rebuild Wine Island. It's doable but we've got to want to do it. Collectively we can do a hell of a lot. We all got to be looking at the same plan. Everybodys got to be protected equally not one community over another community. (Applause) You see it all over. Bayou Lafourche, people making comments about how well Bayou Lafourche is protected. The only thing I said is they got different people representing them.

They had an opportunity to build this levee, but for some reason Terrebonne Parish didn't. I don't know why. I wasn't there. I was a little to young to really look at it when it first started but we could have a levee like Bayou Lafourche. It's not by

accident that we don't. We're not here to talk about the sales tax but if we are not going to spend our money on correctly - we've got to rebuild the levee higher or we are going to get flooded next time.

But that is not the solution for (100) one hundred years or (50) fifty years from now. If they don't go

out and rebuild the Barrier Islands and save the marshes, between the Barrier Islands and the levee we got nothing. We can't maintain the Barrier Islands how the hell are we going to maintain a flood levee in between the two. We can't do it. It is physically impossible. Not the Corps, not the Tidewater Board, nobody can do it. Let's keep the Gulf in the Gulf and try to bring back some of our estuaries. We are not going to rebuild marshes if we don't go out there and block out the Gulf from coming in.

MR. BUDDY CANTRELLE:

My name is Buddy Cantrelle and I'm from Larose. Supply boat company offshore. We employ approximately 165 people. I'm also happily married with (2) two children, (2) daughters. One recently married and another one that is still in school. I think everyday since Katrina and Rita, in a very short time my daughter has come to me for advice. And she's asked the question, should I build or buy or should I

move out of this area. Right now I don't know what to tell her and that hurts as a father. I tell you what I do know. People talk about the Lafourche levee and how good it is. It's not good enough.

Had Katrina passed (30) thirty miles more to the west we would have been underwater. If Rita would have

passed (75) seventy five miles closer to the east we would have been under water. Then you not only have Cameron and Venice knocked out you have Port Fourchon knocked out. All I hear about Coastal Restoration and Hurricane Protection how much it is going to cost. I say it doesn't make a damn what the cost is. It doesn't matter the cost. The cost not to do it is to expensive.

We are talking about the survival of our community. We are talking about trying not become extinct like the dinosaurs. That is what my concern is and it should be everybody's concern. Lafourche was lucky last year. Everyone was lucky this year. Whose going to be lucky next year? We all know it can happen anywhere. We have six (6) months a year of hurricane season. I rode a couple of them out myself as a captain of a tug boat. It's not pretty offshore and from what I saw last year it's not pretty inside either if you don't have the protection you need.

You're going to have the people in Florida drilling off of their coast. Every time people in Georgia, North Carolina. What has been constant over the last (60) sixty years. Offshore drilling off of Louisiana. You want to know what the main cause of Coastal Restoration is? Oil exploration and

exportation. Number one (12) cause. That's not just an assumption that is a fact. All of the canals that were dug. All the drilling rigs. The oilfield has been good to South Louisiana. It's time to give back.

We've given up almost all of our natural resources. We are talking about survival. And I'm going to keep repeating that word often. It is survival. There is no mistake about it. What do you think the price tag would be looking at it from a Federal standpoint? What does it cost to have national security for our country? I think the price tag for national security is whatever the hell it is. Whatever it is, if you have to print more money print more money.

Well we are talking about national security. If a hurricane comes and wipes out Port Fourchon and the neighboring parishes, Terrebonne Parish, Lafourche Parish, the areas that support Fourchon. You think ($3.00) three dollars a gallon for gas was high last

year. You're talking about ($10.00) ten dollars a gallon of gasoline in the entire country. My thinking is yeah, it's a Louisiana problem but it is also a national problem. Because everyone in this country benefits from our area. Everyone. ($2.19) two dollars nineteen, ($2.20) two dollars twenty cents is pretty

cheap right now.

That's what they have been paying in Europe (5) five, (6), six dollars a gallon. But if we want to keep having the cheap gasoline our area has to survive. We can't maybe survive we have to survive. We all benefit from this area. Not just Louisiana the whole country. That's the message that needs to be sent to Washington. We must survive. I don't know how to do it. I'm just saying for our local region, as a state, and as a nation, our area has to survive.

We can not was away into the Gulf. The man before me, makes some very good points. Sixty (60) years ago you had three (3) lines of defense. The Barrier Islands, the marshlands, and then your levees. Well your Barrier Islands are gone. Your marshlands are gone. All you have left is the levees. We didn't cause the problem. The people before us caused the problem. Guess what, we are stuck with the problem of fixing it. Well whatever has to be done we have to fix

it.

Find a way to fix it in a manner that can be done, in a timely way. I know it takes time to plan this but you know what it's time . I'm a person that believes in actions and no so much in words. It's time to get things going. Mr. Windell, who I brought up by name,

that's one man we need in Lafourche Parish to take care of business. He's taking care of the people out there. (Applause) As far as the cost, the cost should be shared by the entire nation. You've got all kinds of tax on gasoline. Tax on this Federal tax on that.

For the survival of South Louisiana and the nation, tax every gallon of gasoline, every gallon of diesel that goes into an automobile in this country one penny. One penny per gallon. Now I'm going to tell you something, every person who owns an automobile can afford one penny. Because the average car holds about (17) seventeen gallons. It might cost you (15) fifteen cents a tank more.

Every person can help because we are the ones who are going get the oil. They don't want to go get it. They are benefitting from us. It's time for everybody to anny up a little bit. I'm not asking for the moon. A penny a gallon. Thank You.

MR. WILSON VOISIN JR:

Hello, my name is Wilson Voisin Jr. I just want to make a point. I, my dad, and my grandparents have been in the oyster business for generations. The reason I make that point is to let everybody know that I have first hand knowledge of what is happening to our coast. I have children and I have grandchildren and I

believe that whatever we can do to benefit ourselves or whatever the Corps can do we need to do. First of all, I believe that the multiple approach is good for this area. I think that the Barrier Islands absolutely need to be tended to. Let me say that they have been tended to and a lot of work has been done.

Many people have been involved in trying to save them. In some areas there is a little bit of improvement. Very little. We are not going to fault anybody. It doesn't pay to look back and see who failed. We need to see how we can make improvements. I just maybe want to suggest something that may at least help our local area and may be able to be extended. The seafood industry needs a stable environment, whether it's fresher or saltier, we deal with that on a constant basis.

The salt water is a real problem because the more the salt water comes in the more it destroys the roots and the fabric of the marsh and stuff and it

deteriorates. My thoughts I want to convey to this group is that the way we get our fresh water from this area is through the Intracoastal Canal. Now the Intracoastal Canal accepts water from the Atchafalaya River to the west to the Mississippi River to the east. Now I know we're not getting a whole lot of water from

the east to the Mississippi.

Now again that is a natural factor but years ago the Intracoastal Canal was routed through the city development and that was to encourage business and enterprise and that was a good thing. The Intracoastal Canal is really too far to the North to nourish our coast. There is a lot of communities, the lower bayou communities, that are being left out of the levee system. When I say the levee system I mean the hurricane levee system. But there is drainage systems that there is a huge need for and has done a lot of good because a lot of times it keeps the natural high tide out of everyone's homes.

If we would take and reroute the Intracoastal Canal to pass right below the highways there is about (6) six major bayous to the west and east. Bayou Dularge, the Navigational Channel, the Grand Caillou Bayou, Little Caillou, Bayou Terrebonne, if that Intracoastal Canal could be rerouted right below the

highways below Dularge, Dulac, Cocodrie, Montegut, that would actually bring a source of fresh water. And that would be based on an environmental cycle. So if we were to do that right below the lower communities it would include all of the population.

But I really believe that if all these communities

were included, people would be more adapt to support a plan because they are included. If you would reroute, and when I say reroute I don't mean plug up what is there's a huge amount of industry that depends on what is there now. I see on the map where you have a levee along the Intracoastal Canal. I think it's a good idea but we first need to move the Intracoastal then put the levee on the backside of the Intracoastal.

Then you could build a levee as tall and as wide as you need to. It's a interstate canal so I don't think you would have a problem getting the Federal government to fund it. Dig the canal, put the levee and on each main bayou put a huge floodgate. We could have a major hurricane and close the floodgates. Now, there's a concern about what is on the outside the levee. You could be tending the floodgate from the main bayou. You could have one way valves to supply fresh water to the marsh for how ever long you need it.

I don't think that in itself would build the marsh

but it would certainly sustain what's there. Anyhow being a long time resident down here and hopefully my kids and grandkids will be too. Anyways rerouting the Intracoastal that would certainly make a difference in that area.

MS. COFFEE:

I've appreciated all of your comments. As we move forward, if you can keep it short so that everyone can have a chance to speak.

MR. KERRY SAMPAY:

Hi, my name is Kerry Sampay and I am the director of the Barataria-Terrebonne National Estuary Program, and I apologize to the C.P.R.A. because I know you've already heard me but I feel compelled to speak. On behalf of all of the other people I want them to hear some of the things that I said earlier. For one, the planning team wants to publicly acknowledge and give you my respect for the job you did and dedication for the development for this plan.

I understand completely the work you put into this. Also I want everyone to know here that the plan, particularly over time, has many points with that are agreeable with the estuary program than disagreeable. Although we had hoped to resolve some of the points that are disagreeable and fine tune them. Certainly

support the greater use of the, the increased use of fresh water to maintain not only our marshes but also things like Mr. Bingham was talking about the use of drinking water. I hope people in Terrebonne Parish understand that (80%) eighty percent of their drinking water comes from Bayou Lafourche also.

Bayou Lafourche is an incredible resource for all the entire region, including the parishes north of Lafourche as well as the industry. The industry is a great place to work and it needs to support the committee . We do support it, and were glad the state stepped up on Bayou Lafourche. Hopefully that will send it on a track to becoming complete. I want people here to know that we fully support the use of the pipeline, the method that you guys are looking at to create marshes.

I know that you realize and we all realize that It is the mid Terrebonne and western Lafourche region that presents some critical problems. Some issues on how we get the sustaining water here. This is one of the reasons why the Estuary Program has fully supported and has become an advocate for the use of harvesting the sediments that are in the river beds. The Mississippi River and the Atchafalaya River and transport them great distances which is entirely

possible. It is done all over the world.

It is the only way, that I see, that we can rebuild wetlands all the way into Terrebonne Parish. The only way. Massive water diversions, the sediments that are in the river are far less than what it was historically would never be carried around all the way

into Terrebonne or into western Lafourche. The only way to do that is with an infrastructure of pipelines. What we encourage everyone to do is embrace this as a programatic level way to restore the system.

This is the way we can rebuild. The phase (2) two study that just came out was an excellent piece of work. They have been critical about maybe it's going to cost more or maybe we don't have enough sediments to do the whole thing in a year or whatever, but certainly the idea of being able to create (500) five hundred square miles of new wetlands in a (50) fifty year period is something we really should look at hard and quickly if it is something that we can do now that is going to result in results as far as landfill.

The annual cost for the most aggressive approach, the most dredging and the most pipeline was ($634,000,000) six hundred thirty four million dollars a year. I think that all of you here fully support a need to implement a plan. I know you want to see the

sense of urgency has been ramped up. This is why the agreement and things that we do must meet broad agreement among the state code otherwise we are going to waste time talking about things that we could never see happening. So once again we thank you.

MR. LARRY WIEDELL:

Good afternoon, my name is Larry Wiedell and I represent the Lafourche Parish Sheriff's Office. Lafourche Parish Craig Webre would have been here today if he had not had a conflict in his schedule. He asked me to make a few comments about how we appreciate you being here and we welcome you to the South Louisiana area. I'm from Lafourche Parish and I'm also from the south Lafourche area. We are very concerned about the lines we see, the levee lines. The type of levees that are proposed in this plan.

We have the South Lafourche levee that protects our area, I'm sure you all are familiar with it. I think it has a height of about (12) twelve feet and I think as Windell said we would like to see that levee raised to a height of (18) eighteen to (20) twenty feet. Our area services the Port Fourchon Industrial Complex. A billion dollar facility. It is a very important facility not only to Lafourche Parish and to Louisiana but to this nation.

I think (20%) twenty percent of the energy that is provided to this nation comes from this area. We are also building a 1.4 billion dollar bridge and elevated roadway in the South Lafourche area. Anything that would not protect the access to the port and this roadway, no secured access would be money poorly spent.

We ask that you consider doing that. We ask that not everybody could come here and speak today but I think they support my view here.

MR. KIRK CHERAMIE:

Thank you. My name is Kirk Cheramie. I'm here representing myself. I do this radio show in Larose and we talk about coastal restoration and levee protection probably (6) six days of the (5) five days that we are on the air and I don't think that I've had one call in the (3) three years that doesn't think that we should have coastal restoration and levee protection of the highest magnitude at the Barrier Islands. Not along the Intracoastal, not somewhere up in the northern part of the estuaries but at the coastline.

My request, and I want to be on record, the purple line that was up on the slide that you showed earlier move it down to the yellow line. Pure and simple. When you take a look at all of those lines and you talk about not trying to create a complex system. That is a

complex system. You are not only following existing levees but you're creating new areas of levees. If you have to go out and get all of the permits, all of the right-a-ways, rearrange all of the drainage systems there and you have to go out and get land rights and have to do the engineering for all of these drainage

systems, it is a lot simpler and maybe a whole lot cheaper just to go down to the coastline.

Build it there, rebuild the wetlands behind it, and rebuild the system that works. I am under the opinion that we no longer have a natural system out there. We have a system that has been so altered by mankind that we can no longer leave it to a natural system. We see what's happening now. Oil and gas pipeline canals, the Mississippi River levees, the South Lafourche levees, the levees around New Orleans. We are building swimming pools and we are pumping from one swimming pool to another swimming pool. We should not be doing that.

And to have a system of what I saw on the screen is the same thing that we have been seeing around here in the local press. It just seems to me to be too complex of a system and too expensive of a system to maintain. Most of our parishes already have drainage systems and they are doing a fairly decent job of

keeping rain waters out and some flood water. We are talking about hurricane protection. That's what I am talking about. Hurricane protection we need to move it further south not further north. For about (10) ten years I have been hearing about this unspoken, unwritten, it doesn't show up on any document about the

Louisiana's coastline that we are not going to spend or invest a significant amount of money.

That is the Intracoastal Canal. This is the first time I see it on a map. I don't like it. I too am a parent. I have a daughter who is (16) sixteen years old. She is going to college in a year and a half. She's already told me, daddy I don't want the house. I am not living here. I don't have the same problems he has back here. My daughter is leaving but I am staying. I want to stay in a system that has land. I remember freshwater in Leeville.

Leeville was a fresh water system not a salt water system. We went to Holland. We learned how the Dutch do it but we are not following the Dutch method. They built a levee along the coast and I have driven it. I've been to Rotterdam. I've been to Amsterdam. I've been all over the estuaries. They built there roads on the levees. They closed of the Port of Rotterdam. We can't close off Bayou Lafourche. We can't close off

the Houma Navigational Canal. We can't close of Grand Caillou Bayou or Barataria waterway. Come on people. We can do that. It's will and it's money. This system is going to be a lot more expensive than a system that is a lot shorter with fewer control structures south.

For Mr. Bingham, he and I go back a long way. I was manager at the Bayou Lafourche Fresh Water District for (7) seven years. Everyday I had to make a decision on how many pumps to turn on. Four (4) pumps, (85) eighty five cubic feet per second per pump. Eight five (85) cubic feet per second per pump. Maximum (250) two hundred fifty, (300) three hundred cubic feet per second per day. Currently operational, (85) eighty five, (100) one hundred, (110) one hundred ten. Why aren't they putting more water in the bayou?

Not enough political will. End of story. No political will. I turned on (3) three pumps. Every pump we had we turned on for seven (7) years. If it wasn't broken it was running. Flooded the banks in Donaldsonville. Got sued. Lost the suit in Donaldsonville. Went to appeal and won the case. Why? Because the Bayou Lafourche Fresh Water District has the mandatory duty to provide water. Those slopes of the bayou are public property not private property. I

say pay for the damages anyway and turn on the pumps.

It's simple. If we can't do that how are we going to do this. If we can't get enough political will for this right now to call, 447-7155, the number to the Bayou Lafourche Fresh Water District. If person in this room doesn't have enough will to call that number

tomorrow and say turn on the pumps, you're not going to build this. People are afraid to stand up especially people who are paid by the public. They don't want to loose their jobs. I lost mine because of it. So I moved on to a radio station and I get a mic.

I think I won personally but the people lost. Mr. Bingham's company is not going to stay. It's not going to stay because tomorrow the Bayou Lafourche Fresh Water District is going to get (2) two calls not (70) seventy or (80) eighty. There's people that I work with at the radio station, some spouses, they're going to loose their jobs. In 1990, I started serving on the National Estuary Program. Spent (6) six years there on the policy committee with the secretaries of the departments of the state similar to Secretary Bradberry and Secretary Angelle.

Spent (9) nine years on the Coastal Zone Management Advisory Committee for Lafourche Parish. Seven (7) years on the Freshwsater District as its

manager and went to every C.W.P.A. meeting five, six, seven times a week for six years. We have a CCNP. We have a CWPPRA. We have a C.W.P.A. plan. We have a Coast 20/50 plan. We have a White Paper. We have a Blue Paper. Now we have the C.P.R.A. plan. I'm tired of it people. It's not rocket science. Go out to the

Barrier Islands, get a dredge go to Ship shore, build in the Barrier Islands, build them up. Let the sand flow. It's better there than in the Gulf of Mexico.

What are you going to hurt? Caillou Island is so full of pipelines that you can't find them. Nobody's claiming them. Cover them up with sand. At least we won't hit them with our boats, but fill them in. Go to the river. West Point-a-Lahache is the only diversion on this side of the river south of Davis Pond. The only diversion. Two miles away - is now a lake. It part of the Gulf of Mexico. It's not rocket science. You don't need a scientist to tell you that.

Mr. Rousselle is going to loose three quarters of his parish for flood protection at the highest order. If we can't protect Venice and we can't protect Cocodrie and we can't protect Leeville and we can't protect Grand Isle then New Orleans shouldn't be protected. Today (2000,000) two hundred thousand people are in New Orleans. Lafourche and Terrebonne

have more than (200,000) two hundred thousand people living there. Take the purple line away from New Orleans and move it down to the Riggleys, put some more controlled structures like ya'll have all studied in Holland and everybody is going to be hunkey dorey. At least we will have one major best line of defense for

hurricane protection.

Behind that, you can't change it. Next year or the year after but it is still going to be there in its current condition or worse. It's not going to be better. Get that line out there. We deserve it. We want it. We're paying for it. We are paying for it with our blood. In my part of the parish there are (19) nineteen cemeteries. Where are we going to move the tombs? When do I have to move my dad's coffin because I'm being written off in South Lafourche for a hurricane protection levee of the highest order that you are going to put at the Intracoastal Canal according to this plan.

If you can't save them then you can't save us. And if we can't be saved they shouldn't be saving them. I don't know how else to say it. I have been going through (22) twenty two years of public appearance. And the same thing I'm saying here is the same thing I said the very first meeting of C.W.P.A. which was in

the Lafourche Parish Court House in 1990 where (29) twenty nine projects were presented unanimously approved by people like Ted and Windell and all of the others that where in that meeting. They said we need to build these. We need to rebuild the Bayou Louris Ridge.

We need to rebuild all of these fingers, let the skeleton of our coast out there. Not one of those projects are complete. After we're getting ($40,000,000) forty million ($50,000,000) fifty million dollars in the C.W.P.A. trust fund. To my calculation that's a half a billion dollars unless it's all been spent in administrative monies for the five agencies of C.W.P.A. I'd like to see the paper. One hundred eighty million dollars ($180,000,000) for the Bayou Lafourche Project is less than half. I'm sorry. My last statement, C.W.P.A. needs to be disbanded because they are hurting us not helping us.

MR. WAYNE KELLER:

I'm Wayne Keller, I'm the director of the Grande Isle Port Commission. I guess I just have two major points to make. One is that ya'll made the statement that priorities have been set here. In what order of a lot of these things or whatever these things might be happen. I just want us to think about the fact that

for every dollar we spend at the Barrier Islands that's less money that we're going to have to spend in the coastal areas, in the more inland areas, the marsh areas and on the levees. So to me you have to start at the Barrier Islands. It's the first line. It's the quickest thing to do. It encompasses the least amount

of area and it will do the most for the money.

One of the other points I want to make is there are existing regulations out there that are hurting us right now. We're making new plans right now but we have existing regulations. I'm extremely frustrated. Grand Isle Port Commission was involved in a dredging project. We fought for seven years and the Corps finally didn't take our money one year and dredged by Enrico and rebuilt (105) one hundred five acres of Pitre Island. Pitre Island was an island just north of Grand Isle which protects us.

At the time, I think there was enough knowledge out there to realize that the ridges, the maritime ridges, to one heck of a lot of good. And we have regulatory agencies telling me that I couldn't go up another two feet because it wouldn't be the wetlands. I'm saying to myself, wetlands. This is the Barrier Islands that should be protecting the wetlands. So lets get some height there. I was standing on a

houseboat a few months back, with our previous speaker Mr. Ted, and he pointed out the Maritime Ridge that they were completing.

And to see the remarkable difference between the south side of that ridge and the north side was unbelievable. But it seems like the Port Commission

Or anybody that's doing any dredging, anybody that's using any kind of dredging materials, it's a major fight to get a few more feet for protection to put some maritime ridges. And I guarantee you, that is one of the biggest, easiest, cheapest ways to protect something and lets do it on our coastline. And so let's get these regulations, not think about it, lets do it now. Encourage us.

If you're going to put something up there, if they want to go three (3)or four (4) feet higher that three (3) or four (4) feet - It meant. I'll tell you what it meant. It meant three (3) or four (4) shrimp sheds and a whole lot bunch of houses on the backside of Grand Isle. And I blame the fact that we could not raise them, I blame half of the devastation on Grand Isle because of that. So let's get these stupid regulations out of the way. Regulations that won't let allow land owner to bulkhead his property without going through some tremendous antics. And so you go back

three (3) years later, and I'm watching this on the north side of Grand Isle.

Three (3) years later you go back and that landowner, now half of his land is gone. Explain to me the sense of these regulations. So our State and Federal agencies need to change them now.

MS. SUSAN TERREBONNE:

Hi, my name is Susan Terrebonne and for the last three years I have been working as the executive director for Reflections for the bayou in Cutt Off. It's a small non profit organization that does beautification, anti-littering activities, and activities that protect our community environmentally. For the last three years that has been the cause of our work. I have to say when I first saw the name of this committee I had to laugh so I wouldn't cry.

C.P.R.A. that meant CPR was needed. The last ditch sustaining method to sustaining life because where we live in Galliano and Cutt Off that's what it is. It is our last ditch effort to sustain life. So don't forget that that CPR doesn't mean Coastal Protection and Restoration it means you are there to sustain our lives. And when I saw that purple line was in New Orleans and protecting oilfields in Cameron and not where we live I was pretty upset.

I was upset so I wrote something for you. I'm going to read it and then I'm going to make a statement. This is what I wrote for you. I would like to formally request the specific formula used to decide who in the State of Louisiana gets what level of flood and hurricane protection as it pertains to C.P.R.A. and

specifically this particular meeting. I want this sent to me in writing, in fine detail, under the Freedom of Information Act.

This is to include the specific variables used in those tabulations and the way it is used on each of those variables. I want the complete list of any and all organizations's input that has impacted this decision making process. I want those organizations exact office, contact person's names, addresses, and phone numbers. I am requesting this information because we, as citizens of the State of Louisiana, deserve to know who makes and who is accountable for the decision of who will be fully protected for a category 5 and who will not.

And to me that says it all. I think it would be better served instead of sending that just to me in the next booklet, which I have to say has a lot of work in it. This is the best work that I've seen in the decades since I've been printing and binding work. But

in the next booklet please put that information because I don't want to hear that there is no formulas because there is formulas.

MR. PORTHOUSE:

Most of that information is currently on the internet at this website.

MS. SUSAN TERREBONNE:

Don't worry,. I'll be visiting that website very soon. But you know if LSU and Dr. VanHisen, who I have the utmost respect, says we can't be saved. I don't want them on this committee. I want someone who lives in Galliano with me on this committee. Somebody who spent years as an administrator of organizations or sat on the Coastal Zone Management Board. I sat on that board for five (5) years. How many people on this board have been waste deep in muck in the marsh putting in plants. When I was in the Enviornmental team leader we did eighty seven thousand (87,000) in one year.

Believe me when you walk in some of that marsh it is like walking in mashed potatoes. It takes a lot to come home to your kids and they look at their mom and say gosh she is covered in dirt. But you know that is what it takes. I am dedicated to this. I heard Ms. Coffee say she has been through good administrations. Believe me if you've been through Mike Foster's

administration and Ms. Blanco's administration and you're still doing this I want to commend you.

That doesn't mean the job stops there. A couple of months ago I was contacted by DEQ. Mr. Jesse was calling. He wanted me to take my organization up there and do the Drinking Water Protection Act. Drinking

Water Protection. I said what a minute you want us to use our volunteers to go out there. He said yes. We don't have any intake water from South Lafourche wells where or organization generally works.

They wanted us to use our volunteers to come up into other areas of the parish, north of us, to assess drinking water problems which were really agriculture run off, urban run off, and heavy metal. And I looked at this man and I said, wait a minute are you doing drinking water protection. And this was in September. And he said, yes. And I said, what happened to salt water intrusion. Not part of this formula.

How can you be protecting the drinking water of the people of South Lafourche and South Terrebonne and not include salt water intrusion into our water systems. He said, we are trying to worry about heavy metal. I said take can you treat for agriculture and urban run off. The answer is yes. He said, you get to a point where you can't treat the heavy metals. I said

that's where the heavy metals are coming from. All of our oilfields have decided to open our waterway. And all of those oilfields at the time didn't realize that those heavy metals were not contained in our underground those heavy metals were in our water.

I have a daughter that was born with heart

disease. I have a daughter with kidney disease. One day will need kidney dialysis. And I have to tell you it is pretty sad when my husband has been working in the oilfield for thirty years and has been away for all this time comes home to a house that is not going to be protected by category 5 hurricane protection or your (500) five hundred year plan because your looking at a family, and everybody in this room who paid the ultimate cost.

And we haven't given our natural resources away. Believe me they have been taken from us. All that we ask is for all that we have done is that this panel makes sure that everyone in the State of Louisiana and in our Federal Government understand that we have paid all the costs and that all we want is our livelihood and our homes protected. As a person I feel discriminated against because we live in South Lafourche and penalized but because our levees did not break everyone else got funded.

Why are our tax dollars, and I work for that sales tax. Why do we have to pay that when the city of New Orleans is not paying that one cent sales tax. Why do we have to pay tolls on the Highway 1 bridge going to Leeville. My husband works there. He gets a tag but whenever I'm going to go bring him to work what am I

going to pay ($5) five dollars. I fine I have paid enough.

This is your chance, your really big chance, to settle the score. And I want you to keep that in mind it is CPR and it really is for our community. So I want category 5 for everybody. And just like everywhere else in any government agency you start where the need is most prevail. Don't start in New Orleans. That wasn't hurricane Katrina that was a poorly maintained and poorly designed system. When I look at this diversion project in the book, everything is to the east and everything is to the west and our area there is one but we have the most land loss.

The Army Corps of Engineers has 2.4 million acres since 1930. This is where it needs to begin. Don't start somewhere else. We won't be here by the time you get to us. Start with us. Let someone else wait their turn because we've waited long enough.

MR. SY CUNNINGHAM:

My name is Sy Cunningham. I am just a private citizen here in Terrebonne Parish. As far as Morganza project is concerned, that is obviously that is Terrebonne Parish's baby. You guys have even said that you like the idea. A lot of people who come here to Terrebonne Parish tell us that you know what it is a

good plan it will work. Not that I have a problem with the Morganza Project itself, but one of the things you were saying earlier is that the longer more complex a system is it's more prone to failure.

And when I looked at the Morganza project it is very long and it is very complex. And I am just wondering , is it truly something that you think can work. And the only reason I am asking this question is because there has been a lot of literature written since hurricane Katrina and a lot of scientist not only around here but around the nation specifically in our state would say, you know what, the Morganza Project, it can't work.

It is not a feasible project. Or because of the length of the project, like you were saying or because of the cost benefit ratio, I don't know. So I mean is that the consensus, from people not so much in the nation but even from our state. Is that the consensus from someone in our state telling us that. We want to

hear that it is going to work. So obviously you guys come and tell us it is going to work. What about the consensus that it won't work. Is that something that you try to ease over.

MR. PORTHOUSE:

The advantage of having the Morganza Project is so

we can take the time to get more detail that in connection that we need and design it to a more higher standard. To maintain it appropriately and make it work better than the current systems we have. It's not a matter of retrofitting the system. It's a matter of building it right the first time and maintaining it in the future. Since it's on this map we think it is feasible.

MR. DICK GUIDRY:

My name is Dick Guidry and I am from Galliano. Our levee district was created in 1968. We went through hurricanes like hurricane Katrina. And we were lucky as hell. If that would have hit Morgan City we would have been another St. Bernard or Plaquemines Parish. It would have been devastating. Our people voted two weeks ago for a one percent sales tax by a percentage of 82.24. How many areas of people were running to the polls to vote for our levee tax. They spoke with their vote and what they wanted. Forty

thousand (40,000) people living in the area and another ten thousand (10,000) in port Fourchon.

I went to the dedication of the ribbon cutting in Leeville. The Governor was there. The Senator was there. They were all patting themselves on the back on what a great job they were doing building an elevated

highway that was going to cost right at five million dollars ($5,000,000). So here we have this hurricane and had we had a hurricane that hit Morgan City why would we waste five million dollars ($5,000,000) on a road that we can't get to because it's flooded from the roads going up to it. It's ridiculous. I tell you what I'm pretty old and I've seen many hurricanes in my life.

This program is completely unacceptable. Purple line, you need to take that out. You should put that levee right under the LSU campus and then you could be a hero to the state. As far as I'm concerned one hundred year hurricane is completely unacceptable for the South Lafourche area. We either have to have a five hundred (500) or we have to have redundant levees one going from Golden Meadow to Terrebonne and one from Golden Meadow to Plaquemine Parish.

Those are the two that are accepted. If we can get those we can live with a hundred year hurricane.

But if we do not get those we can't live with a hundred year hurricane. Mr. Bingham, the water structure in Bayou Lafourche district, the legislature approved 4 million dollar ($4,000,000) appropriation. In 1955 it was closed because we could not have fresh water. Everybody had water systems and ponds. They needed

that fresh water supply. Now you've got Lafourche and Terrebonne taking their water out.

The Corps of Engineers , about two months ago, they've been studying for about thirty years, to put more. They tell me it will take eight (8) years and eight million dollars (8,000,000) for engineering and one hundred eighty six million (186,000,000) to build. And why it's taking so long. Because you got about nineteen (19) levels of bureaucracy to go through. What the state needs is to get things moving and cut out all of these layers.

This is just the state. Wait till this stuff hits the Feds.

MR. DANNY WALKER:

My name is Danny Walker and I am the president of the Morganza Action Coalition. The local citizens have put there efforts and money into seeing that the Morganza to the Gulf Hurricane Protection System gets done. Unlike a lot of the speakers that have stepped

up here, the people of Terrebonne Parish would be happy to have a hundred year levee protection. I think right now we have zero protection. My purpose here is really to stress the importance of maintaining the existing footprint for the hurricane levee protection system for Morganza to the Gulf.

As everyone who has spoken, the levels of bureaucracy and red tape are enormous. The Morganza to the Gulf is a project important. The red tape of bureaucracy that the people that have been trying to put that project forward have dealt with is incredible. The fact that this project has been in the Resource Act before Congress for seven (7) years. What we are doing is hurting the project. That is not something we can just all of a sudden say we are going to change everything. The state is going to rebuild the barrier islands, I don't think that is a realistic thing.

The Morganza to the Gulf Project is at a - of becoming a reality. The next stage is going to be critical. If it doesn't go into this Congress then we have to start all over again. The point that I'm trying to make is that we want things now. We need things now in Terrebonne Parish. We need a levee of protection that is going to give us some rescue from the intrusion of salt water and the intrusion of tidal

surge. Morganza is the best thing that we've got going. Additionally I'd like to impress upon the parts of locking the floodgate on the agency to the extent that influences can be used to have State funding to advance cause .

I appreciate the efforts that are going into this

program and the literature that you put out. It's a tremendous effort. Everybody talks about the fact that we don't need another study. If that study gets it done than that's a good study. I have a lot of confidence in what you are doing.

MS. CANDY THERIOT:

My name is Candy Theriot and I am president of and CEO of the Houma Terrebonne Chamber of Commerce. We represent about (850) eight hundred fifty businesses in Terrebonne Parish. I want to thank you for keeping the Morganza project into your study. This has been the top priority for the chamber for the past six (6) years. We spent a lot of time, effort and resources in trying to educate the community and the importance of Morganza to the Gulf.

The studies have been done. People in our community have taxed themselves to support this project. We are very happy that you have this in your study. We hope that you continue to keep this in your

study. And we stand ready to help you in any way that we can to help educate our community. If you need us to send letters out or anything you need us to do to help support this project. We think it is extremely important. We had a contingent authorization in 2000. Unfortunately there has not been a Work Bill.

We have worked very hard to get a Work Bill that the Chamber has put their own people and their own time and money and have gone to Washington for the past six (6) years. In March we go for five (5) days to put a face to the issue. To say we are the people who live and work in this parish and we think that we need to be protected and we ask for Federal Government funding. The State has been very helpful also to support Morganza and I thank you very much for that. If there is anything that the Chamber can do to help with Morganza please let us know.

MR. WAYNE MARTIN:

My name is Wayne Martin. I am with the Lafourche Parish Coastal Committee for the past ten years. Ya'll have some opportunities. History is going to judge ya'll. The people of the state are going to judge ya'll on the job ya'll do. You are our appointed leaders. As leaders ya'll ask us to retreat . We have already lost a tremendous amount of shoreline.

Anything south of the levees that ya'll propose you are asking us to give up on that land. Ya'll are going to change the map of Louisiana. When I watch Channel 4 and I watch the weather report and I look at that radar.

Look at it closely. Look at how much land is left

and how much water has taken over. C.W.P.A. has become a competitive feeding trough for Federal agencies. Basically we subsidize agencies. Budgets that cost a million dollars for studies and research. Simply we want the Federal Government financially for help. Look at our own House. I have seen a lot of programs fall in the State of Louisiana. They pretty much do what they want.

For the last ten (10) years I have seen where an oil company comes and digs a five (5) acre hole in the marsh. They pay the State three thousand dollars ($3,000.00) per acre and walk away. That is their litigation. For fifteen thousand dollars ($15,000.00) you couldn't even pay for the equipment to rebuild those five (5) acres. How can we go ask the Federal Government to help us out down here when we can't even take care of ourselves.

Another statement I made in my C.W.P.A. letter was that by the actions of the Corps of building a levee

system and the inactions of the State, there has been a passive taking of the land from the people that own the land. As land erodes away it becomes State water bodies. The State now gets the mineral rights. It's been the plan all along. To let it all wash away. It now becomes mineral rights of the State. What's

really going on here.

You guys are leaders and are supposed to lead us in the future. If you are going to draw a line where it is now you are going to be responsible for the redrawing of the map of Louisiana. It will no longer be a boot. We've studied enough. We had a proposal to team up with Jefferson Parish, Plaquemine Parish, and Lafourche Parish to put money from Federal dollars to put a pipeline from the river coming over here.

The dollar figure ya'll put on it was sixty million dollars ($60,000,000.00) for a pipeline. We're not putting new sediments in the system. What we have here has to be - or we are going to have to bring in new sediments. The only way we are going to build marsh. I think with out the blanket of marsh before or levee systems. The levee systems won't survive down the road either. We need to have what I call a research bank that all agencies put into and instead of having to research again, they go and get that research

out of that bank.

C.W.P.A. has had (20) twenty or (30) thirty projects before I even got on the committee. They have only had two (2) projects that have been completed. This is an issue of land rights. We just did a project south of Houma down around Point-Aux-Chenes. The DU

doesn't want to put the money in an area they don't think is going to be here. You work with the banks. You want to give a thirty (30) year mortgage in Golden Meadow.

Will that collateral still be there in thirty (30) years. So when are the banks going to stop loaning money for people to build down here. One more thing, We see projects develop all over the country even in Canada with federal money from the United States. Lafourche and Terrebonne comprise of fifty percent (50%) of all of the wetland marsh in the State of Louisiana. I would just like to see something done. We have to build the infrastructure first to rebuild the marshes. We're building a roads there in Fourchon so that we can keep the oilfield there.

What do we get for a pipeline, Secretary Angelle. What money do we get? We get no royalties. But when they build that pipeline corridor they've created a salt water intrusion that's erosion problem for us. It

took Shell Oil and Texaco six (6) years to do their mitigation for the two (2) pipelines that ran. We had a meeting on our agenda every month. Now you know it took six (6) years for Shell pipeline to get about (38) thirty eight percent eroding triangle on the east side of the Golden Meadow levee. When we go to Washington

and ask for Federal money here to develop something here we better have our own money.

I'd like to see across section of Texas, Louisiana, Alabama, Florida, and Mississippi and see if their regulations for oil and gas exploration versus the state to see what they get in Louisiana. It's three thousand (3000) per acre. I think there formula has changed a little bit. It may be a little bit more. It's not worth the cost of having to replace the marsh.

MR. DANIEL HENRY:

My name is Daniel Henry and I am a business owner from the Bourg area. I see a lot of individuals who are here today that are not going to speak and tell you why they came here today. I was going to ask for a show of hands of who's in favor of moving the purple line further south. I see a lot of people from the Bourg area that are not going to get up and talk. Anybody who wants to move the purple line south of the Morganza to the Gulf. This is important because I tell

you what that's why people came here.

I implore you guys, the Morganza to the Gulf is paramount. I hear people saying it might be feasible it might not be feasible. I think they need to realize the cost effective benefit ratio that was done through the study for the Morganza to the Gulf. I think it

came back favorable. One of the only times we've had a favorable study done. If not for Morganza to the Gulf what else do we have. Thank ya'll for putting it in there and thank ya'll for keeping it. The only thing, the purple line, we'd like to see it moved further south. What type of weight is going to be given to the public hearing and to our comments or is it just an exercise?

MS. SUSAN COFFEE:

Oh, no your comments are being heard that's why we are having this meeting.

MR. DANIEL HENRY:

We thank ya'll for coming. We hope this is the first step is to get something done. We can't wait any longer. This is the first time we've had a chance to speak and the first time it has been brought up. And it's got to this level. Hopefully we can accomplish this.

MS. LESLIE SUAZO:

Hi, my name is Leslie Suazo and I am the director of Coastal Restoration for the parish of Terrebonne. I want to thank ya'll for being here today. As you know our Parish President, Donald Schwab, was here earlier and had planned to speak on behalf of the Consolidated Government, unfortunately he had to leave for the start

of the Parish Council Meeting here in the next few minutes but I do know he would be here if he could to speak to you for a comparable level of protection for all of the citizens of Terrebonne Parish in this project.

Having said that, it all comes down to a time table and priorities for implementation, and the money for implementation. Ms. Coffee you briefly eluded to the funding aspect. I just have one question, do you have a funding stream in mind for implementing this plan? Is this tied to the OCS revenue stream or is there a funding somewhere now that you can tap into?

MS. SUSAN COFFEE:

It'S not been decided yet. I know the state only has what gets through it's trust fund. The OCS revenue sharing is very critical. Whether that happens or not we're still going to have to, and I'm looking at it right now, if the OCS revenue sharing bill passes we are still going to have to bridge that gap for the

first ten (10) years. But yes we are looking at that right now. If the back up settlement securities then that would be an immediate almost two hundred million dollars ($200,000,000.00) that would come immediately.

MR. MAURICE ROBICHAUX:

My name is Maurice Robichaux. I am from Raceland.

I think the way it is now Bayou Lafourche is on life support and it has been for the last fifty (50) years when they first put the pumps in. I'd recommend removing the entire pump system and reconnecting Bayou Lafourche to the Mississippi River as it once was. Anyone who sees this plan sees that Bayou Lafourche is crucial. Rejuvenating the swamp with fresh water and salt water marshes, again there is no mention of that at all.

They already have a canal dug perpendicular to the bayous every three (3) to five (5) miles. Those little canals can be utilized to bring sediments. There is no mention of that at all. As far as us maintaining the Mississippi River levees all the way down to Venice. I don't see why that levee system south of Chalmette should be dismantled and put little levees placed around each individual town. The remainder of the levees should be dismantled and let the river work as it once did.

I'd also recommend putting limestone below the seawall where the marsh is in the Atchafalaya River. And rebuilding the all interior marsh by using sediment that is being deposited in the Gulf of Mexico right now. Do the same thing on the east side of the Mississippi River. Possibly digging a channel from the

Mississippi River connecting it to the Pearl River to get more sediments.

MR. KENNY SMITH:

Good evening. My name is Kenny Smith and I representing the South Central Industrial Association. Our two hundred (200) members and thirty seven thousand (37,000) industrial employees in a five (5) parish region. We truly appreciate you coming down here. You can feel the passion. You can feel the frustration. It's all about survival. This is a great plan. We know a large amount of effort has gone into it.

I actually have a question more than a comment. Ya'll are coming back on December 11th. Is that a working session? The SCI would like to take your plan and bring it to our infrastructure committee. We are going to go through it. We like a lot of what is in here. There are some things we definitely would like to discuss. Do we put that on paper now and send it to

you or are we going to have an opportunity during the 11th to actually sit down with a magic marker and talk about some things?

MR. PORTHOUSE:

You can do both. When we come on the 11th we are actually coming and it will be an open house. In that

discussion format we will see what is possible and we understand what you are proposing. The meeting portion will be like this kind of event where we present and then hear your comments. We will have to understand what you a proposing and take it and put everything together and see if it functions.

MR. JACK BONVILLAIN:

My name is Jack Bonvillain. I am a private citizen. Why not put the levees from Morgan City and run it perpendicular down to the coastline. Can you comment on that?

MR. PORTHOUSE:

Are you asking about the purple line or the Morganza?

MR. JACK BONVILLAIN:

The purple line running east to west. Parallel to the coast.

MR. PORTHOUSE:

We are looking at a redundant system to run within

the Morganza. It is very conceptual and open to discussions and a lot more analysis to figure out where that should go. Right now on the map, it is not a definite that we are putting the levee here on that spot. I encourage you to stick around after the meeting and the other six members of the panel will be

happy to talk about that.

MR. KERRY:

I just have a question and then a comment. My first comment is, in preparing I don't think it is ideal for any of us living south of I-10 to fight each other. I've heard people say don't protect them protect us. We are all in this together and we will die together. Nobody else on this planet is going to take better care of us than anyone in this state. My comment is we all need to be in the same boat.

My question is, how long are you guys going to take before you come to a final draft of what needs to be presented so that you can determine how the money will be spent? And when the first shovel of dirt is going to go any where in the State?

MR. PORTHOUSE:

We are looking at a complete draft of this preliminary draft to be at the of February. Hopefully for the next session.

MR. JEFF FRYWALL:

I am Jeff Frywall. I just moved down here from Lakeview a couple of years ago. All I want to say is the purple line. Move it south toward the Barrier Islands today. Thank You.

MS. COFFEE:

We thank you all for your comments. We thank you very much.

(The meeting ended at 5:20 p.m.)

R E P O R T E R ' S P A G E

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5.3.5 New Orleans Public Meeting Transcript, November 29, 2006

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PUBLIC MEETING OF THE

COASTAL PROTECTION AND RESTORATION AUTHORITY OF LOUISIANA

WEDNESDAY, NOVEMBER 29, 2006

LINDY BOGGS CONFERENCE CENTER
2000 LAKESHORE DRIVE
CERM 248
NEW ORLEANS, LOUISIANA 70148

SIDNEY COFFEE:

First of all, my name is Sidney Coffee and I care about the CPRA and I just want to welcome everyone today. It's a great turnout. We look so forward to hearing what you have to say. And I want to remind everyone that this meeting is about what you have to say. And we're going to get to that as quickly as we possibly can.

The entire presentation of the plan will take 40 minutes or less so that we have plenty of time to hear your comments. What we're going to do today is not about debating what's in the plan; it's simply about taking your comments.

This is the first time, not the last time, this is the first time that you're going to be able to see the preliminary draft plan. And what we're going to do with this is, as we go out today to New Orleans and to Houma, and tomorrow in Lake Charles, these are

the three most critical areas we felt that we needed to formally present the plan.

We're going to take your input and then what's going to happen is again in December, we're going to have a series of workshops that are going to be more detailed, a little lengthier than this, in

which you'll be able to come back and see how we've incorporated some of your suggestions, how we've addressed them. You will get responses, by the way, to all of your comments and suggestions in one form or another.

And then the team will go back again after December. They'll work some more. They'll continue getting input, because you can give input all the way through. There's a website and there's going to be an email address that you send email to. We have a mailing address for you. All of this information I'm giving you right now is in a handout. Make sure you get one of these handouts before you leave. And pass them around to those of you who could not attend today who do want to make some comments.

Then in March there's going to be another series of meetings and that's going to be to look basically at the more finalized version of the plan before it's actually presented to the legislature in

April. So it's a continuing process. And let me also say this. This plan obviously is going to take many years to implement. And the plan, knowing our coast, and the dynamics under which our coast changes every day, obviously, and every year, this plan will be a very fluid plan that will continue to be tweaked and

changed according to what happens, according to future storm events, according to authorizations and whatever takes place. This will be a flexible plan and it will have to remain very flexible throughout its life span, if you will.

For those of you who don't know, I know there are some of you who are not from here who are attending this meeting to find out more about what Louisiana's doing, I wanted to just very, very, briefly tell you that the CPRA, the Coastal Protection and Restoration Authority of Louisiana, is who this body is -- and these are not all of our members but it's a good representation of them -- was created right after Hurricane Katrina, in the special session of the legislature.

We are mandated to, for the first time in the State's history, which is what this plan is going to begin reflecting to you, to begin integrating coastal restoration and hurricane protection for the first

time, not to ever separate the two again. We also are mandated to give oversight to all the levee districts through South Louisiana. Some of the other things that the State has done, and I really do believe that the State has kind of come up to the plate on a lot of different issues.

For one thing, Governor Blanco, in her lawsuit, which was recently settled less than a month ago, has finally forced the federal government to pay attention to Louisiana's environment, to not roll over us, if you will, to do a proper environmental assessment of our coastline, especially since the two storms.

And so that Louisiana, as the primary partner for the federal government, introducing oil and gas off its shore, has a real voice in what happens off our shore, and has voice in its own destiny. And it's able to protect our environment at the federal level, forcing the federal government to do that. I think that was a very historic event that happened.

Another extremely historic event was when the people of Louisiana went to the polls on September 30th, ratifying levee reform, and consolidation of the levee district in the New Orleans area. And also by a vote of 82 percent voting to completely dedicate all, any

and all, revenues that we receive if the bill that's passed in Congress that shares offshore oil and gas revenues with us, that dedicates those revenues, 100 percent of them, to coastal restoration and hurricane protection. And I think that statement alone gives one that the rest of the nation needs to really pay

attention to. And I think they are paying attention to it, and will in the future.

So there are a lot of things that the State's done. The State is taking this very serious. The people of the State know exactly what needs to be done and let's get on with it. So today's the first step in that direction and I think it's the right direction. There's been a tremendous amount of work that's gone into this plan.

As I call Jon Porthouse up to the microphone, Jon is the Project Manager for the comprehensive plan for the state's point of view. Randy Hanchey is the team leader and we have our team sitting on the front row and Jon's going to introduce them.

I want you to, even if you don't agree with every single thing that's in this plan, you must acknowledge this is a very, very difficult and complicated piece of work here. And as I said, it's ongoing; and these folks have worked night and day, on

holidays, on weekends. They have done what I've not seen in a very long time. They have risen to the occasion; they're working hand in hand with the Corps of Engineers. After all, at the end of this, we want this plan and the Corps' plan to technically be the same. It's very important that that happens.

So without any further delay, I'm going to ask Jon Porthouse to come up and show us the plan. Thank you.

JON PORTHOUSE:

Good morning. Can you-all hear me? I was trying to forget that. Like Sidney said, I'm going to introduce the team to begin with. We're starting off with our team leader, Randy Hanchey down front here, and then in no particular order except my right to left, Barry Ardoin, Ricky Brouillette, Norman Johnson, Andrew Bell, Jean Cowan, and Michelle Deshotels.

All these folks run the Department of Natural Resources and the Department of Transportation and Development. But I also want to recognize those of you I see in the audience who have helped us in our one-on-one meetings, our stakeholder meetings, and formulation workshops.

I see a lot of familiar faces out there. You-all were very helpful in putting this plan together

and I think you all need to be acknowledged and thanked for that as well. So to an extent, I hope this is a little bit of validation for your participation at this point. And as Sidney said, we will have an opportunities to shape this plan as we move forward to new steps.

I just want to mention this is not the only thing that we have produced here. You have received a copy of this nice colorful May report. That is only one piece of this plan. We have other pieces available on the Internet. And all that information is in the plan. There is much more on the Internet and much more information available for you to look at.

If you still have questions and you can't find any of the information you're looking for, please feel free to call us and we'll try to help you out.

So what are we going to cover today? As you can see in this plan before you and you will see other stuff available on the Internet, there's a lot of work that's been going on here and there have been a lot meetings, a lot of process. We're not going to deal with all that. We're going to deal strictly with sort of a quick tour through the plan, just dealing with what's in it, not really going into how it was produced.

Because a lot of you again, have just participated in that and that information we can answer in questions if you have afterwards, or we can talk to you later about it. But basically we're going to start out just as a reminder how does this master plan relate to the ongoing plan we have or specifically with the

Corps of Engineers and the Louisiana Recovery Authority. What's the master plan seeking to achieve? What are the objectives we're trying to balance out? What does the master plan represent? Really, what is the status of this thing? Sidney mentioned a little bit a moment ago and it's just a little bit more. Obviously, we're going to spend quite a bit of time on the contents of the master plan. We're also going to talk a little bit about the water issues that will affect the implementability of this plan. We're just going to note those here because we have a substantial amount of work left to do on those. And then with a little bit of a glance ahead of what comes next.

So how does this plan relate to other ongoing planning efforts? You all know a lot of has been going on out there with the Corps of Engineers immediately after the storm. We got two separate congressional directives to put together a comprehensive plan for hurricane protection and coastal restoration. As

Sidney mentioned, this plan from the Corps and the plan that you're about to see will probably be nearly identical, if not identical in the end. But the Corps is really focused just on this project in trying to implement those through existing legislation and policy. And that's the main difference between that

and the other one we're talking about today. As you all recall from Act 8, an act was passed. It was specific that we weren't to deal with just the projects, just the plan. We were supposed to look at all the institutional issues, policy issues, and legislative issues, things that affect the larger program of implementation.

So that's the main difference between the Corps' plan and our plan. And then of course, the Louisiana Recovery Authority, tasked by Governor Blanco to speed and facilitate the redevelopment of South Louisiana after the storms. All these plans from the Corps of Engineers and from the CPRA are being used as basic inputs to help the LRA bring out their redevelopment scenario.

So there aren't a whole slew of unrelated efforts going on. These are very well coordinated. It takes a lot of time to keep these things together and we've been fairly successful.

What are we seeking to achieve? First of all, there are some just general background concepts that we need to establish. Some of these were established in Act 8, some of them we pulled from other places. But basically, a healthy landscape, without that, we are not going to have the ecosystem and

services we expect and we will not be able to put together a reliable flood protection system. So it all starts with a healthy landscape.

We have to give credit to what's called the multiple lines of defense, first trumpeted loudly by the Lake Pontchartain Basin Foundation. This is really the heart of the strategy here. Coastal features, levees, evacuation routes, anything we can put in the face of a storm surge for protection purposes is what we need to look at.

And then based on the healthy landscape we seek to achieve through our restoration program, we get to find where we could protect what levees. And this last one, we'd like to emphasize every time we get a chance, that we recognize the public really does have a very large stake in the outcome of this process. And the outcome and implementation of this plan, so we recognize right up front it's important to keep the public informed and more importantly, involved in

what's going on.

So science and engineering are -- and I keep forgetting, I think it's Mr. Bradberry who keeps asking us: What does science and engineering say? whenever we tell them something in the steering committee meeting. What does science say? So there's one thing that

science tells us is anything we do to fix the system, from a restoration standpoint, and a levee standpoint, the marsh creation diversion, it's going to alter the system hydrology. You're going to have different places refreshed, and different places have more sediment, the salinities are going to move around. It doesn't matter if it's a levee project or a restoration project. Change is going to happen in the ecosystem out there.

The other thing we've all recognized is you can't really fix the problems we're faced with unless you change the system. We cannot achieve sustainable restoration or sustainable flood protection if we keep doing things the way they are right now. And lastly, and most importantly, if we make sure that the public and communities are involved up front, and things are predictable, the changes that are anticipated into the future, if they still have availability of basic services like stores and hospitals and things like that, communities can adapt in the future. This is something

that's sort of a Louisiana tradition. It's not been a static coastline for the last several hundred years and it will not be a static coastline for the next couple of hundred years. So the adaptation of the communities is important.

So we -- again, going back to what I'm not

going to go today, we've gone through a lot of effort to pull together existing planning efforts and everything we've heard into two separate sorts of concepts that really guide the plan. One is the principles. What are the things that we know and want this program to look like? And these deal with things like the necessity to integrate protection and restoration, the absolute mandate in assessing public and stakeholder involvement. The fact that this plan will have to be implemented over several years, so we have to make sure it is flexible and can change into the future. It recognizes there's constraints out there, recognizes it's all tied with land use and other things. These are available in a separate document, but this helped guide where the planning effort went.

We also have a series of four coastline objectives which we were trying to balance throughout this project. And they are pretty diverse. The first one, being obviously the first one on most people's

minds, is hurricane protection. And we have several options for that. First off, levees, the Metairie levee, and also nonstructural issues such as raising houses and getting them up above floods if they do come in. We have opportunities here to rely on one type of protection or another. And in some cases with the

coastal zone, we will actually probably have to rely on both, a combination of some levees and elevated structures, and so on.

Sustaining the ecosystem, this has been on the on the restoration program that I was talking about. How do we put the river back into the ecosystem? How do we make sure that the land lost, the problem we are facing right now, is addressed? And is addressed in a way that make sense for the long term.

But not only that, but we do recognize there is a very diverse array of economic activities in the coastal zone from things like rice farming and crawfishing, and alligator harvesting, and oysters, things that rely on a variety of salinity regimes. And if we lose coast-wide, and we lose the ability to enjoy and to harvest these kinds of natural resources, the plan will be that much less effective.

But also we have a very long and colorful history that just developed throughout the last several

centuries. The key part there is the ties and the landscape. We have cultures out there, communities out there that have developed because of where they live, not just because of who they are, but because of where they live. And it's important also to recognize the importance of those ties and landscape and work to

preserve those ties.

So what does this plan represent? What are we here to discuss today? Again, a conceptual vision for the future of coastal Louisiana. You will see in this report, you will see a lot of lines and a lot of things that look very certain, because as we mentioned, there are a lot of things in there that still need further work, further engineering, further design, further definition in terms of exactly where these things go. But the concepts that are there in terms of how we envision the protection strategies or restoration strategies, those are the important parts of this plan.

It does represent a completely integrated approach. Although each of these individual pieces of the plan represent something that is good to do, it will have substantial benefits. If we want the full benefit of the plan, we cannot necessarily just take one part of it before the other. It's got to be protection and it's got to be restoration. And we have to make sure that

they do go hand in hand.

And this plan that we see today, we did work very hard to try to balance these four objectives. We recognize that we're not going to be able to maximize achievement of all these objectives. There are trade offs to be made and we're trying to put this plan

together. The plan you see before you today really did work to balance those objectives the best that we could. And this of course is the starting point for public discussion.

We had a lot of stakeholder meetings, a lot of focus meetings, but no real general public discussions besides the CPRA meetings where we presented these efforts. Before we finalize the plan, we recognized we needed to do that. So we put this plan together as a starting point to discuss everything that's going on with the public.

So what's in the plan? I'm going to go through some sort of four parts, the first part being the restoration components of the Delta Plain - Barrier protection and components, and then going on to the Chenier Plain restoration and protection. I want to emphasize that the way this is presented is simply a communication device and layering along the lines of the defense. I do not want to give you the impression that

we've assigned priorities to anything here. It's just a communication tool. And it's the easiest way to see how everything fits together.

So the first part of the Delta Plain and the stabilization of the Delta Plain are the things that we've always talked about for the storm surge protection

particularly, various shorelines, shoreline stabilization of land masses that are important like land bridges. And these interior what are distributary ridges that have also been valuable in redirecting the storm surge from the winter cold fronts and smaller tropical storms.

These are all essential features of the landscape and they're all things that we need to look at to restore and to begin providing not only protection but valuable restoration benefits because especially when you take the ridges of the barrier islands, those are diverse habitats of the barrier islands and other issues, other habitats of the wildlife throughout the country.

The other part is navigation channels. When we're talking about stabilizing the system, navigation channels are obviously very important. You can look at them as a two-edged sword. They are navigation channels that have had detrimental impacts on the system, but we

can use them as opportunities.

If we can stabilize the banks, we can use them to transport fresh water to places where we might not be able to do that under ordinary conditions, particularly in the case of the GIWW and the Houma Navigation Canal, a classic example of how we can move fresh water from

rivers to more remote locations. More importantly for this area is the MRGO, which I will talk about in detail in just a moment.

Land sustaining diversions. Once we deal with a stabilized physical landscape in terms of ridges and barrier islands, the next thing you really need to look at is sustaining the existing wetlands that are out there. These are diversions like the Caernarvon Diversion, the Davis Pond Diversion, which are very valuable to sustaining existing levees that are out there, but due to their size and location, will not build significantly greater land in big, open-water bodies. These are sized mainly to be defenses and preserve what we have.

So having said that, we have to find a way to really balance our objectives to achieve the success of this plan. We have to find a way to build land. And the two options we have on the table and that we've always been talking about are marsh creation.

In this case, we have focused marsh creation in a very critical area, on these critical land masses like the Biloxi marshes, the East Orleans Land Bridge, right up close to levees, and then through the Barataria-Terrebonne Estuary. These are areas that we have to restore by finding some sediment somewhere

either offshore or within the rivers, hauling them, and then by finding some way to sustain them.

The two options on the table either being find a way to get rid of water to sustain these new marshes or investing in long-term maintenance of pipeline and infrastructure of pumps and those kinds of issues. And we're still working through those kinds of details about how to best sustain those.

But the other issue and the one we see going back to the Coast 2050 Plan, really the most recently June 1st when the American Wetland Program put out a report on Visions of the Future of the Gulf Coast is: How do you put the river back to work? The lower river, which is so important for deep draft navigation, it also has all that deep open water around it. You need a very large diversion to create land in those areas and to also keep that sediment onshore in an open complex.

So this is a very conceptional representation of that Delta Management. It is something that requires

a lot more work to do to define exactly where this will go with the management, but the bottom -- the principle is just that, put the river back to work.

Moving on very quickly to the MRGO, we are aware that there is a significant amount of interest in how we deal with this channel. And there was a very

large public meeting several weeks back dealing specifically with the MRGO. The overwhelming message that came out of that meeting was that the MRGO should be closed to deep draft navigation and with a very strong preference for filling the channel in for marsh height.

I want to recognize right up front that this plan does not accomplish the second one. It does very definitely close the channel for deep draft navigation. It does that, everybody would become rich. However, rather than closing -- than filling it in to marsh height, if we restore the integrity of this Bayou LaLoutre ridge to what it was before the MRGO was dug through it, that takes care of the bulk of the storm impacts that are related to the channel.

What we have proposed in this is turning again this navigation channel into an asset. That blue arrow pointing straight at that green and white line is a river diversion from the bayou area. But putting a

river diversion into the MRGO and transporting it down through the MRGO to the Biloxi marsh area, we might be able -- we should be able to sustain this area, which is very important for strong protection benefits, with the river.

The hurricane protection, I'm going to go

through this in sort of several pieces. The first thing are a few points. The first line of defense should not be the last line of defense. If you have critical areas that you are trying to protect like New Orleans, you should not have the first place the storm surge meets are the protected areas with that levee.

Longer and more complex protection systems are more prone to failures. Simple probability, longer levees, more structures, more things to operate, more moving parts are more prone to failure.

Water has to have room to move. The surge has to go somewhere. It either goes up and over levees or it can be directed to other places. But you've got to find a way to give the water the space it needs to move. And as we're going to point out in some very specific instances in a few moments, we mentioned that levees can alter hydrologies, but that doesn't have to be a bad thing. You can turn that to our advantage.

So the first one we're going to go through

just very quickly is the Pontchartrain barrier. We do have an existing levee protection around New Orleans, which you all are very familiar with. It's inadequate for the task. It is not providing enough protection that we believe it is necessary for the City of New Orleans and Saint Bernard Parish.

So instead of retrofitting that system with raised levees and that kind of thing, what we're saying here is the best way to do is go back to the early reports, the early plans for this area, and we move to this outer barrier plan, basically this yellow-orange line. Put a second line of defense further out towards the Gulf so that that can help working in tandem with the existing lakefront levees and the entire levee system to provide a higher level of protection for the City of New Orleans.

Through Barataria Bay to Plaquemines Parish, we have seen things in the papers with comments about the possibility of the Gulf alignment not being put into the plan. I want to assure you that is not the case. You do see this red line right across the basin from Donaldsonville to the Gulf Intracoastal Waterway alignment. The same sort of principle as the Pontchartrain barrier on the east side of the river and west bank and vicinity projects.

This purple line right here will not provide adequate protection for the west bank of New Orleans. Again, rather than retrofitting that system to provide a higher standard of protection, moving out this alignment of the levee on the Gulf Intracoastal Waterway to provide a second line of defense, seaward of your last

line of defense there with the levee system, to provide a higher standard of protection for the west bank.

Also, very clearly we are showing three different levels of protection for Plaquemines Parish being the sort of a 500 year level of protection or more, and upper Plaquemines a 100 year level of protection between Oakdale and Myrtle Grove. And then maintaining the existing levees all the way down to Venice. This is one of those areas where this plan very definitely proposes the comprehensive protection scheme for Plaquemines Parish. You must rely on the combination of the existing levees that are there and smarter building practices, elevated houses, stronger houses and the other structures that we have out there.

Moving on to Terrebonne Parish and the Atchafalaya Delta, the other thing we've seen is people have been concerned that the Houma area is getting a lesser standard of protection. But this actually does include both the existing 100 year level of protection

and the uprising -- and hopefully soon to be authorized Morganza to the Gulf project. But also, an interior protection line somewhere south of Houma. We haven't figured out exactly where that line will be, either on the GIWW, or Terrebonne Parish has a line further south. But it's the same system.

Bi-level protection isn't working in tandem with another levee seaward to provide the protection and the assets we need. We have this -- there's an alignment there, the brick red on this map, I guess, which is just to remind us that there are funnel situations out there that we may need to look at realignment here. It's not to say that we don't think this project is a good project. We think it's an excellent project, but there might be some tweaks we might need to take care of to make sure the project functions appropriately.

But even after all of that, all the restoration and all the levees, I'm going to be very up front, there will still be risks. There will be people outside levee protection systems and the levees themselves will not protect. And in a lot of cases, that means the biggest possible source. So there will be risks that we need to manage. It's specific instances on this slide, that big yellow thing right

here to the Northshore of Lake Pontchartain and Lake Maurepas, we recognize there's no existing levee protection there.

What are we going to have to do to protect this as a standard protection, once this Pontchartrain barrier is replaced? Other issues like evacuation

routes, making sure people have as much time to get out in advance of a storm as possible, but also a serviceable road to get back to begin recovery efforts immediately post-storm. Those kinds of issues are things we really have to look at continuing.

Another part of managing the remaining risks is what happens inside your levee system. We got this proposal from the Bring New Orleans Back Commission and it's a very strong concept called compartmentation. Basically, your protected areas should not be one big protected area such that with a single breach, the entire area gets inundated.

We should look at our metropolitan areas and find ways to compartmentalize these features like cruise ships do, to make sure that if we do have a failure in one levee in one part of the system, we don't have the entire system inundated. This is a shot of the Orleans/ Jefferson Parish line after the storm. We can see how compartmentation at work.

But the last part of this whole plan, is the just the water management. Again, recognizing that everything we do is going to affect hydrology. How can we turn that to an opportunity? There's a lot of concern that this Barataria Basin with this alignment here -- There's a lot of concern that that's going to

make this ecosystem less healthy, less sustainable.

How can we manage that upper system, more actively introduce the stability of that upper system? Where the river is, make sure it's sediment nutrients stay in to support the marshes and swamps. But more importantly, can we use that to move water other places we can't normally get, like Terrebonne Parish? Can we move the water through the Gulf Intracoastal Waterway and affect these areas in a sustaining way with that measure?

That's a very, very quick tour through the Delta Plan. The next part of this is the Chenier Plan and you see the similar concepts of multiple lines of defense, again starting with shoreline protection in critical areas, the Gulf shoreline, the lakes, and the land bridges. Well, evacuation routes, we moved these up in the presentation for the Chenier Plain because these really do provide a very strong line of defense as close to the Gulf as we could get is in the Chenier

Plain. Highway 82 and Highway 27 we think we are -- we can raise and armor to provide a very valuable first line of defense out here.

Navigation channels in the Chenier Plain are a little bit different. You know, it's not a delta. They can still transport water. They still can have

shoreline protection issues that we need to address, but in particular, on the Gulf Intracoastal Waterway and the Freshwater Bayou Canal, there's proposals to manage those soil banks for some sort of protection. Those are all issues that we need to -- that are included in this plan.

Unlike the Delta Plain, there are no great river systems running through the Chenier Plain currently. So there is no real easy way to introduce land building by diversions. So if we're going to create new land in the Chenier Plain, we're proposing here that by and large, we have to rely on dredged material.

The good news is we do have major navigation channels - off to the side would be Natchez Channel, through Calcasieu Lake, this ship channel here, and also the Atchafalaya River Navigation Channel. All produce a significant amount of sediments and if we manage it properly, we can create and sustain a significant amount

of levee.

But we are also managing what water sediment is in the system, for example, the Atchafalaya River is going through Terrebonne Parish. I will make sure that that water is optimized for marsh sustaining at capacity. How do we make sure that water and sediment

continue to move down the GIWW?

If all of the rainwater that falls in upper Mementau Basin up here, don't let -- let us not waste that water to the Gulf in the spring. How do we retain that in the system and maintain the ability of -- the flood protection ability first of all, but also maintain access to that water for ecosystem and for agriculture.

And also we see that these major ship channels, in addition to managing the water, the fresh water coming in from the top, we can put in these salt water control structures to manage the salt water coming in from the bottom, from the Gulf.

We think in the strategy here in this planning is, as some of you know, the Chenier Plain is a very actively managed system. The strategy here is to go with a more regional management system with less intensive local management, and we think this plan will allow us to do that. The other part about this is that if you put in a salinity control structure in here for

instance, at Cameron in concert with the four to five hours to provide flood protection.

The hurricane protection system out in the Chenier Plain is very -- it hasn't been studied nearly as much as it has in the Delta Plain, but we do have some options and some very recent studies that are going

on. But I want to emphasize a couple of things. This area here really does need to rely on multiple lines of defense, using the Gulf shoreline, the highways and the spoil banks before we get the major -- the majority of the developed areas back here.

We are proposing for the Lake Charles and Sulphur area and all of the refineries and all the oil and gas infrastructure out there, needs a very high level of protection similar to the City of New Orleans. And the same with this corridor here between Lafayette and Abbeville and New Iberia, one of the largest population centers in the western portion of the state. Those areas all need a very high degree of protection.

We are still working through how much risks they actually face from the storm surges. Some of these areas like Lafayette is on high ground, but we want to make sure as we move through the analysis that we do maintain protection through those large population centers.

This red line that you see that runs along the Gulf Intracoastal Waterway and moves up towards Abbeville here is intended to indicate a 100 year levee. There are -- the population pattern out here is very distributed. There are significant numbers of folks living out in here. It's a very rural community, large

rural community. If the highways, Gulf shore lines, and spoil banks are not enough, I'd be happy to evaluate it for you with this levee along the Gulf Intracoastal Waterway.

So all of those things are very ambitious; they're very large. And as we all know, from just the efforts we put into daily putting together the flood protection plans and restoration plans, there are a lot of things that can keep us from achieving our goals. And we've identified a few here. We can define how these can be solved and recognize how these might limit us in our ability to implement the plan.

One thing in land use planning is zoning. We need to keep wet areas wet. We need to keep these flood protection projects working the way they need to. Some of these things are made and need to be designed to allow for limited overtopping. In that case, we certainly don't want houses right up to the toe of the levee.

If we have to modify these projects into the future to raise them up to maintain a level of protection, again, we don't want houses and development right up to the toe of the levee because it prevents you from retrofitting the system and improving your system. So there's substantial issues here.

Landowner concerns, we realize that most of the coastal zones and the wetlands anyway is privately held. We do have reclamation issues and we do have mineral rights issues. All these things that we've been talking about for years. They haven't gone away; they're still there; they're just more urgent.

Adaptive management, this plan is very big. It will take many -- several -- many years to implement. And we will learn more as we implement the plan. Things will change out there because South Louisiana will redevelop; people move around. We will have things happen that we can't anticipate today.

This plan has to be flexible and we have to have a set process for maintaining this plan and adapting it into the future as we need to. Federal/state partnerships will most likely require a significant federal investment. So we have to find ways to make sure we are still working in tandem with the federal government, the Corps of Engineers in

particular.

But how do we do this expeditiously? How do we make the system work faster? How do we make the system a problem-solving system? Those are significant issues here. Consistency, if this plan's going to be successful. Everything that happens out there has to be

judged by its effect on this plan. Well, issues like appropriating and issues like that, this is not different stuff. It's not significantly different from how we treat the Coast 2050 Plan now. But it -- this must be the basis for consistency.

And the last one is priority. We call it priority because it really needs to dedicate the funding extended. We've go to find a way to dedicate some funds to this project because if we don't, every year we have to have the same conversations, the same budgetary considerations. What is the priority this year in relation to other things we're trying to accomplish? Dedicated funding's the answer. What's the appropriate priority on this that facilitates the long range planning and the implementation of the plan?

Last thing, what comes next? Public discussions starting now or in about two minutes. Public discussion is the key part to finish this plan. You saw a lot of measures there that have not been

refined and defined. Measures like shoreline protection where most of you can tell us you don't need shoreline protection because it's actually building. We recognize that.

We put that out for discussion and we still have to find the actuaries or highest need. The plan

that you see next year, early next year, will be more defined in that respect.

And we have to do that because we have to develop a better process. And we have a very, very conceptual process and that's right now. We don't have a really detailed or reliable process or the discipline for the plan you have before you. And we have to do that over the next couple of months.

We do have to develop and implement sequencing. We cannot start and finish all these things at the same time. Things have to come first, and we have not developed that priority the sequence yet.

And most significantly, going back to public discussions over the next couple of months, with public discussion, with ongoing analysis, we will have to modify the plan you see before you to continue to reflect the best analysis we have going and the public desire. Towards that we have, as Sidney mentioned, five public meetings.

They are listed here. We have a handout in the back of the room on the table. I guess you all received that as you walked in. If you did not get that handout, let us know, but also for a technical appendices and information on these meetings, we do have a website - The reports were handed, all the technical

appendices, the schedule of locations of meetings. Everything is on this website. You can read anything. You should be able to get your answers here and if you can't, then there's a phone number you can call to talk to a real live person and get your answer, or be directed to someone like me or the team sitting down here before you.

So that was a very quick tour through the plan. We hit the high notes and we fully recognize that it's a lot to digest right now. I'm not really expecting a whole lot of detailed questions and for comments on it. I think the technologists can clarify anything for you now so that for the next couple of weeks you can really get into this and think about it and figure out how it affects you, and how you'd like to suggest improvements. If we get those kind of comments, I think that would be great.

SIDNEY COFFEE:

Okay, Jon. Thank you. Jon, I'm going to ask you

to stand, to stay here. Randy, if you would, could you come and we've got a couple of extra mikes up here, if there are questions that you may need to address with Jon. And I apologize at the end of my spiel I was -- I needed to introduce the CPRA members who are here today. And I also wanted to acknowledge Secretary John

Bradberry at the Department of Transportation, and Secretary Scott Angelle of the Department of Natural Resources. These two gentlemen have the two lead agencies on the authority that actually are going to be responsible for implementing this plan. So I definitely wanted to point them out to you.

And for the Record, for the court reporter, and since this is an official meeting of the CPRA, I'm going to ask the members here to please state their name and who they represent. Stephanie?

STEPHANIE LEGER:

Stephanie Leger on behalf of secretary, Mike Olivier, for Louisiana Economic Development.

KAREN GAUTREAUX:

Karen Gautreaux, Louisiana Department of Environmental Quality.

KING MILLING:

King Milling, Governor's Advisary Commission.

SCOTT ANGELLE:

Scott Angelle, Department of Natural Resources.

JOHN BRADBERRY:

Johnny Bradberry, Department of Transportation and Development.

BENNY ROUSSELL:

Benny Roussell, Plaquemines Parish and Louisiana

Police Jury Association.

WENDELL CUROLE:

Wendell Curole, Levee Board Association.

SIDNEY COFFEE:

Thank you. All right. Well, let's take your questions.

JON PORTHOUSE:

Sidney, did you want folks to come up to the microphone to ask the questions?

SIDNEY COFFEE:

I would like for that to happen if you don't mind. It would help us hear you. And we can, you know, do it any way you want. Just go ahead and step up and start. You don't particularly have to raise your hands. If you want to get behind whoever is at the mike at the time, you can certainly do it that way.

And for our court reporter, please give your name and who you represent before you ask your question or make your comment. Yes, we are taking comments.

Everything's being recorded and will be responded to.

Mark, I recognize you.

MARK DAVIS:

I was just passing by. I'm Mark Davis. I'm Executive Director of the Coalition to Restore Coastal Louisiana, at least for a little while longer. I wanted

to first of all commend the team for the amount of work that's gone in. This is a terrific level of effort, even to get to I guess the broad canvas that's been painted for us today. And there's a lot to digest, a lot to like, and a lot to puzzle over.

And I think we will certainly be looking forward to sitting down with the team to work on the details. I know we have questions not only about the old levels of protection and the Coalition would like to see us aspiring even beyond 500 year protection for our population centers to see even if that's possible.

We also would like to make sure that the levee alignments are not only, you know, technically feasible, but practically feasible and what's termed leaky levees and whatnot need. I think we all have to define those and we look forward to not only sitting down with you, but helping you come to the answers and communicating those. And that's an offer we'd like to make.

There is one specific comment I'd like to make

and that is with respect to the Mississippi River Gulf Outlet. We do commend the State for taking I think the, what is it? the obviously correct, but historically difficult decision to decide that the MRGO, as we've known it, must move into our history, and to plan for a new future for the region that I think, that, you know,

the physical closure of Bayou LaLoutre is an essential step to anything we do in the future. And the use of it to help move fresh water sediments and nutrients to rehabilitate the area is an essential piece of any long term solution.

I will make one specific comment as well about the notion the priority. We would have trouble with the idea that priority equals a dedicated funding stream. We don't think it does. Priority is priority; it's the ability to rank your needs, your opportunities, your resources. It's difficult stuff. But I don't think there's any prospect of a dedicated funding stream showing up tomorrow, next week, or any time soon to take the burden off of us to make hard choices to begin this process.

So I think that as much as we will work with you to get dedicated funding stream, it would be a mistake to tell people that is the answer to our prioritization needs. It won't be. And we need to tell

people. Thank you.

JON PORTHOUSE:

If I could just clarify one thing. I don't want to debate, but this needs to be clarified. The priority is indeed different than just funding stream and we did have that as something to do in the next few months,

sequencing which deals with all that you just mentioned. So it's not off the table. It's there and we're going to working with the public and with ourselves and the agencies to work through that.

ALMA LOISTELL:

I'm Alma Loistell. I'm a representative of COPE, Citizens of Plaquemines East Bank, and recently there was an article in the Times Picayune which showed the coastal erosion due to Hurricanes Katrina and Rita, and 70 percent of coastal erosion was on the east bank of Plaquemines, yet I didn't see where you were going to do any restoration of the coast on the east bank.

The other thing is you showed where you cut the river, making east/west in Plaquemines Parish. As most of you know, Plaquemines has -- already has the Mississippi River dividing us from north to south. And now you're talking about cutting it east to west. That's not acceptable to us.

JON PORTHOUSE:

Again, let's look through it very quickly, and if you looked through the report, you will see a lot of restoration effort on the east bank of Plaquemines Parish, marsh creation, diversions at Caernarvon and White Ditch, Bayou LaMoque. There is some significant restoration going to be out there, but if it's not

enough, we can talk to you about that. And again, the river diversions, I want to emphasize that's conceptual. Whether or not it goes are east and west, or just west, or just east, we have not figured that out yet. So there's still plenty of opportunity to work with those issues as well.

ALMA LOISTELL:

Thank you.

RANDY MORTELL:

My name is Randy Mortell and I'm representing Biloxi Marshlands Corporation and Lake Eugenie Land Development Company, which is the largest landowner in Saint Bernard Parish. We own 150,000 acres of commonly known as the Biloxi marsh.

This comment is to give ya'll some kudos about having an open door policy. We, as a major land owner, that owns or we're interested in the ecological effects of sustaining our marsh for hurricane protection. We were able to meet with Scott Angelle and Randy Hanchey,

yourself Jon in -- privately and then ya'll directed us toward the IPT team, which was very good.

We spent a considerable amount of money putting together a plan of restoration that didn't just include our property, but included the Biloxi marsh region. And I've noticed in this draft, that ya'll have included

almost every element, at least conceptually, that we had spent a lot of time and effort. We actually put cost estimates to it and everything else so we could have a good starting point. We appreciate it very much.

The one thing that I do have to say, though, that I was concerned about, on the MRGO deauthorization meetings that the Corps was putting on, the Department of Natural Resources was actively involved at the very beginning. When the lawsuit came out, they were -- it did not appear that they were involved in the continuation of those stakeholder meetings with the Corps.

As I understand, or as far as I know, that was the largest group of stakeholders in a particular basin across the State that were meeting. They were covering everything from navigation interests to ecological interests, to Lake Pontchartain Basin Foundation, and Lee Richardson's group and everything else. And we came up with 17 consensus items which were huge. And we would

like for this group to consider very carefully those 17 consensus items. Because to get a group that diverse to put together the 17 consensus items was a big deal.

And so that would be something we would very much like to see integrated into this planning effort for the MRGO and the Lake Pontchartrain Basin region. Thank

you very much and thank ya'll for all your effort.

CHARLES PARKINS:

My name is Charles Parkins. I'm just a private citizen who lives in Venetian Isles. I've had some questions about this Pontchartrain Barrier project which looks like it's really extremely important.

What is your time sequence for your -- your proposed time sequence for accomplishing this? And what step wise -- what is the time sequence of the individual portions of that as you develop it? And what is the priority you are giving that project in view of all of the other projects that you have in mind? How much do you think that this is actually going to protect the City of New Orleans and all of its villages and so forth on the northshore of Pontchartrain?

JON PORTHOUSE:

I cannot answer all of those questions specifically, except to say that the increased protection for New Orleans is obviously near to the top of our list. We

don't know exactly where. Because as I mentioned, over the next several months we will be dealing with those sequencing issues. All right, so my answer to the first parts of your question, we don't have those answers yet. In terms of how long it's going to take to get to -- through design, to get the federal government involved

with that kind of partnership design effort, to get to construction, we just don't have those estimates right now. But by the time the next version of that comes out in February, we hope to have a better handle on that. So it's not -- we will have that answer, we just don't have it right now.

STEVE VAUGHN:

Steve Vaughn, Plaquemines Parish Councilman out of District 5. My concern is -- is the actual proposal of diverting the Mississippi River potentially east and west just below Myrtle Grove.

I believe that there's probably some alternatives if you use a combination of fresh water diversion and also the pipeline delivery system instead of actually cutting two channels, which my understanding is they will not be used as a shipping channel, but still it would create an avenue for the Gulf of Mexico to be funneled, just like it has been through MRGO. And if we are in the process of closing MRGO, then, you know by

doing this, anywhere else along the Delta, it would create, you know, that potential storm surge to travel further up the Mississippi River.

When Hurricane Katrina struck, we had water top the levees as far as the Belle Chasse Naval Air Station. Also, we have to deal with the salt water intrusions

during a certain time of the year. So if we create -- my only comment is if the local government authority or the federal government move in this direction, they have to definitely make some type of a protection. And these potential side effects of, you know, diverting the river, which would be astronomical when you look at the salt water intrusion.

So I just would like, as far as to comment, to let everyone to know to consider this as, you know, because there would also be -- require some locks to prevent the storm surge from coming up between the channels that would be created. And I'm well aware that if the channel's are created, we would have to maintain it properly, to keep it dredged, so that way the Mississippi River would be able to replenish the marsh.

So at that cost, there may be some other terms in trying to replenish the marsh and sustaining it with fresh water diversion without maybe having -- I don't know if the benefits outweigh the negative effects, if we were

to do that. So with that, I'd like to commend everyone working on this and trying to protect our businesses, our homes, as well as our livelihoods, and so that's my only comments at this time.

SANDY ROSENTHAL:

Good morning. I'm Sandy Rosenthal, founder of

Levees.org. We're a grass roots group here in Louisiana started after Hurricane Katrina.

I'm just an amateur. I'm just a citizen. This plan looks wonderful to me. I can see a lot of work's gone into it, but I also know that all these water projects are all going to be designed and built by the U.S. Army Corps of Engineers. And the Corps of Engineers, as we all know in this room, is the organization that brought us the great flood of New Orleans.

The Corps of Engineers operates with absolutely no independent panel of experts making sure the job gets done right. The Corps of Engineers still operates with no independent peer review. So we at Levees.org are asking that this panel, the State of Louisiana, and also our Louisiana delegation, to push hard for independent expert peer review so that these wonderful projects, as good as they look now, get designed right, and built right, and inspected after they're done to make sure they were designed to spec. Because we all know, as the saying

goes, two heads are better than one. Thank you.

JUNIOR RODRIGUEZ:

Junior Rodriguez, Saint Bernard Parish resident. Gentlemen, I don't have any questions. I'm just going to make a short statement. I may cough because I have a cold, but I'm talking too much. But I just want to

commend you. You did a lot of work. This is a great day for Saint Bernard. This is a great day for myself. I feel good today. But when you're 71 and you get up in the morning, and you feel good, that's a good day!

But the fact is this is the day that should go down in history really because over all the years we've been complaining and all the years we've been making predictions about the Mississippi River Gulf Outlet, this is the day that I see where someone has come up with a plan, alternatives in that plan, procedures in that plan that Saint Bernard can agree with, and a goal. And that's important.

We have a plan and we have a goal. I'm not going to tell you nothing about the engineering, guys. That's just -- that's your ball game. But in fact what this is, this is the beginning of the end for the MRGO. And thank you for that. Everybody in coastal Louisiana should thank you folks and all the folks, not only just you folks, but Carlton, the whole group.

And incidentally, Randy, I see one proposal in here that I think you had something to do with that. It's probably the best one I've looked at in a long time. And I knew it had to come from you, but people should be more comfortable with what's happening today. We have a plan, we have a goal. We have the dedication that we need to

find, a dedicated public-swayed effort, and with that I just want to tell you thank you. I appreciate all the work you've done.

SIDNEY COFFEE:

Thank you, Junior. I also want to say to that if -- I invite the board -- I mean, the authority members, if there is a comment that you'd like to make, to respond to anything that's being said today, please feel free to, this is your meeting as well. So.

JOHN BECHNEL:

John Bechnel, Councilman-elect, District 1, Plaquemines Parish. I'd like to know how flexible is this plan due to time constraints. And we could plan for a hundred years, and how flexible is it for additions to some things maybe that we object to or we want to add?

JON PORTHOUSE:

It's kind of hard to answer that, but it's still flexible. If you've got specific questions and specific concerns, then we need to sit down and talk about it. We

do have a lot of information that we're developing. So if there are proposals and suggestions, we do have to go back and look at the information and analysis already collected to make sure that things still work together as intended. But it's still pretty open, so if you've got some specific ideas, I can sit down and talk to you about it.

JOHN BECHNEL:

Now, as far as from Plaquemines Parish down in the south end, you have a 1 percent levee protection on parts of it. And up a little bit north of that, you got the point, with a point two, point three. And I'm wondering why there is such a difference in such a -- why can't you have it a point two going all the way down because it leaves Plaquemines wide open? I think Plaquemines contributes a lot to this State.

JON PORTHOUSE:

Yes, they do. We tried to explain it in the plan, but basically we have identified areas based on what exists in terms of the number of residences, infrastructures, strategic needs for infrastructure, and we will try to focus the highest level of protection in the most densely navigated sections where we work. This is upper Plaquemines Parish, Saint Bernard, New Orleans are very densely populated with a wide development. Those are the areas we've identified for the higher levels of

protection. As you move down, the population centers, the community get smaller and there's not as much strategic --

JOHN BECHNEL:

The needs of the many outweigh the needs of the few.

JON PORTHOUSE:

Very unfortunately, that's the case. We cannot provide absolute protection for everybody. That's got to be obvious, so .

JOHN BECNEL:

I don't accept that.

One thing that I don't see here that I'm really upset about is there's nobody from the Louisiana Wildlife & Fisheries here to give their input on what goes on out there. So, thank you.

SIDNEY COFFEE:

Well, I would like to say that the Secretary of Department of Wildlife & Fisheries did talk to the authority and has, in fact, commented.

JOHN BECHNEL:

They have?

SIDNEY COFFEE:

Yes, absolutely.

JOHN BECHNEL:

All right. Thank you.

ANDREW MacINNESS:

Good morning, everybody. Andrew MacInnes, Plaquemines Parish Coastal Zone Administrator. I'd like to commend you for the plan that's been put out. As someone whose tried to prepared some quicker projects just for Plaquemines Parish, I know how much work goes into

planning these projects out and what it takes to get everybody together.

So I could only imagine what it takes to do this kind of effort and work on a statewide scale. And there's a lot of thought that's gone into it, and I think there's a lot of pretty smart people who have been asked to come together to contribute their ideas.

With that being said, I'd like to ask a question, Jon, if you don't mind. I may have missed it, but can you elaborate a little bit on what the proposals are to armor and elevate the state highways in southeast Louisiana, specifically Highway 39 and Highway 23, in Plaquemines Parish?

JON PORTHOUSE:

At this point, it's just conceptual. If there are low spots on highways, if there are things that are particularly vulnerable, and they're outside the levees particularly -- if there's a roadway outside the levee that does service the people's need with development,

those are the highest priority to make sure that they raised, and fortified and maintained for evacuation and return access.

That is one particular aspect of the plan that we did not go into great deal of detail in terms of where, how high, and so on. So that is still one of those areas

we need to focus in on. As I said, refine and define. And if it's an evacuation route, it's probably on our list. So we do need to work with you on that issue because of the area's need for it.

JOHN MacINNES:

Well, I just feel if I'd get a little more background information in that regard. We're talking about cutting the 100-year levee protection off at Myrtle Grove. There are gaps in the levee system that exists today, that will not protect Highway 23.

So if raising and armoring a state highway means elevating or doing something to protect a highway, well, by not doing anything to the levee south of Myrtle Grove, where you would have some sort of protection to that highway, you're swapping one for the other.

Along those lines further, I think that based on discussions with residents, industry in Plaquemines Parish, you know, we've got a footprint that exists. There are several levees, whatever that means these days

as far as protection goes, along the west bank and east bank of Plaquemines Parish. We've got something to work with. I know there's been a lot of mention of protecting the oil and gas infrastructures, state highways, things like that, other assets that the State has.

Here we've got something to work with. We're

not talking about building a brand new levee in the middle of the marsh along an existing shoreline or bank of the GIWW. We've got something that's built up. It's got a footprint. It's 12 feet high, it's 14 feet high, depending on where you're looking. It won't take too much to add to what is already in place in a system that exists today to afford some level of protection for lower Plaquemines Parish.

There are a lot of people who are just in limbo, waiting to get some sort of direction about what's going to happen in this area. If this plan comes out without any kind of discussion or modification, it's going to essentially to say that that area's uninhabitable. If it's uninhabitable, and we're just going to write it off, more or less, then what's the point of armoring the state highway? Why elevate a state highway?

There's not going to be any other compelling reason to have communities or stores or other assets in that lower area. So we would like to incorporate and add

into this plan just topping off the existing levees a little bit more than they already are and creating a level of protection that helps not only the immediate residents of Plaquemines Parish, but also provides a very significant storm buffer and storm surge protection for Saint Bernard, for New Orleans, for Jefferson Parish,

depending on which way it comes. You know, we're the first road block to the larger areas that we're all trying to protect. So keep us around and we can help keep everybody else around. That's all I have. Thank you.

BENNY ROUSSELL:

Yes, while we're talking about the Plaquemines Parish program, I want to, first of all, thank all of you for all the hard work that you've done. I know; I've been in the meetings with you that my comments have been heard and maybe you don't agree, but I'm want to mention the work that you've done and a lot of the work you've done I do agree with.

So as was stated earlier, you know, we do have at least a plan for the first time to look at. And as this plan says, this is a draft. So what I'd ask you to do, the comments that you've heard from the residents of Plaquemines Parish is to look at the plans and some alternatives, and possibly be able to give us some type of protection beyond what you've recommended in the plan.

I also would like to ask you to look at the levee systems that are in the east bank that are not within the system to encourage us through this plan to have them put into the plan and discuss the level of protection that they will give us down the line. But we need to be able to at least have a whole system.

And then the other point that I'd like to make is the point of coastal restoration. If you're going to divert the river water or sediment diversion to the middle of the parish on both sides, we have to have some type of agreement or some type of understanding that when certification of levees comes to the table, that that plan works more for certain cases of those levees to allow people to be to get insurance and build, even if it is higher than what they're normally accustomed to building at.

So while we are starting with a draft plan today, I ask you to be open-minded and look at what the opportunities are to provide protection for the east bank, as well as the southern part of Plaquemines Parish, which seems to be based on population density as a criteria, not to protect that area, which is the first time that we've ever looked at building levees based on a population basis.

In the past, it's always been on a cost-benefit

ratio and when the administration out of Washington came to the State and started throwing that idea around, it caught on unfortunately. And I blame the federal administration for that idea being floated around, that we're only going to protect certain areas. Because I know no other area in this country has been sacrificed because

of lack of population when it comes to cost-benefit ratios building levees. So I ask you to be open-minded and look at that and perhaps you could come up with some alternatives.

And thank you again for all your dedication and work that you have performed in this plan.

JERRY ST. PE:

Good morning, everyone. My name's Jerry St. Pe and I'm the Director of the Barataria/Terrebone National Historic Program, otherwise known as BTNHP, or B-T-N-H-P.

My program is one of 28 national estuary programs. It is a congressionally mandated program and we're designed specifically to forge common ground solutions and agreements regarding restoration. We did that between 1991 and 1996.

While we are the current leaders in the need to develop plans, we are so much more so interested in seeing a plan implemented. Restoration plans are nice, but implementation of restoration plans is what we all want to

see. And I know I speak for all of you when I say that. Implementation is the key.

First of all, I know very, very well a lot of people that have worked on this plan and I know how much work you guys have put into this. And I want to publicly acknowledge that I appreciate your dedication, and I know

you haven't slept a whole lot. I question some of you about whether or not you are sleeping better now that the plan was finished and you said not yet. So it might be coming.

First of all, the areas of agreement with the plan, we're very pleased to see that this plan, over time, has become far more consistent with our comprehensive plan that was approved by the State of Louisiana and the federal government in 1996. I know we're pleased with that, not necessarily because you're just agreeing with us, but because we believe that reaching or following an agreement is essential, an agreement with multitudes of stakeholders because that is going to lead us to implementation. That's going to lead us to success. You cannot follow a path simply by -- from the loudest speaker. It has to be from an agreement.

I'm very pleased to see the pipeline sediment, the transport strategy, the harvesting of the river bed, the Mississippi River bed, the Atchafalaya offshore sources,

and transport those long distances to create marshes. We'd like to see that fully embraced on a programatic level approach to restoring some of our wetlands quickly, in a timely fashion, which is essential. Small and medium diversions used to sustain created coastal landscapes is essential. That's all great components of the plan. I

fully agree with those.

There's no time to debate with all these things but -- The large uncontrolled river diversions, as you know, many of you, our issue with those is not necessarily with the large scale of water input solely. It's what you're getting with that. The land-building need is immediate and you're talking about trying to make a river that took thousands of years to build what we're standing on, when it held sediments that forged the path as what it holds now.

And so it's the time scale and the change. I just don't feel like we have time to debate this in court while the stakeholder that would be adversely impacted. We need immediate restoration. The Thompson bill for the Gulf alignment is a point of disagreement in there. The alignment along the Intracoastal seems to be far more environmentally damaging than the alignment that would follow existing ecologic barrier, Highway 90. The Highway

90 alignment seems to us to still afford community protection that we're seeking. So we definitely prefer the Highway 90 alignment.

I want to add comments about the Plaquemines Parish levees. Plaquemines Parish, at least the west bank of it, is within the Barataria/ Terrebonne system.

Plaquemines has had levees certified at a 100 year level for many, many years. This plan seems to remove the ability for a large segment of the Plaquemines business and the metro community to secure flood insurance.

It bothers me because there has not been enough interaction with the people of Plaquememines Parish before that line that stops at Myrtle Grove is drawn. I know when that line first appeared, it appeared at the Lafayette meeting. I was at that meeting it was an alignment or a line that was suggested by one of the attendees and it stuck. For no other reason, that's why it's at Myrtle Grove as far as I can determine.

There seems from my own observations, and this will have to be verified from the Parish President and parish officials, that there seems to be a natural migration from the lower part of the parish, and when I say lower part, I'm talking about Venice, Buras, Empire, up towards Port Sulphur. There are schools being rebuilt in Port Sulphur, relocated to the lower part of the parish

to Port Sulphur. There are grocery stores being built. There are residences being built now. They're not being elevated; they're not elevated. They're all expecting to be able to get insurance. And so for these decisions to be made without their input is just wrong. Perhaps the people would be amenable to drawing a line further down.

I don't know, but I fully support that they need to be part of that decision.

Once again, thanks. Thanks for all your effort and your dedication. Thank you.

JOHN LOPEZ:

John Lopez, Lake Pontchartrain Basin Foundation.

I just looked at my watch and I was surprised to notice that today's the 29th, the 15-month anniversary of Hurricane Katrina. We've come a long way in 15 months and I thank the State and the Corps in these efforts. We need to congratulate them. I think that the report represents a significant change in mind set of how we're going to do or manage our coast in terms of restoration and flood protection. It's extremely important.

One of the observations that are made is that there are, in a sense, standards or metrics in the report for hurricane protection, what levels of protection. I don't see the same metrics, maybe they're coming or for standards in terms of the ecologic health. And that's

recognized as being valuable.

But one of my questions, and this could maybe be something for discussions later, but what metrics will there be to measure the health of the ecosystems in terms of acres lost or gained or for retaining fisheries, any number of parameters that might be used. But if we're

going to rely on the coast for a buffer for storms, that is just as important as these other engineering standards.

That I think is one of the important lessons of Hurricane Katrina. And I think that there's a lot of acceptance in the value of the wetlands. One particular case would be, in the plan, there are in the draft plan gates along the Rigolets and Chef Pass. The Lake Foundation is not opposed to these gates if they are warranted. However, we would with the utmost caution, suggest that these be built to maintain the hydraulic integrity of the Basin just for the reasons that I was just describing the importance of the wetlands and the health of the ecosystem.

So the closing comment would be that this report took a lot more than just hard work by the staff. I think it takes courage by the representatives of the State and the feds. And I would just say let's stay the course, let's not crack, you know, let's not go astray as maybe things have happened in the past, and stick with the

engineering and science as we're seeing here today. And I think that's the going to lead us to a better road. Thank you.

TOM SKELLY:

My name is Tom Skelly. I'm a citizen of Plaquememines Parish and I refer to page 45, the map of

Plaquememines Parish. I just seen this plan a few moments ago with the rest of us. And I guess what I'm struck by is the fact that some of the issues that others have risen our parish, I would say 15 to 20 percent of it, looks like it's protected with levees and the rest was left under its own category to maintain existing levees. Is there any qualification, quantification of that term? Does that mean that if there's a 50-year flood or something of that nature or what? is basically my question.

JON PORTHOUSE:

The data we have to work with is basically what is in our estimate what is a 100 year level, a 500 year level. The portions in blue are most likely to be only the 100 year level. We cannot define exactly if it's 59 year lavel. We're still waiting for that analysis to come through from the Corps of Engineers and others.

TOM SKELLY:

Well, given that, it appears that maybe, I'll say, 15 to 20 percent is covered by some quantified levee

system and the other 80 to 85 percent is not. That also includes our parish seat, which I would suspect that most people who live in the parish would not want their parish seat to be abandoned, but that appears to be more or less what's taking place in this plan. Thank you.

MIKE MARION:

Good morning. My name's Mike Marion and I'm a resident of Plaquememines Parish as well.

I just have -- first of all, I'd like to thank you, but it's unfortunate that it took Katrina and Rita to bring such a huge effort by the Corps. I guess this is definitely the silver lining. But I'd like to thank you. What I'd like to request, and maybe it's a legislative move or not, the members of this Board are members of state government and other positions.

What I'd like to request is that we amend whatever needs to be changed, to give Plaquememines Parish, Saint Bernard, and other coastal parishes that are impacted by what we're doing here a permanent seat on this Board. The members of the Board -- currently we don't have that, and I ask that we make that change to get that to happen because, you know, when you're making a decision, and your house is being left out of the levee, you're going to have a much stronger opinion and you're going to have something to say to the State about this.

Thank you.

DEBBIE KELLY:

My name is Debbie Kelly. I'm a member of COPE and also a resident of the east bank of Plaquememines Parish. And I have not gone through this complete packet yet. That'll take time to digest, but I do have a

question. How much credit are you giving marsh build-up to our back levees? I haven't seen anything that was discussing one foot of levee height for one mile of coastal -- or exactly what is the parameter of that?

JON PORTHOUSE:

The rules of thumb we've seen over the last several years are about 2.7 miles of marsh reduces surge by one foot. Those are all rules of thumb and they're very highly dependent on whether it's marsh or ridges or whatever else on the barrier islands that's part of our landscape.

So our analysis has not gone to that level of detail that if we have this levee with this much marsh versus that much marsh, versus that much marsh, how that affects the levee protection, not those kinds of things in terms of the overall effect with the complete restoration of the levee and levee plan. That analysis is ongoing.

DEBBIE KELLY:

But it will be complete before this plan is

implemented?

JON PORTHOUSE:

You will probably not see a specific statement about this marsh being rebuilt here will reduce surge by that much. You will probably not see that.

DEBBIE KELLY:

All right. We live in an area where the coast has been devastated, 70 percent land loss. How high can I expect my levee in the back to be for 1 percent protection, if you're not --

JON PORTHOUSE:

I don't have those numbers with me yet and I didn't hear if you said you're from the east bank or west bank.

DEBBIE KELLY:

East bank.

JON PORTHOUSE:

East bank. We can probably talk to you separately in more detail because I do not have the surge numbers with me off the top of my head. But I know exactly where you're talking about. So that's one those things that we're going to have to take care of somewhere else. But I just don't have those numbers.

DEBBIE KELLY:

And can we expect those back levees to be federalized

then if they have a 1 percent?

JON PORTHOUSE:

That's not a decision for us to make. It's the State, but we haven't made a decision on that yet. And, again, are you talking about the portion of the -- the lower portion or you're talking about the upper portion in

Caernarvon --

DEBBIE KELLY:

Well, the lower portion at this point in the Phoenix area, south, is already federalized. The northern portion is not, because that levee is not federalized, but it is falling in your --

JON PORTHOUSE:

Anything we put in the plan is going to suggest that a specific level of protection we anticipate will be implemented in partnership with Corps of Engineers.

SIDNEY COFFEE:

And we've asked for those levees to be federalized. It's really being, you know -- I don't know. Because if we could make the decision, I think we would've already made that decision.

DEBBIE KELLY:

But it is in the plan to be federalized is your opinion?

SIDNEY COFFEE:

Well, no. But, yeah, we've requested it be examined. But yeah, we can't put it in the plan because we can't appoint that. The State does.

WINDELL CUROLE:

I wanted to talk to you also on the marsh aspect. The 2.7 miles off the core of that through the

years, and I looked back and found out that some of the variables were questioning whether how effective that really was. And actually the data came from a hurricane strike of Morgan City. It was about 1964.

But basically what they did is look at hurricanes from about 1900 to about 1951. The type of wetland last year that we have is very different from what we have today. There's some question whether if you just have marsh itself, without the cheniers and off the barrier islands, you may not see that type of sediment there. So it may not provide the amount of protection that we have been talking about in the past.

But what is important, is that when you do have marsh on a -- fringing a levee, it protects that levee from daily erosion of just tides. So there is benefit whether it has storm surge or not, it does protect the basic levee. But it's something that without the -- if you don't have the data to really prove just pristine marsh without the cheniers involved and other structures,

it's not providing as much protection.

EDMOND RUSSO:

Hi, my name is Edmond Russo with the Army Corps of Engineers.

I wanted to say that the Corps of Engineers has been very appreciative to work with the State and

collaborating to produce the master plan. We envision a strong working relationship to carry this forward as we produce the technical analysis and design work under the Louisiana Coastal Protection and Restoration Project.

Using the best science and engineering, using external review at the National Academy of Science's level to ensure that as we move through this, we have the best information possible to tell what the performance of these features are, their costs, benefits, and impact.

Thank you.

SIDNEY COFFEE:

Are there any other comments?

LEE RICHARDSON:

Good morning. Lee Richardson, representing the Lake Catherine Civic Association, also here on behalf of the Orleans Wetlands Communities, which include the Irish Bayou, Bayou Savage, Venetian Isles, and the East Orleans Land Bridge on Lake Catherine.

I also want to join everyone here on the

numerous expressions of congratulations on the combination of this incredible effort and to mention that we also were pleased to have met with DNR, with the great planning team. We were well received; our ideas were interestingly debated, and incorporated into some of the planning.

As you know, the East Orleans Land Bridge is the

barrier island protecting about 600,000 people around Lake Pontchartrain. Slidell, Mandeville, Madisonville, LaPlace, Kenner, Jefferson, New Orleans all depend on it. They all live in the shadow of it. It is now, and has been, always a part of the storm protection strategy of New Orleans.

All the levees in the New Orleans area would have to be higher, bigger, stronger, if it wasn't there. All of the communities on the north shore whose shores are not protected, we'd have deeper water going farther inland, if it was not for that barrier island. So it's essential to all of this, not only locally, but regionally and nationally that it be protected, preserved, enhanced.

And we appreciate how you have incorporated the concept of layering that protection, because we also agree that you can't just build the "great wall of Louisiana" across that area.

One of the most important functions of that conceptualizing as far as its protection, hasn't been

mentioned here today and I'd like to include that in the public's attention. And that is that the Orleans, Saint Bernard, and Saint Tammany fisheries that are involved in that area are a regional and national treasure. Millions of pounds of inshore shrimp, blue crabs, softshell crabs have been produced there.

We all take it for granted and most people don't realize just how far under the radar that fisheries infrastructure has flown for all these years. But I think you all will recognizing that it is and has been the source of daily wild-caught Louisiana's local seafood that furnish the keystone ingredient for a lot of our downtown restaurants on which our tourist industry depends. Once you get passed why people come to New Orleans with the usual comments about Bourbon Street and all of our famously sinful living, people come to eat here. And that's why they come to eat and this is where it comes from.

So we appreciate your recognizing that and incorporating it into the planning so that the -- we are able to stop the storm with respect to New Orleans and all of the Pontchartrain communities, that we're able to stop the storm at Lake Borgne, that we use some sort of barrier as you have suggested out into the lake.

I don't believe that that's been incorporated so

far into the Corps of Engineers' barrier alignment system, but I strongly urge that it should be; and that the natural wetlands between the shore of Lake Borgne and the Intracoastal Waterway be strengthened and enhanced as part of our estuary system. That the natural levee that exists now on, I understand, a sand ridge comprised of the CSX

Railroad be incorporated into that layering system, as is Highway 90, which could be protected, elevated, and enhanced. And it's a barrier contribution.

And I want to comment -- to call attention to the fact that the water goes two ways when it goes into Lake Pontchartain. It has to play out, and when it does, if you have not contained enough of it, if you have not prevented enough of it from getting into the lake, when it comes back out, it does great damage.

So I want to thank you again for the incredible diversity of this effort. I join Junior Rodriguez and others who have commended you on that and to also celebrate this is a great day in Louisiana's history as we go forward.

Thank you.

SHERWOOD GAGLIANO:

My name's Sherwood Gagliano. I'm proud to be a citizen-scientist of this state, born here, and spent my professional career here and have -- I have probably been

involved in coastal restoration longer than anyone in this room, beginning in 1969 when we first identified the problem with erosion along our coast, and have dedicated my professional career to what we're talking about here today.

And I join the other speakers who have commented

and praising the effort. I think it's a milestone any way you look at it, but it's a major achievement in our thinking about the future of this State and our attempts to make it a better place and safer place for all of us to live and be.

I'd like to reminisce a minute if I may. My work started when the States of Texas and New Mexico were trying to divert a third of the flow of the Mississippi River to their area because they thought we had too much water and they didn't have enough. And that led to the realization that the river was the life of this state. And it still is. It's still the most important asset -- single asset resource that we have. And how we manage it and how we live in the land that was created by the State is the future of the State, without a doubt.

I've watched us progress from the initial stages of the environmental movement. It started about the same time that this proposal for diversion occurred in 1969 and the National Environmental Policy Act was created. We

progressed to a long debate about coastal management, which I think very few people in this room will remember, but it took us a long time to decide to participate in national coastal zone management. And as a result of that long debate, we probably have one of the best management acts in the country. And we tend to forget that sometimes

by not really using it in the fullest.

We moved into implementation with the passages of the First Coastal Trust, which the number one project of that Trust was to provide funding for some projects that provided the diversion, namely Davis Pond and Caernarvon which had been authorized by Congress way back in 1964. And the State didn't ever come up with its share of the money, you know. And that was the pilot program for what we're talking about now, and managing where we direct water to flow to build land and prevent erosion.

We progressed -- One of the early projects for that Coastal Trust Fund was also the drawings along the Cameron coast, recognizing the need for preventing shoreline erosion. We had some barrier island projects; there were like 10 pilot projects that were the foundation of the whole program. They were the first implementation, not regulation, but implementation. That program led to the passage of the Breaux Amendment, the Breaux Act, as we all know it, in the 16 or so years of projects that

they've followed, you know, building momentum.

Coast 2050 came along and it is a realization that the State needed -- while it needed the help in the partnership of the federal government and its agencies and resources, we needed also to have a vision of our own. And Coast 2050 was just that. It was a reaching out to

the public in a way that we had never done before and incorporating a lot of ideas into a master plan.

I'm very, very pleased to see that Coast 2050 is now being resurrected and is a fundamental part of this program, because I think it has a lot of merit and a tremendous amount of public input. Today's the day to praise the plan.

You know, I'm known as a critic. I'm a bad guy. That's why I'm only marginally involved, I think, in this process because I have a reputation of being hotheaded and saying what's on my mind openly and publicly. But that's my role and I'm going to continue to play that role because I think that's important.

One of the earlier people at this microphone mentioned a meeting for a minority opinion, if you will, for a continuing evaluation. And I think that's one of the things that we need to get into this process. That you need critics. You know, the British have learned that from their government a long time ago. You need a loyal

minority to point out the flaws and what you're trying to do to make it better. And you know, that's my role and I kind of enjoy doing it. It's fun sometimes to polk, you know, polk fun at people who never want to change their direction.

But having said those things, I think that a

real important thing of this plan, as it's been presented by Jon this morning very effectively, is that it puts some concepts on the table. And you recognize, this authority recognizes, the people who developed this, this is an ongoing process. And only by putting them on the table, and debating them openly, honestly, and passionately, do we really come up with something that's really going to work.

And there will be time for disagreement. Today is, you know, the time, as Junior Rodriguez said, and as others, as Mark Davis said, and I'll say, this is a milestone event. And I look forward to going forward with the whole group and the rest of the citizens in this state to making something that would really work and to taking full advantage of the confidence that the nation seems to have in our area and the desire to give us the kind of funds, although we kind of have to arm wrestle with them to actually get what we need to do. But to do it right, and to do it in a way that we will all be proud of.

I thank the whole group for the effort and I look forward to the debates.

Thank you.

SIDNEY COFFEE:

Thank you, Woody. We don't consider you're a bad guy at all. We love to hear what you have to say

always. Yeah, we do. And we do look forward to the debates that could come.

But I would like to say that there's been quite a bit of -- probably more than in any other planning process ever, peer review built into this process. And, Jon, you might just want to mention some of what we're looking at as far as that period.

JON PORTHOUSE:

There's actually a lot of mechanisms for peer review. We have a first line of peer would actually be our peers from DOT and DNR who are not intimately associated with this effort. We try to make sure that everything we're doing still makes sense from their perspective.

Of course, we're in a partnership with the Corps of Engineers, a lot of the data we're using, a lot of the analysis we're using is still subject to all of their either internal technical review and we actually have a panel review. We have also taken the opportunity to incorporate a science and engineering review team from

scientists throughout the nation to comment on things as we move along, to help us anticipate problems with what we're trying to do. And I think this has actually played a very big part in helping shape how this process has evolved.

The other -- the last thing I can mention is,

the Louisiana Coastal Area Restoration Program has a science and technology program. And one of those key pieces is a science board who was responsible for oversight of how science is incorporated in policy making and decision making. They are very interested in looking at this plan. They have offered -- we have asked, and they have offered to look at this to provide detailed comments and any recommendations for how to improve it.

So we are being very open, very inclusive in trying to get these things out there to the most people we can to get it reviewed. We've also had, you know, just from a multi-national perspective, we do have some conversations ongoing with the Netherlands, people that deal with the same sorts of problems we have. Ongoing conversations with them because they are -- they are in a lot of ways further down the road than we are, but in a lot of ways kind of coming back to where we are. So there's a lot of food for action there. So we've made a lot of -- a very concerted effort not to keep it just

among this front table here, but to bring it out to stakeholders and scientists and engineers as well.

SIDNEY COFFEE:

Thank you, Jon. And even international, we've brought in international scientists from all over the world to kind of see what we're doing and to keep that

interaction going. So we're trying, in any ways that we can tweak that or, you know, broaden that, we're certainly interested in.

WINDELL CUROLE:

Sidney, I want to hold you to a comment here.

COFFEE:

Yes?

WINDELL CUROLE:

In 1973, our bridges worked and I had some discussions with other people in the university. And it changed the way I thought about this thing. It changed how I basically approached it. I realized that our whole -- all of our places in Southeast Louisiana was at risk and that work was an important work.

It's a shame that we have this plan right now and not in 1976 when we'd have a lot less to do with the Corps about it. You know, we definitely have to thank our gang that worked on the board, didn't miss the ballgame, and now we realize it's not just the environmental issue,

it affects all of our communities.

I just want to thank you for all your work in the past.

BOB SCHROEDER:

Bob Schroeder, I'm the state representative of American Associates (inaudible and phonetic). And I owned

what was at one time a condominium in Pass Christian before Katrina. And my question is simply: Has the authority given any thought to take any action to working with the counterparts in Mississippi to develop a more comprehensive plan to include the entire central Gulf Coast?

JON PORTHOUSE:

Most interaction we've had with the State of Mississippi has been through the Corps of Engineers' process. They have a similar effort ongoing through the Mobile District to cover the Mississippi and Alabama Gulf Coast. And most of our coordination's been through that process at this point.

DARLA PLANKSHIRE:

My name's Darla Plankenshire (phonetic) and I live on the east bank of Plaquemines Parish in an area from Scarsdale to White Ditch. I'm pointing to your map on page 45; there's no levee protection cited for that area. Our bridges are 35 percent repaired. We have two

of them. And we are being told now that our levees will only be brought up to eight feet.

Why are we expendable in that area? We are probably 60 percent back in our homes. Our homes have been repaired. I stayed during Katrina. I know what went on during Katrina. And our back levee can be a source of

protection for us, but we're expendable and I don't know why. And I would like to know what the story is.

JON PORTHOUSE:

If you look at the plans, we'll sit down and we'll look at it. Our intent was to make sure that all the existing levees were covered there either by increasing the height for the 1 percent levee, while maintaining the existing levees. If there's something we missed by drawing them on the map in terms of renaming community help, we need to know about that. So we need to talk about that.

The other issue has been brought up before in Plaquemines Parish again. That specifically is one of those areas we really need to seriously look at the combination of levees and elevated houses, things like that. So we are concerned to say any citizen of the State is more important or less important than any other citizen or more expendable or less expendable 'cause those terms just don't apply here. We think the issue here is whether

or not we can build levees everywhere we want to build them and whether we have make some hard choices. And we can talk to you very specifically about your situation after the meeting.

SIDNEY COFFEE:

Are there any other comments or questions from anyone

here today?

Well, I want to thank everyone for coming. It's been very gratifying to have you show up. And we do want more of your comments as we go along.

Thank you.

(The hearing was recessed at 11:35 a.m.)

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REPORTER'S PAGE

I, Dorothy H. Schmit, Certified Court Reporter, in and for the State of Louisiana, the officer, as defined in Rule 28 of the Federal Rules of Civil Procedure and/or Article 1434(b) of the Louisiana Code of Civil Procedure, before whom this sworn testimony was taken, do hereby state on the Record:

That due to the interaction in the spontaneous discourse of this proceeding, dashes (-) have been used to indicate pauses, changes in thought, and/or talkovers; that same is the proper method for a court reporter's transcription of the proceeding, and that the dashes do not indicate that words or phrases have been left out of this transcript;

That any words and/or names which cold not be verified through reference material have been denoted with

the phrase "(phonetic)."

Dorothy H. Schmit, CCR

Certified Court Reporter

Louisiana License # 23039

REPORTER'S CERTIFICATE

This certification is valid only for a transcript accompanied by my original signature and official seal on this page.

I, Dorothy H. Schmit, Certified Court Reporter, in and for the State of Louisiana, as the officer before whom this procedure was taken, do hereby certify that those proceedings set forth in the foregoing 81 pages were reported by me in the Stenomask (voice-writing) method, was prepared and transcribed by me or under my personal direction and supervision, and is a true and correct

transcript to the best of my ability and understanding.

Dorothy H. Schmit

Certified Court Reporter

Louisiana License #23039

5.3.6 Lake Charles Public Meeting Transcript, November 30, 2006

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COASTAL PROTECTION
AND RESTORATION AUTHORITY
OF LOUISIANA
COMPREHENSIVE COASTAL
PROTECTION MASTER PLAN FOR
LOUISIANA PUBLIC MEETING

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A Public Meeting of the Coastal Protection and Restoration Authority of Louisiana was heard on Thursday, the 30th day of November, 2006, at the Lake Charles Civic Center, 900 Lakeshore Drive, Lake Charles, Louisiana, commencing at 1:48 p.m.

MS. COFFEE:

I'm Sidney Coffee. There is going to be a series of meetings in December that will be explained how they will work, and then as we get closer, as we take all of that input and get closer to the final plan, then we will go back out to the public before we present that final plan to the Legislature in April.

I thank you all for coming today. We had a very interesting day yesterday. We were in New Orleans in the morning and in Houma yesterday afternoon and heard from a lot of people, and I want to remind you that this is a meeting for you. We want to hear from you. We want your input so that we can go back with it. We want your suggestions, your concerns so that we can go back with it and address it and the plan itself.

I just wanted to mentioned before we get

started that the State has really come to the table on a number of things, especially, in the last year. The Coastal Protection Restoration Authority was created by the Legislature so that the first time in our

history we could fully integrate coastal restoration with hurricane protection; that's never really been done before as a common effort within the State. It's always been to kind of separate things happening out here, and now, we're finally able to integrate that together.

The citizens of our State, as you well know, went to the polls on September 30th and passed a constitutional amendment that would dedicate 100-percent of any offshore revenue, oil and gas revenues, the State may receive, would dedicate all of those revenues to the trust fund to be used for nothing but hurricane protection and costal restoration. That is a huge, huge message that we sent to Congress and to all the doubters out there who think that Louisiana can't be trusted to do the right thing with that kind of money, with the billions that

we can get.

We've got a Bill before Congress right now pending, and we are hoping against hope that the Congress is going to vote in this lined up session when they come back next

week and pass true revenue sharing, and that the State of Louisiana can share -- sharing it because it's become obvious to us, I don't know about you, but in the last year, it's become abundantly obvious to us that we can't depend on the Federal Government anymore. We can't depend on them to make this a priority. We can't depend on them to move this quickly as they should be moving and to help us get this job done, and it's going to take this plan, and it's going to take a lot of effort and a lot of will, and it's going to take us all pulling together to make sure that our voice is heard, that we're working together and that we get this thing moving and on the ground, and that we're building projects, and we're making progress and not constantly restrained, if you will, by the Federal Government.

Another big thing that happened this

year, and I think I've got to mention this, because it was very significant, and that was the Governor's lawsuit against the Department of Interior and the MMS, and she settled that lawsuit about a month ago, and

in that settlement, we got more than we actually -- than we asked for, and we enforced the Federal Government -- she enforced the Federal Government to take an accurate and adequate assessment of our coast, and doing an accurate environmental assessment. Our entire environmental baseline changed after Hurricanes Rita and Katrina, and that data was never taken into consideration by MMS when they put the information together for the upcoming lease sales. So I think that with the Governor's lawsuit, with the constitutional amendment, with the master plan that we're about to present today, we're getting on the right track here, and I think our State is moving in a direction that I hope you will be happy with, and as I said, I hope we can all pull together and make something happen as a result of it.

The way this will work is, after we introduce our members, who are here today, John Porthouse, who is the Project Manager, will give you a brief description of the plan, and you should all have a copy of the

plan with you, in front of you, and if you don't, please make sure you get one; they are out in front, and he'll explain how the public input process will work and what you're next availability will be to give us input, and I also want to stress that if you don't want to get up and ask a question or comment today, there's plenty of -- you have great ability to do that through the internet, through, you know, phone calls, however you want to do it. We're going to be taking your input everyday until this plan is finished. So right now, I would like to introduce the board. Just for the record, and we do have a court reporter who is recording everything. I would like the members to introduce themselves and who they are representing. Wendell?

MR. CUROLE:

Wendell Curole, Association of Levee

Boards of Louisiana.

MR. ANGELLE:

Scott Angelle, Department of Natural Resources.

MR. BRADBERRY:

John Bradberry, Department of Transportation and Development.

MS. HORN:

Tina Horn, I'm representing the Police Jury Association on the Webster end of the study.

MS. COFFEE:

And I would like to make sure you're aware that Secretary Bradberry and Secretary Angelle are the two men who are going to actually lead the implementation effort of this plan. It's their two agencies that will be responsible for the full integration and the actual putting the projects on the ground. Without anymore delay, John Porthouse, if you could get started, and please introduce your team to everyone.

MR. PORTHOUSE:

Thank you. Good afternoon, folks. My name is John Porthouse from the Integrative

Planning Team, and just so you know, our team leader is Mr. Randy Hanchey, sitting down front, then left to right, we have Nolan Johnson, Larry Ardoin, Ricky Brouillette, Keith Allen, Andrew Bell, and

Michelle Deshotel, all working very hard to put this plan together, but beyond them, I do see folks in the audience who have been in our workshops, that have been out our stakeholders meetings, and I want to thank you as well for helping put this plan together. For those of you who are here for the first time and seeing this for the first time, thank you for coming out now. We hope to see you back here again in a couple of weeks to help improve this plan.

Just as a warning, the document that you were handed today is just a piece of what we've been doing over the last several months to put this plan together. There is a significant amount of technical documentation, stakeholder information. We've gathered analyses and so on; it's available. You'll see in the back of the booklet you have in front of you, we have

furnished you a reference to a website. We encourage you, again, to go to that website, and if you have any questions about what you see in the document, look in those technical appendices, and if you do not get the

answers to your questions, there is also phone numbers and addresses, and we will try to answer your questions.

One final thing, I'm not going to go into endless detail that is in this technical appendices. We don't really bore you with the process we went through to get from February to here, but that information is available; it's documented, and it's on the internet. What I want to do today is take you through just a really quick walking tour of the plan. It will be a walking tour of the entire plan from the Delta and the Chenier Plain just to get all the points together and see that we are treating both areas consistently with the extent that we can.

So without further ado, what we're here to talk about today is how this master plan, first of all, just a couple of minutes, on

how this master plan relates to other planning efforts that you all are aware of from the Corps of Engineers and the Louisiana Recovery Authority. From there, just a real quick recap. We do this every

time. What are the objectives? What are we trying to achieve from this master plan, and we will give you just a note. It looks like we put a lot of work in here, and we have, but the document that you see in front of you is this copy of literature; it's not the end result. There's still much work left to be done. We're going to give you a few notes on what it is and where it's going in the next several months. We will, of course, show you the plan and discuss very quickly the policies of legislative institution which is the -- or keep us from implementing this plan in an expeditious manner that we expect. And, finally, a few quick notes on what comes next.

So how does this relate to other planning efforts? One of the first things that happened after the storm was that U.S. Congress directed the Corps in two separate

appropriation Bills to develop a comprehensive plan that integrates hurricane protection and costal restoration. They have been working on that accurately, but the Corps of Engineers really intend to

implement that to the extent that they can with existing processes within existing frameworks, which is the biggest difference between that plan and the plan we're here to talk to you about today from the CPRA.

Our plan is also an integrated hurricane protection echosystem restoration plan. We are working very hard with the Corps of Engineers in a collaborative manner to make sure that these plans are, in fact, the same technical plans in terms of projects that we intend to build, but as per Act 8, we're set up as Coastal Protection and Restoration Authority, we have been directed to look at other things, like how do we implement these programs in a federal manner. If there's things that need to be change in terms of laws, policies, and regulations, let's go ahead and take care of those now to make sure that this plan is implemented as

quickly as we can.

And, again, the technical parts of this, what will we intend to build, should be basically the same as the Corps of Engineers. Both of those plans,

specifically, ours at this points, are being used as the basic input for Louisiana Recovery Authority Planning. They are not doing their own planning in terms of protection and restoration scenarios, levees, where they go, restoration projects; they're using our plan as their basic input and then they're going to prepare some alternative re-development scenarios based on that plan, and they will be -- very shortly, we will discuss that.

So what we're seeking to achieve with this plan? Just as a basis background, some of the tenants that were in Act 8 and that we've learned over the last several decades, that the healthy landscape is really essential not only from the echosystem which was the basis of the restoration program, but a healthy landscape is also a necessity for providing reliable flood protection. We

can not rely on a reliable flood protection system without a healthy landscape so the reason this plan was integrated is because we have to work from there. Define a healthy landscape and then from there,

you'll find what is possible in terms of hurricane protection. It very much relies on the multiple lines of defense strategy. Many of you are familiar with that, working in from the coastal barrier islands, marshes, ridges, swamps, before you get to levees, highway embankments, railroads, evacuation routes, and those kind of issues. This plan is very much built on that strategy.

And, lastly, we want you to understand and we want you to believe that we understand the public has a significant stake in the outcome. Up until now, we've had many, many meetings with agencies and academics, scientists, and engineers, and stakeholders, but we have not had an opportunity until yesterday and today and on through the next couple to interact with the public at large. That is a very significant

and vital part of this planning effort, and that is why we're here today to kick off that literature and public discussion of what's in plan.

So the basics of this, anything we do to

the system will alter the hydrology, and, therefore, the ecosystem. If it's a marsh creation project, if it's a diversion project, if it's a levee project, it will alter the way the water moves around the system. That's not necessarily a bad thing. It just means that we have to be aware of what those changes are, and if we anticipate that there could be some negative consequences, look for those creative ways to turn those consequences into positive aspects for this system, and we'll talk about a few of those through this presentation.

But most importantly as we've come to understand, unless you do something, we're not going to get anywhere. You can't fix the system unless you change the system. We've found this out, and it's a hard lesson to learn, but I think we've finally got it,

and, hopefully, this other point that is also going to hold true as it has for the last couple of hundred of years the communities are adaptive. If we're up front about what we're doing and how long it's

going to take and when we can expect to see these changes, and as long as you still have basic services, like hospitals and nursery schools and schools, we have to rely on our communities to be able to adapt to the changing conditions. We're going to do what we can to support communities as you'll see through the rest of this presentation, but we can not believe or we can not hold to the fact that our communities won't change as well as the landscape.

Throughout the last several decades, we have had numerous planning efforts with the echosystem, restoration and flood protection; we've had a lot of learning since the storms from a lot of scientists from around the world, around the nation. We've used all that material. We've come through it. We developed a series of planning on the program principles. We

defined how a program should be constructed, managed, and implemented into the future to make sure it meets a set of balanced objectives, and it meets them in a way that is focused and expedited, and I'm not going

to through this in detail because they are on the internet. We're basically to mandate why and how we integrate restoration protection.

The need for public and stakeholder involvement. We need to make sure that as this plan evolves or is implemented over the next ten or twenty years or so, that it remains focused on what we're trying to accomplish, but it does adapt to knowledge. We will learn more over an implementation period. We have to make sure that this plan continues to evolve and incorporate that new knowledge in changing conditions. We do have to recognize that there are constraints out there. We will probably not be able to do everything that we want to do because there are limitations in terms of sediment availability, water availability, and, frankly, financial capabilities. We have to

recognize those things.

There's also some significant relationships between land use principles, how we use the land, how we develop the land, and how that relates to flood

protection and restoration effort, we have to keep that in mind. And there are some other principles out there as well. But we've also developed a series of coast-wide planning objectives.

For those of you who are restoration perspective, these are built on Louisiana coast-wide objectives that we have. In the course of integrating this with the protection program, we did have to modify a few of them, and we did have to include protection objectives. So what you're going to see are four coast-wide objectives to recognize it, but we can not necessarily maximize achievement of all four of these objectives. We have to strike the balancing in the best possible way.

So the four objectives are really hurricane protection, that's the obvious one, and we can accomplish that in a number

of ways, including things like levees and even elevated structures. Elevated structures in the low areas is probably the quickest and easiest way to get people above flood waters, and we can look at that.

There are large areas of the coast which we may have to rely on a combination of the these two measures to achieve the level of flood protection they need.

Sustainable ecosystem, we have to make sure that whatever we do from a restoration standpoint and a protection standpoint does not hinder the ability of the system to sustain itself in the future. The marshes, the wetlands, and the shorelines have to be able to sustain themselves, otherwise we're going to be looking at a very significant investment or an ongoing investment in making these features.

We also have to recognize that there is a diversity of activities out there. From rice farming through agriculture, cattle farming, oyster and crawfish, ducks -- there are all these activities that require diverse habitats along the coastal zone, so

this plan be treated effective, you have to make allowances for that to make sure that those things are available on a coast-wide basis.

And, lastly, Louisiana's heritage.

We've a very rich history, very textured history, and a lot of it's in the coastal zone-type in the fact that these communities develop in a close relationship with the landscape. We can recognize that type of landscape; we can foster that type of landscape, and, if possible, make sure that these the communities that are in the coastal zone maintain that type of landscape and for this plan to be mainly successful.

So what does this plan represent. We're truly discussing a conceptual vision for the coastal zone of Louisiana. There are lines you can see on these maps. There are concepts on these maps. Some of them are obviously more certain than others. Projects that are in design are represented on this map, projects that are new concepts of hurricane protection in the western portion of the state is a fairly new

endeavor. So some of the lines you see on these maps are more conceptual than others, and we can discuss those today where we stand on this. But, it is, in fact, a completely new integrated approach; it must

be implemented to meet all these objectives in a balanced way. We cannot just take pieces and parts of this thing and hope it works the way we want it to work. These projects individually add benefits, but to make the plan work as a plan, it must be implemented together.

And as I mentioned, it does strike a balanced objectives, but we have to continue to place emphasis on this as we designs these projects, as we implement these projects to make sure that the implementation truly is meeting the balance of what we're seeking to achieve.

And as I mentioned, it is the starting point for a truly public discussion. We've had a lot of meetings. We think this is a technically sound basis. We hope that it represents something somewhat familiar to you folks, because it is built on a lot of

previous work, but we're here today to begin that public discussion.

So, again, bear with me because we're going to walk through the Delta Plain and the Chenier Plain and taking it in two

separate pieces. The first part being the restoration perspective and then we'll get to the flood protection perspective. But for Delta Plain, stabilizing the landscape and a lot of these concepts are simpler between the Delta Plain and the Chenier Plain, but they do -- restoration really does begin with shorelines, ridges, and critical -- barrier shorelines, ridges, and critical bay shorelines.

Let me just mention that the way I'm presenting this is sort of a communication device. It's just trying to present the enormous amount of material in a way that's easy to communicate. It does not necessarily indicate or place any sort of priority on this first thing up, but, although, in some cases, the priority is roughly -- I'll get to that in a moment.

So the shorelines and ridges are indeed

the first line of defense. They're important for knocking down the first surges and redirecting smaller surges from winter cold fronts, summer storms, and small tropical storms.

Navigation channels are historically considered a negative echosystem perspective, and what we're learning nowadays is that we can turn these into positive aspects for the echosystem. If we stabilize events properly, we make sure they do not erode into sensitive areas, they do not have to be negative future on the landscape, but stabilizing these channels can allow us to use them to move freshwater and sediment. In some cases, spoil bins can be very beneficial for knocking surge down as well similar to the natural ridges out there.

With the Delta Plain, we have an opportunity to sustain large areas of existing landscape with diversion, such as the Caernarvon Diversion and the Davis Pond Version that you'll hear about. These are areas can -- these are projects that can --

in very targeted areas like Caernarvon, like Davis Pond, like Myrtle Grove, that can sustain existing areas of landscape, but they are not designed to build significant new areas of land. They are designed to

maintain solidities, but they can be used to maintain a significant amount of existent landscape.

In the Delta Plain to build new land, we really do have two options. One of them being the marsh creation option represented here in all the green. We can find sediment offshore and the rivers and recreate marsh physically, just dredging places and creating new wetlands. If we cannot find the way to couple this marsh creation with a diversion such as here, for naturally sustaining the newly created wetlands, we are looking potentially to prepare a significant investment to pipeline infrastructure, pumps, and the continued or periodic investment in the financial resources to maintain those existing marshes.

But, in the Delta Plain, the one thing

they do have is a large river running through it, and it conceptually represented one thing that we've been hearing, since the Coast 2050 Plan, the most recently emphasized on June 1st with the America's

wetland, Envision the Future of the Gulf Coast, the real realization that if we're going to make this Delta Plain sustainable into the future, we have to turn the river -- put it back to work. We have to find a way to utilize the resources that are being -- discharging in the deep Gulf of Mexico and lost in the system. So this is a very conceptual representation of what a Delta Plain would look like. Obviously, it has navigational implications. It has implications for the residents of the Parish. All those issues would need to be worked out in the design process.

The Mississippi River Gulf Outlet that many of you are familiar with, we are indicating in this plan the closure to deep craft navigation to provide a ridge. But rather than as the most recent public meeting called for filling the channel in to

marsh height, what we are suggesting for the Mississippi River Gulf Outlet is that we actually turn this thing, which has been a disaster for the landscape, into a benefit and put a river diversion into that channel

and use the channel to spread water and sediment into these existing areas of marshes so that they can maintain their echosystem services and also provide the natural storm buffer capacity.

For hurricane protection develop the levees, and what you're going to see out here are three scenarios, but they all rely on some basics being the first line of defense should not be the last line of defense. That first slide I showed that had a lake-front levee in front of a major populated area. That should not be your first line of defense if it's in your backyard. We have to find a way, again, even with supplemental levees out of barriers or with the natural echosystem to front other lines of defense.

History has also shown us that longer and more complex protection systems are more

prone to failure. You can minimize that nature. You can make your system stronger with just by simple laws of probability. More parts, more length, means it's more prone to failure, and you can engineer a

system to be stronger in that recognition. You have to give water room to move. The levee will not stop a surge. It will not make it disappear. It will redirect the surge, and it will cause the surge to pile up. It will magnify the surge. It will push it off somewhere else, but it does not make the surge disappear.

And, lastly, if we do put in any flood protection works and we do potentially alter the hydrologic, we don't have to have that be a bad thing. We can turn that to our advantage and help us -- and use it to help us manage a more healthy productive echosystem.

So from the New Orleans area east of the Mississippi River, this curved purple line, basically, is the level of protection they have right now. We are suggesting that the New Orleans area level of protection is

inadequate at this point, and we need to find ways to increase that level of protection. The problem is, this is a very long and very complex system with a lot of moving parts, and it's very impractical to

raise the current system to provide that level of protection. So this is the first instance where we're looking into providing a new outer barrier to prevent surge from even getting to these levees, to working with the existing levees to provide a higher degree of protection, a 500 year or more greater level of protection.

What we're showing here is actually pre-conceptual alignments. Each one of them has their benefits, their demerits. They would function differently, but they're three conceptual lines indicating the design phase on this issue we can work those out.

The Barataria Basin in the Plaquemine Parish area, we are suggesting Plaquemine Parish planning for three separate levels of protection. Being the highest level in the Belle Chase area near the station, Metro New Orleans, a 500 degree or greater level of

protection. Between Oakville and Myrtle Grove a 100 year level protection of levees, but we are planning currently on this map, just to maintain those existing levees. So as I mentioned, there are areas of this

coast where it's most practical to allow the existing levees and elevated structures to achieve a level of protection. This is one of those areas in Plaquemine Parish.

We're are also looking at a similar situation to the East Bank where we have a complex system here, which can not be retrofitted to achieve the necessary level of protection. There has been discussion over the Donaldsonville feasability study about where this particular levee and Barataria Basin needs to be. Either north connecting the existing West Bank levee togh Bayou LaFourche, or further south, but this is one that has the most analysis done to it, and we are planning in this instance to show an outer barrier to work in tandem with the West Bank system and provide the needed level of protection.

In Terrebonne Parish, the Atchafalaya

Delta, the same sort of scenario. This is the existing Morganza to the Gulf hurricane protection levee alignment that is before Congress now for authorization. We are saying there that definitely that is a good

project that needs to be built with the exception that we need to take a quick look at this little segment over here to make sure that the current line actually needs the flood protection, needs as well as we possibly can, or if we can take this little shortcut here and eliminate this funnel and protect this portion of the levee just a little bit better.

We are also similar to the other areas. This one, again, is very conceptual, but relying not only on the barrier shorelines and marshes, and the Morganza levee, but an interior line can provide a higher level of protection to the Houma areas north.

Even after all this restoration we talked about and the levees, there will be remaining risk. These levees, we're not suggesting they're going to be completely adequate to stop every conceivable storm out

there. We're talking, in these instances, about a 100 year storm, a 500 year storm. There may be more extreme storms out there very frequently, but in any case, areas such as -- that are outside the levee protection

will still need to maintain -- raised and armored evacuation routes used so the residents can take -- can get out as long as possible and get back as quickly as possible after the storms to begin the recovery efforts, but also areas such as the North Shore of Lake Pontchartrain. Once these barriers are planned and in place, needs an existing level of protection enough to control the lake water moving around. We have to look at all of those issues. But, beyond that, there are still other ways to protect the cities and urban centers with compartmentation, issues like that.

If your primary line of defense right at the edges of the urban areas is breached, it does not mean that the entire city, the entire urban area has to flood. If there are opportunities like highways and railroads and existing canals that we can

connect up and build these water tight compartments, you may have a situation like this where even though you have one catastrophic breach, which floods part of the city, the rest of the city stays dry.

So these are just good rules of thumb, good principles to incorporate into our management system, and we have to look at those every time we have an urban area that they we're planning on protecting.

But, lastly, water management is critical; if we do go ahead and make the decisions to put these levees where we decide to put them, that may have implications for the ecosystem, and we don't want -- we want to make sure that areas like the Barataria Basin and Terrebonne Parish do not become enclosed wetlands. They have remain linked to the system. They have to remain dynamic. They'll have to find ways to put river water into these systems to maintain their elevation, but then to move that river water out preferably in areas like Terrebonne Parish which we can not reach very easily with river diversions.

So for the Chenier Plain there are similar sorts of mechanisms that plan for the Delta Plain, again, starting the shorelines, stabilization of the Gulf. Some of the major bay areas and interior lakes

making sure that the shorelines are stabilized. The Holly Beach project is a perfect example of what we're talking about. Either break waters or sand management to rebuilding the beach itself.

We move the evacuation routes up in the presentation of the Chenier Plain because this a unique opportunity right here between Highway 2 and Highway 27; if we could raise that highway and maintain it and fortify that highway, it really can serve as a second line of defense behind the Gulf shoreline stopping the surges as they move north.

Navigation channels similar to the Delta Plain do provide several opportunities. In this instance what we're talking about is, many of you are familiar with the plan to deepen the channel down the Gulf Intercostal Waterway and the fresh water bayou canal,

using that material to fortify the spoil banks to provide a line of defense against storm surges. Also, to prevent -- to continue water movement down these channels and prevent the channels from breaching into

sensitive areas. However, in the Chenier Plain, as you all keenly aware, there's not a great river running through the majority of the system with the exception of the Atchafalaya, so we can not rely on a natural river diversions to recreate marsh. But what we do have are navigation channels, the Sabine, the Calcasieu, the Atchafalaya Navigation Channels, which provides us wonderful opportunities as we maintain those channels to create new marshes in the vicinity of those channels over here, and in some instances, we may actually go offshore or in these bays and lakes to create new marshes.

There's a lot of water and sediment that is in the system that may be possible and it should be possible to optimize how that water and sediment is distributed across the landscape. Finding some way to retain the

fresh waters that falls in the open system instead of flushing it straight into the lake system and then straight out into the Mermentau River down the fresh water bayou canal in the winter time and find ways to

retain that fresh water in the system and have it available throughout the year.

Other issues like controlling the salinity and particularly Calcasieu Ship Channel and Sabine Ship Channel over here, and re-establishing control of salinity at the Gulf rather than it fighting the Gulf at every little bayou on the interior of the system, fighting the salinity where we need to right here at the Gulf. In this particular instance the way that's it's conceptualized on this map, if you do put a saltwater barrier in this particular area and we do put it in the area of these highways, it can again provide the increased protection to areas north of the highway.

Hurricane protection, the levees we were talking about, similar -- these are existing levees in the Burwick area, but for Lafayette, Abbeville, and New Iberia area

are very densely populated areas, we're planning in this instance for a 500 year level of protection for these particular areas. If ongoing analysis proves or shows that these are not at particular risk

because of they're on high ground, we will have to reevaluate whether that needs to be as a higher level of protection for the smaller communities down here. We are planning for a levee in this area nonetheless.

Lake Charles, where we are, with it's dense population and petrochemical industry, we're also planning for a 500 year or greater level of protection. This is one of the more conceptual lines we have on these maps. We just don't know where that should be. That's intended to be on high ground. There's a lot of work left to do, a lot of design to figure out exactly where that can go, how high it needs to be, and what the risk and vulnerability of this area is.

After we get through planning for shorelines, the highways, the spoil banks, there is a very highly dispersed population

here. There are a lot of people living there, but it's very highly dispersed. You can't find them in very large communities, but that doesn't mean there aren't a lot people there, so as we continue our

evaluation, we need to determine if the spoil banks and highways that we're planning on fortifying are not enough to provide a 100 year level of protection. We are indicating that we need to really seriously consider a levee along the Gulf Intercostal Waterway.

As we all know, despite our best efforts on our policy, legislative, and institutional issues that could effect how quickly this plan gets on the ground. As I mentioned, land use planning and zoning, we want to make sure the wet areas landward of levee systems remain wet. In some instances if the protection systems get overtopped, we don't want it to be in someone's backyard damaging their house. We need to have some storage behind the levees. If not, we're overtopping the water, at least for drainage water that moves into the system into these

low areas.

Land owner concerns in an area that where the coastal zone is over 80-percent privately owned. All these issues we had with the restoration program will still be

there in terms of recreation issues, land rights issues, mineral rights issues, and even, in this case, we are potentially, honestly looking in an extended quick take authority to make sure these projects can be implemented in a very rapid manner. All of these are very conceptual issues. We have not gone through and figured out exactly how we would like to address them. I'm just putting them on the table as we consider them for the next few months.

We also have to make sure that we do have a set policy or a set practice in place for as we continue to learn, as we continue to implement this program as the environment does change that we keep the plan focused on its objectives, but we are able to change it to meet changing needs. It will be a large plan. It will be an expensive plan. It will require partnership with the Federal

Government. As Ms. Coffee mentioned in her opening remarks, right now this partnership is not focused on solving problems and getting things on the ground quicker. We have to work on that partnership to make

sure that we can get these very large projects built.

Consistency, much as we use the Coast 2050 Plan now to make our decisions on permits and CWPPRA projects and such, this plan has to become the new basis for consistency and determinations. And, finally, what was really going to determine how fast this plan can be implemented is financing. We use the word priority here to indicate that if we do not dedicate a funding screen here, we will continue to be subject to annual appropriation processes, shifting priorities from year to year, and if we're going to plan for a quick implementation for a long term program, we can not have that volatility. We have to be able to have predictable, long-term funding source.

So what comes next and despite the

amount of work that's coming here before, we do have a lot of work left to do. Start again with public discussion, which we are beginning here today. There is, as I mentioned before, in several instances a lot

of work left to wholly refine and wholly define the measures that are contained in this plan. The biggest case would be we have drawn lines on the map for shoreline protection areas where we know that the shoreline does not need protection. It already has protection. It's an accreting shoreline. We did not take the time to identify the most critical areas so we will be doing some of that work to find out where the most critical areas are and put further definition on these measures.

Because we have not developed real cost estimates at this point. Before this plan gets submitted to the legislature, before the Congress receives the Corps of Engineers report, there has to be a cost estimate of some sort attached to it so that people know how big the program is, but we do not have that cost estimate at this point.

We do have to develop an implementation sequencing, which you see as a large map with a lot of projects, and we have not indicated which comes first. We have to work over the next several months to define

what the sequence of implementation will be. And as we continue to analyze and develop these cost estimates and figure out where the most critical projects are and discuss this with the public, we will have to modify the documents you see before you and on the internet to make sure that they reflect all the on-going analysis and discussion.

As a point of emphasis, we will be back in this area, Lake Charles, as you see here, December 13th. It says here at 6:30 at night, but that's really the formal presentation, another thing similar to this, probably different slides, but a similar sort of meeting room where someone is standing up here giving you a presentation, talking about the plan and giving you a formal opportunity to stand at the mic and ask your questions and make comments. However, the thing that is different about

this, is we will be here early in the afternoon up until 6:30 with a more open house, sort of, presentation. We know that we're giving you this plan today. It's a lot of material. You can't look at it the

first 20 minutes as you walk in the door, and truly understand it, and truly figure out exactly what you want to say about it, so we're not asking you to get all your comments out here today. We know it's going to take you some time to look at it and discuss it with your peers and really give us a more informant or the completely informed insight that you would like to give us. So we will be here in the afternoon to just sit down with you, talk with you about the plan, about what you like about it and what you don't like about it and potential ways we could improve it. So the upcoming public meetings are very important for us to finish out this planning effort.

I will leave this up here for the remainder of the meeting. This is our website. It does have not only our technical appendices available for

downloading, it has contact information, phone numbers, anything else you could require to get in touch with us. We have more information than just the technical appendices; it has our newsletters, and, as

I said, contact information. That is the end of the formal presentation and, at this point, we're going to go the comment period.

MS. COFFEE:

Sure. We welcome your questions and comments now. And if you would like -- you don't have to raise your hand or anything, just come to the mic and give us your suggestions or comments, and we are anxious to hear from you. And, for the record, for the court reporter, when you do come to the mic, please state your name and who you represent.

MR. HAYDEN:

Chandling Hayden, Port of Lake Charles. Just a point of clarification, in a lot of these charts you have 1-percent level of protection and 0.2-percent level of protection, different lines. Could you explain what that means, please?

MR. PORTHOUSE:

Sure. Right now what we have before us, it's just our planning efforts or two levels of analysis in terms of how high a storm surge would be across the coast. Those

being a 1-percent annual chance of occurrence of a storm surge. So every year you have a 1-percent chance of incurring a surge of a different level. Roughly, equivalent long-term over thousands of years to one in 100 years. Same thing with the purple lines that indicate 0.2-percent annual chance of occurrence. Roughly, equivalent long-term 500 year level of surge. Those are the two data points we have currently in the system that we are using to base our planning effort. We are all, as is the Corps, waiting to update the analysis, updated surge maps, and frequencies to refine the plans.

MS. COFFEE:

Any other comments, or questions, or suggestions at this point?

MR. RICHARD:

Dave Richard. In the planning efforts,

John, it's significant that we do not have shoreline protection on both Calcasieu Lake and Sabine Lake, and I would suggest that your technicians look at that. We have the lock that is put at the mouth of Calcasieu

River and, as you know, that's been suggested for many, many years. And the way we've been able to control the excessive saltwater intrusion from the Calcasieu Channel that's been through perimeter control, which includes about six million dollars worth of structure on Sabine Refuge and about 20 million dollars that we put on the eastside of the channel at the Cameron-Creole Watershed within our CS money and CWPPRA money. Those are intergral parts to wetland restoration. Those particular features probably saved Lake Charles from worse devastation in Hurricane Rita and need to be an integral part of this plan.

On Sabine Lake, there's no shoreline protection there, also. It's not listed and I suggest that they look at that. We have been looking at the widening and deepening of the Neches Channel to 50 foot deep, and I

feel like that we're going to need some extra protection in the Sabine Channel.

I saw that the Cheniers were not listed in your level of shoreline protection. The unique characteristics from Vermilion Bay to

Galveston Bay, is the Chenier structure. That Chenier structure has been compromised in a number of ways including sand mining. That needs to be corrected in that line of defense as you have stated, needs to be an extra line of defense. Awful lot of people in this room and at your tables are also in favor of that, and I think that needs to be addressed.

In regard to the using -- we don't have a river the size of the Mississippi River, so we don't have the fresh water inflow, so we need to manage the fresh water capabilities that we have. We've done that through hydrologic modification, and those hydrologic modifications need to be accentuated in the plan in Southwest, Louisiana. We've been able to control that and actually build marsh with probably the most successful tool in the Cameron-Creole

Watershed that includes about 110,000 acres, and I suggest that be used as a model.

We have not been successful in using dredge material to create marsh because of the federal standard. Federal standard has

mandated that we put those dredge materials right on the edge of the Calcasieu Channel instead of the many areas that we need it. The same way on the Sabine Channel.

An ICC team that's been working for about five years, working on the deepening of the Sabine Channel, and what we're seeing is, is that even today, that the immense, the million, the tens of millions of cubic yards that are going to be needed to come out of the Sabine Channel, will not be used to create marsh in Louisiana. They want to do some dedicated dredging as mitigation, and we feel in Southwest Louisiana that that is terribly incorrect. We would like to see something from in this group that will incorporate beneficial use of dredge coral from every channel and every instance that we can use it in Southwest Louisiana for protection in conjunction with hydrologic

restoration that, as I said before, because of that restoration probably saved an awful lot of damage in Hurricane Rita in Lake Charles. Thank you.

MS. COFFEE:

Thank you, Dave. Anyone else? Would any of the members of the Authority care to say anything?

MR BRADBERRY:

I would only encourage that you step up and make your comments. We're here to listen not to debate, really. So we really encourage you to do that. If you would have heard the comments yesterday in Houma and New Orleans, I'm sure you would be up at the microphone. So, you know, don't feel bashful. Any ideas that you bring to the table is the one that we want to consider, and we want to take note of. And, again, if you don't want to do it like this format, you have the opportunity to do it over the net. You have the opportunity to call in. You have the opportunity to write in, but we encourage your comments. This has to be a plan that has the input of the people for it

to work.

MS. COFFEE:

Sure, go ahead. And if there's more than one, you know, you can just line up behind.

MR. ENSMINGER:

I'm Allen Ensminger. I'm a wetland consultant. I think that at your New Orleans meeting Dr. Gaglana took credit for being one of the oldest wetland commenters. Well, I've got him beat by many years. I helped educate when he was in graduate school.

I was at the meeting last night in Houma and really enjoyed the reaction by those public speakers. You had a professional speaker to right on down to guys like myself that barely could get it out. Try and incorporate those comments into everything you do from this point forward. I'm lucky enough to manage one of those barrier islands. Ponifer Island is owned by the Smith family out of Chicago. They bought it in 1910 as an investment in muskrats. And over the decades as old members in the

family died, they left pieces and bits of their inheritance to The New Orleans Archdiocese of the Roman Catholic Church. Today, the heirs own 60-percent and the church owns 40-percent undivided interest in

that property. Of course, there's a large oil and gas field on the property, and is its major source of income. But, we continue to harvest 250 alligators off of it a year. Sell four or five thousand alligator eggs off the island. Unfortunately, we only are involved in the fur industry by taking nutria tails trying to protect some of those fragile marsh areas.

We have about 6,000 feet of shoreline that's protected by a CWPPRA project and some oil and gas projects that were implemented on the island in protection of the infrastructure of the island. In addition to that, we had one of the very first hydrologic restoration projects on the island, a CWPPRA project, and was able to dredge and fill -- dedicated dredge and fill about 300 acres of land in the heart of the

island in an area that had deteriorated significantly, so it has served as an excellent demonstration, and we can approach marsh management.

I had the luck of working for a guy by

the name of Bourg Angelle, who some of you know quite well, and Bourg was a very dedicated guy. He got involved in the middle part of the Cameron-Creole Watershed. Development of plans for that big watershed area had been stalled by the permitting process. Mr. Angelle called a meeting here in Lake Charles, and when we got out from behind those closed doors, the Corps of Engineers issued the permit to build that structure. It had been 19 years in the permitting process. It took about ten years to build the project. It took Rita about six hours to destroy it.

The bad thing is, we're sitting here not really moving forward and going out there and trying to repair some of those damages that have occurred there on the Creole Watershed. So I think those are the kinds of things you guys have got to be totally

cognizant of. When you build these massive projects, you can't build them and walk away from them. We found that out in Rockefeller and Marsh Island, all of our refuge systems. You build the system. You've got yourself

married to it in perpetuity, and I think we are going to see that very same thing with our coastal restoration efforts, and, certainly I'd be back at each and every one of these meetings I can convince my wife to drive me to so thank you.

MS. COFFEE:

Thank you.

MR. ANGELLE:

Mr. Allen, let me say as a next generation of the Bourg Angelle group that if dad was still on this Earth, he would say that he was the lucky one to have had the pleasure with working with such a distinguished man who has dedicated his life to Louisiana. So on behalf of him I say "thank you."

MR. HEBERT:

Terry Hebert, Cameron, Louisiana. West Cameron Port Commission. The highway

fortification -- I apologize, this is my first meeting, but I would like to know what you have in mind for Highway 82 from Sabine to Vermilion Parish as far as what you have to making that a fortified existence.

MR. PORTHOUSE:

The concept that we have in the plan right now is there are areas in the highway which are below a ten foot level. Bringing the lower spots up to the ten foot level and then similar to what's being done in the Holly Beach area where it's subject to periodically -- and making sure that the roadway itself will be -- will not be destroyed if it's impacted by the surge or overtopped by the surge, but raise it up in the low spots and maintain it to make sure it stays there if it does get hit by a surge. And we do -- that's one of those ones that we do have a little more work to do, identify those low spots, exactly how we're going to that.

MR. BROUSSARD:

I'm Carl Broussard. I'm a resident of Grand Chenier, Louisiana, and also the Clerk

of Court for Cameron Parish. A few years back we had a number one project in Hog Bayou, lower Grand Chenier restoration project, which is number one on the list for CWPPRA. Has those projects been thrown out

the door or is this going to be implemented in this process?

MR. PORTHOUSE:

We don't have the particulars on that project -

MR. CLARK:

I have plenty of information on that. I'm the Project Manager. Basically, we -- I can address that, if you would like, John and Sidney.

COURT REPORTER:

Could you state your name, please.

MR. CLARK:

Darrell Clark, U.S. Fish and Wildlife Service. The Hog Bayou project -- the fresh water introduction project which is called the Grand Chenier Fresh Water Introduction Project, that is an engineering design that was approved by the Coastal Wetlands Planning Protection and Restoration Act for

Engineering Design about four years ago and we completed a hydrologic model on that to see if we could flow water from the Mermentau River north of Grand Chenier, across Grand Chenier into the Hog Bayou

Watershed. That model indicated that we could, indeed, flow water.

We are now working with landowners, key landowners in that area for key places where we would like to bring water across the highway. In that, we've had a problem in that Hurricane Rita has destroyed most, if not all, of the homes in Grand Chenier and many of the people have not come back. So we're trying to locate the people and meet face to face with key people to determine if we can get landowner approval to flow water across at the particular spots that we're interested in.

We also have a marsh creation component of the project to bring some material in from either Upperman Lake or from the Gulf of Mexico into the large open water -- shallow open water area north of Hog Bayou. If the first plan is not successful due to

finding cooperative landowners, we will ask the technical committee and task force to go to plan "B," which would be the marsh creation component. So one of the main problems right now would be seeking

landowner approval. It is not -- it's still on the table.

MR. PORTHOUSE:

If I could answer that a bit more conceptual level from the plan's perceptive, especially as we raise and fortify these highways in the lower spots, we have to make sure that they allow the irrigation of the north and south across the highways. We do have one that you see before you. That kind of project incorporated, so if we do not have the Hog Bayou project represented, per say, on the map, it is consistent with the strategy that we are trying to get done.

MR. BROUSSARD:

I know in some of these projects that Mr. Richard has brought up four -- has also said that putting a lock system on Hog Bayou to help the salinity problem. Also, I think, there might be a project that would

be brought up to put the lock system on the Mermentau River outlet and open up the other river so we don't loose the sediments, which, I think, may be a good thing. Open up the original channel instead of the

straight shot for the sediments just going straight off the shelf. Thank you.

MR. RICHARDSON:

Joseph Richardson, McNeese State University. I just heard several projects being mentioned, and I'm wondering if part of your objective is to actually coordinate all these different projects as they come in, or would everybody still be doing their own thing out there separately?

MR. PORTHOUSE:

Yes, sir. As I mentioned, the key point of this plan is to use it as bases for consistency for all our restoration activities out there such as CWPPRA and Louisiana Coastal Area Restoration Program as well. So there -- we're having this period right now to get all these things wrapped up consistently within this plan and making sure they are working together. But

in the future, we would think that things would be more focused on implementation of this plan.

MR. HENNEY:

My name's John Henney. I own property

down in Cameron Parish. I'm also with Cameron Communications. I've got a question. I'm just curious. How are y'all going to deal with the Corps of Engineers and all the other government regulatory issues and getting all these different government bodies working together and avoiding the bureaucracy, slow down, and if I don't do anything, I don't make any mistakes?

MR. ANGELLE:

What I would offer as an answer is that I believe that it was obvious to many of us in Louisiana that following the storm season of 2005, the government at all levels failed in its effort to protect, and I'm talking about with regards to hurricane protection and coastal restoration over a period of the last, perhaps, 30 years. There are some parts of Louisiana, specifically the south

Lafourche Parish area, that are an exception to that statement. And in the first special session of 2005, we recognized the only way we could attempt to change that is to bring together a group of folks that included

nearly every area of Louisiana Government that would be at play and have them in on the ground floor rather than on the permitting floor. And so, for the first time in the history of Louisiana, we integrated coastal restoration and hurricane protection and put together a board of directors that include the people up here, but also include the people like the Department of Economic Development, also, include the Office of Coastal Forestry and Department of Agriculture Forestry. We've got the Department of Transportation here. You've heard about, perhaps, some of the issues of highway fortification. We've got levee board people here, Mr. Curole. We've got parish government people here, specifically, Ms. Horn and Mr. Rouselle and a host of other people. We've got the Department of Insurance. You know, we

thought it was critical that the Insurance Commissioner be involved in the coastal restoration/hurricane protection plans and, my God, we're seeing how important insurance is, or the unavailability of insurance is.

We've got the Commissioner of Administration, so we thought we would start by building a foundation that would include all these people, and they would be in on the ground floor.

Now, it's tough to agree on a whole bunch of things that are this complex, as you can imagine. But we thought having those voices at the table would be important, and it has worked, and we have began to develop some things.

We've made it very clear to our congressional delegation that it cannot be business as usual. We are in Louisiana trying to change how we go about doing this and this legislation helped us to do that. But we have made it very clear to our congressional delegation. Our congressional delegation, we believe, has made it very clear to the President and to raking

officials in the Corps of Engineers that we must have some kind of abbreviated, flexible, permitting process as we move forth through this, because there won't be anything left to save at the end of the day

if it takes 25 or 30 years to do what it is we want to do. Everybody's frustrated. There are no more people more frustrated than us and you in this room. And so we believe we are working on that, but that is a tough, tough egg to crack. But, we know we got to crack it to make the omelette, and it's a great question, and it is a $64,000 question, can we break through that bureaucracy?

We believe we started; we're in the right direction, and we believe, by the Constitutional Amendments that we have brought to the folks in Louisiana, specifically Constitutional Amendment No. 1, that gives us a dedicated -- it puts all those funds in a locked box. Shows to the American people that if we get OCS revenues, we are prepared to spend that money only on this to be Constitutionally protected,

Constitution mandated, to never, ever have the opportunity to spend that money on road construction, or healthcare, or education, although those are very important things in every state in the Union. And in the states

of Wyoming and New Mexico where they get revenue sharing from federal lands on their property, they get to spend it on those kinds of things. We have said "just give us the money, and we will spend it on this." And all those things, hopefully, will add up until a point where we will break through and pierce through that level of bureaucracy that we can serve the people in this state in the way they need to be served.

And I would add that we have Wildlife and Fisheries and DEQ is represented on here. I forgot to add those two. There are a total of 17. You're testing my memory right now, but, again, all those are permitting agencies and having all those permitting agencies as we are drawing it up, hopefully, will prevent a situation when we go at the same time at a later date to get permits, no one at any of those agencies

gets to say "Oh, we didn't know about that."

Hopefully, this is a better way to govern.

MS. COFFEE:

Anyone else? No? Yes, come on Dave.

MR. RICHARD:

You know I have plenty to say.

MS. COFFEE:

Well, I know that you are not shy. You can come up as many times as you want.

MR. RICHARD:

I would be remised of not being here today. Randy Hanchey is in the room here with us, and I know you're an engineering consultant, also.

A lot of us that went through Hurricane Rita at ground zero here were amazed when we got up into the air on Sunday after being hit here on Saturday and Highway 82 was still there. Secretary Bradberry, you should be also happy to see Mr. Hanchey here, also. We built that with a share of money and through his leadership pumped 1.2 million yards of sand inside the Holly Beach break waters. That project was absolutely, amazingly, successful. Highway 82 would no

longer be here today if it would have not been for that project. I think we should use that technology, and now, that we have used it here in Cameron Parish, it shows that we can save the shorelines. It shows

that by using beneficial use from offshore deposits was able to save that road, and it has applicability along all 75 miles of Cameron shoreline and another 50 miles of the remaining shoreline. So I think it was very important that you recognize that project on the ground and worked for a horrendous storm here in Southwest Louisiana.

One of the most important things we found with Hurricane Rita was that the hydrologic restoration that had been done, and I mean to the Mermentau Basin, was basically put together in 1951, basically put the Cameron-Creole Watershed together and built it in 1991 and put it in operation. We worked on Sabine Refuge on the westside of Calcasieu Channel and put that together. We had shown that wetland management through hydrologic restoration

works, and we feel like the engineering should also incorporate that in, no uncertain terms, into hurricane protection in Southwest Louisiana. It is a terribly integral part, and it needs to be to the

forefront of your plan. Thank you.

MS. COFFEE:

Anyone else? Don't be shy. Okay, if there are no more, I would like to say thank you so much for, again, for coming and take the plan back to those who are interested and come back and see us again in December and then again in March. In addition to that, remind people you can -- even if you, you know, did not make comments here today, you can certainly go to the website and there's a host of ways you can comment and give us your input. Thank you very much, I appreciate you coming.

(THE PUBLIC HEARING WAS CONCLUDED AT 2:55 P.M.)

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C E R T I F I C A T E

This certification is valid only for a transcript accompanied by my original signature and official seal on this page.

I, LORI ACHEE, Certified Court Reporter, in and for the State of Louisiana, as the officer before whom this Public Hearing was taken, do hereby certify that the Public Hearing as hereinbefore set forth in the foregoing 64 pages;

That the testimony was reported by me in the voice-writing method, and was prepared and transcribed by me or under my personal direction and supervision, and is a true and correct transcript to the best of my ability and understanding;

That I am not related to counsel or to the parties herein; am not otherwise interested in the outcome of this matter; and am a valid member in good standing of the Louisiana State Board of Examiners of Certified Shorthand Reporters.

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23 LORI ACHEE

24 CERTIFIED COURT REPORTER

25 LICENSE NO. 24007

R E P O R T E R ' S P A G E

I, LORI ACHEE, Certified Court Reporter in and for the State of Louisiana, before whom this sworn testimony was taken, do hereby state on the Record:

That due to the interaction in the spontaneous discourse of this proceeding, dashes (-) have been used to indicate pauses, changes in thought, and/or talkovers;

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5.3.7 Public Meeting Notes, Plaquemines Parish, December 12, 2006

COASTAL PROTECTION AND RESTORATION AUTHORITY
INTEGRATED PLANNING TEAM

NOTES AND PUBLIC COMMENTS

FROM THE

PUBLIC MEETING
(SPONSERED BY PLAQUEMINES PARISH)

FOR THE

COMPREHENSIVE COASTAL PROTECTION MASTER PLAN FOR LOUISIANA PRELIMINARY DRAFT

HELD IN THE

BELLE CHASSE AUDITORIUM
8398 HIGHWAY 23
BELLE CHASSE, LA 70037

ON

TUESDAY, DECEMBER 12, 2006

Coastal Protection and Restoration Authority
Integrated Planning Team

Plaquemines Parish Public Meeting
(Sponsored by Plaquemines Parish)

Belle Chasse Auditorium
December 12, 2006

Below are the notes taken at the Plaquemines Parish Public Meeting held in the Belle Chasse Auditorium on December 12, 2006. There was no recorder at the meeting. Note takers included: Rickey Brouillette, Oneil Malbrough and David Dodgen.

ATTENDANCE

Host: Benny Rousselle, President, Plaquemines Parish and member of Coastal Protection and Restoration Authority

CPRA/IPT: Jon Porthouse, Larry Ardoin, Jean Cowan, Michele Deshotels, Andrew Beall, Ricky Brouillette, Norwyn Johnson, Juanita Russell

Shaw: Oneil Malbrough, Ben Malbrough

BCG: Robert Tisdale, David Dodgen, Bob Athow, Tony Thomas

Public: 167 (see sign-in sheets attached)

INTRODUCTIONS

Benny Rousselle

CPRA PRESENTATION

Presenters: Jon Porthouse, Larry Ardoin, Michele Deshotels

PUBLIC COMMENTS & RESPONSES *(Responses depicted in italics)*

1. Myrtle Grove provides economic benefit to the state, why doesn't it get protection under the Master Plan? *Benny Rousselle: The Master Plan provides for existing protection for parts of Plaquemines Parish south of Myrtle Grove and 100-year protection from Oak*

Grove to Myrtle Grove. There is funding now to raise the levees from Myrtle Grove to St. Jude from 4'-5' up to 6'to 8'.

2. How does Plaquemines Parish get funding to raise the levees to the new 100-year protection level from St. Jude To Venice? *Benny Rousselle: The Mississippi River levees can't be built high enough to contain the surge during a major storm.*
3. What is the 100-year Flood Protection level? *Benny Rousselle: To get insurance, the levees need to be certified for 100-year protection. The height of the levees is not the issue, the certification of the levees is. Michele Deshotels: ADCIRC modeling is currently being run by the USACE to determine the 100-year and 500-year protection levels.*
4. An article in the Times Picayune showed diversions through the levees. *Benny Rousselle: the large diversions are conceptual at this point but must address navigation (it is imperative to the Plaquemines Parish economy that water traffic on the Mississippi River is maintained), surge levels, fisheries, salinity intrusion, and water intrusion.*
5. Will closing the MRGO lead to saltwater intrusion into Plaquemines Parish? *Benny Rousselle: No.*
6. Plaquemines Parish Sheriff: The Master plan depict sediment diversions going to Plaquemines Parish but to Terrebonne Parish. *Jon Porthouse pointed out diversions going to Plaquemines Parish on slideshow map*. Question was re-asked. *Jon Porthouse again pointed out the diversions going to Plaquemines Parish on the slideshow map.*
7. Can cuts in the levees for big diversions be closed to prevent storm surges from coming in? *John Porthouse: The Master Plan presents the conceptual design for the big diversion. All of those types of questions will be determined in detailed studies*.
8. There appears to be a lot of politics involved in this Master Plan. The plan does not show any marsh creation between Myrtle Grove and Venice but Terrebonne Parish and Lafourche Parish are shown to be getting lots of marsh creation. The lower end of Plaquemines Parish needs marsh creation. *Jon Porthouse: The diversions from the Mississippi River will sustain the existing marsh and create marsh.* Citizen responded: The diversions from the river will be implemented too slowly to create marsh. *Jon Porthouse: The plan has pipeline conveyance for the near term*. Citizen responded: See south of Myrtle Grove, that has no pipeline dredging & no other marsh creation except for the big land building diversions. Please consider adding pipeline conveyance and marsh creation south of Myrtle Grove.
9. Without marsh creation the levees are no good to us.
10. The large land building diversions are too conceptual to have it in the front of the Master Plan report. They should be in an appendix of the report. If freshwater is diverted, you change the ecosystem and remove the reason to live in Plaquemines Parish. *Jon Porthouse: Give us your ideas of how the big diversions should be designed and operated*. Citizen Response: Put the major diversions at Bayou Lahotre and Weat Bay.
11. The spoil removed when the Mississippi River is dredged the material is thrown away offshore instead of used for beneficially. *Response: The USACE is mandated to operate the dredging of river in the most economical way*.
12. Rebuild the chandeliers as a first line of defense. Continue the rebuilding through Breton Sound and to Plaquemines Parish. The big diversions will damage further damage the barrier islands and also cut Plaquemines Parish in have and make it unlivable.
13. How will the diversions be constructed? *Answer: The big diversions are conceptual at this time and the details are not known but will be studied.*

14. Previous projects have been designed but DNR has held up the construction. When will the existing plans be implemented? *Response: Funded Projects?*
15. Why will levees below the new 100-year flood protection level be certified? *Benny Rousselle: Restoration efforts may help, otherwise build to 12' to 14' once the base flood.* Citizen: We need to build it ourselves. *Benny Rousselle: Plaqumines Parish can't go it alone on the funding. We need federal and state help*.
16. California and Florida don't allow offshore drilling. Plaquemines Parish oil and gas money (commercial and industrial money also) have been sent out of Plaquemines Parish to the Louisiana and U.S. Treasuries and Plaquemines Parish has gotten very little in return.
17. The final report will be released in February? *Response: A new draft will be released in February for more public input.*
18. The plan is inadequate for Plaquemines Parish. At a minimum, we need certified levees throughout. CPRA is asking Plaquemines Parish to settle for what is in the plan. Include Plaquemines Parish, make the levees certified. *Response: This is the input we are looking for.*
19. What does the plan show for the east bank of the Mississippi River in Plaquemines Parish? Category 5 for Plaquemines Parish? *Response: The levees from the plan were pointed out on the slideshow map. Braithwaite to White Ditch will be 100-year protection.. The river levees are also utilized as hurricane levees and have to meet the 100-year protection*.
20. Don't redirect storm surge from the funnel near New Orleans to Plaquemines Parish.
21. The levees are a secondary issue. Don't rely on Levees. Spend money to buildup the barrier islands and creating marsh to knock the surge down. Don't cut the Parish in half with the big diversions.
22. Councilman District 5: The big diversions of the plan will split Plaquemines Parish in half and allow the surge into the interior of Plaquemines Parish just like the MRGO. Plaquemines Parish should get marsh creation, certified levees and restoration of the barrier islands. Concerned that the conceptual big diversions will become defacto part of the plan.
23. The diversions at Myrtle Grove and west of Point a la Hache, what are the benefits? *Jon Porthouse: The small diversions will sustain the marshes. The big diversions will create land.*
24. How for south of Myrtle Grove will the big diversions be. Can the Myrtle Grove diversion and the big diversion be combined? *Response: The diversions will be operated and located where best to create sustainable marsh*.
25. What criteria was used to determine the level of levee protection? *Response: Whether or not levee protection was already in place, where levees were already in place, increased protection was based on economic feasibility utilizing pre-Katrina data*.
26. Add projects for lower Plaquemines Parish so they can feel included.
27. Move the big land building diversions 10 or 20 miles south to protect oyster production. There are no oysters left further down near Triumph. Higher levees will not do any good but certify the existing levees.
28. Build the shoreline up instead of the big diversion.
29. Took helicopter ride from Port Sulpher to lower Plaquemines Parish. North of Freeport Canal the marsh is healthy but south of Freeport Canal it isn't. Chaland beach is

beautiful, 6' elevation but both sides of the beach have nothing and the project needs to add elements on each side for marsh. Build more beach replenishments like Scofield beach and Pelican Island and block off Shell Island. *Response:There is another phase funded for the Pelican Island project.*

30. The plan pacifies the City of New Orleans. If Plaquemines Parish isn't preserved, it will put New Orleans a risk too.
31. Use debris to create marsh.
32. The diversions tried in the past such as Caernarvon did not work properly, 40% of the marsh was lost due to the hurricane. It is too late to try and build marsh in Plaquemines Parish with diversions. Dredging is needed to build marsh in Plaquemines Parish.
33. Restoration is the key. Priority is a concern and restoration should be scheduled in tandem with levee building and anything else.
34. Build measures from south to north instead of from north to south. Sandy Point is disappearing. *Response: That will be taken under consideration. Prioritization has not been initiated yet.*
35. What year storm was Katrina? *Response: Katrina was around a 300 to 400 year storm. Rita was around an 80 or 90 year storm*.
36. Stop controlling the Mississippi River and let it go back to Lake Charles.

SIGN-IN SHEETS

BELLE CHASE AUDITORIUM
12 DEC 06

P 1 of 8

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12 DEC 06

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5.3.8 Houma Public Meeting Transcript, December 11, 2006

COASTAL PROTECTION and RESTORATION AUTHORITY
INTEGRATED PLANNING TEAM
PUBLIC MEETING

PUBLIC MEETING taken in the matter of the Coastal Protection and Restoration Authority Integrated Planning Team's Comprehensive Coastal Protection Master Plan for Louisiana, Preliminary Draft on Monday, the 11th day of December, 2006, at 6:30 p.m., given at the Houma Terrebonne Civic Center, 346 Civic Center Boulevard, Houma, Louisiana, 70360

APPEARANCES:

THE COASTAL PROTECTION and RESTORATION AUTHORITY INTEGRATED PLANNING TEAM:

Rickey Brouillette
Andrew Beall
Larry Ardoin
Jon Porthouse
Jean Cowan
Michele Deshotels

O'Neil Malbrough - The Environmental Shaw Group
Robert Tisdale - BCG
Carl Anderson - U.S. Army Corps of Engineers

ALSO PRESENT:General public

Reported by KATHY A. MARTINY, Certified Shorthand Reporter in and for the State of Louisiana.

SPEAKERS:

MS. DESHOTELS: Page 4, Line 1; Page 33, Line 17; Page 93, Line 20
MS. COWAN: Page 11, Line 14
MS. BOLLINGER: Page 39, Line 10
MR. GOUARD: Page 43, Line 11
MR. ROBICHAUX: Page 44, Line 6; Page 95, Line 18
MS. LeBLANC: Page 47, Line 22
MR. THOMASSIE: Page 50, Line 12
MR. GUIDRY: Page 52, Line 23
MR. LINSCOMBE: Page 54, Line 24
MR. PLAISANCE: Page 55, Line 5
MS. SUAZEL: Page 57, Line 1
MR. NEIL: Page 59, Line 3; Page 88, Line 5
MR. SMITH: Page 65, Line 23
MS. MALOZ: Page 68, Line 15
MR. BOULET: Page 71, Line 10
MR. ADAMS: Page 73, Line 17
MR. BARRIOS: Page 76, Line 23
MR. WALKER: Page 80, Line 6
MS. THERIOT: Page 83, Line 18
MS. ARMAND: Page 85, Line 6
MR. HARRELL: Page 91, Line 11; Page 94, Line 24
MR. PORTHOUSE: Page 94, Line 6

ATTACHMENTS:

Public Comment Cards
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(Please note that throughout this transcript when the word "uh-huh" appears it is meant to denote and affirmative response; when the word "unh-unh" appears, it is meant to denote a negative response).

MS. DESHOTELS:

Hello, everyone. I'm Michelle Deshotels; I've been assigned to the Integrated Planning Team; and I'm going to introduce people who are on the Panel up here to answer your questions this evening.

The people here represent people who are on the Integrated Planning Team, as well as one of our honored partners from the Corps. I'm going to start at your left, my right.

We have O'Neil Malbrough, with Shaw; former Shaw Coastal; now with The Environmental Shaw Group.

We have Robert Tisdale with BCG.

Carl Rawl is here this evening -- excuse me, Carl Anderson. Carl is with the Corps of Engineers; and Carl is the liaison to the CPRA; and a little later this evening I will explain what that project is. He is also the Project Manager for Morganza to the Gulf; we're pleased he was able to attend this evening. Thank you.

Rickey Brouillette is on the Integrated Planning Team, as well as Andrew Beall; Larry Ardoin; Jon Porthouse; and Jean

Cowan.

The topics we're going to cover this evening include: How does the Master Plan relate to other ongoing planning efforts?

What is the Master Plan seeking to achieve?

What does the Preliminary Draft Master Plan present?

What are the Preliminary Draft Master Plan key components?

And this is the heart of the talk this evening, and what the meetings really are about; and Jean will be doing this.

What are potential policy legislative or institutional issues that will effect implementation of the Master Plan? And what I just cut off at the bottom of the screen is what comes next.

How does the Master Plan relate to other ongoing planning efforts? We call this our "fried egg" exhibit; and I think you'll see why as it develops.

The Corps was directed by Congress to look at providing Category 5 protection for south Louisiana. Their work did not include looking at

restoration; also that restoration could specifically reduced storm surge.

The CPRA was established by the Louisiana Legislature this past November -- or, well, November of 2005, by Act 8; and in that act, the legislature told us that it was time for Louisiana to be looking at hurricane protection and coastal restoration; and that this, together with coastal protection, that it was time that these things be integrated and no longer be separate.

And that was the task told to us; and so we are looking at a much broader picture than what the Corps is looking at.

Now, I will say we are working very closely with the Corps, and they with us; and we are both benefiting by one another's efforts.

And an even larger planning effort than the one that we have is the task that the LRA -- Louisiana Recovery Authority -- is undertaking; and that has to do with redevelopment; community location and development; transportation; and a host of other issues including insurance; medical health issues; et cetera.

But, at the basis of what they are doing, their first step is our work. So our work is

in forming their plan; and they have also been very cooperative with us in helping, particularly in the early stages of our plan formation, helping with getting us access to stakeholder input and forums for some of our concepts. So all three of these efforts have been working very closely together.

What are we trying to achieve? I'm giving a little background very quickly. I recognize a lot of people in the audience this evening; so I know that you know about this.

Integration of hurricane protection and coastal restoration is essential. We know that a healthy landscape must be achieved before we can have a sustainable ecosystem and reliable flood protection.

Hurricane protection strategies are described in the plan based on the premise of a healthy landscape. Our complete plan is based on multiple lines of defense strategy. And what you cannot see at the bottom of the screen is that each of us has a stake in the outcome, and must be part of the solution.

What does science and engineering say? Anything we do to fix the system will alter hydrology, and therefore alter the ecosystem; we

can't fix the problem if we don't change the system. We are adaptable; our communities are adaptable, especially if you have advanced knowledge of the situation and the continued availability of basic services.

And that means having access to schools, medical services, churches; that means drinking water, roads, and grocery stores; those things that you need to continue to be a viable community.

We know that our first line of defense should not be our last line of defense; that longer and more complex protection systems are more at risk for failure. We know that if we give water more room, this is important on both sides of the levee, in front of it and behind; it is something of a topic. And that altered hydrology can provide opportunities if we're there to take advantage of them, and have the vision to do so.

There are four coastwide objectives that we have in this plan; and they're listed fully on the back on the poster boards; but I think they're very important to go over, because they are something that we're trying to achieve.

Our first objective is to reduce the economic losses from the storm based on surge. We are targeting achieving protection for surge, from a storm surge that has a 1% chance of occurring at any given year; the so-called "100- year storm".

However, this protection can be provided by levees; or it can be provided by raising and elevating homes; or it can be provided by a combination of these and other methods.

Levees alone do not have to provide -- be the source of this protection. I think many people are aware of this; and in some places you can already see homes being raised above that.

The picture in the lower, right-hand corner of this screen was taken after Katrina; it is near the Lake Catherine area on the New Orleans land ridge between Slidell and New Orleans East; and it is of a structure that survived because it was high enough.

The upper, left-hand corner is a typical levee. So a combination of these we believe is what is going to be in our future.

Objective number two: To promote a sustainable ecosystem by harnessing the process of the natural system. A picture of Caernarvon; and on

the lower left-hand corner is some real sediment, some real deposition that's occurring out there.

We need to provide habitats that are suitable to support an array of commercial and recreational activities. We do a lot of things with our coast: We hunt; we fish; we farm; and all of these are things that are important to us.

We recognize that there will be habitat changes; where an activity occurs now it may not occur in the future; but we recognize that it is important that coastwide we maintain the diversity that we have today.

We need to sustain, to the extent practical, the unique heritage of coastal Louisiana. We are like no other place. We know that who we are and what we have are family; and our community is variable; and we don't want to lose this. We also know that who and what we are is tied to the land, and that we are losing land.

So what does the preliminary Master Plan represent? We have some key components that will be coming up. It's a conceptual vision of the future of coastal Louisiana; it's a completely integrated approach, and must be implemented as a

system to meet objectives.

So this isn't necessarily a pick and choose; a multiple choice; we hope at the end of the day this is an integrated whole. We're going to strive to balance objectives, although we recognize that further work will be needed to refine strategies.

This is a starting point for public discussion. And now I'm going to turn it over to Jean; and she's going to get into some of the meat of the situation this evening. Jean?

MS. COWAN:

Can everybody hear me? The back? Can ya'll hear me okay? Michelle just walked us through sort of the basis for putting the planned components together, understanding that we have multiple objectives for the coast, and adopting this notion of a "multiple lines of defense" strategy.

What we mean by that is both restoration and protection work in tandem to insure that we have a sustainable coast, and the opportunities for us to live and work in that coastal system.

So the first thing that we recognize as an important part of that is,

indeed, stabilizing the landscape. You all know probably better than any of us standing up here in this Panel how fragile our coastal ecosystem is.

For those of you who've worked on the coast for a number of decades, you've been out there; and you've seen the landscape disappearing before your eyes. We recognize that the crucial component of that plan is to stabilize that and halt that further degradation.

For the purposes of the presentation, though, we've broken the coast down both into the Delta Plain and the Chenier Plain, just so it's easier for us to walk through the plan with you; so first we'll go through the Delta Plain and the Chenier Plain.

I'm also going to be presenting the plan in multiple layers; and the order in which they're being presented does not necessarily apply to the order of priority; but it's just the way of building the plan up for you so you can see the components; and then hopefully understand at the end how they all work together to bring us the integrated approach that we're trying to achieve.

Also, I want to reiterate that this is

a Preliminary Draft Plan; we're up here talking to you right now because we want your feedback on the components of the plan. We have not established orders of priority or sequencing just yet; that's something that we heard a few weeks ago that you all are very concerned about, as we are.

But first we want to make sure that we've got all the components there; and we would also like to hear your ideas on priority. We are not presenting that tonight.

So the first component of the plan that I'm going to present to you all is the stabilization of what we call the skeleton of the system: The barrier islands; the ridges; the shorelines of the lakes and interior waterways.

This is a multi-objective plan, as we've said many times; and these components of the plan actually support that very well; they serve as lines of defense. The barrier islands are one of the first lines of defense; obviously, the barrier between the Gulf of Mexico and the inland system.

The ridges also serve to break waves and storm surge; and in stabilizing the shorelines insures that we don't have continued encroachment of these inland water bodies into the areas where we

are living.

But just as critical for maintaining these components of landscape are the habitat that they provide; these higher levels of -- higher elevation areas in the coastal landscape are really critical for a variety of wildlife species that we all have grown to depend on and enjoy.

A second is navigation channels; again, multiple objectives here. We want to obviously not make it difficult for ya'll to see this; I'll try to get it from here (indicating): The GIWW; the HNC; the MRGO, which we've all heard so much about over the years.

We want to stabilize those banks; we want to insure that we don't continue to have the erosion that's encroaching into the wetlands; but we also want to insure that we maintain navigation opportunities; we want to be able to put adequate lock structures in these areas to insure that navigation continues to be a vital component of our economy.

In addition to that, though, if we stabilize the banks of these navigation channels we can use them as conveyance channels for fresh water, particularly you all here in eastern

Terrebonne and lower Lafourche Parishes.

Getting fresh water to these areas is challenging because you are remote from both the Atchafalaya and Mississippi Rivers; however, if we stabilize the banks of these navigation channels, we have an opportunity to use them to as conduits to get water from these major rivers into areas that are more remote.

Working in tandem with that we're proposing a number of what we're calling land sustaining diversions. These are diversions that are maybe upwards of 10 to possibly 15,000 cubic feet per second; this is not implying that we will be running at those capacities all the time -- all of them at that capacity all the time.

We're building in opportunities so that when we need water we have the opportunities to open these structures up and get the water where we need the water to be.

Included in this is the Bayou Lafourche Project, which many of you are aware of. It started out as a quicker (phonetic) project; and is picked up and supported by the LHC Program; and we're picking up and supporting it, as well.

These land-sustaining diversions we

believe they're capable of maintaining the existing landscapes; we believe that they will work for that purpose; however, studies have indicated that they are not particularly effective at building new land.

So we'll have to look at other ways of regaining some of the land that we've lost over the last several decades. One way of doing that is marsh creation: Direct dredging and filling of areas that used to be marsh and are now converting to open water, or extremely fragmented marsh that we need to stabilize.

So what you're going to see in the plan -- and I hope you can see it somewhat here (indicating) -- is we have a large number of areas that are shaded in green. Those shaded areas indicate where we would be taking material and piping it into that area to directly create marsh platforms.

In doing that at least just once we would not be providing an opportunity for long-term sustainability of those marshes, though, because once put out there, they'd be subject to the same forces that caused our natural landscape to start to erode; so we have the intention that those land-sustaining diversions that we discussed just the

previous slide can help us with that.

But in areas, again, where the possibility of gaining large amounts of fresh water to an area may be challenging, we may be looking at a situation where we'd have to commit ourselves to long-term maintenance of those marsh creation areas through periodic renourishment through dredging and piping of material out there.

The next opportunity that we would have for building new land would be something called a land-building diversion. These are very large diversions right now; it's depicted as two large arrows (indicating) with a sort of a brown haze surrounding them.

The reason it looks so conceptual is because this so conceptual. We don't really know what the best way of doing this is at the moment; we have a lot of ideas and a lot of proposals on the table; but we need to really look at not just what the best thing is for redirecting the lower Mississippi River for land-building purposes; we also need to be looking at the implications both on navigation and on, quite frankly, the long-term diversity of our habitats out there.

Obviously, doing something this big

east and west of the river would substantially alter our solidity agreement, and therefore our habitat grievance. We need to be looking at how that affects our economy; the people that rely on those natural resources for a living; and balance out the need for creating land with the need to maintain habitat diversity.

Before I move on to the levee alignments that we are proposing for the Delta Plain, I want to spend just a couple of minutes talking about the MRGO, and the proposal we have for dealing with it.

As you all are aware, we've had a lot of discussions over the years on the pros and cons of the MRGO; what we can do to offset the impact that that navigation channel has had on the surrounding area.

And what we, as a state, are going to be proposing, or are proposing, is total closure of this navigation channel. That does not mean that we're going to be filling it in, necessarily, though; we're going to be trying to be taking something that has been a problem for the community and the landscape, and turning it into an opportunity.

The first thing we're proposing is putting in a closure structure just south of the Bayou La Loutre Ridge; we're going to be restoring the Bayou La Loutre Ridge, as well; and as mentioned earlier, shoring up the banks of Lake Borgne, so that we don't have Lake Borgne coalescing into the MRGO, and then into the more fragile marshes on the other side.

Once we've done that, we've now created this channel right here (indicating), which is basically a slack water channel. Oh, another component of this plan would be to complete the Inner Harbor Navigation Lock, so that navigation can continue in that area, not just through the MRGO.

Once we've done all of that, we can then take water off the Mississippi in the vicinity of Violet; and use this remnant of the MRGO to convey water into the Biloxi marshlands area to allow for sustainability of that area in combination with the marsh creation that we're proposing for that area.

So, what are the levees that we're proposing? This slide is just to remind you all of all the levees that exist. There are a lot of

river, and forced drainage, and back levees all up and down the Mississippi River. You all are, I'm sure, well aware the South Lafourche levee that exists, and then other smaller levees in association with the Atchafalaya River Project around Morgan City, Berwick, that area.

These footprints are obviously set; they're already out there; it's what we're working with. That doesn't necessarily mean that we would be keeping the elevations as they are; in some cases we would be proposing raising the elevations; but they would be on top of that existing footprint.

The Morganza to the Gulf Project we have here on the slide with existing system protection. Obviously, not because it's been built yet, although some portions of it are currently under construction; but because it is a more or less set footprint; something that you all have worked for a number of years to reach agreement on what the best alignment would be for your community.

And we are supporting that in this plan as a quote, unquote, "existing footprint". We are also proposing some levees that would compliment those existing levee alignments to

provide a more complete protection system.

I'm having trouble seeing this; so ya'll probably are are, too. But what we are proposing in these -- these ones that are being proposed right now are far less certain in their alignments; so take these as fairly conceptual at this point; some of them are more certain than others; but for the most part this is going to require further analysis in engineering and design to get the exact footprints.

One is this East Orleans Barrier Plan. In your book -- because you can't see it here -- in your book you'll see three alternate alignments. We are also proposing an alignment in Barataria Basin, somewhere in the vicinity of the GIWW; and we're proposing an interior levee, landward of the Morganza to the Gulf alignment to provide greater levels of protection to the Houma metropolitan area.

And I'll go into each of these in a little more detail. Oh, sorry; I'm jumping ahead of myself. So what that results in is these things working in tandem to provide varying levels of protection across the coast. Those areas that are closest to the coast would be either receiving the level of protection that they currently have, or

would be elevated up to a 100-year standard of protection.

And then working in tandem with those, with the barrier islands and the marsh creation, with the ridges, and the shoreline protection, and then the outermost levees, these (indicating) further levees would be providing an added level of protection to those communities that are further inland.

So the Pontchartrain area. As I mentioned, there are some existing levees; these (indicating) around the New Orleans metropolitan area obviously are existing. Currently we have that depicted as a purple line (indicating), indicating that we're looking to provide a .2 percent chance of annual reoccurrence, or 500-year level of protection to the New Orleans metropolitan area.

We're not saying, however, that we're providing that by elevating those levees, because we recognize that that's very difficult, because people have built all the way up to the toes of the levees in most cases; and we just don't have the land available to raise those levees any higher.

In addition, we would want to look at how we can provide greater levels of protection

to the north shore of the Pontchartrain area, and these (indicating) other areas in western Pontchartrain.

So to that end, we're looking at an outer barrier somewhere across the east Orleans land bridge, with, as you see here (indicating), three possible alignments that we're currently looking at; but it's going to take more analysis to determine what the best one is.

Barataria and Plaquemines Parish. Lower Plaquemines Parish, what we're currently recommending is that we maintain these levees to their current elevations that provide the existing level of protection that those communities already have.

As with the New Orleans area, the New Orleans West Bank area, we have a purple line around here (indicating), indicating 500-year level of protection. Again, not that we would be elevating those levees; but through a combination of those existing levees, and whatever GIWW alignment we determine is the best one, they would work in tandem to provide that higher level of protection.

In addition that GIWW levee, with a little ring around the Lafitte area, would be

providing protection that those basic communities currently don't have at all -- a 100-year standard of protection. And of course, it would also provide additional protection to the communities on the east side of the Bayou Lafourche.

As long as we're on this slide, and you see it here (indicating), the lower Terrebonne -- excuse me -- the lower Lafourche levee, the current levee that you have, although it has been authorized for a 100-year standard of protection, indications are that it's not quite there; it's not quite that high.

And so we are recommending a 100-year standard protection for you all; but what that means is raising that levee above what you have right now. A couple of weeks ago somebody mentioned that it needs to be at least as high as the newly elevated LA-1; and that's something that we'll definitely be taking a look at.

Morganza to the Gulf. Again, you were seeking authorization for a 100-year standard of protection; we have that in there with the alignment that you all agreed to. The one potential adjustment that we are looking at right now is over here (indicating) on the eastern side of

it as it meets up with the lower Lafourche levee.

Currently, it's coming up north and tying it up here (indicating). We have been asked to look at changing that, so that it just ties in straight across here (indicating), thereby eliminating one of the funnel effects there.

Working in tandem with the Morganza to the Gulf alignment, again we are looking at what it would take to provide an inner levee that would provide higher levels of protection to the Houma area.

And again, don't get to attached or alarmed by the alignment that we show there for the purple line; it's very conceptual at this point; and we've already received, this afternoon at the open house, some suggestions for how we might adjust that to insure that we get some industry in there, and things that aren't currently shown to be in that alignment.

After having done all of that, though, we recognize that there's going to be remaining risk -- and let me just jump ahead here to my notes -- and we have to try to do what we can to minimize that remaining risk.

One thing that we want to make

sure of is that the evacuation routes shown here (indicating) in yellow are elevated, and otherwise shored up so that they are reliable both for evacuation and for people returning after the storm passes, so that you can come back and resume your lives.

We also need to be looking at what additional protection we might need to be providing to the north shore and the other lowlying flood risk areas in the Pontchartrain region.

And in addition to all of that, we, each as individuals, will want to make sure that if we are in a flood-prone area, we maintain our flood insurance; and when feasible and practicable, we elevate our structures.

Those are things that we can do on our own to insure that if something should fail, you have yet another line of your own defense to offset the risk.

Another thing that we can do to try to offset the risk associated with a failure is this notion of compartmentation, something that was brought over from the Netherlands, and which the Bring New Orleans Back Commission adopted as part of their recommendations.

The idea is that although you have a levee alignment along here (indicating), you also provide further boxes, if you will, to the communities, so that if you have a levee breach in one area, it doesn't automatically flood the entire region.

We actually have seen where that worked during Hurricane Katrina. An example of compartmentation in action here is, here's (indicating) a region where the levee failed, and it's completely flooded; on the other side of the canal (indicating) the community is dry. So these are things that we want to look at to try to reduce that remaining risk.

Next, water management. Both for protection, flood reduction, and ecosystem restoration purposes, we need to know where the water is; where it's going; and where we don't want it to be. So integral to planning of all these components of our larger plan is looking at the hydrodynamics of the region, and how the proposed actions are going to change the hydrodynamics.

We want to make sure that the communities stay dry; that we're reducing flooding; and we also want to make sure that the ecosystems

that are caught landward of all of these levees aren't completely impounded, and aren't permanently flooded, because we recognize that that's the surest way to kill an otherwise healthy ecosystem. So that's something that has to be done along with everything else that we are planning.

The Chenier Plain. This should go much faster; it should look very familiar to you, in that we are also adopting a multiple lines of defense strategy; however, the opportunities for restoration are far different there because they don't have a major river running through this region. So some of our strategies are a little different, although the multiple lines of defense still remain.

Shoreline stabilization. Both stabilization of the gulf shoreline as well as the interior lakes, which you don't see right now, are the lakes of Calcasieu; and we need to go back and look at what regions of those two lakes also would require shoring and stabilization; and again, this is our first line of defense is for this region.

Evacuation routes. We've moved up here (indicating) because they're not simply being proposed here as insuring that we maintain them for inflow and outflow of traffic; but we're

also proposing in this region elevating these evacuation routes to serve as a second line of defense; potentially upwards of 10 feet.

Many portions of Highway 82 are already at or near that elevation; but we're looking to provide a constant elevation across there, 82. In addition to that we will be looking at how we can improve drainage through and across the highway to insure that we're not impounding areas, and allowing for proper water management.

Navigation channels. Similar to the Delta Plain, they provide opportunities to distribute fresh water into areas where we typically wouldn't have many opportunities to bring fresh water to; but they also serve, in this case, as a third line of defense. And we're looking to shore up the soil banks in this (indicating) area, so we now have three lines of defense going further inland.

Marsh creation. Again, we don't have a major river coming through here (indicating); we don't have sediment being transported from all four corners of North America; but we do have lots of navigation channels; and we do have offshore sources of sediment.

And so we're looking to make use of those to create marsh in the most critical areas. We do have the Atchafalaya River over here (indicating); and so we will be making use of that -- the dredging activities that are going on there -- to create marsh in some of the vulnerable areas over there for beneficial uses of importance to the entire coast.

And we want to maximize that; but it's even more important here because of the limited sediment resources that we have, and managing water and sediment, in addition to wanting to insure that we don't flood communities, and that we don't permanently impound wetlands. This area is strong in the cultural community.

And the Mermentau Basin, which is in this region right here (indicating), has, for a number of decades, been managed for fresh water as a source for the agricultural communities. It is a tenuous relationship that's going on there, however, because we have a limited amount of fresh water coming in; we have salt water that's coming in from the other side.

And as is the case everywhere, it seems that the times when we need that fresh

water the most is the dryest part of the season, and there's no fresh water coming in. So we want to try to find a way to better manage the water so we can store it and make it available to the people at the times it's most needed; but that we're also balancing that with the ecosystem sustainability and restoration.

And finally, levee protection in this area. There are a couple of population centers -- the Lafitte Abbeville corridor; and the Lake Charles/Sulphur area -- that we are proposing the higher level of protection for; more densely populated areas, more assets at risk; and we want to look at what it would take to provide the higher level of protection to these communities.

Right now you see purple lines (indicating), indicating 500-year levee protection for this entire region, hooking up with the Berwick Alignment and the Berwick/Morgan City Alignment I didn't talk about earlier. We're looking to keep that at the elevation it is; but it's already at a very high elevation.

I heard it's upwards of the 500-year standard; we'll confirm that and be sure; but that's already very high protection. But

this purple line is here (indicating) because of the Lafayette/Abbeville corridor.

If you've had a chance to look at some of the surge maps in the back of the room, you'll see that at least the early modelling results that we have indicate that at least Lafayette may not be vulnerable even to a 500-year levee surge. So upon further analysis, we'll see exactly what would be required to provide that protection to this area.

Lake Charles/Sulphur area. Again, very conceptual alignment; work just has not been done in this part of the state for levee protection; so there are things that we have to look at for what would really be required to provide the higher standard of protection there.

When that's all done, though, we have a highly dispersed community in this area. Actually, quite a few people; but they're scattered all over the place; and a ring levee situation wouldn't really work.

So we need to analyze our three lines of defense that I've discussed earlier, and determine whether or not we actually need a levee along the GIWW to provide that 100-year standard of protection to these communities.

So those are the constructable components of the plan. There're also other components of this plan that are just as important to allowing us to move forward; and those are the potential policy legislative and institution issues; and Michelle's going to talk about those.

MS. DESHOTELS:

Thank you, Jean. Before I get started, would everyone please check their pockets? And if someone doesn't have their cell phone, I think we may have it sitting at the front desk; so do check.

We'll go over a little bit about these very briefly.

Land use planning and zoning. Wet areas should stay wet; so if we build levees and there are wet areas behind those levees, we need to insure that those areas remain wet, and do not become areas that are now places where there is unsuitable development.

Afterall, we're talking about an entire landscape system. There are very valid land owner concerns out there; and some of these concerns are those that have to do with mineral rights, obviously; with easements; and with

expropriations.

For levees there are expropriation rights; we don't have the same thing right now for restoration projects. Some of these restoration projects are as essential as the levees to the total picture; so these are things that really need to be discussed further as we explore these other levels of issues that are out there.

Adaptive management. What we have is based on what we have today. There's ongoing science that is becoming more refined as it goes on; there are concepts out there; there's modelling out there; there's more information that is becoming available.

There will also be different money strengths. We may get more money in the future; we may have less money to deal with. All those affect what you implement and how you implement it; and you can be aware and flexible enough in this plan to adapt to the times to these various concepts and issues.

It is a reality that this is going to cost a lot of money. A long time ago someone once had a project where I was asking: "How much is it going to cost?"; and they said: "A lot of money";

and I said: "That's not the answer I want. I want to know how much is it going to cost?"

So I understand the frustration with that; but we're still developing costs; and I can tell you truthfully right now, it will cost a lot of money. So we know that this is going to, more than likely, be a federal/state partnership to implement some of these. And that means a partnership with our friends the Corps in most cases.

There are consistency issues out there. What we do and what other people do need to be consistent with this vision. So this plan will direct, hopefully in the future, those other planning projects that are out there, and so forth, in the sense that we're not telling these other concept and planning efforts what to do; but we're telling them that this is the vision; and what you do should be consistent with what we're doing, and supportive of this.

And the priority: When will projects be implemented? And where is the funding for these projects? And the funding strength? And how is that set so that we know the project will go on line?

Public discussion. That's part of what we're having tonight, and will continue through the beginning of January.

For this phase we need to refine our measures; define our measures based on some of this public discussion that we're having. We need to develop those cost estimates so I don't have to say: "It's going to cost a lot of money"; but we can give you some true estimates based on what we hope is the reality of what these projects really entail.

We need to develop that very important implementation sequence: What goes first. We need to modify the plan based on analysis and inputs. There is ongoing modelling; the Corps is doing asset modelling right now; and we're waiting on the results of that newest run; and those results will help to further refine our plan.

There are other analyses and inputs that are ongoing, and will be continued throughout this entire process; and we hope we will continue to have this plan, use that data, so that we are using the best information available at the time.

In January we will take all that we have heard from this month; and look at the issues; consider; and come up with what we hope to be a

complete draft that will be available in February for another public reviewing comment period.

You can come back and tell us how we did then; and hopefully, in April we will get to submit the package to the Louisiana Legislature. This is the rest of our schedule for this week; so if you have family or friends who were not able to be here this evening, they are more than welcome to attend any of these events.

The Preliminary Draft that you received this evening, if someone was not able to receive it, it is at every parish library; the main library; and the branches. It is also available on line; and also on line are the additional appendixes for the report.

Now, those are not going to be in the library; but those are available on line; and those are the hundreds of pages that most people don't want to read, including myself, although I have. WWW.LOUISIANACOASTALPLANNING.ORG is our web site; those reports are there, as I said.

We also have our addresses there; telephone numbers; and e-mail addresses; so if you have comments that you want to make and you do not wish to turn them in this evening, you may e-mail to

us; you may put them in writing to us.

If you put them in writing to us, please do so so that they arrive by January 5th, so we can make good use of them in our next phase. Well, I think I turned it off, so I will not fool with that anymore; and ask someone more skillful than I of putting that back up.

I'm going to start taking comments; if anyone would like to make a statement this evening but has not filled out this card, if you would do so and take it to the desk; and they'll bring them up to me.

I have more than 20 cards; so I'm going to ask that people limit their comments to about three minutes. I will have to move over here quietly across the speaker so I can see Andrew, because he's going to be my timekeeper. When Andrew signals three minutes are up, I'm going to not cut you off immediately; but I will ask that you go ahead and make your closing remarks.

Our first speaker is Charlotte Bollinger.

MS. BOLLINGER:

Thank you, Michelle. I want to thank you all for your hard work. This has been

a program that we have been anticipating seeing for a long time. My name is Charlotte Bollinger; I'm a member of the Bollinger family and the Bollinger family of shipyards that are located all along this coast and Texas; south Texas, also.

We have three thousand employees; and we produce a payroll of about a 150 million dollars a year. In March we will begin building a fabulous new program called the LCS, which is the new series of battorial combat ships; we have completed contracts of the entire United States Coast Guard set of patrol boats, and the United States Navy.

So I say that because when I was in Europe this summer they said south Louisiana was a "City of Jest", or New Orleans was the city of jesting; we were all just people who want to have fun. I'm here to remind people that south Louisiana is a very productive group of people that don't just fish, and hunt, and produce great things for this country.

Of course, I believe that's why we had great success in the LA-1 Coalition; I was a founding member of the Coalition; I also am a founding member of Restore Retreat. At one point we had considered an LA-1 Coalition taking on the

subject of restoration; but I believe that by staying focused we raised three and a half million dollars for that Coalition.

I believe a lot of people believe that the way that it was done before the public meetings happened, all of the discussions that had to be cleared before those public hearings happened gave us a great ticket to succeed.

We really were focused on positioning the project to succeed; and I'm so excited to say that that build road and gateway to the Gulf is moving ahead. And when I see the pictures and the progress, it's just probably the most exciting thing I can think of in south Louisiana right now.

So we know that when there's a will of the people -- and I believe if you look to the Netherlands that there was a great will of these people to do what they did. And it was expensive; but I believe that south Louisiana is worth saving.

I believe that many of the programs that ya'll have mentioned in this plan today are very good; we are very grateful for things like the levee from Grand Isle to Point Chenier; anything that provides a speed bump for anybody getting a storm surge in any area is most helpful to the

highway, and to all of us who live in these areas.

I will say that I believe still when people say to me: "Well, what's your background in all this?" I'm not a geologist, or a scientist, or any of those things; I truly love this area; and I think it's so worth saving. It's just not believable.

The only place on this coast that is building land is Wax Lake; that's it; you can look at any map of south Louisiana. And because of that, we still take the stand that as we approach a comprehensive coastal protection plan that some large scale idea, whether it's the Third Delta or not, needs to be part of this comprehensive plan.

I believe that if you don't have a systematic way to maintain marshes, all of this money will be wasted. You know, I had a husband who had a heart transplant; and he had to take medicine to avoid rejecting the heart. And when he took that medicine, a hepatitis virus flourished; and it killed his liver.

and when he went to have another liver transplant, they said: "The conditions are the same; if you have another liver transplant it

will kill that liver, too." He sued the insurance company; and he had the liver put in; but he died anyway.

The point I'm making is, if you don't change the condition, when you do something like this it'll all go back to what it was. And yes; there will be some ecological changes; I hope to God so, because we need to go back to a little bit more of the fresh water opportunities that allowed our marshes to flourish and be safe.

So I think we need fresh water; we need sediment; yes. Let's do all these things levees are a great; but without some other things to sustain these marshes I think we're making a terrible mistake.

And thank you for the chance to speak to you tonight.

MS. DESHOTELS:

Thank you. Please forgive me, because some of these names I'm going to mutilate, because I cannot read them that well; so I'm kind of hack guessing; so I apologize in advance. Phillip Gouard?

MR. GOUARD:

First I want to thank you all for

the time and effort that ya'll put forth thus far; and I have all the faith in the world in ya'll. One quick comment there on the Morganza to the Gulf Alignment: There is an alternative.

I would hope that the alternative is the alignment that is chosen simply because, one: The funnel effect.

Two: I feel as though we need to try to keep as much land and as much barrier between the levee protection and the intercoastal that we can. And in that scenario, the old scenario, the old alignment, it shows that it's going to be very close to the intercoastal; and because of the evacuation routes and what have you, I think the alternative is the way to go.

And I thank ya'll very much.

MS. DESHOTELS:

Thank you, sir. Maurice Robichaux?

MR. ROBICHAUX:

Hello. Thank ya'll. I'd like to comment about, I said the last time that I was here that a channel could be made connecting the Mississippi River to the Pearl River.

And it occurred to me this morning that instead of a channel, that a

tunnel, like what occurred between what they now have between England and France; a concrete line tunnel extending somewhere between connecting the Mississippi River to the Pearl River, that would obviously include the State of Mississippi, to increase soil deposition to east St. Bernard Parish, which would also benefit the State of Mississippi.

I'm still in favor of, I hope that it would be a long-term goal of opening up Bayou Lafourche; and that on constructing the levees from, I guess approximately from Donaldsonville to Golden Meadow.

And I hope this is just the first phase in the long-term goal would be to include that; and to also, by opening up Bayou Lafourche directly, should a flood that occurred in the north central states ever occur down here, I would think that it would reduce the likelihood of levee failure around the New Orleans metropolitan area.

And the Myrtle Grove to Venice, I think -- I still think that the entire levee system should be dismantled a little bit north of Myrtle Grove to about Venice; and then each town should be encircled with about a five-mile diameter levee encircling each town; and then in between the towns

to where soil deposition could occur as it naturally did before man came here.

And let's see. Oh, yes. As far as the Boston big big (phonetic) that's occurred in Boston, Massachusetts? If the U.S. government could go ahead and spend, now as of 2006, over 14 and a half billion dollars on just a small project, I don't see why they should object to doing all these things here.

And as far as the Louisiana state budget, I spoke to Senator Dupre' this morning; and of the monies that are dead dated because it's a one-time occurrence surplus, why don't they just go ahead and spend all the money on building what would seem to be a priority of building on the barrier islands?

I mean, what good would all those tax rebates, insurance payments be if next year there's a Category 5 hurricane, and the barrier islands are not there?

Oh, and I'd like to know how the Louisiana Congressional delegation's going to vote according to the Procasine (phonetic) Wildlife Refuge in northeast North Carolina. The military would like -- what the military would like to do

there is just unconscionable.

I mean, I don't think I'd be in favor of any of that covering if the U.S. military would then have authority to go ahead and rape and destroy anything that's been built here. If anyone would like to read that article, it's in the Audubon Magazine, the September/October, 2006 issue. The name of the title is "Crash Course".

I'd like to comment, too, about a year ago in the news, I don't remember the name of the U.S. building official, or the name of the news channel, but there was a negotiation between Canada and the United States missile system.

The U.S. official, he came back flabbergasted, exasperated, and wondering why the Canadians -- in his mind, the U.S. government official's mind -- was going to surrender their sovereignty, because should someone fire a missile towards the United States in the direction of the United States, and use the Canadian air space to do it, in the U.S. guy's mind the U.S. would intercept that missile over the Canadian air space; and in the U.S. government official's mind surrending their sovereignty.

So if the guy feels that way about

the Canadians not surrendering their sovereignty, why would he be against anything the people in Louisiana want to do here? Because if they would be against any of that, they would be expecting us to surrender like about half of the Mississippi River delta. Thank you.

MS. DESHOTELS:

Thank you, sir. Lori LeBlanc?

MS. LeBLANC:

Good evening ladies and gentlemen. For your benefit I've lost my voice. I'm sure that Jon Porthouse is very grateful for that after our commission meeting on Friday.

But my name is Lori LeBlanc; I'm a resident of Houma; actually, just about two blocks away. I am a member of the Zone Management Advisory Commission for the Coast; I'm also a member of the Executive Committee for Restoral Retreat; and in the past, a Director of Restoral Retreat.

And obviously, I have been involved, for several years now, in the development of all these plans; and there's been plan after plan; and we all started back with Coast 2050; and after Coast 2050 we moved onto LCA; and now, after LCA, we're putting together this new comprehensive plan.

And while I do agree that we do need a comprehensive plan to merge coastal restoration projects and hurricane protection projects, I am really concerned about the restoration components of this plan.

And I say that because we were very much involved with the LCA project; and during that process we came to public meetings; we wrote our letters; and we expressed our views and our concerns.

However, a major component that we expressed in all of those meetings is not in this plan; and Ms. Charlotte Bollinger mentioned it herself; and that is the Third Gulf Conservation Channel.

And it's this type of a project -- a large-scale, long-term systematic project -- that is necessary for the Barataria Terrebonne Basins. Obviously, we support these near-term projects; we support pipelines; we support the Bayou Lafourche diversion; we support the levee systems that need to be built.

But all of these alone are not going to save south Louisiana. And, you know, people say that the Third Delta, or something like it, is very

large; very expensive; very complicated. But if we are going to allow a price tag to keep us from including what's really going to help us, then we might as well just be passing out for sale signs to all of the residents of this area.

We need long-term, large-scale projects for this region. Most importantly, I think it comes down to those of us who do have children. It's not about us; people say the long- term projects are not going to be built in our lifetime.

As far as I'm concerned, I'm not fighting this fight for myself; I'm fighting it for my two-year-old and my four-month-old so that they can live here and enjoy the marshes for everything that they have to offer that we have been lucky to enjoy.

Thank you so much for coming out tonight; I really appreciate your coming here and listening to our concerns. Thank you

MS. DESHOTELS:

Thank you. Roland Thomassie?

MR. THOMASSIE:

Thank you very much. I'm Roland Thomassie. I'm a former teacher and educator in Lafourche Parish; and I was more than happy to see

many of my former students here tonight who are interested in the same things we are.

You know, as an Earth Team volunteer, a citizen interested in other citizens' well being, and as a lifelong resident of South Lafourche, I am here, first of all, to thank you for your efforts and your dedication in such a tremendous project; and with the great effort that you've put the time and energy to see to it that the best solution to protecting our people, our lands, and our properties from utter destruction caused by water and erosion of all types.

Earth Team volunteers spend endless hours dedicated to enhancing community living without fear of losing everything that people have earned in the blink of an eye. Your hurricane protection proposals deserve the highest esteem of praise and admiration for all the thoughtfulness, and efforts, and toil that you have put into it.

But as we see the Gulf Coast marsh accordian grass; or the vegetation coming out of sea coast; or the Fourchon bitter bonshecoup (phonetic), which was named for the Fourchon area where it was planted; or the pelican grass; or the Vermillion smooth core grass; we want to be

reassured that these plants persist; they thrive, and do the job that they are designed to do.

We know that levees are our immediate salvation, seeking protection from storm surges, and our greatest imminent hope for defense. Living in south Lafourche area, surrounded by comfortable levees, we have hope for survival; however, our residents would look for more than a sense of comfort.

We would like to think that our children, our grandchildren, and our great grandchildren be even more comfortable staying in Houma. It is with this thought that we present our Petition here tonight that we want to preserve our culture and our way of life for the next centuries to come.

We urge you to speedily provide these plans which you have implemented; but we also would like to ask you to consider the alternate plan that you have from the Golden Meadow to Oakville levee; or I would imagine it's a secondary level effort.

And I think that perhaps this alternate levee would serve as a concrete zone to many people in the area; and therefore, with this in mind, I strongly urge you to consider this

alternate.

And I thank you very much for your fine efforts; and continue the work that you're doing. We thank you for letting us speak.

MS. DESHOTELS:

Thank you, Mr. Thomassie. Jessie Guidry?

MR. GUIDRY:

Thank you. I'm Jessie Guidry. I'm from the South Lafourche area; and I would think I'm representing the people of South Lafourche, because I did represent them for twelve years in the State Legislature.

I want to thank the Committee for all the work they've been doing. I know that it's time consuming; and you've done a terrific job; but I'd like to ideally mention, I'd love to see the South Lafourche area included in a 500-year levee system rather than a 100-year levee system.

I know how important it is to have a levee system protecting Louisiana 1, protecting the businesses and the people, because if we have that elevated highway, and we're living in a bowl, and that levee is topped and compromised, we're going to end up not being able to use the elevated

highway, because you won't be able to get to it. And that's one of my concerns.

I am also concerned that if we can't get a 500-year maximum protection levee around the whole system, then I'd love to see the alternate plan, which comes from Point Chenier down to Golden Meadow. But I'd love to see an extension of that system down on the western end to the very far end of the levee system along the south Lafourche levee system.

In other words, the way it's drawn, according to what I'm seeing here, there is at least a tip or so, or a mile or so of it that is still only under the 100-year plan; if we could just extend it so at least we have that protection from the west side, if a storm ever comes down and hits the Houma area, then we're going to get the surge.

And we'd want to protect, if we can protect that west side, at least we'll protect the South Lafourche area; and we'll protect businesses; and we'll have our people back on the road; and our trucks and everything else with supplies.

By the way, the state supplies the nation -- not only the state -- supplies the nation with oil and gas from this particular area. So

again, I'd like to reiterate. We'd love to see that alternate plan put in, and maybe an extension of it, too.

So I again thank you for your time. Appreciate it.

MS. DESHOTELS:

Thank you. Greg Linscombe?

MR. LINSCOMBE:

I don't have to speak; I'm going to sit this one out.

MS. DESHOTELS:

Pat Adams? Pat Adams? (No response) Keith Plaisance?

MR. PLAISANCE:

How ya'll doing? My name's Keith Plaisance; I'm a resident of South Lafourche; I work for Guidry Boat and Towing Company in south Louisiana; and I want to thank ya'll; and tell you really how much I appreciate what ya'll doing.

I didn't understand too much about ya'll's program; but I really learned a lot here tonight; it was very educational to me. And it really means a lot to me, because you know I try to fish, and I try to hunt every weekend, every chance I get. And every time I go out into the marshes of

the South Lafourche and Leeville area, my heart just rips out my chest at the site that I see, you know?

And this is a very important endeavor for me; but most of all for my children. You know, you heard a lot of people talk tonight about their children; and that's what we live for is our kids to have a better place; a better life than we do.

And, you know, we in Cajun country, we take pride in our culture; we take pride in our efforts, you know. Many of us down here, we're just about all of us down here are fishing industry; work in the shipbuilding business or boat business; you know, we build boats that go all over the world, second to none; technologies that people are at awe at some of the technologies that we doing.

So we need to protect all of this; and, you know, I urge ya'll to present ya'll's plan, but to consider all the factors. Consider all the people; consider all our cultures from one end of Louisiana to the other; and really consider that; and present ya'll's plan with force and diligency, because if we don't have a plan, if we not successful with this plan, we won't get the money.

We got to have a plan; ya'll got

to present it, and present it right; and they have to give us the money. If they don't give us the money, we'll do it the Cajun way; we'll build the darn thing ourself.

Thank ya'll.

MS. DESHOTELS:

Thank you. Leslie Suazel?

MS. SUAZEL:

Hi, I'm Leslie Suazel, from Terrebonne Parish Government. Speaking on behalf of the Administration, certainly we are very grateful for you all to be here this evening a second time. We appreciate especially the extended open house that gave the members of the public who were not here on November 29th to get to know the plan a little bit.

And certainly many people on November 29th had many questions about the plan; and so this gave them certainly an opportunity to resolve some of their questions, and maybe some of their fears.

And we certainly appreciate the State's effort to develop a plan that will meet our common goal of providing the maximum amount of protection for as many residents of Terrebonne Parish as we possibly can.

I did have a chance to visit with

many members of my Coastal Zone Management Advisory Committee this afternoon on their way out. We will be providing some written comments to you before your January 5th deadline; but in the meantime, I would just like to mention that, of course, when it comes to implementation, we know that things are uncertain at this time.

However, there are so many projects, when you get down to the project level, that are already engineered, and designed, and are just sitting on somebody's shelf waiting to go; especially barrier island projects that are just looking for a funding source.

Certainly the engineering of certain phases of Morganza to the Gulf and the Inner Harbor Navigation Lock are in various stages of development; we certainly hope that you all will look at running with those projects that are the nearest to completion when the funding and prioritization for your plan comes into play. And one last comment that I would like to make.

In your appendices you mention diverting fresh Atchafalaya River water to the northern Terrebonne marshes, which we would all love to see more fresh water in Terrebonne Parish.

However, the southern part of the parish is really and truly where we need the fresh water.

Certainly we need more water management in the northern part of the marsh area; but what we really need is a way to take that water and get it down into the southern marshes.

Thank you.

MS. DESHOTELS:

Thank you. Herdi S. Neil?

MR. NEIL:

Hi. My name is Herdi S. Neil; I reside at 105 T-Beb Street, Montegut, Louisiana; I'm a cattle producer; and I own T-Beb Westland Nursery; we produce -- the gentleman earlier spoke about the plants, and the flora, and the expansion; we donate some; and we sell plenty all over the coast of Louisiana from Otto Beach to Big Branch; and just all over the coast; we did projects for Terrebonne this year.

Ya'll spoke of a multitude of things here today; ya'll did a terrific presentation; ya'll kind of convinced me that this Master Plan might be in my best interest.

When I came on the 29th I wasn't here for the earlier part of the meeting; I might have

said things that angered people; but I came here to speak because I am angry at what happened to our coast.

The people before ya'll, people before me that had the potential, had the money back in the 80s when we were oil rich, and we wasted millions and billions of dollars on things; and we still have no infrastructure; we still have no storm protection; the money's gone.

We allowed gambling to come into our parishes; and most of the people, if they had a statewide referendum, probably would have voted it out; but it's here to stay. We've misdirected the tobacco money; we've misdirected the gambling money.

We are still not prioritizing our monies that we all are currently receiving without additional taxes; we're not spending our money right; we don't have our priorities straight.

Coastal protection should be our top priority, we hear elected officials say all the time; but the next day they'll fund a walkway over a canal, or behind some stores, or some bird watching site that costs, you know, thousands of dollars.

It's nice to have these things; I'm not

against these things happening; I'm against the fact that we don't prioritize correctly. We talked about infrastructure and roads to get the people out when we got to evacuate. That's the biggest part of our talk here, eventually is going to be evacuation, evacuation, evacuation instead of levees, levees, levees.

My thoughts here today are barrier islands, barrier islands, barrier islands that we have three acts have been sponsored in the past by representatives of Gordon Doff; the Baldon; that's another Craig Romero one of these; and approved bills went through the House of Representatives; made it through the Senate.

But you know how hard that is to get things through, bipartisan as everything is, to get through this quagmire of approval by different people who have different agendas?

But Gordon Doff is responsible for passing these three acts, but we have no funding. We mandated -- our local government mandated to go out to the barrier islands; figure out what the -- prioritize. Our most dire need for coastal barrier islands protection is restoration and closing in some of these passes.

And the gentleman was here last time I came about the Valentine Paper Mill? We never gonna' stop salt water putting these little wheels in, because the gulf is getting closer and closing in; and it's not like the things we've talked about.

And I've seen on some of these meetings is like you standing there holding a fire hose, and I got a little water pistol. Like these water diversion devices? That's what these devices look like to me that ya'll planning and spending millions on a water diversion device, and we haven't contained the gulf yet.

We need to keep the gulf behind the barrier islands. We have asked; approved legislation laws. These are three laws passed by our representatives; approved by the Senate; and we have no money. And we talking about new projects again!

We haven't funded the Gulf to the Morganza, the most important thing we've had going on for the last -- what? -- 15 years; as many years as I been going to meetings. I quit going. You know, you can only go to these meetings so many times, and just say: "Well, we just want keep going over, going over and over, and begging the same

people for the money".

Everybody in the United States knows the need we have to protect our coast; they know what happens if we don't protect it; they having to send money to New Orleans; they send money all over the coast through FEMA. We spending billions when we could have made it for a few millions; we could have protected ourselves for a few million; and they're still balking at giving us money today as we speak.

A gentleman in Oklahoma decided we don't need a Gulf to the Morganza; so he voted no; so another damn year gone. And we talking about removing the alignment? It gives us a lot of time to think. We've changed the alignment several times; and we don't get funded.

Another 20 years, we'll probably extend another line; in the next 25 years it becomes a necessity to extend the line. Where we were going build it? The little trees is gone; the road to get to the trees is gone; we can't bring dirt; we can't bring -- it's gone.

You know, we washing away. Over the years we washing away; we changing the line; and we still haven't got -- well, a little bit of money to

do the Point Sand Reef. And the line -- it's now suggested we change; on the eastern end needs to be a straight line to get going to the big loop and creating a project where it's going to protect.

You can't maintain a curve in a levee; you can't maintain a curve in the road; the water, the wind'll bring it down. A straight line makes a lot of sense; all you got to do is angle it a little south and accomplish the entire goal all the way to Golden Meadow. You don't have to change it; just angle it a little south 10, 15 degrees and you gonna' be 10, 15 miles further south.

But what people haven't thought about is an evacuation route. Why don't we use the Intercoastal Canal? Why don't we use boats? We can't get out of here for a storm. When we got notice of that, my sister got trapped in Texas about eight hours in the car; went about three miles.

They bragged about getting out! They didn't get out any better than we did; any better than New Orleans did. My sister's living proof of that; it took her three hours to get back home; it was tough both ways.

Why don't we use the Intercoastal Canal? We got boats! Ms. Bollinger just left; we

gonna' have to start thinking that if we adamantly refuse to leave, we're going to have to find another route than automobile traffic.

I say build boats; put them in the canal; make them available. When they say a Category 5's coming, the roads blocked; you can't get out? Believe me, I got two boats; I'm not getting in a car; we'll go west far as Beaumont faster than you can in the car.

Thank ya'll.

One more question, please? I have copies of this bill -- these bills passed by Mr. Gordon Doff; if ya'll don't have a copy of it, the numbers are Act Number 407; I want this for the record; Act 407; 846; and 202, which mandates that we repair and restore the barrier islands.

So let's get some money for this (referring to Acts); this is a done deal; this (referring to Master Plan) is not a done deal; it's not an act yet. These are three acts already passed.

Hopefully, the Corps -- we need somebody up here to help us with the funding to get this project moving. Thank ya'll.

MS. DESHOTELS:

Thank you, sir. Ken Smith?

MR. SMITH:

Thank you. I'm just surprised ya'll came back after the last meeting; we appreciate that very much. We truly appreciate ya'll coming to Terrebonne Parish; we don't get this a lot; so when you get it, you can feel the passion, and see the need. Our backs are against the wall, point blank; that's where we're at now.

I'm here tonight representing the South Central Industrial Association. I do have a written statement; I don't know if we can give these tonight; I'll summarize it first; I won't read it; I'll summarize.

SCIA is a tri-parish industrial group that is composed of 200 member companies, and represents over 36,000 employees in the tri-parish area. We fully support the ongoing planning efforts of the Terrebonne Levee and Conservation District and the South Lafourche Levee District; and we have worked closely in a regional effort with them.

You know, all this is about a big plan; and we support it and the work that's been done. But you know, here in our part of the world we have

a plan; we've been having a plan; we've been working on it for fourteen years; and we were very close to actually getting it authorized the other night until the wee hours of the morning, in which the guy's name in Houma is Dr. Tom Coburn -- okay? U.S. Senator

MR. NEIL:

You got a phone number and address?

MR. SMITH:

You better believe it; he got a couple of e-mails from me when I was really mad. But I probably shouldn't have sent them in; this is a human being. I would suggest ya'll talk to them; and to let you know, that's not in my letter.

We support Morganza to the Gulf as is presently proposed; the 785 miles of levee is going to directly protect over 200,000 people in our region.

Additionally, we also support the South Lafourche Levee System, which presently has been under construction since 1965, and is 96% complete. The communities of south Lafourche supports it.

Recently they had a one cent sale tax passed, or a sales tax issued that passed by 83%

approval; so the community supports it. The issue right now is the conversion of their flood gate to a lock. The construction costs have gone through the roof; and we fully support that being a part of this plan.

Additionally, several people spoke of it tonight. There is a revised alignment from Morganza to the Gulf that would connect Morgan City to Golden Meadow in a more southernly component; and we fully support that.

Again, this is all about planning; we feel that we are way ahead than the rest of the state in our planning; we have no choice; our backs are against the wall.

And we appreciate your efforts coming down here. And I'd like to submit this to them.

MS. DESHOTELS:

Thank you. Simone Maloz?

MS. MALOZ:

Hi. My name is Simone Maloz; and I'm the Executive Director of Restoral Retreat. I'm going to keep my comments short, because we do have written comments; also, we also had some representatives up here earlier.

We do think there are several

good near-term components of the plan, including Bayou Lafourche; especially the restoration of Davis Pond, barrier islands, pipeline conversion, beneficial use, restoring historic ridges, multi-purpose use of the IHC Lock and the Atchafayala via the GIWW through western Terrebonne.

But of course, I agree with the people who represented me earlier that we do think that there is a lack of long-term restoration for the Barataria and Terrebonne Basins. This component was included in the LRA and Coast 2050; and we understand that the pipelines have made some long-term infrastructure and will be there.

But we feel that this will be costly; and it's also something that we'd like to see become a project, but on the ground, maybe through CAP, or some of these other things. We'd like to see what we could do with it; but we certainly support pipeline conveyance; we'd like to see something more systematic to sustain it.

We also feel that we should prioritize the area of greatest need. Of course, the people before me have stated the same thing in that we need to take into account this area's total population; the vital infrastructure in the

industry which it hosts, because it supports the majority of the deep water oil industry.

And although we are certainly not always first on the list, we think all these things added up does put us there, in addition to our land loss rates; and the fact that we lack both protection and restoration for this area.

I guess I do have a couple of questions; they're more rhetorical about how will some of these projects that are already existing, what will the process be to modify them? What about the proposed projects, and the conceptual projects? How would those plans be accelerated? What will the process be?

I understand that this plan will take some time; but there also is a sense of urgency. In addition, how much will price play into the factor of the total? We had some people tell us earlier that some the projects, including the Third Delta, are too expensive; there are also some other things that go along with that; but I don't really see where price can be an excuse when there are no other price tags on this plan as it is.

And also, how will you overcome current obstacles to some of the projects we've been

following? Davis Pond? And there's obviously some issues there with the West Guide Levee, and some things like that that has not been able to run to it's operational capacity.

Bayou Lafourche, although we support it, there are some obstacles on some of the federal levels. Can we identify those, and how will we work through those?

And so thank you for being here tonight.

MS. DESHOTELS:

Thank you. Yvonne Collins? Henri Boulet?

MR. BOULET:

Good evening; and thank ya'll for coming back to Houma. I'm going to be reading some comments tonight on behalf of the Chamber of Lafourche and the Bayou Region, which, by the way, has 400 members, and represents over 10,000 employees.

The Chamber knows that this plan offers the potential to secure the presence of oil and gas service industry in southeast Louisiana; this industry right now is the industry in the state providing substantial funding; laying the golden

egg, as we say.

Just recently in Washington you know what came through this weekend with royalty sharing; and in Baton ROuge right now we're discussing how to spend the overbudget; it's largely due to high oil prices that have become a reality over the last year.

We would hope that this authority would realize and retain that huge economic contributor to our state, and to strategically grant the Louisiana Highway 1 corridor from Golden Meadow going northward, which provides the infrastructure for it, the highest flood protection possible.

With this challenge we urge the CPRA to grant -- to do whatever you need to do within the window of the south Lafourche levee system in using the existing footprint, as was mentioned earlier in the night. If we need to get larger right of ways, so be it.

We ask you to do what your economic security conscience tells you needs to be done. If the .2% level of structural protection is not possible, give us .3%, or something close.

We encourage the CPRA to construct the proposed additional levee alignment between

Golden Meadow and Point a la Hache; this alignment will benefit increased protection for over 200,000 residents.

And as well, we encourage you to include funds necessary to convert both flood gates in the south Lafourche levee system, that's the Larose and the Golden Meadow, into functioning locks.

Bayou Lafourche as a navigable channel is going to be increasingly important to America; it's necessary to barge fuel and drilling muds down to America's busiest intermodal energy port, Port Fourchon.

So thank you for taking the time to be with us tonight; and for conveying the critical economic importance for all state citizens on the LA-1 corridor. Thank you.

MS. DESHOTELS:

Thank you. Neil Adams?

MR. ADAMS:

Evening ladies and gentlemen. Thank you for being here tonight, and giving us an opportunity to speak up. To give you a little background of myself, my name is Neil Adams; I'm a resident of Cut Off, Louisiana; been inside the

levee system for quite some time; so our protection is pretty good over there.

I've got some business interests in both Terrebonne and Lafourche Parish for 27 years now; I've been operating our family business that's called Neil's Small Engines, Incorporated. We started out in Lafourche nearly 28 years ago; and for the last couple of years expanded out to Terrebonne Parish.

Two of the biggest problems that I see, especially since Hurricane Katrina, that we're facing as businesses is the insurance -- number one is the insurance costs. This directly affects our insurance costs, as you know; without that being said, I mean, that's insurance costs is going to be a major, major issue for our business survival; we can no longer -- I mean, hey.

The reality is, I can no longer give -- extend anymore costs out to the consumers anymore, because they're out there; and they're faced with the same problems that we are on a residential level; so, you know, the funds are getting dwindled down.

The other thing with business is the work force. I don't know that I'll ever realize

what we can do as far as business growth, because the work force is very -- it's not that it's down; it's just that it's so competitive. There's, you know, I'm -- and just be patient with me, because I'm going to bring this in a little bit further to state my point.

But the work force is very vital to our area because of the growth overall. The Fourchon, I mean, Port Fourchon, that's a main economic engine for us; for both Lafourche, Terrebone, most of Louisiana; so, you know, we got to look at protecting Port Fourchon.

And by doing so, we, in turn -- I'm going to reiterate what some other people have been talking about, is keeping the infrastructuring as far as south Lafourche; protecting the south Lafourche levee system, protecting it a little bit more on the outside, you know.

So let me find my place here. But, you know, these problems just didn't come by yesterday, these problems started years and years ago; years ago we sold our souls to the devil on the environmental part of the oil and gas industry; and we've got to take some steps to correct that.

I don't know if we can right

those wrongs; but we can prevent some more wrongs from taking place. You know, right now our state legislature has given, to date, a two billion dollar surplus that's sitting out there.

I would like to think that Lafourche and Terrebonne Parish contricuted a bit in that two billion dollar surplus, I would like to think that the unhealthy coastline we have contributed a little bit to that two billion dollar surplus. If we had a healthy coastline, it would be great to see what the potential there would be. Okay.

And in closing, I'll just tell you this much is that like I said. My business was started 28 years ago; I've got my sons are in it; and now my grandchildren are just born; so hopefully they'll have an opportunity to keep it up.

I'd just like to reiterate that the Morganza to the Gulf would be very, very critical to us in adding onto Golden Meadow. The Point Oceana Golden Meadow extension, let's try to bring the coast out as much to Golden Meadow as we can.

MS. DESHOTELS:

Thank you, sir. Dirk Barrios?

MR. BARRIOS:

Good evening. Thank ya'll for giving

us this opportunity to address these issues. My name is Dirk Barrios; I'm a resident of Cut Off, Louisiana; I live in that lower Lafourche levee protection; but I'm here representing Lafourche Parish Water District Number One, representing the infrastructure, so to speak, that's been talked about just previously.

Just imagine this. If we do all the protection but we don't protect the corridor from Golden Meadow to Larose, the levee gets over the top, all the infrastructure that leads to the port, which obviously is the most important economic value that we have in this area, and very important to the state and to the nation at this time, we have no way of getting any kind of supplies to them, let alone water.

And believe you me, fresh water is what helps this port run. Back in the middle of the 80s we were delivering a million gallons of water a day. Right now -- and I'm talking to the 50 customers; I'm not talking about the entire port; I'm talking about the 50, what we call export customers -- we delivered in excess of 2.2 million gallons a day to these 50 customers; all that was going on offshore; that's drilling.

Not only would we -- if something would happen we would probably see the cost of fuel go up; but the entire economic base of southeast Louisiana would be gone, because if the port cannot function as it's been designed to function, and one of those functions is getting in and out, providing the infrastructure -- the infrastructure being the roads; the waterlines; the communication; whatever it is -- it wouldn't exist.

They would just move -- the oil companies today do not build -- you know, they rent everything; they don't give a darn about southeast Louisiana; they want easy access of them. They'll go into Galveston; Mobile, Alabama; whatever port is going to cater to their needs.

What I would like to see, and I think would be in the best interest of the area, is that all of these Morganza to the Gulf would get done, and get done as far south as it possibly can.

If the current alignment is the best, fine. But the lower Lafourche levee system, if it were to just -- you know, it's already been, you know, in design and construction since 1966, I believe.

It needs to be improved. If we

lose that corridor, and we lose the infrastructure, heck, I mean, we have four pumping stations; and it takes us that to get water from our plant in Lockport that's just in the tenth ward.

Now, if we got to pump water 50 miles, I mean, you just don't turn on one pump in Lockport and it goes all the way to Fourchon. There's a systems of pumps we keep pumping; put it into elevated tanks and pump it the next few miles; and on, and on, and on.

And if these pump stations would get flooded, it would take us weeks, maybe months, you know, to get 'em back on running. Will the oil companies stay? I don't know. You know, we haven't had to have that yet; you know, we've always had to face what's below the flood gates and below the levee system.

But it's come close very many times; and I think it would be prudent to us that the levee system be upgraded as high as it could be built to where it could withstand what would be designed.

And I also think the Golden Meadow to Point Oceana levee would help, because the west side is the most vulnerable side when a hurricane

hits west of us. And that's where I believe it comes from; and I do believe that that would be the thing to consider.

Thank you.

MS. DESHOTELS:

Thank you, sir. Daniel Walker?

MR. WALKER:

Good evening. My name is Daniel Walker; I'm a local resident, born and raised in Terrebonne Parish; lived here all my life. Generations of my family before me lived here; and I can tell you that it is very distressing and disheartening to go to places out along the coast where I grew up, and the environment is totally changed; the islands that we once played on are no longer there.

I'm here tonight representing the Morganza Action Coalition, which is a local coalition of businesses, governmental entities, and individuals that genuinely believe that our area in Terrebonne Parish and the Barataria Terrebonne estuaries is in real danger and real peril from flooding; and the Morganza to the Gulf hurricane protection system is our salvation.

We are in favor of the three-level

or the three-tier protection, the barrier islands the Morganza to the Gulf, and a redundant system; but the Morganza to the Gulf hurricane protection system is a system that has been proven through planning, and through the rigorous process through the Corps of Engineers and the various governmental agencies that have put it through the test of time.

We were very close Saturday night to getting authorization from the federal government to proceed with Morganza to the Gulf; and the Dr. Coburns of the world saw to it that a hold was placed on our bill and prevented the authorization.

You know, I hear people stand up here tonight from the east of us, and that have the luxury of the Lafourche levee protection system; and we talked about Morganza, the Morgan City system that doesn't need to be raised because it's more than adequate.

But I remind you that the people of Terrebonne Parish have no protection currently; that the Morganza to the Gulf hurricane protection system is critical to the entire protection of our area.

We have, in the Owen Navigation

Canal, a conduit similar to the Mississippi Gulf; and the lock and the flood gate that's proposed for that canal are absolutely critical; and it's an emergent situation that we get that flood funding immediately.

I am very impressed with the plan; the plan is long overdue. A comprehensive Coastal Protection Master Plan for Louisiana is long overdue. One of the things that we face in Washington, and through many trips personally there, is that Louisiana has always presented a very fragmented case to Washington.

And the attitude in Washington is, as I perceive it, that Louisiana has not been very unified or very organized; and for the fact that I'm grateful that we have this comprehensive coastal plan, I am very grateful that Morganza to the Gulf remains an integral part of it; and I encourage you to keep it as part of it.

We also would urge you to use the considerable influence that the Authority has to assist us in getting additional funding on the state level so that we can proceed to get the lock and the flood gate built; and to build Morganza on our own to the extent that we can until the federal

government comes forward.

I'd like to make one more observation; and that is that we are now entering year eight of our efforts to authoritize Morganza to the Gulf by the federal government. In the year 2000, when it was initially authorized on a contingency basis pending a favorable report, the cost of the project was 660 million dollars.

Currently the cost of the project is estimated somewhere at 1.2 billion dollars. So the longer we wait, the more it costs, and the less protection we have, because our coast is being undermined.

I appreciate the opportunity to be here; and I definitely appreciate the work that the Authority is doing. Thank you very much

MS. DESHOTELS:

Thank you, sir. Kandy Theriot?

MS. THERIOT:

Good evening. My name is Kandy Theriot; I'm the President and CEO of the Houma Terrebonne Chamber of Commerce; we represent 800 businesss in Terrebonne Parish who employs about 26,000 people.

We have been following and

supporting Morganza to the Gulf since its inception; and we have surveyed our members and found that, overwhelmingly, the businesses in this community support the Morganza to the Gulf Hurricane Protection Plan.

We're very happy that you have it in your plan, and that you are supporting it; and we understand that the majority of the population is south of I-10; and that a lot of the income, or maybe the majority of the income, that's produced for Louisiana is produced here.

We are the people who live and work on the coast side; we're the people who need to live on the coastline, because we bring in the oil and the gas that fuels our nation; and we bring in the seafood that produces food for the nation; and our people need to live here so that they can continue doing the work that a lot of other states won't do.

They won't drill for oil and gas, and we will; but we need to protect the people that need to live close by so that they can do that work for us. We would like to just make sure that you are keeping Morganza in this plan; we supported it always. We are the one community that already taxed ourselves, three years ago, a quarter cent

sales tax so that we can start paying our local share of it.

Thank you very much; and we appreciate you realizing how important Morganza is.

MS. DESHOTELS:

Thank you. Jennifer Armand?

MS. ARMAND:

Good evening. My name is Jennifer Armand; I'm a resident of Houma, and speaking to you today on behalf of the Bayou Industrial Group. As an organization of business and industry representatives in Lafourche, Terrebonne, Assumption, and St. Mary Parishes, the Bayou Industrial Group is focused on the economic development of this region; and our members recognize that effective long-term coastal restoration and hurricane protection are critical to our sustainability.

To this end, the Bayou Industrial Group supports the efforts of the CPRA to develop a comprehensive protection and restoration plan for coastal Louisiana with future revenues from oil and gas protection off of our state's coast helping to fund the plan's implementation.

But the businessmen and women of

our organization urge members of the Authority to pay special attention to our region, particularly Lafourche and Terrebonne parishes, as they begin finalizing the plan.

It is here in the heart of "America's Wetland", as our region is sometimes referred to, where we proudly provide up to 20% of this nation's oil and gas supply through Port Fourchon; and fabricators and shipbuilders across our region support a global energy industry.

We are the energy workhorses of this state; and yet where we stand this evening is also the epicenter of coastal wetland loss in Louisiana, the nation, and the entire world; a fact that not only threatens the very land beneath our feet, but leaves us increasingly vulnerable to storm surges that could wipe out our entire coastal communities that serve the nation's energy needs, and billions of dollars of energy infrastructure that feed oil and gas from New York to California.

For these reasons the Bayou Industrial Group commends you for including the Morganza to the Gulf protection system in the draft plan; and we urge its continued conclusion.

We also emphatically support the

proposed construction of Golden Meadow to the Point; levee alignment will provide storm surge protection from eastern to western Lafourche, including Port Fourchon, the LA-1 corridor, and the international bayous that provide critical productions and resources to the nation.

Should a hurricane make landfall in Lafourche or slightly west, this region that we call home could be inundated, crippling other employment. The Golden Meadow to Point alignment is a critical piece of protection for this area.

Also critical to this region is a large-scale, long-term initiative for comprehensive coastal restoration, specifically for Lafourche and Terrebonne Parishes, such as the Third Delta Conveyance Channel.

I urge the CPRA to consider this region as the one leg of the state that is not just bleeding, but hemmorhaging when it comes to coastal land loss and its subsidence. The needs of this area must be addressed aggresively in the CPRA plan with projects that mimick the Third Delta building resources of the Mississippi River.

Thank you very much for being here tonight.

MS. DESHOTELS:

Thank you. I have no more cards. Is there anyone else who would like to make a comment or ask a question for the record before we close for this evening?

MR. NEIL:

I'm Herdi S. Neil. How did ya'll prioritize the proposed levees? I looked at all the lines -- the purple lines; the red lines; the light brown lines that have the proposed levees. You guys, what do ya'll think should be the priority spending; the priority measure that should be done first?

Once this is done, it takes ya'll another year or two; it takes 20 years to get the money. What line of defense did ya'll propose that should be done first? My thoughts have always been, like you've heard, the barrier islands; then the Gulf to the Morganza.

As I think I said a while ago, we've already had an act in Congress passed, and legislation passed; we just don't have the funding; and I don't know if you guys could even help in providing the funding. But what is the priority? Is it the purple line at the Intercoastal Canal? Is

it the Gulf to the Morganza? Is it the barrier islands?

I'd like an answer to that. I don't know if, I mean, ya'll can answer that or not.

MS. DESHOTELS:

We haven't started prioritizing yet.

MR. NEIL:

I heard you mention it earlier.

MS. DESHOTELS:

We know it's one of the things that has to be done; but it's something that we have not begun yet; and part of the reason we have not done it yet is we're still doing cost estimates; still looking at the modelling; and we're also coming out to listen to what people have to say about what the concerns are.

That's the question everybody wants to know, including ourself.

MR. NEIL:

How much are you going to give credence to the input from all the people in the community? Not just here. How much credence do these public hearings have? I've been to a lot and lot of public meetings; and the public was just totally disregarded; and they went ahead and did what they

wanted; I'm not sure this is going to happen here.

From the consensus of the meetings, I've been hearing in Houma put the barrier islands first; Gulf to Morganza second; the purple line to the intercoastal third; and whatever other mediation is between water diverted, marsh creation, I guess we could say fourth.

So I'm hoping that somewhere along the line that we are made aware of ya'll's priorities before this is sent to legislation so that the public will know what ya'll's plans are.

MS. DESHOTELS:

That's part of what we have to address in the future; and that's something that we're very much concerned with; and I assure you that standing up here is not an exercise for us. We're here because we want to hear what you have to say, because it's important to us.

This is our state, too; and this is our future, too.

MR. NEIL:

Well, ya'll make me think now that I might not have to pack up the brood and move back to Nova Scotia; we might stay a little longer.

MS. DESHOTELS:

Thank you. Sir, you have a question? Would you come to the mike, please, and identify yourself for the record?

MR. HARRELL:

I probably should have filled out a card earlier.

MS. DESHOTELS:

Yes. Yes. Ill ask that you actually do fill one out, because it will help our person transcribing to get your name.

MR. HARRELL:

I'll fill one out. My name is Gary Harrell; I am the principal and founder of Axiom Strategy Advisory, LLC. I'm speaking on behalf of my company, as well as People Empowering People, which is a civic organization here in Terrebonne Parish through which we typically disseminate this information from you to most of the people in our community.

One of my questions -- well, first of all, let me say that I strongly and vehemently support what you guys are doing; this is really a good first step. And while we know that maybe some things will change from the entirety of this plan, we just really want to see something done,

particularly in Terrebonne.

I can speak on behalf of some persons in New Orleans; I've seen my clients suffer; and they're continuing to suffer. I've got many who are losing their insurance daily; some are probably going to be going out of business in the year to come. So there are a lot of things that need to take place; and it's good to see that the leaders in the state are really taking an initiative to do that.

Standing here, and sitting over there, you know, one of the questions that come to mind is, you know: Are we doing ourselves sort of a disservice by continuing to rehash where we've been? Because we know where we've got to go; and I've heard you guys say that this will be presented to the legislature; and we'll vote on it. But beyond that, who's going to make the sales pitch?

And this is my question: Who's going to make the pitch to the nation? Who's going to educate the American people of the importance of saving this portion of southeastern Louisiana, and much of the coastal area of Louisiana? And I shouldn't exclude the guys over in Lake Charles or Vermillion Parish, for that matter.

But who's going to tell these people why it's important that we protect this state? Because we are; but obviously if one Senator can stop one bill, you know, on a levee system that's been around for about 16 years; and obviously, you know, we supply a great deal of oil; and, you know, it wasn't a substantial amount of money; we've spent way much more money on bridges to nowhere, and museums, and the like.

But who's going to make sure that those individuals don't have the opportunity again to inhibit our ability to protect ourselves? That's my question. And once that's done, once that education process is done, how long do you guys anticipate it taking before the federal government actually kicks in and provides the level of funding that we do need to supplement the packages that we're going to need partnership in?

And that's it.

MS. DESHOTELS:

Thank you. I don't know that I can answer your first question, or the second, because I don't have a crystal ball. And word has it's been trapped for how many years now? Six years, going on the seventh?

But, yes. That is a very important question; and education is one of the things that we have discussed that is important; and it may be time that it becomes a part of the plan of what we need to do as an addition. Jon?

MR. PORTHOUSE:

Yes. I want to just elaborate, though, that one of the key aspects of Act 8, and this plan in general, is for the State of Louisiana to speak in the same voice and authority as the CPRA, which, sometimes in the past, were competing for needs of protection and restoration.

So one of the key objectives of this plan was to put everything on the same page, and communicate one set of priorities; have a chair of the authority communicating Louisiana's needs to the Congress on these issues.

So the plan which you see before you, those booklets are not just about communicating with those of us here in Louisiana; but it was written specifically to communicate to people outside of Louisiana who are not as familiar with what is so vital and important to this place.

MR. HARRELL:

I will say this, because this is

important to me. This is my home; my family's originally from Mississippi, so don't hold that against me. But I grew up here; and so I love this area; and I don't plan to leave; I'm going to stay in Louisiana.

But I take a great interest in making sure that this place sticks around; and we'll do our part as a consultant agency to educate our clients outside of this region about the importance of this matter, because without -- well, without this region, or without our clients here, we don't have a business. So, you know, anything we can do to help out, we'll be more than happy to do it.

Thank you.

MS. DESHOTELS:

Thank you. Please identify yourself for the record.

MR. ROBICHAUX:

Maurice Robichaux. This last guy gave me an idea; or actually it reminded me. Do ya'll actually hire people or lawyers to help ya'll present your case to the state legislature or the U.S. Congress?

MR. PORTHOUSE:

We do have -- as every state and local

entity does, we do have people who help us with that; but by and large the message comes from us; and they just facilitate communication.

MR. ROBICHAUX:

Comes from where?

MR. PORTHOUSE:

We do hire them to help us to communicate things to Washington; but by and large we develop the message and have people help us make the message.

MR. ROBICHAUX:

Because a similar thing came to mind yesterday; I saw a program on, it may have been the Science Channel or History Channel, about Area 51; and I had heard about this -- he's a constitutional lawyer, constitutional law professor, either at George Mason University or George Washington University.

And I've seen him before on the various evening news network programs; and he represented for the plaintiffs, or employees who are being, in his view, and which I agree with, abused by the U.S. Government at the Area 51. I don't know if anyone's ever heard of that, in New Mexico?

Well, he represented these people; and

after seeing this guy represent these people, and the way they were treated by the U.S. Government, I just thought I'd recommend to ya'll, you know, if ya'll need anyone, to try him; to give him a call; he's at one of those universities. I think he'd probably be beneficial, you know, if he'd be so inclined to do so.

MS. DESHOTELS:

Thank you. Any other comments or questions? Then good night; thank you for coming; we appreciate the opportunity to have been here. Good night.

(Whereupon, the meeting was concluded.)

5.3.9 New Orleans Public Meeting Transcript, December 12, 2006

COASTAL PROTECTION AND RESTORATION AUTHORITY

INTEGRATED PLANNING TEAM

NEW ORLEANS PUBLIC MEETING

HELD ON DECEMBER 12, 2006

AT THE UNIVERSITY OF NEW ORLEANS

LINDY C. BOGGS

INTERNATIONAL CONFERENCE CENTER

2045 LAKESHORE DRIVE

NEW ORLEANS, LOUISIANA

PANEL MEMBERS:

Jon Porthouse, CPRA/IPT

Larry Ardoin, CPRA/IPT

Oneal Malbrough, Shaw

Robert Tisdale, BCG

Rickey Brouillette, CPRA/IPT

Tim Axtman, USACE

Andrew Beall, CPRA/IPT

Jean Cowan, CPRA/IPT

Michele Deshotels

David Dodgen

REPORTED BY:

Jill Freeman, RPR, RMR
Certified Court Reporter

MR. PORTHOUSE:

Good evening. If you don't mind, we are trying to wait a little while. I know it's a little foggy out. We tried to wait a little bit. It looks like most of the people in the parking lot have made it into the building.

For those of you who don't know me, my name is Jon Porthouse with the CPRA planning team, and I apologize to you, but Michelle Deshotels will be running a little bit late tonight. Before we get started, just a few logistics. We do have comment cards out at the front desk. They look something like this (indicating).

If you would like to make a comment later into the record, please make sure you fill this out and hand it in to someone at the front desk or someone down at the table. We will be using these to -- to get people's comments first off; and then if you don't fill a comment card out, once we run through the comment cards, we'll go ahead, and anybody else who wants to come back up to the mic. or did not fill out a

comment card, we'll go ahead and call you up.

So before we start, I do want to introduce the panel we have before you. For those of you who were here on the 29th, this is, obviously, a different panel. This is the technical team that put together the plan you are about to see.

Starting from my right, we have Mr. Oneal Malbrough from Shaw; Mr. Robert Tisdale from Brown Cunningham Gannuch; and then we have Rickey Brouillette from the CPRA Integrated Planning Team; one of our partners, Mr. Tim Axtman from the Corps of Engineers, New Orleans District; Andrew Beall from the CPRA Integrated Planning Team; Miss Jean Cowan; and Mr. Larry Ardoin. And, again, Michelle Deshotels, as a lot of you know, she'll be in here a little bit later, and hopefully by the end of this presentation, I'll be able to hand the mic. off to her.

But to get started, what we are here to talk about tonight, and many of you have seen this before, what we want to get

across is the -- the Master Plan that you have before you. We want to talk about how that relates to other ongoing planning efforts. What is the Master Plan really trying to accomplish in terms of objectives? What does it represent? What does this nice, colorful booklet that you have before you really mean in relation to where we are now and where we are going to be by the time we submit it to the legislature and start building projects?

We also want to talk about, obviously, what those projects are; what those colorful maps in the booklets are; what -- what do those signify? We also want to touch upon some of the more nebulous areas of this plan, but we know there are things other than which projects we decide to build which can affect how quickly we implement these projects, and we want to touch on those. We don't have a lot of detail on them, but we want to bring them to people's attention.

And also what comes next? A little -- very quickly, what are we going to

be doing over the next few months to complete this plan in the implementation stages? So very quickly how does this relate to ongoing planning efforts? As you know, the Corps of Engineers has been directed by the U.S. Congress to develop a comprehensive protection and restoration plan for all of coastal Louisiana, not just the New Orleans area.

They are actively working on that plan. We are partnered with them. We are working very closely together to make sure that these plans that we are talking about essentially end up being the same plan. The difference between the Corps' plan and the plan we are here to talk about tonight, the CPRA Master Plan, is that the Corps of Engineers, as we understand right now, will be working to implement their plan under existing federal guidelines, existing federal legislation and policies to put projects on the ground.

Whereas we at the CPRA have been specifically directed by Act 8 not to stop and just listing the projects and using

(sic) business as usual. We have been specifically directed to look at laws and policies and regulations to see what's holding us up, what's keeping us from putting these projects on the ground quickly and work with those to make sure that whatever we decide needs to be built gets built quickly and aren't -- and aren't significantly delayed.

And, again, since both of those plans are going to end up being essentially the same in terms of which projects we choose to build, they are both being used as input for the Louisiana Recovery Authority as they define -- as they work with the public to define future possible redevelopment scenarios for South Louisiana. Things like: How do we redevelop? Do we redevelop these areas in a more densely populated setting with better transportation? Things like education, all those kinds of issues.

The Louisiana Recovery Authority uses the basic protection restoration plans and builds their redevelopment scenarios off

of those.

All three of these efforts we have been putting a very high energy level into maintaining connection between them. They are intended to be coordinated. They are intended to work together and support each other. So I invite any of you to call us on it if it's not working because if it's not working, if these are not coordinated, we are not being successful. So please let us know how we are doing on that.

So what are we going to achieve with the Master Plan? Just a few bits and pieces that we have learned over the last 40 years of trying to provide hurricane protection for the last 15, 16 years of a sustained restoration effort.

Right out of Act 8, we are trying to achieve an integration of hurricane protection and coastal restoration. We no longer have these programs being implemented by the same entity, the State of Louisiana, with two different departments working separately and not talking to each other.

We do know that a healthy

landscape is absolutely essential not only for providing the ecosystem services we typically talk about for the restoration program, the fisheries, the water quality, the bird habitat, those issues, but it's absolutely critical to provide for a viable flood protection system. If you don't have a healthy landscape that continues to pervade, you cannot provide a viable flood protection system.

So these hurricane protection statutes that we'll talk about are based on the -- on the premise that we will have a healthy landscape out there, and it does rely very heavily on the multiple lines of defense. And I see Mr. John Mopez (assumed spelling) in the audience from the Lake Pontchartrain Basin Foundation. I always like to give him credit because this actually stuck. This is what people understand. We are not talking but just levees or just coastal restoration, but how does it all work together to provide a sustainable, safe South Louisiana?

And -- and also a very explicit

recognition that is not just about government agencies, scientists, engineers, and academics putting together a plan. It's about the public and state board as well. We can put together the best technical plan, but if it doesn't meet the needs of the people, it's not going to go anywhere, and we understand that, and we recognize that, and we are here to work with the public, with the stakeholders to make this plan the best it can be for everybody.

We have also learned some very specific things about flood protection and restoration, and y'all know anything we do to restore the system or build hurricane protection projects will alter the hydrology of the system. If you build new land, it changes the way the water moves. If you put a diversion in, it changes what kinds of water and salinity patterns you have out there.

If you build a flood protection system, it can potentially alter the way the water moves out there, but that doesn't necessarily have to be a bad thing. We also

know that we cannot possibly hope to achieve our objectives if we keep going along with business as usual. We can't fix the problem unless we actually change the system, change how we are managing the coastal area.

And, lastly, we do recognize that we humans, we are very adaptable, especially our communities are very adaptable. We know that if we are going to adapt, if we are going to continue to exist in coastal Louisiana as coastal Louisiana culture, we have to make sure that the communities know what we are doing well in advance; they know what's coming. We have to make sure of the basic services, schools, churches, water, power, those kinds of things are available to communities so they can continue to exist.

We also know from very hard lessons that we have learned that our first line of protection out here should not be our last line of defense. If we are fighting the Gulf of Mexico, we don't want to be fighting it in people's backyards.

We also know the longer and more

complex systems are more at risk of failure. It's simple. If you have a longer levee, there are more places where it could fail, even with -- with your best engineering. More floodgates. The more things you have to move make it more at risk for something going wrong.

So we have to try to simplify and shorten these systems wherever we can. We absolutely must give water room to move. If we build levees or anything else, the water just doesn't disappear when the storm surge moves onshore. It does pile up against the levee. If it gets too high, it goes over the top of the levee, or it actually just gets redirected somewhere else. We can't protect one area with the levee and send the water somewhere else. We have to track where that water moves.

And as I mentioned, we can recognize if we alter hydrology for building of any these projects, we can turn those into opportunities. If we do alter the way water moves, we have to recognize that we have changed the way water moves and make

sure we have accounted for all the changes. Accentuate the positive where we can to make sure that anything we have done is used to our maximum advantage.

And we have developed a number of program principles and objectives. Our principles are built -- built on the LCA program, basically defining what kind of program we are looking to implement out there. We are not going to go into those in too much detail, but it's all available in other documents on the Internet specifically, and we'll get to the web site at the end of the presentation.

But, specifically, what are the objectives? What are we trying to achieve out there? We started, for those of you who are familiar with the restoration program, with our Louisiana coastal area coast-wide planning objectives. We modified those to include hurricane protection objectives. We rationalized them with each other to make sure that what we were doing wasn't conflicting or wasn't the wrong thing to do. We made sure that they were still the right

thing to do. We simplified the objectives. We now have four coast-wide planning objectives.

Very importantly, we recognize that we cannot possibly hope to achieve maximum achievement of every one of these four objects. What we are trying to do is achieve a balance between these four objectives.

The four objectives are simply hurricane protection. In this case, we are talking about hurricane protection to a minimum standard of protecting from storms that could occur on average once in a hundred years and one percent chance of occurring in every single year. And we can do that in a number of ways. As you all know, there are numbers that we employ from the typical levee scenario to elevated structures.

In some cases, combinations of levee systems and elevated structures can provide a level of protection which will allow you to obtain insurance and live where you want to live, and those are the kinds of

situations we are looking to achieve.

We also have a sustainable ecosystem. One of the ones we are -- the things we have been talking about for a number of years with the restoration program, we have altered the process. We have altered how water moves around, how sediment moves around, and that's what caused the landscape to fall apart. We have got to find a way to restore those linkages to the river and to areas where we have natural movement of water and natural movement of sediment; such as in this case, the Caernarvon Diversion, the prime example of putting the river back into the wetlands. And what you can see is a nice layer of mineral sediment on top of previously settled starved organic material.

So river diversions work to build marsh, to sustain marsh that's out there, and to make it more resistant to damage under storm conditions.

We also have to recognize that hurricane protection and land sustainability is not (inaudible). We have a variety of

activities that we rely on in coastal zoning that helps us sustain our culture; anywhere from shrimping to alligator harvesting to rice farm to oyster and crawfish and ducks. We have a lot of habitats out there. We use freshwater. We use saltwater. We have to make sure that these activities can occur on a coast-wide basis.

Things may shift around. You may have to go somewhere else to catch your shrimp, but coast-wide all of these resources and activities should be possible.

And, lastly, our objective for maintaining -- or sustaining our heritage in coastal Louisiana, specifically recognizing the ties of our communities to the landscape. If we live in coastal Louisiana, we live here because of what's available to us in the natural system, and that linkage between the communities and the landscapes must be recognized and must be preserved as we implement this plan. Otherwise, it will not be successful.

And you see just a few examples of our rich history between our architecture,

our rich history with the Civil War and crabbing and oyster farming. These things must be preserved as we move forward.

So what are we talking about right now? We are talking about a conceptual vision for the future of coastal Louisiana. That booklet you have in there is the simplest statement of what we are hoping, what we are trying to achieve with this plan. It takes our restoration measures and our protection measures and puts them on the same map and articulates how they are supposed to work together and to provide for the ecosystem and for hurricane protection for our communities.

It does seek to strive balance, being four objectives we just went through. Further work is needed to make sure that we maintain the balance we are seeking to achieve; and especially as we move into the implementation of these projects, it must take constant monitoring to make sure that implementation remains balanced and focused on these objectives.

And it is the starting point for

public discussion. We have been working on this plan basically since April. We have been talking to scientists, engineers. We have been talking to people from around the world, stakeholders, local government; but the one thing that's been missing is true public interaction. We have not come and talked to the public as a whole, and that's what we are doing tonight.

We have taken all the existing plans and processes that have occurred over the last years and decades. We have taken them back. We have analyzed them. We have defined how we see them working together, and we have put that down as a starting point for discussion with the public, and that's why we are here tonight.

So to give you a little break so you don't have to listen to me the whole time, we are going to break this presentation up. Larry Ardoin will be giving a presentation on actually the features of the plan. He is going to run through the restoration protection of the Delta and then the Chenier Plain, and then I

hope I'm going to turn it over to Michele, as she nods at me, and she'll take over from here.

MR. ARDOIN:

Okay. As we go over these components of this plan, one thing I want to emphasize is that we have not set the priorities of this plan yet. We are not to the point where we are going to start the sequences. I want to make that clear before we started to vote on the plan.

Stabilizing the landscape. You heard Jon mention that several times, and we are going to continue to work on it. For presentation purposes, for this presentation, we are going to work inwards from the coast; but, again, it doesn't mean that's how we are prioritizing the projects. It just makes it easier to understand the plan instead of putting all the measures on one plan.

We are going to start, again, at the coastal area, with shorelines and ridges. The shorelines and ridges are the skeleton of the system. We feel like for

any successful plan, we have to stabilize the very elements. We have interior ridges. These are historical, natural ridges that we feel like we need to go back and restore them. They provide a level of surge protection. And we have the shoreline protection depicted in here.

We want to make sure that existing shorelines cease the -- the erosion. We want to stop the erosion from what we are having now, and it's something that we feel like it must be done as part of the critical part of this plan. Not only are these features good for hurricane protection, but they are critical. They are unique habitats to the environment out there. There is just some species that need higher elevations to be sustained in marsh. So, again, we have to stabilize the skeleton of our coastline before we go to the rest of the plain.

Our next feature I want to talk about is the navigation channels. Navigation channels have both been a problem, but they can also be an opportunity. Stabilizing the banks of these

channels is going to be a key part of our plan. We no longer want to let these channels, these navigation channels, continue to roll and widen and take up the marshland.

For example, we have the Gulf Intracoastal Waterway, the Houma Navigation Canal, and the MRGO channel depicted on this map. And MRGO has some specific slides we'll talk about as we get into the presentation.

But as I said, these can also be opportunities, not just the navigation, but also to move freshwaters through the coast and get them to areas that we have problems getting freshwater into. This feature as depicted on this slide, it has little arrows they are scattered throughout the river system. It's one of the things that we know that we can introduce freshwater to the existing marshes to sustain the marshes.

These diversions and the size of these diversions are not really big enough to build any substantial marsh in, but they are critical to sustain what we have there

now. We have some examples of that in existence that are probably not performing to a level that we think we need to. We need to modify the Davis Pond. We need to get the northern (inaudible), the other siphons, the other stuff that has been built and proposed to be built, and we are going to in this plan propose that we make the most -- most efficient use of these things.

But, again, these projects can be very effective in preserving the marsh and preserving the landscape, but they are not going to build enough significant areas of the new land, and to do that we have some other measures that we are proposing.

Starting on this slide -- and it may be a little hard to see -- we have areas depicted in green, shades of green throughout the coastline. These are areas that we feel like we can build marsh mechanically using dredging from the river. We want to make beneficial use of the Corps' dredging operations, and we also are going to pump sediments. Not only from the rivers, but in areas around Terrebonne

Parish, we'll go offshore to get the existing sand sediments that's offshore and pump them through pipeline transport into critical areas of marsh.

This is some things that can be done immediately. We can convert open water to wetlands. We want to stabilize the fragment -- fragmented wetlands that are falling apart now.

But as part of this, we understand and we realize that these freshwater diversions, again, will be critical to make sure that these areas that we pump sand into are sustained. We can't just pump them there and forget about them. So all these freshwater diversions we have will be used in conjunction with each other. We are not going to just open them and forget about them. We are going to make sure that they are modified and operated as a system of diversions and not individually or independently.

In some areas of the coast, and especially in Terrebonne, the central wetland areas, it is just too far from the

rivers to get them there efficiently. That's what we are proposing to use these for and make the most sufficient use of the GIWW and these other navigation channels and move the freshwater and make the most opportunities we have.

Once we stabilize these banks, the small bank, whatever process we can come up and design, then we can use these channels to move freshwater into areas that are not easily done from the river's direction. But, again, even pumping sediment through pipelines, it's probably not going to be for a long time sustained -- long time -- long-term hundred years sustainable coast. To do that, we are proposing some major land building diversions using the Mississippi River.

This option would basically turn the river loose; get it back to the natural conditions as much as possible. This is a long-term solution; that we really feel like it's necessary as part of the plan. At this point, what we are depicting on this map is very conceptual. The locations have

not been set, nor the size of them, nor the design of them.

There's been studies and will continue to be studies. We know there is a lot of issues, potential issues, that we have to resolve before we can just low cut the river. We have issues with navigation. We have to make sure that we maintain the navigation of the Mississippi River. It's critical to this nation. It's critical to the nation that this navigation system remain as it is.

We also recognize that when you start moving this much freshwater into the marshes, the same marshes now, that the salinities will change, the species will change, and there will be some impacts from that, and we'll have to work through that as part of implementation of this land during conversions.

But, again, before I go on to more details and flood protection, I want to emphasize all of these land diversions we have now is depicted on these slides of hurricane protection, and they are all

important to stop the surge, but they are also all important all the economical -- not economical. Ecological reasons that we have in the past. We are not giving up on the FCA plan. All those reasons that we have for doing the FCA are still here, but these are three or four areas that feel like will provide additional surge protection.

MRGO. MRGO has been studied and talked about for many years. We have had legislation -- what's that? Go back one. I missed it.

What we are proposing for MRGO is a total closure of MRGO. We have had the governor's (inaudible) legislation that support the parish. We have a consensus among the state that will make recommendations to the Corps for the Federal government for the closure of the MRGO and Bayou La Loutre ridge. We feel like this is a critical part of this plan. We'll build some type of structure in MRGO here. We'll maintain the existing channel. We are not going to fill it in. We are not going to try to pump sediment and fill in the full channel.

We want to use river diversions in the bottom area, get freshwater into the MRGO channel, and from there we can divert freshwater into these critical marsh areas. We need to take advantage of the channel that's there now and make the best use of it that we can.

Another feature of MRGO is we want to stabilize these -- these banks again. There is already some critical projects planned. We are going to line rocks -- use rocks and line the banks of this channel and make sure that we don't lose this land between MRGO and Lake Borgne.

And in doing so, again, the state had recommended that this lock -- I shouldn't say lock. Most people are urging the Corps to expedite the project as quickly as we can so that the navigation interests that's in the -- that you can see of MRGO we can still use the navigation for the waterway.

No one talked about hurricane protection from this region of the state. The first line -- and hopefully you can see

it from where you're sitting -- shows the existing levees systems. We have levees that were built along the Atchafalaya River for Atchafalaya River flood protection and the Mississippi River levee as part of the MRT project, which are both authorized under MRT. And then we have about five or six individually authorized hurricane protection levee systems. This is Golden Meadow. We have Venice, Lake Pontchartrain vicinity, and the Westbank vicinity. We have several hurricane projects that were authorized. They work independently. And in our plan now, we are proposing -- and we want to make all these work as a system.

Also shown on this map is this line. This line is not existing now. It's the Morganza to the gulf alignment. It is a project. This has gone through a feasibility study. It's been with the chief engineer's report for six years for authorization. It was an order in this morning's paper. It says how close to being a reality this project was authorized.

So we are showing this on this map

as an existing alignment. And the reason we are doing that is because this alignment has gone through the process. It has gone through DIS system, and this alignment has been set, and we feel like it's something that the state will support as it is.

To complement these existing levees and assuming (inaudible) our proposed levee systems. We have proposed levees going across the state to provide comprehensive hurricane protection system. Instead of the piecemeal system we have today, we need to tie them together to make sure we stop the storm surge, and I believe that we see those a little better as we go on.

This is the total system. What we are showing on this map on this presentation is the different levels of protection that we are proposing. The areas with the purple levees are areas that we feel like we have enough economic, enough importance to the state and to the nation that we need to provide a 500-year level of protection, or a 0.2 percent level of occurrence.

The levees in red are what we are proposing as 100-year levee protection. These levees -- and I'll show more detail -- is a -- we haven't set them. They'll be at least a hundred-year levee protection, maybe higher. Whatever it takes to provide 500-year levee protection to the Greater New Orleans areas is what we'll design these levees for.

And, again, the levees in blue, the ones that are remaining, are what we are at this point saying that we feel like they are -- the existing level protection is at.

Moving on a little more detail, the Pontchartrain Barrier Plan, we show three potential alignments. We have these three lines. The anterior line that follows nearly the existing levees there. It still has a little bit of a final (inaudible). We have a second alignment, which is, again, it's off alignment. We don't propose to build all three of them. This one will follow Lake Borgne, and then we have one which will cut across Lake Borgne, and all three of them will cross the land bridge and

tie into (inaudible) and the Pearl River area.

These are still conceptual, very much conceptual alignments. The alignments footprints have not been set. Again, we don't know exactly how high they need to be. It's going to come from the Corps (inaudible) and the Corps results. One of the features all three of these have, we believe we can construct these levees and build them and design them to allow a limited amount of overtopping. These don't have to be a wall 40 feet high to stop all the surge from getting into the lake.

If designed properly, we can allow a limited amount of water surge into the lake and use the existing line to stop the surge without having to go in and reconstruct or reconfigure the existing levees. And then with the flow that came across the New Orleans land bridge with the existing levees, we believe we can get a 500-year level protection for New Orleans.

Again, once we build a levee to close off this system with the water in the

lake and potential overtopping, it's an area here on the west part of Lake Pontchartrain that may need a levee. That's on a feasibility study now. This is the west Lake Pontchartrain levee protection system that we are recommending as a hundred-year levee protection.

Across the river in the Barataria and Plaquemines Parish basin, the existing Westbank hurricane protection system -- and this configuration is currently authorized -- is being arranged up to a hundred-year protection by the Corps of Engineers now. We feel like the assets in this area, the Westbank area, deserve a higher level of protection in the hundred-year that we are proposing as a minimum for 500-year protection for all of the Greater New Orleans area.

And the only way that we -- or the most feasible way to achieve this high level of protection is to build a barrier across the Barataria Basin. This is the alignment that's in Donaldsonville to the gulf feasibility study. This is the GIWW line

and basically -- basically follows GIWW. We have a ring levee around Lafitte area.

And, again, this will be a hundred-year protection for the interior part of the basin. With this levee in conjunction with the existing levees will provide the Westbank a 500-year level protection.

This alignment that we are proposing may be one of the most controversial parts of the plan. But one thing has been clear from all of our public discussion. That upper basin -- we have a strong consensus. Everyone we talk to wants to maintain this upper basin, this freshwater basin. And we feel like the best opportunity to do that is to provide a leaky levee to the system, but open it to allow water to go back and forth so we can maintain and control this upper basin.

Many stakeholders, resource agencies, and other people prefer a northern (inaudible) along Highway 90. The reason that we have chosen this one, again, is to provide multiple lines of defenses for this

area in here; that we feel like it's the most feasible way to provide this protection for the Westbank area.

Moving on farther west to the Terrebonne, Atchafalaya Delta. The existing Larose and Golden Meadow levee here --

MR. PORTHOUSE:

Larry, can you go back and do Plaquemines Parish.

MR. ARDOIN:

Okay. Sorry about that.

Plaquemines Parish. We have -- again, we'll extend our 500-year protection levee from here all the way down and make -- make sure we have the St. Bernard Parish, most of that area and all under 500-year protection. We have on the Eastbank the hundred-year level protection; and raise the Mississippi River levees up as necessary to make sure they don't overtop on the riverside.

On the Westbank, we will have a hundred-year protection level down below Belle Chasse area to pick up the industry areas and the highest level of assets that

the parish has.

Below that on both sides of the river, we are suggesting at this point to maintain existing level of levee protection. There is some debate about whether these levees can be certified at the existing level or not, and that's one of the parts of the plans that we are still open for discussion, and we had meetings this morning in Plaquemines Parish with quite a few people there. And, as well, we have the same level of protection for Grand Isle.

The Terrebonne Parish, Atchafalaya Delta area, we again -- as I said earlier, we are proposing and recommending the Morganza to the gulf alignment and tie into Larose, Golden Meadow, and Donaldsonville (inaudible) and make a continuous line of the levees. From this point, we are going to go across the state barrier plan and the federal barrier plan all the way to the existing levees in the Morgan City area.

What this map depicts, we have a -- a levee here that's been proposed for our consideration to eliminate this funnel

area, and we want to look at this and do the further study on it as we go along with this study.

In addition to Houma and Thibodaux and the metropolitan area, there is enough assets from all indication and everything that we have used for assets that this area deserves and needs the same level of protection that the Westbank, Greater New Orleans area, the same level of protection as Lafayette and Lake Charles will get.

In order to protect Houma and Thibodaux and this area, we feel the best opportunity is to come in inside of this Morganza gulf alignment somewhere south of Houma. Again, this alignment is not set. It's proposed as depicted here on the GIWW and drop down south of the industrial area of Houma; make sure that we pick up all the critical infrastructure that's on that part.

And in order to provide Houma and Thibodaux with this 500-year level protection, this levee will have to be raised up higher so we keep the surge from coming back over. And Morgan City and the

Berwick area, the existing levees that were constructed for the Atchafalaya River and backwater area appears to be from -- these levees appear to be high enough now to stop many storm surges. The design elevation for the river floodings is higher than what we are seeing on certain models at the initial (inaudible). On this map, we are showing that you need these existing levees.

And to build on these levee ideas, we have some -- once all this protection system here is in place, our barrier islands is the first line of protection, restoring the marsh and -- and ridge lines and building the levees, there will still be risks remaining.

We know that in past experience -- and these last storms tell us that there is still some overtopping potential that we have to manage for. In order to do this, to increase our protection, we have shown on this slide the yellow lines are highways that we feel like are critical. Some of them are outside the levee protection area. Well, we poke holes in them. It's reinforce

these highways, raise them up in some areas, and in some instances make sure that they are adequate for evacuation routes; but not only for people to get out, but they have to be maintained well enough and armored well enough to ensure that when the storms are gone, people can get back into their homes and start rebuilding their community.

We also are going to encourage and emphasize that everyone, the people who live both inside the levee protection and who live outside the levee protection, the people who are inside the hundred-year or 500-year protection all needs to maintain flood insurance. We have seen far too well what happened to whole communities if you don't have flood insurance inside the levees.

Not only is flood insurance critical for surge but for interior drainage purposes. Flood insurance is a part of this plan that we are strongly emphasizing. And, also, there are some areas that elevation houses will be necessary to get the 100-year protection. Whether you are outside of it

or inside the levees that maybe overtop with 100-year flood protection, we still feel like elevating of these structures are a critical element of the plan.

Another concept that we have learned is important, and this one, again, is the Bring New Orleans Back Commission has this recommendation as the compartmentalized areas inside of cities, inside the levee protection. And this is, again, a concept that was used in the Netherlands and (inaudible) recommend strongly.

What this will do if we have a failure on any one of these levees and they get breached, only one area will flood and not the whole city. We want to compartment-alize the city as much as we can to minimize the damage in cases of breaching, and this slide kind of depicts this.

This is the 17th Street canal where the break was on this side. This whole part of the city flooded. Jefferson Parish had some flooding but not nearly to the extent or to the damages. This is the example of compartmentalization can work and

will work.

And, again, we -- we go back to our final map on this Delta plain. A critical component piece of this will be managing the water inside and outside of the levee system. The areas that are wetlands now need to remain wetlands. There are areas -- Cypress swamp areas that are drowning now that we need to improve the drainage on.

We can't use these river diversions into this area unless we can provide better access and make sure that the interior drainage component of this plan is built in conjunction with the levees. And, again, with this system and with the intracoastal waterways that we are proposing, we feel like we can move this water westward and get it into the Terrebonne basin areas, where we don't have that opportunity now.

And moving on to the Chenier Plain, we are going a little faster because we use the same concepts of multiple lines of defense and sustaining our existing

coastline. Our first feature that we are pointing out, again, is sustaining and stabilizing the shorelines.

We have shorelines depicted along the coastline and the interior lakes. We are also looking at protecting interior lakes of Cameron, of Calcasieu Lake, and Sabine Lake that are not shown on this plan. So similar to the other side of the state, this will be the first line of defense.

What isn't available in this region, the Chenier region, is the Mississippi River. For that reason, our sustainability and our plans is a little bit different from what we have on the other side.

What we are here -- showing here is moving to the forefront the highway system. Not only are they critical for evacuation and return; but in this part of the state, we feel like by raising Highway 82 and Highway 27, elevating those roads up to elevations of as much as plus ten or more, whatever we feel comfortable with, this will become the second line of surge

defense. So these roads here are critical not only for evacuation, like I said, but also for storm surge.

Moving forward to the inland, we are going to take advantage, again, of the navigation channels that are here. We have proposals before Congress now to deepen this channel and to take all of this dredge and put it on the bank for flood protection and surge protection. We will extend that all the way across the state, again, as a third line of protection.

And just like on the other side of the state, we -- there is some opportunities here to take advantage of the -- the dredge from the surge of the Calcasieu River and Mermentau River. When there is dredging, we want to make use of the dredging material and get the sediment and pipeline and pumped to where we need it. Also come off of some of these shores sand areas offshore and pump them into critical areas to create marsh.

An important feature of this area of the state is the freshwater management and sediment management. We have areas

here, again, with opportunity to take water from the Atchafalaya River to make some protection that we can move water westward. We can also move water into the Terrebonne Basin area using the navigation channels.

We have an area of the state that's been identified as the Mermentau Basin, the freshwater basin. This basin is critical for this community for irrigation purposes for the whole agricultural community, and what we are showing on this slide and what we are proposing is to take advantage of whatever water falls in this drainage basin to somehow maximize the intention of the water until we can get it and use it during the dry periods.

Again, this is a conceptual plan. We haven't worked out the details. We feel like it's important to take advantage of what freshwater is in the area because we have saltwater intrusion coming up into it and years of drought. We just don't have enough freshwater in this basin.

The hurricane protection for this area will be similar to what we saw before.

Starting in the Morgan City/Berwick area, we are going to tie into the existing levees. There is some levee alignments here.

Again, we identified Lafayette, Abbeville, and New Iberia area as a concentrated area of assets that deserve a higher level of protection. The thing that we don't have in this region of the state that we have in other regions is existing studies, existing levee systems. So we are going to have to spend more time analyzing and determining just what we need.

We know we want to protect this area for a higher level. We are not sure how high this levee needs to be to get there. What we are depicting now is a -- a 500-year, 0.2 percent levee. It may not need to be that high in the final analysis. We will build whatever it takes, but it may not be a very tall levee like you see in the southeast part of the state.

The Lake Charles area is another area, heavy industrial, heavy populated area, and we feel like it needs to be protected with 500-year level protection.

Between these two areas, between Lake Charles and Lafayette, we'll have a rural agricultural community that's widely dispersed. There is a lot of people living here, but they don't live in the isolated, concentrated communities. They are widely dispersed.

We will analyze the protection that we'll get from the shorelines, from the highways, and from the navigation channels; and if we still have a need for a hundred-year protection, we'll provide a levee. That's what we are showing here. A levee along the Gulf Intracoastal Waterway (inaudible) protection of these communities.

And with that, Michele Deshotels -- we'll let Michele come up and close out this presentation and show where we go from here.

MS. DESHOTELS:

What are the potential policy, legislative, or institutional issues that will affect implementation of the plan? Well, we have a good many. Land use, planning, and zoning. What areas should

stay wet? There are certain places that people should live, and there are areas that we should not develop. We are aware of this, and we are aware that with the issue of levees that you cannot build up to the edge of the levee.

So there is some very important land use, planning, and zoning issues related to the plan. And some of those things that it's important that we encourage on a state level, and there are other things that need to be encouraged on a local level.

There are a lot of landowner concerns out there. Our partnership with landowners, they are concerned about land that they have been stewards of for a long period of time. There are mineral rights issues out there, there are easement issues out there, and there are issues out there with expropriation for property that is needed for either restoration or levees.

We have the right in this state to expropriate for levees. We do not have that right at this time to expropriate for restoration projects, and we recognize that

our restoration projects are just as essential to our future well-being as our protection levee projects are.

Adaptive management. I was earlier at the Restore America's Estuary Conference that's going on in downtown New Orleans this weekend, an international conference filled with experts who are interested in the future of estuary systems, not just here in the Unites States, but everywhere; and adaptive management is something that I heard over and over and over again, which essentially is a very simple concept, which means that we have to look at what we are doing and address it as we go along.

Science improves, technology improves, we learn more, there are uncertainties out there, and we need to adjust to situations as we go forward and take the best of what we know and continue to make it better and be cognizant of this in our approach.

The federal state partnership. However much the money stream is that we

have in this state, it will not be enough to build all that we need to build. So we are very aware that some of this is going to have to be generated at the federal level. So I'm very happy to see our partners with the Corps sitting with us this evening.

Consistency. All that needs to be done out there needs to be consistent with this plan. The intention of our legislature when they instituted this was that this should be the guidance for how we go in the future. And, therefore, the other projects that are out there need to be consistent with what we are doing here. It does not mean that we dictate what those projects are, but only that we say that, yes, this is a good project. It fits into where we are going.

Priority, the item that we are all interested in. Once the sequencing for priority is established, once the money stream is established, we need to know that projects will go when they are supposed to go and that the decision will not be made to pull that project unless that decision is

based on the best of scientific and engineering and not on political whim.

This plan is for our future, and the priority is just that. It's a priority. What comes next? Public discussion. We have had stakeholder meeting after stakeholder meeting after stakeholder meeting, and many, many people have participated in that.

This is the beginning of an intensive period of public discussion. The CPRA was kind enough two weeks ago to introduce this plan to the public so that people would know that this was out there. This week -- we are meeting yesterday in Houma, this morning in Plaquemines Parish, this afternoon and this evening here, tomorrow in Lake Charles, Thursday in -- on the Northshore, and Friday in Abbeville.

There will continue to be time for people to write us letters, call us, meet with us, e-mail us until January 5th. You can still write after that. But that January 5th date is the date that we then take all that we have heard during this

month of discussion and incorporate it into our next rendition of the plan.

We hope to have a complete draft of our plan in February utilizing all that we have heard. It doesn't mean that everything that everyone wants is going to wind up in the plan, but it does mean that we are going to listen to what you say and that everything will be considered and that the plan is flexible enough to accommodate much of these concerns out here.

We, obviously, have to refine our measures, refine them more fully. That is ongoing. The reason for that is that we are developing cost estimates, and so we are getting a better idea of what is entailed in each of those concepts.

For example, Larry was talking earlier about the -- a barrier across the New Orleans land bridge. And for something like that to work, we are, obviously, aware that it has to be open; that there are tidal flows that are out there that has to be maintained, navigation that has to be maintained, and that it is likely to be

something that only closes in the event of a necessity of storm approach, and so all of that means cost. And as we go through -- obviously, it increases with the more elaborate these openings and closures are.

And so we are detailing out some of these projects. When I say "detailing out," it's detailing out still in a conceptual manner. These are not being designed. They are being detailed enough for us to get a better handle on what a realistic cost estimate is, and hopefully we'll have some of that in February, a complete draft.

As I said earlier, we need to develop an implementation sequencing. That's, obviously, of interest to all of us. We need to modify the plan based on analyses and inputs. We are still receiving input from the Corps. The Corps has been a wonderful partner. They are doing a great deal of modeling that we could not afford to do. They are doing a great deal of modeling that has never been done before ever, cutting-edge work; but some of that work requires

very, very intensive computer time. It's tying up super computers to be accomplished. And we are waiting on the results, and we need those additional results before we can finalize our plan and before we can even go, really, to the next draft because we are -- we are waiting on that.

The complete draft will be available in February, again, for public review and comment. And we hope to have an April bill to the Louisiana legislature.

As I said, we continue to have public meetings. This preliminary draft is available in all parish libraries south of I-10 this week and very shortly will be available in all parish libraries north of I-10 across our state. The appendixes are on-line. You can go to our web site at www.louisianacoastalplanning.org and download, either high speed or low speed, if you are interested in the details. We accept e-mails at this time. Our other contact information is available on that site as well, including mailing address and telephone number.

And now we are going to just go straight into asking for comments and information, and I'm going to try something that I don't know if it's possible. I'm going to walk down here so I'm not way up there, and the reason I'm looking up is to see if we are going to have terribly screechy noises. I think it's okay. Okay. Well, maybe not so. I'll stay over on this side of the room.

We are recording everything tonight. So I will ask that when I call your name if you'll come up to the mic., please have a mic. over here and so that we can get all of your comments for the record. John Tesvich.

I'm going to ask that everyone -- to please limit their comments to about five minutes. We have more than ten cards. So we'll be here at least an hour and a little over that if that happens. Good evening.

MR. TESVICH:

Good evening. Thank you, members of the panel and committee. My name is John Tesvich. I am an oysterman, a lifelong

resident of Plaquemines Parish. I live and work in Plaquemines Parish, and I want to say that I really appreciate what you are doing for -- for us, the public, and the community providing this input.

I was at the Plaquemines meeting this morning, and I think that that was very good, and I was at the workshop, and -- and I really appreciate your -- your taking the time to speak with -- with the -- with the public.

I read the Master Plan. I've got all their appendices, and I read several of them. And -- and I want to say that I have some general issues, and I have some specific things I wanted to comment about.

Number one, in Plaquemines -- I don't know if you attended that meeting and know that feeling, but Plaquemines feels left out and feel like we got the short end of the stick when it comes to this Master Plan.

As a master comprehensive plan, we feel that our parish that had 100-year levees for, you know, any number of decades,

now we're being singled out as not -- not meeting the level that the -- most of the rest of the state is getting, and we feel that it's being based on a number of residents, number of homes, assets, and things like that.

And some of the comments that -- that we heard this morning, and I have to agree, that our parish has contributed so much as far as oil and mineral resources to this state and to this country. And I think as a Plaqueminian, as a resident of Plaquemines, I would use the same argument that the State of Louisiana and our governor is using to sell this proposal to the country.

Look at what Louisiana has done for the country. Don't just look at the four million people we have compared to California or Florida. We don't have the votes and the people, but look at what we have contributed. And that's Plaquemines Parish, I think we have contributed a lot and we have suffered a lot of the damages for this exploration of oil and for the

continued production of oil, and that's where we see a lot of our land laws, and it's -- undoubtedly that -- that production is the cause that our parish is paid, and I think we have to take that into account in this Master Plan, not just the -- you know, so many assets, so many homes, and it doesn't measure up. So let's leave it out.

But that -- I don't necessarily feel that we necessarily need higher levees in Plaquemines Parish. I live in Plaquemines Parish. I have a home that's raised. Higher levees means when it does come over, it means more water; and then -- then, you know, I can't build high enough. You keep building the levees higher than my home, it doesn't work.

But what we do need, we do need -- we need barrier island restoration, and we need marsh creation to protect us so that our levees can hold. So that -- that is important. I think otherwise, then, we just need the higher levees like everybody else.

So another thing that's -- that's -- that bothers us is we have this

great river running right through the middle of Plaquemines Parish delivering millions of tons of sediment a year, and our -- our parish has wasted away. And why has it wasted away?

Some of the things are mentioned in the Master Plan I think, but I think some of the things -- one thing in particular has been left out, and that is the contribution of the jetty system on the river. The jetty system that was developed by Mr. Eads, who was a brilliant engineer -- and he solved a very pressing problem at that time, he did, and it worked.

But just like the MRGO, in the long range -- hasn't really benefited us in the long run. And I think if you look at the jetty system, it has robbed our coast from sediment that's the sediment that used to come out of the Mississippi River Delta, used to be transported along our seashores, along the gulf seashores, on the west side and on the east side, and we used to get the benefit of that from that -- from that sediment moving along the coast and feeding

into the marsh from the gulf. That used to be the normal transport. That is not mentioned in the Master Plan at all.

I think that is a natural phenomena of sediment flow in that area is east to west. It's very clear the jetty system is a significant issue. I think that has to be addressed. And, you know, maybe we need a new brilliant engineer like Mr. Eads to come up with a better idea than the jetty system. Maybe the jetty system has to go, but we do need navigation.

I'm not against maintaining a deep draft, but we need some real ingenuity there, and let's -- let's maybe break the jetties and find a better way to maintain the draft and maintain the ship traffic that we need.

Number -- another thing is the Chandeleur/Breton Island chain. That has been left out of the Master Plan. The -- if you look at the Chandeleur/Breton Island chain, it extends from the northern part of the -- of the state right at the Mississippi border. It comes almost all the way down to

the -- to the river delta.

It's a chain that -- that's broken up over the years. We have seen hurricanes devastated. We watched pictures of the devastation year -- hurricane to hurricane, but nobody is rebuilding it. And it's been fractionalized. That is our first line of defense.

In Plaquemines Parish -- if you are in St. Bernard Parish or Orleans Parish, your water from Katrina, from Hurricane Betsy, and from Camille came from the Eastbank. It came across the Chandeleur Sound, across the Chandeleur Islands and into your -- your respective parish.

If we don't have a -- that barrier island rebuilt, then our levee in Plaquemines Parish and St. Bernard Parish, you're exposed to the brunt of -- of the force of that surge. That should be part of the plan, and we need to have a six-foot dune there extending all the way down to the river.

So in conclusion in that -- and then in Plaquemines Parish, we need marsh.

We have the sediment in the river. We need marsh creation in our parish. If you look on the map, you will see the -- the green depictions. We don't have enough green-depicted areas in the parish. And we need that in order to survive. We need the marsh if we are not going to have the high levees.

And the only other thing quickly is the river diversion is -- whereas it's depicted on the map, it's just -- it's something that would be too much devastation in our -- in our estuaries on the east side and west side. The diversion of that magnitude would only work in the freshwater areas south of Venice, and there the sediment can be diverted and fed along the coast on both sides of the seashore. Otherwise, that's -- that's a no-go. It would -- it would devastate the industry, the whole seafood industry we have in the parishes and our culture and our reason for being there, in the first place.

MS. DESHOTELS:

Thank you.

MR. TESVICH:

Thank you.

MS. DESHOTELS:

And thank you for coming again this afternoon and this evening. Junior Rodriguez.

MR. RODRIGUEZ:

Junior Rodriguez, St. Bernard Parish resident, and I want to thank you gentlemen for the opportunity for us to come before you and make our statements, and I hope you not only hear but you listen. Because even though we may not be the experts that you are, some of us do have some information because of the fact that -- we may not be educated, but we lived through it, and we appreciate you listening to what we have to say.

With regard to the planning unit number one, St. Bernard Parish, our number one priority would be PD 1-12. Closure of the Mississippi River Gulf Outlet, the Mississippi River MRGO, and the Bayou La Loutre ridge. Plug, close, structure, I don't care what you call it, total closure.

Along with that would have be the

restoration of the Bayou La Loutre ridge. Gentlemen, we are going to have -- well, I need to take some of you on a field trip because you are kind of concerned that you didn't know they had a -- a canal down in the middle of that ridge. I'm sorry I didn't bring that to your attention. I thought you people would be -- intelligent as you are would know that that was the last -- Bayou Loutre was the last closure -- the last canal that was closed off with the Mississippi River. That was part of the overflow from the Mississippi River.

I'm sorry I didn't bring that, but I know it's very difficult for you all to understand sitting in an office looking at a map, and, you know, you have no idea what side the ridge is on or if it's on both sides. I fully take the responsibility for that because I didn't bring that to your attention.

Number two on that would be PD 1 and 1A. Raise St. Bernard 40 Arpent Levee System 17.5 and connect all the way through Verret to the existing Chalmette bank levee

system now.

Gentlemen, if you get these two levees in, St. Bernard residents and Orleans residents will be thoroughly protected, and there is some options that we could use -- discuss about not having, but I think the thing that we need to do is a lot of you all need to see what's going to happen when you close the MRGO at the Bayou La Loutre ridge because I don't think you can comprehend what's going to happen. And only after you -- it happens are you going to be able to understand what I have been trying to tell you, because I'm not a smart boy. I'm just a dumb country boy, and it's hard for me sometimes to explain to people because I'm really salty. There may be a lot of people mad at me before I even explain something to them, but I apologize for that. I'm going to try to be a better gentleman.

MS. DESHOTELS:

Thank you.

MR. RODRIGUEZ:

I'm glad you are smiling over here. And the next one is: Construct large

Violet Diversion to sustain the Biloxi marshes.

I have a problem with the way you describe that. You are not only going to protect the Biloxi marshes -- and I think you get that because the Biloxi land company has had a consultant that has been out here pounding you. It's for all of St. Bernard. You keep on showing where the water is going to go down the Bayou Loutre and go out to the Biloxi marsh.

You could make a lot more friends if you also showed that it's going to go out Bayou Dupre, and it's going to go up and go out of bayou -- Shell Beach bayou, and it's going to go out Bayou Bienvenue. You could make Trent Lott a lot happier if he thought that he was going to get something out of this freshwater diversion and another ally.

And the other ones are -- I think that's kind of -- I got all three of them; but, gentlemen, the first one is a priority close MRGO. The next one is our 40 Arpent Levee, 1-2. St. Bernard needs that. Orleans needs that.

I'm also going to -- going to bring this -- what concerns me sometimes about what you all do is not consistent. You keep saying consistency is important. I got a concern sometimes with things I don't see that I know you have planned.

For instance, I'm talking about where in this do I not see -- or maybe it's there -- that you all have hidden -- and I'm not being derogatory or anything, but I just can't understand because I'm not smart enough. You talk about the land ridge.

Well, I'm talking about Chef Pass, and what plans was it going to Chef Pass? Well, what is happening in the Rigolets; what has happened? Is that in here somewhere? Could that be in PD 1-4? Because I don't see it here, but I know y'all talking about it, and I know there is things that's happening with regard to it because the Corps -- I -- I talked to the Corps. And I see him shaking his head, and I appreciate that nod. I think it's a yes.

There are things in the plan that are going to happen there. Where is it in

here do you have that hidden and I can't see? Is it in PD 1-4? Maybe I -- I just don't understand this.

MR. TISDALE:

What is PD 1-4? Just remind us.

MR. RODRIGUEZ:

I don't know. PD 1-4 says: Evaluate the impact of a 0.2% Annual Probability Storm on the Communities Surrounding Lake Pontchartrain and Lake Maurepas with Measure PD 1-1 in Place and Provide Structural Protection Where Needed to (sic) Elevate and Relocate Assets at Risk.

I don't know. Does that run into that, and what does -- what does PD 1-4 mean?

MR. PORTHOUSE:

Where those gates that you mention show up where we are talking about that barrier plan, the outer barrier plan, from -- from basically the high ground and Pearl River area and down to connect into the St. Bernard levees, anytime we cross major passes or major bayous we do need to

evaluate whether or not floodgates are a good idea.

We have to fully evaluate how the surge board interact with these levees and floodgates. Are we -- can we allow them overtopping, as Larry mentioned; or can we leave these gates off to allow the connections with -- between the Lake Borgne and Lake Pontchartrain and still achieve our flood protection?

MR. RODRIGUEZ:

Is that what we are talking about?

MR. PORTHOUSE:

Well, for the floodgates, those are in with the levees. For the rest of the community --

MR. RODRIGUEZ:

You are talking circles around me, my man. I just -- I just want a simple question. Where are we talking about these two structures? Because these structures if they are put into place are going to be certain death for us in St. Bernard. Not only St. Bernard, but it's going to be New

Orleans, it's going to be Jefferson, East and Westbank, because that water is going to go up the river.

You keep saying, Give the -- give the water room to move. When I say it's inconsistent about what I keep hearing y'all say, and then you talk about a wall across Lake Pontchartrain that would protect St. Bernard, too, but only from the north.

All of that water would have to go somewhere, and it's going to come up the Mississippi River. I have shown you and the Corps has -- they saw what happened in 12 hours. It went up from 3 or 4 to 15-5 at the calendar gauge. That's 11 feet in 12 hours. Like it went up, it came down.

In Violet, it went from 3 feet to coming over the levee. That's -- that's 20 feet or 19 feet, depending on who you talk to. It's 17 feet. And that's with water in Lake Pontchartrain. Maurepas, New Orleans, St. Bernard, Slidell. Now, if you stop all of that water and you contain that water from going into Lake Pontchartrain and Maurepas, it's coming our way in Orleans.

So Orleans ain't going to get no break, and Jefferson will get it now. And Plaquemines, both East and Westbank of Jefferson will get it and Orleans.

You know, I just thought I'd throw that in there to you because I see the inconsistencies in some of things that y'all are saying, and maybe I'm wrong. Maybe I just don't quite understand it, but I would hope that you would look at that, and I would hope that you -- I mean, I think -- I know you are going to make a hydrological study of it. You have to. Common sense tells you that you don't have to, but you have to because you have to prove to somebody in Congress that you have -- you need the money to do whatever you are going to do. And I know government, and I appreciate that.

The other thing that -- that concerns me is, again, like the gentleman from Plaquemines and -- and I totally agree with him. Where do we leave someone out? Where do we draw the line? Are we saying to Plaquemine we don't care about your oil and

gas. Well, I care about it because that's -- if they don't have the -- the solution to their problems where they can get their oil and gas activities and have access to them.

They -- the gentleman said it right. Plaquemines is facing the same thing that Louisiana is facing with Congress. New Orleans is facing with Congress. There is talk about that you don't really need to rebuild New Orleans or St. Bernard. I'll tell you what. They will change their minds if when I leave St. Bernard I take them -- I cut off them four refineries we got. And the same thing if Plaquemine would stop delivering the fuel and the oil, it would make a hell of a difference to Louisiana and to the nation. So I concur with that.

And the Chandeleur Islands is not depicted right on that map, gentlemen. The Chandeleurs went from the beginning all the way to Plaquemines Parish. At one time, you could hardly -- on that -- we have a man in here is going to get up later, and he is probably going to tell you because he was an

outlaw in them days. He wasn't supposed to be hunting out there on the reservation, and he didn't have a reservation either, but his name is Dan. He'll be up here.

Barrier (assumed spelling/ inaudible) Island is gone. St. Bernard Parish had a plan because we talked to Plaquemine about it. You know, we talked about a -- a -- a channel being constructed all the way along inside parallel to the islands being dug, dredging up Baptiste Collette. The Corps dredges it out now. The oil and gas industry needs it more than 13 feet. They are all -- they are all on our side with this, yet I see nothing with regard to that.

The beneficial use of that dredge material if you dig that channel the same depth as MRGO and you take that channel and run and replace Bird Island, use that beneficial and use the dredge material, put these islands back and when you get to the end, don't stop at the end of the Chandeleur, because if you look, this is only a couple miles more than you can go to

the gulf port channel. You accomplish a few more things.

Mississippi is going to be real happy. Boyd Travers is going to be real happy because they only have 23 miles that of unprotected water that they have to go through.

But I see nothing mentioned of that, and it really concerns me because there seems to be a move afoot not to do anything with the Chandeleur Islands. So I'm just bringing that to your attention, gentlemen. But there is battles we have to fight, and those are the things that I see.

I got a number of issues down here, and I think I have taken care of most of them. But -- and I'm looking at the studies and planning to use one, two, and three. I agree with every one of them, and I see beneficial use of dredging that material. You know, that would apply to the Chandeleur Islands. I mean, if you are serious about that, that's what you ought to look at.

Backfill and/or plug nonessential

oil and gas. I got a problem with that. You know what my problem is? That's something that the oil and gas people should do. Not the taxpayer's money. As far as I'm concerned, oil and gas is the hit man, and we're taking all the hits for this catastrophe, when they are the first guys that dredge the canals straight into our marshlands and brought the saltwater from the gulf in. Yet, they are getting away like a champ. And they need to step up to the plate. They need to do more than just give us lip service.

I was never so disturbed when Shell Oil come to St. Bernard Parish and gave us twice (inaudible) for the fishermen. Like they did a miracle. Great big deal. You want to do something for my people? Take some money off the top of that fuel cost where they can afford to go out.

Gentlemen, that's all I have to say. Thank you.

MS. DESHOTELS:

Thank you. Doug Daigle.

MR. DAIGLE:

Thanks. Doug Daigle with the Mississippi River Basin Alliance. Thanks for the opportunity to make some comments tonight. I agree, and I think everybody does, that the priorities -- prioritization is going to continue to be a big challenge, as it always has, and the situation now forces that we are going to be watched very closely, more closely, to see how we handle that issue.

And, you know, looking at the range of things that are being considered, it seems like some of the same priorities really are presenting themselves. We have to protect population centers in as expeditious a way as we can, and that means looking at those places ahead of some of these ideas of, you know, leveeing off basins instead of leveeing off -- or raising levees to protect population centers.

I was glad to see sediment pipelines included. A lot of people have mentioned that's something we can do now. And coming from the river, you wouldn't have the concerns about the potential process you

would as in some other waterways, but it's a measure that would be taken very rapidly.

And the multiple lines of defense, of course, includes those areas that we have talked about for so long in terms of restoring the coast, the marshes, the ridges, and swamps are critical parts of those lines of defense.

One of the things that I think we are going to have to deal with in the short term as part of that strategy is the situation that's developing with the coastal wetland forest of expanded logging of Cypress swamps being proposed. Some of those swamps are in a situation where they can't grow back unless there is hydrological restoration. Some of those areas no matter what condition they are in they are serving as part of that critical buffer.

And somebody comes in and does a thousand acre clearcut, it doesn't matter what condition the swamp was in. You just opened up a channel for the next storm surge, and there are some folks who just do not want to acknowledge that issue, but

fortunately those folks are not generally the landowners. They are people with an agenda that they are pushing, and I think there is plenty of potential to work with landowners to deal with the situation, but it does need to happen soon because the logging is expanding, even as we speak.

I was glad to see, too, reference to (inaudible) and simulation in the wetlands. One of the things that we have worked for -- and it was part of the LTA -- was to integrate and clarify how the coastal effort will relate to and work with the hypoxy (sounds like) effort. People upriver wondered about that. They know we want to restore the coast, but they have a very direct interest in this hypoxy (sounds like) issue, and as we do we, obviously. And so, you know, we are going to need to be clear about that.

There's numerous opportunities to do things that will help both routing some of the water from the Atchafalaya into the east of some of those Terrebonne marshes. That will help. Things we want to do,

anyway, and we are just going to have to keep those two -- the connections between those two policy imperatives clear because they are kind of on separate tracks right now, and a lot of folks are wondering about how that's going to play out, but the state -- our state has the biggest interest in both. So if we don't do it, nobody is going to do it for us.

Finally, I just wanted to mention, again, seeing the inclusion of the Inner Harbor Navigation Canal Lock gives me pause. It's been referred to as a restoration project. It's obviously not, and the latest cost estimates I saw for it are that it would cost as much as Morganza to the gulf, you know, this one lock. So I think that's something that's going to be looked at.

Whether or not someone thinks it's a good idea the place -- the role that it has in this entire plan and this question of prioritization, you know, I think that needs another look because it is going to get scrutiny on Capitol Hill. Thanks.

MS. DESHOTELS:

Thank you. Aaron Viles.

MR. VILES:

Good evening. My name is Aaron Viles. I'm with the Gulf Restoration Network. I want to thank you for the opportunity to provide comments. I want to thank you for the hard work you have done in creating this preliminary draft plan. And I want to, I guess, just -- I'm coming from the RAE Conference as well, the Restore America's Estuary Conference, and it's on my mind right now. So I wanted to share it with you, given that we are going to be under an immense amount of scrutiny about this effort as we move forward.

I think due to a very long history of hard work, we finally secured some measure of OCS revenue sharing. So we will have some sort of funding stream to move forward and create this plan. But we are going to be asked how we are spending the money, and we need to make sure that our prioritization matches up with the -- the image that the nation has of why this -- why this plan is important and why it's worth

the -- the national revenues.

So let's just make sure that as we move forward that we can always account for how we spent the money. As we all the know, Louisiana has a -- has a credibility problem in the eyes of the nation. So this is our chance to kind of go above and beyond what's going to be asked of us; and as we develop the plan, we make sure that all the I's are dotted and the T's are crossed in the accounting of this being done.

But I would just like to make sure that all the restoration goals that we are putting out here are ones that can be scaled to the -- to the resources available. While we need to kind of shoot for the moon to some degree, we are not -- I mean, looking at the OCS revenue sharing that we have right now we don't have the resources to get everything that we want right away, and the prioritization needs to be available to what we have.

Getting into some specifics, but we'll comment more specifically later with some written comments, we were in D.C. last

week to talk about MRGO. We continue to be concerned that the MRGO closure plan won't actually do the thing that everyone agrees needs to be the -- the first order of business, which is protect people.

I think that the La Loutre ridge closure makes a lot of sense from the hydrological perspective, but I would like to see the modeling that shows the La Loutre ridge alone and the shore stabilization is actually going to protect people, and I think there is still some folks who have significant questions about that.

As we move forward as well, there is some great language in the report about our natural processes and making sure that our -- our wetlands are there to protect us as the first line of defense; but then I see these lines on the map, and I get nervous about what's the actual effect of these leaky -- quote/unquote, leaky levees on those natural processes that are -- that are going to sustain the coast, and I'd like to see more details about that before -- and more alternatives and more alternatives to

look at rain levees around the -- the population centers that you have identified and maybe putting aside a few of those leaky levees so that we can respect the natural processes that are out there.

Additionally, as we move forward with the planning, I hope that we incorporate sea level rise and not just the most modest forecast for sea level rise but some of the more aggressive. It seems like more and more evidence is piling up that we need to be ready for those.

So I just want to make sure that as this plan moves forward, it's going to (inaudible) with the kind of reality in what we are seeing in the Gulf of Mexico, and it will, in fact, protect people and protect our wetlands.

Thank you for your work and the work that you have yet to do.

MS. DESHOTELS:

Thank you. Maurice Robichaux.

MR. ROBICHAUX:

Hello again.

MS. DESHOTELS:

Hello. Good evening.

MR. ROBICHAUX:

I do want to comment about the -- y'all give the impression that -- y'all have said that the U.S. government will have to fund in cooperation with Louisiana, but y'all don't give the impression that -- well, I -- I have the impression that y'all really are not certain if the U.S. government is going to spend any money on it at all.

Personally, I think last night I said I think the U.S. government should -- should be responsible for all the funding of it. In this little pamphlet prepared by the Corps of Engineers, it says that the Caernarvon freshwater diversion structure, a feature of the Mississippi Delta region project was authorized by Flood Control Act of 1965. The water resource of development act of 1986 authorized for now to be built at 100 percent U.S. government expense.

And, for some reason, a few years later as signed by the sale of Louisiana and the Army whether the state would then

voluntarily pay 25 percent, which I don't know why it's spending anything because if the U.S. government had built the levees and -- I think they should be responsible for -- for the -- the -- the consequences that took place.

About a year ago, there was a rock and roll concert where a -- a fan was crushed to death, and within hours of the concert -- within hours of the ending of the concert, all the parties involved were -- were bickering about who should be liable.

And then one of the rock and roll band members was -- was being interviewed, and he said that, "At the end of the day, it's our name that's on the tickets," implying that he felt that their band should be liable for any liability.

At the end of the day, it's the U.S. government that had the levees built, and I don't think anyone in U.S. government or anyone on behalf of the U.S. government could -- could try to claim being absolved of any liability because that -- if they try to claim that at the time the levees were

built, they didn't know what the consequences would be because -- I don't think they can make that claim because I remember reading a letter by Thomas Jefferson, and I have a book of his correspondence. About 200 years ago he wrote correspondence to a friend of his questioning the wisdom or the efficacy of draining swamps in marshlands.

Essentially, I think he was speaking to the unknowns, the consequences of draining swamps or marshlands because he -- he -- I -- I suppose he didn't fully understand the swamps and marshlands that occurred in Virginia; that because he was uncertain of the consequences of draining those lands that he was essentially saying that they should be left alone.

So, I mean, those issues were talked about. So it's not as though anyone could claim ignorance from the consequences of shutting down the still (inaudible) to the marshes that would naturally occur had -- had the river not had the levees.

MS. DESHOTELS:

You can go ahead and make your closing remarks.

MR. ROBICHAUX:

Okay. Which -- which brings me to the question of the funding, but I don't know anything about hydrogen, the -- the mass production of hydrogen fuel for internal combustion -- I mean for (inaudible).

But suppose someone were to invent a method tomorrow of being able to mass produce hydrogen without the -- without the current need the way it's mass produced now. If it were to be, they -- they would use a carbon-based fuel of natural gas or oil or coal; but suppose someone would invent a way tomorrow to mass produce that and there is no longer a need of carbon-based fuel because if you want to have (inaudible) vehicles and use a carbon-based fuel to mass produce the hydrogen, you would be defeating the purpose that wants to reduce carbon emission.

But suppose someone were to invent a way tomorrow night to do that? That would

shut down the oil and gas industry in the Gulf of Mexico within a short period of time, and because of that they -- I still think the U.S. government would still be liable for that funding.

So that's it already?

MS. DESHOTELS:

Uh-huh (affirmative response).

MR. ROBICHAUX:

All right.

MS. DESHOTELS:

Thank you. Mark Madary.

MR. MADARY:

Hello. My name is Mark Madary. I'm a councilman from St. Bernard Parish. I -- I looked over the plan, and most of the proposals in that I don't agree with. I have some issues with a couple, and I'd like you to explain some of them now.

As Junior previously mentioned, I think it's imperative that we close the MRGO and to me closure means a little bit more than just putting a little stop gate somewhere. But if we did close it at Bayou La Loutre, that could be accomplished within

days. You could sink some ships and it's closed, and then you can start the process of building the barrier to stop the saltwater and stop the other intrusion coming in.

Unfortunately, in the past, we have made part of the closure of the MRGO contingent upon whether the completion of the Inner Harbor Navigational Canal Locks took place. They are two separate issues. As one of the other gentlemen said -- it's even quoted as -- in the Wall Street Journal as one of the biggest pork projects ever -- ever built, but they are not contingent upon each other.

The safety of human life is the most paramount thing that y'all have to make for this coastal restoration. Economic interests become secondary to human life. You know, that's a given, and that's what we have to remember. Never should this be contingent upon the other.

If we are going to close the MRGO, then let the process begin now. Don't make it contingent because of some vested

interest of -- of -- of certain industries that want to keep it open. You know, most of those businesses were paid to locate there. You could have paid them to locate on the Mississippi River, and it would be a mute issue.

So we don't have to make one contingent upon the other. There wasn't a mention of the Chandeleur Islands. I hope that was included in the -- in the Breton Isle marsh re-creation. But we talked about the barrier island defense, and part of it is to build back all of the islands to make that first line of defense. That, again, is another process that can be equally accomplished. We can sink a lot of ships. The government pays $2,500 a day to tie a ship up that's in mothball. There is billions of dollars a year that we spend tying them up.

Southern Scrap, one of the businesses that are located on the conversion of the MRGO and the Inner Harbor Navigational Canal, they buy ships weekly for $50,000. The solution is not that

costly, and I think that we can kill two birds with one stone. Plus you are saving the government money because they don't have to pay the money to tie the ships up. So I really want to compliment y'all. The MRGO has to be closed. It can be closed quickly, it can be closed easily, and it should never be contingent upon whether or not been the Inner Harbor Navigational Canal Locks are built, and that's all. Thank you.

MS. DESHOTELS:

Thank you, sir. Dan Arceneaux.

MR. ARCENEAUX:

Dan Arceneaux, member of the Coastal Zone Management Advisory Committee for St. Bernard Parish for eleven years. Six years of that I have been chairman. I'm still chairman now, and I hear a lot of people coming up and thanking you people at this desk for all your help.

Now, in my 72 years, all I can see we have got from you people was more water. I swam for Betsy, and I swam -- I didn't swim for Rita. I knew better after studying all this for so long and attending so many

meetings with the Corps.

There is two people I'd like to thank for helping us. Mr. Oneal Malbrough, who at a lot of meetings supported our projects when we had no other people supporting us, and we got the project -- well, I say we got them. We got them in 2000, 2001, 2003, and nothing has been done yet. So I can't find any reason to tell anybody thank you because my family, myself, my five daughters, and my grandson had 20 feet of water in his house. My brother had -- the second story had 4 feet, and him and his wife spent three days in the attic before he was rescued.

I guess maybe you can understand why I can't thank anybody for this. On the Bayou Loutre ridge -- I've heard Greg Miller at the last council meeting in St. Bernard Parish tell us they were going to put a 125-foot wide, 14-foot cut in the Bayou Loutre dam.

Now, we strictly don't want that. I've heard another rumor said the reason they want this is because it's going to put

freshwater in the Biloxi marsh. This is not going to happen. You can't take 125 feet of freshwater 14 feet deep and put it in a 42-foot channel 3,000 feet wide and expect the freshwater to make this saltwater from the gulf help us.

With the ridge closed and the water going out through the Bayou Loutre ridge, it will flood out the whole Biloxi marsh and, like President Rodriguez said, up in Lake Borgne and all the way up to Maurepas if we get enough water from that particular siphon.

Now, on the Caernarvon siphon, it says: Modify Authorization of the Caernarvon Diversion. What does that mean?

MR. PORTHOUSE:

What that means is currently that diversion is authorized to maintain a certain salinity gradient in -- in the Breton Sound area. We would like to have the flexibility to put freshwater into that system at times of the year when it is already fresh so it would not call for much of the sediment-rich waters of the marsh.

So we are just looking for a little more operational flexibility to improve the health of the marsh.

MR. ARCENEAUX:

All right. Because I -- I feel about the Caernarvon siphon the same way I feel about this 14-foot deep, 125-foot wide cut in the Bayou Loutre ridge that we are going to put across the MRGO; and that is six miles north of Caernarvon is the MRGO, which I guess it's 2 to 3,000 wide, and it's been 46 feet for so long. Most people think it's 36 feet, but we found out after all the discussion with the Corps of Engineers that 36 feet is the authorized depth.

Now, on that they add 5 feet for maintenance and operations, and 1 foot for overdraft. And Mr. Russo, who I spoke with after one of the dredging sessions, said, "They come with an 8-foot cutter-head so they can make everything in one pass. And if they go to four to six feet deeper, all that does is a bonus for the Corps of Engineers," and all I could tell him is all that does is put ten more feet of water on

my house, and it did.

The main thing is the Bayou Loutre ridge, we need that built all the way out to the base, and that would nourish the Biloxi marsh, which I have been hunting in for 63 years. I have hunted -- maybe I shouldn't say I hunted on Breton Island, but somebody's already mentioned that, and I was in high school at the time. The rabbits were running around out there like you wouldn't believe, but let's -- let's say we only killed the winner.

MS. DESHOTELS:

Before you get in too much more trouble --

MR. ARCENEAUX:

Okay. Well -- oh. On this Mississippi River Gulf Outlet shoreline stabilization, let me give you a little joke about that. I got a call about six or eight weeks ago from the man that's planning to (inaudible) in the Northshore of the MRGO. Where he got my name and my number, I never could tell you because I don't know him; but after we talked for a good while and he

felt -- I told him how I feel like I'm telling you all now. I asked him one question.

And the question was: "Have you ever seen the geotechnical study of the MRGO?" And he thought for a few minutes, and then he says, "I'm sure the Corps of Engineers has one."

So they have put rocks and rocks, and they disappear, and they put more, and they disappear, and that goes on and on; and I don't know how to tell them to fix it, but I sure hope they don't waste more money.

Also he said they have to cut a canal closer into shore so they can get the rocks the way they want them. And after they cut the canal, bring in the big barges and the cranes, then I'm sure the rocks are going to fall in that channel that they just put.

I think that's enough for tonight, and thank you again, Oneal Malbrough and Jon Porthouse.

MS. DESHOTELS:

Thank you, sir. Tony Ricky

Melerie (sic).

MR. MELERINE:

Close enough. Good evening. I'm Councilman Tony Ricky Melerine, St. Bernard Parish, District E, which is 70 percent of St. Bernard Parish, mostly all marsh. That was there before the storm. Now I think I'm down to maybe 20 percent.

First of all, I do want to thank you for holding these meetings and letting the public make their comments, letting me come here and make my comments.

I am born and raised in St. Bernard. I'm 56 years old. Yeah, Charlie, I know I look older. I know. I have seen the ship channel dug, and that tells you my age, since I call it the ship channel. I think the MRGO came out maybe just a few years ago, but it was always -- we called it the ship channel in St. Bernard. We watched it dug, and I hunted and fished all back in the Lake Borgne area. Got lost in those Cypress swamps numerous times, where my dad had to come locate me, find me, and get me out of that swamp.

And you really can't get the feeling about what was lost with this MRGO ever since it was created. Now you go back in that area, and you can see the lights in Chalmette from back in the Lake Borgne area. So I just wanted to come up here and -- and, again, I agree with the plan, the total plan. I'm glad to see it.

I know that if it wouldn't have been for Katrina and Rita, we most probably wouldn't be sitting here for another hundred years trying to do this, which should have been done a hundred years ago. But it is a good plan. I'm glad to see it. I'd like to just go ahead and just a few comments on a couple of things that really should have emphasis, and it's just like my other colleague said and my parish president, the closing of the -- of the MRGO, yes, that is number one priority.

I do like the plan. Like most people, I like the total closure at the Bayou Loutre ridge. I like the way the plan is to let freshwater go into the open part of this -- of the channel that is left open

with bank stabilization. I think it's a good plan for the freshwater.

Years ago we used to hear high tides at Shell Beach was at 6:00 in the morning, and high tide at Violet was almost 6:00 in the evening. Now, the high tides are the same. If it's high tide Shell Beach at 6:00, it's high tide 15 minutes later in Violet all because of the MRGO, and along that goes with the restoring of the Bayou Loutre ridge.

That, again, will make it to where the saltwater has to go through its -- the -- the way it used to in estuaries and all through the prairie and all of that and then give us time for this freshwater to be able to push saltwater still away from our Cypress trees and our marsh.

The 40 Arpent levee, we got to have that authorized and built up to that 17.5 feet. If that levee was at 17.5 feet when Katrina came, St. Bernard would not be a hundred percent devastated like it is.

Next, the Violet diversion. I think that is as much for the freshwater and

the Caernarvon. We need as much freshwater as we can to go in there. And, again, it was mentioned, I have to mention it, too, the Chandeleur Sound. In the plan that was submitted from St. Bernard, there was a channel that be dug from Plaquemines up to Biloxi that would take sediment and build up those islands. I think that is a -- a great thing to do. That will help us in the protection.

Again, I want to thank you for giving me the opportunity to speak to you. Thank you.

MS. DESHOTELS:

Thank you, sir. Kenny Henderson.

MR. HENDERSON:

My name is Kenny Henderson, Councilman from St. Bernard Parish. I'd like to thank the committee for letting me speak tonight, and I'll be brief. The proposals I'd like to see passed for St. Bernard Parish are -- and I'm just going to read the numbers. I won't even read the caption. PD 1-12, PD 1-22, PD 1-1A, and PD 1-16. And also the Chandeleur Islands, you

know, it wasn't mentioned in this brochure here, but we really need the Chandeleur Islands to help St. Bernard Parish -- to protect St. Bernard Parish, and that's all I have to say. Thank you.

MS. DESHOTELS:

Thank you, sir. David Gegenheimer.

AUDIENCE MEMBER:

He had an emergency and had to leave.

MS. DESHOTELS:

Thank you. Dr. Barry Kohl.

DR. KOHL:

Good evening. My name is Barry Kohl, and I'm here representing the Louisiana Audubon Council. Thank you for the opportunity to speak this evening. There are several issues that were presented earlier that I totally support. One is the total closure of the MRGO.

The Audubon Council has for the last 15 years taken a position for full closure of the MRGO at the Bayou La Loutre ridge and with no navigation capabilities,

in other words, full closure, to -- to help divert the freshwater into the Biloxi marsh and the historically freshwater areas.

It was mentioned just the compartmentalization of the levee system within New Orleans. I don't know whether that was used as an example or whether that is part of the plan. Can somebody --

MS. DESHOTELS:

Jon.

DR. KOHL:

-- mention --

MR. PORTHOUSE:

Right now -- right now that's just an example. That slide itself was borrowed from the Bring New Orleans Back Commission. We think it's a sound concept, especially we are building on existing infrastructure. We can minimize the construction of new compartments, but it's a good concept for New Orleans, and we need to reevaluate it in full for New Orleans and other metropolitan areas.

DR. KOHL:

Well, I -- I fully endorse

that -- that plan, that -- that -- the compartmentalization. With the ridges that we have within Orleans Parish, it makes a great sense to -- to continue those ridges so that they are not breached by flood waters. I live in Carrollton, and we were flooded two days after the breach in the 17th Street canal from backwater coming through the underground canals and coming up through the storm drains.

One -- one issue that I was a little concerned about was the -- the interest in this project being built quickly. Now, we are all interested in expediting the process, but the Army Corps of Engineers wants to bypass the NEPA process to get many of its pet projects through, and we feel that that would cut out the public involvement. Also it could cut out some of the federal agency involvement.

If anything, the Army Corps of Engineers needs more oversight. They need more public oversight and expert oversight of their projects versus less. If they had had moreover sight, maybe the 17th Street

canal levee wouldn't have breached if it had been properly designed.

You mentioned that you were going to use the Calcasieu River sediments dredge -- from the dredge material and use it for beneficial use. The Calcasieu River sediments are contaminated. Before they are used for any beneficial use, there needs to be a thorough study of the amount of contamination and where the hot spots are before that sediment is -- is broadcast over the marshes.

The Barataria Basin is another area of specific interest for us, and the Barataria Basin is one of the most productive estuaries in the gulf coast, and the placement of a levee system along the GIWW we have a great concern about. That follows the GIWW, and it just happens to coincidentally follow the alignment of the Lafitte-Larose highway, which was proposed in the '70s, and a federal suit by a coalition environmental group stopped that project, but it followed the exact same line as the -- the levee aligned with the Shahoa

(phonetic/inaudible) along the GIWW.

The concern is that it would cause an impoundment across the Barataria estuary. We already have the Davis Pond Freshwater Diversion Project, which is supposed to pump freshwater into the upper part of the Barataria estuary, freshen up Lake Salvador, and also freshen up the lower part of Barataria Bay.

Putting a barrier between the freshwater diversion and others is going to cause a significant problem and possibly change the intent of the Davis Pond project by not pushing the salinity regime or the salinity isohalines further to the south.

The Army Corps of Engineers dredged the Barataria Waterway in the '50s and deepened it in the early '60s, and because of that the saltwater intrusion came into the Barataria Basin, killed all the oyster reefs and also eliminated the commercial catfish industry in Lake Salvador.

So we need to look at the entire estuary as a whole. The Donaldsonville to

the gulf levee alignment study is going to include one of those alignments that's going to follow the GIWW, but there are others that are supported by EPA and the U.S. Fish (sic) and wildlife service. So please look at that. That's a big concern. And also potential back flooding in the -- in the developed areas above that potential alignment.

I just wanted to close mentioning the importance of protecting and maintaining our coastal Cypress forests. According to the Army Corps of Engineers, they have had inquiries to date for clear-cutting 200,000 acres of Cypress swamp south of I-10. That's 200,000 acres.

A significant number of acres are going to be used to -- to convert Cypress forests to Cypress mulch for gardens. And we have to take a stand in protecting these Cypress forests because they are a major line of defense for the inland communities. And if you could see from the impacts of Katrina and Rita, the Cypresses were not bothered or harmed in great deal. Many of

the other trees in the forests were -- were blown down, but the Cypress still stood, and it's still a major barrier to storm water surge.

We'll send more detailed comments in before the deadline, and I appreciate the opportunity to speak tonight. Thank you.

MS. DESHOTELS:

Thank you. John Lopez.

MR. LOPEZ:

John Lopez, Life Oshsner Basin Foundation. Thanks again for the opportunity to comment.

First point I want to make is we agree with President Rodriguez's priorities, that plugging the MRGO, Bayou Loutre, rebuilding the ridge in Violet are the top priorities. And I would also at that -- with making that point, my -- the group here that -- tell me if I'm wrong, but when the LACPR was first announced that it was -- we would -- the public was told that this didn't mean that everything had to wait until December '07, that there could be some actions taken before that, or at least

initiated some processes, and I would suggest certainly the MRGO qualifies for those things to fast track sooner and not wait till December '07 and finally do what everybody has been saying needs to be done for many years.

MS. DESHOTELS:

We'll convey that.

MR. LOPEZ:

Okay. Thank you.

MS. DESHOTELS:

You're welcome.

MR. LOPEZ:

The surge modeling -- I think that you guys are waiting on the surge modeling, and I'm glad to hear that the modeling is being done, but it seems like the public is being asked to comment with a deadline before we have the benefit of seeing this model.

So it seems like it's, you know -- I mean, the model is important, but it seems like we should have an opportunity to see some of the results of the model before we really comment on it.

MS. DESHOTELS:

I apologize because I did not make that clear earlier, John, but you will because our next rendition should have the benefits of that model, and there will be another draft of this also for public comment and review.

MR. LOPEZ:

You mean before January 5th?

MS. DESHOTELS:

No. We may not get the modeling before January 5th.

MR. LOPEZ:

Well, that's my point, but that's the deadline of the comments, correct?

MS. DESHOTELS:

For this version. This is a preliminary draft.

MR. LOPEZ:

Okay.

MS. DESHOTELS:

But there will be another complete draft with another period of public comment, and we hope at that time the model.

MR. LOPEZ:

Okay. Well, I mean, the specific point for the Pontchartrain Basin, of course, is -- is the gates and on Chef and Rigolets, and, you know, our position is that if they are proven to be justified, you know, then -- then we have to do them and do them ecologically in a sound way. But we haven't seen that, that case, and -- and --

MS. DESHOTELS:

We haven't either.

MR. LOPEZ:

Right. So one last point which was made earlier, but I think Doug Daigle made, it was very important. The IHNC, it's -- it's hard to make that a big enough project, a restoration project, and I think that's going to be smoked out very quickly in Washington and -- and could be detrimental to the whole plan to try and put a project like that in a restoration flood protection program. Thank you.

MS. DESHOTELS:

Thank you. Darryl Malek-Wiley.

MR. MALEK-WILEY:

Good evening. My name is Darryl

Malek-Wiley. I'm here representing the Sierra Club, and the initial part of my comments will also be from the Holy Cross Neighborhood Association and the Lower Ninth Ward.

We feel that the Inner Harbor Lock replacement is totally out of place with this proposal. That's close to a billion dollar project. With inflation, we feel that if we are talking about coastal wetland restoration and flood plains protection, that is not -- should not be part of this plan, and we will continue to litigate on that if that is continued in this plan.

I have some concerns about different alignments. One of the questions I have on the proposed alignment around New Orleans East and Bayou Sauvage, it talks about increasing the flood protection around the Bayou Sauvage wildlife refuge to a 500-year levee. Once again, that's a questionable amount of resources, and we need to really think about prioritization.

There is a possibility -- I -- I see another line going along 510 and

possibly some additional ring levees out in New Orleans East instead of continuing all the way out US 11. So that might be something we need to look at.

As far as cost, economics, that whole area at one time was saltwater marsh, and it became a freshwater system because of a levee built before environmental altering in place.

The closure of MRGO is -- definitely needs to be at the top of the list, the -- the closure to the ridge. The other thing I don't see in here and something that's an ongoing project, I know, with the New Orleans Sewerage & Water Board and the St. Bernard Sewerage & Water Board is talking about the introduction of freshwater-treated sewage into those Bayou Bienvenu system.

That's something that the neighborhood -- the Holy Cross neighborhood is actively working on to support. The residents in the Lower Ninth Ward are working actively to support that to restore the coastal forest system.

And concern I have -- also we had talked about marsh creation. Where do we talk about Cypress forest creation? Because the whole system that was destroyed by MRGO, a lot of it was Cypress forest. And we want to make sure that in this process we're bringing back those Cypress forests. And if the Corps of Engineers destroyed those forests, the Corps of Engineers should pay to put them back.

Bayou Manchac, I know there is some discussion about Bayou Manchac up on the north end up near Baton Rouge of a possible diversion there. I don't have -- see that involved in this plan. I don't know if this is limited geographically in the -- in the legislation, but Bayou Manchac is something else we want to look at.

The other thing that -- the Chandeleurs, we definitely support the restoration of the whole Chandeleurs. And, once again, this system has been broken by a political line, i.e., the Louisiana-Mississippi border. We should be talking with our state representatives in

Mississippi about also restoration of the coastal barrier islands off the Mississippi coast.

I know it's not in the Louisiana legislation, but the Corps of Engineers needs to be thinking beyond just Louisiana state barriers, state lines there. And that will help maybe give Mr. Lott more interest in some of the stuff we are doing, especially if we are giving him freshwater for his oystermen in the Mississippi Sound.

Also, the -- and Dr. Kohl's comments about the -- the levee alignment along the Lafitte-Larose highway, that is a grave concern pushing it that far south. We would like to see it further up north along the Highway 90 alignment.

And I have been involved in so many of these meetings since the '80s. It looks like, in some cases, every thought-of idea, levee alignment that's been put on the map without all the discussions that have happened throughout those 20 years about environmental impacts, and there have been discussions about that specific levee and

environmental impact going back beyond 20 years and some of these other things.

So we don't know if behind the scenes, especially like the Inner Harbor Lock, economic forces are driving this, not really restoration of the coast, and we want to call names. There is a Mr. Bollinger who's got something on the lock that -- that might -- why is his interest of more concern than the citizens of the -- the state that need the coastal wetland restored?

And, once again, this whole process that we are being involved in is going to be closely followed by -- on the federal level and the nation as far as being effective use of physical dollars. And we do not need to include in this projects that are just economic boondoggles, and we need to really have a discussion about prioritization of different projects, and we'll be involved with that throughout the process. I thank you.

MS. DESHOTELS:

Thank you. Mike Mariana.

MR. MARIANA:

Good evening everyone, Mike Mariana. I'm a resident of Plaquemines Parish. I know you heard a great deal of input from my friends and neighbors from Belle Chasse today. Unfortunately, I wasn't able to make it. I won't go too far into that other than to say that the residents ... owns businesses in Plaquemines Parish should be just as important as those in Orleans Parish. We need to consider that and think very hard when we are talking about where the different levels of protection should be because I'm not sure if that means the levee in New Orleans is going to be 40 feet, the levee in Venice is going to be 17 feet. I'm not sure what that means. I don't think we know what that means as a group yet. I just want to make sure everybody understands that.

I'd also like to echo some of the comments of Mr. Rodrigue (sic) about the dredging of the Baptiste Collette and using that as beneficial dredge material to help rebuild the Chandeleur Islands. It's very important.

I mean, if you look at the map right behind you, you can see some places have protection; and then as you come down towards Plaquemines Parish, the entire Eastbank of Plaquemines Parish will have no benefit of barrier islands, and essentially that's the only place along the entire Delta plain that doesn't have that protection. And not only is that going to be Plaquemines Parish, but that's going to be St. Bernard as well. So I just wanted to mention that.

Also, if you'll look at the map where you show -- that specifically lists Plaquemines Parish, on the Eastbank, there is a place that shows no levee whatsoever. You show the red, which is the 1 percent levee protection apparently in the northern end of the Eastbank, the Braithwaite area; blue, the existing levee where the federal levee is in the Phoenix area and down to Bohemia, but there is a section there with absolutely no protection whatsoever. There is a state highway there.

People need to be able to move up and down to be able to evacuate because if

not, you are just talking about the Pointe a la Hache ferry, you know, bring your life jacket kind of thing. People need to be able to evacuate and get out of there. It is a state highway. These people need protection as well.

We need to have ideally federalized levees on this side, whatever that's going to mean in the future. But these people need the back levee protection as well in addition to the river.

And I'd like to just ask a question about, again, some of these terms that we talked about certified levees. I got to tell you I never heard that term before the storm.

One of the discussions that I had heard that took place with the Corps in Washington was the idea of raising the barrier islands to a point where they would knock down a storm surge where the levees in Venice could then be certified at 17 feet, and -- and the people could get insurance in order to move back and move their businesses and homes back to the southern end of

Plaquemines Parish.

I'd like you to -- I'm not sure where that is. I haven't seen that mentioned here or even heard it talked about that much, but I'd like to ask that we include that in the plan because all of this is great, but the people can't get insurance in southern Plaquemines to move back to their homes and businesses, you essential -- if -- if you haven't written us off in the plan, it's effectively writing us off, and I know -- I know that you guys don't want to do that.

That's why, to be honest, one of the things that I -- I came when you had the meeting a couple weeks ago. I suggested it then. I put it in writing, and I'm just -- and I'll put it in writing and e-mail it to you. I'm just saying it again for the people who are here who might not have been here last time.

I believe that each of the parishes that's impacted by this study, by the Chenier plan as well, need to be represented on the board, need to be

represented here. We have our -- we have experts who could sit on these boards. I know all the other parishes have experts as well, and if not experts on the board, representatives on the board, somebody that directly is involved.

Our parish president currently sits on the board, but he is -- he represents the --

AUDIENCE MEMBER:

Policy Jury Association.

MR. MARIANA:

-- Policy Jury Association, not our parish; but when his term is up in a few weeks, we will have no representation on the board. You guys are great people. I'm not questioning that, but somebody from Plaquemines Parish, I believe, ought to represent -- ought to have a say on -- a direct say and a direct involvement in what we are doing.

The other thing that I didn't hear mentioned that much -- I heard it mentioned by people who came up to the mic., using Cypress trees and rebuilding Cypress swamps.

I'd like to go a little bit further than that, that aquatic plants and marine plants themselves need to be part of this plan, not just Cypress trees.

My family and I are doing something on our own in our little private effort to rebuild the wetlands, but Dr. Richard Neal (assumed spelling) down at the -- there is a plant station in Golden Meadow. He is -- the Federal Department of Agriculture has a deal going on down there. We went down, and we talked to him, and he actually gave us some seeds from mangos -- mangos trees that are working. They had -- they themselves -- you know, they don't tolerate cold that well and freezing, but I -- I just think -- I really encourage you to make the introduction or reintroduction of marine and aquatic plants a -- a major part of what we are doing.

The plants, we need them. All the freshwater diversion in the world doesn't matter if you don't have plants growing there to stabilize the land. They need to be a major part of this plan.

The other thing is -- the other thing is -- my -- my last comment: Regardless of what happens to the levees and regardless of where these major diversions are placed in Plaquemines Parish, I'd ask you to consider how our -- the residents and businessmen and women who live south of those are going to get there. We are going to need a bridge overpass, whatever it is.

I mean, obviously, we don't need a Greater New Orleans bridge-type thing, but I'm sure that's not the style of the version of your plan, but keep in mind that we will need infrastructure in place, bridges for people to get there.

Thank you very much for allowing me to speak.

MS. DESHOTELS:

Thank you, sir. We have gone through all the cards that I have in my hand. Does anyone else wish to make a comment this evening before we close for the evening? Thank you very much for coming. I appreciate this. We all do. Good night.

REPORTER'S CERTIFICATE

I, JILL FREEMAN, Certified Shorthand Reporter, do hereby certify that the above-named witness, after having been duly sworn by me to testify to the truth, did testify as hereinabove set forth;

That the testimony was reported by me in shorthand and transcribed under my personal direction and supervision, and is a true and correct transcript to the best of my ability and understanding;

That I am not of counsel, not related to counsel or the parties hereto, and not in any way interested in the outcome of this matter.

Jill Freeman, RPR, RMR
Certified Court Reporter

5.3.10 Lake Charles Public Meeting Transcript, December 13, 2006

COASTAL PROTECTION AND RESTORATION AUTHORITY

INTEGRATED PLANNING TEAM

COMPREHENSIVE COASTAL PROTECTION MASTER PLAN

FOR LOUISIANA

PRELIMINARY DRAFT

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PUBLIC MEETING

DECEMBER 13, 2006 6:30 P.M.

AT THE OFFICES OF
LAKE CHARLES CIVIC CENTER
901 LAKESHORE DRIVE
LAKE CHARLES, LOUISIANA

A P P E A R A N C E S:

MR. RICKEY BROUILLETTE, CPRA/IPT
MR. NORWYN JOHNSON, CPRA/IPT
MR. ANDREW BEALL, CPRA/IPT
MR. LARRY ARDOIN, CPRA/IPT
MR. ONEIL MALBROUGH, SHAW
MR. ROBERT TISDALE, BCG
MS. MICHELE DESHOTELS CPRA/IPT

REPORTED BY:
BETTY CURRY MINTON, RPR, CCR

P R O C E E D I N G S:

MS. DESHOTELS: Good evening, if everyone will go ahead and have a seat, please. Good evening. Thank you for coming this earning. Before we get started, I'd like to welcome you. And I'd like to ask Tina Horn to come up for a few minutes and give us a few words. Tina is the Cameron Parish Administrator but she also sits on the Coastal Protection Restoration Authority.

MS. HORN: I just want to thank all of y'all for coming out and putting some of that Christmas shopping aside and making an appearance here. We just want to make sure that all of your comments are included in this plan. Anything that -- any projects that you see that aren't in the plan, we need to get them in here. We can study the plan and project as we go and something isn't good, then we'll get it out of there, but we do need to make sure that any projects that you see that will help Cameron Parish, Calcasieu Parish, Vermillion Parish, on the western end of the state, make sure that we get all of the protection that we can get into this plan. And once again, thank y'all for coming out tonight.

MS. DESHOTELS: Thank you, Tina. The topic we're going to cover this evening is how does the

Master Plan relate to our ongoing plan at this time, what is the Master Plan seeking to achieve, and what does the preliminary draft Master Plan represent, what are the plan key components, and Rick Brouillette who is with our planning will go over that section. What are the potential policy legislative or institutional issues that would affect the implementation of the Master Plan and what comes next.

Before I get into how the Master Plan relates to ongoing planning efforts, I want to go ahead and introduce some of the members of our team who are up here. We have Robert Tisdale with BCG, Oneil Malbrough with Shaw, Larry Ardoin, Andrew Beall, Norwyn Johnson, and Rickey Brouillette.

After the storms, Congress directed the Corps to look at providing category five protection across coastal Louisiana. They were not necessarily directed at restoration in this directive that they were given. They also have a problem in addressing that because no one has fully defined what exactly is a category five storm. What is the upper limits of a category five storm.

We were directed by the Louisiana legislature to look at integrating hurricane protection and coastal restoration under the umbrella of coastal

protection. Our legislature has said it is not working, these two things need to be completely separated, and it is now time that we look at the system as a whole and look at these two components together in an integrated fashion.

They were directed at looking at a much larger picture. They're looking at redevelopment issues, insurance issues, medical, hospital, education issues, the full array of concerns that have to be addressed in order for us to fully recover. All three of these planning efforts are working together; however, these are not completely separate efforts.

The work that the Corps is doing, the modeling work, we are utilizing. We're utilizing the input that they're receiving from the public. The Corps in utilizing some of our planning and our efforts in their work. The L.R.A. is using our planning efforts as the basis for their work, and we're using their comments and input into our work. So all three of these efforts recognize the other planning efforts and we're working together.

What are we seeking to achieve? Again it's time for coastal protection to recognize that both hurricane protection and coastal restoration are linked. We recognize that a healthy landscape is

essential in achieving both a sustaining ecosystem and reliable flood protection.

Hurricane strategies are defined in the plan based on the premise of a healthy landscape. We're using the multiple lines of defense strategy. And we recognize that each of us have an outcome and must be part of the solution in obtaining the outcome.

What does science and engineering say? Anything that we do to fix this system will alter hydrology and therefore alter the ecosystem. We can't fix the problem if we don't change the system. We recognize that our communities are adaptable, that we are adaptable, especially with advance knowledge of changes and continued availability of basic services. And what this means is that we recognize that we must have schools, medical services, churches, we have to have roads, we have to have access to the grocery store, that these are the things that a community needs in order to remain viable.

We know the first line of defense should not be the last line of defense. That longer and more complex systems are more at risk for failure. We know that we have to give water room to move. And water needs room to move on both sides of the levee, both on the Gulf side and on the side that people live on. We

know that altering hydrology can have problems, but it can also provide opportunities.

There are four coast wide objectives that we have looked at as we prepared the Master Plan that we hope to achieve as a goal. Objective Number 1 is to reduce economic losses from storm-based surges. What this means is that we're targeting and achieving protection for everyone from a storm surge that has an one percent chance of occurring in any given year, the so-called 100 year storm. What does this mean? It means that this protection may be provided by levee or by individuals raising or elevating their houses which is already occurring or by a combination of these and other measures.

We recognize that we need to promote a sustainable ecosystem by harvesting the marshland with the natural system. This is a picture of the Caernarvon Diversion off the Mississippi that I'm sure y'all are all familiar with, and the Corps shows there is actual clay degradation that is occurring out there. We know that with natural fluctuation the water levels that are provided by the diversion, can include an ecosystem production at this and resilience.

Objective Number 3 is to provide habitat suitable to support an array of commercial and

recreational activity coastal wide. We hunt, we fish and we farm on our coast. While we recognize that these -- there will be habitat changes in some occasions, we also recognize that we must maintain the diversity of habitat coast wide that we have today. We need to sustain to the extent practicable the unique heritage of coastal Louisiana by protecting our historic properties and our traditional different cultures. We know that we're like no other place. We know that who we are and what we are is tied to our family and our community. It is valuable and we don't want to lose it. We also know that who and what we are is tied to our land.

So what does this plan represent? It's a conceptual vision of the future of coastal Louisiana. It's a completely integrated approach that must be implemented as a system to meet objectives. It strives to balance objectives, although further work is needed to refine strategies. And this is the starting point for public discussion. We've had a good deal of stakeholder input through the development of this preliminary draft. We've also utilized not only our own stakeholders input, but the input as I said earlier from Corps meetings and from meetings that the L.R.A. have held. We're now aggressively going to the public.

We're looking for your comments, for your concerns. We hope to answer your questions. We're going to take the input that you give us and we're going to go back to redo what we're working on in a complete draft for it to be out in February.

We're going to go over now the preliminary components of this plan. I'm going to ask Rickey Brouillette to come up and to go over this.

MR. BROUILLETTE: Thank you, Michele. It's a privilege for us to be working on this extremely complex project to help solve the issues and problems that Louisiana is facing. Unprecedented in its nature and size, going back to the Flood of '27, nothing similar since has occurred in our region, and just like technical challenges evolve, the science -- art and science of engineering and ecology after the Flood of '27, we think that this is going to do the same regarding hurricane protection for Louisiana and possibly other parts of the world.

We're dealing with extremely complex problems that we're faced with trying to model the system that in some places has never been built. And we're relying on models that have never been tested. Unlike New Orleans which has had 280 something years of flood control experience, a model basically on the

ground, it's already built and constructed, and has been hit from multiple directions throughout that entire period of time, every time a weakness occurred, the system was beefed up and they are still evolving. So we need to recognize that this is going to be an evolving situation for us as a state and hopefully the country recognizes that there's a lot of benefit to attacking the problem in Louisiana because just like things that are learned in attacking the problems that occurred after the Flood of '27 our science and engineering and the sciences have been developed as a result of studying our problem.

So for instance, we're talking about super computer times in the order of 30 days to evaluate one alternative per surge across the whole state. A very complex problem. Some of the best minds in modeling are trying to solve the problem. So by no means, do we think our plan as it currently sits is going to be the final solution. It's the first step, something for you to look at, for you to comment on. It's going to evolve in time because quite frankly it's a function of the existing landscape, and it's going to be continuously changing as well as all of the other uncertainties that we are faced with in terms of design challenges for levees with the sort of surges and wave

environments that southeast Louisiana and southwest Louisiana has been subjected to.

Basically, we will start with the Deltaic Plain planning and we first talked about how do we want to stabilize the landscape before we get into the protection aspects. We start off in the Delta Plain because it has got different challenges and different opportunities compared to the western part of the state. The geology is different in the west compared to the east. The coastal processes is different and the vulnerabilities are different as well as population profiles and so forth.

The first thing we're talking about evaluating in the plan is shoring up the shorelines and ridges. So for instance, with no preference of how these are going to be constructed or prioritized, some of these layers are going to pop up. So don't presume we have already defined priorities. That's not the case. But for those of you who are not familiar with the eastern part of the state, we have a barrier island system which is considered the first line of defense and this area over here is Grand Isle, and here is Port Fourchon, and Venice. Two major areas that support the offshore oil industry. In addition to that you've got historical ridges, natural ridges that are along

streams that used to flow or still do flow that need to be beefed up to provide another line of defense for some of the winter storm events and small tropical storm events. And then the shorelines along some of the rims of lakes that are subject to being breached up in this area, Maurepas, Lake Pontchartrain area and South Shore of Lake Pontchartrain, along the Lake Barre area and then this channel here is the famous MRGO, Mississippi River Gulf Outlet, and this is the New Orleans grand land ridge area, and the Biloxi marsh area over here. Here is an area that we're going to be shoring up the shorelines, also.

This area over here is the Chandeleur Islands. It is so far removed from existing marshes and we feel like it's already been degraded and the benefits of storm surge reduction at this point in time at least don't warrant restoring that island back to its previous condition. However, we will work with the Department of Interior to evaluate habitat issues because they do have some critical habitat on that island.

The second component are navigational channels. The MRGO for instance is a navigational channel and we will get into a little bit more detail on that. It's infamous in terms of the perception and

some reality of what it contributed to the flooding in the New Orleans area. And then GIWW and some of these other channels, the IHMC, and so forth. These channels would be armored and they also provide opportunities for us to redirect freshwater flows into certain areas and to help nourish some of the existing marshes and systems out there and anything else that we might build in the future.

In conjunction with those two previous elements, we're also looking at mass sustaining diversions. We have existing diversions that are currently operating. Some of them not to their full potential. Some of them are currently being operated for sledge control. We would be interested in reauthorizing some of those to provide some other benefits to like introduction of freshwater with nutrients to sustain some of the existing marshes. In addition, like I said you would also use some of these existing navigational channels to transmit water and have these land diversions which are small in magnitude. Generally, in the order of less than ten thousand to maybe as little as 500 cubic feet per second.

In addition to maintaining a healthy ecosystem, we also want to rebuild some of the broken

fragmented marsh areas that we have across the southeastern part of the coast, and these green areas are what's depicting that measure, a variety of places. The Biloxi Marsh area, and also the land ridge area, along with the various Barateria and Terrebonne Basins, too. This is the Mississippi River for your point of reference.

A very inceptional idea. Basically there are three levels of projects we're depicting here. They are projects that are of the scale and technically challenging type that we have never had experienced in performing those sorts of projects, and that those sorts of projects are going to require a significant amount of study before we would proceed even to a feasibility stage on that project to see if it would be even worthwhile. There are also going to be projects that we have studied and had some construction and operation maintenance experience that we know are technically feasible, and then we have a limited number of those that we have had some experience in.

And then there's a third set that the state Corps of Engineers have had ongoing work involved in and have been constructing; designing and studying; designing and constructing; operating and maintaining for quite sometime. And marsh creation is one of

those. Barrier Islands is another one of those, and some of these smaller diversions are also some of these sorts of projects that we've got experience building.

However, for a long-term survivability of the coast in the eastern part of the state, we feel like it's essential to have a land building version, which is basically re-engineering the lower Mississippi River to allow introduction of freshwater and sediments into the natural depositional environment of the coast or coastal process. You can take those sediments and minerals and rework them and direct them into different portions of the coast. We know that's going to be a very controversial type of project. That is what this large peanut depicts by the way. So the location that is shown here is not necessarily the true location. It might be further down the river. We know we have to address all sorts of navigational issues. There's an ecosystem over here that a lot of people hold dear to their heart, the Breton Sound area. So there's going to have to be a significant amount of study to evaluate the feasibility of that sort of project. It's considered very conceptional at this point. It's going to be a very challenging project, too.

Special focus is the Mississippi River Gulf Outlet or the MRGO. The MRGO goes through St. Bernard

Parish and here's the channel. We've had communications with multiple parties, the state legislature, St. Bernard Parish folks, various stakeholders, and the governor. And the CPRA's position is that based on the input from all of these folks and the impact that it's had for the Biloxi marsh area that we're going to suggest a total closer of the MRGO at the Bayou La Loutre ridge down in this area. We're not proposing however to completely fill in the channel with sediment because it would be extremely expensive plus we see an opportunity to use the channel to redirect freshwater flows from the Violet Canal, Violet area into the MRGO channel to feed Bayou La Loutre ridge channel and subsequently the marsh back up into this area, behind this area, and the shoreline that's going to be protected. That is the sort of project that we feel like could be accelerated, by the way.

Going onto the hurricane protection system for the Deltaic Plain. We want to first show you what the existing protection system for hurricane and flood control exist, how it exists. We have the lower Atchafalaya River levee system, Mississippi River levee system. We have the Golden Meadow area system over here, and then a few other smaller managed protection

systems. Not all of them are hurricane protected systems. Some of them are exclusively for flood control. But they're probably of adequate size and height to be incorporated into our integrated system flood control for hurricane protection, also.

This blue line is the Morganza to the Gulf project which is currently unauthorized. It's been in the works for six years now. It hasn't received funding. I think it has missed by the senator who voted in the Oklahoma area. I understand he might be getting a few messages from the folks in that part of the country via E-mail, so you might want to help our patrons down there and do the same.

Here's our proposed levee system for the Deltaic Plain area west side starting from the top, the west side of Lake Pontchartrain. There may be a need for some protection here. We have three alternatives that need to be considered along this side of the Lake Bourne area, east Orleans Land Ridge, on up the Pearl River and then tying in over here at the Mississippi River to the Lafitte area, coming down to LaRose, and then coming across south of Houma, and then eventually tying in the Morgan City River levee system. We have an alternative aligning for the Morganza to the Gulf that we're also suggesting to be evaluated to try to

eliminate this funnel affect here and that's this little portion right here. That defines the footprint of the levees.

Now, to establish what the levels of protection are, real briefly, what we did is we considered the size and density of the population areas, assets at risk, existence or non-existence of multiple lines of defense; which by the way is multiple lines of defense is the issue of having several things that would be available to you if the landscape knock down in the surge. That's a concept that John Lopez brought to the effort here. And whether they -- the area that you're trying to protect is going to be subjected to shallow waves which have short periods, the short amount of time that it takes for the wave to travel or long period of waves which are ocean waves, you have a big wave coming in and it has a lot more mass to it, so it's going to have a lot more tendency to run up the levee which is a more severe erosion condition.

And then we also wanted to evaluate what level of protection to what consequences would be for the risk of overtopping or breaching of the system. We have a very challenging problem to try to solve in terms of designing protection systems that can sustain

overtopping type loads without breaching.

So at this point in time, the state of the art, I don't think that anybody could stand up here and tell you that there's not a chance that we're not going to have a breaching phase or a scouring phase in the future. So for instance, in the New Orleans area, we felt like there are enough assets in that area, Westbank and then the East Side to have what's called 500 year level protection, which means a storm has a 1 over 500 or .2 percent chance of being exceeded in any given year. It doesn't mean it will happen only once in 500 years. It just means in any given year. That's a significantly large storm. For instance, Katrina was probably a 400 something year storm. That definition and the information that we based our current study on is subject to change. The Corps of Engineers is still going through statistical evaluations of storms going back to the 1850's. So the information we've got is tentative preliminary and subject to change.

Coming through to this point, we're going to also have 500 year protection. And then down to the White Ditch area on the east side of the Mississippi River would be 100 year protection and then down to Myrtle Grove would be 100 year protection, and then following that same level of -- that same footprint

that we talked about earlier going down to the Golden Meadow area would be 100 year and coming down up in this area over to Terrebonne and so forth, South Lafourche would also be 100 year level of protection. Here is the little alternative alignment we talked about. The elimination of the funnel affect.

Lower Plaquemines would continue to have the existing level of protection that they have, which is not 100 year from a levee standpoint, but there are more than one way to obtain 100 level of protection which is what most people aspire to so they can have 100 year level of protection of some sort so they can obtain flood insurance. And that really affects future development, not existing development or folks that are able to rebuild before the base level elevations are reestablished. Right now there are no base level elevations established inside the levees, so technically people could rebuild on the ground and that's certainly not something we subject that they do because of the fact that this area is subject to wave loads on both sides of them as opposed to a region like this you would have waves from one direction. You have to have four times the levees because you also have to protect flooding from the Mississippi River to get the kind of protection you need to achieve 100 level

protection down here. Also because of the limitations of designs for breaching and overtopping that we mentioned, we feel that it's the best interest of people to build in this area by elevation. Also, you're in an area that wind is going to be controlling your design anyway. So you certainly should be using the latest building codes that we've established in the state to construct in that area.

We feel like the Houma/Thibodeaux area is sufficiently important enough with all of the things that we talked about just a few minutes ago to warrant 500 year level of protection. So the combination of this 100 year levee, plus this levee will give them 500 year protection. So again, there's going to be some technical challenges as to how we're going to do that. That's conceptually what we're trying to do.

And as we move over this way, this is 100 year level of protection. We think the Morgan City levees currently already have 500 year level of protection, but that will certainly be evaluated when the storm surge follows and surge data will be presented to y'all in the back. It's all based on surge predictions based on existing conditions as we know it and if you put a barrier up there, you're going to effect the surge. So we're going to have to select

alignments and re-evaluate what the real surges might be predicted to be. Acknowledge that we have potential errors in prediction of surge, too.

Going to a little more detailed area, Lake Pontchartrain so you can see a little better, going up the Pearl River, and Slidell area, and the Westbank, and a little more detail on Myrtle Grove that I mentioned and Golden Meadow. I should have went through these. I apologize for that. And Terrebonne Parish and Atchafalaya Delta in more detail and here's the whole narrative. These two levees combined to a 500 year level of protection.

In addition, we acknowledge there's going to be some remaining risks associated with any protection system you put out there and so we're going to recommend that even if you're behind the levee, you should be maintaining flood insurance coverage for your home. Of course, there are other options, too, depending on where you are and if you don't feel safe, you always have the option of moving. And you are certainly encouraged to elevate and in some cases it is to your economic benefit to do so.

For instance, if there is one person that built a home out on a land ridge area. They built above the base of 17 feet. When they went to get

insurance, their insurance was going to be about $6,000 a year. Well, in further communication with the insurance folks, they realized that if they had built three more feet, their insurance would have dropped to $800 a year. So the gentleman sold that camp and rebuilt three feet higher and that is one of the five handful of camps or houses that survived the onslaught of Katrina with 20 something foot surge in the neighborhood of 20 feet surge in that area. The only thing that was damaged was the stairway. He had a China cabinet inside the house. None of it was damaged. He had hurricane cladding on the side and a flat roof and basically accommodation of the extra elevation was the economic decision as well as, you know, the sense that he was secure and wasn't going to lose his prize possessions by potentially being a flood condition. A condition that FEMA insurance only covers up to about $250,000. And so unless you go to Lloyd's of London, do you really want to put your possessions at risk by building in a condition that you're subject to flooding.

Something else that needs to be considered is compartmentation. It's an idea that's been around for a long time, but to bring back New Orleans people reminded us as well as Dutch, you have the 17 Street

Canal area that was one of the locations of the breaches and to the north Orleans Parish where the walls failed in this area over here and all of this massive flooding and areas where the wall did not fail which is Jefferson Parish stayed high and dry. So basically if you could compartmentalize your flood control system or if you have that opportunity, that's something that we're going to suggest be considered, also.

Water management, we want to control and manage our water in a comprehensive way, not individually. It needs to meet the goals and objectives to carry water and sediments and nutrients to sustain our landscape and to compliment all of the other projects that we have on the ground and the hydrology as well as helping to sustain the system to protect the levees with the ecosystems and marshes and barriers and funnel levees.

It's a very challenging job to manage water. Surveying is one of the key problems Louisiana has had in terms of having a good stable benchmarks that we could rely on to measure the proper elevation. We need to incorporated system wide hydrologic modeling so that we can calibrate these models or observe conditions and then apply them in the future to suggest

the changes or things that we want to consider in terms of how we want to manage a project. One of the first things the folks did is that they developed their own hydrologic model and made sure they knew where model was going and why it was going where. So if they did make a change, then they could figure out what the likelihood of the project being successful would be.

Moving off to the Chenier Plain which is probably the area of most of your interests. You have a different set of problems and opportunities. You have a lack of a major river except for the eastern side of Louisiana where you have the Atchafalaya River. However, you have better geology than the east. Your coastal processes are different. You don't have as much settings as they had to do in the east. And you have a lot more opportunities for multiple lines of defense. However, your water management problems are certainly of concern and shoreline protection is important to you because a lot of the shoreline, for instance, the Rockefeller area is moving northward. If it continues to move northward, those surges you saw during Rita would be much higher in the future. So our plan is to try to plan for managing this system over 100 year planning horizon. So we need to start acting today so we don't have a bigger and worse problems to

deal with in the future.

Your restoration opportunities are also somewhat different. The first thing you're going to be interested in is the shoreline stabilization. We're not implying that the entire shoreline is going to need to be stabilized. We're going to have to get into a lot more detail to establish where we have an appreciation of land building. We've been told the Mississippi River -- the Atchafalaya River is actually helping to increase some of the land in these areas over here. And so we're going to have to evaluate exactly where shoreline protection is needed. Some of it may be just beach nourishment. Some of it may be some sort of structure to prevent it from moving northward. We also want to protect the shorelines from the lake rims and then in the bays, too.

Evacuation routes, Highway 82 and 27 are going to be a second line of defense. A lot of Highway 82 is already in the Cheniers which provides some elevation in knocking down the surge affect. But we want to make it consistently an elevation plus ten is the first concept, elevate it and Highway 27 to an elevation ten. So that would be a second line of defense. Now, we also need to address ecological issues. I know there's concerns of the ponding of the

water if you have overtopping or heavy rain falls from the north coming down, so we do have to acknowledge that there's bound to be some challenging ecological elevations to make sure that it's possible, to make sure that water management is right to satisfy needs of the region.

Navigation channels. Same opportunity we have out in the east. We want to armor the channels and use them to convey water to provide nutrients to some of the systems that are starved for nutrients now. Marsh creation there are opportunities to use dredge spoil material to create marsh in some of the navigation channels. As a second resort, we might go offshore to get sediment resources or in the vicinity of the Atchafalaya there may be an opportunity to dredge in this area to sustain marshes close to it in these areas. And as a last resort, we may have to resort to interior dredging in some of the interior areas to sustain some of the marshes where it's just not economically feasible to transport sediments from offshore or navigation channels.

Managing water and sediment is an issue that has not been studied in a great detail to our knowledge, at least, but we recognize there are problems to the region. There's multiple users of the

water. Farmers using it for rice, crawfish farming, fishing and managing some of their hunting areas. We're told that when you have large rainfall events, the water in the upper parts of the bases are getting out of the system too quickly. So if there's a way to manage it so we can hold that water back and be able to use them at the opportunity -- an opportune time when maybe we have a drought or solidity problems, we need to evaluate that or maybe also transmitting water on the Mississippi River -- I mean, the Atchafalaya River or through the GIWW some way to alleviate some of the water management problems we have. But I consider that a study sort of project. It's going to require a great deal of effort to understand the system. We've got ongoing efforts, hydrological model occurring. But we're not suggesting that we know exactly what we would do at this point in time.

Hurricane protection in the Chenier Plain. We have multiple lines of defense that we talked about for shoreline protection. Elevating the highway. Then for Lake Charles, feel like the assets are sufficiently concentrated enough to warrant 500 year level of protection. Now, this is probably the most inceptional footprint or layout where this line would be. So it's going to be subject to change and it may move to

somewhere else or it may go more to a ring levee type of arrangement to protect this area as opposed to the land along this whole alinement.

Likewise in the Lafayette to New Iberia area has sufficient assets to warrant 500 year level of protection, although the initial surge models subject that it's not susceptible to 500 year level of flooding; however, we're not certain that the model runs closely enough to each other to pick up the features like the Vermilion River, Mermentau River and so forth. So before we say it does not need 500 year level protection, we're going to make sure that we have the modeling as best as we can. So it would tie into the Morgan City area over near Berwick.

From Abbeville west, there is a disbursed population. Checkerboard pattern development: East, west, north, south. There's a relatively large population in this area, about 100 thousand people. And we feel like it warrants 100 year level of protection. If the shoreline protection raising of the highway and I forget to mention bank stabilization along the GIWW are not sufficient to provide this area with 100 year level of protection, we may be forced to put 100 year level of protection along the GIWW. The levee should be relatively smaller than it would be had

it been protecting -- providing that level of protection by itself.

I'll turn it back over to Michele now.

MS. DESHOTELS: Thank you, Rick. There are going to be policy institutional and legislative issues with anything associated with this plan. We know that there are land use planning and building issues. If we put a levee in, it does not mean that people can then build up safely to the edge of the levee. Whatever should remain wet. There are issues with zoning, where you build, how you build. There are landowner concerns out there. There are concerns about mineral rights, about how easement would be done, about how purchases of land would occur. Whether or not expropriation will happen. Currently, the levee we can expropriate land. There is not the authority to expropriate land for restoration at this time.

Adaptive management is an issue. As we go through this process, science will get better, modeling will get better. We will have more knowledge of what works and what doesn't work. Monies will change. We will get more money. We may have less money. Some projects may be more expensive to do. Some may be less expensive to do. Whatever the scenario that is out there, we will have to be able to adapt to it quickly

and with flexibility in order to continue to accomplish our goal to protect both from hurricane protection and coastal restoration for our state.

There are projects that we know that we cannot accomplish without federal assistance. For reasons of authority, responsibility, or in some cases just management. There are consistency issues. We've had a great many programs out there. Some of these programs have to do with protection from storms. Some of the programs have to do with restoration. There's a magnitude of programs. And it all needs to be consistent with this plan. That does not mean that this plan says to a program you cannot do that project. What it does mean, that the project should hold some ground. It should be consistent with what we're trying to achieve. There are priority issues and much of this is tied to funding.

And it is important that once the projects are put into a sequence in the stream for priority, implementing, and that's when the mesh is necessary, because there are certain projects that as you put them together, they need to be put in the system. Protection and restoration will work together and these projects can go on-line when they are supposed to go on-line together.

What comes next? Public discussion. This is one for public discussion. We are going to refine our measures, further design them. We're developing processes. Now, we're looking at implementation sequencing. We're going to modify the plan based on analysis, based on input that we're receiving from the public. We hope to have a complete draft available in February for public review and comment. In April we submit this to the Louisiana legislature. These are the public meetings that we are having this week. We have two more to go. This is available at your local library. So if someone wants to look at a paper copy and we're not here this evening, they can get one. You can check these out at the library. They're available on-line as well. In addition, all of the appendices are available on-line. So if you want to read the hundreds of pages we have supporting of our data, you are welcome to go on-line. And we have put them on two formats. We have high speed broadband. You can download and get access that way. We also have a low resolution version so that if you have dial up, you will not ruin the day that you ever decide to push the button to download. www.louisianacoastalplanning.org is my website. We will also take comments on our website.

If you want to E-mail us, or if you want to use snail mail. We're more than happy to get mail. You received a comment form as you came in the door. It has our mailing address on it. You may also turn that in this evening as you leave. We're going to sit and read all of those comments and in a few seconds we're going to listen to what you have to say. I'm going to go ahead and move this mike very gently I am told. We are very fortunate because we are being filmed this evening and the people in this area will be able to see this during the upcoming week and we're delighted to have that opportunity to share our message. That was very kind offer.

I have a handful of cards. I'm going to call people and ask that you will come up to the mike and state your name for the record. We are having a court reporter here this evening to transcribe the comments. I will ask that you limit your comments to about five minutes each. Our first speaker is David Richard.

MR. RICHARD: Thank you. I'm David Richard. I would like to go through a number of issues that have been brought out to this group before. I think the government issued it last Saturday and I think with Secretary Angelle and Mr. Bradbury.

In the western part of this state, the omission of the stabilizing shorelines of Calcasieu and Sabine Lake. You have the stabilization of the shorelines of Grand and White Lakes, but we've omitted Calcasieu Lake and Sabine Lake. We have the same erosion there. We actually had more tidal front surge there and erosion that is taking place. The Grand Lake and White Lake areas are inside the Mermentau Basin. There is tremendous erosion there, and we do need projects there as they've identified and done some on both the Calcasieu, Sabine, and Grand Lake, and White Lake. I applaud your integrating the hurricane protection wisdom with coastal restoration. We feel in southwest Louisiana that the coastal restoration efforts that we've done in the last 20 years probably has had immensed benefits to knock out catastrophic damage to the metropolitan area of Calcasieu Parish because of the restorations that went on in Calcasieu and Cameron Parish.

One of the issues that is not on your plan, one of the more successful hydrologic restoration plans in the world is the Cameron/Creole watershed area south of Lake Charles. It was heavily damaged in Rita, in Hurricane Rita, but needs to be rebuilt and fortified using present engineering techniques so that those

wetlands can be rebuilt and can maintain the buffer area between Calcasieu Parish and the Gulf of Mexico.

The GIWW is also listed as statewide from the banks between Vermilion Bay and the Sabine River. We would suggest or I would suggest that the GIWW be fortified from Vermilion Bay to Sabine River. We feel like the substraight there because of the clay base that goes along the ridge has the substraight is available to build a levee there, along the Intercoastal, along the existing channel. It could be used for fortification. You have identified certain areas but we see some substantial omissions. The omissions that I would like to point out to you are along the eastern shores of Sabine Lake and also the southwestern area of Calcasieu Lake. Now, both of those areas as you see on the map are tremendous areas of open water that should be used for beneficial use.

You made a statement in your program that hydrologic changes will need to be made. I want to emphasize to you and your group that hydrologic changes have been the causative action, and that we have worked very hard to reestablish the hydrologic flows in the Calcasieu, Sabine and in the Mermentau Basin, and we feel that the hydrologic restoration in these areas is the most important restoration but it's more

hand-in-hand with hurricane protection.

Another omission that I'd like to talk to you about is restoration of the Cheniers. This is a unique zone in Louisiana. I mean, it's a unique zone in the world, but between Vermilion Bay and Galveston the Chenier Plain zone has had lots of breaches. In Cameron Parish, in particular, sand mining has been allowed. It should be stopped along those cheniers. The cheniers that need to be rebuilt and should be rebuilt as a line of protection as a natural barrier as they were historically. The Mermentau Basin, you mentioned something about the Mermentau Basin. I want to say something the report should take into account. The Mermentau Basin is authorized for the maintenance of the control structures in Catfish, Calcasieu Lock, both locks, and Schooner Bayou Lock. The levees or the areas of control around that basin are not authorized. It has been a real problem around Schooner Bayou to recognize by the Vermilion Parish Policy Jury, the Louisiana Farm Bureau, Louisiana Cattlemen's Association, and the authorization and the protection of the Mermentau Basin needs to be included in this plan.

Because of my history, I have to say something about eastern Louisiana and the Chandeleur

Islands. The Chandeleur Islands are probably one of the most important nesting areas and production areas for not only fisheries but for ambient species, brown pelicans. It's the largest staging area in the Gulf for frigate birds and the rebuilding of the Chandeleur Islands is most important. There is a huge sand source available. Yes, we know it is expensive, but I also think it's important to the culture and to the sustainability of our diversity.

You said -- one of the things in your report here said that we needed more study in the western area of the state. I want to bring to the attention of your panel the Grand Lake/White Lake study which the Corps of Engineers has spent about 20 years on, the Calcasieu Lock study which is ongoing for the past 20 years, the HILCP study that was done in regard to the Chenier Plain, the Calcasieu Sabine Watershed Plan that was published in 1989 by the Natural Resource Conservation Services, and the Mermentau Watershed Plan has also been published. There have been huge amounts of studies in southwest Louisiana over the past 35 years and those of us in southwest Louisiana, we're going to give you projects, but we hate to wait on another study. We want to see action. The actions that we have take have been productive and we feel that

those actions should be mimicked and expanded. You said also about modeling. I want to make sure that this panel also knows that in the Mermentau Basin, we have had the Black Bayou Cove monitoring that was done. In the Calcasieu/Sabine Bain, we've had the Black Bayou restoration, two different Black Bayous. Black Bayou restoration, hydrologic restoration model done, also. In conjunction with the group in Vicksburg with the Corps has done modeling for the enlargement of the Sabine-Neches Channel and that modeling is also available. So as I just mentioned those eight studies, we feel like we have had lots of studies in southwest Louisiana and it's proposal for action is what is needed. Thank you very much.

MS. DESHOTELS: Thank you, Charlie Atherton.

MR. ATHERTON: Good evening, Charlie Atherton, 122 Vine Street in Sulphur, Louisiana. The first thing that comes to my mind is the appreciation the public has for the large amount of work that has been accomplished in nine months. Also an amazing accomplishment would be the cooperation between the agencies. In my lifetime, there was a time when agencies didn't talk to one another, and now to see the cooperation in the last few years is absolutely mind

boggling and appreciated by the taxpayers. We want solutions. So for you to have a deadline of basically a year to have done this quality and quantity of the work is very commendable.

It appears that you have incorporated a lot of ongoing projects that Mr. Dave Richard mentioned that are just waiting on funding. You obviously have had some cooperation or discussion with the Army Corps of Engineers, and I would point out that just for the general layman there will be confusion as to this plan which I understand is at the request and authorized by the state legislature and may incorporate some of the Army Corps' plan, but it is totally separate plan as I appreciate it.

MS. DESHOTELS: Yeah.

MR. ATHERTON: Because in this area of the woods, there was a lot of concern about the Army Corps tenure plan that basically said for this area of the state they were going to do nothing. So that upset a lot of people. Your plan, obviously, the input of Tina Horn with the Cameron people and the past public hearings that we've all attended, you obviously somewhere gleaned past public comments and incorporated them into your model.

Also I couldn't support Mr. Richard's

comments any more. He's one of the most knowledgeable people in the area, and I really do appreciate him pointing out additional resources that are available to you and actually telling you or reminding you where you can look. As -- my personal opinion, a few comments I would suggest as priority that you focus immediately on Highways 82 and 27. I'm personally of the opinion if we had loss 82 between Cameron and the Sabine, you would have to go to the Intercoastal. Because when you're up in a helicopter anywhere west of the channel, it's all open water. So if for some reason, you have a breach where the Gulf actually gets to the Intercoastal like has happened over in Texas, you absolutely shut down the entire economy of southwest Louisiana. You shut down like five percent of the nation's refining. It's -- I mean, it's a national impact that will be felt if you shut down this channel. So whatever needs -- that you can do like putting the levee, I guess, that would be like the second line of defense, levee that you're speaking of. The media had mentioned the possibility of it being on the north side of the Intercoastal waterway. My gut feeling would suggest to you putting it on the south side in order to protect the breach of the Gulf getting into the waterway. If you've got a big levee on the north side and even a

little bit of the Gulf gets into the Intercoastal Waterway you're immediately going to fill that channel up with silt and you're going to shut it down. So just in my mind, I would ask that you entertain putting the -- that levee, that second line of defense on the south side. And also again beef up those areas you know that Mr. Richard spoke of.

I want to re-enforce one of Mr. Richard's comments also about the damaged water structures in Cameron Parish. At this point, I don't know the status of them, but in past public meetings, they -- it was my understanding they had not been properly prepared, I think, not too many years ago. They had like eight of them that were put into operation. I don't know the status of them, but I do -- I am of the opinion they were working, and in the Louisiana Recovering Authority meeting they had not been repaired. I would hope by now they would have been repaired if they had not been, obviously they should have been a priority item. And again, the beefing up of Highways 27 and 82. I mean, I would suggest that that be done immediately as well as anything you can do to re-enforce the coast.

I know in the past, offshore material had been identified that would be suitable for beefing up the coast. Just because we have lost some in the past,

it held the last time, I would think -- you're talking about stabilizing the coast, especially on the west side from the channel of the Sabine. I would suggest bringing in this pre-identified offshore material, and beefing those areas up again. And again, you know, we do appreciate you bringing this to us so the public has an opportunity.

It's one thing to look on the website, but the other thing is to speak one-on-one a little bit to better understand the material that you're presenting and again the incorporation that is being demonstrated and the aggressiveness by which you're, you know, you're pursuing your mandate, but actually listening to people. That's very commendable and from what I've seen so far, again the public comments in past meetings that we felt like were lost, somebody actually went and dredged them up and gleaned them from past meetings and seem to have incorporated them in that. So again, we do appreciate your time and your effort in giving this opportunity to the public. Thank you.

MR. DESHOTELS: Thank you, sir. We appreciate your comments.

MR. BROUILLETTE: Excuse me, we do have a levee on the south side. The levee is on the south side of the GIWW that we've got. We're planning to use

the GIWW as a conduit to conduct water all along the area, but the levee would be on the south side as you mentioned.

MR. ATHERTON: Okay. I do appreciate that. You see things are working already.

MR. DESHOTELS: We're immediately responding.

MR. HESS: Good evening, I'm Tom Hess. I'm a biologist with the Louisiana Department of Wildlife and Fisheries stationed at Rockefeller Refuge. I would like to thank you for the opportunity to speak tonight and like to compliment you on a very aggressive and well-done plan. I have several comments and issues. One great thing is to see the Gulf of Mexico shoreline stabilization identified in your plan. The staff at Rockefeller has been working on this since 1940 to get some Gulf shoreline stabilization established and it's very difficult. We had the best engineering minds in the county working on this project. We've got a Quipper project that we've been working on MA-18 to look at test sections. A very expensive project. It's over ten million dollars, but we really desperately need to get those test sections in place to see what technology will work to stabilize our coast. If it works great, if it doesn't work, we need to go onto

something else and find something.

MS. DESHOTELS: Good adaptive management.

MR. HESS: Yes, ma'am. And so this is a great thing. Hopefully this project and this emphasis that you have right now will kick-start that project. We went to a meeting last week, a Quipper meeting, a technical committee meeting. There were $56 million available for projects, two projects in the east Baton Rouge area but our project was left out. So hopefully this project will be identified and hopefully we can move on with that because this is going to help everybody in your plan.

The other thing I wanted to mention is Rockefeller Refuge is kind of at the southern end of the Mermentau Basin. We have a very complex and intricate water management system there. In the southern portion of our levee south of the Superior Bridge, the southern portion of the Basin, hopefully we can work something out that will be intergrade into this plan. It directly affects about 600,000 acres in the Basin. It affects agricultural, crawfish, and everything to the north into the Grand Lake, White Lake areas north of there. So that's something that really needs to be looked at and see if there is an option to understand when you use Highway 82 as a line of

defense. But we also need to build on the existing infrastructure that we have in the parish, and we worked for the last 25 or 30 years building some great projects. And this program needs to compliment what we already have there and make it work more efficiently.

Like I say congratulations to y'all, and we look forward to working with you in the future. Thank you.

MS. DESHOTELS: Thank you. Look forward to working with you. Allan Ensminger.

MR. ENSMINGER: Well, this is my fourth one to attend in the last few days. My name is Allan Ensminger. I'm a private wetland consultant, manage roughly 100,000 acres of coastal marshland. Some of it here in the Chenier Basin. I certainly want to compliment David and Tom and take credit for hiring those two guys a long time ago. But basically those guys really have a great grasp upon the ecological system of our entire coastal area. As David pointed out, the Chandeleur Islands are remote and don't have a lot of residential importance. They are extremely important for fish and wildlife.

One of the sites in southwest Louisiana that I am going to make -- basically the LaBranche Wetlands are those wetlands that we travel over when we

enter into New Orleans on Interstate 10 has been drastically impacted by the MRGO influence on the water quality of Lake Pontchartrain. A word of bill project was authorized many years ago to implement a freshwater introduction to the Bonnet Carre. It is a publicly owned Corps of Engineers Reservation, no real estate problems, and it's the entire objection to the thing is based on perceived ecological impacts that it had on the eastern complex of Lake Pontchartrain, but each and every time the Bonnet Carre has flowed into the area has actually resulted in some increase production in crab and fishery resources there in the lake. So a lot of the concerns expressed in the past has been overplayed. I will continue as long as I have an interest in coastal wetlands to insist that project be brought back on the table, take a look at it, and as all of you guys on the panel has witnessed, it is an important project to Senator Lott over in Mississippi, and he has repeatedly said that he will support Louisiana as long as we can finally wake up and realize that Bonnet Carre is an important part of his coastal area, also.

The other point that I want to make, on Point au Fer Island that's the island that you see in the very corner of the map displayed. We have been

lucky enough to have some dedicated dredging projects on that property really demonstrated the capability and the desire of that type of coastal marsh restoration. We have already met -- we as landowners have met with the Shaw Group and investigated the use of some of the channel material out of the Atchafalaya navigational channel as disposed on the island and certainly look forward to that.

I would like to, and I will in my comments add that to the same degree that dedicated dredging is planned for Marsh Island be included. Thanks for the opportunity to come back. I don't know whether I'll make another one this week or not.

MS. DESHOTELS: Thank you, sir. Carl Broussard.

MR. BROUSSARD: I'm Carl Broussard, Clerk of Court for Cameron Parish. I resided at 2733 Grand Chenier Highway in Grand Chenier, Louisiana. First of all I want to reiterate a couple of what the previous speakers have said. I think our first priority in Cameron Parish is our shoreline stabilization just like y'all have. Like Mr. Hess said Rockefeller Refuge probably lost 60 feet of shoreline from Hurricane Rita. Tropical Storm Francis, a few years prior to that, they lost 65 feet. So it doesn't have to be a major

hurricane to lose a great amount of shoreline.

I've been able to make a few corporate meetings in the past, studying -- you know, we do studies, studies and studies. I think it's time that we need to do some implementation on some of these projects. Some of these projects have already been prioritized, especially like the South Grand Chenier Restoration Project which I think is the number one project in the State of Louisiana a couple of years ago. We've already studied -- had the studies on and I think it's ready for the implementation.

Also shoreline -- to go along with the shoreline stabilization, David Richard was saying about the banks of the Calcasieu river and the Sabine. I mean Calcasieu Lake and the Sabine Lake, but also I think a greater threat to the people of Hackberry, Grand Lake, and Lake Charles is the Calcasieu Ship Channel. When it was originally dredged, the right of way was probably about some 500 feet. I think some stabilization needs to be done on these shorelines. For Hurricane Audrey, they probably had 18 inches of water in Hackberry. For Hurricane Rita, they had up to four feet in some areas, and the main reason is this channel is widened out, deepened and widened. So I think some shoreline stabilization also needs to

be done on that ship channel.

Also in the Mermentau River Basin, I live in Grand Chenier and that is probably my number one priority, but since the Mermentau River Channel has been dredged, we really have had a big influx of saltwater intrusion, too. Also the draining of the basin has increased and I think the number one factor of that is because of the dredging of the Mermentau Channel. I propose that you may put a lock system on there and dredge the old Mermentau River to its original channel, try to get the hydrology back like it was at an earlier time.

Let's see. Highway 82 project raising the highway, I think is a good thing. The only problem we have is some people -- like me being from Grand Chenier, Grand Chenier ridge is very narrow. We do have some bayous and stuff to the south of there, canals, that I think some infrastructure is already there that probably could be added.

Also in Vermilion Parish, like at Pecan Island if you go from 82 they have a ridge to the south where most people live and they would be cut off. Also another factor when you get following Highway 82 up to the Oak Grove area, they have Trosclair Road which is a parish road. Your project goes following up 27 and

back to 82. That would be a straight shot and also would be cost saving measure. So I wish you would take these into consideration. Thank you.

MS. DESHOTELS: Thank you, sir. Rachel Lindsay.

MS. LINDSAY: My name is Rachel Lindsay. I'm actually from Texas but as an heir to property here on the Cameron coast or Cameron Parish coast, I'm here to speak on behalf of basically my own children and my grandchildren for the property that they deserve to be able to go and enjoy and actually have a beach. I've pulled up multiple ESI maps and looked at -- I've read through almost everything and looked over different websites and I was finally grateful to find out that breakwaters were going to go into effect between Sabine and Calcasieu because then there may actually be a beach. Because right now, there's a road and the water is just lapping up on it, and that's not what I would want for my kids.

On a side note I've spent many, many years in environmental emergency spill response, and my question to be the devil's advocate. I've seen, reported, and typed reports many times on spills in estuaries off the Mississippi River. You're talking about pulling freshwater out of rivers that are

traveled not just by shrimpers and fishermen, not just small boats, but you're also talking barge traffic. And what's on those barges is not always the cleanest items. There's no mention of the Natural Resource damage assessment. There is no mention of any work with LASCO or any communication. I would hate to see all of this work and all of the planning and then everything be put into place to have a tragic environmental disaster where freshwater is going into areas that are environmentally sensitive already. And you're going to take and pollute that water and have it go in. So if there's a possibility of installing flood gates into the division of navigational channels that would be -- I try not to come with questions but with solutions, and that would be the only solution that I have as far as what I've read. But that would be my comment.

And I appreciate you guys finally doing something as far as the shoreline. I know my husband's grandfather would really appreciate the findings so that this great-grandchildren will have the camp and the beach that he always envisioned that they could enjoy, thanks.

MS. DESHOTELS: Thank you. My last card is Randy Roach.

MR. ROACH: Thank you for coming to Lake Charles and allowing us an opportunity to view the plan and to comment on it. I feel like in some respects I'll been reiterating some of the comments that some of the individuals who have already presented before you have already made. But there are a couple of things that I would like to perhaps just add to. Charlie mentioned a moment ago about the navigation channel, about the stabilization and about the problems that we have with the Calcasieu Ship Channel. One thing that I noticed in here and I don't remember exactly which page it was on, but towards the back of the report where you start -- where you highlight the navigation channels. It's on page 53. You highlight the Intercoastal but you don't highlight the Calcasieu River Ship Channel and that ship channel is a major navigation channel and as David Richard pointed out to you, it is a major source of marsh restoration projects may not be the source of the projects but it is source of what creates the need for the project. And I think that needs to be at least highlighted on that map.

And I think also with respect to the comments about that stabilization, you could almost kill two birds with one stone. One of the problems you have with your navigation channels is maintenance,

maintenance dredging. Which leads to further degradation of the channel and it's kind of an ongoing thing. If you stabilize those banks which we did on the lower portion of that channel with some rock that we got through a project, a joint project with the Army Corps of Engineers, and you stabilize that entire ship channel, you will do a lot not only to secure the channel but also to address the issue of saltwater intrusion created by the channel.

Speaking with respect to the levee around Lake Charles, this is not the first time I've seen the plan. I saw it last Friday, I guess it was Thursday or Friday, and it was the first time that I've really seen the levee around Lake Charles. And of course, I think that would make a lot of us feel very secure. The question I have on that map, I didn't see the floodgate, but on the maps that you have on your board, there's a floodgate. I would be interested to know how you anticipate operating that floodgate. I would assume there's going to be ample consideration given to not only the water coming from the south but the water coming from the north. You also -- it's more common for us to have eight, ten inch rains than it is for us to have a Hurricane Rita. So I would be interested to know how that's going to effect that area because that

area particularly in the southern portion of the parish is subject to flooding. And I will tell you the City of Lake Charles, Calcasieu Parish Police Jury, Army Corps of Engineers are jointly funding a drainage study for the area. So it might be something that we would want to look into.

With respect to the comment made by the Chenier Plain and about the need for more study. I'm concerned about the comment. Not because there's any ulterior motive or anything really sinister in it, but my concern is whenever I see or historically whenever I've seen the word "study," that means it will take its time and it takes a long time, and I would like to just remind the committee that we have been developing and approving a coastal restoration and protection plan for over 15 years on an annual basis. Louisiana legislature, Louisiana Wetland Authority has been approving a plan for 15 years. That plan does address projects in this area. And Tom Hess and David Richard and others who have been working for that 15 year period have got all kinds of information that I think would indicate and would validate the need for and the justification for and the conclusion of those projects.

Where I think we do need to give some consideration is with respect to the damage done by

Hurricane Rita. Historically, the residents of southwest Louisiana have been -- have realized and recognized the tremendous land loss in southeast Louisiana and has kind of stood to the side as priorities were set really taking those projects from southeast Louisiana land, bringing all of those projects ahead of projects in southwest Louisiana. You look at the water bill, that was proposed also had projects, most of the projects came from southeast Louisiana. We understood that. This is post Rita. And we now recognize that because of the damage that has been done particularly in the Mermentau Basin and other regions along the coast particularly in Cameron Parish the damage that has been done to those marshes now makes that area extremely vulnerable to further damage. And we're concerned that if we don't immediately begin to address this issue, we're going to have -- we're going to look like southeast Louisiana, and the problem is that we're not going to have the mechanisms, the natural hydrologic mechanisms available to us to restore that marsh if we don't begin to act right now. So I would like for you to at least consider that in mind as you go through the completion of the plan.

The other thing that I would like to point

out and I made this comment Friday when I saw the plan is the list of priorities that you've established. And this is just a minor thing. Might not seem like major to some people, but I think when you have objectives one, two, three, and four, I think you can probably say there is no particular order. They're all important. But Objective Number 4 I think is the most important because Objective Number 4 talks about the unique areas of coastal Louisiana. And that heritage of coastal Louisiana is unique and unlike anything else that exists in North America. I would compare it to the culture and the heritage of the American Indian. The people who settle coastal Louisiana were predominately people that came from a land that they were exiled from, people that nobody wanted, came to the land that nobody wanted, and they created a wonderful land and a way of life that is celebrated by this state and I think contributes in a large part to the personality of the state and what some people identify with when they talk about Louisiana. I think that should be objective number one.

But when I look at objective number one, I realize it addresses that term "economic loss" and it's hard to argue with projects that address economic loss. So maybe you have to bump four from one to two. But I

think it deserves that level of recognition because it's a small thing but it makes a big statement. And I think it is important that we, we from Louisiana, that we define that heritage and that we say that heritage is important because nobody else is going to do it. Nobody from Oregon is going to worry about it. Nobody from Massachusetts is going to worry about it. When you present this plan to the federal government, I think they need to understand that we Louisianians value that heritage and we're putting that objective as being one of the preliminary objectives of this plan, and I think in a subtle way that will affect our thought processes as we move through the process of trying to define what we need to do and making some of the hard choices that we are going to make.

You have a statement in your plan that talks about the need for bold action, bold statement, bold decisions, decisions need to be made in the context of that unique heritage or we're going to lose that heritage and it's something that people will write about years from now but it will just be a memory.

There are some other provisions in here, and I know you said five minutes, but one thing that I would just like to end on and it was something that I had noted in here relative to the area of lower Cameron

Parish. There was some discussion about the fact that you and I would be interested to know what David and the folks from Cameron feel about this proposal levee along the Intercoastal waterway. My concern is that we not write off lower Cameron Parish. Elevating Highway 82, elevating Highway 27 will afford some protection but primarily for evacuation. There may be -- to have the same concept of this ring levee that you have around Lake Charles and Sulphur, Carlyss and Iowa, those areas, maybe some consideration needs to be given to some type of system or something that would protect that lower Cameron region. That lower Cameron region is a very important region of the state because it provides the network of support for the offshore oil and gas industry, and we have to have a hospital down there. We will be talking some more about that money for the hospital we think is coming on-line. But that hospital is below that levee. That hospital is extremely important to the offshore and gas industry. It is extremely important to the community of Cameron Parish as a whole. So I would be interested to know what the thinking is. I know that I've talked to some folks from Vermilion. They felt like that levee should be -- they were the ones that brought it to my attention and they were arguing that the levee should

be along the coast. Whether it should or should not be. I know Rockefeller Refuge is down there and consideration needs to be given to that but Rockefeller has gotten a levee embankment system that is at risk itself right now. Tom is probably better to address that.

But all in all I know, you have worked very hard for the last nine months and we appreciate your effort. I don't think that there is any -- there is ever going to be a point at which we can say we got it all done. We know what we need to do and we're ready to go. It is going to be by its very nature, a living, breathing thing and we're going to have to be adaptable, and the one thing that I would like to say, I don't know if it helps any, but at some point in our dialog on this issue, we have got to make people understand that we're not telling them that this is the Bible, this is the solution, but we're telling them this is the best we can do with the circumstances and information that we have today, and that we will make mistakes. Mistakes will be made. But they won't be made in ignorance. They will be made with the best science and the best information that we have and they will have the mechanisms in place to address it as we go along. But if we get all wrapped up in this idea of

almost political correctness that we're so afraid of making mistakes we'll never get anything done and we're running out of time as you have pointed out with this document. And it's really critical that we move quickly. And again, I get back to my statements about southwest Louisiana. We don't want to take anything away from southeast Louisiana at all. We understand the severity of the problems that they face but as the result of Hurricane Rita, we feel that our problems are geared in that same level of concern and we don't want it to get to a point where we have that level of degradation of our coastal marshes because we, like I said earlier, we would have the same flexibility to restore as they do the same options as southeast Louisiana. Thank you.

MS. DESHOTELS: Thank you, Mayor. I have no more cards in front of me. Does anyone else have a question or a comment before we close the meeting this evening? Please state your name for the record.

MR. ATHERTON: Charlie Etheron, 122 Vine Street. What I mentioned a while ago about the suggestion of going offshore to where the prior agencies in the past have identified material that would be good, you know, for beefing up the entire coast. As you recall I didn't dwell on it but part of

the reason for beefing that coast up was exactly what Randy Roach was speaking of. But also there are numerous pipelines that run right along 82 and I know some of the proposed LNG facilities have tie-ins just like there. I believe they are just barely north of 82 and right alongside the road. So I realize that no one had even mentioned about the pipelines and you may or may not be aware but there is a tremendous network of pipelines in that area which would beg that you -- to build the coast up and push it further back out to protect infrastructure of the oil and gas pipelines and the people of the parish. Thank you.

MS. DESHOTELS: Thank you, sir. Any other comments? Thank you. We will end. Good night.

(PUBLIC MEETING CONCLUDED)

5.3.11 Covington Public Meeting Transcript, December 14, 2006

COASTAL PROTECTION AND RESTORATION AUTHORITY

INTEGRATED PLANNING TEAM

TRANSCRIPT AND PUBLIC COMMENTS

OF

PUBLIC MEETING

FOR THE

COMPREHENSIVE COASTAL PROTECTION

MASTER PLAN FOR LOUISIANA

PRELIMINARY DRAFT

HELD IN THE

GREATER COVINGTON CENTER

317 NORTH JEFFERSON AVENUE

COVINGTON, LOUISIANA 70433

ON

THURSDAY, DECEMBER 14, 2006

GAUDET KAISER, L.L.C.
Board-Certified Court Reporters

PUBLIC MEETING

FOR

COMPREHENSIVE COASTAL PROTECTION

MASTER PLAN FOR LOUISIANA

PRELIMINARY DRAFT

GREATER COVINGTON CENTER

COVINGTON, LOUISIANA

THURSDAY, DECEMBER 14, 2006

7:00 P. M.

Transcript of the public meeting in the captioned matter, including opening remarks, presentation of general information, exhibits and project details, receipt of statement from public, concluding remarks and end of meeting.

Appearing for the Coastal Protection & Restoration Authority Integrated Planning Team:

Jon Porthouse

Jean Cowan

Larry Ardoin

Michele Deshotels

Ricky Brouillette

Norwyn Johnson

Also appearing:

Members of the Firm of Brown, Cunningham & Gannuch, Inc.

Members of the Firm of Shaw Coastal, Inc.

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MICHELE DESHOTELS:

Good evening. Thank you for coming. I'm going to introduce a few of the members of the Integrated Planning Team who are here this evening. We have Jean Cowan sitting here. On the stage, we have Jon Porthouse, Rickey Brouillette, Larry Ardoin. We have Oneil Malbrough from Shaw Coastal, Robert Tisdale from BCG is here, and we have Norwyn Johnson who is a team member. And also from the Corps of Engineers, we have the project manager for the Corps' LaCPR program Edmond Russo with us this evening.

The topics that we're going to cover this evening is how does the Master Plan relate to other ongoing planning efforts -- and that will include Edmond's project -- what is the Master Plan seeking to achieve, what does our Preliminary Draft Master Plan represent, the key components of the plan -- this is the meat of it and Rickey's going to go over this part of the presentation this evening -- and what are the potential policy, legislative, or institutional issues that would affect implementation of the plan and what comes next.

How does a Master Plan relate to other ongoing efforts? The Corps' perspective which stems

from the authorizing language is mainly focused on reducing risk. The Corps was directed by Congress to look at providing a high level of protection, and their efforts do not necessarily take into account restoration.

Our work which was directed by Act 8 of the 2005 Extraordinary Session is to specifically look at integrating both coastal restoration and hurricane protection under the umbrella of coastal protection. The Louisiana legislature specifically told us to state that it was time to integrate these two previously separately pursued items.

The LRA effort is a much larger planning effort; and it's looking at redevelopment issues including health, insurance, transportation, and other similar regional issues.

Now, all three efforts are working closely together. We are utilizing the modeling that the Corps is doing in their work. The Corps is working with our objectives and some of our planning goals. We are providing input to the LRA work and utilizing the LRA's strength in being able to reach out to the public and bring in some of that public comment and input into our work.

So all three plans are working together.

Although these are separate planning efforts, they are coordinated planning efforts; and the intent in doing this is that we make use of all the public input that we are getting and so that we can assure that the valuable time that our public has given us is well utilized by all of us.

What are we seeking to achieve? Give you a little background here. Again, we were directed that this has to be an integration of hurricane protection and coastal restoration. That a healthy landscape is essential in achieving both a sustainable ecosystem and reliable flood protection.

The hurricane protection strategies are defined in the plan based on the premise of a healthy landscape and that a complete plan is based on the multiple lines of defense concept. We know that hurricane protection and coastal restoration are linked. We know that anything that we do to fix the system will alter hydrology and, therefore, it will alter the ecosystem.

We also know that we cannot fix the problem if we don't change the system. We know that we are adaptable, that our communities are adaptable especially with advanced knowledge of change and the continued availability of basic services. And those

services include schools, medical services, churches, drinking water, roads, et cetera. Those things are needed for a community to remain a viable community.

The first line of defense should not be the last line of defense. Longer and more complex protection systems are more at risk for failure. And we need to give water room to move on both sides of the levee, in front and in back. We also know that altered hydrology does bring opportunities.

There are four coastwide planning objectives that the Master Plan seeks to achieve as a whole. We want to reduce economic losses from storm based surges. We are targeting achieving protection for everyone from a storm surge that has a 1 percent chance of occurring in any given year. The so called 100-year storm.

However, this protection may be provided by levees or by individuals elevating their houses, which is already occurring, or by combination of these and other measures. The photo in the lower left-hand corner that you are looking is a photo that was taken after Katrina in the Lake Catherine area between Slidell and New Orleans East, and it shows a house that survived Katrina. It was

sufficiently high that it was above the surge and the waves.

Objective No. 2 is to promote a sustainable ecosystem by harnessing the natural system. More natural fluctuations of water levels as provided for by divergence increase ecosystem productivity and resilience. I think everyone's familiar with Caernarvon, and the lower picture shows you some clay deposition that's occurring out there.

Objective No. 3 is to provide habitats suitable to support a diverse array of activities coastwide. We know that our coastal harvest is not limited. We hunt, we fish, we farm. And while we recognize that there will be habitat change in some locations, we also must recognize that we have a responsibility to assure that there is diversity coastwide.

Objective No. 4 is to sustain, to the extent practicable, our unique heritage. We are like no other place. And we know that who we are and what we have; that our family and our community is valuable; and that we don't want to lose this. We also know that who and what we are is tied to the land and land that we are losing.

What does the Preliminary Draft represent?

It's a conceptual vision of the future of coastal Louisiana. So while it's fairly detailed, this is still conceptual. It's an approach that needs to be implemented as a system to meet our objectives. We need to strive to balance objectives. We realize that further work is necessary.

And this is a starting point for public discussion. What we have here does not represent a complete answer but a beginning. And I'm going to turn this over to Rickey who's going to go through the measures that we're currently proposing. Thank you. Rickey.

RICKEY BROUILLETTE:

Thank you, Michele. First of all, I'd like to say that I'm very humbled to be working on this project for the state and the United States. All of us that are on this team bring our knowledge and strengths and passions about the coast and Louisiana and protection to the table, and I'm very privileged to work with this group of folks.

I'm one of the newer members on the team, but I've been a lifelong resident of the state. I feel like I've benefitted from the actions of people about 80 years ago after the flood of '27 that constructed the Mississippi River flood protection

system.

My father was born four years prior to the flood of '27. My daughter was born four years prior to Katrina. My grandfather was involved in cutting the grass on the levee system, and so I know he was very appreciative of the foresight and efforts that the group of people that were in power and control in those days that made a decision to protect the citizens of the whole central part of the states all the way down to Louisiana without regard to some of the constraints that we are having to live with today.

And everyone that's protected by that system continues to benefit from that system, but we also know we love the environment and we know we've made past mistakes. We also acknowledge that we have a better handle on to how to maybe address some of those problems in the future and hope that we can apply them to this program. So that's one of the goals and objectives of what we're trying to do.

Like Michele mentioned, what we're talking about is tradeoffs between protection of the environment and protection of people. And the footprint and features you're going to see today are the results of many years of experience of the

people on this team as well as input from personnel from across the state from environmental groups, key stakeholders, and citizens like yourself. It builds on the concept of multiple lines of defense that John Lopez initiated sometime back.

And what we're going to talk about initially is the Delta Plain, which is basically the eastern part of the state. It offers different unique sets of problems and challenges but also opportunities. And we're going to work from there to the western part of the state which is the Chenier Plains. And then what we're going to do is talk about some of the measures.

And the first thing we're going to talk about is stabilizing the coastal landscape. And we'll specifically discuss some of the measures in particular in some order, but that does not imply we've set or established priorities or sequencing. We're just going to present it in that fashion just for convenience.

And basically starting off with one of the first lines of protection is the shorelines and ridges. And basically, we've got a series of colored measures down here which represent the barrier islands in this portion. This is the

Chandeleur Islands.

Currently we're not recommending restoring the Chandeleur Islands. They're so far outside away from populated areas that we feel like they offer little benefit to controlling surge for protection for people and even restoration features that are further closer to the inland. However, we do recognize that there's some valuable habitat there; and we plan to work with the Department of Interior on that issue.

Then these figures over here, these small orange lines, represent ridges. In most cases natural ridges that existed previously. And we're planning to include those in the plan to be restored. They offer some protection from surge and waves for the various communities that are going to be behind them depending on the direction of the storm.

And then shoreline protection along the Lake Borgne area adjacent to the MRGO, Lake Pontchartrain, and Maurepas area, and then a shoreline protection up in this area adjacent in front of the Biloxi Marsh area.

The next measure that we have implemented into our plan involves navigation channels. And

they have been a source of problems in terms of them being widened and a source of potentially surge coming up through them. Saltwater intrusion. But they also offer opportunities. So what we plan to do is stabilize the banks of these navigation channels.

And in some cases, we might use the dredge material that's going to be removed from them to -- that will be dredged to maintain their channel depth for navigation purposes to create marsh. And then the MRGO also will have a special focus on it as to what we plan to do with that.

Just might want to mention that a lot of these measures are going to fall into one of three classes. One might be a class that would be a type of project that's of the scale and size and technically challenging nature that has not been done before in our environment, and we would consider that a conceptual project and measure at this point in time.

Another project would be one that maybe we have applied and constructed and built and maintained. But we've had a limited number of projects of that size and scope, and so our knowledge would be somewhat limited although we do

have some experience.

Then the last set of projects would be those that we have been implementing and constructing and operating and planning for quite some time. Department of Natural Resources, the coastal engineering division, restoration management division, DOTD, the Corps of Engineers, and some of our other federal partners have been working on a variety of these sorts of projects that I'm sure some of you are aware of.

Land sustaining diversions include diverting freshwater which includes nutrients into the ecosystem from a variety of locations along the natural waterways that we have including using some of these navigation channels to distribute the water to sustain the existing landscape and making sure that these landscapes to the best extent is possible continue to survive and are nourished by these nutrients. In some cases, some fine sediments. So that's one of the next components of the plan.

The next component is marsh creation type projects where we would be using dredge material. And in the east, we would plan to use dredge material from these navigation channels or from the Mississippi River or from offshore sand sources or

other sorts of sediment sources offshore to sustain these marshes or nourish them.

We've got quite a bit of experience doing those sorts of projects. The Little Lake project we just completed. It included about a thousand acres the east side of Cutoff, Louisiana as an example of one that was very successful.

In conjunction with those sorts of measures, we recognize that this whole part of the state is going to need a bolder plan of action; and this is one of these projects that we would consider something that is going to need a significant amount of effort to implement. And it has indications regarding navigation of Mississippi River, ecosystems in the Breton Sound area.

And so very conceptual at this point, but we're talking about a major diversion off of the Mississippi River. And its location may not be here, it may be further down. But we're talking about trying to get the sediment sources using the Mississippi River to supply the water, silts, clays, and sands into this area here, allow the natural coastal processes to distribute those sediments to build land in a large way.

The self-sustaining diversions are not of

sufficient size that we would be able to build significant amounts of land, but we think that this is one of the opportunities that we want to pursue.

In effect, Eads back in the 1860s was responsible for opening up the Mississippi River to long-term navigation for the country; but we know that those sediments are going off to the shelf and to the detriment of our coast, and so we want to try to correct that problem.

Special focus on the Mississippi River Gulf Outlet. We've had a lot of stakeholder input from a variety of people and including the state legislature, the St. Bernard Parish, the governor, and other stakeholder groups. And the Coastal Protection Recovery Authority's position is based on this input is we want a total closure of the MRGO at the Bayou LaLoutre Ridge.

However, that does not imply we want to fill in the channel with sediment because it's so wide and it would cost a significant amount of money to do that. In fact, what we want to do is use it as an opportunity divert freshwater to Violet diversion area. And it would go down the MRGO and follow the Bayou LaLoutre Ridge channel and nourish the marsh and the Biloxi Marsh area behind this

shoreline protection area.

There might be other options we might want to consider. Maybe even diverting water into the Lake Borgne area suggested by some of the folks from St. Bernard Parish.

Moving on to the hurricane protection system for the Delta Plain. We want to first illustrate the existing hurricane and flood protection system that exists. We have the Lower Atchafalaya River area over here, the Mississippi River system, Lafourche Parish has its hurricane protection system here. It's currently authorized to a 100-year level of protection that's currently constructed. And then in an authorized project that's in a were to build Morganza to the Gulf project, and it was authorized to the pre-Katrina 100-year level of protection for hurricane protection.

And we had the surrounding areas. There's a few other smaller flood protection systems. Some of them are not federalized, though. And this is the complete system of the proposed levees that we are going to implement or proposing to include in our plan, and you can see that it's complementing a large amount of system that's already in place. And

basically the brown represents the new proposed levees.

In this area, we have three options that we're considering. One that would follow the rim of Lake Borgne, another one that goes through Lake Borgne and goes across the Rigolets and up to the Pearl River. Town of Pearl River. Coming down through here to Larose and south of Houma tying in to the levee system over near Morgan City and moving westward into the Chenier Plain.

For establishing what we think is appropriate levels of protection, we considered the density of the population, the population itself, the assets at risk, the existence or availability of multiple lines of defense, whether the environment was a shallow or deep water wave environment.

If you're so far out near the gulf, you have deep water waves coming in. That means they're a very long period. In other words, they have a long distance between crest to crest. And so to stop those kind of waves, there's so much mass and momentum, those represent areas that are going to be especially challenging to try to prevent those sorts of areas from flood protection from hurricanes strictly by levees.

And what we did was we evaluated what existing available data existed in the communities that were pre-Katrina or pre-Rita conditions. And just recognize that this is tentative, and it's possible that the final mix of the plan would be different than what we're depicting here.

Getting into a little more detail of that system, this is the area where I mentioned there were three alternatives. And in this area, there is enough -- the problem with New Orleans is that the existing system is in an urban environment; and so to elevate those to reach 100-year level of protection status would be very difficult and very expensive.

Plus we feel like the area needs to have some redundancy. Levees that are long just offer more opportunities in places for failures to occur and assets that like New Orleans need to have some redundancy in the system. So we're looking at an outer barrier system basically to complement the inner barrier system, and that's what this would represent.

And then also this barrier since we'd be able to close off the Rigolets and some of the channels prior to a storm approaching the coast

would prevent buildup of water inside of Lake Pontchartrain which would provide some protection to the south shore and the north shore.

Our ADCIRC or surge modeling, these colorful drawings you see over to your left, those are all tentative surge models using a very sophisticated computer model. Advanced circulation model. Relatively new model.

And like all models, it's only as good as what you calibrate it to. And you might calibrate it to one set of storms today; but if the storm moves over, you might recognize and find out that your parameters that you use in your calibration don't work in another area.

So just recognize that what we're going through in Louisiana today is going to basically increase the art and science of these types of projects for the country and the US. We're talking about having super computers running 30 days of runs to get one alternative. So it's not a very trivial exercise, and we don't take it very lightly that we're going to plan our whole system only on a model.

So there's a lot of other things that we need to consider. Although eventually we do want to

act and so we're going to have to plan this system and construct and implement things eventually, but we'll have to acknowledge that mistakes will be made. The system may or may not work like we envision it.

Just like the Mississippi River protection system around New Orleans has been around for 287 years, every time the city gets hit by a new storm, we find new vulnerabilities and weaknesses in the system that has to be tweaked. So we recognize that that's going to occur also as well as in the restoration arena, too.

So we would have the system tie in at 500-year status all the way to this point, and then the West Bank is going to require 500-year level of protection. But, again, we're going to have to do something else because we won't be able to raise these levees in this urban environment to reach that kind of condition.

This area is a 100-year level of protection in red over on the west side. And we'll have to evaluate whether the levees on the south shore will have to be raised. In addition, we're going to have to evaluate even with this system closed here what are going to be the impacts for a storm just moving

the water within Lake Pontchartrain northward to the Northshore where you're currently residing.

So there's going to have to be a lot of work. The system we put on the ground is going to affect those storm surge models. They're a couple. And so we're going to have to do a lot of iterations to try to establish what we think is going to be needed. And the Corps is going to be doing a lot of that work with their specialists and consultants that are doing these advanced models.

Barataria Basin and Plaquemines Parish. Again, we're going to have 100-year level of protection down to the White Ditch area on the east bank and 100-year level of protection down to Myrtle Grove on the west bank. Below there, we're looking at maintaining the levees to the existing elevations.

So that implies that people that are going to be coming in to develop in the future will be required to elevate in those areas. Anybody that was in this area prior to only in the next year or so until the next based flood elevations are established might go in and build on the ground but we don't recommend that. The area is just too vulnerable that we would recommend that anybody go

in and build on the ground.

And people need to make educated decisions. I know we talked to one lady that bought a house just above north White Ditch just north of the White Ditch area in '92, and she had been told that you didn't need flood insurance to obtain her loan. Well, that was true but what they didn't tell her was you should have flood insurance because this is an area that's vulnerable to flooding.

So we want to make sure that there's enough information for people to be able to make educated decisions on where they move, where they live, where they play, and evaluate in their own mind what kind of risk they want to take. A lot of people that live in this area know they're in a coastal environment. They should be designing their systems to be able to withstand those kind of coastal forces.

This section would also be a 100-year level of protection tying into the Larose to Golden Meadow Levee which is currently existing, but it would have to be elevated to the new 100-year level of protection. In other words, it was built previously to a 100-year level of protection; but Katrina and Rita basically changed what we think those levels

are.

Moving westward into Terrebonne and Atchafalaya Delta areas, this is the Morganza to the Gulf project. And one alternative we would suggest to eliminate this funnel effect is to look at an alternative to this alignment. This area has the assets and the ability to construct a 100-year level of protection. Dulac-Houma warrants and requires a 500-year level of protection.

So the combination of this levee plus that levee would give Houma and Thibodaux 500-year level of protection. This part of the levee is 100-year protection. Again, this levee plus the West Bank Levee would give the west bank of New Orleans 500-year level of protection.

Moving over to the state plan from here to here and then the federal plan from here to here, using the footprints which were established for riverine flooding for also for our hurricane protection flooding for both 500 to here and then 100 to here. Morgan City existing levees we think are already adequate, but we will be checking that and confirming that in conjunction with the Corps to make sure that that's the case.

Even after we implement this full system

which would take years and years and hopefully some commitment on the basis of the federal government to support us with that effort because it's not something we can shoulder ourselves, we're going to still have risk. And we have already mentioned that people should be considering elevating their structures. Everybody should obtain flood insurance even if they're protected by levees. Also people can make the decision to move or evacuate or self-insure, flood proof, and so forth.

Another thing that should be considered to offer some redundancy to the flood protection system is compartmentation. New Orleans has this system of these old canals that contributed to some of the problems we know during Rita. But they also highlight that if you have systems that have redundancy or compartments that are independent of each other, you have opportunities to minimize the consequences in the event of a catastrophic failure.

The Orleans Parish versus the Jefferson Parish area, you can see this side flooded and this one didn't. This is the 17th Street Canal. So we recommend where possible implementing compartmentation.

Also water management. We should look at

water management from a system perspective. Make sure that we get as much water and sediments delivered to the areas to maintain healthy ecosystems and also meet the goals and objectives naturally of rainfall hydrology in flooding events, too.

And we know that's going to be a very challenging problem to deal with. We know that this area over here there's a lot of sensitivity to the fact that we've got a levee across it. It's going to provide some very unique opportunities or challenges to the engineering community to make sure that this system can be maintained as a healthy freshwater ecosystem. And we just have to have that sort of commitment on all sides of the table to make sure that that is the case.

Moving on to the Chenier Plain. Again, we're going to want to stabilize the landscape first. Different set of circumstances out west in the Chenier Plain.

Out east, we have the Deltaic active depositional environment. Deep very soft materials. Out west, we have a thinner layer of soft materials with the stiffer materials beneath it. But although there are different sets of challenges, there are

also different sets of opportunities.

One of the key things is shoreline stabilization. Some of these areas are losing 150 feet a year. And so if the shoreline keeps moving northward, the problems we saw during Rita are going to get exacerbated and continue to jeopardize these communities. Lake Charles, Lafayette, I-10. And so we want to make sure we stabilize the shoreline.

We're not suggesting that the entire shoreline has to be stabilized. There are certain areas that are worse than others like the Rockefeller area we know has a large problem. So we will be evaluating these in more detail.

But we also want to make sure inland lakes don't coalesce into larger inland lakes. Because the more and larger sized lakes are provide more opportunities for the wind fetch to drive larger and larger waves or ultimately break open into the gulf like we have here on the bay situation. So we're going to be stabilizing in our plan what -- our plan considers stabilizing those shorelines.

Using John Lopez' concept of multiple lines of defense, the second line of defense would be elevating Highway 82, a large portion of which

already resides on the Chenier Plain, Chenier Ridges, and Highway 27 to an elevation of plus 10. And so that would provide the second line of protection that would knock the surge down.

We also recognize that there's ecological concerns about the area behind here and whether we're going to get adequate hydrologic exchange across this barrier which, quite frankly, already exists in a lot of areas. Or in the event of overtopping surges that we can get the surges out quick enough so that we don't damage that ecosystem. So, again, very challenging problems to solve that problem; and we feel like it can be done, though, with proper evaluations.

Navigation channels. The Gulf Intracoastal Waterway, the GIWW, also, again, would be stabilized for shoreline protection and be used to convey freshwater with nutrients and some small amount of sediments in the areas that are adjacent to it, too.

Marsh creation type projects in areas that are in danger of coalescing or breaking in these areas. We would be using dredge spoils from the navigation channels and offshore sources and, in a limited number of cases perhaps, inland bays or inland lakes.

Managing the water and sediment in the region. This region traditionally has had feast or famine conditions where you're either in a drought condition where saltwater is coming in through the Calcasieu and Sabine, Mermentau Rivers. And when we are in the opposite extreme when we have large rainfall events, the drainage occurs so fast that it gets out of the system so fast and it doesn't provide opportunity for the nutrients to get in the system that needs them.

And so we need to look at this system very carefully. There are ongoing hydrologic studies, there are previous hydrologic studies. We need to look at that as a system and establish what's the best way to manage the water and sediments in the region.

And it might mean conveying water from the Atchafalaya River, it could mean some sort of reservoir up here if at all possible to retain the water long enough so that we can release it when it needs to be released without flooding people, naturally.

Hurricane protection again tying in to the east, Morgan City area, the Lafayette-New Iberia corridor, the future I-49 corridor, Abbeville,

Delcambre, so forth. There are enough assets in this region to justify 500-year level of protection.

Preliminary ADCIRC surge models suggest that the 500-year surge would not reach Lafayette. However, we think that the model may not be refined at this point enough to be 100 percent accurate. So we're going to delay deciding whether or not we would remove the 500-year level of protection until we get further analysis. But this section may be end up being 100-year level of protection.

Lake Charles again has the assets and warrants 500-year level of protection. This is the most conceptual footprint. It may turn out that we have a ring levee around this area with some sort of protection system around Lake Charles.

Between Abbeville and Lake Charles, it's a very dispersed population. Roads going north, south, east, west. There's a large population residing in this area. Farming community, fishing communities. Probably about 100,000 people. So this area we feel warrants 100-year level of protection.

If shoreline protection elevating of the Highway 82, 27 corridor and spoil bank management which would be like a third line of defense for

knocking the surge down are not adequate to provide 100-year level of protection, we may have to resort to 100-year level of levee along the GIWW on the south side where we think it would offer the least opportunity for providing additional hydrologic barriers.

I'll turn it back over to Michele.

SHARON VERCELLOTTI:

Could I ask a question about the terminology? You talked about 100-year and 500-year.

RICKEY BROUILLETTE:

Sure.

SHARON VERCELLOTTI:

How does that compare to hurricane levels of -- level 3 hurricane compared to a 100-year flood?

RICKEY BROUILLETTE:

Okay. I'm sorry. I should have mentioned that. Categories of hurricanes are not the way that field is moving. Now we're moving towards probabilities of exceedance. And a 100-year level of storm, for instance, is a 1 percent chance of occurring or being exceeded in any given year. So there is a chance that a 100-year storm may occur

multiple times over a 100 year planning horizon.

Now, a Katrina event we think -- and there's still some ongoing statistical analysis of the data -- is on the order of about a 400-year, 400-something-year event for New Orleans. And so a 500-year event would be bigger than Katrina. And a 500-year event means it has a 1 divided by 500 or 0.2 percent chance of being exceeded in any given year. Does that answer your question?

JON PORTHOUSE:

The category levels refer to wind speed. They're not used typically well correlated with surge levels. Where we think the major threat to coastal Louisiana is the storm surge. For example, Hurricane Camille which was a Category 5 storm at landfall had nowhere near the size, the magnitude of storm surge as Hurricane Katrina which was a Category 3 at landfall.

So although the storms when you look at the category numbers because it tells you how much damage you can expect on land from wind, other factors like the size of the storm and the central pressure really have a bigger effect on the size of the surge. And the size of the surge is what we're interested here. It's a little bit different.

MICHELE DESHOTELS:

Thank you, Jon. I'm going to briefly go over some of the policy, institutional, and legislative issues that are facing us. In land use, planning and zoning, we recognize that actions need to be taken to ensure that when areas remain wet whether they are inside or outside a levee system. As we've been reminded rainfall, flooding continues to remain a concern as well as surge protection.

Landowner concerns. 80 percent of the coast is privately owned. There is considerable interest in maintaining mineral rights. We need, however, to find ways that we can quickly gain easements. And it may be necessary for us to have quick-take authority in certain situations.

We are able to do things quickly with building levees. With restoration, we do not have the same ability to acquire property; and so these are things that need to be addressed in the future. And we need to do it in a way that is fair for everyone.

Adaptive management. As we move through design and implementation, we recognize that there are many things for us still to learn. And that as we move forward that there is new science that is

out there. There will be a recognition that there are some things that we are doing correctly, some things that we are doing well, some things that we can do better, and that we will be able to adapt and to have the mechanisms in place to evolve.

We also recognize that funding streams may change and so that may govern what we are able to do. So we have to be able to have the plans be able to change but change in a way that it keeps its focus.

We recognize that this will be a huge undertaking and that to implement it, it needs to be a state and federal partnership; that we also must work with agencies from a regulatory point of view; and that we need to do this so that we are working in a cooperative manner towards a common goal instead of putting up hurdles.

The plan needs to be consistent. It is the basis for consistency. So other federal, state, and local planning needs to be taken into account and needs to follow the guidance offered by this plan. This doesn't mean that other plans out there will not be accomplished, that other projects will not be accomplished, or that we say no to other projects. But it does mean that those projects should be

consistent with the vision that this state has for the future.

And lastly, we must find ways to ensure reliable funding streams so that there is not competing priorities each year with this process within the annual budgeting process.

What comes next? Public discussion. As I said earlier, this is a starting point for public discussion. We have been having continued stakeholder meetings and input throughout this process, but now we're having a formal month of discussions. We are having five public meetings this week.

In addition, we have had a meeting at the request of Plaquemines Parish in Plaquemines Parish. The CPRA had three public meetings a few weeks ago to release this plan. We're taking all of the input received, and we are going to incorporate it into our next rendition of a complete draft in February.

We are refining and defining our measures. We know that we need to develop better cost estimates. We need to develop implementation sequencing. We need to have this plan modified as necessary based on ongoing analyses and inputs.

We are still awaiting results of modeling,

the ADCIRC runs that are being done by the Corps at this time. As many of you are aware, these are very complicated modeling efforts that require a great deal of dedicated computer power; and each run is giving us more information.

As I said earlier, we expect the draft to be available in February. There will be another period of public review and comment; and in April, this will be submitted to the Louisiana legislature.

This is our schedule for this week. The Preliminary Draft is available at the local parish libraries in print. It's available online at www.Louisianacoastalplanning.org. The appendixes are also available online. And for those of you who have the time and inclination, there are hundreds of pages of supporting text there for you to look at.

And we are taking comments by E-mail, by letter, and this evening. I have two cards in front of me. And I'm going to go ahead and call Gene Turner, please, up to the mic and if you have questions or comments.

EUGENE TURNER:

My name is Gene Turner. I'm here as a private citizen. I have some teaching and research experience in Baton Rouge with varying pursuits in

wetland, ecology, and restoration book. I'm a editor of one of two wetland journals, chair the international wetland group.

I have a little bit of experience with this, and I don't presume to know all of it. So I have some comments. And they're not meant to be in any way personal.

One of the first is that I'm -- appalled isn't the word, but this is just too short a timeframe to put this forward. And it's impossible to weigh all these things within the time that you're allotted. And the review process is going to be impossible to take in the comments and weigh them because there's people involved and they have their own set of interactions and opinions.

And if you wanted to introduce a new idea, it's a little bit like St. Aquinas said, it's like you want to impregnate a tiger and the tiger isn't even in heat and you're a mouse. So, I mean, it's hard to get new ideas in.

And, for example, there's several times said here that nutrients are important to grow the marsh. This is exactly the opposite of what you probably want to do. These are organic soils. There's hardly an organic soil around that doesn't

decompose faster with more nutrients or at least stay the same. It doesn't build them up. It's a microbe issue.

These are organic soils. They're organic because of roots and rhizomes. If you have nutrients, you don't need the roots and rhizomes as much. They don't work as hard, they don't create it, they don't hold the soil.

If you want an example of maybe the way -- an explanation of this, you look at the USGS maps of where the hurricane damage was around Caernarvon, it's all red. And if you look at the reference area to the east of that, it's not. Rather than the strengthening the marsh, it actually looks like a diversion and particularly weaken the marsh. This is in a letter, too.

So second point would be wherever your science advisors are if they're capable or being compromised, I'm worried that they're not being listened to. And I think that requires more vetting and a lot more time in order to get that out.

And for me if -- I think this really is a pretty shocking document in many ways because I -- I will support flood protection for the existing homes. But with regard to wetland restoration, I

wonder -- or just maintenance to save these coasts, it doesn't look like we've learned much over the last 30 years.

If there's one thing we should have learned over the last 30 years is that levees, spoil banks, cause hydrologic compoundment incidentally, indirectly and all the land loss in this coast on the Deltaic Plain on both sides of the river where we dredge and put up spoil banks -- small little things relative to what's being planned -- we've lost land.

And where there's hardly any levees, we haven't lost land. The intercept is practically zero. And now we're putting up levees that are probably on the order of 25 feet high that have four to one ratio of slope. And if you roughly figure that out, it's going to be 200 to 600 acres a mile for every -- you're going to have to have just for the levee and for the bank. That just seems to be going in the opposite direction.

I know there's thousands of hydrologic channels going through all the systems to keep it the way it was built. And every time -- when you put -- there's only seven or eight openings across on these east-west levees, and it's basically going

to change the hydrology not a little bit but it's going to be the driver. Water can't get in, it can't get out, and change all the natural flows.

And what we've learned, again, from the oil and gas dredging on the coast which we allowed, based perhaps on our unexamined assumptions at the time when we should know now, you're going to lose wetlands. And all of the areas north of those you can pretty much write off.

Socially, I don't know how we fix the problem we had in New Orleans which was that the levees failed. There's plenty of appropriate criticism of the system. Not of the levees but of the people that were running them and how the professionals who got distracted or compromised in some way.

And until you can figure out how to get that admittedly human component that we're all -- that society has, we make perfect decisions. Till that's fixed in something like New Orleans, I don't see how even more that it's going to do better. We're going to trap people into more disastrous situations.

When you go through deliberations, I think it would be instructive to see if it costs, say, a

billion dollars for whatever it is, how much of that is going to be required for maintenance from now on to make sure that those things are there. People make decisions on short term but they have disasters in the long term.

Hurricane Betsy went through in '65. It hit almost the same place as Katrina. Flooded 80 percent of the river and they then went forward and expanded to the east. That's just kind of the way human systems are. And we're not perfect.

And so I applaud multiple lines of defense for that; but actually what you need -- we have to demonstrate that before we spread it across the whole coast. We're just trapping people behind these prisons basically.

So the leaky levee concept is a brute force hydrologic concept. I've written this, too. It's being implemented to sustain the natural hydrology, and there's nothing natural about it. It's in stark contrast to the way a wetland works with all these little small cuts in it. All these little small channels. And we should have learned that.

And it's not only aboveground flow but it's below ground flow. Just think about all the weight of that material with this high levee whatever the

height is going to be, 20 feet, 50 feet, 10 feet. And it pinches the below ground and the salt marshes we know which are more inorganic content than these floating marshes up here, a lot of this flow is below ground as well. It's 50 percent of the salt marsh as far as we can tell.

So we're changing hydrology below ground, aboveground, it's organic soil, we're going to oxidize it, we're going to stress the plants. It won't produce the organic matter and you're going to lose it. It may not happen in 2 years, it may not happen in 10 years but you're going to lose it. Because that's the record we have.

And the assumption that it's not going to behave that way have to be proven, I think, rather than accept something we'd like to have out of wishful thinking.

So I think you guys got to -- well, men and women, have a pretty tough job. The assumption is going to this -- or I realize it's going to take decades on this, but the understanding on how wetlands work is missing out of this. And I'm sure we'll have future conversations about this later. Thank you.

MICHELE DESHOTELS:

Thank you. Sandra Slifer.

SANDRA SLIFER:

My name is Sandra Slifer and I'm president of the League of Women Voters here in St. Tammany. I don't have, you know, this gentleman's technical expertise. So I'm going to more or less comment that I had from experience and from going to a lot of meetings and listening to a lot of people, you know, that -- one of the things that you did just address was, you know, prioritize -- you know, some of the areas should be allowed to flood naturally.

So, you know, I had written this before you got up to speak; but it just seems, you know, that a lot of times that nature does a much better job than what man is able to create.

Zoning and land use, that the floodplains must be preserved. And, you know, that I thought it was interesting that in our discussions earlier today that, you know, I think that in the short term as well as the midterm, you know, that because these systems are going to take such a long time, there's so much that we don't know about how to build them that there are things that could be done, guidelines, incentives for parish governments to

protect their flood zones.

And I'd like to really encourage, you know, you all to work with the state legislators to implement incentives as opposed to sticks with parish government. That one of the things that -- a lot has been made of the oil and gas revenue, you know, that plan that the federal government just passed; but that there was also a provision in there for green space dollars.

And I don't know -- you know, I haven't read the bill to see what those provisions are; but I think we need to explore every avenue possible to compensate landowners for their land and not -- just because you can make it buildable doesn't mean that it's a good thing for us to put houses and structures on every square inch of land.

And that I think that we need to make every effort to see if some of that 12 and a half percent that's going to be allocated for some sort of parks or green space, you know, we need to go after every single dollar, you know. And, you know, not that landowners shouldn't receive some compensation, you know, find a way to compensate fairly but let's get some land out of commerce.

Implement these best practices, you know,

develop a procedure, get it through the legislature, you know, do incentives that are better that give the parish more than what they get from development. And we can do this now because it's going to take -- you know, that it could take years to implement everything that's being discussed here.

And with the science being -- you know, we're in the learning stage. You know, we don't know how to do this. There are all kinds of factors. It seems that we should concentrate some of our most -- you know, a lot of effort into doing things that we can do that maybe don't require a lot of the money and the infrastructure and the building that's going to be required to do this. So thank you.

MICHELE DESHOTELS:

Thank you. I have no more cards. Does anyone else wish to make a comment? Would you please identify yourself for the record.

LESLIE MARCH:

My name is Leslie March and I am the chair of the Delta Chapter of the Sierra Club in Louisiana. But this statement is from me personally because the Chapter is already preparing a more formal statement of comments to the plan.

Yesterday I had the pleasure of meeting some of the Dutch engineers who, you know, have worked on the different projects in the Netherlands. One thing that they advised us over and over again was balance. That we need to have balance and also that we need to have patience.

Now, they've been building dykes and levees since 1200. I think they know a little bit about what they're doing but they've made major mistakes. They've killed wetlands, they've had international boundary disputes, they've had a lot of other issues but they kept telling us be patient. Don't rush into things.

Now, of course, we all feel this sense of urgency. We've got to do something about this right away. Well, I have some comments about the plan. And the first thing about the plan is this is incredible. And I have been part of the stakeholder process, and the fact that you've been able to put all this information together in such a short period of time. But I'm also concerned as the previous speaker that maybe we're going a little bit too fast on some things.

But one of the things I'm concerned about is the timing and the funding of the hard protection

versus restoring our natural systems. I'm concerned that the hard levee walls will become No. 1 priority and they're the ones that will get built but the restoring the natural systems will get put off until it's too late when we have no natural systems to restore.

MICHELE DESHOTELS:

That's one of the reasons that we believe this needs to be done as a system integrating this together.

LESLIE MARCH:

Yeah. It really needs to be integrated. I'm concerned on some individual projects that were listed in the plan. The Holy Cross neighborhood and the Lower 9th Ward have fought the completion of the Industrial Canal Lock for years. And I find that kind of a dismay that that has been put into this plan because these are people who have suffered the most because of the storm and now they're going to have to fight this again.

I'm also concerned that the Morganza to the Gulf project continues to be a priority despite the fact that funding for it has not been passed in several Congressional sessions. And the Delta

Chapter is on the record of being against this project.

And all of these lead to the elephant in the room and it's when will the implementation be able to start and how are we going to pay for it. Also what kind of independent checks and balance system will be used to analyze the effects of each project and to ensure that we aren't making mistakes.

Our experience with Corps projects are that once they're approved, the project's momentum continues whether the project is a mistake or not. And the MRGO is a good example of that. In the 1950s, scientists already said that project was a mistake but they built it anyway. So, basically, I guess to conclude my remarks, the slide you had on what's next, all of those are very important. And I almost think that before a real draft plan is released that some of those questions need to be answered. Thank you.

MICHELE DESHOTELS:

Thank you. Edmond, did you want to make a statement? Would you please introduce yourself for the record.

EDMOND RUSSO:

Hi. My name is Edmond Russo with the Corps of Engineers, the project manager for the Louisiana Coastal Protection and Restoration project. I'm wanting to say that we've been very glad to have been a part of the CPRA's effort to produce this Preliminary Draft Master Plan. And my team looks forward to continue participation with your group to help you answer the questions on how these plans perform, what are their benefits, what are their impacts, what are their costs, using the best science and engineering with external peer review from the National Academy of Sciences. Thank you.

MICHELE DESHOTELS:

Thank you. Are there any other comments or questions?

Yes, ma'am. Would you please come to the mic and identify yourself for the record.

SHARON VERCELLOTTI:

I'm Sharon Vercellotti, a resident of Covington. And I just wanted to ask, is the LSU Hurricane Center and the LSU coastal restoration department part of the participants in this?

MICHELE DESHOTELS:

LSU is working with us on this. And

I'll let Jon give some of the details of the CLEAR program and how they interact with us. We're working with them just as we're working with some of the Dutch through Edmond's program, and Jon may be able to address that as well.

JON PORTHOUSE:

Since we initiated the Louisiana Coastal Area Restoration Program around about the same time, we also implemented a program called the CLEAR program. Coastal Louisiana Ecosystem Assessment and Restoration.

Basically what we recognized was there was a great amount of good solid theory about how wetlands work, how deltaic systems work, and a great deal of understanding. But what we are lacking was some real usable analytical tools where we could look at a project concept and say, Hey, if I build this, what's it really going to do for me.

So for the past four or five years, we've been working with not only LSU but we've used that as a vehicle to reach out to other universities within the state, around the nation, and even some -- we have a Canadian on the team as well. So we've been using that as a vehicle to get university involvement, bringing the states' academic resources

to bear here. Bringing the ecological knowledge into the system.

Since the storms, one of the things we've acknowledged is that things are a little bit different. We've got to incorporate not only sort of the average environmental conditions that we always planned for but the acute disastrous conditions like a storm surge. So since the storms, we've also reached out to additional people like the University of North Carolina. One of the developers of this advanced circulation model is working with us now to really help us understand how surges work around here and how the modeling really can be used to the maximum advantage.

So we've been putting a lot of emphasis over the last several years, we continue to put a lot of emphasis to bring academics from around the world between the federal government, the Corps of Engineers, USGS, all those folks. Bring them to the table, coalesce all this great body of theory into usable analytical tools so that we can really look up front at the concept before we put it into the ground and make a mistake.

It's an ongoing process. We learn more everyday and the trick is to make sure those tools

evolve as we learn more.

MICHELE DESHOTELS:

Does that help to answer your question?

SHARON VERCELLOTTI:

Yes. Thank you.

MICHELE DESHOTELS:

Are there any other comments or questions? Eduardo Parra.

EDUARDO PARRA:

Yes, my name is Eduardo Parra with CBM and I have a quick question. This is going to take years if not decades to get built, what will be a priority? What would be a first stage in the system? Thank you.

JON PORTHOUSE:

As was mentioned in the presentation, what we're working on right now is figuring out the prioritization process. One thing we don't want to do is just sit down and say, Let's do this one first, this one second. We want to have some sort of a thought process laid out in front, some sort of objective process that we can then implement and really focus on the more high priority items.

We don't have that right now. We're

working on it and it's something that will go into the final -- the complete draft that we release in February.

But I do just want to say this plan, it looks like something new and it looks like a snapshot in time. But as far as when implementation starts, it has already started. We are building upon all the planning efforts and implementation efforts that have been going on since the '60s for hurricane protection and in earnest since 1990 for coastal wetland restoration.

So the state and the federal government have been involved for a long time working on these issues, and this is in many ways just an acceleration of the implementation of these projects.

MICHELE DESHOTELS:

Thank you, Jon. Are there any other questions or comments? Thank you. Good night.

5.3.12 Abbeville Public Meeting Transcript, December 15, 2006

MICHELE DESHOTELS:

I'm going to go ahead and introduce members of the CPRA, Coastal Protection and Restoration Authority Integrated Planning Team. Starting on my far right, your left, we have Larry Ardoin; Juanita Russell, who is our liaison with the Corps and the Corps' liaison with us. We have Robert with BCG, O'Neal Malbrough with Shaw Coastal, Rickey Brouillette, Jon Porthouse, and Jean Cowan. And not present this evening, we have Norwyn Johnson and Andrew Beall, who are also members.

The topics that we're going to cover this evening: How does the Master Plan relate to other ongoing planning efforts, what are we seeking to achieve, what does the Preliminary Draft Master Plan represent, the key components of the plan. This is the heart of the plan. And Jean Cowan will go over this part. What are potential policy, legislative, or institutional issues that would affect implementation of the Master Plan, and then what comes next.

As I'm sure all of you have heard, there are three major ongoing planning efforts. And some of you may have participated in these efforts to date. The Corps was directed by Congress to look at

providing Category 5 protection or high-level protection across coastal Louisiana. The Corps' perspective, which stems from its authorizing language, is mainly focused on reducing risks. So they're not so focused on ecosystem-restoration projects; on these projects only as it relates to reducing surge.

Our work, which was directed by Act 8 of the 2005 Extraordinary Session is looking at the integration of hurricane protection and coastal restoration under the one umbrella of coastal protection. Our legislature has decided that, as we have done in the past pursuing these two objectives separately, it's not working, that they have to be looked at together as part of an integrated system.

The LRA, after the storms, was charged with looking at a larger picture than we are looking at. They're responsible for regional redevelopment for community issues, for health issues, for the insurance issues.

Now, all three of these efforts are working together. The Corps is doing substantial modeling that they are allowing us to use. They have done public scoping, which we have utilized. The Corps

is using our planning prospectus and our efforts to incorporate into their work. We have formed the basis of the LRA's work on restoration and protection. And we are utilizing much of the LRA's stakeholder input into our work.

So all three of these efforts are cognizant of one other, are working together. So even though our objectives are a little bit different in what we're trying to achieve, we're trying to make the most use of that public input that we're getting. And we are aware of what one another is doing.

So what are we seeking to achieve? First, as I said earlier, the integrational protection and coastal restoration under the one banner. A healthy landscape, we know, is essential in achieving both a sustainable ecosystem and reliable flood protection. Hurricane protection strategies are defined in the plan based on the premise of a healthy landscape. And our complete plan must be based on multiple lines of defense strategy.

We know also that each of us has a stake in the outcome, and each of us has to be a part of the solution. We also know that anything we do to fix

the system is going to alter hydrology and, therefore, alter the ecosystem. We know that we

can't fix the problem if we don't change the system.

We also know that we are adaptable, that our communities are adaptable, especially with advanced knowledge of change and continued availability of basic services. And those services include schools, medical services, churches, drinking water, roads, those things that we need to remain a viable community.

What does science and engineering say? The first line of defense should not be the last line of defense. It goes back to that multiple lines of defense strategy. We're also aware that the longer and the more complex protection systems are, the more at risk for failure they are. We know that we have to give water room to move. And there's room to move on both sides of a levee: both the front of the levee and the back of the levee. We also recognize that altered hydrology can provide opportunities.

There are four Coastwide Planning Objectives that define what the Master Plan seeks to achieve as a whole. We want to reduce economic losses from storm-based surges. We're encouraging achieving protection for everyone from a storm surge that has

a one percent chance of occurring in any given year. This is a so-called 100-year storm.

How does that protection occur? This protection may be provided by levee or by individuals raising or elevating their houses -- and this is already occurring -- or by a combination of these and other measures. The levees are not the sole source of providing hurricane protection.

Let me go back just a second there. For those of you who may not be familiar with this area, the photo in the lower right-hand corner of the screen is a picture of a house that was taken after Katrina. This is at Lake Catherine on the New Orleans Landbridge between Slidell and New Orleans East. And it is one of the very few recognizable structures out there. In fact, in this area, it

was the only thing left out there that was not a lone pile in the sand. But the house was above both surge and waves and survived.

We need to promote a sustainable ecosystem by harnessing the processes of the natural system. This is a photo, in the upper left-hand corner, of Caernarvon, and the lower right-hand photo shows clay deposition on the organic marsh surface.

We need to provide habitats suitable to support an array of commercial and recreational activities coastwide. So we recognize that we use our coast for a great many purposes. We hunt. We fish. We farm on our coast. And while we recognize that there will be habitat change in some locations, we also recognize that we must maintain coastwide habitat diversity.

We need to sustain, to the extent practicable, the unique heritage of coastal Louisiana by protecting our historic properties and our traditional cultures. We are like no other place. We know that who we are and what we have, that our family and our community is valuable, and we don't

want to lose this. We also know that who and what we are is tied to the land, land that we are losing.

What does the Preliminary Draft Master Plan represent? While fairly detailed, this is a conceptual vision of the future of coastal Louisiana. It is a completely integrated approach, and it has to be implemented as a system to meet objectives. We know that much work is left to be done to refine and define strategies further. We know that this is not the complete answer, but it

is a starting point for public discussion.

And now we're going to get into some of what will provoke that public discussion, our Preliminary Draft Plan key components. Jean?

JEAN COWAN:

Thank you, Michele. Okay. This plan is very big. It's very complex. It has many components. So for the purposes of presentation, we've broken it up -- we've broken the coast up into what we're calling the Delta Plain and Chenier Plain. The Delta Plain we're moving from the Pearl River west

to the Atchafalaya. And the Atchafalaya is then the breaking point for the purposes of presentation of where we'll begin to talk about the western part of the state.

In addition to that, though, I'm going to be presenting the plan in layers. The order in which I present those layers does not represent order of priority in terms of what we consider what needs to be done first or last, but it's simply the opportunity to layer the plan to you as we walk through.

Just to touch on, for a minute, priorities and sequencing -- something that, as we've been giving this presentation across the coast this week, it's

a question that's in the forefront of everyone's minds -- how are we setting priorities and what are we going to build first. And all I can tell you right now is that we haven't set that yet. We haven't even completed -- we barely even started being able to clearly discuss with ourselves how we would go about setting those priorities and sequencing of what comes first.

So I would encourage you tonight to not only comment on the components of the plan -- which is the reason we came to you at this stage of the planning, so we can be sure that we have the components of the plan in place -- but also what you feel as citizens of this region are the highest priorities and the things that you think need to be done before other things are done.

So the first thing we're going to discuss -- and I will walk through the Delta Plain quickly so that you can see what we are proposing over there and then move on to the Chenier Plain. The first thing we're going to be discussing in the Delta Plain is stabilization of the landscape by stabilizing what we call the skeleton of the landscape: the ridges, the critical shorelines that we need to stabilize to prevent coalescence of one

water body into the other, and the barrier island system.

So we're proposing, in some cases, rebuilding, but at least just going and stabilizing the barrier island chain in both Terrebonne and Barataria

Basins. There are a number of natural ridges out in the system that we want to restore. And then, again, these critical shorelines, as we're calling them, these things that either are falling apart, and we know we need to maintain them to prevent a long fetch of water, just open water moving in. And that also comes into play with these what we call landbridges, these land bodies that separate one water body from another. We want to make sure that those are stabilized so that you don't get this long fetch of water and continued erosion into the more sensitive areas and all the way up to the highly developed areas.

Again, this plan is multi-objective. And these strategies are consistent with that because these serve not only as lines of defense, as natural lines of defense, with the barrier islands and the ridges, but they also are critical habitats in our landscape. They are different elevations than the rest of the wetland area. And, therefore, they

support different species of wildlife that the rest of the surrounding wetland at a lower elevation

doesn't support.

The next is navigation channels, something that you-all in this part of the state are also very familiar with. The Gulf Intracoastal Waterway, and in this part of the state, the Houma Navigation Canal and the Mississippi River Gulf Outlet are waterways that were carved into our landscape to allow for a navigation transport of goods and materials throughout the state and into the rest of the country. But the way they've been maintained over the years has proven to be problematic because they are now eroding out into sensitive wetlands and into areas that are areas that we cannot allow that to continue to happen.

So the first step is to stabilize those banks -- in some cases, narrow the banks, if possible -- and create land where it's eroded away. Once you've done that, then you can actually use these canals as opportunities, turn something that has potentially been a problem in the landscape into an opportunity because you can use it as a conveyance of fresh water for areas where -- you're bringing it from areas where it's relatively easy to move

fresh water into the system, areas east and west of the Mississippi River. But finding ways to move it through the navigation channels and get it into areas, more remote areas, that are further away from these major rivers so that we can continue the land-sustaining processes of moving fresh water and sediments into those wetland areas.

Connected to that is this notion of land-sustaining diversions. These are the relatively smaller diversions, maybe upwards of 10 to 15,000 cubic feet per second of water moving off of, in this part of the state, the Mississippi River, but also the potential of moving Atchafalaya water eastward into Terrebonne Parish and using the navigation canals as means of conveying that water into more remote regions of eastern Terrebonne Parish.

These diversions, as labeled on here, analyses indicate to us that they will be very effective in sustaining the landscape that currently exists, preventing further land loss of that land that is there now, but they are not necessarily going to be effective in building land.

So we have a couple of opportunities available to us to do that. One is this notion of marsh

creation: dredging material from one area and putting it into another area. Typically, areas for this case, what we're calling strategic areas, areas that are closer to places where people live, areas where we may want to -- when we put the levees on here, you'll see that we want to make sure that these levees aren't eventually exposed to the open-Gulf conditions. There are areas that are falling apart very quickly. And if we don't do something now, they will be converted to open water. So marsh creation gets us to this sense of urgency of putting something back out there right now.

It does not, however, get us to that long-term sustainability, one of our four objectives. Because once the material is put out there, it's exposed and subjected to the same conditions that are causing the rest of the landscape to degrade already: subsidence, sea-level rise, erosion from wind and waves. So that's where they work in tandem with the land-sustaining diversions and with the water that we can move through the navigation canals. Through those combinations, the expectation is that we will be able to sustain that land.

Another possibility that's available to us for building new land is harnessing the river, as Michele said in one of the objectives. Making use of the Mississippi River, which is what built the eastern part of our state for over thousands of years, taking large amounts of water off the river currently depicted with these big, blue arrows and these brown hazes, it's very conceptual at this point. It's very complicated. We're talking about completely re-engineering the lower Mississippi River to do something like this. And so there are many, many things that you have to consider in order to be successful in doing something like this, and not the least of which is the land-building side of things.

In addition to that, this region east and west of the river is one of the richest oyster grounds that we have in our state, very important shrimp grounds and, of course, we have the navigation channel of the Mississippi River. If you were to take large amounts of water off of the river above the passes down here in the Bird's Foot Delta, it will alter the navigation, the ability to maintain

and dredge this portion of the river. And so we need to consider what our options are so that we

can maintain navigation while continuing to make use of the river's water and sediments to rebuild land that has been lost in that area.

Mississippi River Gulf Outlet: if you've been in the state for any length of time, this is surely something that you've been made aware of. Pretty much since its construction, citizens of St. Bernard Parish have called for its closure because of concerns over the environmental damage that not just the dredging of this channel, but the continued erosion of this channel out into the surrounding wetlands, the intrusion of salt water up into what were historically fresh-water wetlands and swamp, and the effects of the channel and its associated spoil banks on being able to bring more storm water up into St. Bernard Parish.

So our proposal here, we're calling for total closure of the Mississippi River Gulf Outlet by putting a closure structure just south of the Bayou LaLoutre ridge, which is depicted here in orange.

We would restore the ridge, plug the channel just below the ridge. We're not going to fill in the channel, though. Number one, it would take a tremendous amount of sediment that we could be using more efficiently by building wetlands other

places, but also because we can use it -- the portion that's above the closure part -- as an opportunity to convey water. You see a blue arrow right here in the vicinity of the town called Violet.

And what we're proposing to do is take water off the Mississippi River here, get it into this channel after we've also done some shoreline protection here so that Lake Borgne isn't coalescing into the MRGO anymore. That water can then be conveyed out into these, what's called the Biloxi marshlands. This is a very important landbridge, not only for its ecological significance, but also in that it serves as a line of defense against the more populated areas of New Orleans and the north shore of Lake Pontchartrain.

So moving forward to the hurricane protection

that we're proposing for the Delta Plain -- what you see on this slide is the existing levees, the river levees, the forced-drainage levees, and the hurricane protection levees that were built along the lower portion of the Mississippi River after Hurricane Betsy. I also see some levees here, and then the Atchafalaya levees that are part of the MIT project, also surrounding the Morgan City and

Berwick/Patterson area.

What's in blue here is the Morganza to the Gulf Project. If you're all familiar with eastern Terrebonne, this is a project that they've been working on for years and years and have, for the last six years, seven years, been trying to get it passed through the Water Resources Development Act in Washington. Although it has not been constructed, portions of it are being constructed now. It is a footprint that we feel is set. Therefore, we're putting this on the map as an existing footprint. And that is distinguished -- all of these are distinguished from the levees that we're proposing and are very conceptual at this

point in terms of the alignments that we have depicted on the map.

The idea is that we would be providing an outer barrier for the New Orleans metropolitan area and the North Shore area of Lake Pontchartrain. Somewhere along this landbridge, there's several different alignments being proposed. We would be basically connecting the dots of the existing levee systems to provide a more comprehensive protection system across the Barataria area, and then an anterior levee as needed to work in tandem with the

Morganza to the Gulf Alignment to provide a higher level of protection to the Houma area. And you see that here, the resulting levels of hurricane protection that this now, more comprehensive system would provide.

There's a lot of colors here. I'll try to walk through them quickly for you. Red indicates we're intending to provide a 100-year level of protection. Purple indicates we're intending to provide a 500-year level of protection. And blue is what we are suggesting that we would maintain

the existing levees at the levels that they are currently at. All of the other ones along here, again, would work in tandem with that.

What I mean by 100-year versus 500-year -- a lot of people have asked, how does that relate to a category of a storm, Category 1, 2, 3, 5, whatever? And the answer is, it's not directly related. The categories that you hear on the news when a storm is approaching have to do with wind speed, forward direction, barometric pressure. What we are trying to protect against here is not the wind but the resulting water. So when we're talking about 100-year or 500-year, we're talking about the surges and the waves that would be the run-up that

we're trying to protect against. And these are probabilities of occurrence.

So to get a little more detailed, the Pontchartrain area, the levees that currently exist around New Orleans, as you can see, they're built right up against water bodies. The communities have built right up to the toes of the levees. And it is challenging, if not impossible, to adequately

raise the levees along the existing footprints to improve the protection that's being provided to this area.

So, for that reason, in addition to recognizing that we need to be providing some sort of protection to the North Shore of Lake Pontchartrain and the other surrounding communities, we're looking at this outer barrier.

Again, three alternatives are being depicted here for alignments because it is very conceptual at this point. Not a great deal of work has been done to determine what the best way of providing that protection would be.

So the levees here would remain at what they will be built back to once the Corps is done with all of the work that they're doing now. And they would work in tandem with this outer barrier to

provide that higher level of protection.

Barataria Basin, Plaquemines Parish: As indicated earlier for Plaquemines Parish, we are suggesting a 100-year level of protection working in tandem with all of the other coastal restoration

work that we are proposing, to provide a 100-year level of protection to the highest populated areas of Plaquemines Parish and keeping the existing levees at their current heights further south. And so the people living downriver, to provide the protection that they need, we would have the coastal restoration, those existing levees. But they would also need to be relying on elevating their structures and improving their building codes to be able to withstand the vulnerable conditions that they live in down there.

For Barataria, we're proposing right now an alignment somewhere along the GIWW, put a little ring levee around Lafitte that would work in combination with the existing levee on the West Bank of New Orleans, to provide a higher level of protection to that area. But this alignment would also provide protection that currently does not exist for the basin communities in the upper portion of the east side of Bayou Lafourche.

There is an existing levee. Larose to Golden Meadow is the name in the levee alignment that's

done here in the southern part of Bayou Lafourche. It is not currently up to what will be the new 100-year standard. So we are proposing raising that up because of the importance of this community to the extensive oil and gas infrastructure that's done here in Port Fourchon.

I mentioned the Morganza to the Gulf Alignment earlier. That is a 100-year standard of protection. We will then be evaluating what else we may need to do in the region of Houma to provide a higher level of protection to this more densely populated area.

Morgan City, Berwick/Patterson area: The surge results that we have from the ADCIRC modeling that the Corps of Engineers has provided to us indicates that the levees that are here already are adequate -- are an appropriate level of protection to this area. The ADCIRC modeling that the Corps has provided to us, they are already working to revise it. They have more data points. It's going to be a much tighter grid and model. So once we get that improved information, we'll have to go back and reevaluate just to be sure that this is still the

case, that this is the adequate level of protection for this flood-prone area.

Once all that is done, though, once we've done the restoration, barrier-island restoration, all of these things in tandem with the levee alignments we're proposing, risk remains. Risk remains from these levees failing. Risk remains from an extreme storm that we haven't even thought of yet coming into the area. And so what we are telling people is that whether you're inside a levee or outside of a levee, it's crucial that you maintain your flood insurance and that you elevate your house to the extent that you can afford to ensure that you are providing yourself that added bit of protection. It's a part of that multiple lines of defense strategy of giving yourself a little room above the potential for water coming in.

Let me just jump ahead here. Another strategy that we can implement to reduce risk is this notion of compartmentation. It's something that the Dutch are looking at and are working with. It's also something that the Bring Back New Orleans Commission has adopted as a suggestion to us to implement as part of our strategy, not just in New Orleans, but, really, in any densely populated area

along the coast. And that is -- again, you know, as much as we learn about the proper way of engineering and maintaining these things, levees can fail.

If you don't have, within your levee system, compartmentation -- in this case, shown by the canals in New Orleans -- then if a levee fails over here, the entire area can flood. But if you have compartmentation within your metropolitan area, you can prevent the entire area from flooding out. And that was actually demonstrated to us during Hurricane Katrina. This is the 17th Street Canal where there was a breach in one of the levees. And this portion of the city flooded. And over here, the people remained dry. So it's something that we need to look at, again, not just for New Orleans, but any of our metropolitan areas.

Finally, water management: In your part of the state, it's finding enough fresh water for all of your needs. In this part of the state, it's getting that fresh water away from the areas that you don't want it. So what we're talking about here is serious alteration to the hydrology. And the very first thing we need to understand is how that's affecting not just the potential flooding of

communities, but the potential for impounding wetlands.

One of the worst things we can possibly do for these wetlands in this area and these bottomland hardwood and swamp forests is to allow the water to just stand there. Because if you do that, they're going to drown, and they're going to disappear. So we have to be sure that the fresh water that we're bringing in has the opportunity to move back out.

So one thing that I haven't discussed, with all of these levee alignments just yet, is this notion of a leaky levee. We want to make sure, that while these levees are impermeable barriers when we need them to be for storms, that they are actually very permeable during those times when we don't need them for hurricane protection so that we minimize the impact of hydrology. Water can continue to move out. The wetlands can continue to have a sheet flow across them and all of the things they would have to help build and sustain them if we weren't here altering the system, if the Mississippi River were just building a delta naturally.

So on to the reason that you-all are here for tonight, at least I believe most of you are here

tonight for this reason: the Chenier Plain. You-all are different. The Chenier Plain was not a remnant -- it was not an old Delta lobe. It was in the shadow of the Mississippi River. And the mud stream of the Mississippi River is what brought the sediments over to your area. And the wave action is what created your cheniers.

Although we are going to build for you this multiple lines of defense strategy, as I'll lay out for you here, our opportunities for coastal restoration and water management are different here because you don't have a major river system in your region.

But the first thing we are going to do is, again, stabilize the landscape, make sure that the skeleton is intact. And that means for you stabilizing the Gulf shoreline, a lot of your bays that are highly eroding right now, your lakes.

What we've heard when we went to Lake Charles is that we also need to be looking at shoreline

stabilization for both Calcasieu and Sabine Lakes. And we will be building that into our revisions.

We can do this by rocking everything, or we can do it through multiple alternatives. Some of the things we're looking at for the Gulf shoreline is

segmented breakwaters, which have been proven to be very successful in certain parts of your coastline already. We can bring in mineral sediment from offshore to rebuild some of your shoreline that has eroded away, possibly working in combination with the segmented breakwaters. That would be ideal.

Although rock may be required for a lot of your lakes and bays, we also know that terracing is something that has been tremendously successful in this part of the state. And it's something that we can continue to look at for areas that that would be appropriate for.

The other thing, I guess, I want to point out here is that you see a lot of pink here encircling all of Grand Lake, all of White Lake. We know that some of this work has already been done. It's one of those things that we need to be doing over the

coming months is identifying those areas of greatest need and being sure that we aren't covering up things that are already done. We're trying to hone this in. So, again, tonight if you-all have suggestions on that, please let us know.

Evacuation routes: I missed this when I was talking about the Delta Plain. In the Delta Plain,

we also have stabilizing evacuation routes, elevating them, shoring them up as necessary to be sure not only that they are there to allow people to leave harm's way as much as possible, but that they don't get washed away and undermined during the storm so that people can return and resume their lives as quickly as possible.

For you, we have evacuation routes here for the same purposes, but they're going to serve an additional purpose for you here. The shoreline stabilization would be your first line of defense. Elevating Highways 82 and 27 would be considered a second line of defense. What we are currently proposing is that we be elevating Highway 82 to

approximately 10 feet. And large stretches of Highway 82, it's either already close to that height, or you have a chenier close behind the highway that's even higher, and so it wouldn't be necessary. But what we're saying is, on average, across the length of Highway 82, you'd have 10-foot elevation to serve as a second line of defense for this community.

Navigation channels, similar to the Delta Plain, your navigation channels, the GIWW, in particular, Freshwater Bayou as well have not been

maintained to their originally authorized widths. They're continuing to erode out. We need to halt that, again, finding the areas of critical need first to make sure that we stop the areas of greatest erosion first.

But, then, we are also looking to use them as conveyance channels for fresh water. The Mermentau Basin here, we want to do what we can to actually improve the ability to keep this basin fresh for agriculture. That's so important to this region.

So once we stabilize the banks of the Gulf

Intracoastal Waterway, we plug some of the existing gaps, if you will, where the GIWW connects to larger water bodies, there's a potential there that we can use it to convey water from the Atchafalaya River westward into this area where you would like to have more fresh water.

Marsh creation: Again, you don't have a major river here. We can't be pulling large amounts of sediment out of the Mississippi River for you and easily, readily dumping it into your eroding areas, your subsiding areas, but you do have major navigation channels, and you do have near-shore sources of material. And so beneficial use of dredge material is something that we're going to

try to maximize in this area to be sure that we are recreating marsh where you're losing it.

We heard earlier tonight the Rainey Marsh area is an area that we need to go back and look at and make sure that we find those hot spots and propose marsh creation or possibly terracing some of those open waterways there.

And then, finally, managing water and sediment.

Not finally, but finally for the restoration side of things, managing water and sediment. Again, we understand that the Mermentau Basin is crucial for this community to maintain its fresh. So we want to be sure that we are making maximum use of the fresh water that's coming in. We're minimizing the water that's flowing out immediately without being able to be used.

So this notion of water storage is something that is crucial for this area that we're going to have to examine further exactly how we can do that. Again, trying to find ways of moving more Atchafalaya water into the area so that there's more fresh water to work with, not just for agricultural purposes, but also for ecosystem restoration and sustainability in the area.

The hurricane protection that we're proposing,

again, multiple lines of defense: The actual levees that we're proposing would work in tandem with stabilizing the shoreline, elevating the highway, recreating marsh in the areas that are crucial.

I'm going to go back to the managing water and

sediment because I missed a very important point. We're also discussing salinity control structures at the mouth of the Cameron -- at the mouth of the Calcasieu and the mouth of the Sabine. These structures would not need to be closed all the time, but we would have the opportunity to close them when salinity was an issue and a real stressor so that we don't end up getting excess salt water intrusion into this area. For the most part, it would remain open, as long as we had enough fresh water moving down the rivers. But we would have an opportunity to plug it when necessary.

The same thing for the highways here: We're not looking to have these as a solid impermeable barrier. They would be closed -- unlike on the Delta Plain where we were trying to keep them open most of the time so that the fresh water could continue to move through, here, we would like to have them perhaps closed a lot of the time, unless you had the excess fresh water that was needed to

move some water out.

But we also need permeable structures here,

gated structures, so that, in the event of another Rita, and salt water did come into the area, we would have an ability to open those areas up and get that salt water back out. That was one of your big problems here you-all lived through was, we didn't have the ability to get the water back out. It was trapped behind all of the elevated areas.

Okay. Now to the hurricane protection. We've identified those areas of highest population, strategic assets that we're looking to ensure against a 500-year level storm surge. This Lafayette/Abbeville corridor is one of those areas. So we're proposing a 500-year level of protection. This levee would provide the Lafayette/Abbeville area that 500-year level of protection.

Currently, the storm-surge modeling that we have indicates that Lafayette may not be vulnerable, even to a 500-year storm event. So as we get more information, more refined modeling analyses, we're going to have to see exactly what is required for this region. But, in general, this is the alignment that we're looking at to protect this corridor.

Lake Charles is another one of those densely populated areas for this region of the coast. It also has nationally significant oil and gas infrastructure in this area. And so we're also proposing determining the best way to provide a 500-year level of protection to that area.

It should be stressed that these alignments are easily conceptual at this point. Unlike the eastern part of the state, you-all have not had a lot of study of what's really the best way of providing protection in terms of a levee for your communities. So it's something that will continue to be refined and developed as we move along. If you don't like exactly what the alignment looks like right now, trust me, there's substantial opportunity for your input before anything gets built.

Lastly, you have, although very dispersed, a large number of people living in this area, farming, ranching. And we recognize that, although we can't provide you ring levees for protection, with this many people here, we do need to find a way to protect these assets that are in the region. So we'll be looking at what else would be needed after the shoreline is stabilized, after the

highway is elevated, after the spoil banks are reestablished along the GIWW. If these things in combination don't provide that 100-year level of protection to these communities, we would look at what type of a levee would be required to maintain that.

Those are all the constructible measures that we are considering. But there's a whole host of policy and legislative actions that we have to take in order to be able to build any of this. And Michele is going to go through, at least, what a few of those are that we've currently identified right now.

MICHELE DESHOTELS:

Thank you, Jean. Okay. We have land-use planning and zoning. We know that actions need to be taken to ensure that wet areas remain wet whether inside or outside of levee systems. We recognize that rain fall flooding is going to remain a key issue with many areas of our state. And people are very concerned about this, in addition to surge protection. So how water moves on each side of a levee from different sources will remain an issue of concern as we look at land-use planning and zoning.

There are landowner concerns out there regarding mineral rights, easements, purchases of land, negotiation for land, the potential for expropriation of land. There are abilities to acquire land for levee and hurricane protection that we don't currently have in the state for restoring coastal marsh and wetlands. All these are things that we have to look at in order to continue implementing this plan.

Adaptive management is an issue. We know where we want to go. We have a vision of our future. We also recognize that we don't have all of the information that we need at this time. Modeling is becoming more refined. There is new science and new technology happening all the time. There are things that we will try that may work not as well as we expected. There will be some things that we will try that will work much better than expected. And as we move forward with this plan, it needs to be flexible enough and adaptive enough that we can take advantage of all that is happening and that it's not a stagnant plan that doesn't recognize the abilities that we have to learn and benefit from

our experience.

We recognize that in order to accomplish this

plan, there has to be a federal and a state partnership. We, the state, will not have enough money to implement all of this, although, as of last week, there apparently will be a stream. We're very grateful for this. But we do not know at this time if that will be sufficient and expect that it will not be.

Were we to have all the money on our own to implement this, there still is federal legislation, regulatory requirements out there that we must comply with. We recognize that, in order to accomplish these projects, we will have to work with the federal government. We want to make sure that what we do expedites getting these projects on the ground, and there's not a hindrance to getting them there.

For the plan to be effective, there must be the basis for defining consistency in all federal, state, and local planning. There are many programs out there now for coastal restoration. There are

programs out there to provide hurricane protection. This plan will be the master plan, the umbrella of where we want to go. And these other programs need to comply with that vision and be consistent with it.

This doesn't mean that this plan says no to other projects that are out there. It does mean that this plan will give preference to those projects that are consistent with this vision.

And, lastly, we recognize that we must find ways to ensure that there is the dedicated funding stream, that the implementation of our project will not be subject to competing priorities that the state may have on an annual basis because, again, this is a system. It is a whole. To implement just one part of it fails to recognize that these other parts are necessary in order for it to be successful at the end of the day.

What comes next? Public discussion. This is a month for public discussion. As many of you know, we've had extensive stakeholder input. We've worked with the LRA. We have worked with the

Corps' LACPR Program. But this week we have gone out across the state. We are receiving lots of comments at our meetings. We are receiving written comments. Lots of people have taken the time to sit down and provide us with letters and e-mail. I can assure you that lots of people are taking the time to phone. All of this input will be taken into the process and considered in our next

rendition of this that will be out in February, when we hope to have a complete draft.

We are refining and defining our measures. We are developing cost estimates. We are developing implementation sequencing, perhaps one of the things that most people are interested in and that will be essential to a successful plan at the end of the day. We are modifying our plan based on analyses and inputs. Even now, the Corps is continuing to model an additional ADCIRC run. We are working with LSU and the CLEAR program with their inputs and analyses.

Each time there is a computer run, there is more data that is put in. There is more refined

information out there. The results will give us a better, a clearer idea of how this plan will work.

In February, we hope to have a complete draft for public review and comment. And then in April, we submit this to the Louisiana Legislature.

This is where we've been this week. We have been delighted to be involved in this process. It is absolutely wonderful going across the state and talking to all of our fellow residents and citizens. But I must admit, I will be very happy tomorrow morning when I am not going somewhere

else.

This is a copy of our Preliminary Draft. Each of you should have received this as you came in. If someone is interested, and they were not here this evening to get their own copy, it is available in the public library system, and every branch should have a copy. It is available online. And, also, online are all of the appendices supporting this Preliminary Draft. So for those of you who have the time, the interest, and the inclination, we have hundreds of pages of technical data

supporting our Preliminary Draft.

www.louisianacoastalplanning.org is the website you can go to for more information. As you came in this evening, you were handed a statement card in case you wanted to make a comment or ask a question this evening. You were also handed a comment form. You may fill out that form, turn it in this evening. You may mail it to us. It has our mailing address on it. It has the website information on it. And you may give it to a friend or neighbor who was not able to come here this evening and who would like to provide us with comments.

And, at this time, I'm going to start asking

people if they will come. I have two cards. And, first, Tim Creswell, would you please come to the mike because we are recording?

TIM CRESWELL:

Can you call back up the navigation channel.

MICHELE DESHOTELS:

I would be happy to.

TIM CRESWELL:

First of all, I'd like to thank the Integrated Planning Team for coming to Vermilion Parish. I know everybody here in the room appreciates -- y'all could have left O'Neal home. Next time, leave him home. Seriously speaking, O'Neal and I have been fighting the same battle for six years, the AgMat Channel, which is right here. The comment I have is concerning the AgMat, which is, for all practical purposes, is probably going to be the first thing done if we can ever get a WRDA Bill through.

You notice that you're talking about elevating here and here. If we get the AgMat in, we can put a levee from here, or barrier from here, to 82 or from here to the Rockefeller Canal levee.

MICHELE DESHOTELS:

Tim, I'm going to paraphrase, because we're

writing this down for the record. But you're talking about the most southern -- furthest southern point on the AgMat, moving over to --

TIM CRESWELL:

That's correct, on the west bank of Freshwater

Bayou. I am saying it right when I say the Rockefeller? That's right. What would be much cheaper is a levee from here or a barrier from here across, and you don't need to elevate this portion. This portion is through the marsh. That's going to be your most extensive portion to elevate. And you can do this for a lot less money and have the same result.

Now, the other comment I have is, as you know, up until now, all of the studies that we've seen are showing hurricane protection here, which wrote off this, the Mermentau Basin, which is unacceptable for us. This is the first protection. Highway 82 is the second. And this will be the third.

As you know, the Vermilion Parish Police Jury has adopted a resolution opposing this, the levee on the GIWW. I just talked to Mr. Todd Vincent, who is working with your group. And after the first of the year, he and I are going to get

together to redo the resolution with some more positive language and submit it where it will be a

positive note if we get the first, the second, and the third. I'll go back to the police jury to get them to adopt this new resolution.

But, once again, we appreciate the help because we don't want to see this happen again. You know, the original thing that upset me was what you're doing right here is destroying a culture. You're writing off Pecan Island and Cameron and these coastal communities. And I'm a little picky on that. Because my grandmother was a southern Chinelean. And the federal government, in all its wisdom, destroyed that culture. And excuse the expression, we ain't going to see it happen here.

Again, thank y'all for coming. Leave O'Neal home next time.

MICHELE DESHOTELS:

Ann Burrows.

ANN BURROWS:

Hi. My name is Ann Burrows, and I live in Lafayette. And I really want to thank y'all very much. I know just a tremendous amount of time and effort has gone into this project so far. The maps and graphics are really wonderful to help us all

understand what y'all are planning and where. I was going to make some general comments. But, really, now that I've seen the presentation, I really do have some questions, and I'm wondering if y'all can help me understand a little better.

There's a lot of talk in the reports about some of these new levees. First of all, you explained well the levee protection that we do have throughout the coast, the Morganza to the Gulf Project that's more than likely going to go in once word of it has passed, and then some new areas where you're hoping to do some additional new levees that you're calling leaky levees and talking about how they'll have flood gates and how now, you know, with modern thinking, you think more about how to keep our ecosystems and our estuaries connected and viable and rebuild levee protection.

So I'm wondering what, exactly, methods do we have to make these levees leaky enough and permeable enough so that we aren't cutting off our estuaries and harming the very things that make our coast so special: our shrimp, our oysters, our crabs, our fishing ability, our ability to pass in and out of these areas easily for recreation. I'm wondering where else in the world have we succeeded

in leaky levees and how do we do it, and how we're going to do it here.

MICHELE DESHOTELS:

I'll let Larry try to answer some of this. Some of this is going to be new and cutting-edge technology. But some of it also uses some tried-and-true stuff.

LARRY ARDOIN:

I'll try to explain the leaky levee system in reference to the Morganza to the Gulf Project, some of the engineering and design today. The Morganza to the Gulf Project has 12 navigation structures that will remain open all the time when there are major bayous and streams that are navigable.

In addition to those 12 structures, there's also environmental control structures that will be more in the line of large box covers, large openings that the water can -- which will remain open so the water will flow north and south, just like they do now, to maintain a tidal influence inside the levees, and to maintain the areas that are inside the levees as wet. We're not going to let them be developed. We want those areas that's behind the levees to remain wetlands. So we'll keep all those structures open. And the only time

they'll be closed is when there's a storm that's threatening the area.

MICHELE DESHOTELS:

Do we have any other questions or comments? Okay. Thank you. I have no more cards. Does anyone else want to make a comment by asking a question this evening?

Would you identify yourself, sir, for the transcript?

ROBERT LEBLANC:

You mentioned bringing fresh water from the Atchafalaya. You indicated it was coming from east to west. What are you going to utilize the Teche/Vermilion project for? That's exactly what it's doing now, is bringing fresh water down in the Vermilion. Why can't you just increase the flow and bring it down to Vermilion River? I think Gene can comment on that better than I can.

MICHELE DESHOTELS:

Well, Gene, if you're going to comment on that, please come to the mike. I'm sorry, sir. Your name, for the record?

ROBERT LEBLANC:

I'm Robert LeBlanc. I'm the OEP director for Vermilion.

EUGENE SELLERS:

I can't answer his question fully. My name is Eugene Sellers, the parish engineer for Vermilion Parish. I worked with the team on some aspects of this program. Bob, what you're saying is a good point. But the restriction, as I understand it today, from the Teche/Vermilion is the channel, that restriction from the pump to get the water to the Vermilion and to the Teche. That's where the restriction lies right now. I don't think they can pump any more water down there unless it would be relocated at a different location or that channel would be enlarged to carry more water.

MICHELE DESHOTELS:

We can look further into that situation.

EUGENE SELLERS:

I know that that's a restriction today.

TIM CRESWELL:

You flood the Bayou Courtableau area.

MICHELE DESHOTELS:

Are there any other comments or questions or things that you feel that we should know?

BEN LANGLINAIS:

My name is Ben Langlinais. I'm a resident of the Delcambre -- I'm a resident of Iberia Parish,

but I was born and raised in Vermilion, educated in Erath. And I, like Creswell, I don't want to ever see myself and my neighbors go through this again. I'd like to thank y'all, though. Out of all the plans I've ever seen, this is one of the best thought-out plans that I've seen in a long time, because y'all are addressing a lot of things and a lot of issues. Like the young lady said, the features of this plan are unbelievable. I mean, there's a lot of thought process that went through this.

What I'd like to say is, being a resident of Vermilion -- well, not a resident anymore, but born and raised in Vermilion, played and grew up in the marsh, there's a couple of things I'd like to bring out that I see that maybe this plan could be a little better.

Number one, Point Maroon to Marsh Island, I'm not exactly sure what the alignment of that existing reef was prior to the dredging of the shell reefs. This is Point Maroon to Marsh Island. I'm not quite sure that is the exact alignment, but there was once abundant amounts of shell reefs from this, here to here. We took them out.

Now, what we're seeing, and I think anybody who

lives along the coastline in St. Mary, Iberia, or Vermilion can attest to this, because I see it everyday in Delcambre, the tidal amplitudes are dramatically increased from what people have told me in the past. And when I look at the system, that's the only thing I can attribute it to, those reefs being removed. If, at all possible, I'd like to see this group, in the planning process, look at possibly doing something to restore it. I know we can't make it a reef, but we can make it function like a reef, anyway.

The third thing that I'd like to bring out is on the levee alignments -- and I know this is conceptual, because I can't tell looking at those

lines where in the hell it's at. I can't see where my house is at, but I hope it's on the other side of the levee. What I'm getting at is, when I look, from a landowner's perspective, because I farm in that area also, nobody wants a levee on them. And I'm worried about all the bickering that's going to happen when we try to figure out where these levees go, because nobody wants to give up any land.

And in addressing Ms. Burrows' comments -- and this is just conceptual in my mind -- the one thing that I would like to see us looking into and when

we construct these levees, that when we build the levee, we're going to have a bar area. And the most common way that it's been done is to associate the bar area right adjacent to the levee, and then we have a wetland. We've created a wetland, but it doesn't have very much wetland benefits to it.

I'd like to consider building the levee, in association with the levee, some type of wetland corridor that functions as a wetland where we actually build wetlands that function and have benefits. It may be that we have to do a

combination of the bar area and build wetlands. But I've heard, "Well, we're going to build this levee at a five-foot contour." Well, a five-foot contour sounds great because maybe it doesn't take as much dirt to build it at five foot. But the one thing we're removing, when we go at five foot, is remove the areas to the left that are now functioning as our storage areas. Because once we put this levee up, then we got ourselves locked in for a storm or any kind of rainfall even that's going to fall, that water has got to go somewhere. So if we can build that wetland corridor, that gives us some additional storage.

I guess the part that, I think, could maybe

help in the planning process is if we can partner with other agencies -- because I see what's helping with the USDA along the Mississippi River in the Wetland Reserve Program where they actually go and buy conservation easements where they actually buy the land for easement purposes, and then they go in and develop it into a real nice wetland area. It's still the landowner's land. He hasn't given up a

thing. He's got something better than he ever had before.

So if we can have a plan that would incorporate that concept in the building of our levees, we might have people fighting to have the levee go through them instead of fighting not to have it there. And, I think, from that approach, you will get more participation from outside groups. I think Ducks Unlimited would be thrilled to have that concept, because you're going to be creating a habitat that's not really a good habitat for ducks right now. I mean, it's just a concept. I don't have it on paper, but I will put it on paper. And I think I can come up with some numbers on it for y'all. And, again, thank y'all.

MICHELE DESHOTELS:

Thank you, sir. Are there any other comments

or questions? Please come to the mike and identify yourself for the record.

ELEMORE MORGAN:

My name is Elemore Morgan. I'm a resident of Vermilion Parish. I'm an artist. I'm just a

private citizen who's very much concerned, like everyone else, about the preservation and defense of our way of life down here. And I must say that I came here wondering if you-all had been coordinating with other people doing planning. So I'm reassured to hear that.

I took part in a planning session in Lafayette, about several months ago, organized, I believe, by the LRA. Calthorpe Associates of California presented the planning. And it was interesting. He was asking us questions and actually talking about the same things y'all are dealing with now. And this is more advanced. He was asking at that time, "What do you think about this idea? What do you think about that idea?" You-all seemed to have incorporated some of those questions and dealt with them. So am I correct that you have worked closely with them?

MICHELE DESHOTELS:

We have worked closely with them. In fact, we

were there at that event as part of the resources.

ELEMORE MORGAN:

Well, it's just reassuring. I agree with this gentleman. This is really -- the multiple-defense idea seems to be really reassuring.

My next question would be, I believe, that recently LRA people, Mr. Calthorpe and his group, had a breakfast in Crowley. People were invited. I couldn't be there, but I heard that they mentioned -- they hoped to present some of their ideas some time after the first of the -- in the early part of the year. You're doing the same thing, apparently?

MICHELE DESHOTELS:

Yes.

ELEMORE MORGAN:

Are we coordinating?

MICHELE DESHOTELS:

We are coordinating. In fact, I have been e-mailing with them all this week in the mornings before we had the meetings. Our work is in advance of their work. But our work is the cornerstone for what they will be doing. So they will be utilizing this plan as they go forward with what they're doing.

ELEMORE MORGAN:

You-all represent, I believe, the official, if you want to put it that way, State of Louisiana plan. That's what you're developing here?

MICHELE DESHOTELS:

We represent the Comprehensive Plan for Coastal Protection. This is for hurricane protection and the coastal restoration. We are the basis for the regional planning work that they're doing on top of what we're doing. So they are responsible for that bigger, broader picture of where communities will go, where schools will go, of how we will have transportation networks, where the hospitals will be, and the issues of medical services. For example, all of you know that New Orleans is particularly challenged with some of those issues right now. And the whole concept of insurance in the state. So they're dealing with some of those larger, broader issues that are not our choice.

ELEMORE MORGAN:

And, eventually, if things go well, maybe by April, you mentioned that you-all might be making a proposal to the legislature?

MICHELE DESHOTELS:

This plan will go to the legislature in April.

ELEMORE MORGAN:

I must say, I feel like here in Louisiana, this hurricane has caused us to pay attention. We would never have had this kind of comprehensive plan, I'm afraid, had this hurricane not come along, nor would we be paying attention to it. So I think it's reassuring in that sense. Thank you very much for all you've done.

MICHELE DESHOTELS:

Thank you. Are there any other comments or questions?

JANICE MACOMBER:

I'm Janice MaComber. I'm a concerned citizen. I agree with everything that everyone said about what you-all are doing. I'm always curious about time frames. And I can appreciate being there in April. What can we do to -- your plan is, obviously, going to be superior or hopefully.

MICHELE DESHOTELS:

Thank you.

JANICE MACOMBER:

What do we do as citizens, other than contact our representatives, to adapt the plan and then move forward? Because every one of us in here can say we're losing ground every day. We were blessed

this year with no hurricane. Once this is presented to the legislature, then what?

MICHELE DESHOTELS:

That's a big question. But we believe that action will be taken on this plan. Some of that action, quite frankly, will have to do with the money stream that's dedicated to the plan. And so, as I had said earlier this evening, we know that we have or will be getting a money stream. Now, I understand from newspaper accounts that some of that money stream may be coming in as early as next year. I do not know this. I mean, this has just happened last week. So I think people have to have time to regroup and to see what is actually there.

And then one of the issues, of course, is what actually will this cost. Some of our charge has been that, at this point, at this initial planning level, we were not to worry necessarily about cost, other than that something makes sense and be cost-effective, that our charge was to come up with a good, solid plan, and then that other people out there would go find the money and make sure that it would happen.

JANICE MACOMBER:

Again, I guess going back to the original

question, what can we do?

MICHELE DESHOTELS:

What you're doing now: commenting, writing, telling us, and then telling people who are our elected officials, the people that we have put in office to guide us and to direct us and to put into action those things that we need. Talk to your elected officials.

JANICE MACOMBER:

Which would be the Vermilion Parish elected officials and the representatives and the senators that represent us?

MICHELE DESHOTELS:

Yes.

JANICE MACOMBER:

Because it's crucial.

MICHELE DESHOTELS:

Yes. They're there to represent you.

JANICE MACOMBER:

I know money is an issue, but we're losing it

daily. Thank you.

SHERRILL SAGRERA:

I'm Sherill Sagrera. I'm a landowner. I serve on the Parish Coastal Advisory Committee seeing if we can get some of this stuff done. You mentioned

something that's close to as soon as April possibly getting some funding to do this; we won't be ready in April. What is our time frame for actually getting this thing to where it's all -- to where if we get money in April or May or whatever it is, we'll be able to start doing something? Can you answer that?

MICHELE DESHOTELS:

That's part of our next complete draft. Ask me that question in February.

SHERRILL SAGRERA:

Okay. So we're in February. It's getting close to April already, and we're still drafting.

MICHELE DESHOTELS:

In February, I'll be able to answer your question, I hope.

SHERRILL SAGRERA:

I appreciate it, Michele. I know Rick and I talked a lot before this meeting about several, I guess, things that we think should be, basically, in the plan, to be sure that it is part of the plan. I'm hoping we get millions of dollars where we can do everything that we put in the plan. But to be realistic, we're not going to get everything we want. But I think there's some things that we

need to add to the plan that we got to be sure that's in the plan so that it can be implemented because it's in the plan. Most of that stuff, instead of me just rattling it off, I'll just go ahead and write it in the comments and send it in.

MICHELE DESHOTELS:

Thank you.

O'NEAL MALBROUGH:

Michele, I'd like to add one little thing to it. Michele touched on it. For many years, a number of the levee districts east of Atchafalaya have been working on levee alignments for many, many areas. Morganza to the Gulf that Gene talked about, it's been in the planning since 1992. So

it's 15 years. A lot of the details and citing of those structures that Larry talked about, the sizing, the hydrodynamics of moving water in and out of the channels, a lot of that has been looked at and evaluated.

One of the things we can do now is do everything we can to flush some of those -- we keep talking about, in some of these areas, these are real conceptual ideas. And the IPT realized that early on. That's why we brought Gene and his group on board on the planning team.

In the Lake Charles area, there's a weakness there. There's some planning that needs to be done. We got another consultant that's doing the parish work in Lake Charles, working for us to help us do that.

So the more we can flush some of those details out between now and April and right after April, that would be helpful. So one of the things -- one of the good things I'm hearing today is that, what we've heard at most of y'all meetings before, I think a lot of it got implemented into the plan.

It sounds like we got a fairly good plan that most people on the conceptual side agree with it.

But the secret of moving this thing forward is going to be to get into the details and move it forward to the next level. The faster we can do that, the faster it can move forward. So the money is going to come from the people who appropriate the money. But we need as a group, as us, we need to make sure that when the money does come, that we're ready to go and ready to begin building and not studying and doing some of the things. There's a lot of studying. There's some things that we don't have all the answers. So we do need to know some of the things. We got to get

that done as quickly and as fast as we can. The more we get involved and the more the people get involved -- and, hopefully, Gene and them can help y'all flush those things through. The faster we can do that, the quicker we'll be able to, hopefully, do something that we can build and put on the ground and reap the benefits.

MICHELE DESHOTELS:

To add a little bit to what O'Neal is saying and to the question asked earlier about what can we do or what can the citizens do, some of the funding for some of these projects, the projects that are further along, may be out there. Because some of these projects are now sitting in the WRDA Bill. There are restoration projects that are waiting for authorization because some of this is new that is in this plan. Some of this is items and things that have been looked at for a long time and that have been developed to the point that they're ready to implement with federal funding for that federal funding being authorized. As you know, we've waited for what? Six, seven years for WRDA, and it's not going to be authorized now until probably the next fiscal year.

So to let people know that there is concern

about some of those things, that there is support for those projects, what the thoughts on those projects are, and to know that there is a possibility that some of these are in a position to be implemented sooner than other projects if that

funding comes through. So it's not just the state money out there. Although, for many of these things, there has to be a state match.

SHERRILL SAGRERA:

The only thing is, the main concern at this end of the state, we have no hurricane protection, zero. Our hurricane protection is the barrier islands, natural ridges, possibly the few canal banks that are still there.

To do most of this restoration -- I mean, this hurricane protection and restoration work, your footprint is already there. You don't really have to go appropriate very much more land, with the exception of possibly the raising of 82, to implement a lot of this stuff. So that should cut some of your time of negotiating to buy land or appropriate land or whatever it is.

So I'm really hoping that y'all give the Chenier Plain a little bit of consideration beings we don't have any hurricane protection at all, that

we kind of get a little bit higher on the priority list to see if maybe we can get some restoration

work done and some protection. Thank you.

MICHELE DESHOTELS:

Thank you.

ANDREW GRANGER:

I'm Andrew Granger. I'm a citizen here in Vermilion Parish. I was wondering, you have two levees. You're talking about putting a spoil bank along the Intracoastal. And that's part of a project that might get in pretty quick. I know we're proposing putting that spoil bank on the south side of the Intracoastal and then on the east side -- I mean, the west side of Freshwater Bayou. But, then, you've also got this big levee plan, at some point in time. I just don't see why maintain a spoil bank here. And that's what we want you to do, is maintain it. Why not join these two projects together. And I don't know if we need a 500-year protection right there. But it just seems to me like, instead of maintaining two hurricane protection devices, just install one.

MICHELE DESHOTELS:

Thank you, sir.

JOHN BOUDREAUX:

I'd like to thank y'all for coming, like y'all have heard before. My name is John Boudreaux. I'm a resident of Vermilion. I raise rice, cattle, horses, and three kids. And I had water in my house, too, so I'm concerned like everybody else is.

One thing I'd like to touch on in some comments that were made before about the Teche/Vermilion system, which is already in place at Port Barre pumping Atchafalaya water over the levee, there's five six-foot discharge pumps there. They have 10,000-horsepower electric motors on each one. One is a spare. When they designed the system, the channel that carries the water after it's pumped over doesn't carry enough water, like Gene and everybody talked about. And if that's improved, more water will come done, and that will be great, down the Teche and the Vermilion. But I see you have a control structure that stops the water on the Vermilion, which is great to hold some of that fresh water back.

But if you left out -- if they put another one on that GIWW, or south of it, you could increase the flow by clearing the channel north of that, bring more water down, use four or five pumps.

Okay. The water is coming up here from Port Barre north of I-10. It's coming down the Vermilion through Lafayette and all that and Abbeville. You're getting -- I think there's a control structure right here that is stopping it or controlling it or something.

O'NEAL MALBROUGH:

Both of those structures are open all the time. They would always let the water go through. They're designed right now to be just closed when the water is coming in, not going out.

JOHN BOUDREAUX:

What I'm getting at, O'Neal, is, okay, we're pumping water down here. We can't pump enough because the channel won't carry it. We can't use the pumps we have like we should. Well, if you had some -- you want to bring fresh water. I see all the blue arrows over here, which is great. We want to bring some more fresh water down here east to west. We got a perfect conduit with the GIWW going east and west.

If you can get this fresh water down to it with more volume, open this channel up more, and put some locks or something and make some of this fresh water go east and west -- right now, the bathtub

plug is wide open. We're pumping -- the bathtub ain't going to fill up the rate we're going now because the pumps won't put out enough because the channel won't take it. Open the channel. Stop it down here and make it go down east and west. You have a lot of fresh water that won't be just going straight out to the Gulf.

UNIDENTIFIED SPEAKER:

O'Neal, that's in the Four-Mile Canal.

O'NEAL MALBROUGH:

I know where he's talking about.

JOHN BOUDREAUX:

That's my comments. Thank y'all.

MICHELE DESHOTELS:

Thank you, sir. Identify yourself for the record, sir.

SHERRILL SAGRERA:

We're working on a project through NRCS and with the people of Rapides Parish to bring some water from the Red River down to the Mermentau Basin, which is, basically, if we can ever get it done, to possibly alleviate the problem with fresh water in the basin. We can bring some fresh water

directly into the basin instead of having to come down from the Teche/Vermilion pumping station and

have to widen the conduits to try to get more water down the Vermilion, we just put it directly into the Mermentau Basin.

MICHELE DESHOTELS:

Thank you. Are there any other comments, questions?

DONOVAN GARCIA:

My name is Donovan Garcia. I'm from St. Mary Parish. One of the questions that y'all jogged my mind about was the levees in New Orleans, that it would be very difficult to maintain them or rebuild them because the population grew up right against the levee. I'm not sure about the population right here. I don't know. But will there be anything, a barrier, to prevent people from building right to the levee where you cannot maintain these levees in the future?

MICHELE DESHOTELS:

That's part of the issues that we have with the land planning and the zoning. So we recognize that

those things are things that have to be considered and provided for.

DONOVAN GARCIA:

Thank you.

MICHELE DESHOTELS:

Thank you, sir. Does anyone else have a comment, a question?

ANN BURROWS:

Ann Burrows again. I do have just one more question. One thing that's really good about the report is that up front somewhere it talks about, as a goal, kind of removing roadblocks, thinking about new policy things, new initiatives, and the legislative things that could help resolve some of these problems. I know levees, of course, protect people so that your home can exist after a flood potentially comes or hurricane comes; so does elevating a house.

Now, FEMA, as far as I'm aware, has not come out with elevation guidelines for the whole coast so that you can get flood insurance?

MICHELE DESHOTELS:

That's still in progress.

ANN BURROWS:

Can this progress kind of help that move forward and kind of put -- does it have any ability to have the recommendations be that we really need to get that information from FEMA and include elevation options in this report, or is this report just looking at --

MICHELE DESHOTELS:

We would hope that FEMA would be able to move forward without our prodding.

O'NEAL MALBROUGH:

One of the problems that FEMA -- and I don't want to defend FEMA, by no stretch of the imagination. But one of the issues that they're having in setting those new building elevations is that the Hurricane Rita and Katrina have shown us that the existing elevations that we had and the probabilities associated with them were not correct. So they're revisiting things. And with the old FEMA maps, what came out in the '70s, the modeling and computer techniques that we had then

were significantly less than they have now. So you heard some discussion about the Corps and FEMA coming up, doing some new ADCIRC modeling and some new modeling. They're using Rita and Katrina to calibrate those models. There was a lot of work going on that, hopefully, it will be eventually part of what we're doing. But as of right now, the model runs and the definition of those exact heights are not set.

It's not just a problem unique to this area. It's actually unique to the whole coast. Everybody

is sitting and waiting. Parish governments are waiting to find out how high. People are trying to rebuild. They don't know how high to build. So it's a problem. I think there's a lot of pressure on FEMA to deliver those numbers. They want to make sure if they do it -- if they do it in too much haste, then they would be telling people today to build at this height. And, later on, they could be changing those. So the idea is, they want to make them as accurate and as good as possible.

So I understand those numbers are going to be

released in the future. I wouldn't say the near future. That's coming out as soon as they possibly can, from what I understand.

In our case, if you notice, when we talk about those red lines and those purple lines, none of us talked about heights tonight. Nobody knows how high those levees are. We also are talking about 100-year heights and 500-year heights. And we're counting on the Corps in the near future coming out with those new model runs.

Those model runs -- Rickey talked about it last night. Those model runs take super computers to run. There's only a few places in the country that can actually run some of the modeling. The

probabilities of how often storms -- having two Category 5 storms in the Gulf at one time in one year two years ago is changing the probabilities.

We're trying to predict 500-year storms, and we only have 150 years of record to go by. So there's some issues being addressed. And I can tell you, there are a number of people a lot smarter than me all over this country attempting to tie those

things down. Hopefully, that will be done as quickly as possible. But it's coming. I do know that it's coming. I would hope that it would be in the near future so that everybody can get back to trying to recover.

MICHELE DESHOTELS:

There's a lot of intensive modeling and studying going on and some very cutting-edge work that, as O'Neal said, is taking a lot of dedicated time of some super computers in order to produce.

O'NEAL MALBROUGH:

One of the things I'd like to add while I have the mike, when you hear us talking about -- one of the things we learned in Betsy is, we set some of these heights of levees. But we didn't do it based upon what we call a sustainable coast. We did it based upon the coast at that time. And people were

counting on the coast still being there 40 years later.

In this particular case, when we talk about adaptive management, and we talk about having a sustainable coast, one of our objectives is to

design this system so that it will be around years from now, and so that what we're building today will be, in fact, the height that's required or needed 30 years from now and 50 years from now.

When you heard our presentation earlier on, we are actually attempting to look forward 30, 40, 50, and even looking out as far as 100 years into the future just to make sure that what we're trying to do today, 30 years from now is not going to be obsolete, and things would change. So that's not an easy task. If you look at some of these objectives, some of that is to designate our coast and make it sustainable. And those changes are what we've kind of been talking about in the plan.

SHERRILL SAGRERA:

O'Neal, that's why it's very important to address the coastal shoreline.

O'NEAL MALBROUGH:

Exactly.

SHERRILL SAGRERA:

Like the old saying says, the buck stops here. You got to say, okay, we're not going to lose any

more coastline. Because it's going to keep encroaching, encroaching, and encroaching. And before you know it, Interstate 10 is going to be the shoreline.

O'NEAL MALBROUGH:

That's why that first line of defense, that pink line, is set up there. That was part of the plan when we did it. We're attempting to draw that line there where that first line is.

SHERRILL SAGRERA:

We need to stop it there. I mean, enough is enough. How much are we going to lose before we decide, well, this is where we're going to stop. So we need to stop it now and get it over with.

MICHELE DESHOTELS:

Please identify yourself for the record.

MARTHA BUSH:

My name is Martha Bush. I grew up in Abbeville. I was just wondering how many people in the room saw Al Gore's documentary? I'm just surprised that the issue of rising sea levels is not even touched upon.

MICHELE DESHOTELS:

If you listened to Jean's presentation earlier --

MARTHA BUSH:

We did arrive late.

MICHELE DESHOTELS:

-- that's one of the things that we are looking at. In addition to erosion by wind and wave and subsidence, sea-level rise is one of the concerns and one of the things that is affecting our coast.

MARTHA BUSH:

Did you mention any figures about the protection?

JEAN COWAN:

No. There's global numbers that people are discussing. There's also regional numbers. And it's something very difficult. We can put numbers to sea-level rise or the change in sea level that's occurred to date today. But to project out into the future how the elevation of sea levels have changed is less-than-an-exact science, to put it kindly. And so we have broad estimates, a broad range of estimates, out there as to what projections are for sea-level rise out into, as O'Neal mentioned, our 100-year planning horizon.

It's something that we are -- we have not put

it into the glossy document you see. We have not put a discussion of it into that. But it is most definitely something that we have in our minds and in our modeling and analysis that we are trying to use to evaluate the effectiveness of this plan. It is paramount among many that we are trying to work with them.

We are also working on this notion of scenario testing where you would take something, for example, like sea-level rise, and you would look at the low estimate out into the future and a high estimate out into the future, and you would judge your plans -- you would weigh your plan's performance against that unknown parameter. If the sea-level rise was a low estimate out into the future, how would your plan perform? If it was much higher than that, how would your plan perform?

MARTHA BUSH:

There must be a minimum that people are talking about, because there's no suggestion that it's not going to happen.

JEAN COWAN:

I don't have that number off the top of my head. I don't know if anybody else on the panel does right now. I probably should have that number

right at the tip of my fingers, but I don't.

MICHELE DESHOTELS:

I think part of the reason for that is that there is a lot of discussion going on on exactly what those numbers are.

MARTHA BUSH:

It's happening. I mean, I'm not talking about projection. I'm saying there's a minimum. There must be a minimum that you could be using. One foot would be --

MICHELE DESHOTELS:

We could certainly use a minimum figure, but that minimum figure might not have a basis in reality. There's discussion going on about what that minimum actually is.

JEAN COWAN:

Jon Porthouse next to me here is whispering into my ear that the minimum figure for current rates right now are approximately 2 to 3 millimeters per year. So project that out to a 100-year planning horizon -- if it increases in that 100-year planning horizon by a little amount, we can offset it. If it quadruples, increases

ten-fold, we would be challenged to keep up with it. So I don't know if that makes you sleep any

better at night. That's the reality.

O'NEAL MALBROUGH:

One of the things is in our planning effort, we made sure -- and if you read in the documents that Michele talked about, there is a reference to sea-level rise, actually, not just sea-level rise itself, but relative sea-level rise, which is the land sinking and the water coming up.

From our perspective, when we talk about managing our risks, that's what we're talking about. None of these levees and projects we measured and we're talking about are guaranteed protection to any one storm or anything.

So when we talk about managing risks, what we want to make sure is that -- there was some discussion post Katrina and post Rita in certain areas -- not as much Rita in the western part. I think y'all knew your risks. Audrey kind of taught everybody the risk that we were in. But in Katrina, there was some discussions about having --

people had false security, that they built houses on the ground thinking they couldn't flood or they they wouldn't flood for certain events.

So one of the things that -- our direction, as part of the IPT team, was to make sure that we

manage risks or we make sure we inform everybody of the risks that are there. Jean talked about it. Even if you have a 100-year levee elevating homes inside the system makes sense. And that, in fact, reduces the risk even more. So part of the plan is going to be to make sure that everybody incorporates -- that number of sea-level rise is unknown. But as we grow, and the plan matures over the years and adaptive management, putting that risk and informing everybody of what those things are going to make sense.

MICHELE DESHOTELS:

Are there any other comments or questions?

JUDGE EDWARDS:

Judge Edwards, Vermilion Parish Coastal Restoration Committee. I didn't recognize any elected officials from the parish here. I have a

real question. In reading the public comments and the comments that are on the boards and hearing discussion tonight, I'm real confused as to whether Vermilion Parish supports or doesn't support, and if the support is conditional, a levee along the GIWW. Personally, I would support one. And, personally, I would support -- and I'm surprised no one was here from the Forked Island community. But

if we're going to put a levee on the south side of the GIWW, I would like to at least throw the idea out so that you-all can look at it between now February or now and April of bringing that levee along the ag/marsh interface south in the Forked Island area south of the Intracoastal Canal to protect the community. We're here along 82. It would go down like that.

O'NEAL MALBROUGH:

What you're saying, Judge, is somewhere right in here?

JUDGE EDWARDS:

Right, at the Forked Island bridge. I don't know how far you'd have to go on either side. But

you can look at a road map, at a state map, and see and designate the difference between the marsh land and the ag land. Whether you did it there or whether you included some marsh land would be up to the planners. But there's a whole community there. I don't think you're talking about a whole lot of extra dirt or dollars. Maybe you are. Maybe you aren't. But it's one thing that should be considered.

I heard also tonight a lot of talk about -- or at least a little talk about the Mermentau Basin

and the importance of it being fresh to protect our culture. But there's nothing in the plan that I can recognize that -- and maybe the plan is not the vehicle to address that. But we have a serious problem with salt-water intrusion into the Mermentau Basin which affects the agricultural community.

I was contacted by some members of the agricultural community and asked, "Why isn't this in the plan? Why aren't we talking about building a levee along the north prong of Schooner Bayou to

keep the salt water from coming in?" And I had a response to them. But would that be -- it's more of an infrastructure project probably. It could be a marsh restoration, maybe, project. But it's certainly a project that's important to the infrastructure here. I know plans like 20/50 were supposed to address infrastructure. This plan is large, and we're not looking at any detail right now. Should we be talking detail at this point in time?

MICHELE DESHOTELS:

Those elements that you're concerned about, give us your concerns, all of them. And as we filter through them, we'll consider if it's

appropriate or not appropriate. It's better for you to have your issues on the table now than to regret not having given them to us.

JUDGE EDWARDS:

Our government, in a nutshell, if I can paint a picture for you, our government spends millions of dollars annually on the Leland Bowman Locks and the Schooner Bayou Looks, and they spend nothing

on the infrastructure that keeps water from circumventing those locks. And the fact of the matter is, today, if we were both in speed boats, and I decided to bypass the locks, the Schooner Bayou Water Control Structure, and you were to go through it, I'd leave you behind because we can get by them real fast in a good-size outboard today.

And the Corps of Engineers isn't addressing this. The Parish is talking about trying to address it with CF funds, but we don't if we're going to have enough. We don't know if we're going to actually get it. We don't know that the project is going to be approved for CF funding by MMS. And so, short of that, farmers in the southern part of the parish are -- you know, if it's a dry year, they've got problems. They've

got serious problems. And so this could be perhaps something that you could look at because we have water exchanged on every time frame. It's not just a high-water event that puts water into the Mermentau Basin right there.

There are some other areas where levees along the GIWW might need addressing where the water circumvents Leland Bowman as well as Schooner Bayou.

Just a few quick comments: On Page 54 in the publication that you handed out at the door, I would like to suggest that it -- it reads that marsh creation; where you speak about marsh creation by dedicated dredging -- include private oilfield canals as a source of sediment for marsh creation. We talked only about navigation channels as though only the federal government might do this. But I think the plan ought to be big enough to where we can encourage the private sector to do it as well.

In the idea of the north prong of Schooner Bayou, prior to the meeting this afternoon, there was discussion about constructing -- something about constructing a salinity control barrier or small levee perhaps from Highway 82 along the old

GIWW to the Schooner Bayou Control Structure and then north along the east bank of the north prong

of Schooner Bayou. That's the project that I talked about, but a little more comprehensive.

And then I was noticing on the board, so I have to make a public comment, on the boards you have over there in Region 3 and 4, it says there will be -- there may be negative impact, it says on the board, from dredging to create marsh. I would like to make a public comment that says, there may be positive impacts from dredging to create marsh because there will be. I've seen that.

Having said all that, just a question for Gene. He's left? Noah recently rechecked benchmarks here in Vermilion Parish. Bob, I think you were with them, weren't you, at the time?

ROBERT LEBLANC:

Uh-huh.

JUDGE EDWARDS:

Am I wrong, or is the one at Mouton Cove, in the last 20 years, relative sea level has subsided six inches? Am I right about that?

ROBERT LEBLANC:

That's right.

JUDGE EDWARDS:

So I don't know if the press is here. But there's a number you can bring home that will wake you up, six inches in the last 20 years. We're going down fast. So take that into your planning considerations. Thank you.

By the way, y'all are doing a fabulous job. It's a huge project and huge undertaking. Let's just hope we can get some funding for it. Thank you.

MICHELE DESHOTELS:

Are there any other comments or statements for the record before we close tonight? Thank you so much for coming. Good night.

5.3.13 Written Public Comments

The following documents are written public comments received concerning the Preliminary Draft Master Plan. The comments were received during the public comment period (November 29th through January 5th) and from meetings held in late November and mid-December 2006.

1/5/2007 17:09	Karen K. Gautreaux, LA Dept. of Environmental Quality, P.O. Box 4301, , Baton Rouge, LA, 70821, USA, karen.gautreaux@la.gov	Congratulations to all involved in reaching the important milestone that this draft plan represents. There are 3 areas/issues that I recommend be addressed in the final plan. These issues include: 1) A focus on the proposed Bayou Lafourche Freshwater Diversion proportionate to the priority the State of Louisiana has placed on this project. Governor Blanco included the Bayou Lafourche Diversion as one of her top coastal restoration priorities in her letter to President Bush that was sent shortly after her inauguration, and the state has maintained that support. A special subcommittee of Louisiana Legislators was created to monitor progress and provide input on the project. It is the only committee I am aware of to be created for a particular project. 2) Water quality issues such as hypoxia and eutrophication, and potential linkages to the coastal protection effort are deserving of dicussion in the plan, and DEQ would be pleased to assist in the development of that discussion. 3)The plan's boundaries are essentially no different than previous planning efforts, therefore not including areas like the Atchafalaya Basin or the continental shelf. These areas are not part of the statutorily established coastal zone, but are important components of the dynamic coastal ecosystem, therefore meriting additional consideration in the plan. Thank you in advance for considering these comments, and please do not hesitate to contact me if I can provide additional information or assistance. Sincerely, Karen Gautreaux

1/9/2007 20:13	Rosa E Harris, , 1044 cotton st, , wesson, ms, 39191, copiah, cowkillerv@bellsouth.net	It is very important to save our coast , wildlife, and our people of southern louisiana. We need help and the sooner the better. It's really sad when you have to fight so hard for something so important to the whole country when all these millions are being spent on sports arenas and such. Our goverment needs to really think about what is important for all of us!!!!!and quit wasting time and M O N E Y

From: Piers [pchapman@lsu.edu]
Sent: Friday, January 05, 2007 3:37 PM
To: comments@louisianacoastalplanning.org
Subject: Comments on CPRA draft plan

Attachments: Comments on CPRA draft.doc; ATT00034.txt

Comments on RA draft.doc (28

ATT00034.txt (302 B)

Please find attached some comments on the draft CPRA Master Plan for Louisiana.

Sincerely,

Piers Chapman

Comments on Preliminary Draft Comprehensive Coastal Protection Master Plan for Louisiana

By

Dr. Piers Chapman, Louisiana State University

Thank you for the opportunity to comment on the preliminary draft of the Comprehensive Coastal Protection Master Plan for Louisiana. I am confining most of my comments to the 62 page glossy brochure produced by the CPRA, rather than to the appendices as this is the part that will be read by most of the inhabitants of the state (or rather, most of those who bother to read any of the document). I have also tried to consider only major aspects of the plan rather than individual components that will inevitably be subject to more detailed consideration later as the plan becomes more focused.

First, let me put down what I like about the draft plan. The plan has four main objectives, and I like the wording that is used here as it combines elements of both protection and restoration, both of which are certainly necessary if we are to ensure the future of the southern half of the state. I particularly like the acceptance of the fact that whether we like it or not, things in this region are not immutable, with the natural consequence to the need to plan for change, and the fact that "displacement and dislocation of resources, infrastructure, and possibly communities may be unavoidable." This is reality in a subsiding deltaic region, such as comprises much of southern Louisiana.

I also like the idea of the multiple lines of defense strategy. The need for this may be obvious now, but it has not necessarily been taken up by planners in the past. Similarly, the acceptance of the basic concept that not all of the region needs the same amount of protection and that we likely can not afford it is a welcome sign. In the past, it has seemed that many protection/restoration activities have been undertaken because of the "squeaky wheel" concept without any attempt at making them part of a comprehensive plan. The new draft goes considerably further than its predecessors on laying out possible alternatives. Of course, how well this concept of differential protection will be received by the communities concerned is another matter, as was made clear following hurricanes Katrina and Rita when the call was for "Category 5" protection for the whole of the Louisiana coast.

Finally, I am happy to see that the concept of the "leaky levee" is being considered. Protection and restoration are not separate concepts; one must proceed in conjunction with the other. So the acceptance that wetlands can protect levees and vice versa is good, as is the realization that if one builds a levee across wetlands, then there must be a means to ensure that the wetlands inside the levee system continue to receive nourishment in the form of water, nutrients and sediment. This, after all, is how the delta has been built up over the past few thousand years.

Having said this, there are several areas where I believe the plan falls down. The first is the omission of any priorities or cost estimates. I realize that it is explicitly stated that these have been left until later, but without them how can we do any meaningful planning? Here we come face to face with political reality. Plans have been around since the 1960s to deal with restoration, but because there has never been any prioritization, other than building bigger and bigger levees, we are now in the present sad state with a more severely degraded environment than existed then.

The balance between protection and restoration could also be better. This plan still pushes the former over the latter. While it is not surprising that after Katrina and Rita people are more concerned about protecting their homes and livelihoods than the environment, without such

restoration there can be no protection. To my mind, the swamps and marshes are treated more as providing extra protection than as regions that are worth preserving for their own sake. Thus, te main reliance in the whole plan as regards protection continues to be on building levees. While we have moved slightly from the concept of "category 5 protection" for the whole state to that of providing protection from the 1% and 0.2% storm, we are still essentially talking about the "great wall of Louisiana." However, there is very little detail in the plan of what this actually entails. Also, since the magnitude of Atlantic hurricanes is apparently increasing, and the resultant storm surge heights are likely also to increase as sea level continues to rise, where is the baseline from which the 1% and 0.2% levels will be determined? What will this mean in practical terms as regards levee heights along proposed routes? To take just one of example, the footprint of New Orleans in the draft plan remains exactly as it was prior to the landfall of Katrina inside a 0.2% protection levee. Is this the best way to deal with the situation faced by the city? The plan talks in several places about leaving certain areas within levees undeveloped to provide interior flood storage capacity, but there are no examples of where this might be the best option – I could certainly make the case that parts of New Orleans should be left undeveloped while the city also needs lower, internal barriers to ensure the integrity of the majority of the area in case parts of the outer defences are breached.

Much mention is made in the plan of using diversions, both freshwater diversions for marsh nourishment and water/sediment diversions for land building. Do the positions of the proposed diversions tie in with the proposed new levee systems? It is stated that we need a vegetation barrier along the levees to increase the protection of the latter, but the maps do not necessarily show that this is being considered in practice. I see only one mention of the need to ensure land availability for any new structures, however. Given the complex legal aspects pertaining to land ownership in Louisiana, it will doubtless be a major job to sort out the necessary rights-of-way. This will apply equally to any attempts to use existing waterways for the conveyance of fresh water if additional channels must be constructed, so the sooner such routine background work is started, the better. Many of the proposed diversions have been on the books for years, yet the issues of rights-of-way have still not been resolved.

Sediment availability is a major constraint on land building. At present, large volumes of sediment are dredged annually by USACE to allow navigation at different points along the coast. Some of the dredged material is used beneficially to restore eroding marshes and build new land, but much is not. We have to ensure that as much of the material dredged from navigation channels is used as is economically feasible; it is a resource, not a waste product, and should be treated as such, whether this requires pipeline transport to get the material to the right place, or whether this can be done easily by ship. There have been plans to abandon the birdsfoot delta entirely and construct new deep-draught navigation channels that would meet the river near Venice, thus allowing the whole of the present birdsfoot region to be dredged for land construction. This alternative does not appear in the draft plan, but may be buried in the appendices.

Finally, the omission of the Atchafalaya basin from the plan is another problem. This is a hold-over from COAST 2050, and yet coastal forests are an integral part of the region and this area is the largest forested swamp in the country. The mismanagement of water in the deltaic/chenier plain has led to the loss of large areas of forested wetlands further south, and the continued prevention of freshwater access to the Atchafalaya swamps risks extending this. (There is some mention of this in Appendix A.)

So while the latest plan at least has the advantage of being much more internally consistent than its predecessors, it is still just a plan. On its own it will not provide any additional protection to a single building or person in the state. Louisiana has been talking about coastal protection and restoration for decades and there is still no decision on what needs to be done. Without the necessary political will (and the necessary funding from both state and federal sources) nothing

will happen for another decade, and by then it will likely be too late. Many of the proposed diversions, for example, could be started now while we work out the best options for levees, but I don't see it happening.

Piers Chapman, Ph.D.
Director, CREST Office
SC&E
3153 Energy, Coast and Environment Bldg
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Baton Rouge, LA 70803

Tel: 225-578-0069
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Email: pchapman@lsu.edu

From: Mark Ford [maford@crcl.org]
Sent: Friday, January 05, 2007 2:03 PM
To: comments@louisianacoastalplanning.org
Subject: CRCL comments
Attachments: comments on State Master Plan jan 5 2007.doc

Dear IPT,

Attached is a cover letter and comments from the Coalition to Restore Coastal Louisiana. Please accept these and let us know if you have any questions.

Sincerely,

Mark A. Ford

****

Mark A. Ford, Ph.D.
Executive Director
Coalition to Restore Coastal LA
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****
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January 5, 2007

To: Jon Porthouse
LA DNR Integrated Planning Team

RE: Comments on the Preliminary Draft Comprehensive Coastal Protection Master Plan

Dear Mr. Porthouse:

The Coalition to Restore Coastal Louisiana wants to thank you for the opportunity to comment on the State's draft Preliminary Draft Comprehensive Coastal Protection Master Plan (CCPMP). The CCPMP is a step in the right direction in coastal management in Louisiana since its objective is to integrate water management in fair weather and storm conditions through utilization of the natural landscape and the unnatural landscape alterations such as levees. However, the plan falls short of describing necessary landscape restoration features. Detailed comments are attached, but let us emphasize several key points.

1) We applaud the clear recommendation to close the MRGO and we ask that priority is placed on this in Planning Unit 1 (Pontchartrain Basin).
2) Better definition needs to be given for the overall restoration of the coastal estuary.
3) Modeling needs to be improved for surge and the estuarine functions. Better informed comments can be made after this work is provided to the public. Therefore, we ask that an additional comment period be planned in the near future.
4) The flood gates at Chef and the Rigolets need to have a proven need and result. Their design and management must be to minimize environmental impacts while providing the needed flood protection. The current CCPMP design suggests a 50% reduction in the pass opening and is of great concern.
5) Wherever and whenever possible, the CCPMP should try and mimic natural landscape form and function.
6) Navigation concerns, such as bank line stabilization, should be secondary in a plan for restoration and flood protection. Inclusion of the Inner Harbor Navigation Channel Lock is not acceptable. This is a national transportation issue and has no connection with either flood protection or landscape restoration.
7) Release of the CCPMP just prior to the Christmas Holiday season, with comment due immediately after the New Years holiday left little time for many to review and comment on the plan. Most academics are out of the office during this time period and many people are on holiday travel with their families. To ensure a complete set of comments, we hope that the January 5, 2007 deadline is not absolute and that any later submitted comments will be included in the decision making process.

8) There is no mention of implementation of the elements of the plan. Also, timelines such as long-termed vs short-termed goals and implementation would be useful.

Sincerely,

Mark A. Ford, Ph.D.
Executive Director

Comments on the Preliminary Draft of the Comprehensive Coastal Protection Master Plan (CCPMP) for Louisiana

Submitted by the Coalition to Restore Coastal Louisiana

General comments

Title
The CCPMP title does not reflect the stated scope of the CCPMP. It only reflects Objective 1 (flood protection) and does not reflect Objectives 2 & 3 (coastal restoration) or Objective 4 (cultural heritage). It appears that this (protection) is the overriding purpose of the CCPMP and that other objects are all secondary in nature. Details on Objectives 2-4 are much more scarce than that of Objective 1.

Multiple Lines of Defense
The plan strongly embraces the idea of integration of the natural landscape and engineered flood protection. Multiple lines measures create significant numbers of combinations of measures with differing combined effect. Models will assist in determining the best array of measures. However, the CCPMP needs to strengthen the broader restoration goals of the estuary which are best defined as the wetland habitat goals for the coast. If the estuary fails, the flood protection benefits it can supply will also fail, thus weakening engineered flood protection measures. The health of the coast must be assured.

Natural Hydrology
The water management goals are to reduce storm damage while maintaining a healthy estuary. This is as ambitious and complex as it is necessary. Wherever possible, it is desirable that we restore the natural hydrology and emulate natural processes.

Levee Alignments
Levee alignments should minimize inclusion of wetlands located within the protected side of the levee. This practice will reduce the alteration to the wetland hydrology while allowing wetlands to buffer storm surge in front of the levee. Since much of the coast is developed along old distributary ridges, traditional back levee locations along the ridges are, in general, a preferred location for hurricane protection levees. Levees located along old distributaries do not alter the hydrology and are located closest to the assets in need of protection (concentrated assets on the ridges). In general, trying to protect every community is not reasonable. Following the wetland/upland interface makes the most sense from a habitat point of view. There are other measures by which some of the more isolated communities can obtain flood protection such as raising of buildings. Major population centers, such as New Orleans, Slidell and Houma should be provided the best reduction in flood risk we can create.

We do not endorse the concept of ‘leaky levees’. Whatever portion of the tidal exchange that is cut off from tidal exchange will directly lead to a similar portion of land loss. This was one of the lessons the Dutch have been trying to impress upon us. Their levee construction along the North Sea lead to almost immediate hypoxia conditions of the waters within the levee system, barely one year to result in catastrophic ecosystem collapse. Even the great Eastern Scheldt Barrier with its enormous openings and gates is causing rapid loss of the salt marsh on the landward side of the barrier.

Some of the alignments are not acceptable. One example is the proposed levee across Lake Borgne. This alignment will cut off hydrology and tidal influences severely changing the estuary. (pg 41). Another is GIWW alignment from Golden Meadow to Lafitte cuts off an enormous amount of tidal marsh (pg 42). Even with 'leaky levees', this ecosystem will degrade rapidly. There is no reason to include any substantial wetland landscape within the levee protection system anywhere along our coast.

In addition, we need to be sure, either by new zoning regulations or something similar that new levees do not lead to new development in wetlands. We cannot keep crying to the nation that our wetlands are disappearing at an alarming rate if we continue to allow development in these fragile and critically important lands.

Flood Protection levels
The draft CCPMP defines the different levels of protection that may be expected for the alternatives and the preferred plan. It is significant to recognize and describe areas of the coast that cannot be protected or protected to the same level as others. The maps show boundaries but do not illustrate the areas. For example, a map of colored fill patterns of non-protected areas, 1%, 0.2% flood protection will be more effective communicating the expected protection from the preferred plan. The CCPMP does not emphasize sufficiently the role of elevating homes and businesses. Language should be added to encourage parishes and individuals to utilize base flood elevation maps and the expected protection map of the preferred plan to plan for residential and commercial activities.

Estuarine health objective
The draft CCPMP suggests the long term use of wetland features to reduce storm surge impact yet it does not define a functional estuary that is necessary to be sustainable. A sustainable estuary must be hydrologically functional. This is best defined by geographic delineation of wetland habitat goals across the entire coast. This is in contrast to the "Objectives and Measures" matrices utilized in the CCPMP (appendix B) which are largely incomplete and unnecessarily complex.

Models
In general, the evaluation criteria and alternative selection are still too subjective. It is difficult or impossible to critique the CCPMP without more complete modeling results. The ADCIRC modeling for surge is probably the reasonable model to use. The CLEAR modeling is not adequate and appears to be a crude attempt to retrofit LCA work for CPRA.

Reefs
The draft CCPMP has almost no emphasis on restoration of structural reefs, which often means oyster reefs. Shellfish, in particular, are recognized to have tremendous benefits throughout the estuary including providing shoreline protection of marshes. Once the hydrology is restored, oyster reefs can be re-built within a few years and provide highly sustainable benefits. Structural reefs should be targeted for specific historic sites or along submerged remnants of distributary ridges

Shorelines and Ridges
While we support the restoration of historic coastal ridges, we need to point out that on page 32 restoration of the ridges (cheniers) near Fourchon are noted on Wisner Donation property. Wisner Donation has put considerable time, effort and money into degrading the man made ridges in this area to restore the natural hydrology. Careful coordination with the land owners is necessary to achieve the

goals of the plan. The best example of ridge restoration is the replacement of the Bayou LaLoutre Ridge across the MRGO. This feature will have tremendous positive impacts on storm surge reduction, limiting salt water impacts and allowing for the restoration of the associated ecosystems.

Navigation Channels
Proposed bank stabilization of the MRGO channel will no longer be as critical since the channel will be deauthorized for deep draft navigation and large boats will no longer be using this outdated and little used channel. However, modifications such as constrictions will be useful in reducing surge and fetch within the existing waterway. Bank stabilization of other channels throughout the coast does not fit in with protection or restoration measures. Though they may slow erosion on these channels, they are not the primary cause of wetland loss, nor does stabilizing necessarily result in wetland restoration.

Land Sustaining Diversions/Land Building Diversions
Over the long term, diversions, or river reintroductions, will provide benefits for keeping the wetland ecosystems healthy. However, these are slow land builders and must be viewed as such. The figure on page 34 contradicts the figure on page 37, showing diversions in different places and in fact put several diversions on top of each other. This needs to be sorted out and corrected.

We agree with the use of piped sediments to build land in various places. This practice has been used with great success in western Louisiana, specifically at the Sabine National Wildlife Refuge were thousands of acres have been created in recent decades.

MRGO
We strongly agree with the plan to close the MRGO at Bayou LaLoutre and to restore the ridge. Researchers from LSU have suggested that filling in portions of the MRGO near Lake Bornge (ex. Hassan Mashriqui) will eliminate the need for bank line stabilization in that area. Comments on restoration of the Central Wetlands and the Golden Triangle need to be better developed. Tying the IHNC lock to the closure of the MRGO has no place in a restoration or protection plan. While vital to navigation, this is indeed a national navigation concern and not one of restoration or protection. This element should be removed from the plan.

Chenier Plain
Restoration and protection plans for Southwestern Louisiana a light at best. A major component is the stabilization of the entire coast. In some area, land is prograding, not receding. Also, the use of reefs along this shoreline has been overlooked. Artificial near shore barriers, such as those near Holly Beach, offer tremendous wave reduction and shoreline retreat benefits.

The raising of the highways will be very costly, but could offer additional protection for the area communities as well as offer improved evacuation routes in times of extreme storms. Since this road is already in place, the hydrology is already greatly diminished. We hope that road improvements will include structures that can increase tidal flows, but can also be closed to reduce storm surge effects and opened easily to allow salty flood waters to retreat after a storms passage.

Very little attention has been given to marsh creation. Much of that is near Calcasieu Lake, where dredged materials can be used close to the lake to restore marsh.

Managing water and sediment is ambitious. However, the plan suggests water being diverted to Wax Lake, Terrebonne and towards the west. The Atchafalaya River has limited water and sediment resources, so though this is an idealistic plan, we need to be sure the water and sediment budgets are sufficient to achieve the goals of the plan.

Concluding Remarks

In general, the best restoration measures are those that mimic nature. Restoration of our wetlands will go a long way to helping protect our communities, but we recognize that engineered structures will also be necessary. These need to be engineered in such a way that there are minimal adverse impacts to the landscape. The bottom line is we must try to restore the coast to a self sustaining system.

Charlie Callais
320 W 41st St
Cut Off,La.70345

1/11/07

985-693-4314

Original: ✓
Copy:

TO/C.P.R.A.- IPT
DNR
P.O.Box94396
Baton Rouge La.70804-9396

Dear Sir,

As we talked yesterday in the meeting, I am writing you in concern to the costal erosion problem Louisiana is facing.

Sir, As I told you, I have the solution that the state of Louisiana has been looking for since the mid 30es. Plus the state also has been paying $50,000,000 yearly to the Army Cores of Engineers to TRY to find THE SOLUTION THAT I AM now trying to get the state of Louisiana to adopt and put it in the field's to work in Louisiana's favor.

Sir, the solutions that you now have on concern with the projects you are now working on is good ideas, BUT -- in the future will become wash outs.

Let me say this , With out revealing my solution, I will @ this moment let you know what my solution will do for Louisiana, when it will be working in the field's in Louisiana's favor. #1- It will put a stop to the costal erosion #2- It will help to rebuild our badly needed marsh lands #3- It will put security & strength in our levees to help fight against future hurricanes .

-I know that if & when my solution will be used in the right places in the field's, Louisiana will become a NEW REBUILT LOUISIANA. Then after Louisiana will be rebuilt -- it will then, because of a few idears that I have, -- I see in my dream that Louisiana will become a GOLD MINE.

Yes , You just read it right -- In my dream, with in 5 years, the new growing Louisiana will become a [illegible] WORK IN THE FIELD'S IN LOUISIANA'S FAVOR

'ourchon, my solution will be of great help in protecting
ed in the right place in the fields.
ality in the near future, IF only I can get the right persons
ll work in Louisiana's favor so she can become the gold

ie in reading this letter and I pray that you are one of the
na to come to reality in the near future. Thank you -- I
ouisiana becoming a gold mine in the future and with

Sincrely;

Mr. C

Charlie Callais

ouisiana's favor, what happened to the Chaineer / Grand
en to the now being built roat to Fourchon in the future.
e engineers DO NOT HAVE the solution to put a stop to

INCLUDED IS 2 POSSABLE AGREAMENTS FOR YOU TO SEE + REVUE TO SEE IF MY SOLUTION BEING REVEALED WHEN WE MEET IN THE FUTURE

FOR LOUISIANA'S FUTURE CAN YOU NOT AFFORD TO AGREE TO MEET WITH ME TO SEE IF MY SOLUTION IS GOING TO WORK IN LOUISIANA'S FAVOR IF IT IS PUT IN THE FIELDS?

(COPY)

Charlie Callais
320 W 41st St
Cut Off,La.70345

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985-693-4314

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Yes , You just read it right -- In my dream, with in 5 years, the new growing Louisiana will become a gold mine IF MY SOLUTION WILL BE PUT TO WORK IN THE FIELD'S IN LOUISIANA'S FAVOR in the near future.

Now, Where the Port Commission is located in Fourchon, my solution will be of great help in protecting the port because of where my solution will be located in the right place in the fields.

I know my dream for Louisiana will come to a reality in the near future, IF only I can get the right persons to let me explain to them about how my solution will work in Louisiana's favor so she can become the gold mine I mentioned.

I thank you for taking some of your precious time in reading this letter and I pray that you are one of the persons that will help to make my dream of Louisiana to come to reality in the near future. Thank you -- I remain -- the one person that has my dream about Louisiana becoming a gold mine in the future and with your help *** I WILL MAKE IT HAPPEN *** Sincrely;

Mr. C

Charlie Callais

PS/ With out my solution working in the fields in Louisiana's favor, what happened to the Chaineer / Grand Isle bridge from Kathrena & Rita , WILL also happen to the now being built roat to Fourchon in the future.

Y ? Because on the erosion. The engineers DO NOT HAVE the solution to put a stop to it Y E T.

Is it possible that you could arrange a meeting in between the governor & I in the near future?
If so - will be appreciated

My copy
For levees

Charlie Callais
320 W 41st St
Cut Off,La.

AGREMENT OF PAYMENT

We the under sine elected government members do here by agree that if the solution that Mr. Charlie Callais is revealing to us on this date } -- -- { is put in the field, part or whole, using the material he suggest or other material of our choosing in the future from this date shone above, WE, the elected Government officials Do agree that Mr. Charlie Callais, Will receive a ¼ of a million dollars ($250,000.oo) IF -- part or whole of said solution is used in the field in the future...

"ELECTED GOVERNMENT OFFICIALS SIGNATURE"

Signature	Whitness
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Atturney:

_____

_____

*****This is a Confidentiality Agreement *****

My copy
Compleat package

Charlie Callsis
320 W 41st St
Cut Off, La. 70345

******Agreement of payment *******

*For my solution for which I - Charlie Callais is about to reveal - If excepted to be put out in the field at any time from this day on into the future, --WHOLE or PORT -- I am to receive a deed to: or, ***IF*** I die before I see all those projects through, The members of my family is to take over where I will stop... THEY ARE TO RECEIVE *** (WHICH I WILL LEAVE INSTRUCTIONS TO THEM, for after I am gone)*
 # 1- 'A CERTAIN TRACK OF LAND , which will then become government property ;

 # 2- WIN'S from the POWER BALL , Which is to be decided by me when (at this moment, I am not at liberty to reveal any more details due to other plans, IF my solution is not adopted to be put in the field..) BUT Once my solution will be working in the field, Then there will be a few other projects that will be added to my solution working in the field that the New Rebuilt, State of Louisiana WILL BENNEFIT from in the future..

*We the under sined elected government officials DO AGREE to the terms of payment that is presented to us by Mr. Charlie Callais for the solution that will put a stop to some of the problem Louisiana is facing, *** COSTAL EROSION ****

Signatures: *Witness:*

#1-..... *#1-*.....

#2-..... *#2-*.....

#3-..... *#3-*.....

Transactions entered on this date:

...../...../.....

*****This is a Confidentiality Agreement *****

December 17, 2006

Sidney Coffee
Chair, Governor's Office of Coastal Activities
Office of the Governor,
Baton Rouge, Louisiana

Randy Hanchy
Deputy Secretary
Department of Natural Resources
Baton Rouge, Louisiana

Comments on Preliminary Draft of the Comprehensive Coastal Protection Master Plan for Louisiana, submitted by Oliver A Houck, Professor of Law, Tulane University

Dear Sidney and Randy,

Please accept these comments on the above Draft Plan. By way of background, I have researched, taught, published on and participated in litigation and the development of legislation and regulations for Louisiana coastal zone issues since 1971. Two articles among others that bookend this experience, are Land Loss in Coastal Louisiana: Causes, Consequences and Remedies, Tulane Law Review (1983) and Can We Save New Orleans?, Tulane Environmental Law Journal (2006). These comments are based on this experience and on conversations with members of the Louisiana coastal scientific and engineering community, whose experience in some cases pre-dates my own.

Overall, the Draft Plan is an advance over previous planning efforts towards an integration of coastal protection and restoration. Looking backwards, that is the good news. Looking forward, as we must, the Plan falls short. It's primary difficulties are in its assumptions, its science, and its failure to provide for the management of the landscape as a whole. In more particular:

A. GENERAL OBSERVATIONS:

1. Objectives. The Plan identifies several objectives. It provides great detail on the first of them, hurricane protection, less detail on the second, restoration, and no detail on the planning that will be required to maintain the sustainability of the coastal zone. It thus repeats the familiar levees - first scenario for water resources development in Louisiana. Unless planning and restoration are made first priorities, the rest, over time, will not matter.

2. Alternatives. The Plan is presented as that, a plan. Elements of the plan, particularly the levee elements, are presented in considerable detail. There is no presentation of alternatives from which a decision-maker (and the public) can choose. This approach violates the essence of a planning process, which is to fully and publicly consider the options. No amount of declarations about keeping an open mind erase the fact that only one option is being advanced.

3. Foreclosure. Some elements of the Plan are new and will be subject to detailed further study. Other elements, and particularly the Morganza to the Gulf Project, are accepted without question, although it is based on outdated assumptions of project storm and project costs and although the environment it affects has been dramatically changed by Hurricanes Katrina and Rita. Accepting the project and its alignment as given compromises any effort to explore less damaging and less costly alternatives. A serious planning effort has to put its major elements on the table.

4. Severability. The Plan is presented, in overview, as a joint venture between opening up northern portions of the coastal zone to restore river inputs and cordoning off the zone at the bottom with "leaky levees". These two elements are by no means interdependent. A wide consensus in the scientific community supports restoring natural hydrology into and through the coastal zone. Such projects, however, can be done without reference to levees along the coast. The most glaring omission in the entire Plan is an alternative that would make major structural improvements to inflow and through-flow from the north without leveeing off the zone below. From a coastal restoration point of view, this is without doubt Option A.

5. Levees. Levees are the enemy of viable coastal systems; the larger and more extensive they are, the worse they are. The literature on their adverse impacts is overwhelming. The Plan seems to respond to this

phenomenon by proposing even greater levees, on the theory that these new levees will be more environmentally friendly. Again, the obvious option is missing. If the current hydrology of the coastal zone is damaged by existing road bed, marsh management and other structures, it will be more easily and surely remedied by eliminating or modifying these obstacles than by building large new levees. Option B, however, is also not on the table.

6. The Precautionary Principle. An emerging principle of science and policy is the need to approach activities that have great potential impact with great caution. The greater the impact, the heavier the burden shifts on proponents to show no adverse long term effects. This Plan will determine the fate of the most productive coastal zone in North America for all time, for good or ill. The unknowns in this Plan are large. The burden is on its proponents to satisfy the many science, engineering and social questions it raises.

7. Implementation. The Plan is completely silent on how any of its ambitions are to be executed, by what body, and with what degree of expert and public participation. There is no framework for the long term, and this is a very long term project. Option C is the proposal of a planning and management entity capable of handling the engineering, scientific and land use planning elements inherent in the Plan. Handing these elements off laterally to existing institutions is an invitation to Babel. We not only need a new Plan; we need a new institution.

RECOMMENDATIONS: The next Draft Plan should be presented as a comparison of several structural and non-structural options for expert and public comment. It, further, should place all of its major components before the public; post-Katrina, everything about Louisiana coastal planning has changed, including the necessary priority of restoring the coastal zone. The Plan should, further, present the major scientific unknowns and its own responses to them. Lastly, it should propose a viable institutional framework for implementing the Plan over what will be a very long time.

SPECIFIC COMMENTS

8. Levee Alignments. To the naked eye, and the science eye, the most aggressive features of the Plan are two large levee loops running from the Mississippi River south and west, nearly touching the Gulf of Mexico. The second of these, Morganza to the Gulf, is mentioned above. The first, the Barataria Basin unit, is even more breathtaking in its inclusion of undeveloped wetland areas. To say the least, alternative, more northern alignments of each proposal deserve serious consideration and exposition to the public. Consider them Options D and E: alternative alignments along existing route 190.

9. "Leaky" Levees. The Plan seems to assume that providing gaps in these levees will offset their adverse environmental consequences. No assumption in the document is less proven. Indeed, no assumption is more disproven by previous experience in Louisiana. We have already tried these measures by cutting gaps in the spoilbanks along oil and gas canals, with meager results; the backwater areas ponded, or starved, and died out. We tried again with canal plugs, that washed out. We tried with larger marsh management projects, hailed as the savior of the coast; they too ponded and turned largely to open water. The Plan's levees are in effect huge marsh management projects. All evidence is that they will harm wetlands.

10. Unknowns. At the very least, the concept of "leaky" levees present several serious unknowns. It would be the antithesis of caution to bet the farm so completely while these unknowns are pending. They include:

a. The effects on surface water hydrology of the marsh;

b. Differences in impacts between open water and marsh;

c. Impacts of levees of this weight and footprint on subsurface hydrology; and

d. Impacts on storm drive transport of sediments north, into the coastal zone from the Gulf.

The urgency of all of these questions would be blunted by aligning the levee systems themselves along route 190 or another, non wetland corridor. As they now stand, leaky levees present more of an opportunity to develop coastal wetlands than a remedy to restore them.

11. Development Impacts. The history of Louisiana unfolds in one of two ways; wetland development and a cry for levees, or a cry for levees in order then to develop the wetlands. Mega-levees of the kind proposed in the Plan invite both scenarios. The Plan is untenably vague in its response to this phenomenon. Unconsidered Option F is the acquisition and public ownership and management of all enclosed wetlands, to reduce development pressures.

12. Regulatory Programs. Ostensibly, Louisiana's coastal wetlands are protected under both federal and state permit programs. The practice is otherwise. The Plan makes no mention of continued permitting behind and ahead of whatever levee alignments are ultimately chosen. Assurances that these programs will control wetland development are naive or disingenuous. Current permits are based on mitigation projects that underperform badly, where they perform at all. Concomitant with the expenditure of coastal protection and restoration monies, the State needs to articulate a new policy and program for wetland permitting based

on no new loss, not mitigated loss. Option G.
13. Spoilbanks. Nor is mention made of the restoration of thousands of miles of canals, now dredged and lined with spoil banks that have done enormous damage to the wetlands are continuing to erode. The spoilbanks alone represent a resource available for backfilling and other uses. Option H: tear down these walls, and assess those responsible for them their fair share of the costs.
14. Armoring. The Plan seems to rely at many locations on armoring the coast with rocks and other bulwarks against the Gulf. We have done this, too, many times before, and the rocks and jetties tend to end up in open water, after the erosion has cut in behind them. Critical inquiry should be made into the expectations of these projects, and alternatives to them.
15. Quantification. No mention is made of the most critical measuring stick for the state plan: How many acres of wetlands will be directly taken, indirectly affected, or open to development under the Plan, as opposed to how many acres are to be restored. And at what cost. One's guess is that, measured by the costs of simply restoring the number of wetlands taken by the project alone, that the costs of the Plan will be significant, and should be a significant factor in the deciding among alternative approaches.
16. Alternative Costs. Ultimately, what is missing is a benefit/cost comparison among alternative plans (not of a single chosen plan), for expert review and comment. Only then can reasonable public responses and public choices be made.
17. Coastal Zoning. The plan seems to propose that Louisiana protect, behind levees, the maximum amount of land, and wetland, possible, because people want to live there. People should be able to live, on private lands, wherever they want, but expecting federal hurricane protection, infrastructure improvements and flood insurance is another thing. The long-term success of this Plan will depend on encouraging residential and commercial development to move out of vulnerable and environmentally sensitive areas. The Plan is stone silent on what these efforts can and should be, and what government inducements are possible. Those elements are yet another unconsidered option, Option I.
RECOMMENDATIONS: The Plan should address, again in option fashion, each of these concerns with enough specificity so that the public can comment on them, and have confidence that they will in fact be addressed.
CONCLUDING THOUGHTS
The basic assumption of the Louisiana Plan is that the answer to a badly engineered coast is more engineering, witnessed in more controlled diversion structures, pumps and pipelines to transport sediments, gated weirs, pumps and pipelines. While these measures have their place, experience tells us that the more manipulation and human decision-making that is required, the more breakdown will occur. Recent history with the river diversions illustrate the point. And this is before one factors in perpetual maintenance requirements, subsiding soils and rising seas.
That system will work best that requires the least human intervention, and allows natural forces from the north and the south to work in their natural ways. A Plan that relies on the restoring the zone with a yet more complex system of engineering is doomed, over time, to fail. A Plan that maximizes removing the barriers to natural forces and getting out of their way will succeed.
Thank you for your consideration of these views.
Respectfully submitted,

Oliver A Houck
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TULANE LAW SCHOOL

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Professor of Law

January 9, 2007

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James "Randy" Hanchey
Deputy Secretary
Department of Natural Resources
P.O. Box 94396
Baton Rouge, LA 70804-9396

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SPECIFIC COMMENTS

8. Levee Alignments. To the naked eye, and the science eye, the most aggressive features of the Plan are two large levee loops running from the Mississippi River south and west, nearly touching the Gulf of Mexico. The second of these, Morganza to the Gulf, is mentioned above. The first, the Barataria Basin unit, is even more breathtaking in its inclusion of undeveloped wetland areas. To say the least, alternative, more northern alignments of each proposal deserve serious consideration and exposition to the public. Consider them Options D and E: alternative alignments along existing route 190.

9. "Leaky" Levees. The Plan seems to assume that providing gaps in these levees will offset their adverse environmental consequences. No assumption in the document is less proven. Indeed, no assumption is more disproven by previous experience in Louisiana. We have already tried these measures by cutting gaps in the spoilbanks along oil and gas canals, with meager results; the backwater areas ponded, or starved, and died out. We tried again with canal plugs, that washed out. We tried with larger marsh management projects, hailed as the savior of the coast; they too ponded and turned largely to open water. The Plan's levees are in

effect huge marsh management projects. All evidence is that they will harm wetlands.

10. Unknowns. At the very least, the concept of "leaky" levees present several serious unknowns. It would be the antithesis of caution to bet the farm so completely while these unknowns are pending. They include:

    a. The effects on surface water hydrology of the marsh;

    b. Differences in impacts between open water and marsh;

    c. Impacts of levees of this weight and footprint on subsurface hydrology; and

    d. Impacts on storm drive transport of sediments north, into the coastal zone from the Gulf.

    The urgency of all of these questions would be blunted by aligning the levee systems themselves along route 190 or another, non wetland corridor. As they now stand, leaky levees present more of an opportunity to develop coastal wetlands than a remedy to restore them.

11. Development Impacts. The history of Louisiana unfolds in one of two ways; wetland development and a cry for levees, or a cry for levees in order then to develop the wetlands. Mega-levees of the kind proposed in the Plan invite both scenarios. The Plan is untenably vague in its response to this phenomenon. Unconsidered Option F is the acquisition and public ownership and management of all enclosed wetlands, to reduce development pressures.

12. Regulatory Programs. Ostensibly, Louisiana's coastal wetlands are protected under both federal and state permit programs. The practice is otherwise. The Plan makes no mention of continued permitting behind and ahead of whatever levee alignments are ultimately chosen. Assurances that these programs will control wetland development are naive or disingenuous. Current permits are based on mitigation projects that underperform badly, where they perform at all. Concomitant with the expenditure of coastal protection and restoration monies, the State needs to articulate a new policy and program for wetland permitting based on no new loss, not mitigated loss. Option G.

13. Spoilbanks. Nor is mention made of the restoration of thousands of miles of canals, now dredged and lined with spoil banks that have done enormous damage to the wetlands are continuing to erode. The spoilbanks alone represent a resource available for backfilling and other uses. Option H: tear down these walls, and assess those responsible for them their fair share of the costs.

14. Armoring. The Plan seems to rely at many locations on armoring the coast with rocks and other bulwarks against the Gulf. We have done this, too, many times before, and the rocks and jetties tend to end up in open water, after the erosion has cut in behind them. Critical inquiry should be made into the expectations of these projects, and alternatives to them.

15. Quantification. No mention is made of the most critical measuring stick for the state plan: How many acres of wetlands will be directly taken, indirectly affected, or open to development under the Plan, as opposed to how many acres are to be restored. And at what cost. One's guess is that, measured by the costs of simply restoring the number of wetlands taken by the project alone, that the costs of the Plan will be significant, and should be a significant factor in the deciding among alternative approaches.

16. Alternative Costs. Ultimately, what is missing is a benefit/cost comparison among alternative plans (not of a single chosen plan), for expert review and comment. Only then can reasonable public responses and public choices be made.

17. Coastal Zoning. The plan seems to propose that Louisiana protect, behind levees, the maximum amount of land, and wetland, possible, because people want to live there. People should be able to live, on private lands, wherever they want, but expecting federal hurricane protection, infrastructure improvements and flood insurance is another thing. The long-term success of this Plan will depend on encouraging residential and commercial development to move out of vulnerable and environmentally sensitive areas. The Plan is stone silent on what these efforts can and should be, and what government inducements are possible. Those elements are yet another unconsidered option, Option I.

RECOMMENDATIONS: The Plan should address, again in option fashion, each of these concerns with enough specificity so that the public can comment on them, and have confidence that they will in fact be addressed.

CONCLUDING THOUGHTS

The basic assumption of the Louisiana Plan is that the answer to a badly engineered coast is more engineering, witnessed in more controlled diversion structures, pumps and pipelines to transport sediments, gated weirs, pumps and pipelines. While these measures have their place, experience tells us that the more manipulation and human decision-making that is required, the more breakdown will occur. Recent history with the river diversions illustrate the point.

And this is before one factors in perpetual maintenance requirements, subsiding soils and rising seas. That system will work best that requires the least human intervention, and allows natural forces from the north and the south to work in their

natural ways. A Plan that relies on the restoring the zone with a yet more complex system of engineering is doomed, over time, to fail. A Plan that maximizes removing the barriers to natural forces and getting out of their way will succeed.

Thank you for your consideration of these views.

From: Kerry St. Pe [kerry@btnep.org]

Sent: Friday, January 05, 2007 5:13 PM

To: comments@louisianacoastalplanning.org

Cc: Andrew Barron; Dean Blanchard; Joni Blanchard; 'Kerry St.Pe' (W)'; Lainey Pitre; Michael Massimi; Richard DeMay; Sandra Helmuth (W); Shelly Sparks; Susan Testroet Bergeron; Al Levron

Subject: BTNEP Comments on CPRA Plan

Attachments: CPRA Master Plan comments.doc

On behalf of the Barataria-Terrebonne National Estuary Program, please accept the attached comments on the CPRA Comprehensive Coastal Protection Master Plan for Louisiana Preliminary Draft.

Thank you.

Kerry M. St.Pé, Program Director
Barataria-Terrebonne National Estuary Program
1-800-259-0869
http://www.btnep.org/

Barataria-Terrebonne National Estuary Program
Comments on the
CPRA Comprehensive Coastal Protection Master Plan for Louisiana
Preliminary Draft

Friday, January 05, 2007

The BTNEP Office would like to express our acknowledgement and appreciation for the efforts of the CPRA IPT in putting together this Preliminary Draft. We are intimately familiar with the daunting process of cobbling together a coherent coastal protection plan, as we went through a similar process in the early 1990s. Our process, begun in 1991 with the federal recognition of the Barataria-Terrebonne system as an estuary of national significance, took five years to complete and resulted in the BTNEP Comprehensive Conservation and Management Plan (CCMP). In 1996, the CCMP was approved for implementation by both the state and federal governments. It is through the lens of the CCMP, a plan forged in multiple stakeholder consensus, that we view the Master Plan Preliminary Draft. Speaking on behalf of the agreement represented by the CCMP, we offer the following comments.

Our most general concern with the state's Master Plan is its "implementability." Over the years we have seen too many plans fail to be properly implemented, most often due to the failure to incorporate the "human factor." The best-laid plans of research science and academia repeatedly strike the impenetrable wall of political and public acceptance. Therefore, finding common-ground solutions and forging stakeholder agreement is absolutely vital to the future success of any plan to restore and protect coastal Louisiana.

Of course, considering the menagerie of stakeholders involved, forging agreement on a given specific restoration measure can be difficult and can take considerable time to develop. But only by blending ideas from all positions into the realm of agreement can implementation realistically move forward. The list of potential restoration measures should be vetted to exclude those outlying proposals for which no agreement could be forged. Ideas not consistent with acceptability must be discarded, as we simply do not have the time to wrangle over them now. We must identify the areas of agreement and move forward. That is the key to successful plan implementation.

As a specific example, we refer to the so-called "land building diversions" of Plaquemines Parish. Our Program Office staff participated quite closely in the development of the Preliminary Draft, and witnessed an excellent process of consensus-building take place. Well-organized meetings and workshops saw measures come and go, resulting in a list of projects for which there was general agreement. The "land building diversion" was not one of them. In fact, after a year of manipulating the state's two alternatives and eventually forming one Master Plan, this measure only just appeared in the November 2006 release of the Preliminary Draft. Frankly, we are disappointed by this development. It runs completely counter to the spirit of participation and agreement, which is the only path to implementation.

Further, the BTNEP does not accept the supposition that large river diversions will build significant amounts of land in a reasonable time frame. Due to the greatly decreased sediment load present in the river relative to historical data, such diversions will not result in land building in a time frame that is acceptable. Also unacceptable are the ecological and socioeconomic impacts associated with introducing such massive quantities of river water into the basin. In short, this proposal is not consistent with the BTNEP CCMP. The development of that document ten years ago showed that, regardless of distant future benefits, such disruptions to the way of life in the Barataria and Terrebonne systems constitute a trade-off that residents here are unwilling to accept.

Small diversions of freshwater into the wetlands have been shown to be effective strategies for sustaining marsh. We believe diversions are an essential component of comprehensive restoration and overall sustainability. However, diversions must be sized and located appropriately to maximize the benefits and minimize the impacts. Very large or uncontrolled diversions, considering current resource use and ecological change, simply have too great an impact for too little near term benefit and questionable long-term benefit.

We have reservations about the results of the CLEAR model runs that show questionably generous land gains in surprisingly short spans of time for many of the large diversions it modeled. We question some of the inputs to the CLEAR model, as well as many of its outputs, and we feel that the model should not be heavily weighted when making ultimate decisions on restoration measures.

Regarding levee alignments, the BTNEP would like to point out two areas of concern. First, in the Barataria system, we feel strongly that any levee placed on or south of the Gulf Intracoastal Waterway would result in the unnecessary impounding of internal wetlands. Although a "leaky" levee system is proposed, we feel that there can never be enough exchange to properly maintain healthy hydrologic connectivity. An alignment along Highway 90 is preferable, as a hydrologic barrier already exists there. A Highway 90 alignment would enclose less wetland, increasing flexibility in future restoration plans, and maintaining the hydrologic functionality of the systems to the south.

We also are concerned with the proposals for Plaquemines Parish levee protection. Although there are now fewer residents of the west bank from Myrtle Grove to Venice, there are still myriad businesses and industries as well as people attempting to rebuild Lower Plaquemines. It seems that by both changing the standard of what constitutes 100-year protection, and proposing to maintain the existing levees as they are, the state has effectively removed the level of certified protection that residents have had for decades. In other words, "maintaining existing levees" does not equate to "maintaining existing protection" as the protection was 100-year and now no longer will be. In no other area of the state have residents been asked to accept a decrease in their level of protection. This proposal is unfair to those residents, who are currently rebuilding their lives and businesses, only to just discover that they may no longer enjoy the protection they assumed would continue.

The BTNEP would also like to point out a few of the many areas of agreement our CCMP shares with the Master Plan Preliminary Draft. We fully support the use of pipelines for the delivery of dredged sediment for marsh creation. Indeed, we see this as the best alternative for timely land building. The technique is precise, minimizing negative impacts to surrounding areas, and is relatively cost-effective when compared to other land building strategies. Furthermore, pipeline sediment delivery can be used not only to create marsh, but also to restore remnant ridges and barrier islands, both essential landforms for habitat as well as hurricane protection. Areas of newly created marsh should be nourished with freshwater wherever possible. We support small diversions of the Mississippi River as well as efforts to introduce freshwater from other sources such as the Atchafalaya River, the GIWW, Bayou LaFourche, or even stormwater redirection.

The BTNEP appreciates the opportunity to comment on the Master Plan Preliminary Draft, and we look forward to participating in the future development of the plan.

Sincerely,

Kerry M. St.Pé

Kerry M. St.Pé
Program Director

C: BTNEP Management Conference

From: Simone Maloz [simone.maloz@nicholls.edu]
Sent: Friday, January 05, 2007 3:01 PM
To: comments@louisianacoastalplanning.org
Subject: CPRA Plan Comments
Attachments: CPRA Comments 01 07.doc

Please see the attached written comments from our organization, Restore or Retreat.

Simone Theriot Maloz
Executive Director
Restore or Retreat
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Fax: 985/448.4486
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simone.maloz@nicholls.edu
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Louisiana's Valuable Coast: Infrastructure along coastal Louisiana has an estimated value of $150 billion.

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January 15, 2007

Coastal Restoration and Protection Integrated Planning Team
c/o Mr. Jon Porthouse
Louisiana Department of Natural Resources
P.O. Box 44027
Baton Rouge, LA 70804-4027

Re: Official Comments on the Preliminary Draft of the State's Comprehensive Master Plan

Dear Mr. Porthouse,

Restore or Retreat, Inc., a non-profit coastal advocacy group created by coastal Louisiana residents and stakeholders who recognize that the Barataria and Terrebonne basins are the two most rapidly eroding estuaries on earth. Representing over 200 businesses and individuals, Restore or Retreat would like to respectfully submit the following comments on the Coastal Restoration and Protection Authority's Preliminary Draft of the State's Comprehensive Master Plan.

We support the planning team's utilization of already existing work, as well as incorporating input from a wide variety of stakeholders, as our organization was included in several stakeholder meetings held throughout the fall. Although we fully understand the intention has been for the plan to be somewhat fluid, we found the material presented at the Coastal Restoration and Protection Authority's meeting on Wednesday, November 8, was much different that what was discussed at fall stakeholder meetings and in the smaller stakeholder meetings held immediately prior to the full CPRA meeting. We understand tough decisions had to be made, but we would like some insight on the filtering process in which these tough questions were asked, who asked them, who answered them and how they were answered since stakeholders were not always privy to this information.

To discuss the plan itself, there were several projects ROR wholeheartedly supports, and some projects of merit which were omitted. Individually, our comments are as follows:

Small Bayou Lafourche Reintroduction- The seemingly easy task of reinvigorating Bayou Lafourche with freshwater from the Mississippi River has been an example of the many challenges restoration has faced in Louisiana. Although there has been significant modification from the original plan which included a higher rate of introduction, the state and the local community support the plan, but the recent attitude of the federal CWPPRA partners needs to be taken into great consideration. While the State has accepted greater responsibility in the continued design and engineering with the community's support, the less-than-warm attitude of the agencies will need to be addressed when planning its implementation.

Re-authorization of Davis Pond- A key component of the state's plan should include the better use of the considerable time, money and effort spent on already existing restoration projects and structures. While the Corps continues to make slow progress on bringing Davis Pond to its full operational capacity, future plans must also be made for the reauthorization of Davis Pond to include its modification to divert more fresh water and sediment, which will have a far reaching result on the deeply effected Barataria Basin.

Third Delta Study- Although its continued study was in both alternatives presented at stakeholder meetings in the fall and in worksheets handed out during December public meetings, the project, nor its continued study on the federal level, was included in the preliminary draft of the master plan,. It was stated during the November 8 CPRA Meeting that the long range plans for the Barataria and Terrebonne Basins include the state's commitment "to a long term pipeline infrastructure and periodic mechanical re-nourishment" or finding "more innovative means of moving river resources to this area." The Third Delta concept is an example such innovation which conforms to the state's ideology of "fixing the system" by a necessary systemic change. It is well known and stated that Third Delta or any closely related concept is in no-way a "near term fix," but its continued study and plan for implementation can, and should be, considered *in conjunction with, not in lieu of* any of the short-term, middle/inland marsh projects for the purpose of long term sustainability. Because of the importance of the growing delta as a result of the Wax Lake Outlet, Third Delta was included in the full Louisiana Coastal Area Study and the Coast 2050 plan, as well as the abbreviated near term LCA plan awaiting Congressional authorization. This effort and inclusion should not be overlooked in constructing the State's Comprehensive Master Plan, especially because of the significance the new delta played in protection that area from the devastating effects of Hurricane Rita, which was hard-felt by those to the east and west. If the state is to remain true to their mission of incorporating restoration projects for immediate and future results, the implementation of long term plans that would sustain the critical near-term middle/inland marsh projects should not held to a minimum or even excluded, especially for area of the greatest need-- the Barataria and Terrebonne Basins.

Barrier shoreline restoration projects- ROR also subscribes to the "Multiple Lines of Defense" strategy now widely held by most in the restoration and protection community. Barrier islands provide our first line of defense from the encroaching salt water and storm surge from the Gulf of Mexico. These projects will prevent the barrier islands from further breaching through the deposition of dredged material, and will provide a continued barrier to reduce wave and tidal energy, thereby protecting the mainland shoreline from continued erosion. This is a critical and vital component of the state's plan.

Pipeline Conveyance of Sediment- Pipeline conveyance of sediment is an essential near term restoration technique that must be wisely planned and implemented in conjunction with a freshwater diversion for sustainability. Projects being considered for the Coastal Impact Assistant Program (CIAP) funds should include a significant demonstration project for this long distance conveyance of sediment into the Barataria and Terrebonne Basins. Rebuilding historic ridges and prioritizing projects to areas of the greatest need is essential because time, resources and funds will rapidly deplete because of the expensive nature of these types of projects. We ask that these areas of greatest need, such as the Barataria and Terrebonne Basins, not be on the losing end of the pipeline conveyance when time and money run short.

Beneficial Use of Dredge Material- While not all of material dredged is available to be beneficially placeed in the coastal ecosystem, there is a potential for greater use of this material for the benefit of wetland nourishment, marsh creation, and barrier island and ridge restoration. As for location of these projects, priority of basin-wide loss rate should weigh heavily in site selection. Our organization wholly supports the state's initiative for improved use of this material for the betterment of the entire south Louisiana ecosystem, while also benefiting navigation critical to economic development.

Restore ridges including Bayou Lafourche Ridge, etc.- There is a great need for the contemporary rebuilding and/or redesign of historic landscapes in future planning of coastal restoration. Pipeline sediment transfer from the Mississippi River can be beneficially used to rebuild historic ridges to strengthen the "bones" of the system needed to support any additional "muscle" that is to come from other methods of restoration such as freshwater and sediment diversions and pipeline sediment conveyance. Planning to incorporate the topography and vegetation of the ridges can also directly contribute to the diversity and productivity of the world's seventh largest delta.

Multi-purpose operation of the Houma Navigation Canal (HNC) Lock- The installation of a lock complex at the Houma Navigational Canal is vital to the community for two very different reasons: restoration through the prevention of salt water intrusion and community protection from storm surge that has inundated low-lying areas more frequently than ever before. Both reasons could stand alone on their own merits. The Morganza to the Gulf Hurricane Protection System is meticulously proactive in its design and intention- to be environmentally responsible while providing adequate protection for a community of 200,000 plus. The wise use and planning of the navigational canal's lock and future channel dredging is essential to the healing and restoration of this area.

Use of the Gulf Intracoastal Waterway for Atchafalayla Delivery into Western Terrebonne – New freshwater and sediment delivery projects need to be implemented in the area of western Terrebonne via the Atchafalaya through the GIWW. This is a great example of a regional project that will aid in using sediment and freshwater that has become a nuisance in St. Mary Parish for the benefit of an area of greater need, western Terrebonne.

Because of the devastating effects of Hurricanes Katrina, and especially Hurricane Rita for our area, it is vital for the CPRA's Master Plan to include both near-term and long-range perspectives and to incorporate already existing and planned structural, management, and institutional components, which has not been truly incorporated in past plans. So much time, effort, and hope has already been dedicated to past efforts that, now, more than ever, the state needs to aggressively and expeditiously implement a comprehensive master plan, in coordination with the federal government and the Louisiana Recovery Authority, for the long term sustainability of our coast, communities, and culture.

If you have any questions about these comments, please do not hesitate to contact our office at 985/448.4485 .

Sincerely,

Simone Theriot Maloz

Simone Theriot Maloz
Executive Director

Cc: Louisiana Congressional Delegation
Reggie P. Dupre, State Senator District 20
Butch Gautreaux, State Senator District 21
Gordon Dove, State Representative District 52
Loulan Pitre, Jr., State Representative District 54
Warren J. Triche, Jr. State Representative District 55
Coastal Restoration and Protection Authority Members
Secretary Scott Angelle, Department of Natural Resources
Charlotte Randolph, Parish President, Lafourche
Don Schwab, Parish President, Terrebonne
Lafourche Parish Council
Terrebonne Parish Council

1/5/2007 11:33	John Plaisance, , P. O. Drawer 730, , Galliano, LA, 70354, SUA, JPlaisance@JWaynePlaisance.com	I agree with Restore or Retreat's stand that the plan does not go far enough. We need to restore the coast. Fourchon can not atand as an island. We need the area between Leeville and Larose to sustain the oil industry in the southeast Louisiana area.

From: Randy Lanctot [Randy@lawildlifefed.org]
Sent: Friday, January 05, 2007 9:04 PM
To: comments@louisianacoastalplanning.org
Subject: Master Plan Comments
Attachments: Coastal Master Plan comments.pdf

Please find attached the comments of the Louisiana Wildlife Federation on the preliminary comprehensive master plan for coastal protection.

LOUISIANA WILDLIFE FEDERATION
". . . conserving our natural resources and your right to enjoy them."

5 January 2007

The following comments are submitted on behalf of the Louisiana Wildlife Federation by the LWF's Coastal Restoration and Protection Committee. We thank you for the opportunity to comment on the preliminary draft of the Comprehensive Coastal Protection (and Restoration) Master Plan for Louisiana (Master Plan). It is a good preliminary effort and we commend the team responsible for building this initial report in the relatively short amount of time allotted, particularly given the complexity and enormity of the challenges to securing a safe and sustainable coastal environment.

We'd like to recommend that future iterations of the Master Plan be made available on the Internet in a format that is easier to access and digest by the average citizen. Specifically, a plain text document that is b&w printer friendly should be available. Companion graphics can be provided as an appendix. It was indeed a challenge to navigate the Master Plan, despite its brevity. Also, we found the Master Plan document to be unintentionally misleading due to lack of detail (and, with respect to some graphics, incomprehensively cluttered with too much detail). Although critical clarifying detail and discussion is contained in one or more of the appendices for at least some of the questions raised in reviewing the Master Plan, reviewers not able or willing to wade through the lengthy appendices were unnecessarily left with the impression that the Master Plan overlooked many important issues. That is not fair to the developers of the plan, or the reviewers. If the Master Plan cannot be communicated in a format that is friendly to the public, it will only provoke suspicion, and it will have failed, no matter how technically sound it is.

Although emphasizing the inevitability of change, and acknowledging that not everyone will receive the protection and benefits that they might desire, the Master Plan fails to give adequate emphasis to the scientific and engineering, not to mention funding uncertainties to achieving the touted 100 year and 500 year storm surge protection from levees. That failure promotes unrealistic expectations by the public which are detrimental to the success of the Master Plan.

The Master Plan is somewhat ambiguous on big river diversions. It should give more emphasis to utilizing the freshwater and sediment conveyed by the Mississippi and Atchafalaya Rivers to restore and nourish coastal landscapes that are essential storm buffers and fish and wildlife habitats, and to the discussion of how that will be achieved in a significant way considering the continued use of the Mississippi River for deep draft navigation.

The Master Plan anticipates the requirement of adaptive management to respond to changing conditions like sea level rise, subsidence and geomorphic changes, etc. but gives little detail of how these circumstances will be monitored and assessed, and adaptation implemented. The next iteration of the Master Plan should include a discussion of how adaptive management will be applied to the various plan features.

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The Master Plan's proposed use of navigation channels for distribution of freshwater and sediment to restore, build and sustain wetlands is untested with respect to feasibility for restoring/creating significant acreage of wetlands. The emphasis on navigation channels should first be the prevention of further deterioration of the coastal landscape, with navigation and compatible use of existing channels for restoration, secondary.

The plugging of the MRGO at Bayou la Loutre is critically important and should be expedited. Consideration should also be given to "pinching" the MRGO channel at strategic locations to accelerate shoaling and fill of the channel.

Regarding the Inner Harbor Navigation Canal (IHNC) lock replacement as a protection/restoration feature, what is the explanation of how doing so would serve either or both of these purposes? Why is the IHNC lock replacement related to the closure of the MRGO? If the inclusion of the IHNC lock replacement in the Master Plan is to support maintaining the crucial economy associated with navigation, one of the purposes of the Master Plan(economic sustainability), then that should be stated as such rather than encouraging the inference that replacing the locks will somehow serve the purposes of coastal restoration and protection. Preserving the economy of the region is a legitimate purpose of this plan, but specifying lock replacement as part of it opens a Pandora's Box and challenges the Plan's credibility. Lock replacement on the IHNC should be addressed independently of this Master Plan for coastal protection and restoration.

The Hope Canal and Blind River diversions are important ecosystem restoration and enhancement strategies but where do they fall in priority among coastal protection/restoration measures that will provide the most defense against storm surge flooding? These proposed diversions as well as other strategies should be prioritized in the next iteration of the Master Plan.

The Master Plan gives little emphasis to restoration of structural oyster reefs. Shellfish, in particular, are recognized to have tremendous benefits throughout the estuaries including providing shoreline protection of marshes. Once the hydrology is restored, oyster reefs can be re-built within a few years and provide highly sustainable benefits.

The levee alignment traversing Lake Borne should be dropped from consideration, however, building the shoreline wetlands further out into the lake, perhaps in conjunction with the landward alignment proposed, if feasible, would provide for greater protection as well as avoid the impacts and management issues associated with a levee through Lake Borne. We are also concerned about the effect of the proposed flood gates at Chef Pass and the Rigolets. Before a decision on these concepts is made, their impacts and benefits should be carefully and thoroughly modeled.

The concept levee alignments for 1% protection for Barataria and Westbank are problematic in several respects. This provokes the question, one that struck a cord with many of the participants in the "Louisiana Speaks" workshops held last summer, of the economic and ecologic sense of

protecting wetlands from water (flooding) by constructing a continuous levee through the marsh and along the ICWW. The feasibility of engineering, costs, and materials to construct the concept levees is very uncertain, and the hydrologic/ecosystem impacts such levees would have on the natural resources that are responsible for nurturing the culture that this plan purports to hold in such high esteem and to sustain as one of its objectives are predictably adverse and unmitigable. This and other levee concepts for providing hurricane protection to the west should be revisited with more consideration being given to employing ring levees around communities coupled with effective transportation and transportation infrastructure, as well as reasonably comfortable accommodations for temporary staging of evacuees landward of the flood impact zone. Such evacuation transportation infrastructure and evacuee staging accommodations should be integral to the planning in all planning units addressed by this plan.

Regarding the proposed repair of the gap in the Elmer's Island beach, it should be considered that this area is naturally accreting and will likely fill back in without intervention, over time. Whatever "repair" measures that are ultimately taken should be complementary to the natural accretion process and not have unintended consequences of undermining the natural land-forming processes at work at this location.

As a member of the Management Conference of the Barataria-Terrebonne National Estuary Program (BTNEP) that crafted the Comprehensive Coastal Management Plan (CCMP) for the estuary, we are disappointed that the Master Plan does not acknowledge those elements it has in common with the CCMP and discuss the reasons why the other CCMP features were not included. We urge that the next iteration of the Master Plan incorporate such treatment of the CCMP.

A fundamental principle of coastal protection and restoration should be that, from here on out, all sediment produced from dredging in the coastal zone must be used for coastal restoration/protection, or must be "stored" in accessible places for future use for such purpose. This principle should be applied to ALL public AND private dredging activities on all coastal lands, public and private.

The State's Coastal Zone Management Program and the strategies for its execution must be reformulated in light of the hurricanes and the urgency of preventing further land loss. If necessary, state law should be modified to reinforce what should be a more stringent application of the authority of the state through the CZM or other program to manage public and private land uses to prevent further land loss and enhance opportunities for restoration and conservation of public and private coastal lands.

Randy P. Lanctot
Executive Director
On behalf of the Louisiana Wildlife Federation
& the LWF Coastal Restoration and Protection Committee

Mississippi River Basin Alliance
P.O. Box 4268
New Orleans, La. 70816

January 5, 2007

CPRA-IPT
DNR
P.O. Box 94396
Baton Rouge, La 70804-9396

To: Coastal Protection & Restoration Authority Integrated Planning Team

I am submitting the following comments on the Preliminary Draft Comprehensive Coastal Protection Master Plan for Louisiana on behalf of the Mississippi River Basin Alliance (MRBA). MRBA has worked for a number of years to promote and support restoration of Louisiana's coast, with an emphasis on educating and engaging stakeholders and officials upstream in the basin about the importance of coastal restoration.

General Comments:

As the Preliminary Draft of a Comprehensive Master Plan notes in the Preface, the storms of 2005 have elevated the coastal crisis faced by Louisiana, and Act 8 has charged the state with elevating its efforts. The most difficult and critical part of those efforts, in our view, involves making the difficult decisions that will ensure sustainability for southern Louisiana and the coast. The Draft notes that change is upon us, and identifies some areas where significant change is required, such as land use practices, while also noting that it assumes that "pre-storm development patterns" will continue (Step #2, p.21). This assumption limits the help that the newest plan can provide the state in making decisions that have been long resisted by a number of interests, such as recognizing and instituting limits to the development of wetlands and vulnerable lands.

For over a decade, Louisiana has made the case for comprehensive restoration of its coast by stating that a restored coastal ecosystem will provide the best and the only effective storm protection system. This fact does not eliminate the need for structural protection of coastal population centers, but it will determine whether those structures are effective in the long run. A number of post-Katrina/Rita studies showed that levees with wetlands in front of them fared better than those without.

The need to integrate restoration and protection more fully, as stated by Act 8, still leaves the state with the obligation to make the best decisions for sustaining southern Louisiana and the coast. The report recognizes that levees alone cannot do the job (p.14), but the disagreements over levees have largely been about their placement and purpose, not their use in protecting coastal communities. There are areas of increased vulnerability for

communities, such as lower Terrebonne Parish and the West Bank, where levees have been known for some time to lack sufficient height to provide effective protection. This was shown tragically for lower Terrebonne in Hurricane Rita, while the West Bank was largely spared in 2005. It is not clear why improvement of those levee systems cannot be an immediate priority. The Draft notes the vulnerability of the West Bank on page 43, but ties its protection to proposals to levee off entire basins rather than raising levees that protect population centers.

The concept of "leaky levees" and their effect on deltaic functioning, as well as restoration, has been raised by a number of researchers and stakeholders. Uncertainties about funding the proposed levee system across the entire coast, as well as questions about the entire new level of water management required if such a system were ever built, should lead to a strategic approach of protecting population centers and lives first by completing those sections nearest to those communities.

We are encouraged to see pipeline conveyance of sediments highlighted (pages 21 and 35) as one of the short-term actions available for near-term benefits, but are concerned about the apparent dichotomy presented between this technique and "natural sustaining of the coast" presented in Step #4 (p.21). There is no conflict or dichotomy between the utilization of sediment pipelines and restoration of deltaic functioning through methods such as river diversions. The approval, funding, and construction of river diversions will take an indeterminate number of years, perhaps a decade or more in some cases, depending on Congressional approval and other factors. Pipeline conveyance of sediments can be instituted almost immediately, and can help repair areas scoured out by the storms in 2005, and help retard or even reverse the conversion of wetlands to open water.

It seems clear, therefore, that this near-term opportunity should be grasped, even while longer-term actions that can operate on a larger scale are also pursued. The Mississippi River, even with its sediment loads historically reduced, contains millions of tons of sediment that are going unused. The river offers another advantage in that utilization of its sediments does not raise the concerns about toxics that are present in the sediments of many smaller waterways in Louisiana as a legacy of past practices of waste disposal.

We would also encourage the pursuit of new opportunities that may lie "outside the box" of agency thinking. One of these is the offer by the state of Illinois to convey excess sediment from the Illinois River and other waterways to Louisiana for use in restoration and protection work. While the amount of the sediment involved in this proposed project will not by itself solve Louisiana's problems (no single method will), it is of high quality, and more importantly, represents a synergy of interests and an expression of outside support and involvement of the kind that the state has said it wants. A partnership of this kind would also build upon the common interest that states in the Mississippi River Basin have for a sustainable river system, something that will be necessary if full national support for comprehensive coastal restoration is to be obtained.

This common interest in the river system lies at the heart of another issue only touched on by the Draft – the spread of hypoxia in the Gulf. Questions about the role that coastal restoration will play in addressing this problem are still unanswered. The issue is one of more complexity than is suggested by point 5 under Objective #2 (p.19): "Project design should promote conditions that route riverine waters through estuarine basins and promote sheet flow over wetlands in order to maximize nutrient assimilation and minimize nutrient export to shelf waters." A sizable body of science on this issue exists and should be consulted and integrated into restoration plans. From a policy standpoint, the state can only benefit from coordinating the hypoxia and coastal policy efforts, and recognizing clearly both the limits and opportunities that these issues pose for their respective policy responses.

A symposium organized in June 2006 by the EPA and the Lower Mississippi River Sub-basin Committee on Hypoxia discussed a number of the issues and questions involved in the utilization of coastal projects for nutrient uptake. The presentations from that symposium can be found at http://www.epa.gov/msbasin/taskforce/reassess2005.htm. The presentations examined the potential for the Atchafalaya Basin to function as more of a nutrient uptake system, the results of studies done on the two existing diversion projects, Carnaervon and Davis Pond, and projects utilizing wetlands for nutrient assimilation from municipal wastewater.

In the case of the Atchafalaya, management of the basin for flood control and resource use pose some challenges for hydrological restoration that could increase nutrient uptake, but some promising opportunities were discussed, including the prospect of an "East Atchafalaya Restoration Spillway" that could nourish and help rebuild degraded marshes in western Terrebonne Parish, and in the process result in assimilation of a significant portion of the nutrients now being conveyed by the river into the Gulf, which function as an important driver of hypoxic conditions offshore.

The diversions at Carnaervon and Davis Pond can serve as important case studies for how two different designs of such projects have functioned. Studies by Louisiana State University have shown that the Carnaervon Diversion can result in high levels of nutrient uptake under certain conditions, in particular during warm weather. Research by the Louisiana Universities Marine Consortium, on the other hand, has shown that the Davis Pond Diversion has resulted in the growth of noxious algae and bacteria in its receiving waters. A conclusion that could be reached is that the role that coastal restoration projects in helping to alleviate Gulf Hypoxia will have to be determined on a case-by-case basis, rather than assuming a blanket utility of all projects for this purpose, given the uncertainties that remain about what projects will actually be built and how they will function.

While a number of the municipal wastewater-wetland projects currently operating in Louisiana are not hydrologically connected to the coast, they are showing that interior

wetlands can benefit from careful operation that monitors and controls nutrient loading. We feel that a promising new project is especially deserving of support – the plan by the New Orleans Sewer & Water Board and St. Bernard Parish to divert a portion of the city's wastewater flow into the degraded wetlands east of the 9th Ward, eventually restoring the area to a cypress swamp that can function as a hurricane buffer for the eastern section of the city, as well as diverting a portion of the city's nutrient releases away from the river (and the Gulf.)

The issue of coastal forested wetlands also needs greater attention in the Plan. A Science Working Group convened by Governor Blanco concluded that many of the forested wetlands in coastal Louisiana are under stress from the same factors causing coastal land loss, and cannot regenerate if logged under current conditions. (The report can be seen at www.coastalforestswg.lsu.edu.) The issues raised by the report have not been accepted by all parties. The Louisiana Office of Forestry and the Louisiana Forestry Association have refused to accept the science conclusions of the report, and are actively promoting and funding increased logging of cypress swamps in southern Louisiana.

The risk of losing critical storm buffers for coastal communities, as well as the loss of vulnerable habitat for migratory birds, waterfowl, and other species, should have resulted in accelerated action to address this issue, but the state has been largely paralyzed in its response. The importance of coastal forests and swamps as storm buffers means that even some areas that can regenerate under current conditions should not be cut if doing so would open up a new avenue for storm surge, while the need to protect areas that cannot regenerate seems obvious.

Long-term sustainability of coastal forested wetlands will depend on hydrological restoration, but in the near term, their survival, as well as that of a number of coastal communities, depends on the state immediately implementing steps to ensure that they are not logged indiscriminately. These can include acquisition of title or easements, methods that have been employed for conservation purposes for many years in every other state in the U.S.

There are legal strictures on some areas of coastal forested wetlands that fall under Section 404 of the Clean Water Act and Section 10 of the Rivers & Harbors Act, and the U.S. EPA and Corps of Engineers have taken enforcement actions under these federal laws, though their jurisdiction and regulatory capacity does not cover all areas of concern. The state sent a mixed message on this issue by passing Concurrent Resolution 71 in the Regular Legislative Session in 2005, which called on the Corps not to enforce Section 10 of the Rivers & Harbors Act in Louisiana, and by the attempts by some members of the state's Congressional Delegation to amend the Water Resources Development Act (WRDA) to strip the Corps of authority to enforce Section 10 anywhere in the U.S.

MRBA Comments to CPRA-IPT - 5

Specific Comments:

The "Key Points" raised on p.30 outline some of the major constraints that the Draft's authors have rightly highlighted in the introduction.

Cost – In addition to cost estimates for specific projects and plans, the overall issue of cost remains a major challenge for comprehensive restoration. On a national level, the administration and past several Congresses have created a major fiscal problem for the country, with growing debt and deficits. This situation will undoubtedly impact Louisiana's attempts to gain federal funding for the greater portion of the restoration program, despite the valid argument that many of the impacts to the state's coastal zone were made for the nation's benefit. It also lends credence to the argument made by some stakeholders that the state will have to invest more of its own resources, at least initially, in the effort than had been previously planned.

Areas of greatest need – We have mentioned previously the situations of heightened risk in areas such as lower Terrebonne and the West Bank. An expeditious effort to raise existing levees protecting population centers which are currently inadequate seems an obvious area of greatest need, and should not be delayed in the interest of more ambitious agendas for continuous levees across basins and wetlands.

Establishing priorities – This consideration ties into the point raised above: priorities established on a basis other than greatest need are clearly serving other agendas. One glaring example of this is the inclusion of the completion of the Inner Harbor Navigaton Canal Lock in New Orleans in what purports to be a restoration and protection plan (p.39). This project has never been justified economically in an analytically defensible way, and studies by the Corps which aimed to do this were not completed prior to the storms. However, the lack of funding for the IHNC Lock was long used as ransom for closure of the Mississippi River Gulf Outlet, despite the pleas of residents and others over several decades that the MRGO be closed, with the disastrous results obvious to all in 2005. The price tag quoted for this single project almost equals that of the entire Morganza to the Gulf levee expansion plan, and its inclusion in any plan presented to Congress will weaken the state's credibility and its claim that it now faces a heightened emergency.

Scientific and engineering uncertainties – As noted in the Draft, significant uncertainties apply to the "leaky levee" concept and the proposed major replumbing of the river in lower Plaquemines Parish. The uncertainties associated with those proposals should not be allowed to delay or divert projects that can be undertaken now with little or no scientific uncertainty about their efficacy.

The Draft notes the importance of consistency for the entire effort, and highlights land use and zoning issues as a key part of that consideration (p.59). Coastal parishes would

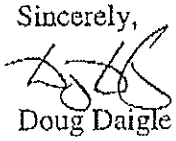
eventually face the more finite limits that they have for land development even without the land loss crisis. With this crisis, survival, sustainability, and prosperity are all factored together in a more immediate way than they would be otherwise, and demand that consistency in policy and practice be a priority.

Two considerations of future trends seem worthy of mention: climate change and energy costs. The projections of sea-level rise from global warming should be factored into restoration plans. Louisiana possesses an advantage that many coastal states lack, with two large rivers to work with for deltaic restoration, which can counteract sea-level rise to some degree. Louisiana currently lacks a climate change policy, while development of such policies is another trend that is spreading among states. This shortcoming may damage the state's credibility as it attempts to address sea-level rise while lacking any mitigation program for its role as a major national source of greenhouse gases. It is more difficult to plan for the predicted trend of rises in energy costs, particularly those associated with oil and gas, but consideration of this trend and its potential effects on plans and projects that call for a greater amount of engineering, as opposed to utilization of natural systems, should be included in ongoing discussions.

Pulling all of these considerations together emphasizes the importance of phasing, timing, and location in creation of a comprehensive plan. The state and its federal partners should work to immediately to improve existing protection structures for coastal communities and cities, expand the effort at restoration of deltaic functioning, and institute policies that will guarantee the sustainability of the coast by not allowing activities that work at cross purposes to restoration in a significant or systemic way to continue as they have in the past.

In conclusion, MRBA appreciates the opportunity to comment on the Preliminary Draft Master Plan. This organization has worked for greater recognition of Louisiana's coastal crisis as a major facing the Mississippi River Basin, as well as the country. As MRBA concludes its work, we hope that other organizations, agencies, and stakeholders will continue that effort.

Sincerely,



Doug Daigle
Lower River Program Director

\THLEEN BABINEAUX BLANCO
GOVERNOR

State of Louisiana

DEPARTMENT OF WILDLIFE AND FISHERIES
OFFICE OF SECRETARY

BRYANT O. HAMMETT, JR.
SECRETARY

27 December 2006

Ms. Michele Deshotels
Coastal Protection and Restoration Authority – Integrated Planning Team
Louisiana Department of Natural Resources
PO Box 94396
Baton Rouge, LA 70804-9396

RE: Comments on the preliminary draft comprehensive Coastal Protection Master Plan for Louisiana

Dear Ms. Deshotels:

The Louisiana Department of Wildlife and Fisheries' (LDWF) staff has reviewed the November 2006 DNR-DOTD Preliminary Draft Comprehensive Coastal Protection Master Plan for Louisiana. Our comments reflect the breadth of the Department's interest and public trust responsibilities throughout coastal Louisiana.

LDWF's mission is to manage, conserve, and promote wise use of Louisiana's renewable fish and wildlife resources and their supporting habitats through replenishment, protection, enhancement, research, and education for the social and economic benefit of current and future generations; to provide opportunities for knowledge of and use and enjoyment of these resources; and to promote a safe and healthy environment for the users of these resources. The Department manages coastal wildlife and aquatic species including fur-bearers, waterbirds, fish and shellfish and game species as well as approximately 500,000 coastal wetland acres on refuges and wildlife management areas and approximately 1.6 million acres of public oyster grounds. We lease another 398,000 acres for oyster cultivation.

Per Act 8 of the 2005 First Extraordinary Session of the Louisiana Legislature, the Coastal Protection Master Plan (CPR) is intended to provide for "comprehensive coastal protection, including the encouragement of multiple uses of the coastal zone and to achieve a proper balance between development and conservation, restoration, creation, and nourishment of renewable coastal resources." LDWF's staff recognizes the need for balancing protection of coastal property and the citizens of the state during severe storm events with replenishment, protection, and enhancement of Louisiana's renewable coastal natural resources. One of the most important lessons of the storms of 2005 was that extensive healthy wetland ecosystems provide storm protection as well as habitat and other ecological services. There should not be a conflict between protection of coastal property and rehabilitation of coastal ecosystems when such goals are properly balanced.

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LDWF's staff has been working with the U.S. Army Corps of Engineers and federal natural resource agencies on the Corps's parallel planning effort, the Louisiana Coastal Protection and Restoration plan (LACPR). We find that we are faced with large uncertainties regarding predicted future coast scenarios. This is because the coastal system itself is so dynamic, and because of possible acceleration of some coastal processes such as relative sea level rise due to the interaction of Louisiana's subsiding land mass and the worldwide increase in sea level (eustatic rise). We can however identify the critical pieces of the coastal ecosystem and design our plans to protect and maintain those critical pieces. One of the most critical pieces is the hydrological and biological link between coastal watersheds and estuaries. Our experiences in Louisiana have demonstrated the impacts to Louisiana's coast when watersheds and estuaries are decoupled when fresh water flow with its important sediment and nutrient components is lost to the wetlands, long-term wetland sustainability is jeopardized and the important role that wetlands play as wildlife habitat and nursery grounds for estuarine species is diminished. The preliminary plan contains levee alignments that will reduce the linkage between watershed and estuary. We refer specifically to the so-called Perimeter plan along the East Orleans land bridge and the gates on the Rigolets and the Chef Menteur (PD1-1), the GIWW alignment in the upper Barataria basin (PD2-1), the dogleg off the Morganza to the Gulf levee west of Miner's Canal and the "Twin Pipeline" alternative (PD3a-1), and potential closing off of the Verret basin (PD3a-2). LDWF is committed to working with its state and federal partners to maximize that linkage between watersheds and estuaries, and restoring the natural processes that created and maintain our coastal landscape.

Because the Coastal Protection and Restoration Authority have not yet published a cost-analysis of the CPR plan, there has not been an attempt to use standard cost/benefit ratios to prioritize projects. The CPR plan's Economic Analysis only documents the insurable value of assets behind the levee systems as the plan envisions them. It does not address the potential foregone value of estuarine and wetland values and services that would result from leveeing wetlands and reducing the link between wetland and estuary, and associated losses in estuarine productivity, harvest and habitat degradation. For example, Louisiana's commercial coastal fisheries rank second in the U.S. behind Alaska, and first in the lower 48 states in volume. Louisiana's commercial marine fisheries, which are dominated by estuarine dependent species, had a dockside value of $285, 954,170 and a total economic effect of $2,535,375,795 in 2003 (Southwick 2005). Southwick (2005) also reported that the saltwater recreational fishing industry generated $435,324,520 in retail sales with a total economic effect of $792,578,882. Recreational hunting generated $599,474,791 in retail sales with a total economic effect of $1,023,913,412. In the same report non-consumptive fish and wildlife recreation accounted for $175,157,058 in retail sales with a total economic effect of $317,435,573 and the state's alligator harvest retail sales were valued at $37,933,078 (Southwick 2005).

The CPR plan contains no discussion of the timing and sequence of construction of the proposed measures. It is extremely important that hurricane protection levee reaches and the wetland features designed to protect those levees are constructed together. There may be a desire to see the levee features constructed first, and then to construct the wetlands protection but this would not provide the protection for property envisioned by the CPR plan. Mitigation for the wetland impacts sustained as a result of levee-building should also be scheduled simultaneously with the construction of the levees themselves. This makes sense both ecologically and logistically.

The compensatory mitigation plans designed to off-set impacts to fish and wildlife resources shall be devised and approved by the resource and regulatory agencies, including LDWF. To the greatest extent practicable, mitigation for unavoidable wetland impacts shall be accomplished within the same hydrologic basin as the anticipated impact.

The CPR plan booklet has a paragraph discussing trade-offs between fisheries and use of extensive freshwater and sediment diversions in the southeastern part of the state. The models used to develop CPR basin salinity scenarios use average annual discharge rates to determine the salinity of receiving basins. However, in nature, seasonal salinity gradients are critical to maintaining viable and productive fisheries. Maintaining sustainable estuarine fisheries by imitating natural seasonal flows and manipulating deltaic landbuilding is possible with proper planning. LDWF has expertise and data to aid in developing future discharge scenarios, and we are committed to working with state and federal partners to find ways to maintain Louisiana's estuarine fisheries and rehabilitate her coast.

We appreciate the opportunity to comment on this extremely important plan, and we look forward to working with our state sister-agencies to benefit the Louisiana public and the trust resources that we manage. Should you have any questions, please contact Heather Warner-Finley at 225.765.2956 or hfinley@wlf.louisiana.gov.

Sincerely,

Bryant O. Hammett, Jr.
Secretary

jhwf

c: LDWF – Ortego
LDWF - Balkum
Governor's Special Assistant for Coastal Activities - Coffee
Secretary, Louisiana Department of Natural Resources - Angelle
EPA
NOAA
USACE
USFWS

Literature Cited

Southwick Associates, Inc. 2005. The Economic Benefits of Fisheries, Wildlife and Boating Resources in the State of Louisiana. Developed for the Louisiana Department of Wildlife and Fisheries. Baton Rouge, LA. 38 pp.

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January 4, 2007

RELEASE AGREEMENT to share Louisiana Department of Transportation and Development data created by the Office of Planning & Programming, GIS/Cartography Unit.

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DARRYL W. MARK
IT Geographic Project Supervisor
Office of Planning and Programming

Maurice Robichaux

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PROPOSALS TO THE COASTAL, PROTECTION AND RESTORATION AUTHORITY,
THE LOUISIANA STATE GOVERNMENT AND THE U.S. GOVERNMENT
BY: MAURICE T. ROBICHAUX

SHOULD BAYOU LAFOURCHE, HOPEFULLY, ONE DAY BE FULLY RECONNECTED, UNFETTERED BY ANY LEVEES OR PUMPING STATIONS, I SUPPOSE THE CONSTRUCTION OF MAN-MADE LAKES COULD BE ACHIEVED FOR THE PURPOSE OF PROCURING A SOURCE OF SOIL FOR THE CONSTRUCTION OF BAYOU LEVEES AND DIVERSION LEVEES; THIS WOULD BE DONE IN ASCENSION, ASSUMPTION, LAFOURCHE AND TERREBONNE PARISHES.
HOW MANY MAN-MADE LAKES WOULD BE REQUIRED OR THE SIZE OF EACH LAKE, WOULD HAVE TO BE DETERMINED.

I HAVE RECENTLY OBSERVED THAT ONE THING THESE PARISHES HAVE IN COMMON IS NOT HAVING INLAND LAKES; LAFOURCHE, TERREBONNE AND ASSUMPTION PARISHES HAVE INLAND LAKES, HOWEVER, THEY ARE ENVELOPED BY SWAMP OR MARSH-NONE THAT ARE APPROACHABLE BY CAR OR TRUCK.

IN THE PROCESS OF MAKING THESE LAKES ONE WOULD TAKE INTO CONSIDERATION DESIGNING THE LAKES FOR RECREATIONAL PURPOSES AND ALSO STOCKING THE LAKES WITH INDIGENOUS FLORA AND FAUNA. THE LAKES COULD SERVE AS A RECREATIONAL DESTINATION FOR CAMPERS, BACKPACKERS, FISHING ENTHUSIASTS AND WATER SPORTS ACTIVISTS. HUNTING, I THINK, SHOULD BE PROHIBITED. THEY WOULD ALSO SERVE AS PRIME HABITAT FOR WILDLIFE, AND, AS A REFUGE FOR MIGRATORY BIRDS.

AS FAR AS LAND DEVELOPERS ARE CONCERNED, WHETHER THEY ARE RESIDENTIAL, COMMERCIAL, INDUSTRIAL OR MILITARY, THOSE DEVELOPERS MUST BE MADE TO STAY CLEAR AWAY FROM THESE LAKES AND ITS ENVIRONS. LAND DEVELOPERS ARE THE MODERN DAY EQUIVALENT OF THE PROFESSIONAL PASSENGER PIGEON HUNTERS OF THE MID TO LATE 1800'S.

THE LAKES, I THINK, SHOULD BE SURROUNDED BY ABOUT A ONE QUARTER MILE WIDE AREA WITH WILDERNESS. THEY COULD BE POSITIONED NEAR THE FRINGES OF THE REMAINING FORESTS OR SWAMPS AS INDICATED IN MAPS PROVIDED. A DIVERSION CANAL FROM THE MISSISSIPPI RIVER OR BAYOU LAFOURCHE COULD SERVE EACH LAKE.

THE RED PASS BAYOU AS INDICATED IN THE PLAQUEMINES PARISH MAP WOULD REPLACE THE M.R.G.O.; AS SHOWN IN THE MAP PROVIDED, UNLIKE IN ST. BERNARD PARISH, THE MARSH ON EITHER SIDE OF RED PASS COULD BE NURTURED BY THE MISSISSIPPI RIVER. THE PURPOSE OF THIS DEEP DRAFT CHANNEL WOULD BE TO REDUCE DREDGING IN THE MISSISSIPPI RIVER AND TO SLOW THE SPEED OF WATER, THEREBY COLLECTING SEDIMENT IN THE RIVER TO SIPHON AND TO DISTRIBUTE INTO SURROUNDING MARSHES. THE RED PASS DEEP DRAFT CHANNEL WOULD TERMINATE AT VENICE AND UNER NO CIRCUMSTANCES COULD IT CONNECT TO THE MISSISSIPPI RIVER. THIS WOULD DEFEAT THE PURPOSE OF HAVING THE DEEP DRAFT CHANNEL TO AVOID THE DEEP DREDGING THAT WOULD BE REQUIRED TO FACILITATE THE PASSAGE OF THOSE LARGE VESSELS. THE CHANNEL WOULD BE LINED ON EITHER BANK WITH RIPRAP AND EARTHEN LEVEES TO PREVENT BACKFLOW INTO CHANNEL.

IF THE WIDENING OF THE PANAMA CANAL MATERIALIZES THIS CHANNEL WOULD SERVE A USEFUL PURPOSE. AN ELEVATED TWO LANE HIGHWAY AND ELEVATED TWO LANE RAILWAY FROM VENICE TO CEDAR GROVE SHOULD INSURE PROTECTION FROM STORM DAMAGE.
I SUPPOSE ALL MISSISSIPPI RIVER PASSES, EXCEPT SOUTH WEST PASS, SHOULD BE ABANDONED AND TO LET THEM NATURALLY BUILD UP WITH SEDIMENT AND OVERFLOW THEIR BANKS AND BUILD UP SURROUNDING MARSHES. THE DEPOT AT VENICE VIA RED PASS WOULD

MERELY SERVE AS AN UNLOADING POINT FOR DEEP DRAFT VESSELS, AND PORTS AT NEWORLEANS WOULD STILL BE SERVED.

SINCE HISTORICALLY THE ATCHAFALAYA RIVER WAS A DISTRIBUTARY OF THE RED RIVER, PERHAPS EVERY OTHER YEAR, THE THIRTY PERCENT OF MISSISSIPPI RIVER FLOW IT NOW RECEIVES COULD BE REDUCED FROM THIRTY PERCENT TO FIVE PERCENT, AND THE

RESULTING INCREASE OF FLOW IN THE MISSISSIPPI RIVER COULD THEN BE DIVERTED TO BAYOU LAFOURCHE AND OTHER DIVERSIONS IN THE MISSISSIPPI RIVER; ALSO, ALL THE DIVERSIONS AS SHOWN ALONG THE MISSISSIPPI RIVER IN THE MAPS I HAVE PROVIDED, IF THEY COULD NOT ALL SIMULTANEOUSLY BE USED, THEN RATIONING MISSISSIPPI RIVER WATER TO SELECT DIVERSIONS ONE MONTH COULD BE DIVERTED TO OTHER DIVERSIONS ANOTHER MONTH, ETC. I SHOULD THINK THAT EVEN IF ALL DIVERSIONS CANNOT BE USED SIMULTANEOUSLY, THAT SHOULD NOT PREVENT CONSTRUCTION OF DIVERSIONS WHERE DIVERSIONS SHOULD BE CONSTRUCTED. FOR EXAMPLE, I THINK THEIR SHOULD BE FIVE SEPARATE DEDICATED DIVERSIONS TO SERVICE ST. BERNARD PARISH AND PLAQUEMINES PARISH; ONE TO SERVICE THE RIGOLETS PENINSULA, THE INLAND MARSH NEAR CHALMETTE WEST OF THE MRGO, THE WEST SHORE OF LAKE BORGNE, THE SOUTH EAST ST. BERNARD, VIA BAYOU LA LOUTRE, AND THE BILOXI DIVERSION FOR THE BILOXI WILD LIFE MANAGEMENT AREA AND FAR EAST ST. BERNARD PARISH.

REGARDING THE OPENING OF BAYOU LAFOURCHE, SHOULD THIS MATERIALIZE, HOPEFULLY, IT SEEMS OBVIOUS THAT IT SHOULD ALSO BE USED FOR COMMERCE; TO THAT END PASSAGE ALLEYS COULD BE CONSTRUCTED EVERY FEW MILES TO FACILITATE TWO WAY TRAFFIC.

AFTER SEEING ON THE SCIENCE CHANNEL THE OPERATION OF THE DUTCH STORM SURGE BARRIER, I WAS JUST FASCINATED HOW EFFECTIVE AND INGENIOUS ITS CONSTRUCTION IS, AND IT ALSO HAS A TWO LANE HIGHWAY ON TOP. THE BARRIER ALLOWS FOR THE UNINTERRUPTED ESTUARIAL PROCESSES THAT TAKE PLACE IN THE TIDAL MARSH, WHERE ONLY DURING INCLEMENT WEATHER ARE THE GATES LOWERED. ITS JUST SHAMEFUL THAT THE LOUISIANA STATE LEGISLATURE AND THE US CONGRESS WOULD LET THE PEOPLE OF SUCH A SMALL COUNTRY EAT THEIR BREAKFAST, LUNCH, DINNER, SUPPER AND DESSERT! APPARENTLY THE DUTCH PEOPLE ARE PIONEERS IN SUCH TYPES OF CONSTRUCTION-LEARN FROM THEM.

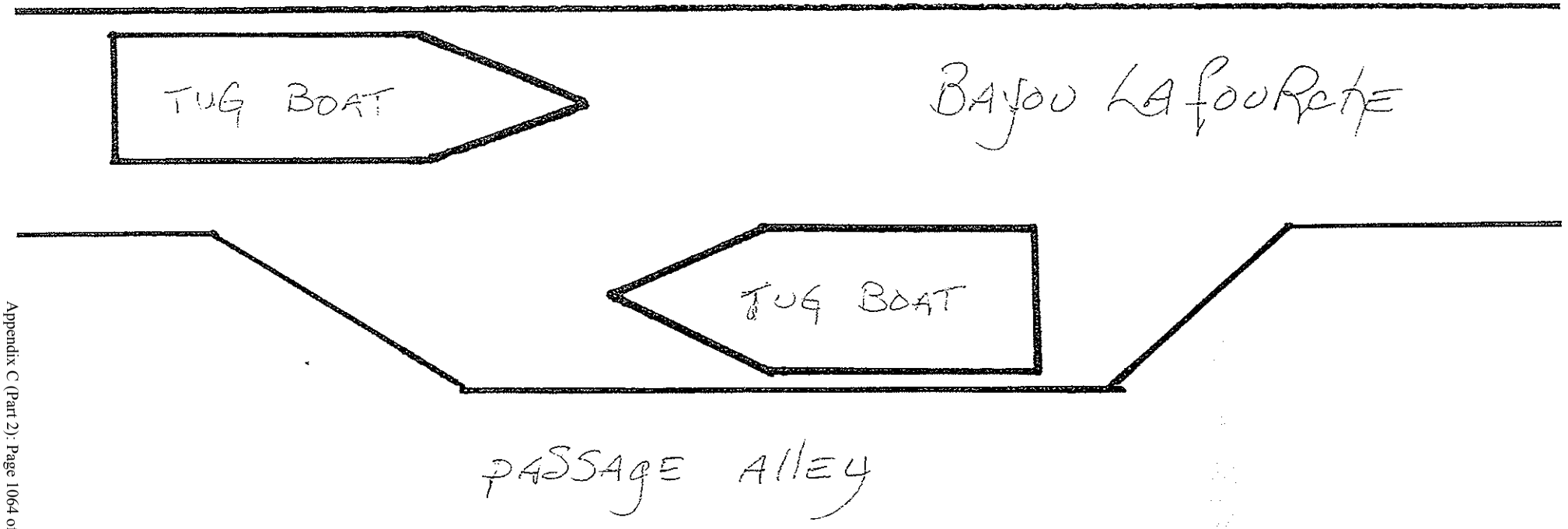
I THINK THAT IF ANY CONSTRUCTION IS TO BE ALLOWED TO TAKE PLACE AT LAKEVIEW OR THE LOWER NINTH WARD OR ELSEWHERE THAT WAS DEVASTATED THE ONLY CONSTRUCTION METHOD ALLOWED FOR HOUSING, SHOULD BE THE DURA VERMEER FLOATING HOUSE METHOD.

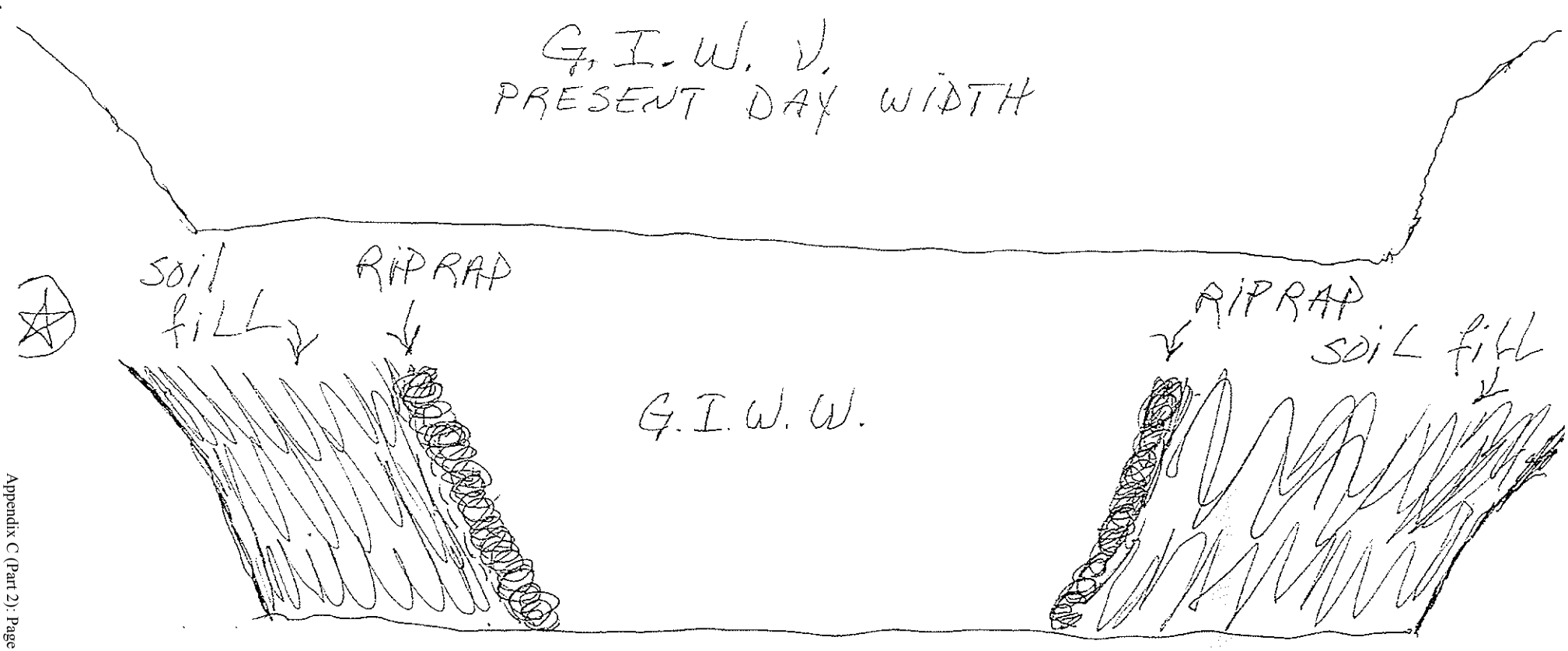
WHEN I FIRST ATTENDED THE PRELIMINARY DRAFT MEETINGS I WAS SILENT ON TERREBONNE PARISH BECAUSE IT DID NOT APPEAR AT FIRST GLANCE THAT ANY WATER COULD BE SENT TO THE LOWER PART OF THE PARISH, HOWEVER, UPON STUDYING MAPS, I REALIZED THERE ARE SEVERAL WAYS. I NOTICED THAT DURING CONVERSATIONS ON THIS TOPIC NO MENTION WAS EVER GIVEN TO THE USE OF THE FOLLOWING BAYOUS.
IT SEEMS TO ME SO ABSURD NOT TO USE WHAT MOTHER NATURE HAS PROVIDED FOR FREE, NAMELY, BAYOU LAFOURCHE, BAYOU TERREBONNE, BAYOU DULARGE, BAYOU PETIT CAILLOU, BAYOU GRAND CAILLOU, BAYOU BLACK AND OTHER WATERWAYS NOT MENTIONED IN THE PRELIMINARY DRAFT PROPOSALS.

MAURICE T. ROBICHAUX, 412 FIR STREET, RACELAND, LA. 70394 985 537 6210

Maurice T. Robichaux JANUARY 2007

Refer to page 2 of 3 Paragraph 3 (PROPOSAL SHEET)





PROPOSING THAT THE G.I.W.W., FROM HOUMA TO BAYOU BOUEF, BE REDUCED TO ITS ORIGINALLY DESIGNED WIDTH, IN ORDER TO RESTORE, TO THE VARIOUS PROPERTY OWNERS, THE LANDS ALONG THE LENGTH OF THE G.I.W.W.

Maurice Robichaux
JANUARY 2007

submitted by: Maurice Robichaux
412 FIR STREET
RACELAND, LA. 70394
985-537-6210

Appendix C (Part 2): Page 1065 of 1393

ST. BERNARD PARISH
MIDDLE SECTION
LOUISIANA
LEGEND
JEFFERSON PARISH
LOUISIANA
RED
PASS
PLAQUEMINES PARISH
SOUTH SECTION
LOUISIANA

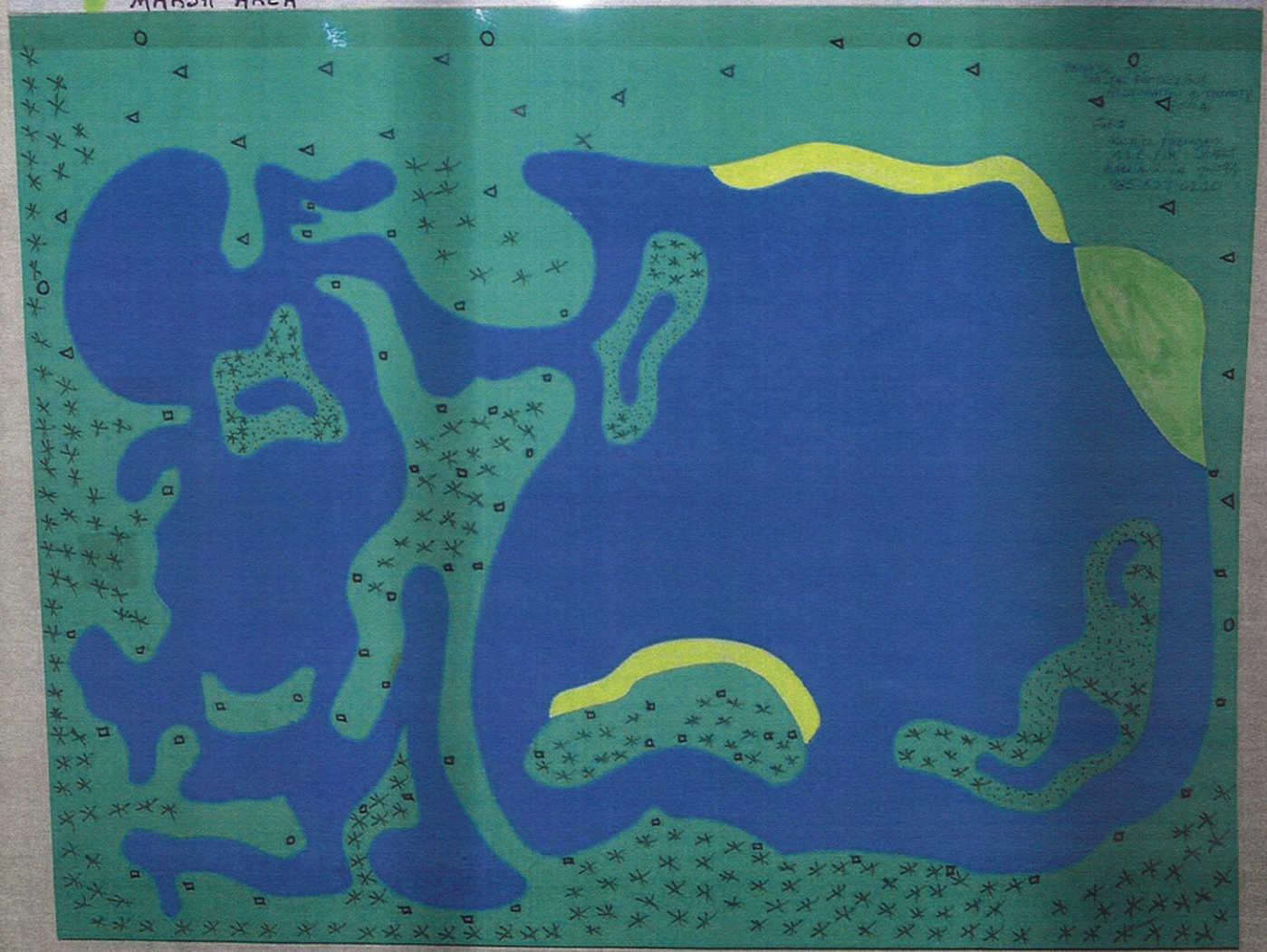
ASCENSION PARISH
LOUISIANA
ST. JOHN THE BAPTIST PARISH
LOUISIANA
ST. MARTIN PARISH
LOWER SECTION
LOUISIANA
LEGEND:
LAFOURCHE PARISH
SOUTH SECTION
LOUISIANA

WHAT ONE OF THESE MAN-MADE LAK[illegible] typically MIGHT look like.

Built ALONG the FRINGE OF A FOREST OR SWAMP

LEGEND:

- □ PRIMATIVE CAMP SITES (HIKING, BACKPACKING)
- Δ MOTORHOME FACILITIES
- O RESTROOMS
- X LAKE ACCESS (BOATING)
- * TREES
- ⁘ SHRUBBY, UNDERGROWTH, PRAIRIE TYPE HABITAT
- BEACH AREA
- MARSH AREA



January 4, 2007

Comments on the Preliminary Draft of the

COMPREHENSIVE COASTAL PROTECTION PLAN FOR LOUISIANA

First, congratulations are in order to the Louisiana Legislature for passing the Act which enabled creation of this comprehensive, multifacited plan. Second, the planners deserve thanks for a yoeman job in developing the preliminary draft. Long experience in commenting on proposals of the U.S. Army Corps of Engineers (the Corps), U.S. Forest Service, old Soil Conservation Service and other entities clearly illustrates it is far more difficult to create a plan than critique one.

Nevertheless, the unquantified factors involving the Louisiana Coast are of sufficient magnitude to raise serious questions about any plan presented as a basic format with no alternatives.

This lack of alternatives not only defies the accepted planning process, but is of questionable legality under precedent established by the Louisiana Supreme Court in ruling that alternatives including other sites, other projects and additional mitigation shall be given full and careful consideration prior to project approval (the IT and numerous other cases involving Article IX, Section 1 of the State Constitution).

Subsidence, a shifting land mass on part of the coast and predicted rising sea levels demand, not only the most flexible of plans but the most accurate possible projection of likely impact. In fact, a series of predictive models, based on various levels of these factors is critical to the planning process and subsequintly the final plan. For example, the chance of success for any levee system varies greatly with a constant sea level compared to the 20-foot rise predicted if the entire Artic ice cap melts.

Thus the success of efforts to moderate human induced global climate change must be monitored continually and plugged into the necessary flexible plan.

A list of 10 potential restoration sites and 50 potential preservation sites compiled by the old State Planning Office in 1977 should be considered, particularly since some have already been acted upon or discussed in the preliminary draft plan, while others, of possibly equal value, have not. A copy of both lists has been presented to the Governor's Office of Coastal Affairs.

Other factors to be considered include the twin impact of an increasing population, coupled with the public's desire to live and work in the coastal zone.

The report states actions should be taken to ensure that wetland areas inside the protection system remain intact and undeveloped "The most state of the art hurricane protection system can actually increase the assets at risk if it encourages development in wetlands or areas near the levee footprint." (page 47 the Preliminary draft)

This raises the very real fear that Louisiana people will show little tolorance for zoning or building restrictions and that the local governments charged with enforcing regulations will be unwilling or incapable of saying no.

In reference to needed alternative considerations, Tulane law professor Oliver Houck has presented an excellent list potential alternatives, some conceptual in nature, others more specific. At a minimum, these alternatives warrent the most careful and comprehensive consideration.

Finally, this is the most massive and critically important project contemplated in Louisiana since the levee system which followed the last great Mississippi River flood early in the 20th Century. What we have come to realize in the ensuing years is a mixed blessing which resulted in the protection and development of a vast river floodplain at the expense its river delta, an area now realized to be of significant importance to most of the North American contintent.

We have an opportunity to prevent overlooking the tradeoffs which may result in efforts to offset the mistakes of past planning

While completing the plan in time for the April 2007 Legislature is a worthwhile goal, it pales in comparison when judged against the importance of devising a plan which will minimize the potential tradeoffs of a plan which will affect millions of people, and their health, safety and welfare for many years in a time of rapidly changing natural conditions.

With today the deadline for commeting on the preliminary draft, February 2007 seems an extraordinary, if not unrealistic, goal for completing the draft plan, in light of the numerous weighty factors unquantified or undiscussed in this report.

As it stands today, this report leaves me with no choice but to request it be revised to include the best possible scenario of the impact of various conditions on project plans and from that devise a number of alternatives to best meet project goals under these conditions.

I appreciate the opportunity to comment on a proposal of great importance to Louisiana and the rest of the nation.

Respectfully submitted,

Richard W. Bryan, Jr., Vice-President,
Forest & Water Issues Chair,
Louisiana Audubon Council

Member Governor's Advisory Panel
Coastal Forest Conservation and Use

cc: Sidney Coffee, Chair
Governor's Office of Coastal Activities

Oliver A. Houck, Professor of Law
Tulane University

Dr. Barry Kohl, President
Louisiana Audubon Council

Allan Ensminger
(337) 462-0762

January 2, 2007

CPRA – IPT
DNR
Post Office Box 94393
Baton Rouge, LA 70804-9396

RE: Comments on Coastal Protection Master Plan- Preliminary Draft

I appreciate the opportunity to submit written comments in addition to oral comments I presented at one or more of the four Public Meeting I attended in Houma and Lake Charles, Louisiana.

In view of the fact that I have been privileged to work in and manage diverse types of coastal wetlands in Louisiana and other areas during the past fifty-two years, I have observed extensive changes of ecosystems along the northern Gulf of Mexico shoreline and interior marshes. Without exception, those marshlands both private and public where structural management has been allowed and applied have provided superior habitat for fish and wildlife as compared to unmanaged wetlands where saltwater intrusion and disrupted hydrology has been allowed to occur. I am very knowledgeable about wetland management activities on the State of Louisiana, Department of Wildlife and Fisheries properties and during the past twenty years I have worked as a private wetland consultant in Louisiana and other coastal States.

In order to make some type of orderly presentation of my comments regarding the Preliminary Draft Plan, I have followed the Measure designations applied to the Planning Units. My comments will not be directed toward measures of levee protection and will mainly address features designed to restore or protect wetlands.

Planning Unit 1

PD 1-2 Extend this feature to include all of the south shoreline of Lake Pontchartrain from the East Guide Levee of the Bonnet Carre Spillway to Jefferson Parish. Install saltwater barrier control structures in the mouth of Bayou La Branche and the St. Charles- Jefferson Parish Boundary Canal to allow for evacuation of rainfall and forced drainage water and stop tidal action in this freshwater marsh and swamp complex.

Wetlands and Wildlife Management Co. ◆ 246 Allan Ensminger Rd. ◆ DeRidder, LA 70634

PD 1-6 Re-Evaluate the proposed Hope Canal Diversion into to the swamp complex south and west of Lake Maurepas where extensive natural subsurface fault movement has been documented. Excessive water introduction into this swamp will create ponding and the loss of swamp habitat unable to adjust to deep water flooding.

Re-Evaluate the proposed Bonnet Carre Spillway Freshwater Diversion into Lake Pontchartrain to be used to combat the increase in salinity of this system to the point where extensive adverse impacts have already killed thousands of cypress and tupelo gum trees. The expense of right-of-way easements would be minimal due to the fact that the entire project as planned is within the Corps of Engineers Reservation as compared to the Hope Canal Diversion.

PD 1-10 This measure should also address the shoreline protection along Lake Pontchartrain in St. Charles Parish. The La Branche Wetlands are the last remaining ecosystem of this type on the south side of Lake Pontchartrain and would provide excellent sites for Forested Wetland Restoration efforts in the future if saltwater values of less than 5 parts per thousand can be maintained in the Lake. This work should be included within PD 1-14 by dedicated dredge and fill in line with the CWPPRA project installed on the east side of Bayou La Branche between the railroad and the Lake.

PD 1-12 If closure of the MRGO means a complete closure, saltwater intrusion into the eastern end of Lake Pontchartrain would be greatly reduced; however; if a navigation structure is to be installed, a water quality management plan must be incorporated so that daily operation of the opening will be closed for other than immediate navigation traffic when the salinity of the water on the outside of the structure exceeds 5 ppt.

PD 1-14 This feature should be applied to the large open water area within the La Branche marshland in order to replace surface elevation for wetland plant communities to be established. The surface elevation of this large freshwater marsh area has been scoured out by tidal action and saltwater intrusion to the point where emergent vegetation cannot grow.

Planning Unit 2

PD 2-13 This feature would accomplish the very same edaphic conditions that I have advocated in PD 1-14 above.

Planning Unit 3a

PD 3a-4 Protection of the bank line of the Houma Navigation Canal is long overdue; however; PD 3a-7 would be necessary to restore adjacent freshwater marshland and swamp complex destroyed by saltwater intrusion through this facility.

PD 3b-3 During the extensive discussions held during studies by NRCS in regard to the Penchant Basin, movement of Atchafalaya River water into lower sections of the Terrebonne Parish marsh was considered as a needed project; however; to accomplish

this goal would jeopardize the fragile marshland in the northwestern and central portion of this excellent fish and wildlife habitat.

Planning Unit 3b

PD 3b-2 A large section of the Gulf Shoreline on the front of Point au Fer Island has been protected by placement of riprap material in conjunction with a Coastal Wetland Planning, Protection and Restoration Act project. Some necessary maintenance has been required to this facility on each end where the riprap tied into the natural beach material. This clearly demonstrates that in order to protect a critical Gulf of Mexico shoreline, a continuous riprap structure is needed to prevent wash around on the exposed ends of the project. Additional shoreline restoration has been proposed as a CWPPRA project and would reconnect the mainland of Point au Fer Island to Point au Fer Point. This would allow for an extensive amount of silt to be trapped in the southeastern portion of Atchafalaya Bay and hasten the development of land building along the western shoreline of Point au Fer Island.

PD 3b-10 This measure should be amended to include conveyance of Atchafalaya River water from the point where the river empties into Atchafalaya Bay in a southeastern direction along the natural shoreline of the mainland in order to distribute silt and freshwater along the north shoreline of Point au Fer Island and into the saline marsh complex along the northern and eastern shoreline of Four League Bay. This alignment is a natural direction for the flow of water from the river and some development of mud flats are presently forming in these sections of Four League Bay. Management of the flow of freshwater from the river and bay could resolve some of the needs for movement of water through the Penchant Basin Complex as called for in PD 3b-3.

Planning Unit 4

PD 4-5 Water control structures presently exist along the east side of Highway 27 north of Holly Beach; however; they were designed to allow a continuous flow in and out to allow marine fisheries access and have failed to prevent saltwater intrusion into the freshwater marsh of the Calcasieu/Sabine Basin. A management plan for these structures need to be developed and implemented while there are still sections of the Basin that can be restored.

PD 4-7 and 8 These measures are necessary to protect the shoreline of the lakes; however; the shoreline around Calcasieu and Sabine lakes also need this type of protection. The Creole Watershed project on the east side of Calcasieu Lake has demonstrated that structural management of a large ecosystem can be accomplished and has produced excellent fish and wildlife habitat as well as provide storm surge protection to the communities located south of Lake Charles, La.

I look forward to working with the Planning Team as the Final Plan is developed. While the destruction of communities and wetlands by Hurricane Katrina and Rita were traumatic events, it is obvious that citizens of Louisiana and the Nation are aware of the

fragile condition of coastal Louisiana and the importance of our wetlands to the well being of the nation.

Sincerely yours,

Allan B. Ensminger

c.c. Mr. Charles I. Denechaud
Mr. William A. Monteleone, Jr.

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southeast Regional Office
263 13th Avenue, South
St. Petersburg, Florida 33701

January 3, 2007 F/SER46/RH:pw:jk
225/389-0508

Mr. Randy Hanchey, Deputy Secretary
Louisiana Department of Natural Resources
Post Office Box
Baton Rouge, Louisiana 70160-0267

Dear Mr. Hanchey:

NOAA's National Marine Fisheries Service (NMFS) has reviewed the Preliminary Draft Comprehensive Coastal Protection Master Plan for Louisiana (Plan) dated November 2006 and appendices. This Plan details a wide variety of efforts to provide a comprehensive hurricane protection and wetland restoration program for coastal Louisiana. Efforts described in the Plan include levee construction, river diversions, marsh creation, and barrier island and ridge restoration. The Corps of Engineers (COE) is presently undertaking an effort to develop a similar plan under the auspices of the Louisiana Coastal Protection and Restoration (LaCPR) project. Staff of NMFS has been working with the other natural resource agencies in assisting both the COE and the state agencies in developing their separate plans. The following general comments are provided to the Louisiana Department of Natural Resources (LDNR) in an effort to identify problematic issues that we believe need to be resolved as these plans are developed further:

GENERAL COMMENTS

NMFS believes it is imperative the Plan summarize, as major points: 1) the uncertainties of the plan; 2) areas of controversy; and, 3) issues to be resolved. Inclusion of these should not be misconstrued as plan shortcomings, rather they represent a means to better inform the public and aid the plan formulation and decision-making process. The uncertainties of the protection and restoration features should be identified in the main report of the Plan and not the appendices. The observed and anticipated sea-level rise (SLR) will make the tasks of providing storm protection and ecosystem sustaining wetlands daunting. Although technically feasible, the magnitude of wetland restoration necessary to offset both the expected wetland losses due to construction and SLR will be problematic. The realties of the magnitude of the restoration task in terms of feasibility, time, and cost should be clearly presented to the public in the Plan to aid in understanding of the challenges ahead.

Areas of controversy should be listed in the Plan. Points of controversy exist with some of the proposed levee alignments and restoration features. NMFS expects substantial negative impacts to the ecology of coastal Louisiana with some of the structural alternatives contained in the Plan. Of greatest concern is the enclosure of large wetland areas. Enclosing wetlands is deleterious to sustainable wetland health and dependent fisheries resources. In the absence of feasibility level hydrologic data, it should not be implied that levees would protect enclosed wetlands by potentially stopping saltwater intrusion. Severe impacts to fisheries would occur through disruption of natural migrational pathways from the Gulf of Mexico to estuarine nursery areas. Additionally, diversions have the potential to harm marine fisheries species as the diversions could result in gulfward displacement or near elimination of some species from an estuary.

We suggest the Plan be revised to list issues to be resolved. The issues we recommend be described include resolution of levee alignments where wetlands will be enclosed, optimization of diversions while

minimizing adverse environmental impacts, prioritization by area of need for protection and restoration, and timely implementation of restoration to minimize temporal loss of wetland functions that will occur with levee construction. Sediment resources for both protection and restoration have yet to be adequately addressed both in terms of location, quantity, quality, transportation, and feasibility. Economic impacts to all resources affected and not those just enclosed or within an alignment should be evaluated.

PLAN SPECIFIC COMMENTS

Enclosing Wetlands

In Barataria Basin, the draft plan identifies the preferred levee alignment as running from Lafitte southwest to just south of Larose. This alignment would enclose tens of thousands of acres of wetlands and water bodies and destroy many hundreds of acres of marsh. For these reasons alone, NMFS is concerned about this aspect of the Plan. We also are concerned that such an alignment would be infeasible to maintain in the long term given wetland loss, subsidence and sea level rise rates, and present patterns of wetland loss in the Barataria Bay estuary. Even constructability data are not yet available to support the selection of such an alignment. Alternatively, we believe a feasible, much less damaging alternative alignment that would parallel Louisiana Highway 90 should be considered.

While the draft plan for levee alignments in Terrebonne Parish largely follows that identified in the Morganza to the Gulf Hurricane Protection Project, significant revisions are evident. Despite these revisions, the draft plan is routinely presented incorrectly to the public as the authorized Morganza plan. Specifically, the alignment from Golden Meadow westward towards Point au Chien is not a component of the Morganza to the Gulf plan. Considering the high wetland loss rate in this area, the relative closeness to the Gulf of Mexico, and the lack of proposed wetland maintenance projects in this area, it appears that such a levee alignment would be unsustainable. Given this, and the lack of demonstrated need to enclose such an unpopulated area, NMFS questions the need to vary from the Morganza to the Gulf alignment. Other variations from the Morganza to the Gulf alignment that would impact hundreds of acres of marsh and are questionable in terms of need and sustainability are along the Bayou DeCade ridge and adjacent to Minors Canal.

Levee alignments in the Lake Pontchartrain, Barataria Bay and Terrebonne Parish areas cross numerous waterways important to navigation and as fishery migration pathways. In addition, the Plan recommends the installation of a water control structure in the Calcasieu Ship Channel in the vicinity of Cameron. All waterbodies affected by these channels serve as historically important fishery production and harvest areas. Structures installed at all existing channels should be sized and designed to not affect isohalines important to maintaining fish species composition, to not impede drainage and thereby ensure the constrictions do not pond water on enclosed marsh surfaces, and to maintain fishery access pathways important to maintaining marine fishery production.

Land Sustaining and Land Building Diversions

The draft plan identifies a number of various sized diversions intended to provide fresh water and nutrients for the purpose of sustaining existing wetlands, or to provide sediment to create new wetlands in shallow water areas. NMFS understands and supports the need to strategically use this historic "tool" to maintain and rebuild Louisiana's wetlands. However, NMFS is concerned that concentrated use of river diversions in the Barataria Bay estuary could result in the entire estuary becoming a fresh water system. Such an impact would destroy marine fishery productivity in that area. Alternatively, NMFS recommends pipeline slurry of riverine-dredged sediment, in combination with diversions, be used as the primary tool to more quickly rebuild and maintain wetlands in the Barataria Bay estuary.

Shorelines and Ridges

The Plan proposes to rebuild subsided ridges throughout the deltaic plan. These ridges were formed during historic times along the banks of distributary channels connected to the Mississippi River. In most locations, these ridges have subsided and eroded significantly and are largely now characterized as marsh. As such, the restoration of these ridges would result in the destruction of hundreds of acres of marsh. In some places, restoring these ridges may provide storm surge protection benefits. In other locations, the destruction of wetlands to restore these ridges may not be warranted if they provide limited storm surge protection. NMFS suggests LDNR include in the Plan only those ridges that would provide substantial, verifiable storm surge protection.

Prioritization of Construction

NMFS understands that LDNR intends this effort to be self-mitigating in that, if the entire plan were implemented, it would result in a net gain of wetland habitat. However, we are concerned that levee construction would be given a higher priority for implementation and that plan components which could offset adverse wetlands impacts would be constructed much later, if at all. NMFS is concerned that the high cost of project construction could result in all plan components not being implemented. As the Plan is developed further, NMFS urges LDNR to include a business plan that would identify how the timing of construction of the various components would be integrated in a logical order. Because restoration efforts are critical to being able to maintain proposed levees and other barriers, NMFS believes such an integration of construction components is the only means of building a sustainable hurricane protection system and ensuring that the permanent or temporal loss of wetland function is avoided.

We appreciate the opportunity to review and comment on the preliminary Plan and hope these comments aid plan development. If you have any questions about these comments, please contact Richard Hartman of our Baton Rouge office at (225) 389-0508, ext 203.

Sincerely,

for Miles M. Croom
Assistant Regional Administrator
Habitat Conservation Division

cc
FWS, Lafayette
EPA, Dallas
LDWF – Finley
F/SER46, Ruebsamen
BTNEP, Kerry St. Pe
Lake Pontchartrain Foundation, John Lopez
CRCL, Mark Ford
Sierra Club
LA Wildlife Federation
Files

Memo: Sidney Coffee, Randy Hanchey, King Milling, Robert Twilley
From: Jim Tripp
Re: Comments on the Draft State Master Plan

Randy, Sidney and King, at the Governor's Commission meeting on December 8, along with other members of the Commission I articulated some of my initial reactions to the Comprehensive Coastal Protection Master Plan presentation that John Porthouse gave. I thought it would be useful to provide some additional comments in writing. While I have read the 62-page main text, I have not perused any of the appendices. In addition, these comments do not pertain to the Chenier Plain. Until someone articulates a set of water quality, ecological, hydrologic and storm buffer goals for the Chenier Plain that make sense, it is difficult to assess a program designed to attain those goals. The LCA plan does not do this; nor does the draft State Plan.

My hope would be that the final State Master Plan document would set forth an aggressive coastal wetland restoration program, properly integrated with a strategically targeted hurricane protection program, with a description of an implementation program, budget and time line that would serve as the basis for additional funding requests at the federal level, as well as at the state level. The Corps' LACPR Plan will probably not be a useful vehicle to seek additional OCS funding between now and 2017. The State Master Plan could play that role if it can justify major increases in federal OCS revenue support prior to 2017.

Overview. In general, the draft Plan does a good job of describing the magnitude of coastal wetland degradation in coastal Louisiana and the national importance of oil and gas, navigation, fishery and urban/cultural resources that historically have depended on the vast Delta of the Mississippi River. The Preliminary Draft in the Preface at p. 7 points to "extreme rates of land loss compounded with inadequate hurricane protection measures" that now threaten south Louisiana. This would suggest that the State Plan would put forward a set of wetland restoration proposals that would effectively deal with high rates of land loss.

While the draft Plan proposes various barrier island rebuilding measures and restoration measures east of the River in the greater MRGO region and outlines a major lower River diversion, coupled with more modest measures such as the Myrtle Grove diversion and sediment pipeline into the Barataria Basin, it is unclear what the Plan is proposing to address "extreme rates of land loss", let alone restoration, in the central portions of the coast. Greater use of the GIWW as a conveyance channel does not do this. The draft Plan does not look at effective use of Atchafalaya River water and sediment as a strategy for large-scale protection and restoration in central and eastern Terrebonne Parish via a third outlet through the east guide levee; nor does it consider some kind of large diversion or sediment conveyance strategy for the central coast on either side of Bayou Lafourche beyond the very small, 1000 cfs Bayou Lafourche project. In addition, the description of the Mississippi River Delta Management project, incorporating one or more major sediment diversions below Myrtle Grove, does not get us much beyond what COAST

2050 proposed. More generally, the Master Plan lacks a compelling vision of a restored coast and restoration processes.

On the protection side of the Plan, by way of an overview, the rationale for both a 0.2% and 1% levee protection alignment for major parts of the coast is unclear. Further, the levee protection and wetland restoration proposals do not appear to be integrated at all, except through graphic juxtaposition on p. 49, and it is not clear how the levee proposals comply at all with the five bulleted guidelines presented in the box at the top of p. 40. The entire levee program and there much of the draft Plan does not appear to be the outcome of a systematic scientific and engineering assessment of what wetland restoration and hurricane protection measures can work effectively together at a cost that is feasible and on a time line that will be genuinely useful.

MRGO. We certainly support the proposal for total closure of the MRGO and restoration of wetlands on the east side of the River together with some set of levee structures. Our own report on MRGO closure incorporates these features. This would include rebuilding the Bayou LaLoutre ridge and constructing an appropriately-sized diversion at Violet that will reinject significant amounts of freshwater, as well as some sediment, into this sub-basin, with the hopes of restoring the coastal swamp forest and other wetlands that MRGO decimated.

However, we have two specific concerns with the bullets on p. 39. As our MRGO report states, the MRGO channel should be restricted in specific locations in terms of its width and depth. This would not entail completing filling in the channel – there is not enough sediment to do that anytime soon – but redesigning the channel to retard the flow of freshwater from Violet and elsewhere. Second, the bullet regarding accelerating the completion of the IHNC lock once again is linking that project with MRGO closure. If that is not the intent of the State Plan, it should be explicit that MRGO closure should proceed immediately, not linked in anyway to the IHNC lock project. The IHNC lock project is very expensive and will take a long time to build even if the Congress appropriates the requisite funds. MRGO closure should proceed on the fastest possible time schedule in light of Katrina experience, and the Plan should make it clear that MRGO closure and the Violet diversion are very high priority projects that should be completed within three years. Delay is inexcusable. This sense of urgency for MRGO closure should be emphasized in the Plan since the Corps MRGO proposal provides no sense of urgency.

Shorelines and Ridges. The question is how the navigation channel bank stabilization program fits into the wetland restoration program. Will it have any impact on it? Also, it is unclear from the draft Plan what is being proposed for the ridges colored in orange on p. 32.

Land Sustaining Diversions. As you know from numerous earlier comments, we consider the Mrytle Grove diversion and sediment conveyance to be very high priorities for any restoration initiative in the Barataria Basin. The draft Plan proposes a Mrytle Grove diversion with a capacity of 5000 to 15,000 cfs (p. 35). At the Lafayette

meeting, we discussed Mrytle Grove options at far higher capacity. The Corps in the text of the LCA report describes a Mrytle Grove diversion of only 2500 cfs, apparently to prevent any significant change in the salinity regime of Barataria Basin. Even at 15,000 cfs Mrytle Grove would have capacity only 50% greater than the Caernarvon Diversion. Why not provide for a sediment diversion at or near Myrtle Grove (perhaps at a bend that would maximize opportunities for sediment capture) with capacity in the range of 25,000 cfs or higher with the understanding that the diversions would be pulsed, designed to take advantage of high River flows. In our view, furthermore, a sediment pipeline should be designed to convey sediment towards the western part of Barataria Basin. The State Plan should set a time schedule for the design and implementation of this project.

The State Plan should consider a far more ambitious Bayou Lafourche project. The current 1000 cfs project was designed primarily to augment fresh water supplies in the Bayou for urban use. It is not clear that the engineering team evaluating this project has conceived it as a potential wetland restoration project. Bayou Lafourche would provide by far the most efficient way of conveying significant amounts of Mississippi River water and sediment into the central coast. It would not entail destruction of thousands of acres of wetlands such as one version of the Third Delta might entail. An enlargement of Bayou Lafourche as a restoration project would have an impact on the urban communities that have encroached on its floodplain. The Plan talks about the need for trade-offs. This part of the coast has become extremely vulnerable to storm surge as a result of massive wetland loss. A creatively designed Bayou Lafourche project, perhaps with a channel that skirts part of the most heavily urbanized areas, should be presented as a real option for central coast restoration.

Land building diversions. An ambitious Mrytle Grove diversion project can prove to the citizenry of coastal Louisiana that sediment diversion and conveyance can be a reality on an accelerated time schedule. However, the potential for large-scale wetland protection and restoration will not have reality until the large Lower River diversion described at pp. 36-37 proceeds. If this project is not ready to proceed until 2017, there is much reduced justification for seeking a major additional infusion of OCS funds for wetland restoration between now and 2017.

On December 10, Paul Harrison and I drove from New Orleans to Venice on the west side of the River and back on the east side. It is stunning how few people and facilities are evident in the narrow corridors between the River levee and hurricane protection or bay levee on either side, below Myrtle Grove. The draft Plan, while talking about trade-offs, proposes maintaining these existing levees at current height. The question is why. Existing communities that are still inhabited and are important for oil and gas servicing industries or fishing can be protected to a similar degree by ring levees, coupled with provision for evacuation. This would allow for consideration of a lower River management plan that would include dismantling of large stretches of levees so that River overbank flooding and sediment dispersal could be accomplished cost-effectively. As the draft Plan states, "In order to allow the river to create new land, science tells us that we must turn the river loose and let it resume doing what it did for thousands of years; spread water and sediment into broken marsh and shallow water to create new

delta lobes." What is the proposal to do this in the draft Plan? Redesigning the whole levee system below Myrtle Grove would be a start for reconnecting the river and its surrounding wetlands. Randy has proposed convening an internationally renowned group of experts to design the basic parameters of such a strategy for letting the river "loose" and providing for navigation through some kind of elongated lock structure. The Plan should provide a time schedule for convening this group. We have also proposed, following the adoption of basic parameters for the redesigned levee system, diversion and navigation structure to encourage a design competition through an RFP process. The major engineering firms must be engaged if this hugely challenging and exciting restoration program is to move forward over the next five years with construction underway in time to give everyone confidence that large-scale restoration is becoming a reality.

The Atchafalaya Basin. We are mystified why the draft Plan says so little about the potential for effective use of Atchafalaya Basin water and sediment to restore portions of the central coast in Terrebonne Parish that have suffered "extreme" wetland loss. We have submitted a proposal for a third outlet through the east guide levee. Since this outlet would be north of Morgan City, it provides for much more restoration potential than relying just on expanded flows through the GIWW. The Atchafalaya River has built a huge amount of land in the Basin and in the Bay through the Lower Atchafalaya River and Wax Lake Outlet over the last 30 to 40 years. A third outlet would allow for the land building capacity to be broadened in a manner that might enhance the unique ecological features of the Basin at the same time and protect Morgan City.

In addition, it is critical that the State Plan address the operation of the Old River Control Structure with a view to optimizing the distribution of flows between the Mississippi and Atchafalaya Rivers for coastal restoration as well as flood control purposes. The Corps is not apt to investigate this issue on its own. Increasing the distribution of flows down the Atchafalaya River would create angst in Morgan City and provide limited restoration benefits without a third outlet designed to take advantage of this extra water and sediment.

Hurricane Protection for the Delta and Chenier Plains. The dual levee alignment program that is proposed for the entire coast of Louisiana from the Mississippi River to the Texas border strikes us as environmentally destructive, very expensive, probably infeasible and counter-productive. The draft Plan refers to a strategically designed hurricane protection system, but we see little evidence of strategic design, unless having an alignment in places that provides for 0.2% protection and in others, or in pairs, 1% protection. The draft Plan states, properly, that development incursions into wetland areas that would be "protected" by this vast levee system should not be countenanced, but provides no realistic mechanism whatsoever for controlling such land development that is an inevitable feature of such broadcast protection schemes. Proposing land use controls by local governments is not such a mechanism and has worked virtually nowhere in the country. Any incremental "protection" of wetland areas that would induce development must be proceeded by a comprehensive program of

purchase of development easements, backed with a credible financing scheme. Land use controls will not work.

The draft Plan describes "leaky" levees as an innovative technology that would allow for linear levees to co-exist with wetland restoration projects. In our view, Jim Coleman raised the right question at the Governor's Commission meeting: won't this levee design have significant and severe adverse hydrological and ecological impacts on wetlands both north and south of the levee alignments? Periodic placement of water control structures that will, when open, allow for the passage of flows of water and sediment will not substitute for more open flows of water and sediment. Levees will serve to impound water and block the exit of salt water following storm events a la the Rita experience in the Chenier Plain.

Major urban areas in coastal Louisiana can and should be protected through a ring levee system combined with an aggressive and accelerated wetland restoration diversion and sediment conveyance program.

The Plan's design team and process. During the LCA process, the State assembled a remarkable team of scientists and engineers led by Robert Twilley. It is not evident that such a team has been leading the State's planning effort. The Corps has a planning team at work in Vicksburg, but, as far as we can tell, that planning team is focused overwhelmingly on levee system designs. Further, it is not clear that the Corps' storm surge model incorporates wetland features that can affect surge and wave energy. If so, its basic planning tool is incapable of integrating wetland restoration and levee structures as parts of a comprehensive storm protection program. In addition, its process is effectively closed. The State must pursue a process that relies on a team of the best coastal scientists and engineers available and engages the public at the same time in considering the large choices that the State and nation must make as they consider the future of North America's most remarkable coastal ecosystem that actually has the potential to restore and enlarge itself even in the face of global warming and accelerated sea level rise.

We have a lot to do in the next few months if the State is to have a dynamite plan, designed by the best team of scientists and engineers, properly vetted by all state and national stakeholders, that can serve as a basis for major State and federal legislative and budgetary initiatives. It is time to roll.

To: CPRA

I would like to see a 2 step plan.
First step to build a chain of man made islands along the affected coast. Do this by hiring as many ship or barge builders as possible and build very large barges. If not Barges, some sort of tidal surge deflectors. The Barge system would be filled with sand and sent along the coast. Pumping sand back on the existing barrier islands does not work due to high Tides and storm surges washing it away.
2nd step is to continue building as many water deversion project from the Miss River as possible. As everyone knows, it's the sediment from the Miss River that can Rebuild this Delta. Some Tributaries like Bogue Falouria could use a lot more water flowing down it.
The man made islands would protect what we have left. While waiting for the water deversion projects to rebuild the wetlands.

Sincerely Yours
J. McKeall

GULF RESTORATION NETWORK

United For A Healthy Gulf

338 Baronne Street, Suite 200 • New Orleans, LA 70112
Mailing Address: P.O. Box 2245 • New Orleans, LA 70176
Phone: (504) 525-1528 • Fax (504) 525-0833
www.healthygulf.org

January 5, 2007

Jon Porthouse
Coastal Protection and Restoration Authority Integrated Planning Team
PO BOX 94396
Baton Rouge, LA 70804-9396

RE: Comments on the Preliminary Draft Comprehensive Coastal Protection Master Plan

Dear Mr. Porthouse:

Thank you for the opportunity to comment on the Preliminary Draft of the Comprehensive Coastal Protection Master Plan (CCPMP). While we are excited to see that Louisiana intends to look at coastal protection and restoration in a comprehensive and interdisciplinary fashion, we do have the following general comments and concerns related to the CCPMP:

- Four objectives are stated in the CCPMP document, however only Objective 1 (flood and storm surge protection) is covered in any detail. In order for this plan to be truly comprehensive and holistic, Objective 2 (sustainable coastal ecosystems), Objective 3 (healthy habitats), and Objective 4 (sustainable heritage and culture) must be fleshed out and given equal (if not higher) standing.
- While the maps supplied in the CCPMP provide a decent picture of where levee alignments are being proposed, they supply an incomplete picture as to how comprehensive restoration and protection will take place. If this plan is to be comprehensive, it must include a plan to preserve and restore important habitats throughout the coast, and conceptually and graphically place them on equal footing with structural flood protection.
- When levee alignments are considered, the least hydrologically and ecologically damaging alignments should be given highest consideration. If wetlands are impounded, even by "leaky levees," they will lose at least some of their hydrologic integrity, and thus become stressed.
- The State and U.S. Army Corps of Engineers (Corps) must be consistent in the goal of coastal restoration when developing any plan and projects. Thus, all on-going and previously authorized Corps projects must be re-evaluated in order to make sure that they are consistent with the goals of restoring Louisiana's coast.
- In order to facilitate true and meaningful public comment, alternatives should be offered. The majority of the CCPMP delineates single levee alignments, while many different alignments might exist. If the developers of this plan truly want public input on this draft document, alternatives to be considered should be presented.

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The GRN notes that comments are being submitted by persons having expertise on issues of specific concern to the GRN. We therefore adopt as our comments and incorporate herein by reference any and all comments submitted by the Lake Pontchartrain Basin Foundation, Oliver A. Houck, Tulane University, the Coalition to Restore Coastal Louisiana and the Sierra Club.

We look forward to continuing to work with the planning team to ensure all of the ecological, cultural, and public safety goals of the CCPMP.

Respectfully Submitted,

Matt Rota
Water Resources Program Director

From: John Lopez [johnlopez@pobox.com]
Sent: Friday, January 05, 2007 3:14 PM
To: comments@louisianacoastalplanning.org
Cc: carlton@saveourlake.org
Subject: Lake Pontchartrain Basin Foundation CCPMP comments 1-07
Attachments: LPBF comments - CCPMP 1-5-06 final.pdf

Please accept the attached document for comments on the Comprehensive Coastal Protection Master Plan.

John A. Lopez, Ph.D.
Director-Coastal Sustainability Program
Lake Pontchartrain Basin Foundation
SaveOurLake.org
225-294-4998 - land line
504-421-7348 - cell
johnlopez@pobox.com

SAVE OUR LAKE
LAKE PONTCHARTRAIN BASIN FOUNDATION
P.O Box 6965 Metairie, LA. 70009-6965 - SaveOurLake.org

January 5, 2007

To: Jon Porthouse
LA DNR Integrated Planning Team
Baton Rouge, La.

RE: Comments on the Preliminary Draft Comprehensive Coastal Protection Master Plan

Dear Mr. Porthouse:

Thanks for the opportunity to comment on the State's draft Preliminary Draft Comprehensive Coastal Protection Master Plan (CCPMP). The CCPMP is a formidable document and represents a breakthrough in coastal management in Louisiana since its objective is to integrate water management in fair weather and storm conditions through utilization of the natural landscape and the unnatural landscape alterations such as levees. Detailed comments are attached, but let me emphasize several key points.

1) Better definition needs to be given for the overall restoration of the coastal estuary. This is best done with a map of wetland habitat goals for the entire coast.
2) Much more modeling needs to be done for surge and the estuarine functions. More informed comments can be made after this work is given to the public. Therefore, we ask that an additional comment period be planned in the near future prior to initiation of formal NEPA meetings.
3) We applaud the clear recommendation to close the MRGO and we ask that priority is placed on this in Planning Unit 1 (Pontchartrain Basin).
4) The flood gates at Chef and the Rigolets need to have a proven need and result. Their design and management must be to minimize environmental impacts while providing the needed flood protection. The current CCPMP design suggests a 50% reduction in the pass opening and is of great concern.

See the attached document for complete comments.

Sincerely,

John A. Lopez, Ph.D.
Director - Coastal Sustainability Program
Lake Pontchartrain Basin Foundation
225 294-4998 504 421-7348 cell
johnlopez@pobox.com

Comments on the Preliminary Draft of the Comprehensive Coastal Protection Master Plan (CCPMP) for Louisiana

Submitted by the Lake Pontchartrain Basin Foundation

General comments

Title
The CCPMP title does not reflect the stated scope of the CCPMP. It only reflects Objective 1 (flood protection) and does not reflect Objectives 2 & 3 (coastal restoration) or Objective 4 (cultural heritage).

Multiple Lines of Defense
We support the application of the Multiple Lines of Defense Strategy to the CCPMP. The plan strongly embraces the integration of utilization of the natural landscape and engineered flood protection. Multiple lines measures do create significant numbers of combinations of measures with differing combined effect. Models will assist in determining the best array of measures. The CCPMP does need to strengthen the broader restoration goals of the estuary which are best defined as the wetland habitat goals for the coast. If the estuary fails, the flood protection benefits it can supply will also fail. The health of the coast must be assured.

Natural Hydrology
The water management goals are to reduce storm damage while maintaining a healthy estuary. This is as ambitious and complex as it is necessary. It is desirable that, wherever possible, we restore the natural hydrology and emulate natural processes. Closure of the MRGO at Bayou la Loutre is a good example in the CCPMP to restore the hydrology. Possible measures such as flood gates on Chef and The Rigolets passes, or a levee in Lake Borgne will be very difficult to engineer so that they do not cause large scale hydrologic alteration.

Levee Alignments
Levee alignments should minimize inclusion of wetlands located within the protected side of the levee. This practice will reduce the alteration to the wetland hydrology while allowing wetlands to buffer storm surge in front of the levee. Since much of the coast is developed along old distributary ridges, traditional back levee locations along the ridges are, in general, a preferred location for hurricane protection levees. Levees located along old distributaries do not alter the hydrology and are located closest to the assets in need of protection (concentrated assets on the ridges).

Evacuation routes
Ultimately, the flood protection levels provided by the CCPMP will be layered along the coast with lower protection seaward and higher protection landward. Evacuation routes allow movement of people in and out of an area threatened and so, in general, the evacuation route should have a higher level of protection than the area being evacuated. Evacuation routes are also routes of re-entry after a flood event which are critical to first responders. A guiding principle should be that the flood protection level for an evacuation route within any area should be at least equivalent to the adjacent inland area with a higher level of protection. This is intended to assure evacuees can move from any area to the next level of protection. This would also apply to areas of the coast outside levee systems and therefore provide for complete

evacuation for the entire coastal region. All existing evacuation routes should be posted on maps in the CCPMP and evacuation planning should be included in the CCPMP.

Flood Protection levels
The draft CCPMP does define the different levels of protection that may be expected for the alternatives and the preferred plan. It is significant to recognize and describe areas of the coast that cannot be protected or protected to the same level as others. The maps show boundaries but do not illustrate the areas. For example, a map of colored fill patterns of non-protected areas, 1%, 0.2% flood protection will be more effective communicating the expected protection from the preferred plan. The CCPMP does not emphasize sufficiently the role of elevating homes and businesses. Language should be added to encourage parishes and individuals to utilize base flood elevation maps and the expected protection map of the preferred plan to plan for residential and commercial activities.

Estuarine health objective
The draft CCPMP suggests the long term use of wetland features to reduce storm surge impact yet it does not define a functional estuary that is necessary to be sustainable. A sustainable estuary must be hydrologically functional. This is best defined by geographic delineation of wetland habitat goals across the entire coast. A map of habitat goals is extremely effective in communicating and clarifying ecologic goals. This is in contrast to the "Objectives and Measures" matrices utilized in the CCPMP (appendix B) which are largely incomplete and unnecessarily complex. (see detailed comments Appendix B below)

The "preferred outcomes" uses a land classification which is novel and inconsistent (fresh water, marine dominated, river dominated, and swamp). For example, "fresh water" and "swamp" categories are somehow different from riverine which would presumably be at least partially, if not all, fresh or swamp. The classification has large areas without any designation such as Lake Pontchartrain, Chandeleur Sound (saline) or the Central wetlands (swamp). The unclassified areas have no goals or outcomes. Is there some advantage to this invented classification over the well established wetland classification used in Louisiana (fresh, intermediate, brackish, and salt)? Our view is that it only obscures the potential goals and expected outcomes.

Models
In general, the evaluation criteria and alternative selection are still too subjective. Over time, models should have greater influence, although they should never be the completely dominant influence. Two basic types of modeling are needed: surge (elevation) models of storm conditions and hydrodynamic (salinity) models of fair weather conditions. It is difficult or impossible to critique the CCPMP without more complete modeling results. The ADCIRC modeling for surge is probably the reasonable model to use. The CLEAR modeling is not adequate and appears to be a crude attempt to retrofit LCA work for CPRA (see comments on Appendix F). In PU 1 the model projects are inappropriate and the results in PU 1 appear to be fundamentally flawed.

Oyster reefs
The draft CCPMP has almost no emphasis on restoration of structural oyster reefs. Shellfish, in particular, are recognized to have tremendous benefits throughout the estuary including providing shoreline protection of marshes. Once the hydrology is restored, oyster reefs can be re-built within a few years and provide highly sustainable benefits. The historic reefs of the

Biloxi marsh and Mississippi Sound (circa 1930) are targeted for restoration through the proposed freshwater diversion at Violet and through creation of hard structure for reef growth. Structural reefs should be targeted for specific historic sites or along submerged remnants of distributary ridges that cross the Biloxi marsh. Restoration of structural oyster reefs in these areas is probably the only viable alternative to sustain the Biloxi marsh. Other areas of the coast have even greater potential to help sustain the coastal marshes.

Leaky Levees
The concept of leaky levees is questionable on the scale proposed and is contrary to the stated goals of a healthy coast. Enclosure of wetlands within any levee will welcome future development and is contrary to a healthy coast and building smarter.

Planning Unit 1

Lake Pontchartrain Basin Foundation's Pontchartrain Coastal Lines of Defense
The CCPMP preferred alternative measures include many project areas from the Lake Pontchartrain Coastal Lines of Defense Program. This includes PD 1-6, PD 1-8, PD 1-10, PD 1-11, PD 1-12, PD 1-16, PD 1-17, PD 1-19, PD 1-21, PD 1-22. LPBF will continue to develop better project definition for these and share this work with CPRA.

Lake Pontchartrain Basin Foundation's Comprehensive Habitat Management Plan
The CCPMP includes several projects included within the Comprehensive Habitat Management Plan for the Pontchartrain Basin. This includes PD 1-7, PD 1-9, PD 1-18, PD 1-20, PD 1-23. LPBF will continue to develop better project definition for these and share this work with CPRA.

Priorities
The ten projects within our Pontchartrain Coastal Lines of Defense Program are the highest priority for the LPBF and it is our expectation is that all ten Pontchartrain Coastal Lines of Defense areas will have a major project completed within 4 years (2011). Therefore in PU 1, we suggest the following restoration projects in the CCPMP, be given highest priority for restoration. This includes PD 1-6, PD 1-8, PD 1-10, PD 1-11, PD 1-12, PD 1-16, PD 1-17, PD 1-19, PD 1-21, PD 1-22. It is these restoration project which we believe will contribute to flood protection. Traditional flood protection projects within PU 1 are also a priority and must be phased concurrently with coastal restoration.

Levee Alignment in the Pearl River Delta & East Orleans Landbridge PD 1-1
The proposed levee alignment crosses an entirely wetland area of the Pearl River delta referred to as Weems Island. An alignment along Highway 90 would avoid this impact. The Highway 90 alignment would also place significantly more wetlands east of the levee to act as a buffer in front of the levee. Highway 90 generally follows the distributary ridge and would provide a better foundation for the levee. The Highway 90 alignment is a significantly less angular alignment and shorter. The Highway 90 levee would be nearly straight from Lake Borgne to the Pearl River. Either alignment will have impact to the Pearl River, but more so with the western (CSX RR) alignment. The western (CSX) alignment would require additional gates not shown for tidal passes such as Unknown Pass and St. Catherin Pass. To offset the impact to the Pearl River delta, the upstream sills on the Pearl River and Bogalusa should be removed. This is particularly warranted since they were built for a now defunct navigation project (see LPBF's

Comprehensive Habitat Management Plan for details) . Removal of the sills will allow additional sediment to flow downstream and rebuild wetlands in the Pearl River delta.

Flood gates on Passes PD 1-1

Hurricane Katrina demonstrated that greater flood protection is needed for the populated areas around Lake Pontchartrain. New levees, improved levees and restored wetlands will all enhance that protection. The additional need for the proposed flood gates across Chef Pass and The Rigolets has not yet been determined. These flood gates would be very expensive and should be considered a last resort from a cost and environmental standpoint. The proposed dimensions of the gates is of concern. The total width in an open position is approximately 50% of the width of the Passes at Chef and Rigolets. The actual cross-sectional reduction could have a dramatic effect on the hydrology of the entire Pontchartrain estuary. For example, residence time of water will increase in Lake Pontchartrain and lead to higher lake levels from rainfall events. Higher residence time would likely also reduce water quality. Any migratory species dependent on tidal flow might be proportionately reduced. The gates may reduce migratory-dependent fisheries, such as shrimp and blue crab. Any proposed gate needs to be justified for the incremental flood protection it provides while being designed and managed to minimize effect to the natural hydrology and estuarine processes. Design should also consider the need for regional storage of flood water in Lake Pontchartrain and the effect of excess water seaward of the gates by reduced storage in Lake Pontchartrain.

Levee in Lake Borgne PD 1-1

The 0.2% protection levee across Lake Borgne is perplexing. The engineering and cost of such a levee questions the fundamental feasibility of alignment in open water. The environmental issues would be great. Splitting Lake Borgne into two lakes, even with a very leaky levee, would fundamentally alter the water circulation of Lake Borgne, Lake Pontchartrain, Lake Maurepas and the surrounding wetlands.

North Shore of Lake Pontchartrain PD 1-9

Shoreline protection with armoring on the north shore should be minimal and only in areas with exceptionally high erosion rates. This shoreline has the highest concentration of SAV in Lake Pontchartrain. The grassbeds are an essential fish habitat and naturally develop on the eroding shoreline. Impact to SAV should be minimized.

MRGO PD 1-12

The closure of the MRGO at Bayou la Loutre is appropriate and should be a priority project. The CCPMP should allow acceleration of closure of the MRGO with a minimum of an earthen dam at Bayou la Loutre and rebuilding of the south bank along the St. Bernard levee by the fall of 2008. The proposed Violet diversion is related to the closure at Bayou la Loutre and should begin planning immediately. The combined effects of closure and the diversion are to re-establish the historic habitats in the Lake Borgne and Biloxi marsh are defined in the Comprehensive Habitat Management Plan published by the Lake Pontchartrain Basin Foundation. Preliminary modeling indicates with the MRGO closure that in normal rainfall years 7,500 cfs diversion would be appropriate.

MRGO PD 1-13

The proposed project is referred to as "shoreline stabilization", yet it describes bank stabilization along the MRGO. The need for bank stabilization is questionable considering the closure of the MRGO to deep draft vessels which contribute significantly to the bank erosion problem along the MRGO.

Caernarvon PD 1-18
The proposal to modify operating goals of Caernarvon are appropriate. The plan should also recommend utilizing the Caernarvon structure to the maximum extent possible now including maximum discharge during the spring months (April to June).

IHNC PD 1-24
The recommendation to build a new IHNC lock is entirely out of place in CCPMP since it does not support the stated objectives. Since the IHNC lock is a water management project, it does have some relevance to the overall CCPMP. A statement as to the compatibility or incompatibility of this project to the preferred plan may be appropriate. A request to include it as a project is not appropriate. Inclusion of a navigation project may allow some to characterize the entire CCPMP as a "Trojan horse" for local economic projects and not for the broad stated objectives in the CCPMP. If the IHNC is discussed at all in the CCPMP, it should be made clear that its completion is not a pre-condition for closure of the MRGO.

Appendix B
The "objective and measures" tables such as those for PU 1 (Table 2.8 c) is an attempt to measure the performance of various restoration proposals. The planning unit objectives should in sum define a functioning estuary. Instead, the tables are fraught with vagueness because words in a matrix several pages long are impossible to envision on a map. For example, almost every ecologic unit has the same general objective "to sustain productive fish and wildlife habitats". What value is added by repeating the same vague objective? In lieu of wordy tables, maps should be used to reveal relationships more readily. Objective #2 of the CCPMP is to "promote a sustainable coastal ecosystem by harnessing processes of the natural system". The coastal ecosystem is an estuary. The planning unit objectives when mapped together should define a functional estuary reflected in the wetland habitat types of the estuary. This can best be accomplished in the CCPMP with a map of habitat goal maps which will then be a basis for defining, selecting and monitoring restoration and flood protection measures that affect the estuary

Appendix E
Table E-26 does not match the values in the summary table.

Appendix F
The CLEAR modeling work is a crude retrofit of prior work done under great urgency to complete the LCA report in 2003. Numerous individuals involved recognize that this work was compromised by the rush to get the report complete. In PU 1, the baseline salinity that is used is at least 50% too fresh. If the starting salinity is grossly incorrect, then the model can only generate unreliable information including all the secondary calculations of habitat benefits to fisheries productivity, etc. The modeled diversions often don't match the proposed diversion in the CCPMP. For example, the Violet diversion is not included at all and should be modeled assuming the MRGO closure.

CLEAR modeling is of virtually no value to the CCPMP and has shown little prospect of improving. There is an institutional issue. CLEAR is a carryover of one program (LCA) with one scope that is being applied to another planning effort (CCPMP) with a much different scope. The CLEAR modeling is almost entirely oriented to evaluate river diversions, yet the CCPMP has many other types of restoration proposals. In addition, the LCA/CLEAR approach emphasized maximizing the creation of land regardless of where the land may be created. The approach by the CCPMP is to create land at the most critical locations for the benefit of restoration and flood protection. The later approach is appropriate, and does not preclude large diversions - just a more judicious use that complements other projects and fits into the larger flood protection scope of the CCPMP. Since the CCPMP includes a goal of flood protection, the greater urgency to meet this need requires restoration measures other than diversions which CLEAR was not designed to address.

From: Mimi Nothacker [mimi.nothacker@gmail.com]
Sent: Thursday, December 14, 2006 11:48 AM
To: comments@louisianacoastalplanning.org
Subject: Save cypress trees
It is difficult for me to comprehend, but even after the hurricane, and our desparate need for trees and more wetlands, some fools are trying to cut cypress trees. Please don't let them to this. Thanks

--
Mimi Nothacker
Cell No. 504-427-2528
Work No. 504-483-8695

From: Louise6677@aol.com
Sent: Thursday, December 28, 2006 9:52 AM
To: comments@louisianacoastalplanning.org
Subject: (no subject)

All of coastal Louisiana including major cities such as New Orleans, Houma, Lake Charles, Morgan City, New Iberia (as well as Baton Rouge and Lafayette in the not too distant future) is at a serious risk from damage from catastrophic storms as a result of the dramatic loss of our wetlands and other barrier protection. New Orleans never had to worry about a Category 5 storm since it had many protective barriers between it and the Gulf, but gradually those have been weakened and/or destroyed, and now it is faced with a very real possibility that a storm of category 4 strength and maybe even a 5 could reach the area, which only has barriers against a Category 3 (supposedly, although we found out otherwise).
What is the solution?

The best solution is to try to repair our storm barriers in all of coastal Louisiana in order to protect the state from future storm damage. We need the plan, and we need the money.

1. The Plan

For too long we have had a multitude of parties studying this issue but no one has had the money or the inclination to unite and develop one plan agreeable to all. We have a plan developing **-the Comprehensive Coastal Master Plan- and we need to get all the parties involved to "come to the table" and develop a plan beneficial and acceptable to all.** Difficult decisions and compromises will of course have to be made in order to develop a plan that is reasonable and effectual but cost effective.

2. The Money

The cost estimate for this elaborate plan of coastal repair together with hurricane protection is being bandied about at $14 billion or more. Where do we get this money? The Florida Comprehensive Everglades Restoration Plan involves a $10 billion dollar restoration of the Everglades with Florida contributing 50% of the money and the federal government contributing the other 50%. We can do a similar cost sharing plan for restoration of our coast.

Much of our land loss today can be attributable to the unintended consequences of the federal project of leveeing the Mississippi River. Billions of tons of silt are lost to the Gulf of Mexico on a yearly basis instead of replenishing our coastal wetlands. Our coastline has provided much of the energy for the United States but as a result of navigational canals and pipeline dredging, much of the coastline has been severely compromised. Not only are these lands valuable for the energy business as well as fishing and other industries, these are the "speed bumps" to protect more populated northern areas from devastating hurricane storms. We need reparation and help from our federal government in rebuilding our coast.

We need the 2007 Water Resources Bill to include a comprehensive funding project for Louisiana's coastal protection needs. From the newly passed oil revenue sharing bill, we will have access to approximately $3 billion in present day dollars. We have $2.4 billion from surplus state funds (much of it resulting from bloated post Katrina and Rita sales tax dollars). We of course will need to use a bulk of this money to resolve our insurance crisis**, but we could also set aside close to $1 billion to help fund our share of the reparation costs for the coast. In future years we could continue to set aside a portion of money. Let's show the federal government we mean business- we need at least a $7 billion commitment from them**, **but we will do our 50% share also for our coastal repair -we need to get the bill passed expeditiously and this will provide us with an opportunity to do so.**

We have no time to waste. Hurricanes Katrina and Rita were wakeup calls, and it's time to act now or we will forever lose the opportunity.

Louise Saik
louise6677@aol.com
504-831-3246

From: JECSSE1014@aol.com
Sent: Sunday, December 03, 2006 10:50 AM
To: comments@louisianacoastalplanning.org
Subject: Alternative Plan
Dear Coastal Planners,

A way to get the masses involved in this hugh endeavor, would be to start some sort of "Adopt a Tree" or aquatic plant program. It would be similiar to the "Adopt a Brick" program the Audubon Institute used in building the Aquarium. The Army Corps. can have these prepared sites ready for transplanting. Tour companies could then set up excursion tours where people pay a $100 fee to have HIS or HER own tree or aquatic plant taken to the site for transplanting.

The tour might begin with a viewing on Coastal Erosion over at Imax Theater then people be bussed to several of the surrounding Swamp Tours and taken to the prepared sites. They might be given an Official Document and a "Swamp Rat" T-shirt.

It all sounds crazy, but until we can get the masses involved we may never get our Coastline fixed. We've been talking for twenty years on doing something and we haven't accomplished a damn thing! Get EVERYONE involved and a way to make some money and we'll get our coastal protection back to where we need it! We don't have the time to wait on the GOVERNMENT to solve all our problems!

John

From:	KENTBISON@aol.com
To:	comments@louisianacoastalplanning.org;
CC:	
Subject:	Master Plan
Date:	Friday, January 05, 2007 11:21:50 AM
Attachments:	

To Whom It May Concern,

This plan is nice, but nowhere did it mention the barrier islands. The barrier islands are a much needed resource for our protection. These islands have been approved for reconstruction yet nothing is being done. I can't say enough the need for the barrier islands to be included within this plan. It least the people of our State can see that we are not forgetting all our resources to aid in our protection and survival.

Sincerely,
Kent Bourg

From: Ted Savoie [tedcgt@mobiletel.com]
Sent: Thursday, January 04, 2007 2:49 PM
To: comments@louisianacoastalplanning.org
Subject: Hurricane Protection South Louisiana

Gentlemen:

The area from the mouth of the Mississippi River to the Atchafalaya River is in need of food. You need to get Mississippi River water into the Terrebonne and Barataria Basin. You need to start building road bumps (sand dunes and Islands from the Gulf of Mexico toward inland.

You need to continue building levels inland, levels that protect the communities from Plaquemines to St. Mary Parish.

You cannot have your community levels as your primary line of defense. You would need a level 30 to 40 feet high all along the communities.

I hope that you understand my points of view.
Please contact me if you want to expand on my views/
Ted J. Savoie
Central Gulf Towing, LLC.

From: Gerald Fontenot [geraldfont@yahoo.com]
Sent: Friday, December 22, 2006 5:47 PM
To: comments@louisianacoastalplanning.org
Subject: Can we help?

Boy Scout Troop 21 of Moss Bluff, LA may be interested in participating in any way that we can help. Our boys are ages 11-16 and we have active adults. Several boys are looking for Eagle projects. This requires their helping plan and carry out a project involving at least 6 hrs. of work to benefit their community, working w. adults, and involves their fellow troop members and possibly others. If one or more could be worked into helping your objective, you would be helping to shape at least one young man's future. Their projects often spark career interests.

Please let us hear from you.

Thank you,
Susan or Gerald Fontenot
855-2812

LOUISIANA SPEAKS

Public Poll Will Enable Citizens to Weigh In on Key Planning Decisions for South Louisiana
Lake Charles, LA December 13, 2006

Wendell G. Lindsay, Sr.
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Calcasieu Parish Local Emergency Planning Committee
Team Green SWLA
1201 Ryan Street
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Doug and Rachel Lindsay
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Cypress, TX 77433
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Rachel@houlindsays.com

There has been substantial speculation regarding the significance of subsidence in the Gulf Coast region induced by prolonged extraction of hydrocarbons. One-dimensional modeling of reservoir compaction around oil and gas fields in Louisiana suggested that potential land subsidence would be insignificant (Martin and Serdengecti, 1984; Suhayda, 1987). Without debating the accuracy of those conclusions, it is clear that the modeling results focused on the vertical displacement that might be expected and not the impact of that vertical displacement. Subsidence of a meter or less induced by oil and gas production is not great, especially when compared to the extreme examples of subsidence such as 9 m at Wilmington, California (Yerkes and Castle, 1976) or 4.5 m at the Ekofisk Field in the North Sea (Mes, 1990). Nevertheless, the relatively small observed reductions in elevation in the Gulf Coast region are sufficient to cause dramatic impacts on the affected wetland ecosystems. This study has demonstrated that even minor lowering of the marsh surface can translate to large wetland losses through a combination of coastal-plain submergence and marsh-sediment erosion.

URL: http://pubs.usgs.gov/of/2001/of01-274/env-implications.html
Last modified: 14:35:06 Thu 19 Sep 2002

National Assessment of Coastal Vulnerability to Sea-Level Rise: Preliminary Results for the U.S. Gulf of Mexico Coast

One of the most important applied problems in coastal geology today is determining the physical response of the coastline to sea-level rise. Predicting shoreline retreat and land loss rates is critical to planning future coastal zone management strategies and assessing biological impacts due to habitat changes or destruction. Presently, long-term (>50 years) coastal planning and decision-making has been done piecemeal, if at all, for the nation's shoreline (National Research Council, 1990; 1995). Consequently, facilities are being located and entire communities are being developed without adequate consideration of the potential costs of protecting or relocating them from sea-level rise-related erosion, flooding and storm damage.

URL: http://pubs.usgs.gov/of/2000/of00-179/index.html
Last modified: 16:21:57 Tue 15 Aug 2006

Pipeline flow from the Sabine River: It is already stated that the river and Sabine Lake are not full enough to supply fresh water when needed. Will the pipeline be above or below ground? If above, what NWR and WMA would the pipeline pass through? What about the communities in the path of the p/l? If below, would it require the 75' pipeline easement? Who would mandate that only fresh water would be pumped through the line? Who would own the p/l? Who would operate/maintain it? Where would the terminals be located for emergency shut off? What security would be provided?

In Louisiana, Dr. Shea Penland and his colleagues at the LGS reported that Andrew stripped sand from 70 percent of the barrier islands leaving exposed old coastal marsh. More than 80 percent of oyster reefs behind the barrier islands were smothered by a 0.3-0.9-meter thick blanket of sediment. More than 70 kilometers of valuable dune habitat providing storm protection to estuaries, wetlands, and the coastal population were destroyed.

Information and expertise gained during the Louisiana Barrier Island Erosion Study has had a direct impact on local plans for mitigating barrier island loss. Data on seafloor change, shoreline change, and geologic framework have been provided to parish planners and engineers involved in restoration projects. USGS scientists cooperate with State and local governments to provide technical advice on use of sand resources for barrier island nourishment.

USGS URL: http://pubs.usgs.gov/fs/hurricane-impacts/index.html
Last modified: 15:49:26 Mon 05 Jan 2004

There is no one listed on the panel from USGS. Utilizing the resources, in conjunction with the documentation, the Master Plan can benefit greatly with their findings and knowledge.

Coastal Environmental Implications

The different surficial wetland responses and accommodation spaces created by prolonged large-volume hydrocarbon production at each field investigated is partly related to the primary fluid type produced and the rates of production. For example, the greatest wetland loss and creation of accommodation space occurred at the Port Neches Field where the largest measured vertical subsidence was associated with the largest cumulative volume of gas produced. The second greatest wetland loss and creation of accommodation space occurred by minor subsidence and major erosion at the Caplen Field. Significant volumes of both oil and gas were produced at Caplen and the wetland loss was controlled primarily by fault reactivation and subsequent wetland erosion. Wetland losses and creation of accommodation space were the least at the Clam Lake Field, which primarily produced oil with some gas. In fact, the cumulative volume of gas produced at Clam Lake was the least of the three fields studied (Table 1). The wetland losses occurring at Clam Lake are also fault controlled as at Caplen. At both fields it appears that the vertical displacement (subsidence) is less than the breakup of wetlands and conversion to open water by erosion and exportation of organic-rich sediments. Wetland losses are localized around the hydrocarbon fields examined in southeast Texas because the fields are widely spaced relative to the nearest large field. In parts of coastal Louisiana, large fields are relatively close to one another, and there is greater potential for subsidence, faulting, and wetland losses between the fields induced by cumulative production and regional depressurization.

Coastal Classification Atlas

Western Louisiana Coastal Classification Maps - Lower Mud Lake Entrance Channel to Sabine Pass

USGS Open File Report 2005-1261

Robert A. Morton, Russell L. Peterson, Tara L. Miller

Western Louisiana Coastal Classification Map

Coastal Classification Map for Johnsons Bayou SW/Smith Bayou NW. Map showing the coastal classifications along the western Louisiana shoreline. The top item in the legend refers to the most landward data line. The last item in the legend refers to the most seaward data line. Click on the links below to download and view larger versions of the map. At the bottom of the page is a clickable index map that will take you to the other maps.

8 1/2" X 11" (127 KB JPEG)
14" X 18" (339 KB JPEG)
21" X 27" (733 KB JPEG)

Printable PDF version (11.8 MB PDF)
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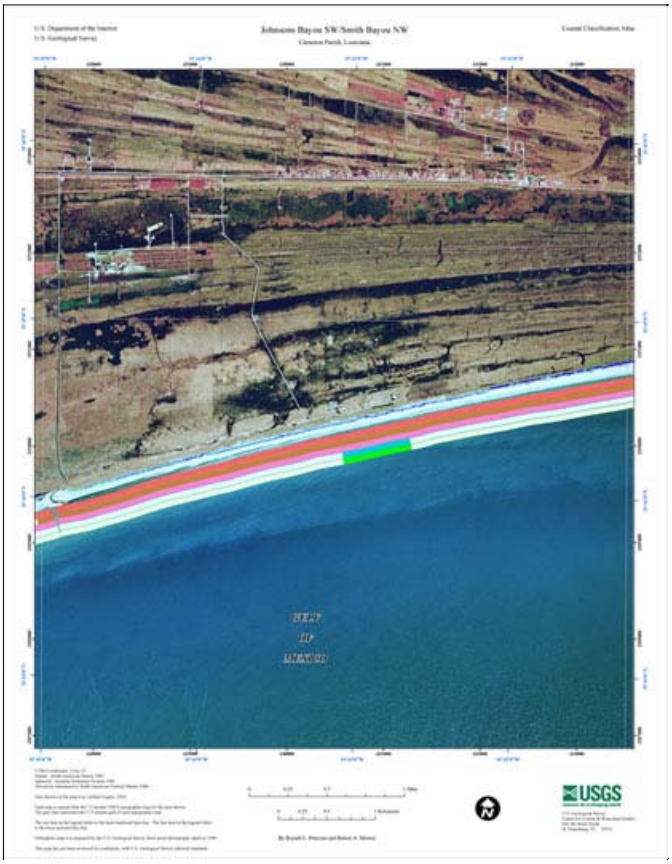
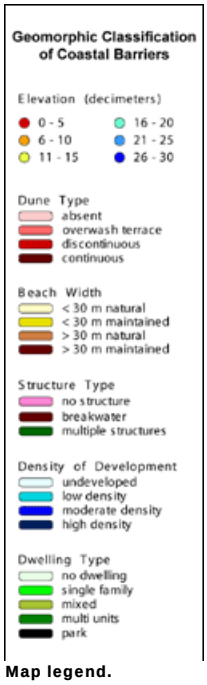
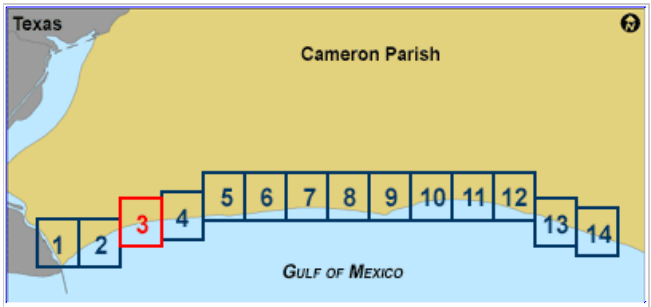


Coastal Classification Map for Johnsons Bayou SW/Smith Bayou NW.



Map legend.



1. Texas Point NW
2. Texas Point NE
3. Johnsons Bayou SW / Smith Bayou NW
4. Johnsons Bayou SE / Smith Bayou NE
5. Peveto Beach SW
6. Peveto Beach SE
7. Holly Beach SW
8. Holly Beach SE
9. Cameron SW
10. Cameron SE
11. Grand Bayou SW
12. Grand Bayou SE
13. Creole SW / Hackberry Beach NW
14. Creole SE / Hackberry Beach NE

Clickable Index Map. Use the index map above to navigate to the different coastal areas.

U.S. Department of the Interior, U.S. Geological Survey
URL: http://pubs.usgs.gov/of/2005/1261/johnsons-bayouSW.html
Maintained by Publishing Services
Last modified: 13:18:33 Tue 12 Jul 2005
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LINDSAY CONCRETE PILINGS-BARRIER BLOCK SYSTEM

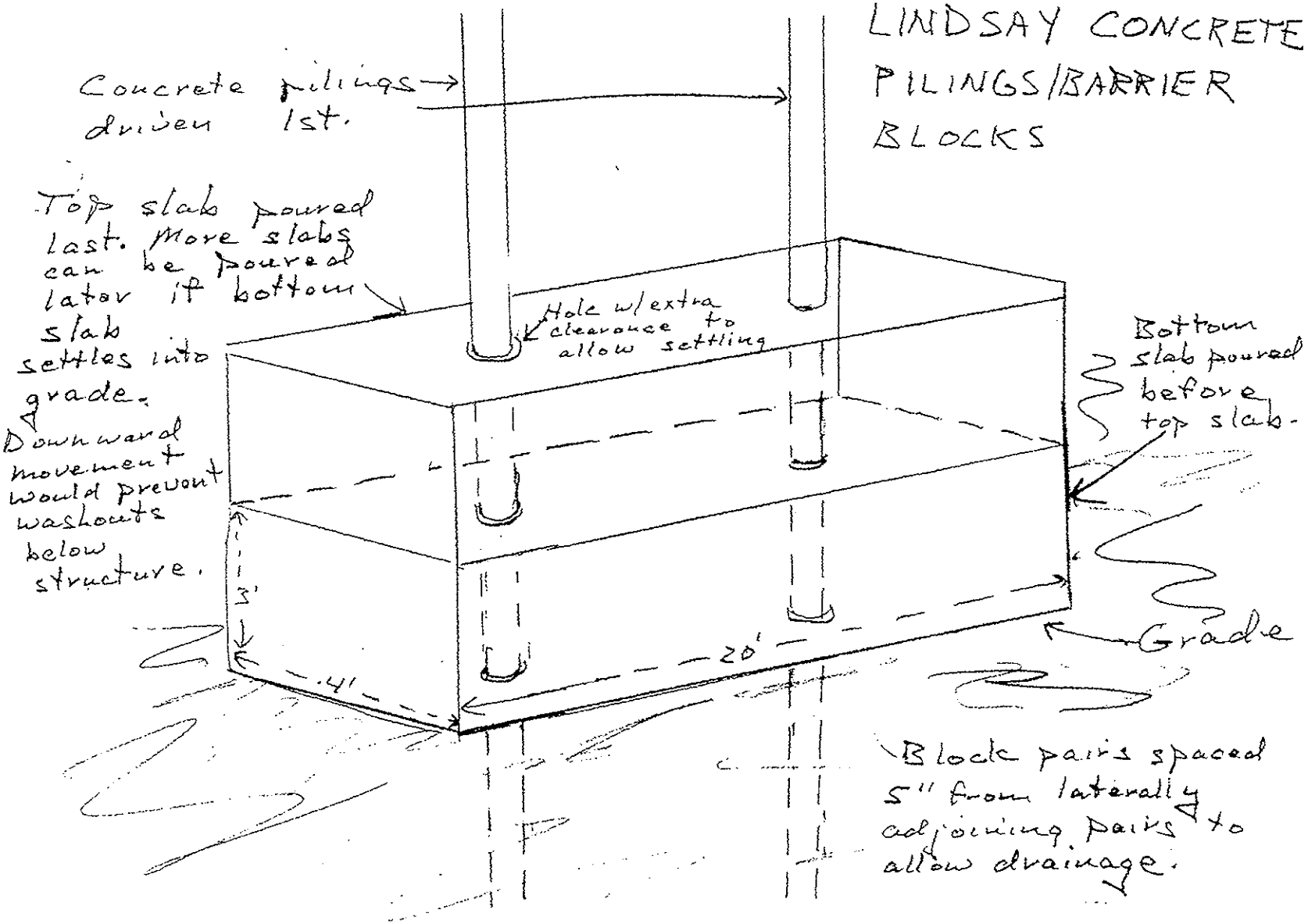
First, two concrete pilings, approximately 12' apart, are driven on the beach parallel to and near the shoreline.

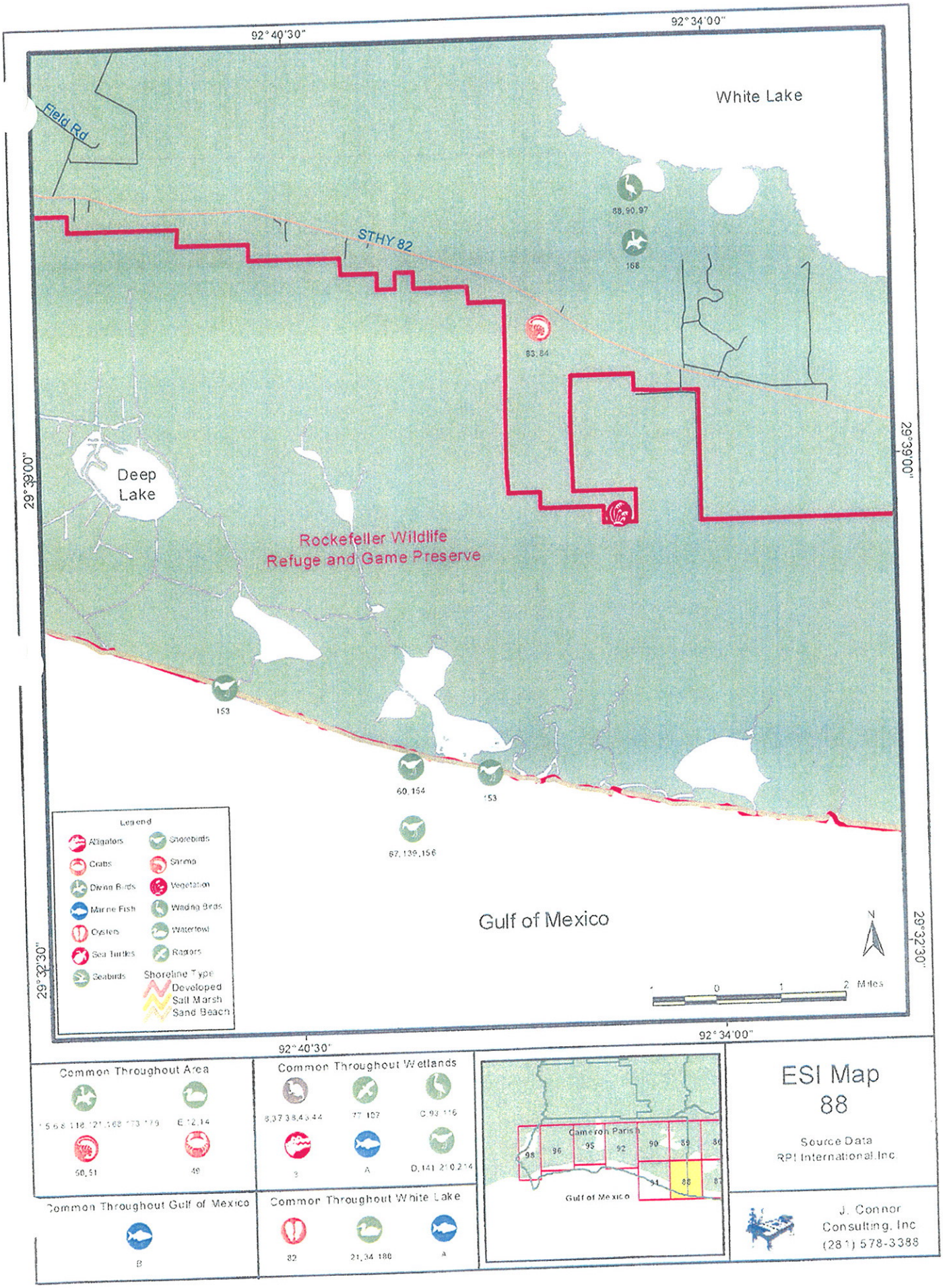
Second, a concrete slab or block is poured with dimensions of approximately 20' long, 4'wide and 3' high. Rebar is placed in the form for strengthening. Old broken concrete could be encased by the new concrete to lower concrete costs. 3' lengths of PVC pipe, approximately 1-2" larger in diameter than the pilings, are split and clamped around the pilings so that the slab will be free to move downward if weave action washes out sand supporting the slab.

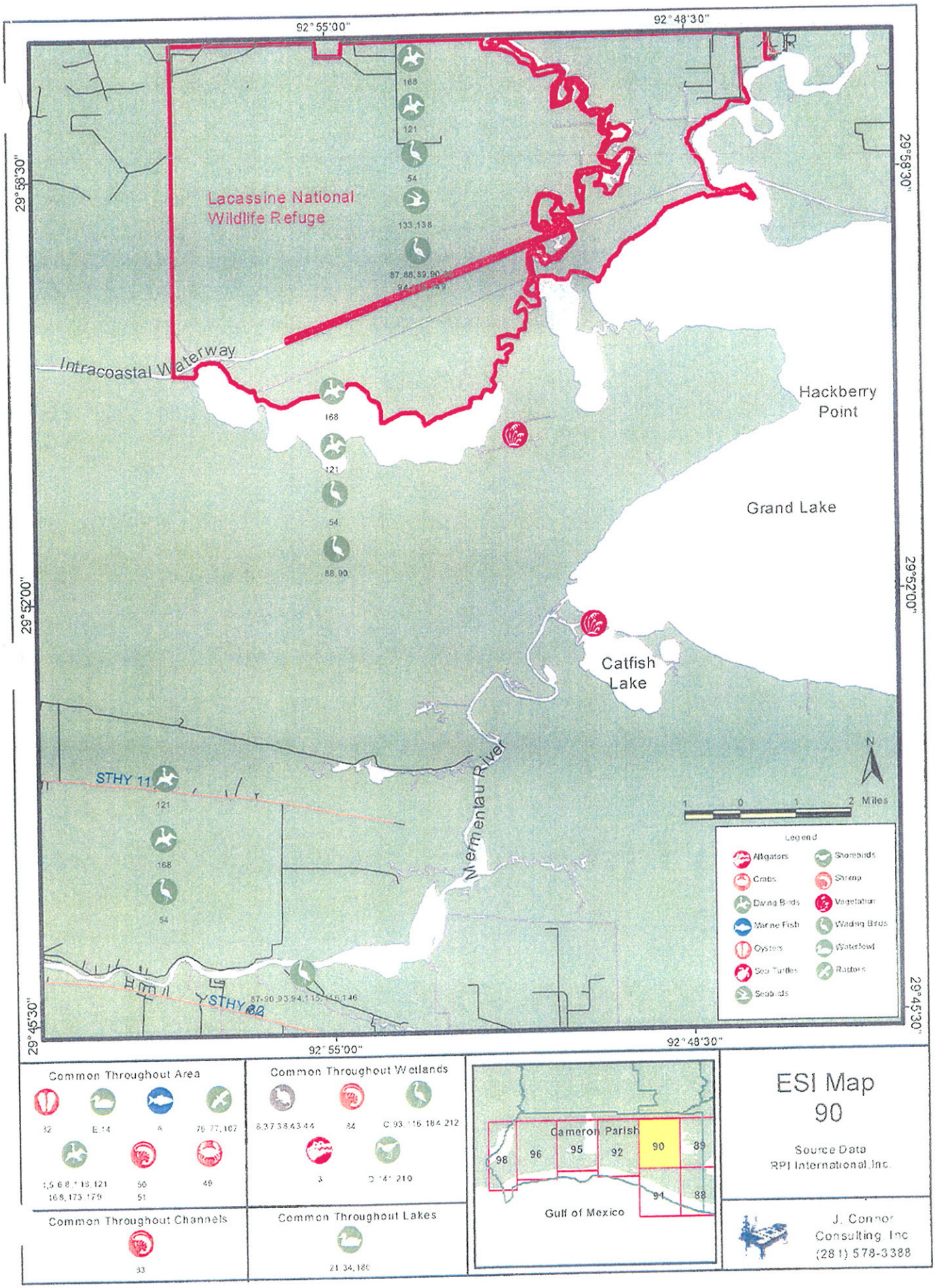
Third, after the first slab is hardened, a second is formed and poured in like manner directly on top of the first slab. If these two slabs with the passage of time sink too much, then one or more slabs can be poured on top of them.

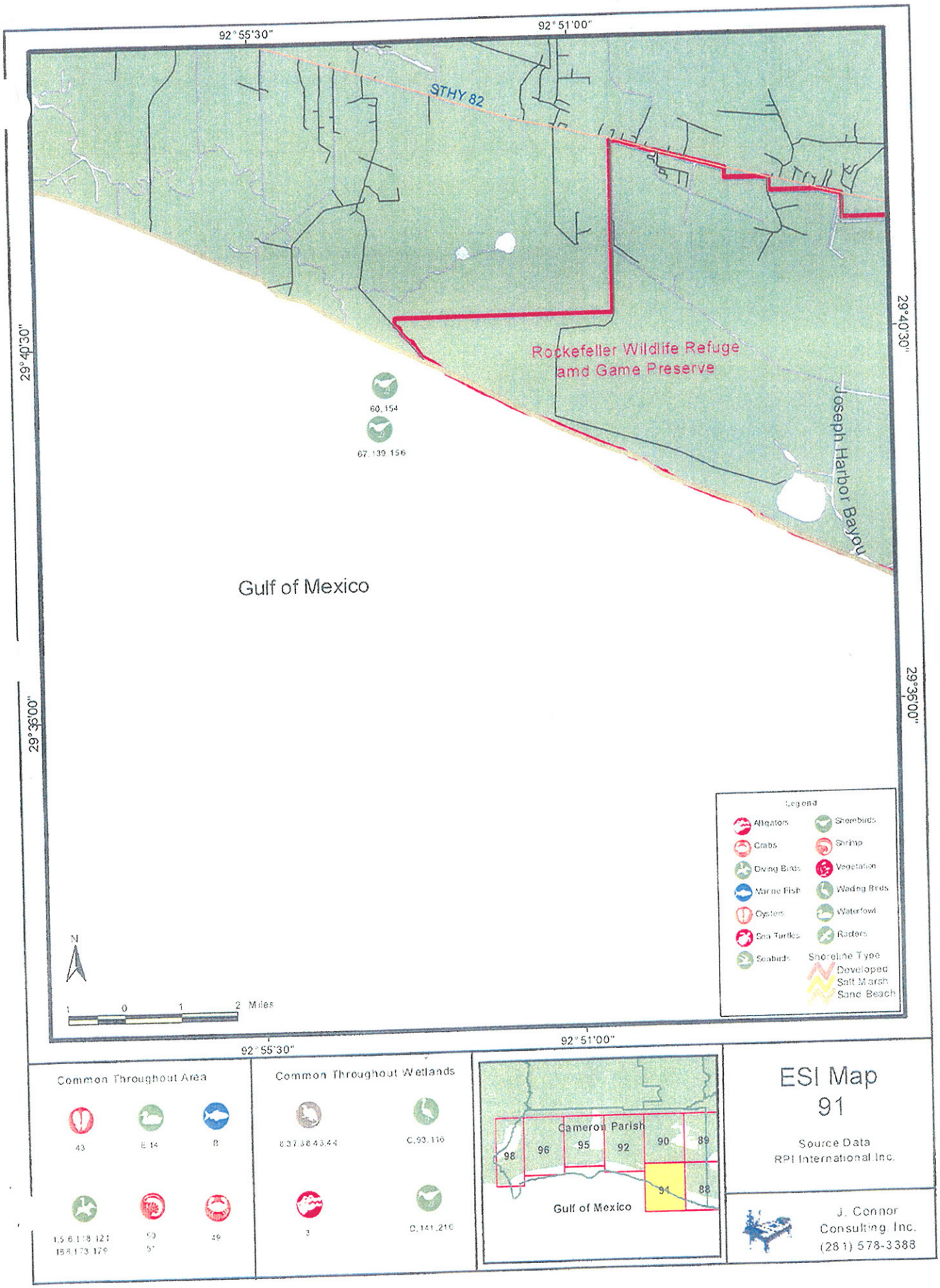
Additional stacked pairs of slabs are poured end to end and adjacent to the ends of the first pair, parallel to the shoreline. A 5" gap between the pairs would enable water which may accumulate on the land side of the slabs to drain back into the Gulf.

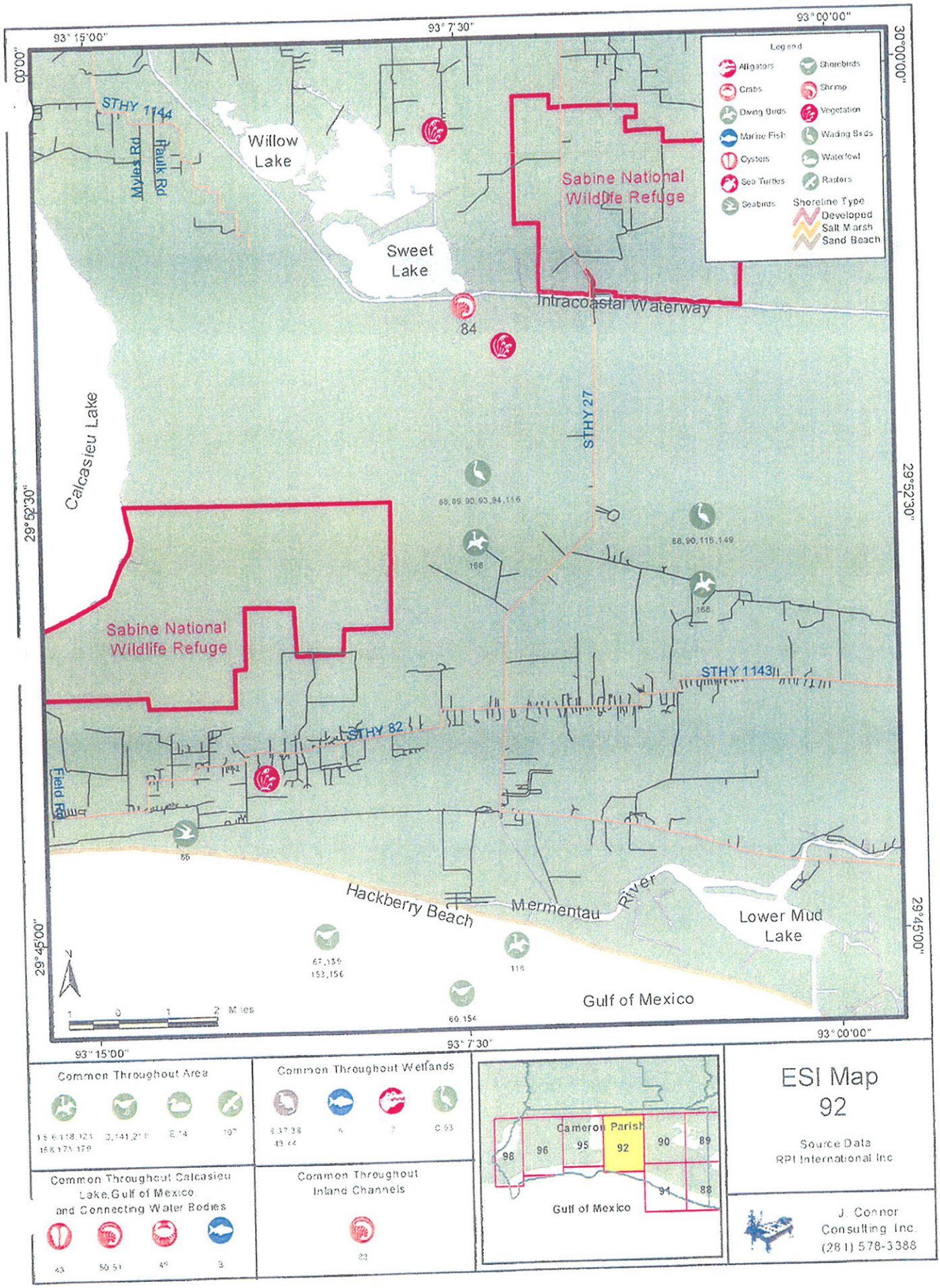
Additional strength to combat wave action could be achieved by backfilling the land side of the barriers, as was done at Galveston.


LINDSAY CONCRETE PILINGS/BARRIER BLOCKS
Concrete pilings driven 1st.
Top slab poured last. More slabs can be poured later if bottom slab settles into grade.
Downward movement would prevent washouts below structure.
Hole w/extra clearance to allow settling
Bottom slab poured before top slab.
Grade
3'
20'
41'
Block pairs spaced 5" from laterally adjoining pairs to allow drainage.


92°40'30"
92°34'00"
29°39'00"
29°32'30"
White Lake
Field Rd
STHY 82
Deep Lake
Rockefeller Wildlife Refuge and Game Preserve
Gulf of Mexico
88,90,97
168
83,84
153
60,154
153
67,139,156
Legend
Alligators
Crabs
Diving Birds
Marine Fish
Oysters
Sea Turtles
Seabirds
Shorebirds
Shrimp
Vegetation
Wading Birds
Waterfowl
Raptors
Shoreline Type
Developed
Salt Marsh
Sand Beach
N
0
1
2 Miles
Common Throughout Area
50,51
49
Common Throughout Wetlands
77,107
A
Common Throughout Gulf of Mexico
B
Common Throughout White Lake
82
A
Cameron Parish
Gulf of Mexico
ESI Map
88
Source Data
RPI International,Inc
J. Connor
Consulting, Inc
(281) 578-3388


92°55'00"
92°48'30"
29°58'30"
29°52'00"
29°45'30"
Lacassine National Wildlife Refuge
Intracoastal Waterway
Hackberry Point
Grand Lake
Catfish Lake
Mermentau River
STHY 11
STHY 82
168
121
54
133,138
88,90
87,88,89,90,93,94,115,145,146
N
1 0 1 2 Miles
Legend
Alligators
Crabs
Diving Birds
Marine Fish
Oysters
Sea Turtles
Seabirds
Shorebirds
Shrimp
Vegetation
Wading Birds
Waterfowl
Raptors
Common Throughout Area
Common Throughout Wetlands
Common Throughout Channels
Common Throughout Lakes
Cameron Parish
98
96
95
92
90
89
94
88
Gulf of Mexico
ESI Map
90
Source Data
RPI International, Inc.
J. Connor
Consulting Inc
(281) 578-3388


92°55'30"
92°51'00"
29°40'30"
29°36'00"
STHY 82
Rockefeller Wildlife Refuge
and Game Preserve
Joseph Harbor Bayou
Gulf of Mexico
60, 154
67, 139, 156
N
1 0 1 2 Miles
Legend
Alligators
Crabs
Diving Birds
Marine Fish
Oysters
Sea Turtles
Seabirds
Shorebirds
Shrimp
Vegetation
Wading Birds
Waterfowl
Raptors
Shoreline Type
Developed
Salt Marsh
Sand Beach
Common Throughout Area
43
E 14
B
1,5,6,11,8,12,1
18,8,17,3,17,9
49
Common Throughout Wetlands
8,37,38,43,44
C,93,116
3
C,141,210
Cameron Parish
98
96
95
92
90
89
91
88
Gulf of Mexico
ESI Map
91
Source Data
RPI International Inc.
J. Connor
Consulting, Inc.
(281) 578-3388


93° 15'00"
93° 7'30"
93° 0'0"
30°0'0"
29°52'30"
29°45'00"
Legend
Alligators
Crabs
Diving Birds
Marine Fish
Oysters
Sea Turtles
Seabirds
Shorebirds
Shrimp
Vegetation
Wading Birds
Waterfowl
Rasters
Shoreline Type
Developed
Salt Marsh
Sand Beach
STHY 1144
Myles Rd
Faulk Rd
Willow Lake
Sweet Lake
Sabine National Wildlife Refuge
Intracoastal Waterway
84
Calcasieu Lake
STHY 27
88,89,90,93,94,116
88,90,116,149
168
Sabine National Wildlife Refuge
STHY 1143
STHY 82
Field Rd
66
Hackberry Beach
Mermentau River
Lower Mud Lake
67,139
153,156
116
69,154
Gulf of Mexico
1 0 1 2 Miles
Common Throughout Area
Common Throughout Wetlands
Common Throughout Calcasieu Lake,Gulf of Mexico and Connecting Water Bodies
Common Throughout Inland Channels
Cameron Parish
98
96
95
92
90
89
94
88
Gulf of Mexico
ESI Map
92
Source Data
RPI International Inc
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Consulting Inc.
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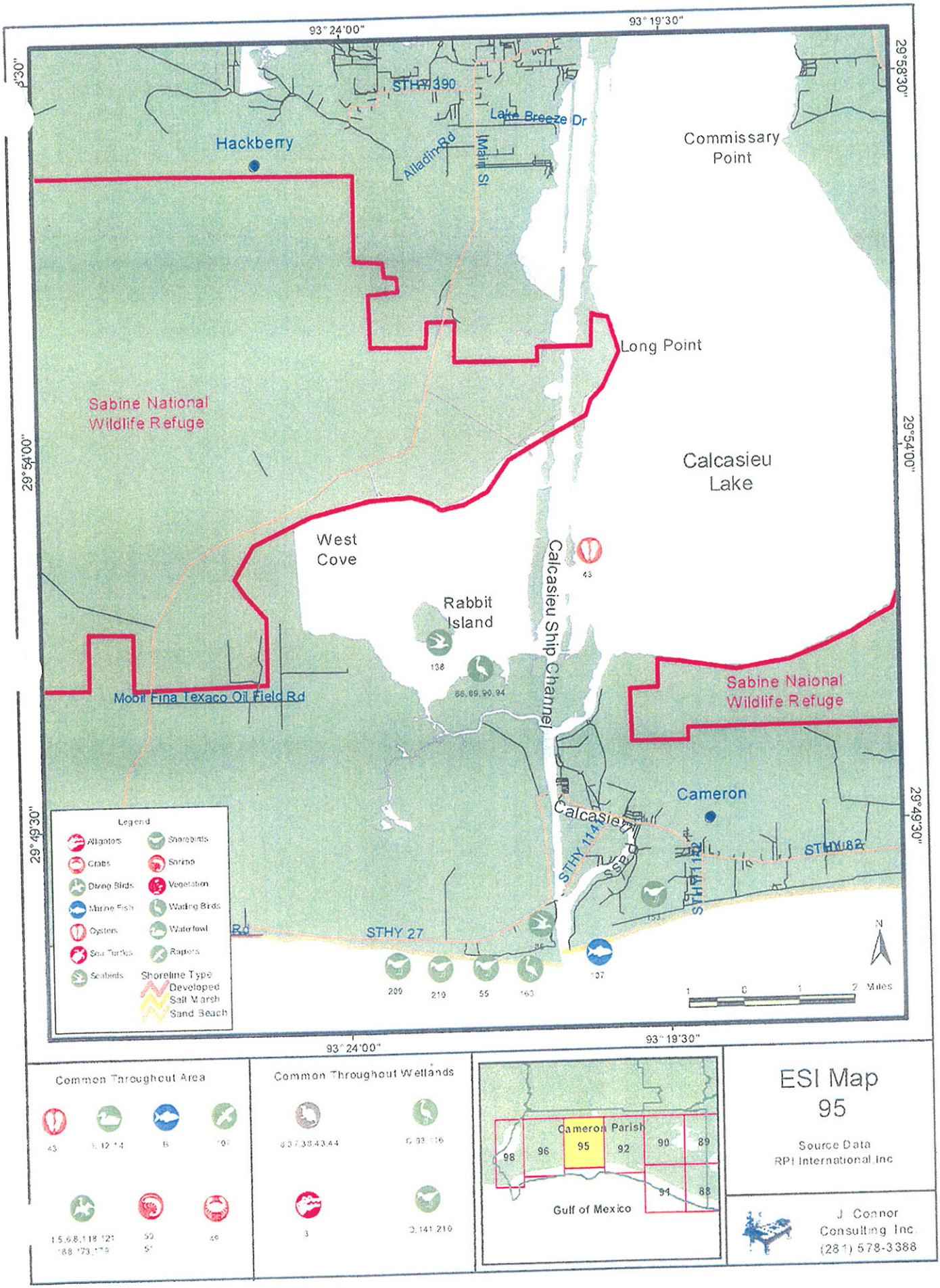
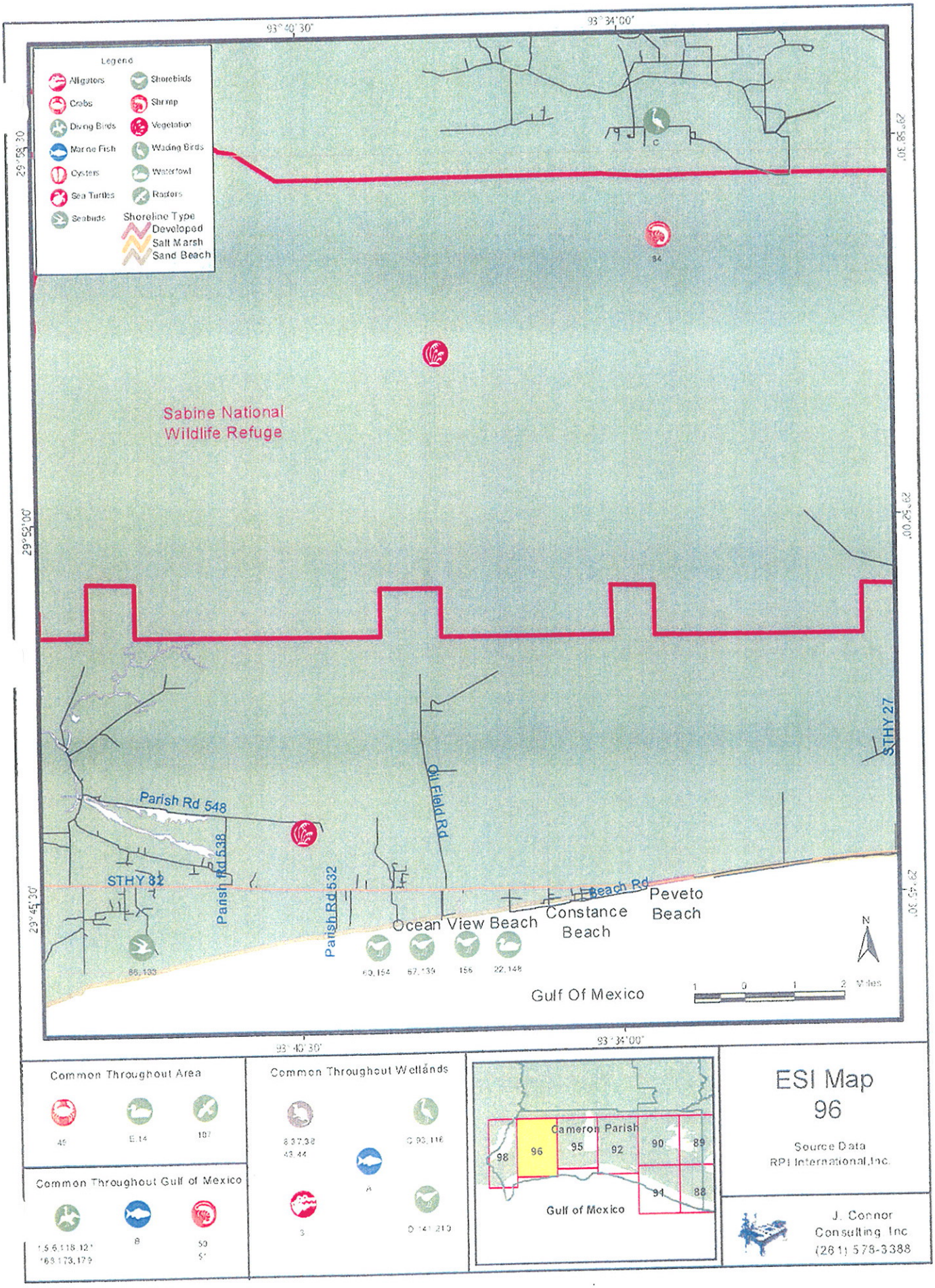
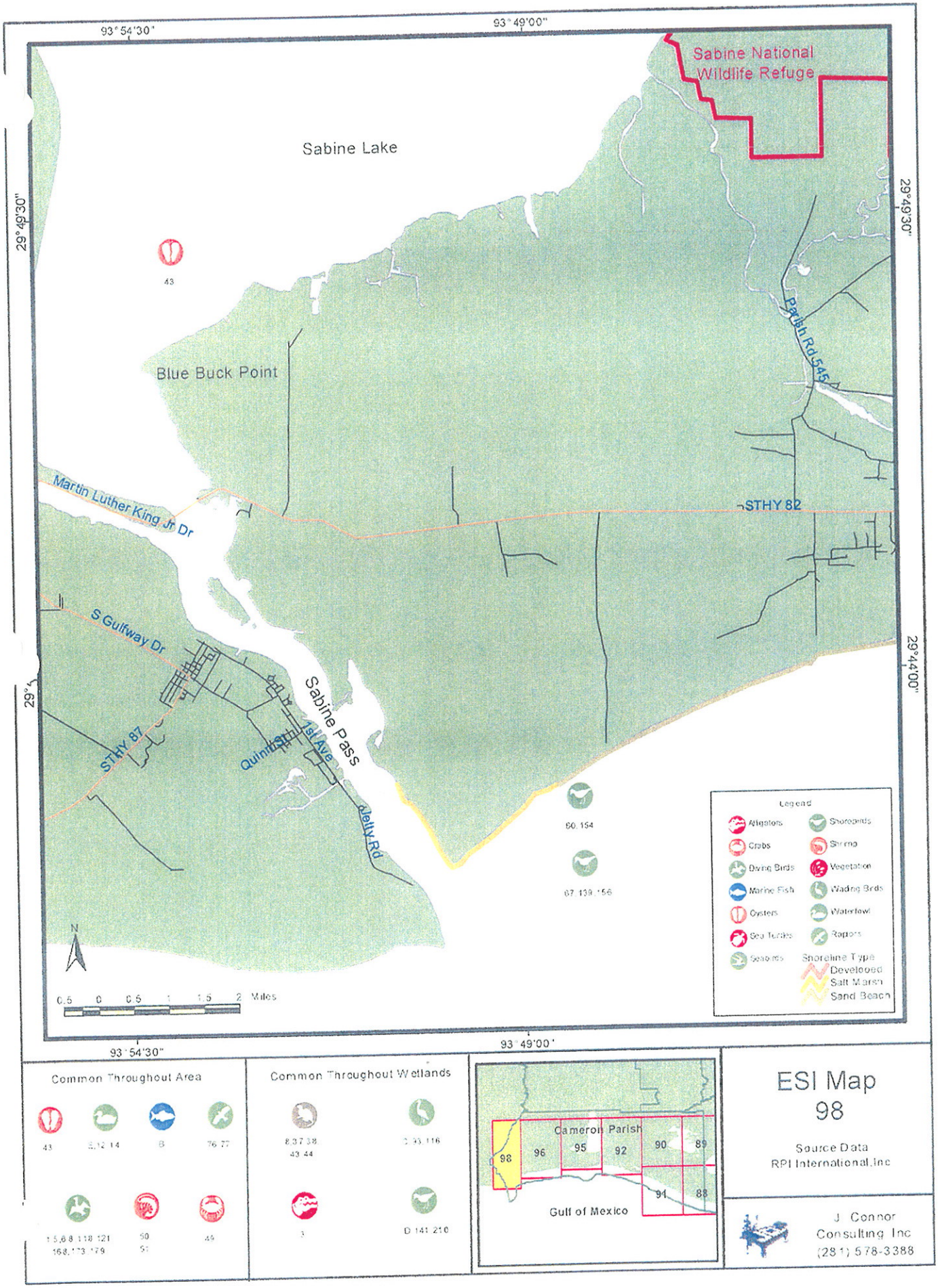
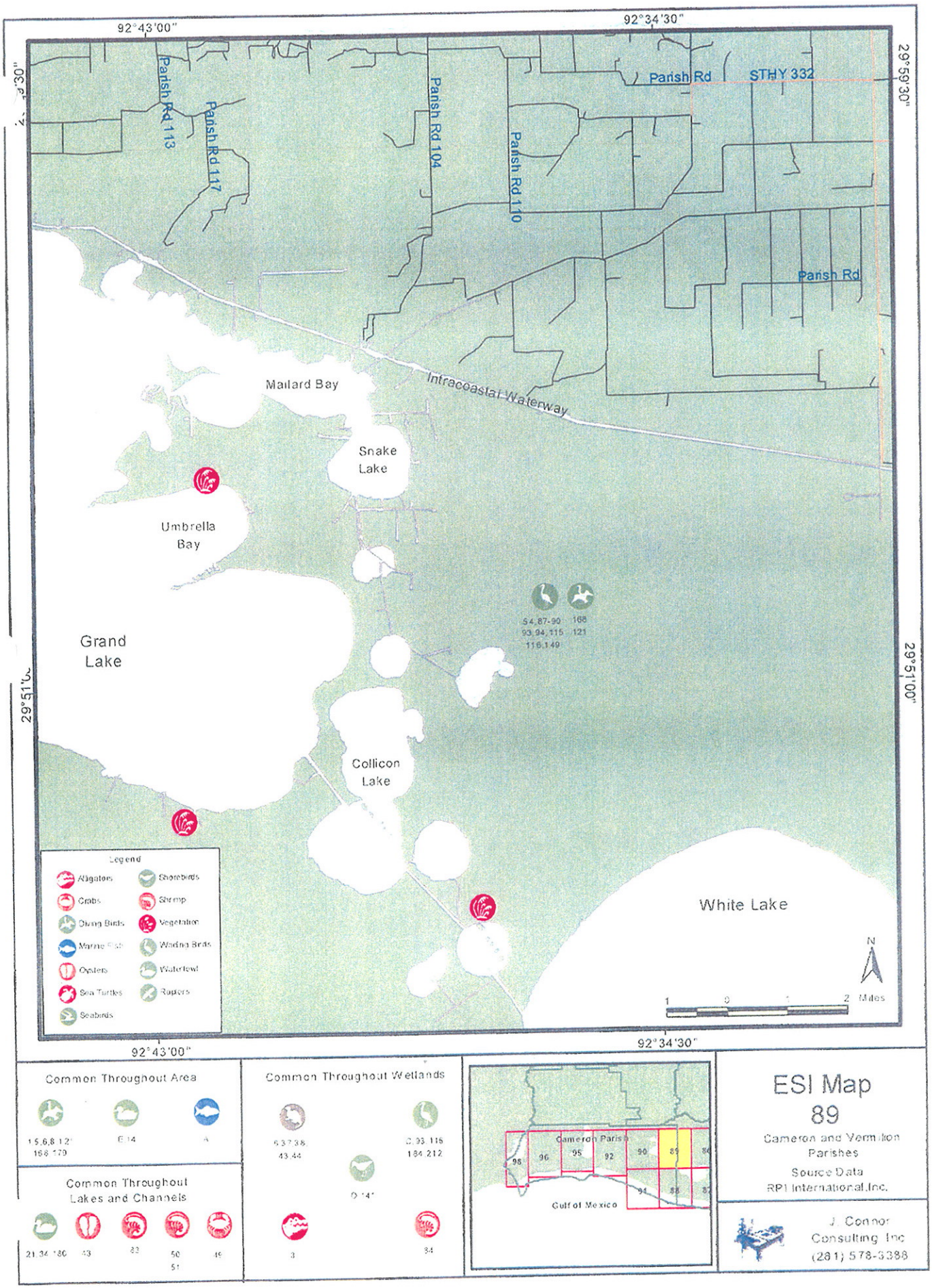

93° 24'00"
93° 19'30"
29°58'30"
29°54'00"
29°49'30"
STHY 390
Lake Breeze Dr
Hackberry
Alladin Rd
Main St
Commissary Point
Long Point
Sabine National Wildlife Refuge
Calcasieu Lake
West Cove
Rabbit Island
Calcasieu Ship Channel
Sabine Naional Wildlife Refuge
Moon Fina Texaco Oil Field Rd
Cameron
Calcasieu
STHY 27
STHY 82
Legend
Alligators
Crabs
Diving Birds
Marine Fish
Oysters
Sea Turtles
Seabirds
Shorebirds
Shrimp
Vegetation
Wading Birds
Waterfowl
Raptors
Shoreline Type
Developed
Salt Marsh
Sand Beach
N
1 0 1 2 Miles
Common Throughout Area
Common Throughout Wetlands
Cameron Parish
98
96
95
92
90
89
94
88
Gulf of Mexico
ESI Map
95
Source Data
RPI International Inc
J Connor
Consulting Inc
(281) 578-3388


93°40'30"
93°34'00"
29°58'30"
29°52'00"
29°45'30"
Legend
Alligators
Crabs
Diving Birds
Marine Fish
Oysters
Sea Turtles
Seabirds
Shorebirds
Shrimp
Vegetation
Wading Birds
Waterfowl
Raptors
Shoreline Type
Developed
Salt Marsh
Sand Beach
Sabine National Wildlife Refuge
Parish Rd 548
Parish Rd 538
Parish Rd 532
Oil Field Rd
STHY 27
STHY 82
Beach Rd
Ocean View Beach
Constance Beach
Peveto Beach
Gulf Of Mexico
N
1 0 1 2 Miles
Common Throughout Area
Common Throughout Wetlands
Common Throughout Gulf of Mexico
Cameron Parish
98
96
95
92
90
89
94
88
Gulf of Mexico
ESI Map
96
Source Data
RPI International,Inc.
J. Connor
Consulting Inc
(261) 575-3388


93°54'30"
93°49'00"
29°49'30"
29°44'00"
Sabine National Wildlife Refuge
Sabine Lake
Blue Buck Point
Parish Rd 545
Martin Luther King Jr Dr
STHY 82
S Gulfway Dr
STHY 87
Quinn St
1st Ave
Sabine Pass
Jetty Rd
43
60, 154
67, 139, 156
N
0.5 0 0.5 1 1.5 2 Miles
Legend
Alligators
Crabs
Diving Birds
Marine Fish
Oysters
Sea Turtles
Seabirds
Shorebirds
Shrimp
Vegetation
Wading Birds
Waterfowl
Raptors
Shoreline Type
Developed
Salt Marsh
Sand Beach
Common Throughout Area
43
5, 12, 14
8
76, 77
15, 68, 118, 121, 168, 173, 179
50
51
44
Common Throughout Wetlands
8, 37, 38, 43, 44
2, 33, 116
3
D, 141, 210
Cameron Parish
98
96
95
92
90
89
91
88
Gulf of Mexico
ESI Map
98
Source Data
RPI International,Inc
J. Connor
Consulting, Inc
(281) 578-3388


92°43'00"
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Parish Rd 113
Parish Rd 117
Parish Rd 104
Parish Rd 110
Parish Rd
STHY 332
Parish Rd
Mallard Bay
Intracoastal Waterway
Snake Lake
Umbrella Bay
Grand Lake
Collicon Lake
White Lake
54,87-90 168
93,94,115 121
116,149
Legend
Alligators
Crabs
Diving Birds
Marine Fish
Oysters
Sea Turtles
Seabirds
Shorebirds
Shrimp
Vegetation
Wading Birds
Waterfowl
Raptors
N
1 0 1 2 Miles
Common Throughout Area
15,6,8,12, 168,179
8,14
4
Common Throughout Wetlands
63,7,38, 43,44
C, 93, 115, 184,212
9,14
Common Throughout Lakes and Channels
21,34,180
43
22
50, 51
46
3
84
Cameron Parish
98
96
95
92
90
89
94
88
Gulf of Mexico
ESI Map
89
Cameron and Vermilion Parishes
Source Data
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J. Connor Consulting Inc
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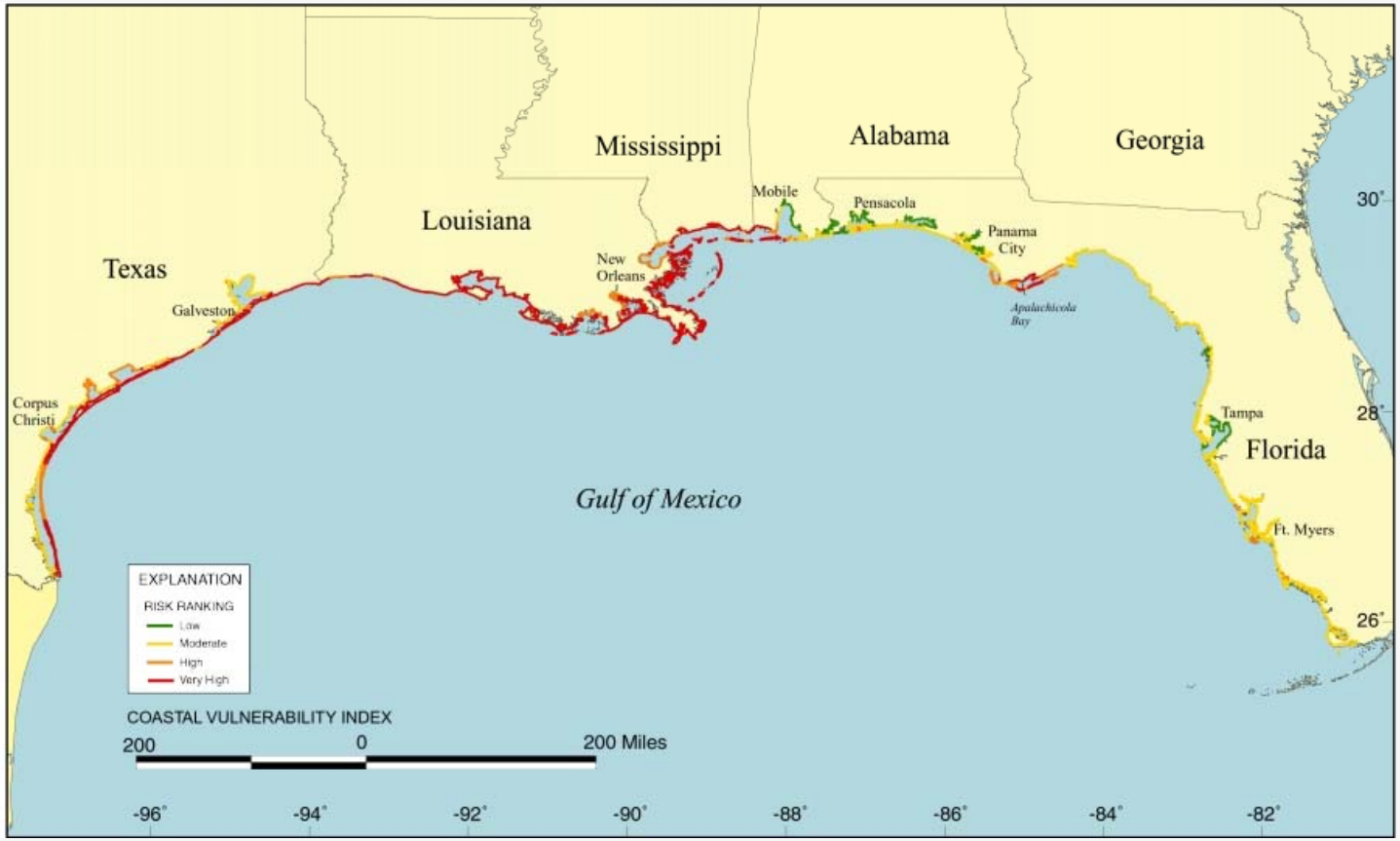

Mississippi
Alabama
Georgia
Louisiana
Texas
Mobile
Pensacola
Panama City
New Orleans
Galveston
Apalachicola Bay
Corpus Christi
Tampa
Florida
Gulf of Mexico
Ft. Myers
EXPLANATION
RISK RANKING
Low
Moderate
High
Very High
COASTAL VULNERABILITY INDEX
200
0
200 Miles
30°
28°
26°
-96°
-94°
-92°
-90°
-88°
-86°
-84°
-82°

12/30/2006 8:32:00 PM	Ross Mestayer MD, , 28242 Maria Drive, , Lacombe, LA, 70445, , mestayer@bellsouth.net	I have read the Preliminary Plan. Unfortunately it looks extremely expensive. My fear is the priority of projects will stray from Wetlands Restoration to hurricane protection. The hurricane protection methods most feared are more levees. Our coastline has been lost because of levees diverting sediment into the gulf. If any plan which gets implemented does not have the majority of it's effort directed toward long term solutions like major diversion projects as described by Gagliano we will be facing the ruin of South Louisiana.

1/4/2007 21:39	Mark Schexnayder, La. Sea Grant, 6640 Riverside Drive, Suite 200, Metairie, LA, 70003, USA, mschexnayder@agcenter.lsu.edu	It is obvious that a lot of smart folks put a lot of time and effort into this plan; it is a very good plan overall, especially considering the complexity and scale of the work proposed. I like very many of the projects and strategies proposed, including the gates on the Rigolets and Chef and the rebuilding of the locks. I would like to point out what I see as some other areas of concern. 1) Much more emphasis needs to be placed in meaningful (larger) inputs of Mississippi River waters into the upper Basins. Smaller amounts of water will do more good the further up the system they are introduced, with fewer impacts. Gary Schaefer estimates that up to 95% of the Maurepas cypress/tupelo forests are presently unsustainable, yet the current plan virtually ignores any meaningful flow into the upper Pontchartrain basin. It seems to me in (at least looking at where the lines are on the maps) that the Upper Barataria Basin gets a little better treatment in this first draft plan. Again, looking at the proposed size of the Hope Canal Re-Introduction Project, and the lack of any other meaningful sized inflows north of Violet, there seems to be some faults in the models and management objects used for the Pontchartrain Basin. The entire upper swamp system is in the process of collapse because of excessive amounts of salt water, yet our biggest tool that could fight this, the re-establishment of historic inflows from the Mississippi River, is not being used. 2) Utilization of existing structures and right of ways (such as Bonnet Carre and the Blind River PD 1-7 needs to be a much larger scale) would speed up implementation and reduce cost over establishing totally new projects. In the case of Bonnet Carre (we should change the name for political purposes if that helps), once the waters were near Lake Pontchartrain, outflow management projects could divert some of these waters back into the surrounding wetland areas, such as the Pontchartrain/Maurepas landbridge and Hwy 51 canal, to maximize benefits to surrounding wetlands. (see Lake Pontchartrain Basin Foundation Comprehensive Management Plan, 2005 for more details).

From: Jeff and Jara Roux [jeff@roux.org]

Sent: Monday, January 08, 2007 11:53 AM

To: comments@louisianacoastalplanning.org

Subject: Coastal Restoration Levees I 49 South

"I sent this to LA Speaks and they rec me fwding comments to you as well."

The proposed I 49 route from Raceland to the Westbank in Jefferson Parish is now to be elevated with a price tag in 2006$ of $2.6+B. An alternative route south of hwy 90 (elevated) that is not now in the discussion loop was projected at $1+B in 2005$. Reasons for non inclusion were given but need to be revisited after Katrina/Rita and taking into consideration the spiraling cost. The difference in $ could buy a lot of mitigation and the build of a parallel hwy would reduce building disruptions along a busy corridor and probably be completed in a shorter time frame.

Many studies are being done and one by the Corps is attempting to define risk in areas protected by levees in the Metropolitan area of New Orleans. This particular area of I 49 South is only inside a levee area in the Jefferson Parish area and therefore risk will not be defined.

Relationship Define the coastal restoration projects in the project area and time line for completion
Select a levee alignment and a time line for completion
Run the risk analysis of the proposed restoration and levee projects and come up with a decision if the route needs to be elevated or can be just at a higher elevation. (The decision to elevate I49 does not include the portion from Raceland to the elevated portion east of Morgan City and the ensuing costs which will be higher than the $# above. An event that requires an elevated hwy is not going to recognize Bayou Lafourche in Raceland as a demarcation line).

Another alternative if the levee alignment along the Inter Coastal Waterway is selected is to build an elevated hwy (possible toll road) from Lafitte to Larose alongside the levee. I 49 would have to take a back seat but the hwy along the levee may have other useful purposes as an aqueduct to help with coastal restoration projects (siphons/diversions/pumping) in the area.

The New Orleans/Fourchon/Lafayette triangle is important for the local/state/national interests but the escalating building costs and limited resources require another look.

Jeff Roux
10391 River Road
Ama La 70031

From: Colleen Starks [csbiloxi@bellsouth.net]

Sent: Wednesday, January 10, 2007 10:03 AM

To: CPRA Comments

Cc: 'William B. Rudolf'

Subject: Comments Concerning Comprehensive Coastal Protection Master Plan for LA-Prelminary Draft

Attachments: BMLC - CPRA public comments 12 14 06.pdf

Attached are comments from Biloxi Marsh Land Corporation and Lake Eugenie Land & Development, Inc. on The Comprehensive Coastal Protection Master Plan for Louisiana – Preliminary Draft.

For your review –

Colleen Starks
Biloxi Marsh Lands Corporation
Lake Eugenie Land & Development, Inc.
Phone: 504.837.4337

Biloxi Marsh Lands Corporation
Lake Eugenie Land & Development, Inc.
1605 Airline Drive, Suite 103
Metairie, Louisiana 70001
Phone: (504) 837-4337
Fax: (504) 837-1889

December 14, 2006

CPRA Integrated Planning Team
Department of Natural Resources
P.O. Box 94396
Baton Rouge, LA 70804-9396

RE: Biloxi Marsh Lands Corporation and Lake Eugenie Land Development Company
St. Bernard Parish, Louisiana
Comments concerning Comprehensive Coastal Protection Master Plan for Louisiana – Preliminary Draft

CPRA Integrated Planning Team,

The Biloxi Marsh Lands Corporation and Lake Eugenie Land Development Company (owner of 150,000 acres in St. Bernard Parish) appreciate this opportunity to comment on the Coastal Protection and Restoration Authority (CPRA) Preliminary Draft Master Plan (CPRA Draft Plan). Our comments are as follows:

We began our participation in the Coastal Protection and Restoration Authority (CPRA) planning initiative in March 2006 during the very first 2006 public meetings. On May 26, 2006 we were able to attend a meeting between us and Department of Natural Resources (LDNR) personnel Scott Angelle, Randy Hanchey, and Jon Porterhouse. At this meeting, we were able to present the components of The Biloxi Marsh Stabilization and Restoration Plan[1] (BMP) through a PowerPoint presentation and our Executive Summary. On June 15, 2006, we met with LDNR personnel from their Integrated Planning Team (IPT), Coastal Impact Assistance Program (CIAP), and land rights department. Again we presented a PowerPoint presentation and the completed BMP. On June 16, 2006, we again met with Secretary Scott Angelle and provided him with copies of the BMP. Following these initial meetings, we had several opportunities to talk with IPT team members Norwyn Johnson, Jean Cowan, and Michele Deshotels along with

[1] http://www.biloximarshlandscorp.com/restorationplan.htm

O'Neil Marlborough (LDNR consultant) about the BMP. In each instance, they assured us that the BMP was being considered by both the IPT team and their select technical expert team that included the Science and Engineering Review Team (SERT), representatives form federal, state, and local agencies, parishes, levee districts, universities, and specialized nongovernmental organizations. These meetings were closed to the public and it was difficult for us to determine how the BMP was actually be integrated into CPRA planning effort. We had asked for landowner representation at these IPT/SERT meetings on several occasions (including the March 2006 public meeting), however, we were not allowed a seat at the table. Only during the Louisiana Landowner Association (LLA) CPRA stakeholder meeting on September 8, 2006, were we able to find out what the CPRA planned for the Pontchartrain Basin. At that meeting, we commented that shoreline protection needed to extend from the Northeast to the Southwest along the entire perimeter of the Biloxi Marsh complex. We were assured at that time that our comments were recorded and would be considered.

On July 27, 2006, the U.S. Army Corps of Engineers (COE) began a series of stakeholder *MRGO Deauthorization Study* meetings for closing of the MRGO to deep draft vessels. According to the COE's definition, deep draft navigation is anything over 15ft. The stakeholders attending these meetings included federal, state, and local governments, landowners, academic and environmental community, navigation interests, and local business interests. Personnel from the COE's Galveston District participated in the discussions and were there to assist in compiling stakeholder comments into the deauthorization study recommendations. From this group came three regional plans (BMP, The Lake Pontchartrain Basin Foundation Plan, and St. Bernard Parish Plan) for hurricane protection and coastal restoration. From these plans and stakeholder comments, this group developed 16 consensus items (Attachment) for hurricane protection and marsh restoration that they wanted included in the *MRGO Deauthorization Study*. At the beginning of these meetings, LDNR was present and listened to all concerns and recommendations of the stakeholders. In September 2006, however, the State of Louisiana joined in a lawsuit by St. Bernard Parish residents and St. Bernard Parish against the COE to close the MRGO and to restore the wetlands. From this point on, LDNR no longer attended the COE stakeholder meetings. This was too bad because I know of no other basin that had such a diverse group of stakeholders that worked through consensus items and asked that they be included in the planning efforts for their basin. At these meetings, there was concern expressed by the stakeholders that the CPRA and the federal Louisiana Coastal Protection and Restoration Act (LACPR) were not working together toward a common goal. Absence from participation by the LDNR IPT near the end of these stakeholder meetings was evident. In our opinion, these stakeholder meetings were probably the most in depth and consensus oriented meetings for any Planning Unit in the State and was exactly what is needed in order to demonstrate a united front to the nation during the funding solicitation process. As you know, finding

consensus is painful, but was actually done by this group for the Pontchartrain Basin. We believe these consensus recommendations were supported by all the Pontchartrain Basin stakeholders and should be included as a list within the CPRA Plan. This list can be presented to our congressional delegation in their efforts to solicit funding for Planning Unit 1. In our opinion, the level of consensus for this Planning Unit makes it the ideal region to **begin** our restoration efforts. The stakeholder participation template used for this Planning Unit can then be used to help form consensus within the other planning units.

Our comments concerning specific components of the CPRA Draft Plan are as follows:

1. Barrier Shorelines – The CPRA Draft Plan states that "the Chandeleur Islands are far enough from the mainland that their storm protection function is minimal." The plan only recommends working with the Department of Interior to develop a management plan for continuing to maintain the area as a national wildlife refuge. **We disagree with this assumption**. **We believe that the Chandeleur Islands are essential to the protection of the Biloxi Marsh, St. Bernard Parish, and the New Orleans metropolitan area and need to be restored to historic conditions.** To simply maintain them as a National Wildlife Refuge (NWR) will assuredly call for the total erosion and disappearing of this important barrier island chain. The BMP plan recommends a significant restoration effort of the Chandeleur Island that includes hard structure on the seaward shoreline. If the Chandeleur Islands continue with present management practices, they will disappear. If they disappear, we will completely lose our first "line of defense." If the State takes the position that we going to use the Multiple Lines of Defense strategy (page 23 of CPRA Draft Plan) then they are already giving up on the very first line of defense. The Chandeleur Islands are an integral component for protecting the Pontchartrain Basin, are included in the consensus items for the *MRGO Deauthorization Study*, and their restoration should be included in the CPRA PLAN.

   The importance of this barrier island as the "first line of defense" was reiterated by Paul McIlhenny (McIlhenny Company), Newman Trowbridge (Louisiana Landowners Association), and Junior Rodriguez (St. Bernard Parish President) at the Governor's Coastal Advisory Commission meeting at the CPRA Plan presentation on December 8, 2006. It makes no since to ignore an obvious line of defense that creates the first barrier approximately 55 miles seaward of the first St. Bernard Parish hurricane protection levee. According to the CPRA Plan aggressive coastal restoration and protection would begin in the lower Biloxi Marsh at the Bayou LaLoutre Ridge which is 37 miles inland from the Chandeleur Islands. This would be a retreat for

aggressive coastal restoration and protection of 18 miles. Please do not misunderstand that the protection components in the CPRA Plan must remain as shown in the draft, however, the Chandeleur Islands as the "first line of defense" must be included in the final plan.

2. Ridges – The CPRA Draft Plan recommends the restoration of the Bayou LaLoutre Ridge. We are in agreement in principal. However, **we are concerned that any plan to close MRGO that does not allow shallow draft commercial, fishing and recreational vessel traffic to transit to the open Gulf using the MRGO south of Bayou LaLoutre will redirect this marine traffic down Bayou LaLoutre causing additional bank erosion and ridge degradation**. We believe that any regional plan must include bank stabilization along Bayou LaLoutre east of MRGO as well a rebuilding of the Ridge.

3. Shoreline Stabilization – We agree with the plans shoreline protection on 2/3rds of the Biloxi Marsh, however, we recommend additional shoreline protection to the seaward shoreline both north and south of the MRGO (Figure 1 – yellow line). Again, we believe that the lines of defense need to start at the most seaward reaches of healthy wetlands and not many miles inland. It is essential that we protect the outer shoreline reaches which will in turn protect interior wetlands. It does not make since to start our protection at the Bayou LaLoutre Ridge and sacrifice all the seaward marshes. Protection of the outer reaches will be much more cost effective over the long term by creating shoreline protection over 10 miles seaward of the Bayou LaLoutre Ridge. The State is taking a position that the erosion of the wetlands southeast of the Bayou LaLoutre Ridge can continue unabated until it reaches the Ridge. In our opinion, this is unacceptable.
4. Navigation Channels – We are in agreement with the CPRA Draft Plan that navigation channels can be used as conduits for freshwater, but they must contain some type of saltwater barrier, either through freshwater flow or water control structures. The CPRA Draft Plan shows some type of barrier in the MRGO at the Bayou LaLoutre Ridge. We agree.
5. Land Sustaining Diversions – We completely agree and are glad to see the recommendation to construct a large Mississippi River Reintroduction near Violet, Louisiana. It was a cornerstone to our plan (BMP) and we believe it is essential to the region. It is also a consensus item of the MRGO Deauthorization Study stakeholders. We would like to see a significant diversion that meets historic habitat salinity ranges for the Biloxi Marsh. This can only be determined by hydrologic modeling.

6. Marsh Creation – We are in support of marsh creation as shown in the CPRA Draft Plan, but we still do not understand why there is no marsh creation recommended for the area between the Bayou LaLoutre Ridge and the MRGO. We recommend expanding the marsh creation component of the plan between the Ridge and the MRGO (Figure 2 – yellow polygon). It makes no sense to leave this area out of the plan. It is obviously very important to the protection of the New Orleans/St. Bernard metropolitan area.

7. Mississippi River Gulf Outlet – We are in support of the MRGO closure plan except we again recommend the shoreline protection and marsh creation components mentioned above.
8. Pontchartrain Barrier – No comment.

Conclusion

Overall we are pleased to see many of the elements of our plan incorporated in the CPRA Draft Plan; however, we are concerned that it does not go far enough in the Pontchartrain Basin. We are cognizant of the effort by the State of Louisiana to control spending, but it is our opinion that the plan leaves out the key components mentioned above, namely protection of Chandeleur Island and more extensive shoreline protection and marsh creation between the Bayou LaLoutre Ridge and the MRGO. **We are concerned that any plan to close MRGO that does not allow shallow draft commercial, fishing and recreational vessel traffic to transit to the open Gulf using the MRGO south of Bayou LaLoutre will redirect this marine traffic down Bayou LaLoutre causing additional bank erosion along Bayou LaLoutre and degradation to the Ridge.** This plan is very broad and the components of the plan have no specificity or cost estimates. We believe that the recommendation mentioned need to be an essential part of the plan. If they are not, it will be very difficult for the landowner, local, state, and federal resource agencies to recommend work in these areas because we believe this plan will become the standard for all restoration efforts within the State.

We would again like to thank you for being allowed to present The Biloxi Marsh Stabilization and Restoration Plan to the Secretary of LDNR and to the CPRA planning team. We are also very appreciative that the plan was given careful consideration in the CPRA Preliminary Draft.

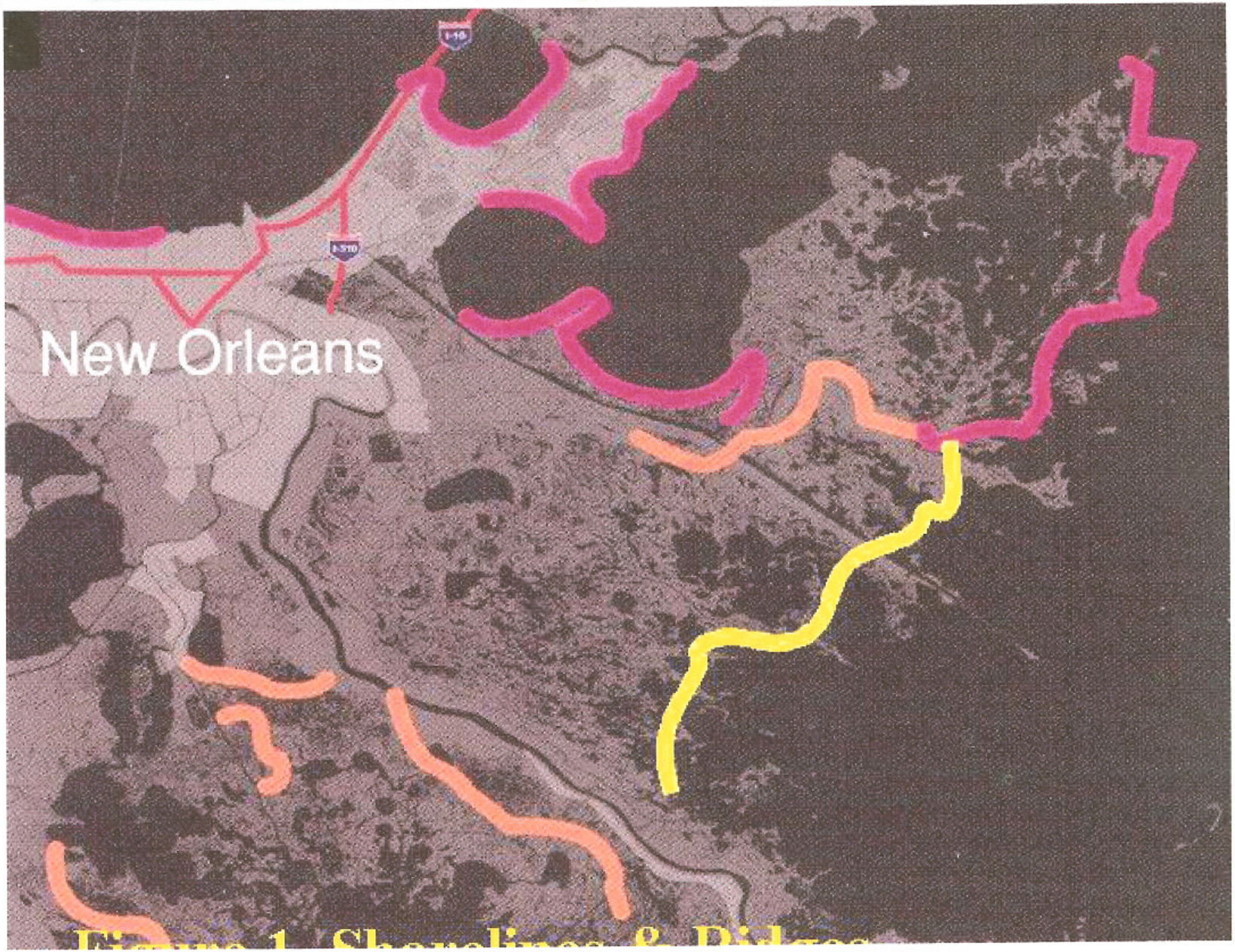
Sincerely,

William B. Rudolf
President and CEO, Biloxi Marsh Lands Corporation
Vice-President and General Manager, Lake Eugenie Land & Development, Inc

WBR:cbs

MRGO CONSENSUS PRIORITIZATION
9/20/06

ITEM NUMBER	DESCRIPTION	PUBLIC SAFETY	ENVIRONMENT	ECONOMIC	COMMENTS
1	Overall, establish Habitat Goals of returning the landscape to historic (1912 – 1932) pre-MRGO conditions (as defined by LPBF's Comprehensive Habitat Management Plan		LONG TERM		1. Dependent of freshwater introduction and constriction/plugging of MRGO 2. Will probably require dredging of Bayou La Loutre
2	Restore Bayou LaLoutre Ridge east of the MRGO to Christmas Camp Lake with introduced sediment and replanting of forest	NEAR TERM	NEAR TERM		1. Will require dredging of Bayou La Loutre; refurbishment of ridge; vegetative planting; freshening of system
3	"Something" located in the MRGO at the Bayou LaLoutre Ridge. There were numerous suggestions but no consensus as to what this 'something' needs to be.	NEAR TERM	NEAR TERM		1. Plug, lock, water control structure, weir
4	Restoration of the Chandeleur Islands with beach nourishment, and including armoring, if necessary.	NEAR TERM	NEAR TERM		1. Breton NWR - Designated Wilderness Area - need clarification from FWS on what type of protection/restoration techniques will be allowed 2. Need legislative de-listing of area as Wilderness Area
5	River reintroductions are needed, including but not limited to one at or near the site of the current Violet siphon, Bayou Dupre, and Bayou Bienvenue. The goal of the river reintroduction is to re-establish historic habitats. It was noted and agreed upon to be sure impacts to navigation on the Mississippi River were considered in all modeling efforts for these and other potential freshwater introductions.	NEAR TERM/LONG TERM	NEAR TERM/LONG TERM	NEAR TERM/LONG TERM	1. Need hydrologic modeling to determine size and location of fresh water introduction(s) (i.e. Violet Canal, Bayou Bienvenue, Bayou Dupre)
6	Long-distance slurry pipeline of sediment for purposes of land restoration throughout the project area.		NEAR TERM	NEAR TERM	1. Need to identify areas for rebuilding marsh platform (i.e. Chandeleur Islands, Lake Athanasio) 2. Need to identify borrow sites (Chandeleur Sound, Lake Bourgne)
7	Improve existing levees, armor them (MRGO levee including banks), increase height where needed and protect them with restored marsh (marsh aprons)	NEAR TERM			1. Use St. Bernard Parish levee height recommendations 2. Restore marsh aprons starting with narrowest and working to widest
8	Storm breakwaters constructed from the Golden Triangle to Bayou St. Malo.	NEAR TERM			1. Determine type of breakwaters (i.e. concrete panels, boudin bags, sunken ships) 2. Initiate feasibility study immediately then planning and design
9	Shoreline protection from the Golden Triangle to Bayou St. Malo.	NEAR TERM	NEAR TERM		1. Rock armoring
10	A levee constructed from approximately Verret to the GIWW including protecting the land of the Golden Triangle.	LONG TERM			1. Initiate planning and design
11	Assured maintenance of MRGO by the Federal Government to new authorized draft.			NEAR TERM	1. Plan recommendation
12	No gate constructed across the MRGO/GIWW at Paris Road	NO LONGER AN ISSUE			
13	Fully fund a deep draft lock at the IHNC and fast track this project to provide access for navigation to businesses currently relying on the MRGO.			NEAR TERM	1. Plan recommendation
14	Find relocation funding for existing businesses that currently rely on the MRGO			NEAR TERM	1. Plann recommendation
15	Subsidize businesses until they are relocated or viable.			NEAR TERM	1. Plan recommendation
16	Restore the Biloxi Marshes	NEAR TERM	NEAR TERM		1. Use Biloxi Marsh Lands Corporation; St. Bernard Parish; LPBF recommendations


New Orleans

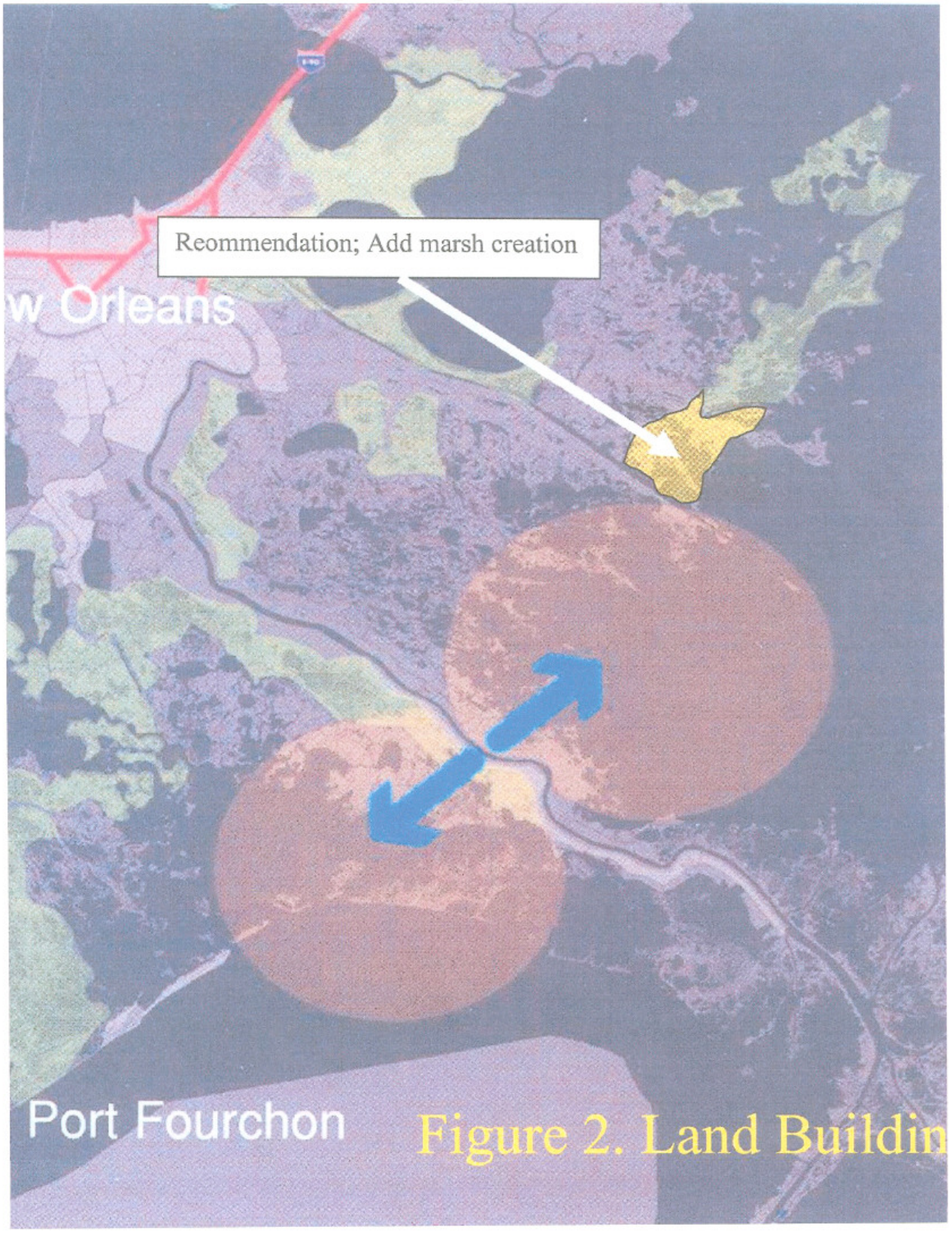


Figure 2. Land Buildin

Coastal Protection and Restoration Authority
Integrated Planning Team

PUBLIC MEETING COMMENT FORM

Comprehensive Coastal Protection Master Plan for Louisiana
Preliminary Draft

To insure that your written comments are considered, they should be turned in this evening at the reception desks located near the entrance or mailed to the following address so that the comments are received no later than January 5, 2007:

CPRA – IPT
DNR
Post Office Box 94396
Baton Rouge, LA 70804-9396

Email comments may additionally be submitted at: comments@louisianacoastalplanning.org

Please consider the following comments:

It seems quite ironic, Plaquemines Parish through which the last 80 miles of the Mississippi river flows, receives so little funding for hurricane protection.

Any channel diversion of the river should be to the East of the river to keep from cutting off the lower end of Plaquemines Parish on the westbank which is populated south to Venice.

(Use the back of this form if more room is needed)

Name: David J. Eppenheimer Date: 12-31-06

Address: 420 Palm Dr. Braithwaite, La. 70040

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Email comments may additionally be submitted at: comments@louisianacoastalplanning.org

Please consider the following comments:

The non-federal levee on the Eastbank of Plaquemines Parish should be fully rebuilt now before the 2007 hurricane season. Then, over time it should be brought up to a catagory 5 protection for residents.

The Mississippi Levee in the Nails Point area is not considered a part of the hurricane levee protection system. That needs to change because storm surge did over-top the levee in this area. Now it is much too low and needs to be higher.

Drainage needs to be addressed for both east and west banks of Plaquemines Parish. Once storm surge or rain water fills the area, pumps can not keep up causing roads to close and area to flood.

(Use the back of this form if more room is needed)

Name: Mildred Martin Date: 12-28-06

Address: 170 Bee la Place Braithwaite, La. 70040

From: Adinolfi, Frederick [Frederick.Adinolfi@mms.gov]
Sent: Wednesday, December 20, 2006 5:54 PM
To: comments@louisianacoastalplanning.org
Subject: Baton Rouge Fault

Attachments: Baton Rouge Fault System.doc

Please add this to the public comments submitted by mail. You may not have yet received it.

The Rigolets are the topographic expression of the largest active fault system across South Louisiana. Any seawall, levee, dam, or bridge built across the Rigolets fault (channel) must account for movement (down to the west) and north/south slip along the fault into consideration.

The Mississippi River follows a major strike-slip fault offshore downriver from Crown Point. These faults can be mapped with a simple seismic survey. They may have been already documented. The data should be available from the LA Dept. of Natural Resources or any oil company that has production
In Plaquemines Parish.

Frederick Adinolfi
222 Deckbar Ave. Apt.128
Jefferson, LA 70121

<<Baton Rouge Fault System.doc>>

- Gulf Coast Association of Geological Societies Meeting, 2004. San Antonio Texas

Relation between Holocene and Tertiary normal faults: A comparison of shallow seismic and gravity data with deep well data across the Baton Rouge fault system, northern Gulf of Mexico coast, Louisiana, USA.

Juan M. Lorenzo,[1] Carrie Cazes,[1] Clay Westbrook,[1] Allen Lowrie,[2] and Ivor Van Heerden[3]

[1]Department Geology and Geophysics, Louisiana State University, Baton Rouge, Louisiana 70803-4101

[2]Consultant, 238 F. Z. Goss Road, Picayune, Mississippi 39466

[3]Louisiana State University Hurricane Center, Louisiana 70803-4101

Extended Abstract

The Tepetate-Baton Rouge fault system traverses Louisiana from west (Tepetate system) to east (Baton Rouge system), and continues east and south of the Pearl River. This fault system is part of a larger, regional, down-to-the-basin fault system along the northern Gulf of Mexico that extends into eastern Mexico (Murray, 1961). Within our study area (Fig. 1) productive hydrocarbon accumulations occur principally south of the Baton Rouge fault-line scarp in deep (~5-10,000 feet) rollover structures, downthrown to the fault. Immediately to the north of the fault there are no equivalent structural traps. Shallow (<1000 ft) hydrogeology studies suggest that fluids can migrate across the fault zone.

Extensive, but unpublished well data from oil and gas exploration has generally suggested the existence of E-W striking subsurface growth fault trends but correlation with much lesser studied near-surface faults is lacking. By comparison, the location of shallow (< 1500 ft) growth faults, their geophysical characterization and the natural moderators that control their rates of movement in the southern Gulf Coast region are poorly known. We show for the first time that fault-line scarps are parallel to subsurface growth fault traces that are mapped within productive hydrocarbon intervals. At depth, this fault system exhibits late Eocene to Oligocene synextensional growth strata. Maps of surface, fault-line scarps (McCulloh, 1991 and 1996) indicate reactivation of these growth faults during at least the Quaternary. New laser altimetry data (www.atlas.lsu.edu) (Fig. 1) helps verify and modify prior interpretation of fault-line scarp locations.

Overlapping normal fault segments along the central Baton Rouge fault system, in Livingston Parish, may develop ramps that serve to divert local stream flow from a general N-S direction into a more NW-SE direction. We use new, high-resolution gravity data (+/- .01 milligal), digital elevation models (LiDAR, +/- 1 ft; Light Detection and Ranging), and borehole data (<100 ft depth), to investigate the effects of ramp evolution on sediment history. Associated shallow (<300 ft) sedimentary bodies can be discerned in gravity models. Gravity data reveals there is no consistent spatial relation between the

northern limits of Bouguer gravity anomalies and location of the fault-line scarp. However, gravity anomalies are probably associated with denser (sand) elongated units oriented parallel-to-subparallel to the strike of the fault-line scarp and within the overlap zone. Interpreted sand bodies increase in width (~500-3,000 ft) and thickness (~150-250 ft) toward the east where the fault offset is expected to be greater and accommodation created by the rollover larger. A fault zone ~300 ft-wide extends from the northern fault-line scarp southward, as interpreted from high-resolution (~100-350 Hz), seismic data. Together with forced folds and late-stage multiple fracture directions that are expected from competent rock models of overlapping normal fault zones (Peacock and Sanderson, 1991), a complex sediment distribution pattern is predicted.

References

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Miller, B., McCulloh, R.P., John, C.J., Harder, B., and R. Bourgeois, 2002, Occurrence and structural control of hydrocarbon production associated with the Baton Rouge Fault zone, Louisiana: American Association of Petroleum Geologists Annual Meeting Abstracts, 2002.

Murray, G.E., 1961, Geology of the Atlantic and Gulf coastal province of North America: New York, Harper and Brothers, 692 pp.

Peacock, D.C.P. and D.J. Sanderson, 1991, Displacements, segment linkage and relay ramps in normal fault zones: Journal of Structural Geology, v22, p. 1359-1367.

December 19, 2006

Singletary & Associates
508 River Oaks Drive
New Orleans, LA 70131-5208
Phone 504-393-4859
TaradactylTaraTS@netscape.net

CPRA-IPT
DNR
PO BOX 94396
Baton Rouge, LA 70804-9396

RE: ***Comprehensive Coastal Protection Master Plan for Louisiana Preliminary Draft (with Appendixes A-K)***

Dear Sir/Madam:

Please send a hard copy of the above publication to the above address. If there is a fee, please inform us as to whether we need to send payment beforehand or will be invoiced. Thank you for your attention.

Sincerely,

Tara Singletary

Tara Singletary

TSS:
/tss

Coastal Protection and Restoration Authority
Integrated Planning Team

PUBLIC MEETING COMMENT FORM

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Preliminary Draft

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Post Office Box 94396
Baton Rouge, LA 70804-9396

Email comments may additionally be submitted at: comments@louisianacoastalplanning.org

Please consider the following comments:

1) The Mississippi River should not be rerouted to the East & West of Plaquemines Parish. The Parish is already divided East & West. The government and community interaction would be most difficult. How would the residents of Plaquemines East South and West South would be cut off and would need another ferry for food, medicine and entertainment. We should not change the flow of the Mississippi River.
2) The Wetlands should be rebuilt with the sand dredged from the mouth of the Mississippi River instead of it being pumped into the Gulf of Mexico.
3) The back levee of the East bank (from Braithwaite to White Ditch should be ~~put on the~~ certified and the West bank from Myrtle Grove to Venice. They should be rebuilt to the standard 100 year ratio to protect the people, citrus, oil refineries, Electric Coal Plant, B.P. Oil, Chemical plants, vegetables (over)

(Use the back of this form if more room is needed)

Name: Emma M. Cousin Date: Dec. 18, 2006

Address: 5015 Hwy 39; Braithwaite, LA 70040

Page 1 of 2

and seafood industries. These company along with the oil and gas revenues make a big impact on the States tax revenues.

4) The approval of the oil and gas to receive a large tax payment and this should be used to rebuild our homes and wetlands.

5) Do not forget Fort Jackson and Fort St. Philip as national monuments for the nation.

6) It has been proved that the final water diversion in Breithaupt is not rebuilding the wetlands but has a reverse effect and is actly eating away at what remains.

7) We the citizens of Plaquemines Parish pay our taxes and we should be guaranteed the preservation of our lives (by the Constitution of the USA). We should be protected by levees and the rebuilt wetlands. Our numbers should not matter because all citizens of the USA should be treated equal. If you follow through this draft plan it would be destroying our homes and our way of life. In other words- Our American Dream.

I have lived here in Plaquemines parish all my life and all the people in Plaquemines Parish want to continue our way of life here.

Page 2 of 2

From: JLPoyadou@aol.com
Sent: Wednesday, December 13, 2006 8:39 AM
To: comments@louisianacoastalplanning.org
Cc: JLPoyadou@aol.com
Subject: Plaquemines Parish

Why is the lower end of Plaquemines Parish being left out of the levee planning. What happened to the Oil Royalities money, the state claimed if we get the money that they would fix our levee's without the government's help. WE WANT PROTECTION TOO!!!!!!!!!!!!!!!!!!!!!!

The oil revenues comes from our parish and this is the thanks we get. We choose to live here and we will not be driven out. This is America the land of the Free.

From: Greg Nothacker [mailto:gregn@zenmarkinc.com]
Sent: Thursday, November 30, 2006 2:37 PM
To: Michele Deshotels
Subject: Lower Plaquemines

Mr. Deshotels,

I have a client who owns an immovable business in lower Plaquemines. In reading the Preliminary Draft of the Comprehensive Plan, I saw no mention of "buyout" or compensation to businesses that would be impacted. My client's facility has a finite life of approximately 20-25 years and a calculable present value. How does the committee plan to address this issue? Thank you.
Sincerely

Greg Nothacker, MBA
Sr. Consultant
ZenMark, Inc. New Orleans/Austin
Cell 832.474.3384
gregn@zenmarkinc.com

From: Jane Tesvich [jptesvich@yahoo.com]
Sent: Friday, January 05, 2007 4:01 PM
To: comments@louisianacoastalplanning.org
Subject: comments on LA Master Plan
Attachments: LA Master Plan.doc

Here's my comments. Jane Tesvich

Comments to the Louisiana Coastal Planning Members:

I am a lifelong stakeholder from Plaquemines Parish that will be affected by the Comprehensive Coastal Protection Master Plan for Louisiana. I live south of Myrtle Grove and Phoenix where the proposed plan states that the levees would be maintained at their current height. The plan also states that my area would not receive enhanced hurricane protection. I do not need "enhanced protection", but I do need and expect wetland restoration. This is a priority for my community. The preface to the Master Plan states that "scientists, engineers, and policy makers have long worked to improve flood protection and wetland restoration in the region." This statement is just not true. My community would not have been so vastly devastated if the wetlands had been there to lessen some of the storm surge. The preface also states that the Louisiana coastal problem has changed from a crisis to an emergency. Our emergency status requires the fastest, most effective method possible to rebuild our wetlands which would be the use of a pipeline sediment delivery system. Remember: This is an emergency!!!

Why do I need wetland restoration? -To increase flood protection for my community
Why do I need flood protection? -To maintain my valuable community life
Why do I need to maintain my valuable community life? -To provide the workforce for the shipping, fisheries, and oil industry
Why does my community need to provide the workforce for the shipping, fisheries, and oil industry? -To supply the nation with essential products used daily

In addition, wetland restoration for the Plaquemines Parish area would also serve as the first line of defense during a hurricane for protecting the city of New Orleans.

Nature may not have been very fair to our area, but that is more understandable than the continued injustices done by scientists, engineers, and policy makers that neglect our part of the world by not restoring our wetlands in the swiftest manner possible.

Concerned citizen,
Jane Tesvich

RE: South Lafourche Levees

Bonjour

1-2-07

CPRA

Gentlemen:

Please consider granting to the South Lafourche Levee system a higher elevation than the 100yr. structural level of protection -

Also, please consider construction of the additional higher levees between Golden Meadow and Point-au-Chien -

For the east side of South Lafourche, we encourage

II

Bonjour

you to utilize the Donaldsonville to the Gulf Levee Alignment -

We appreciate your kind consideration of these three points of great interest to us living in the South Lafourche area -

Thank You,

Gail D. Adams
Carl J. Adams
Dean M. Adams
[illegible]

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Integrated Planning Team

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Please consider the following comments:

I AM LOOKING AT YOUR PRELIMINARY DRAFT BOOKLET ON PAGE 42. THE LEVEE IN THE 10TH WARD SHOULD BE EQUAL TO OR CLOSE TO THE HIGHT OF THE NEW BILLION DOLLOR HIGHWAY FROM GOLDEN MEADOW TO FOURCHON. IF WE DO NOT RAISE LEVEES IN THE LAFOURCHE PARISH LEVEE SYSTEN TO 500 YEAR OR 0.2 LEVELS WE WILL HAVE A ONE BILLION DOLLOR HIGHWAY UNASSESABLE IF THE SOUTH LAFOURCHE AREA FLOODS. WE HAVE THE NUMBER ONE ENERGY PRODUCING PORT IN THE U.S. AND IF IT IS UN-ASSESABLE WE WILL HAVE WASTED ONE BILLION DOLLORS. THE COMMUNITY AND THE CONTRY DESERVES AT LEAST 500 YEAR PROTECTION OR CLOSE TO THAT. PLEASE CONSIDER WHAT IS RIGHT FOR THE COMMUNITY AND THE CONTRY. HOW WILL YOU EXPLAINE TO THE COMMUNITY OF LAFOURCHE THAT YOU ARE BUILDING A LEVEE THAT WOULD NOT PROTECT THE USAGE OF A BILLION DOLLAR HIGHWAY. IF NOT A 0.2 PROTECTION PLEAS →

(Use the back of this form if more room is needed)

Name: TRACY CUROLE Date: 12-29-06

Address: 163 SUZANNE ST. LOCKPORT, LA. 70374

CONSIDER A 0.3 OR 0.4 PROTECTION. I DO NOT FEEL THAT 1.0 PROTECTION IS ADEQUATE FOR THE COMMUNITY WITH A BILLION DOLLOR HIGHWAY & THE NUMBER ONE PORT FOR ENERGY IN THE SOUTH LOUISIANA AREA.

WE ALSO NEED DREDGES OF 100 INCHES TO PUMP SAND ONTO OUR COSTAL MARSHES & BARRIER ISLANDS. LOCALS HAVE THE TECHNOLIGY TO DESIGN & OPPERATE THESE DREDGES. THESE COULD OPPERATE 24 HOURS A DAY TO BUILD UP OUR MARSHES & BARRIER ISLANDS

FINALLY, CONSIDER ARMOURING THE COAST WITH ROCK JETTIES OR USING OLD GRAIN BARGES FILLED WITH ROCK AS HAS BEEN DONE AT GRAND ISLE AND PORT FOURCHON. RESPECTIVELY. YOU CAN SEE FROM FLYING OVER FOURCHON THAT THE ARMOURING SAVED SOME OF FOURCHON BEACH.

Coastal Protection and Restoration Authority
Integrated Planning Team

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DNR
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Please consider the following comments:

The First Line of Protection should be The First Project To be completed. If not The First Line will be gone. and The Fist Line will move north. and The Road To The Port of Fourchon and access To oil field will not be There for many more years. The State economy will Suffer.

So Please help out with The Coast, and The Lafourche & Lower Parishes.

(Use the back of this form if more room is needed)

Name: Eddie Tyler Date: 1-03-07

Address: Po Box 396 Laroso La

CPRA-IPT
DNR
PO Box 94396
Baton Rouge,LA 70804-9396

Dear Ms./Sir:

Respectfully and adamantly these requests are made.

First, consider granting to the South Lafourche Levee System a HIGHER elevation than the hundred year structural level of protection which is insufficient.

Second, please consider constructing additional higher levees between Golden Meadow and Point-au-Chien.

Third, you are encouraged to utilize the Donaldsonville to the Gulf Levee Alignment.

As a widow, I request these on behalf of ALL widows who don't want to deal with the loss of home, relatives, and property. As a teacher, I BEG for these improvements so I will not have to look in the eyes of the young children and have to explain why

adults who could have helped and protected them and their homes chose not to do so.

Sincerely,

Joy Segura 1/2/07

Joy Segura, Widows,
School Children

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Construct the additional levee between Golden Meadow and Point-aux-Chene.

Construct the Morganza to the Gulf levee alignment.

Construct the Donaldsonville to the Gulf levee. This levee will provide protection to 400,000 residents.

Fund the conversion of the Larose and Golden Meadow flood gates on Bayou Lafourche into operating locks. Bayou Lafourche will be of increasing importance to America as a navigable channel, barging commodities to Port Fourchon.

(Use the back of this form if more room is needed)

Name: MAURICE GUIDRY Date: 1/3/07

Address: 886 E 5th St Galliano LA 70345

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Name: Rachel Gindry Date: 1/3/07

Address: 286 East 28th Street, Cutoff, LA 70345

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Name: Maurice A. Pisani Date: 1/3/07

Address: P.O. Box 334 Larose, La. 70373

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Name: Michael C. Compeaux Date: 1-3-06

Address: 1289/04 East 29a St. Cut Off, LA 70345

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Name: James Bonvillain Date: 1/3/07

Address: 115 PLANTATION DR. CUT OFF LA 70345

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Name: David A. Guidry Date: 01-03-07

Address: P.O. Box 1266 Larose, LA 70373

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Name: Dora Bundy Date: 1/3/07

Address: 319 E. 14th Pl Cut Off, La 70345

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(Use the back of this form if more room is needed)

Name: Mr. & Mrs. Teddy Ledet Date: 1/3/07

Address: 136 Adam Blvd.

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Name: Herman C. Hukins Date: 1/3/07

Address: 210 West 26 St. Cut Off, LA. 70345

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Name: Ashley A LeBlanc Date: 1-3-07

Address: 405 West 11th Street Cut Off, LA 70345

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Name: Michael Rogers Date: 1-3-07

Address: 231 W. 107th Street Cut Off La 70345

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Name: Amber Jenkins Date: 1-3-07

Address: 203 West 32nd Cut off, La 70345

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Name: Amanda Terrebonne Date: 1/3/07

Address: 123 East 26th Place, Cut Off, LA. 70345

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Name: Kristie P. Domangue Date: 1-3-07

Address: 14452 West Main St. Cut Off, LA 70345

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Name: Cindy T Dufrene Date: 1/3/07

Address: 14752 West Main, Cutoff, La 70345

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Name: Sharon Ewan Date: 1-3-07

Address: 360 E. 37th Place Cutoff, LA 70345

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Name: Thora C. Delahoussaye Date: 01/03/07

Address: 137 Cidan Blvd., Lockport, LA 70374

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Name: Terry Robichaux Date: 1-3-07

Address: 4778 W. Main Cut Off, La 70345

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(Use the back of this form if more room is needed)

Name: Peggy M. Clemente Date: 1-3-2007

Address: 188 W. 107th St. Cut off, LA 70345

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Name: Welby Mathews Date: 01-03-07

Address: Rt. Box 21.5, Larose, La. 70377

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Name: [signature], Executive Director BCC Date: 1-3-07

Address: P.O. Box 1105 Larose, LA. 70373

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Name: Serena R Bruce Date: January 3 2007

Address: 116856 West Main, Cut Off, LA 70345

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Name: Antoinette J. Knoblan Date: 1/3/07

Address: 164 West 178th St, Galliano, LA 70354

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Name: Dan DeSoto Date: 1-3-07

Address: P.O. Box 165, Cut Off LA 70345

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Name: [signature] Date: 1/3/2007

Address: 106 N 3RD ST. GOLDEN MEADOW LA 70357

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Name: Julie Barrow Date: 1-3-07

Address: 106 E 46th St Cut Off LA 70345

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Name: Betty Falgout Date: 1-3-07

Address: P.O. Box 87 Larose La. 70373

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Name: Peggy Tenhoven Date: 1-3-07

Address: PO Box 85 Larose LA 70373

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Name: Edwin H. Callais Date: 1.3.07

Address: 1402 W Main St Cut Off, LA 70345

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Name: Mark Bourg Date: 01/03/07

Address: 207 Palm Ave
Lockport LA 70374

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Name: BRUCE AUTIN Date: 01-03-07

Address: 15613 EAST MAIN ST. GOLDEN MEADOW LA 70357

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Name: Rogers P Charpentier Date: 1-3-07

Address: P O Box 315 Larose 70373

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Name: Robin Rome Date: 1/4/07

Address: P.O. Box 22 Cut Off, LA 70345

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Name: Ryan J Callais Date: 1-4-07

Address: P.O. Box 1662 Cutoff, LA 70345

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Name: Robin Callais Date: January 4, 2007

Address: 202 West 14th St. Cut Off LA 70345

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Name: [illegible] Date: 1-2-07

Address: [illegible]

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Name: Mary Grace Marie Date: 1-2-07

Address: 117 Plantation Dr -

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Name: Raymond Melancon Date: 1-2-07

Address: E Main 15227 Cut Off La.

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Name: Donovan Lougon Date: 1/2/07

Address: 201 WEST 56 ST Cut Off, LA 70345

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lease consider the following comments:

Grant the South Lafourche Levee District system the highest protection possible. The LA 1 Corridor between Larose and Golden Meadow is crucial to the nation's energy security and the State of Louisiana's long term economic stability. Utilize the existing footprint to build 500-year structural level of protection, expanding the right-of-way if needed. Construct the additional levee between Golden Meadow and Point-aux-Chene. Construct the Morganza to the Gulf levee alignment. Construct the Donaldsonville to the Gulf levee. This levee will provide protection to 400,000 residents. Fund the conversion of the Larose and Golden Meadow flood gates on Bayou Lafourche into operating locks. Bayou Lafourche will be of increasing importance to America as a navigable channel, barging commodities to Port Fourchon.

(Use the back of this form if more room is needed)

ıe: [signature] Date: 1-2-07

ldress: P.O. Box 490 Galliano, LA 70354

From:	elainea@mobiletel.com
To:	comments@louisianacoastalplanning.org;
CC:	
Subject:	
Date:	Friday, January 05, 2007 8:06:49 AM
Attachments:	

.The state plan should consider the highest level of protection possible for the South Lafourche Levee District (SLLD) system due to the significant role LA 1, businesses, and residents within this system play in both national energy security and the state's future recurring revenue flow.

.The level of protection planned for the SLLD system should be greater than the proposed 100 year structural level of protection. The 100 year structural level of protection does not raise the levee height to the height of the planned elevated Louisiana Highway 1, on which vehicles tires will ride at approximately 20 feet above sea level.

.Include funds necessary to convert both floodgates in Larose and Golden Meadow into functioning locks. Bayou Lafourche as a navigable channel will be of increasing importance to America, necessary to inland barging of fuel, drilling muds and other commodities which make their way down Bayou Lafourche to Port Fourchon, America's busiest intermodal energy port.

.Construct the proposed additional levee between Golden Meadow and Pointe-aux-Chenes. This additional levee will slow water coming from an incoming storm west of Lafourche, which would place the LA 1 Corridor on the bad side of an incoming hurricane. This alignment will reduce dramatically the amount of water that will get to the existing levee, thereby increasing the ability of the present levee system to keep very powerful hurricanes approaching us from the west from flooding the area.

.Construct both the "Morganza to the Gulf" and the "Donaldsonville to the Gulf" levee systems in the Draft Master Plan. The Donaldsonville to the Gulf project has extensive studies underway that avoid the need for additional years of studying another alignment.

R & A ELECTRICAL SERVICES, INC.

♦ ♦ ♦

36192 Hwy. 11 ♦ P.O. Box 449 ♦ Buras, LA 70041
Phone (985) 657-9497 ♦ Fax (985) 657-9455
Email: raelect@bellsouth.net

CPRA Integrated Planning Team
P.O. Box 44027
Baton Rouge, LA 70804-4027
Attn: Jon Porthouse
www.louisianacoastalplanning.org

Ladies and Gentlemen,

As a spokesman of Plaquemines Parish, I am a life long resident and businessman in South Plaquemines Parish. It's time for the people of Plaquemines to take a stand and support our well-being and heritage. As a whole we can and will get our message to local, state and federal government!

As we now sit in question, what is the Corps of Engineers up to now? People, have you ever seen anything that would deter Mother Nature? The answer is clearly NO! The Corps of Engineers, or man in fact, never will. Like many others, I will take a stand and fight to save our parish, and most importantly, our heritage. I'm tired of watching our hard-earned tax dollars drift out to sea to benefit the rest of our great nation while we get nothing in return. Our federal government took our land from us once already and it is clear to me that the downward spiral began there.

The federal government says the money is not there to rebuild levees to 18' plus. Great! We don't want 18' plus levees! Man's attempts to control the flow of the mighty Mississippi River is what got us into the situation we are in now...coastal erosion, vanished fishing estuaries, abandonment of oil and gas industry development. Now all of the sudden, OH NO, New Orleans is going under! The natural, unobstructed flow of the mighty Mississippi River and its tributaries is the key. Take a look back to our forefathers and the Native Americans of this land, who lived in sync with nature in their day.

Instead of spending BILLIONS on levees, isn't it more logical to spend mere *MILLIONS* on non-obstructed spillways that would re-establish lost tributaries, fishing estuaries, oil and gas industry development, great marine sea ports, etc.? Development of a new deep water outlet alone would save billions on the Corps of Engineers yearly budget by omitting the continued dredging of the head of the passes and South West Pass.

Please observe the map illustration showing sand bars created by Mississippi River sediment just waiting to be utilized as nature intended, ***not*** the Corps of Engineers way.

People of Plaquemines, St. Bernard and New Orleans, I have personally watched our parish land and barrier islands disappear during my lifetime of 46 years. I have listened to countless stories of my elders, stories about what they originally had and what they have observed since the organization of the Corps of Engineers.

Please don't get me wrong, I am not trying to discredit our government or the Corps of Engineers, but merely to put this very dire situation into perspective. If we do as Mother Nature intended, with the help of the Corps of Engineers, we can restore what was lost – our land, barrier islands, fishing estuaries, etc. Man can work in sync with Mother Nature to achieve a greater result - if we work geologically, nurturing the flow of nature as it was intended.

People of Plaqumines, St. Bernard, and New Orleans let's take a stand! Please refer to the map illustrations I have provided. Plaquemines Parish residents in particular, it is critical to support the utilization of unobstructed spillways which could save us all and keep us on the map, ***period!***

If the Corps of Engineers gets their way, within the next 100 years we can say goodbye to New Orleans and all surrounding areas and hello to *Orlandist*! Is this the legacy we want to leave behind for our children and grandchildren?

Thank you for your time today,

Zane P. Melancon

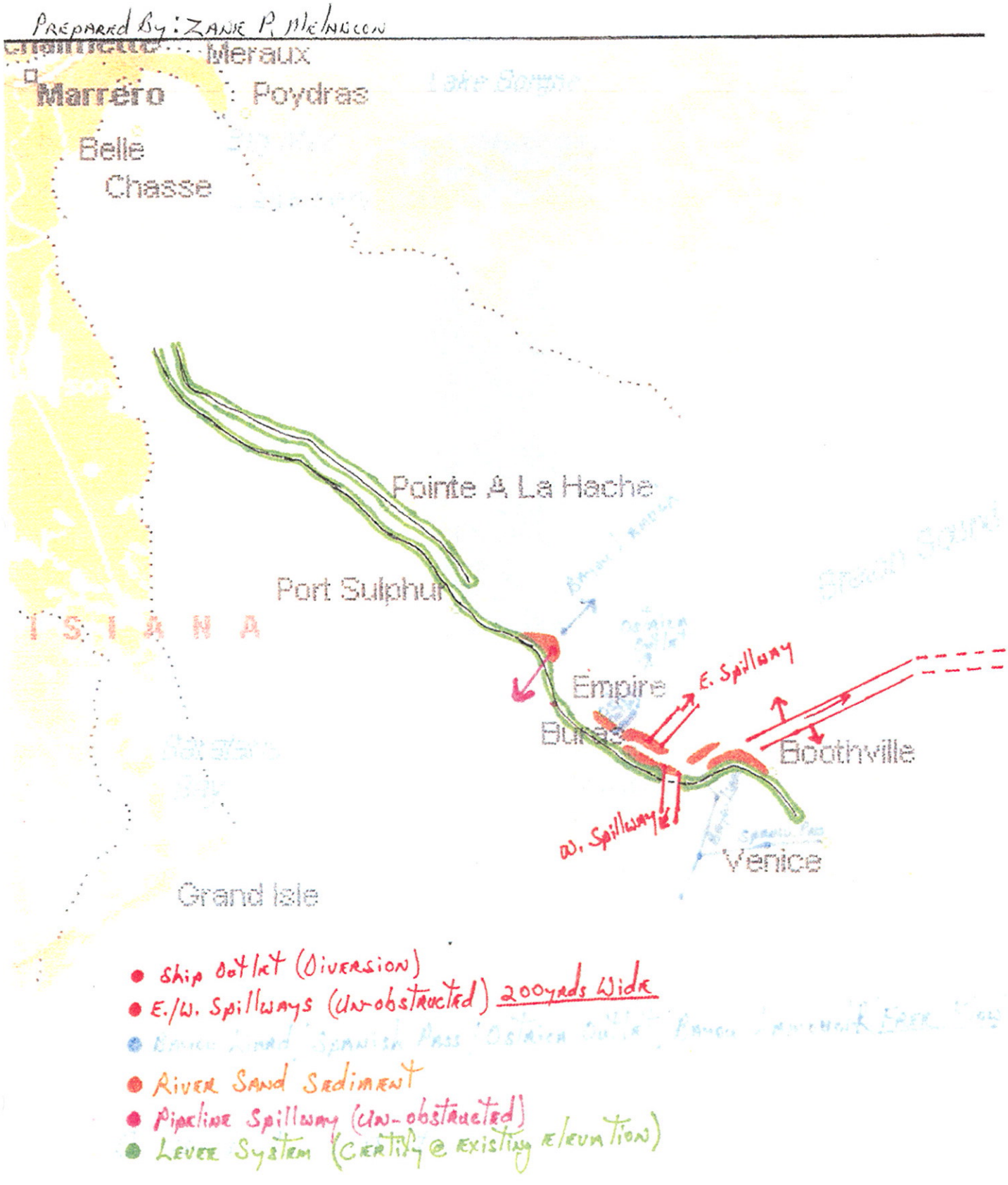
A. Ship/Navigational Outlet:
    1. Quick access to deep water
    2. Allowing sediment disbursement
    3. Omit dredging to head of passes and South West Pass
    4. East Bank hurricane approach acts as counter-flow towards West through West Spillway.

B. West Spillway:
    1. Crossed by Hwy. 23 bridge at existing levee system elevation and connecting northern and southern ends of Parish.
    2. Cluster piles driven at river/spillway intersection detouring a navigational channel.
    3. Utilization of river sediment and fresh water for marsh development
    4. Acts as counter-flow relieving pressure on levee system due to hurricane tidal surges through ship/navigational outlet and East Spillway.

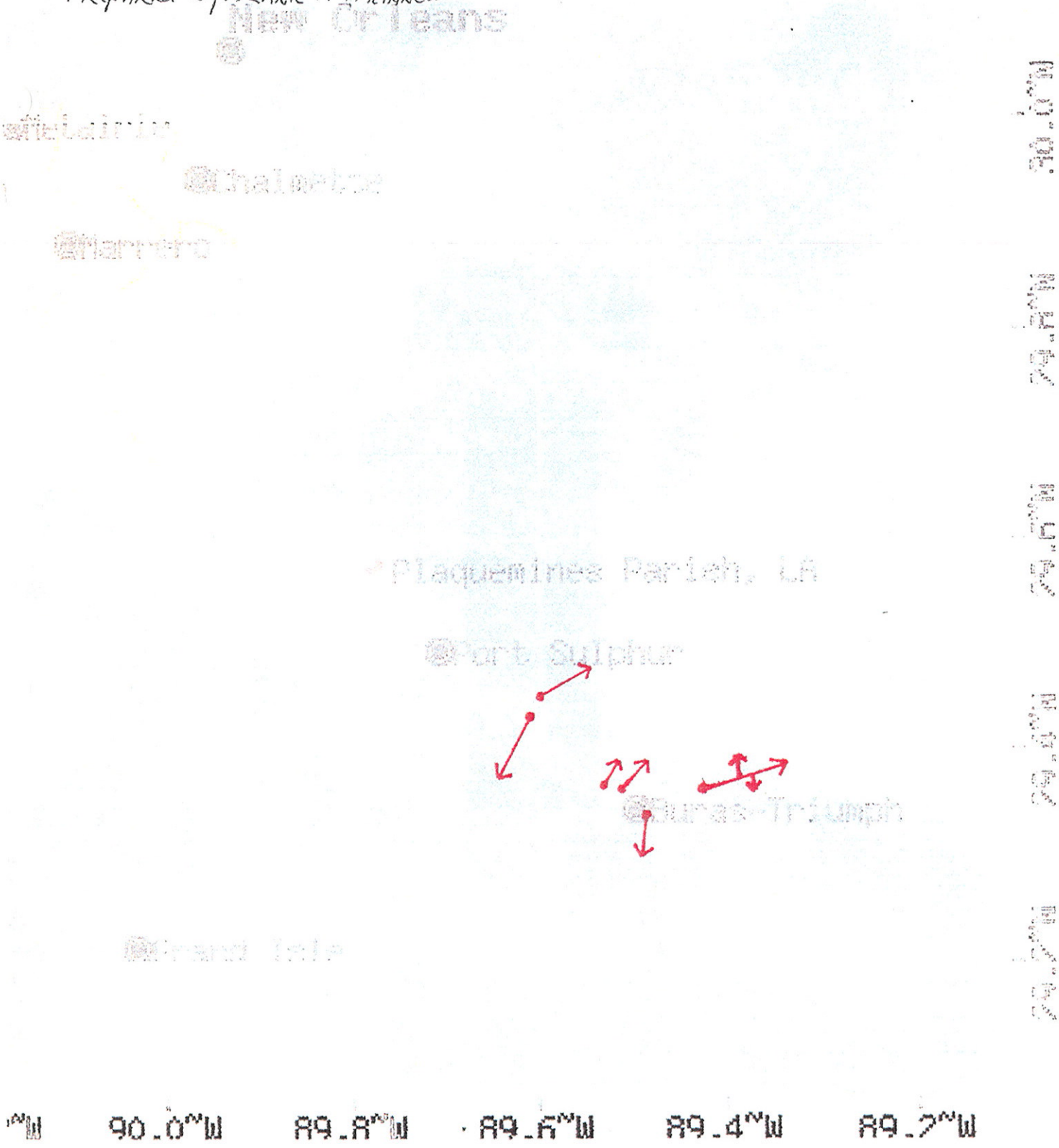
C. East Spillway:
    1. Utilization of river sediment and fresh water for marsh development
    2. Spillway will be unobstructed, as mentioned for West Spillway.

D. Bayou Lamuchk, Ostrica Outlet, and Spanish Pass:
    1. Unobstructed free flow

E. Pipeline Spillway:
    1. Controlled water and sediment flow
    2. Excavated through levee system and beneath Hwy. 11 and Hwy. 23
    3. Regulatory operation in sync and co-existence with oyster leases.


Prepared By: Zane R. McNeilcon
Meraux
Marrero
Poydras
Belle
Chasse
Pointe A La Hache
Port Sulphur
T S I A N A
Empire
E. Spillway
Buras
Boothville
W. Spillway
Venice
Grand Isle
Ship outlet (Diversion)
E./W. Spillways (un-obstructed) 200yards Wide
River Sand Sediment
Pipeline Spillway (un-obstructed)
Levee System (Certify @ existing elevation)

Prepared By: Zanie P. Melancon



Coastal Protection and Restoration Authority
Integrated Planning Team

PUBLIC MEETING COMMENT FORM

Comprehensive Coastal Protection Master Plan for Louisiana
Preliminary Draft

To insure that your written comments are considered, they should be turned in this evening at the reception desks located near the entrance or mailed to the following address so that the comments are received no later than January 5, 2007:

CPRA – IPT
DNR
Post Office Box 94396
Baton Rouge, LA 70804-9396

Email comments may additionally be submitted at: comments@louisianacoastalplanning.org

Please consider the following comments:

Ref: Page 43 Barataria and West Back
I support the GIWW alignment
most cost effective, speed up the
protection, in our Levee District
from Bayou Lafourche and tie
in to west Jefferson and Orleans
west bank area. conclude to Algiers
~~to Algiers~~ to the mississippi River Levee
Levee to Algiers

(Use the back of this form if more room is needed)

Name: Stacy C. Foret Date: 12-11-06

Address: 21030 Hwy 20
Vacherie, La 70090

From: Weidel, Larry [larry-weidel@lpso.net]
Sent: Friday, January 05, 2007 8:52 AM
To: comments@louisianacoastalplanning.org
Cc: Webre, Craig; Dill, Bud; Henri Boulet
Subject: public statement

Attachments: January 5 letter to levee group.doc

January 5, 2007

As decisions are made on levee systems, particularly in Lafourche Parish, the state plan should include the highest level of protection possible for the South Lafourche Levee District (SLLD) system. We have taxed ourselves to get the protection we now have and would like assistance in protecting our families and infrastructure.

LA Hwy.1, businesses, and residents within the South Lafourche Levee District are located in a vital corridor of increased national energy security and the state's future recurring revenue flow.

There is a need for the level of protection planned for the SLLD system to be greater than the proposed 100 year structural level of protection. The planned elevated Louisiana Highway 1, is expected to be approximately 20 feet above sea level. It makes no sense to have a levee lower than the road people have to evacuate on.

Please consider Including the funds necessary to convert both floodgates in Larose and Golden Meadow into functioning locks. Bayou Lafourche is a navigable channel for vessels to bring supplies to and from Port Fourchon, America's busiest intermodal energy port.

Protection of the western part of Lafourche Parish would be enhanced by the construction of the proposed additional levee between Golden Meadow and Pointe-aux-Chenes. This levee will slow water coming from an incoming storm west of Lafourche, which would place the LA 1 Corridor on the bad side of an incoming hurricane.

It is important that both the "Morganza to the Gulf" and the "Donaldsonville to the Gulf" levee systems in the Draft Master Plan be constructed. A considerable of research and studies have been done and it would be counter productive to spend years with additional studies. We may not have the luxury of that much time.

Larry D. Weidel, Public Information Officer
Lafourche Parish Sheriff's Office

From: John Tesvich [jatesvich@yahoo.com]
Sent: Wednesday, January 03, 2007 12:11 PM
To: comments@louisianacoastalplanning.org
Subject: Comments on Coastal Restoration Plan

Attachments: Comments to the C C P M P L - 1.doc
Please find the attached word file with comments to the master plan

John A. Tesvich

504-912-2750

jatesvich@yahoo.com

John A. Tesvich
30300 Hwy 23
Buras, Louisiana 70041
Ph: 504-912-2750

CPRA –IPT, DNR
P.O. Box 94396
Baton Rouge, LA 70804-9396

January 3, 2007

RE: Comments to the Comprehensive Coastal Protection Master Plan for Louisiana Preliminary DRAFT

My name is John A. Tesvich; I am a life long resident of Plaquemines Parish. I am a fourth generation oyster grower of Croatian heritage. I have a BS degree in Mechanical Engineering. I have been involved in representing the interests of the oyster industry in Plaquemines Parish as a member and past president of the Plaquemines Oyster Association, and in the State of Louisiana as a member and past chairman of the Louisiana Oyster Task Force.

I attended the public hearing of the **Comprehensive Coastal Protection Master Plan for Louisiana Preliminary DRAFT** on December 12 in Belle Chasse and at the UNO conference center that same afternoon and evening. I appreciate the ability to make what I hope are constructive comments.

I will present my comments in two parts; the first will be my suggestions in the context of the master plan's written narrative, its objectives, and rationale. The second part will be more specific and detailed in regards to specific projects that should be added to the master plan.

Part One – Comments to the Master Plan's Objectives and Rationale

A. On page 15 of the master plan, under "**Implications**" the text states "***Implementing the comprehensive solution will require one of the largest public works programs our nation has ever attempted. … Such assistance is not a handout, but rather an acknowledgement that south Louisiana's coast was altered so that it could better serve national energy and navigation interests. . .***" This is an important assertion that is not sufficiently supported in the written narrative that precedes it. In order to make the point to an outside observer, the section under "**Losing Ground**" on page 12 should be expanded with more illustrative explanations. Real and honest depictions that show the long-term effects that oil and gas extraction has had on scissoring Louisiana's coastal marshland would be more convincing. Likewise, depictions are needed to illustrate the effects that jetties, located at strategic navigational channels, have had on in robbing our barrier islands of much needed beach sediments. I've seen such depictions in other reports and they are moving beyond words.

B. Under the master plan's listed objectives, the flood protection objective is very clear and concise. However, the objectives are less clear in defining an ultimate goal regarding

wetlands restoration, besides its relation to flood control. Wetlands restoration is important in itself. For the master plan to be truly comprehensive it should include a goal to achieve a certain level of wetlands restoration. The remedy would be to add another objective that would establish **Zero Net Wetland Loss** as a goal for the state. The short-term goal could be to arrest additional wetland erosion and further losses in critical coastal areas. The application of resources should be prioritized according to the level of wetlands destruction due to man-made intrusions, and the importance of those wetlands to a coastal community's economic sustainability, and flood protection.

C. On page 27 under "**Facing the Tradeoffs - Fisheries**", the entire passage needs to be re-thought. The current narrative strictly blames the flood protection levees of the Mississippi for the destruction of the wetlands, and uses that premise to propose that large-scale diversions are necessary. This would, of course, result in a major disruption and dislocation of fisheries. The passage is a false and misleading interpretation of the facts, and it hinges on the very shallow logic that "turning the river loose" is the only solution. It speaks to a pre-conceived bias for radical projects, which are nothing short of reckless. The master plan should stick to the facts, and not use scare tactics.

Fact #1) The commercial and recreational fisheries of Louisiana are important renewable and self-sustaining resources of the state. The economic viability and productivity of the commercial and recreational fisheries in the State of Louisiana are very high. In the face of the ongoing geographic changes in our wetlands, the state's fishermen have been forced to adapt, for reasons not of their own making. With the development of a sustainable coast, and with proper stewardship, there is every reason to expect that this asset, our fisheries, will be here for many generations to come.

Fact #2) If we were to allow continued wetlands loss and barrier island deterioration, a drop in the fishery productivity would be expected.

Fact #3) Our state has a number of fresh water diversion projects operating already. There are plans to include more river diversions in key areas to enhance marsh creation and provide sustainability in the ecosystem. Salinity changes and some corresponding displacements of fisheries are going to be unavoidable. There are also plans to study the viability of large-scale river diversions in some areas.

Fact #4) Currently, the master plan refers to two methods of rebuilding marsh lands along the coast. They are: A) Using large-scale river water and sediment diversions to build new deltas, and B) Placing dredged sediment using pipeline delivery systems directly where rebuilding is desired. Each of these methods has their benefits and drawbacks. The master plan states, however, that the use of large-scale river diversions is only conceptual at this time, and more studies will be required before implementation would be considered. Therefore, it's quite obvious, from what is known to date, that large river diversions will not be part of the near term (10 to 30 year) solution. So, in the current time frame, the only real and practical method that we have to rebuild critical wetlands is the application of sediment dredging and delivery systems.

D. It is notable that fisheries were the only economic sector of the state that was mentioned in the section "Facing the Tradeoffs". The (so called) "comprehensive" master plan makes no mention of potential impacts on future exploration and production by the oil and gas industries. Although, we accept the strategic and economic importance of the oil and gas resources, and understand that the extraction of those resources must continue, but couldn't oil and gas companies also be required to implement improvements to help minimize future wetland impacts? Could that be studied? Shouldn't that be a part of the plan? Or, is it that the state expects the public to believe that oil companies are already doing everything they can to reduce wetlands impacts? It would not be wise for the state to give a carte blanche pass to an industry that has contributed to the dramatic acceleration in the loss of our wetlands; an industry that, in reality, won't even be around here in 50 to 100, much less 500 years. The state needs to start planning for that reality now. As such, the failure of the master plan to even begin addressing this situation would make it anything but comprehensive.

   What could and should be done? Targeted engineering studies which could help develop more "environmental friendly" exploration and production technology, which would minimize energy-related impacts in our wetlands. Further expanding mitigation programs and creating industry incentives to reduce energy industry related impacts to our coast, should be a part of the plan also.

E. On page 36 under "**Landbuilding diversions**" the passage needs to be re-thought to reflect a more disciplined approach and eliminate the pre-conceived bias favoring radical large-scale river diversions. Some alarming statements in that passage include the following gems: ***". . . the concept of building very-large, land building diversions is well established.", ". . . science tells us we must turn the river loose . . .", "Using the majority of the river sediment and fresh water available is the only way to create and sustain large areas of southeastern Louisiana."***. Some of these statements are just misleading, while others are patently false.

F. On page 44, concerning Plaquemines Parish, the plan falls grossly short in addressing the needs of lower Plaquemines Parish. This deficiency may be partly due to a lack of stakeholders' input at the early stages of the plan's first draft. I also believe, however, that this "hole" in the plan is a residual of the well-documented debate brought on by ideologues who have long proposed, and are still pushing, the idea of re-shaping and re-designing our coast by giving up the bird-foot delta and redirecting the river farther north. For the citizens of lower Plaquemines Parish this ideology has been a grave disservice. Since Katrina, media reports on the state's master plan have focused on the radical proposal to split the parish in two with a huge river channel. This has left the citizens on the southern part of the parish unsure of what, if anything, the government will do for their communities and their livelihoods.

   The argument for committing to rebuilding and protecting lower Plaquemines parallels the State of Louisiana's own argument before the federal government. Even though it is not densely populated, the coast of Plaquemines Parish has suffered great losses "***so that it could better serve national energy and navigation interests***". If the state ignores the

specific challenge of rebuilding such a critical area, it will put itself in a hypocritical position. The IPT could do a lot to help Plaquemines Parish by amending the master plan to incorporate the objective of Zero Net Wetlands Loss as described in section B above, and include the scoring for that objective in appendix A.

Members of the IPT have said that a dramatic redesign of the lower river delta is not in the state's plan, and that the large-scale river diversion in Plaquemines is only conceptual at this time. If that is, in fact, the case, then two things need to be done: 1) The state needs to make it abundantly clear that there it has no intention of radically re-designing the coast that includes lower Plaquemines Parish, and 2) Incorporate into the master plan the projects that are necessary to bring to the lower Plaquemines Parish communities the same baseline protection that the state is targeting for most other coast-wide communities, as described on page 28 of the master plan. (For specific projects needed in Plaquemines Parish, see pages 6 & 7)

G. It is a simple-minded and popular opinion to blame the flood control levees for most of the loss of wetlands. And in the master plan that explanation is used extensively, but in reality it is not that simple. A case in point, for example, is the real life situation that has existed in Plaquemines Parish for years. From Bohemia, near Pt. a La Hache, on the east-bank of Plaquemines Parish, to the Head of Passes, some forty plus miles south, there are no flood protection levees on the river. The river is free to overflow its natural banks, and does so whenever it reaches a critical flood stage. In that same expanse of river there is a medium-sized, man-made fresh-water diversion at Bayou Lamouque. There are also two un-controlled crevasses in that section of river; one near Ostrica, and another at Fort St. Phillip. The wetlands in that area are also beneficially impacted by the Caernarvon River Diversion, which enters the estuary farther north and ultimately drains into Breton Sound. From the perspective of the river's impact, looking from inside the estuary outward, the adjacent estuary and the wetlands within it are in a situation that mimics a very natural scenario, at least as close as is humanly possible. But this natural scenario is not enough to prevent the loss of marshlands along the shores of the American Bay and California Bay which are adjacent to the river in those areas. The reason this is so is because other key components of the natural system have been degraded by man's intervention, and have not been addressed.

Most solutions that have been proposed and carried out to date have focused on solving the wetlands problem from inside the estuary, working outward. That is demonstrated by many planners' fixation on more and more river diversions within the estuaries. Not to say that river diversions aren't beneficial, but that they are not the solution on their own. They mainly benefit upper, interior wetlands. What is being overlooked, for the most part, is working on balancing the natural system from the outside (Gulf-side) in. By that I mean rebuilding barrier islands and providing sediments for sustaining the barrier islands and adjacent wetlands.

In that regard, in **Appendix A part 2.2 River and Coastal Processes,** and in **Appendix I** there is no mention of the natural process of long-shore transport of sand along the gulf beachfront. It is a well-established natural process in which sediments from the river, which

are deposited near the shore at the mouth of the river, are transported along the Gulf seashore. As the sediments travel away from the mouth of the river, in the natural system, these sediments are introduced into the wetlands by spring tides and common storms that cause the re-suspension of the sediments. The strong currents then carry the sediments through the passes and into the estuary. The larger heavier particles of sand aren't carried very far, and normally fall out near the passes forming the sand bars there, while the finer particles of mud and sediments are carried well into the marsh at high tide. There the sediments drop out – and the marsh is nourished from the outside in from a river many miles away.

That was the case, at least, until the construction of the river jetties, first successfully engineered by James B. Eads in 1875. Jetties are nothing more than levees in the water. Since then, the bulk of the river's sediment has been channeled farther and farther offshore where it cannot return near the shoreline and begin its long-shore journey into the estuary. Numerous other navigational channels along the Gulf have jetties also. While these jetties serve an important function to minimize dredging of navigational channels, their unintended impact has been to serve as dams in the natural flow of sediments along the seashore of the Gulf. Without the flow of sediments the barrier islands and wetlands suffer degradation. This man-made intervention has caused more detriment to the saltwater wetlands near the Gulf than flood protection levees have. This man-made situation should be addressed in appendix **A** part **2.3 Human Intervention,** as well as in **Appendix I** and other places throughout the master plan. Furthermore**,** proposed solutions need to be incorporated into the master plan to alleviate continued coastal damages due to jetties on navigational channels.

Part Two – Concerning the Projects in the Master Plan

A. **Chandeleur Islands** – The CPRA should seriously reconsider its current position on rebuilding the Chandeleur Island chain. The combined Chandeleur - Breton Island chain has for centuries provided a great natural barrier that protected much of southeastern Louisiana and parts of Mississippi from storm surges. It serves a critical function in the protection and separation of the natural salt-water estuary from the Gulf. This natural barrier is an important geographic formation that has been allowed to erode due to man-made interventions and negligence. The Chandeleur-Breton beachfront is Louisiana's beach. The attitude that this beach is not worth rebuilding is evidence of the continuation of Louisiana's historical careless attitude toward its natural resources. An attitude that has gone on for too long in this state, and that is why we are in the predicament we are in now. Maybe if there were condominiums on our beach, like in other states, people would have a different attitude. Although though there aren't condominiums on the Chandeleur, it's still an invaluable asset and should be maintained for the many benefits it provides to the state and our country.

For the best in storm surge protection, science will tell you it is important to put the biggest defenses the farthest outward to sea. As far as efficiency in reducing storm surge, a six-foot ridge located on a barrier island will do more to deflect storm surge than the same size

ridge built inshore. The reason this is so is because the surge is not as high when it is in the deeper open waters of the Gulf and the water has more room to be deflected. The Chandeleur-Breton barrier island chain extends from the of Louisiana - Mississippi border all the way to the Mississippi River. It is important to note that the last three hurricanes that flooded the Greater New Orleans area; Betsy, Camille, and Katrina, brought flood waters that had to cross the Chandeleur Island chain at some point. The parishes of Orleans, St. Bernard and Plaquemines, would all greatly benefit in flood protection by rebuilding this barrier island chain.

The Chandeleur provides an excellent natural base on which to rebuild a very important flood protection defense. The explanation given for not including the restoration of Chandeleur Islands in the master plan was that it was shown by storm surge modeling studies to have had a minimal impact on the storm surge for Katrina. The reason this is so is because currently not much of the island is left above water. This is due to the cumulative erosion from hurricanes and natural subsidence over many decades. However, if the Chandeleur islands were rebuilt to a six-foot elevation along its forty-plus mile length, its impact on deflecting storm surge would be vastly improved. Hydrodynamic modeling studies can prove this.

The Chandeleur Sound and Breton Sound are important estuaries for fish and wildlife, which are key attractions to the Louisiana way of life. To allow the continued loss of the barrier islands would also contribute to damaging the critical wildlife and fisheries habitat in the vast and extremely productive Chandeleur and Breton Sounds. As the barrier islands erode, the amount of water that is exchanged at each tidal event increases. This causes further acceleration in erosion of marshlands in the estuary.

B. **Plaquemines Parish** - For Plaquemines Parish the master plan needs to take additional measures to increase hurricane flood protection for the lower part of the parish. Higher levees in southern Plaquemines Parish may not be the ideal way to prevent flooding. But the re-establishment of multiple levels of defense is needed to protect against storm surges. The erosion of barrier islands and the loss of critical marshlands have left Plaquemines exposed like never before to the fury of storms. It is critically important to rebuild the barrier islands and critical wetlands, including ridges and cheniers in the areas between the levees and the Gulf. These barriers are necessary to deflect and reduce storm surge before it piles up, overwhelming the flood protection levees. In order to save the quickly diminishing critical marshlands that remain in Plaquemines Parish, rebuilding them in near term is imperative. The no non-sense proven way to accomplish that type of rebuilding is with sediment delivery from sources in the nearby river. On the east bank of Plaquemines Parish critical projects include:

1. Rebuild Breton Island – Breton Island, an important barrier island needs to be rebuilt, extending it to Taylor Pass near Baptiste Collette. This could be incorporated into the larger plan to rebuild the entire Chandeleur chain, which would be even more beneficial.

2. Baptiste Collette -- Build a ridge from Taylor Pass to the River along Baptiste Collette

3. Rebuild Marsh -- Rebuild critical marsh lands on east bank of Plaquemines (PD 1-19), fill in unnecessary canals, and stabilize shorelines south of Pt a la Hache, along American Bay, California Bay, including California Point, Quarantine Bay, Coquille Bay, and Grand Bay.

4. Beneficial use of dredge spoil. It should be a law that all dredge spoil is put to beneficial use wherever possible.

On the west bank of Plaquemines critical projects include:

5. Extend ridge rebuilding (PD 2-14) farther south along Grand Bayou across the Freeport Sulphur Canal and to the end of existing Grand Bayou shoreline.

6. Rebuilding strategic marsh platforms - Extend project PD 2-13 to the new extended Grand Bayou ridge south of Port Sulphur. Continue sediment delivery marsh rebuilding from the levees outward, in sections from Empire to Buras. Rebuild lost wetlands around Buras Boat Harbor to Bay Pommed'Or. Continue sediment delivery marsh rebuilding from Buras to Venice. In many of these areas, displacements of oyster leases will be inevitable.

7. Stabilize shorelines – The existing interior shorelines along Barataria Bay, Lake Grande Ecaille, and Lake Washington need to be stabilized to prevent further wave erosion of the remaining marsh platform.

8. Medium sized fresh water diversions – River diversions similar to the West Pt A La Hache diversion should be planned at Port Sulphur and below Fort Jackson.

9. Freeport Sulphur Canal -- The shoreline stabilization along Freeport Sulphur Canal

10. Empire Navigational Canal – The jetties at the Empire channel need to be re-designed or removed.

11. The Third Delta Study -- D3 should to be moved from where it is presently depicted on the map, near Port Sulphur, to an area south of Venice. To divert a major portion of the river flow directly into the saltwater estuaries of Breton Sound and Barataria Bay would mean the literal devastation of those natural estuaries. The obvious environmental, economic, and cultural cost of such project makes it preposterous to even consider.

The Third Delta Study would be a lot more acceptable if it would focus on the area south of Venice, which is already a fresh water environment. At the Venice location the river diversion would deliver the much-needed sediment to the barrier islands of the Barataria Basin to the west, and along the Breton/Chandeleur island chain to the north.

C. Other Projects

Sediment Traps in River -- Other subjects that merit further engineering study are the creation sediment traps in the river, and the development of advanced dredging and pumping systems to improve efficiency and lower cost of dredging and sediment conveyance.

MRGO – On the bottom of the MRGO are rock jetties that need to be removed. The rocks could be used to fill in and reduce the profile at the land end of the MRGO channel. Restricting the flow of water through the lower remnant of the MRGO channel would reduce salt-water intrusion, and tidal flooding for the communities of Hopedale and Shell Beach.

From:	Executive Director
To:	comments@louisianacoastalplanning.org;
CC:	skct@mobiletel.com;
Subject:	Comments
Date:	Thursday, January 04, 2007 4:47:27 PM
Attachments:	

Comments:

This area of the country pays a high price for the rest of the nation in the sacrifices that local families make to insure the nation's energy supply. Our loved ones do not come home in the evenings to deal with the struggles that constantly face families, especially young and aging families. Because of this, all oilfield families face the same demands on their lives as those of struggling single parent families. These workers miss holidays with their families, like Christmas with their children and their school plays, ball games, teacher meetings and school open house. Sometimes they miss the birth of their children, baptisms, and the death or funerals of their parents and other loved ones. They miss the comfort of their spouses for more than half their life. Instead, they are working a minimum of 12 hours a day, every day, a minimum of 7 days a week, mostly in the weather. More than likely, they will be needed an extra couple of days or be called back because a problem arose. They travel home on their "off" time. For some this is a few hours, for others a day or more if they work overseas. If they are lucky, they will have the balance of their off time

for their families and their own needs. It takes them a whole day to catch up on their rest, their first day back. Then on their days off, they try to catch up on what they did not have time to do on their last hitch off. The stress and sacrifices, year after year takes its toll on us and our family life. The stress on their bodies from working in the harsh conditions takes it toll too. For these scarifies, we get to pay the same high cost for fuel as the rest of the nation. We get to see our way of life, our culture and heritage be washed from under our feet and homes. We get to watch, as our nation takes and takes, but doesn't give back. When our house insurance has climbed so high, we can no longer afford to live in our modest homes because our risk assessment is so high due to the land losses caused by oilfield activity over ¾ of a century and the mistakes made by the Army Corps of Engineers. When our nation throws us away as collateral damage, and thinks were too ignorant to notice, or to small a population for the rest of the nation to notice our screams -it is time for our nation to give back. The cost to the nation will never exceed what the cost to us has been. If any homes in the United States of America are worth protecting it is our homes. If any American way of life is worth protecting it is our way of life. If any American has the right, to live in the place they call home it is our right. But yet, in 2007, we are asked to comment on whether or not we should be allowed to live here. Make no mistake; this is what you are asking us to comment on. Every resident in Lafourche Parish, especially those in South Lafourche, whether or not they respond to you, want to live here in peace (otherwise they would have already moved). Can anyone who is

taking these comments fathom what 2.2 million acres of land loss since the 1930’s means! [Documented by the Army Corps of Engineers, NOT A MADE UP ESTIMATE] We did not move to the coast, the coast moved inland to us.

The rest of the nation needs highway 1 to Grand Isle and Fourchon, yet we are told we have to pay tolls to use it to access our oilfield jobs and recreational use of our vanishing resources. Our nation rapes us and then sends us the bill. This cannot be the America I live in, the one I have made all those sacrifices for! I want, so much to believe, that America, just did not understand, that my home, my family **is really** valuable to them and that their rights are also my rights. For me and all those like me, this is the test case and the finale'. Every person in America that uses oil field fuel or by products has a chance to help in our struggle, right now. Do we matter? You will be answering this question in your decisions. Better make some good ones.

- • The state plan should consider the highest level of protection possible for the South Lafourche Levee District (SLLD) system due to the significant role LA 1, businesses, and residents within this system play in both national energy security and the state’s future recurring revenue flow. The levee plan should start with the coastline and build northward. If not, we will not be here when you decide it is our turn. Stop penalizing South Lafourche for their vision and proper maintenance of our levees. We were successful in 2005, build upon that success. Do not

start with those who lost sight of what was important and put their money elsewhere. There is not one life, one home or one persons possessions anywhere else that is more valuable then ours. We were the responsible ones. Put our nation's money where responsibility reigns. If the current formula does not account for us, as being in the most need with Terrebonne Parish, change the formula – you have made a grave error. It is time to include in the formula the value we are to the nation and our sacrifices. A repaired coastline with marsh restoration will protect New Orleans more than any levee that man can rebuild. That coastline protects us all. Start at the coast!

- •The level of protection planned for the SLLD system should be the proposed 500-year structural level of protection. The 100-year structural level of protection does not raise the levee height to the height of the planned elevated Louisiana Highway 1, on which vehicles tires will ride at approximately 20 feet above sea level.

- •Include funds necessary to convert both floodgates in Larose and Golden Meadow into functioning locks. Bayou Lafourche as a navigable channel will be of increasing importance to America, necessary to inland barging of fuel, drilling muds and other commodities which make their way down Bayou Lafourche to Port Fourchon, America's busiest intermodal energy port. The local fishing community must have these locks to sustain

their boats and gear. Often the tide rises, unexpectedly, trapping them on the other side.

- •Construct the proposed additional levee between Golden Meadow and Pointe-aux-Chenes. This additional levee will slow water coming from an incoming storm west of Lafourche, which would place the LA 1 Corridor on the bad side of an incoming hurricane. This alignment will reduce dramatically the amount of water that will get to the existing levee, thereby increasing the ability of the present levee system to keep very powerful hurricanes approaching us from the west from flooding the area.

- Construct both the “Morganza to the Gulf” and the “Donaldsonville to the Gulf” levee systems in the Draft Master Plan. The Donaldsonville to the Gulf project has extensive studies underway that avoid the need for additional years of studying another alignment. Money should be put in, on the ground projects.

Thank you for your time.
Susan Terrebonne

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No virus found in this outgoing message.
Checked by AVG Free Edition.
Version: 7.1.409 / Virus Database: 268.16.5/616 - Release Date: 1/4/2007

From: Helen Ragas [hragas@cox.net]
Sent: Friday, December 15, 2006 10:04 PM
To: comments@louisianacoastalplanning.org
Subject: Master Plan for the Lower Mississippi River

I have not read the entire content of the report and was not able to attend the meeting in Belle Chasse. I was involved as a member of the Barataria Basin CWPPRA RPT team several years ago but my job constraints do not allow me to be an active participant at this time.

A very effective process was discussed many times and to my knowledge was never included in a PPL project. I think the process was called sediment traps. Hydraulic dredging was used to mine pits in the middle of the river and deposit the fill in the marsh areas or discharge it into river diversions such as the Myrtle Grove Diversion which is presently in the preliminary construction stage. The pits would then be filled with sediment deposited by the river thereby reducing the sediment at the head of passes and Southwest Pass and preventing the precious sediment from being dumped into the Gulf of Mexico.

Spillways are the answer for preventing a CAT 5 surge from topping the presently repaired CAT 3 levees. These spillways would be of the Bonne Carre type with side levees extending from the river to the back hurricane protection levee. Borrow from the river and back levees would be used to build the side levees along with borrow from the spillway itself. A low sill levee could be kept on the river end to prevent flow to occur except when a storm surge occurs or the river reaches a calculated height to allow natural river diversion. The spillways would have to be sized to accommodate a CAT 5 surge from either direction in order to prevent over topping of the CAT 3 system. This method would imitate the natural high river bank over flow which has been cut off by the levee system. It may be possible to construct the spillways at areas presently being used as borrow pits for the levee repairs now in progress, such as the one above Fort Jackson and also the one below Port Sulphur. The Myrtle Grove Diversion could be redesigned to fit into this system of spillways. Of course the highways would have to be elevated across the spillways such as is in the planned Myrtle Grove Diversion and the Fort Jackson Diversion projects. It is absolutely necessary to have a link all the way to Venice.

Please consider my input. I was born and spent my last 63 years in Buras and I grieve the lost of my town.

Sincerely, Kenneth Ragas

From:	Mike Mariana
To:	comments@louisianacoastalplanning.org;
CC:	Ammariana@aol. com;
Subject:	Public Comments
Date:	Friday, December 01, 2006 1:15:04 PM
Attachments:	

Good afternoon. I was a the meeting in New Orleans on Wednesday and was impressed at the effort at hand. I have 2 suggestions.

1. All the coastal parishes that are impacted by this study must have permanent representation on the CPRA Board. Though I realize a board too large could get difficult to manage, the final plan must not be a Baton Rouge plan but a long-term, comprehensive local, state, and federal restoration and protection commitment. Maybe you could have a Delta Subcommittee and a Chenier Subcommittee. Either way, their must be direct, permanent, local representation.

2. An intensive and extensive plan of planting aquatic and marine plans should be a key part of this plan. Plants such as the mangrove could quietly, naturally, and effectively help us stop erosion, create new land by trapping sediment, and redevelop habitats for wildlife. Dr. Richard Neill at the Plant Station in Golden Meadow has gotten me started with some mangrove seeds that I will use to start a coastal restoration project of my oven here in Plaquemines Parish. A massive, well funded effort that is part of the CPRA Plan could have significant benefits.

I will follow closely the plan's progress and hope to send more comments going forward. Thanks.

Regards,

Mike Mariana
Industrial Welding Supply
111 Buras Drive
Belle Chasse, LA 70037
504-392-2400 Phone

504-392-1500 Fax

Home:
112-A Live Oak Dr.
Belle Chasse, LA 70037
504-394-8749 Home
504-250-0365 Cell

Attachments: parish resolution.tif; town resolution.tif;
donaldsonvilleto the gulf.pdf

-----Original Message-----
From: Scott Angelle
Sent: Wednesday, December 27, 2006 4:22 PM
To: Jonathan Porthouse
Subject: Fw: donaldsonville

Fyi

----- Original Message -----
From: Timothy Kerner <jeanlafittetownhall@yahoo.com>
To: Scott Angelle
Sent: Wed Dec 27 16:19:45 2006
Subject: donaldsonville

Dear Mr. Angelle:

Attached ia a letter from the Delegation, a resolution from the town and a resolution from the parish asking the state of Louisiana to keep the Lafitte/Barataria and Crown Point area in the Donaldsonville to the Gulf alignment. Thak you for your time

Sincerely,
Timothy P. Kerner
Mayor

On motion of **Mr. Roberts**, seconded by **Mr. Young**, the following resolution was offered:

RESOLUTION NO. 105685

A resolution requesting the United States Army Corps of Engineers to include Lafitte, Barataria and Crown Point areas of Jefferson Parish in the Donaldsonville to the Gulf Levee Project.

WHEREAS, the Donaldsonville to the Gulf Levee Project is being studied; and

WHEREAS, extending the project to the east to include the areas of Lafitte, Barataria and Crown Point of Jefferson Parish will give protection to those areas an the coastal wetlands; and

WHEREAS, this levee project would further enhance the protection of the west bank of Jefferson Parish;

NOW, THEREFORE, BE IT RESOLVED, by the Jefferson Parish Council of Jefferson Parish, Louisiana, acting as governing authority of said Parish:

SECTION 1. That the Jefferson Parish Council hereby regrets the United States Army Corps of Engineers to include Lafitte, Barataria and Crown Point areas of Jefferson Parish in the Donaldsonville to the Gulf Levee Project.

SECTION 2. That a copy of this resolution be forwarded to U.S. Senators Landrieu and Vitter, Louisiana Congressional Delegation, the U.S. Army Corps of Engineers and Mayor Tim Kerner, Town of Jean Lafitte.

The foregoing resolution having been submitted to a vote, the vote thereon was as follows:

YEAS: 6 NAYS: None ABSENT: None

The resolution was declared to be adopted on this the 28th day of June, 2006.

THE FOREGOING IS CERTIFIED TO BE A TRUE & CORRECT COPY

Eula A. Lopez

EULA A. LOPEZ
PARISH CLERK
JEFFERSON PARISH COUNCIL

RESOLUTION # 1468

On a motion by Councilman Smith and seconded by Councilman LeBeau the following resolution was offered:

A resolution asking the Corps of Engineers to add the entire Lafitte, Barataria and Crown Point area into the Donaldsonville to the Gulf project.

WHEREAS, the area is the largest shellfish producing area in the State of Louisiana, possibly in the United States.

WHEREAS, the area has hundreds of active oil wells that help fuel automobiles and homes throughout the United States.

WHEREAS, we feel it is vitally important to protect the people, the oil and gas, the seafood industry and the culture of the Lafitte, Barataria, Crown Point area.

BE IT RESOLVED by the Mayor and the Councilmen of the Town of Jean Lafitte a municipal corporation domiciled in the Parish of Jefferson acting as governing authority of said town:

This resolution was submitted to a vote and the vote was thereon as follows:

YEAS: 5 NAYS: 0 ABSENT: 0

Councilman Badeaux
Councilman Creppel
Councilman Guillie
Councilman LeBeau
Councilman Smith

THIS IS A TRUE COPY
OF THE ORIGINAL.

Yvette Crain
TOWN CLERK

This ordinance was hereby adopted on this 12th day of December 2006.

Timothy P Kerner
Mayor

Yvette Crain
Town Clerk

From: Dispatcher, Galliano [rlcgal@rlcllc.net]
Sent: Saturday, December 16, 2006 9:01 AM
To: comments@louisianacoastalplanning.org

Dear Sirs,

I will start by saying, I think when you set a meeting in designated areas you should be able to answer questions pertaining to that specific area. This past Tuesday there was one of these meeting's in which my husband attended, he said when everything started no one was saying anything about Plaquemine's Parish the southern in to be exact all anyone was talking about is the entire coast of Louisiana not including the Lower end of Plaquemines. When any questions were asked pertaining to this area it seems no one had any answer's, seems to me if you are not prepared to answer the hard questions then what is the point of setting the meeting?

Now, some comments on what few questions were answered by our present Parish President Benny Rouselle, I live in the lower end of the parish I am raising a family there like most and we are concerned about our future here. As a mother of 5 children who by the way wanted to move back home what do I tell my children when they ask Mom will we have to move, will these people force us to move some where else? What make's anyone else who live's along the coast of Louisiana better than me or my children or family? Take for instance all the focus that is on Fourchon or Grand Isle or even Cameron Parish, why is there not more focus on the lower end of Plaquemines Parish? If Katrina had not hit the lower end of Plaquemine's try to imagine what would have happened to New Orleans you think it was bad this time and the storm did not even hit them the levees broke the day after Katrina came through. Does anyone pay attention to the amount of Oil and Gas that come through our little end of the world? Does anyone know or pay attention to the amount of seafood that comes from our little end of the world? Does anyone even care? Most people who live here just want what anyone else wants, just a chance to raise our kids in a safe enviroment. My husband and I work hard we pay our taxes like most american's but I have to say that we surely do not get treated like most american's because of where we choose to live. In this great country that we live in I think there is something wrong with this picture. Why can you not start the dredging and filling in of land at the southern end of the parish and then work your way to the northern end or for that matter get two dredges and put one in the southern end and the other in the northern end meet in the middle I think you would accompish more faster than just using one. I think the people of the southern end of the parish would just appreciate a little more consideration as the rest of the coast is getting they are just a vulnerable as we are. If someone is listening just please don't let us go forgotten, for my children for the people who live here in this wonderful place and their children don't forget us! Not to mention the thousand's of people who like to visit here every year to fish and hunt.

Thank you,

Tina Drury
Resident of Lower Plaquemine's Parish (Venice)

From: Callahan, James [jamesc@mobiletel.com]
Sent: Thursday, January 04, 2007 1:56 PM
To: comments@louisianacoastalplanning.org
Subject: Comments on Louisiana's Master Plan for Coastal Restoration and Comprehensive Levee Protection

Attachments: James Callahan.vcf

Dear Sir/Madam,

I am writing in support of the La. 1 Coalition's position on the items to be included in the draft of the master plan. Recommend items for inclusion in the plan are as follows:

- The state plan should consider the highest level of protection possible for the South Lafourche Levee District (SLLD) system due to the significant role LA 1, businesses, and residents within this system play in both national energy security and the state's future recurring revenue flow.

- The level of protection planned for the SLLD system should be greater than the proposed 100 year structural level of protection. The 100 year structural level of protection does not raise the levee height to the height of the planned elevated Louisiana Highway 1, on which vehicles tires will ride at approximately 20 feet above sea level.

- Include funds necessary to convert both floodgates in Larose and Golden Meadow into functioning locks. Bayou Lafourche as a navigable channel will be of increasing importance to America, necessary to inland barging of fuel, drilling muds and other commodities which make their way down Bayou Lafourche to Port Fourchon, America's busiest intermodal energy port.

- Construct the proposed additional levee between Golden Meadow and Pointe-aux-Chenes. This additional levee will slow water coming from an incoming storm west of Lafourche, which would place the LA 1 Corridor on the bad side of an incoming hurricane. This alignment will reduce dramatically the amount of water that will get to the existing levee, thereby increasing the ability of the present levee system to keep very powerful hurricanes approaching us from the west from flooding the area.

- Construct both the "Morganza to the Gulf" and the "Donaldsonville to the Gulf" levee systems in the Draft Master Plan. The Donaldsonville to the Gulf project has extensive studies underway that avoid the need for additional years of studying another alignment.

These items are good for both residents and business from Lafourche Parish, but just as importantly, these items make good long term economic sense for the entire state. These improvements will secure the future viability of Port Fourchon and Lafourche Parish. Furthermore, these improvements insure that the economic impact that Port Fourchon has today on the state's economy will not be sent

to other gulf coast states due to a lack of foresight. I implore you to give due consideration to the inclusion of the items mentioned above. I look forward to reviewing the plan when completed and seeing the positive results which Louisiana will reap from a properly designed and executed plan.

Sincerely,

James Callahan

President

Vision Communications, LLC

<<James Callahan.vcf>>

From: Melanie Boulet [melboulet@cajunnet.com]
Sent: Wednesday, January 03, 2007 11:54 AM
To: comments@louisianacoastalplanning.org
Subject: South Lafourche levee concerns
I am writing to you as a concerned citizen along Bayou Lafourche. Please consider:

1) Moving ahead with the Reintroduction of fresh water to Bayou Lafourche Project. Our land and marshes need more fresh water!

2) Granting the South Lafourche Levee District a higher elevation!

3) Constructing additional levees between Golden Meadow and Pointe au Chen (whose residents had water coming at them from 3 directions during Hurricane Rita!), and

4) Using the Donaldsonville to the Gulf levee alignment!

Flood protection and levees are thousands of years old. We KNOW what needs to be done. We just need the political will to do it. Please rally all the money we need to preserve our valuable wetlands and our unique lifestyle and contribution to the United States economy. With Best Regards, Melanie Boulet.

December 6, 2006

Mr. Buras by telephone provided the following comments (paraphrased): If the levees are overtopped by a storm, water remains trapped between the levees with no where to go, for an unacceptably long period of time causing additional damage. Current pumping system is either insufficient or not operable after a storm. Improvement of this or installing flood gates in the levee system in locations at Empire, Buras and maybe further north would allow the water to drain out of the closed system. Bay St. Louis and Waveland were able to drain after the storm. Buras had water sitting for thirty days after the storm because there was no way to get it out.

Mr. Buras
942 Buras River Rd.
Buras, LA 70041

(Notes on telephone conversation taken by Michele Deshotels.)

12/06/06

Dear Sir;

We believe that "the Coastal Restoration Authority" should see that all of Terrebonne and Lafourche Parishes, (including the areas South of the intracoastal) be protected as that part of the Parish, is the lifeblood of our area's economy and much of the Nation's energy.

It is worth a significant investment of protection!!

Please, for our future and our Nation's future, do not leave these areas out.

Thank you.

Sincerely,
The Thomas Purvell Family
136 Canna St - Houma, La.
70364

Coastal Protection and Restoration Authority
Integrated Planning Team

PUBLIC MEETING COMMENT FORM

Comprehensive Coastal Protection Master Plan for Louisiana
Preliminary Draft

To insure that your written comments are considered, they should be turned in this evening at the reception desks located near the entrance or mailed to the following address so that the comments are received no later than January 5, 2007:

CPRA – IPT
DNR
Post Office Box 94396
Baton Rouge, LA 70804-9396

Email comments may additionally be submitted at: comments@louisianacoastalplanning.org

Please consider the following comments:

To whom it may concern,
I am a lifelong resident of Lafourche Parish. I have reviewed the Preliminary Draft of the Comprehensive Coastal Protection Plan for Louisiana. I am deeply concerned about the Barataria Basin and West Bank section which calls for 1% level of protection for southern Lafourche. I do not understand the rationale for excluding this vital economic area from 0.2% level of protection as is being offered to the west in Houma and to the east in New Orleans. Although the southern areas of Lafourche are not as densely populated as the New Orleans and Houma areas, this south Lafourche area is home to the main highway (La. 1) to Port Fourchon. I am requesting that this section of the plan be reviewed to provide at least 0.2% protection to the South Lafourche areas.

(Use the back of this form if more room is needed) Thank you

Name: Lisa Ogeron Date: 12/27/06

Address: P.O. Box 504, LOCKPORT, LA 70374

1/5/2007 13:56	Jerome Zeringue, Terrebonne Levee & Conservation District, 220-A Clendenning Road, , Houma, Louisiana, 70360, U.S., jzee@tlcd.org	On behalf of the Terrebonne Levee and Conservation District, I would like to reiterate our support of the Principle Objectives Underlying the master Plan. In addition, we whole heartily support inclusion of the Morganza to the Gulf Hurricane Protection Project to a minimum 1% level of protection and that .2% level of protection be considered and implemented as soon as practical and feasible. Our request is to achieve hurricane protection for this area as soon as possible. It is the position of the TLCD that the Morganza Project, along its current alignment, is the most reasonable, environmentally compatible hurricane protection plan there is. If .2% level of protection is intended, and cannot be constructed along the current 1% Morganza alignment, then it should be placed where it is most economically justified and environmentally compatible. The primary consideration should be constructing Morganza to a minimum 1% level of protection along the current alignment in order to provide hurricane protection to this area. In addition, the TLCD is in support of the proposed Comprehensive Protection and Restoration Plan for the Eastern Delta Plain. As outlined, this plan can fulfill the need to restore and maintain our coastal wetlands while providing desperately needed flood protection to the communities of coastal Louisiana.

From: toby voisin [tobyvoisin@yahoo.com]
Sent: Friday, January 05, 2007 2:32 PM
To: comments@louisianacoastalplanning.org
Subject: Re-routing of the intracoastal canal in Terrebonne Parish

This proposal can be accomplished as a seperate project from the Morganza Levee System. It would serve as a primary levee which would serve as a surge protector or speed bump to minimize damages from hurricanes to the community and the Morganza Levee. It also would provide a natural source for sediment and fresh water from the Atchafalaya River which would sustain and rebuild the marshes along the coast.

1/5/2007 14:45	Jack Moore, Terrebonne Parish School Board, P.O. Box 5097, , Houma, LA , 70361, Terrebonne, jmoore@tpsd.org	On behalf of Terrebonne Levee and Conservation District, I would like to state my support of the Principle Objectives Underlying the master Plan. In addition, I whole heartily support inclusion of the Morganza to the Gulf Hurricane Protection project to a minimum 1% level of protection and that 2% level of protection be considered and implemented as soon as practical and feasible. I believe our objective should be to achieve hurricane protection for this area as soon as possible. I think that the the Morganza Project, along its current alignment, is the most reasonable, environmentally compatible hurricane protection plan there is. The primary consideration should be constructing Morganza to a minimum 1% level of protection along the current alignment in order to provide hurricane protection to this area. In addition, I support the proposed Comprehensive Protection and Restoration Plan for the Eastern Delta Plain. As outlined, this plan can fulfill the need to restore and maintain our coastal wetlands while providing desperately needed flood protection to the communities of coastal Louisiana. The time to act is NOW!

1/5/2007 11:06	Lori LeBlanc, , 205 Fern St., , Houma, LA, 70360, , lori@separator-spareparts.us	I have submitted comments on several occassions in the past for other state wide restoration plans, i.e., the LCA Plan; however, these comments were not taken into consideration in the development of this new plan. A large-scale long-term naturally systemic restoration project for the Barataria & Terrebonne basins must be included in any State restoration plan. The Third Delta Conveyance Channel is the only large scale project that offers long term sustainability to the region and this is currently not included in the plan. This plan must outline the state's intention to continue with the Third Delta Feasibility Study.

From: jjjones [niceskin@bellsouth.net]

Sent: Friday, January 05, 2007 3:09 PM

To: comments@louisianacoastalplanning.org

Cc: zzz grand isle

Subject: Please make sure that the restoration plan uses the Third Delta Conveyance Channel Plan to ³protect the protection² .

I feel the plan needs both near-term and long-range restoration projects. I believe the protection of the communities of South Louisiana is of utmost importance. Please make sure that the restoration plan uses the Third Delta Conveyance Channel Plan to “protect the protection” .

The plan as presented does include some very worthy individual restoration projects, including the following: Small Bayou Lafourche Introduction, Re-authorization of Davis Pond, Barrier Island Restoration projects, Pipeline Conveyance of Sediment, Beneficial Use of Dredge Material, Restoration of historic ridges, Multi-purpose use of the Houma Navigational Canal Lock Complex, and Use of the Gulf Intracoastal Waterway for Atchafalaya Delivery into Western Terrebonne.

The master plan needs to include a long term restoration option for both the Barataria and Terrebonne Basins for the sustainability of the abovementioned projects. This includes, but is not limited to, the continued study of the Third Delta Conveyance Channel, as presented at stakeholder meetings in the fall and public meetings in December.

Because of the devastating effects of Hurricanes Katrina, and especially Hurricane Rita for our area, it is vital for the CPRA’s Master Plan to include both near-term and long-range perspectives and to incorporate already existing and planned structural, management, and institutional components.

Now, more than ever, the state needs to aggressively and expeditiously implement a comprehensive master plan, in coordination with the federal government, for the long term sustainability of our coast, communities, and culture.

Thank you for including the Third Delta Conveyance Channel Plan in the project to restore our coast , hopefully , forever.

John J. Jones, Jr. M.D.

Dermatology. Allergy. Skin Cancer Surgery

404 NORTH ACADIA RD THIBODAUX, LA. 70301

email address:

niceskin@bellsouth.net

Web Site:

www.jonesderm.com

From: JENNIE LACOSTE [jennieancar@yahoo.com]
Sent: Friday, January 05, 2007 2:03 PM
To: comments@louisianacoastalplanning.org
Subject: Re: Rerouting of Intracoastal Canal in Terrebonne Parish

It is agreed that the coastal areas of Terrebonne Parish need massive amounts of sediment and fresh water to nourish its wetlands. A cost effective method would be to reroute the Intracoastal Canal (ICWW)from the Atchafalaya River at Morgan City, LA in a southeasterly direction into the marshes and below the communities in Terrebonne Parish.

This would be a more natural approach to replenishing the sediment and fresh water into vital areas and would provide for a primary levee to diminish hurricane water surges. Protection would be provided to the communities, as well as the Morganza to the Gulf Levee System.

It is also true that the possibility of a collision of barges containing harmful chemicals or explosives passing through the inner City of Houma could cause a serious disaster.

From: Kathy Hanks [kathy@levettmechanical.com]

Sent: Thursday, January 11, 2007 3:46 PM

To: comments@louisianacoastalplanning.org

South Central Industrial Association (SCIA) is a tri-parish industrial organization composed of over 200 member companies representing over 36,000 employees, committed to the communities we serve. On December 11, 2006 we sent an initial statement regarding the CPRA Plan (copy in current SCIA newsletter). We commend the efforts to devise a workable plan for both hurricane and coastal protection. Upon additional review of the Preliminary Draft of the State's Comprehensive Master Plan, we would like to provide additional comments to reflect the following:

1. In addition to supporting Morganza to the Gulf and the Donaldsonville to the Gulf projects, please consider including Thompson Road in the 500-Year Protection (second line of defense). Several companies were flooded during Hurricane Rita that affected thousands of people. Thompson Road includes multiple businesses that are critical to the economic base of Terrebonne Parish and the state economic base. It is home to fabrication yards, shipyards and service companies that need to be protected.
2. We recommend that the state plan include the highest level of protection for South Lafourche Levee District system due to the significant role LA 1 with its businesses and residents play in the national energy security and revenue flow. The current 100- Year plan is not conducive to the planned elevated height of LA 1 with vehicular tires riding at 20 feet above sea level.
3. Funding is necessary to covert floodgates in Larose and Golden Meadow into functioning locks for added protection, as well as an industrial navigational source for the inter-modal energy Port Fourchon.
4. An additional levee between Golden Meadow and Pointe-aux-Chenes would provide added protection for the LA 1 corridor.
5. Though the plan includes several individual restoration projects, its lacks both near-term and long range restoration projects that are vital. Long term restoration should seriously be considered for both the Barataria and Terrebonne Basins, including the continued study of the Third Delta Conveyance Channel.

From: Kirby Collins [kcollins@mobiletel.com]
Sent: Friday, January 05, 2007 7:41 PM
To: comments@louisianacoastalplanning.org
Subject: Please include the following projects.

My name is Jacqueline Collins. I was reading the Daily Comet and decided that I must e-mail. As a resident of Golden Meadow I am well aware of the importance of the following projects that need to be included in the plans.

1. Include Thompson Road in Morganza. I watched Ch 10 and the effects of Rita on Terrebonne Parish. It was horrible. The businesses that are located in this region play a valuable part in the economy of not only the parish and region but of the United States as a whole.

Even if you disregard the damage to my property during the three hurricanes, the horror I felt seeing Hwy 1 covered south of the floodgate, knowing that the water was lapping at the levee behind my house and the hurricane hit so far away, driving down to Fourchon and Grand Isle after when the roads and bridges were finally passable and seeing the extent of the damage, realizing that we should have left for Rita like we did for Katrina because in a few feet more we would have been under water you should know that the following projects should be included. If you were to have looked at the aerial views that Martin Folse of Ch.10 took from a helicopter showing Lafourche parish as an island surrounded by water lapping at the tops of the levee you would know that the following projects are a necessity. If you realize the magnitude of the importance that Fourchon has on oil production and the importation of foreign oil and that Hwy 1 is the only way in and out you would realize they should be included. Fourchon was able to get up and running as fast as it did because Lafourche was still a viable area. However, a nearer turn of either Katrina or Rita and we would have been like a bowl filled with water. We must have greater protection.

2. Provide the South Lafourche Levee District system with the highest level of protection, an inclusion that's warranted because of LA.1.
3. Provide money to convert Larose and Golden Meadow floodgates into locks for added protection.
4. Build another levee between Golden Meadow and Pointe-aux-Chenes to give the La. 1 corridor added protection.

The following project is important to the entire area and must be included.

5. Consider long-term restoration projects for the Barataria and Terrebonne basins, including continuing the Third Delta Conveyance Channel study.

From: June Butler [jnbtlr@charter.net]

Sent: Friday, January 05, 2007 7:55 PM

To: comments@louisianacoastalplanning.org

Subject: Comment

Dear Sydney,

Now that we have funds, let's start some projects to show sincere efforts toward restoring our coasts. Examples: the levee system in Lafourche Parish needs to be built higher from Larose to Golden Meadow. Terrebonne Parish needs levees. The Houma Navigation Canal is widening by the minute. It's another MRGO. Bayou Lafourche need to be addressed by dredging and increasing the water flow. It is presently turning into a big ditch from Donaldsonville to Thibodaux. How about dredging silt from the Gulf and pumping it onto the offshore islands?

Joseph T. Butler, Jr.

From: Charlotte Bollinger [CharlotteB@bollingershipyards.com]

Sent: Tuesday, January 09, 2007 11:48 AM

To: 'comments@louisianacoastalplanning.org'

Cc: Simone Theriot

Subject: Coastal planning

Please include large scale restoration projects in the work to be done. I am a member of Resprte or Retreat and the LA 1 Coalition. We know that if we build new land and do not restore the wetlands with a sustainable method of pushing back the salt wter, all will fail under the current system. If not the 3rd Delta Conveyance channel, give us some science that can work.

I know this for sure: there is only one place on the Louisiana coast that is building land--Wax Lake, where we have allowed the Atchafalya River to supply sediment and fresh water with volicity. It works!

From: Karl Boffanie [kboffanie@stoneoil.com]
Sent: Friday, January 05, 2007 1:19 PM
To: comments@louisianacoastalplanning.org
Subject: South Lafourche Levee

1. Need the highest level of levee protection due to the significant role LA. 1 plays in the nations energy program and the state's future revenue flow.

2.Construct both the "Morganza to the Gulf" and the " Donaldsonville to the Gulf" levee systems.
No need for more studies.

3.Include necessary funds to convert the Golden Meadow & Larose into functional floodgates.

4.Ensure that LA. 1, between Golden Meadow & Port Fourchon, remain open to vehicle traffic by continuing the elevation project.

Karl Boffanie
John W. Stone Oil Distr., LLC
Port Fourchon, La.

From: Jane Arnette @ SCIA [scindustrial@bellsouth.net]
Sent: Friday, January 05, 2007 3:40 PM
To: comments@louisianacoastalplanning.org
Subject: comments

South Central Industrial Association (SCIA) is a tri-parish industrial organization composed of over 200 member companies representing over 36,000 employees, committed to the communities we serve. On December 11, 2006 we sent an initial statement regarding the CPRA Plan (copy in current SCIA newsletter). We commend the efforts to devise a workable plan for both hurricane and coastal protection. Upon additional review of the Preliminary Draft of the State's Comprehensive Master Plan, we would like to provide additional comments to reflect the following:

1. In addition to supporting Morganza to the Gulf and the Donaldsonville to the Gulf projects, please consider including Thompson Road in the 500-Year Protection (second line of defense). Several companies were flooded during Hurricane Rita that affected thousands of people. Thompson Road includes multiple businesses that are critical to the economic base of Terrebonne Parish and the state economic base. It is home to fabrication yards, shipyards and service companies that need to be protected.
2. We recommend that the state plan include the highest level of protection for South Lafourche Levee District system due to the significant role LA 1 with its businesses and residents play in the national energy security and revenue flow. The current 100- Year plan is not conducive to the planned elevated height of LA 1 with vehicular tires riding at 20 feet above sea level.
3. Funding is necessary to covert floodgates in Larose and Golden Meadow into functioning locks for added protection, as well as an industrial navigational source for the inter-modal energy Port Fourchon.
4. An additional levee between Golden Meadow and Pointe-aux-Chenes would provide added protection for the LA 1 corridor.
5. Though the plan includes several individual restoration projects, its lacks both near-term and long range restoration projects that are vital. Long term restoration should seriously be considered for both the Barataria and Terrebonne Basins, including the continued study of the Third Delta Conveyance Channel.

Once again, we commend your efforts and are pleased that citizens and community groups are allowed the opportunity to make suggestions in developing a comprehensive plan.

Thank you for your help. We hope you will take time to send an email on this very critical issue and for the future of our region!

Jane Arnette
SCIA Executive Director
PO Box 2143
Houma, LA 70361
Phone: 985-851-2201 Fax: 985-851-2202
scindustrial@bellsouth.net
VISIT OUR WEBSITE AT sciaonline.net

From: Jennifer Armand [jen@armandcreative.com]
Sent: Friday, January 05, 2007 4:21 PM
To: comments@louisianacoastalplanning.org
Subject: Barataria and Terrebonne Basins Must be Priority

My name is Jennifer Armand. I am a resident of Houma, and serve as Executive Director of the Bayou Industrial Group. As a organization of business and industry representatives in Lafourche, Terrebonne, Assumption and St. Mary parishes, the Bayou Industrial Group is focused on the economic development of this region, and our members recognize that effective, long-term coastal restoration and hurricane protection are critical to our sustainability.

To this end, the Bayou Industrial Group supports the efforts of the CPRA to develop a comprehensive protection and restoration plan for coastal Louisiana, with future revenues from oil and gas production off of our state's coast helping to fund the plan's implementation. But the business men and women urge members of the authority to pay special attention to our region –particularly Lafourche and Terrebonne parishes – as they begin finalizing the plan. It is here in the "heart of America's wetland," as our region is sometimes referred, where we proudly provide up to 20 percent of this nation's oil and gas supply through Port Fourchon and fabricators and shipbuilders support the global energy industry. We are the energy workhorses. And yet, where we stand this evening is also the epicenter of coastal wetland loss in Louisiana, the nation and the world – a fact that not only threatens the very land beneath our feet, but leaves us increasingly vulnerable to storm surges that could wipe not only our coastal communities that serve the nation's energy needs, but billions of dollars of energy infrastructure that feed oil and gas from New York to California.

For these reasons, Bayou Industrial Group thanks you for including the Morganza-to-the-Gulf Hurricane Protection project in the CRPA draft plan and urge its continued inclusion. We also emphatically support the proposed construction of the "Golden Meadow to Point-Au-Chene" levee alignment, which would provide enhanced storm surge protection to south and central Lafourche parish, including Port Fourchon, the LA 1 corridor and the numerous local and international businesses that provide critical products and services to this state and nation. Should a future storm make landfall in Lafourche parish, Terrebonne parish or slightly west of us, this region that we call home will be inundated, crippling our communities and the national energy supply. The Golden Meadow to Point-Au-Chene levee alignment is a critical piece of protection for this area.

Also critical to this region is a large-scale, long-term initiative for comprehensive coastal restoration for Lafourche and Terrebonne Parishes, such as the Third Delta Conveyance Channel. This proposal has already undergone a state feasibility study and is awaiting further state and federal action to proceed. I urge the CPRA to consider this region as the one leg of the state that is not just bleeding, but hemorrhaging, when it comes to coastal land loss and subsidence. The needs of this area must be addressed aggressively in the CPRA plan, with projects that mimic the delta-building resources of the Mississippi River.

The Barataria and Terrebonne basins cannot be forgotten, and this area of the state deserves a priority level of attention in the state master plan, both in restoration efforts and hurricane protection.

Jennifer Armand
Armand Communications, LLC
jen@armandcreative.com
phone: 985-580-3901
fax: 985-223-1415
cell: 985-790-1150
602 Clayton Drive
Houma, LA 70360

CONTINENTAL LAND & FUR CO., INC.
39730 LES ROIS ROAD
GUEYDAN, LOUISIANA 70542-5246
TELEPHONE (337) 774-0098 CELL (337) 519-8006 FAX (337) 774-0823

December 28, 2006

VIA FAX

Coastal Protection and Restoration Authority
Integrated Planning Team
Department of Natural Resources
P.O. Box 94396
Baton Rouge, LA 70804-9396

Re: Comments on-Comprehensive Coastal Protection Master Plan for Louisiana Preliminary Draft

Gentlemen:

Continental Land & Fur Co., Inc. (CL&F) owns and manages a large tract of wetlands in northwest Terrebonne Parish. CL&F has commented on sections of the 2050 Plan and the LCA Comprehensive Study that related to this portion of northern Terrebonne. The concerns expressed in our earlier letters have not been addressed based on the latest plan. Our review of an earlier version of the Master Plan showed a measure labeled as 3a-2e shown in Figure 3-1 as Planning Unit 3a as part of the Alternative Plan 1 Measures. Even though we do not have the details explaining the project, this Measure-3a-2e "Convey Atchafalaya River Water to Northern Terrebonne Marshes" is of great concern to CL&F.

In the latest version of the Master Plan there are references and maps on pages 34, 48, 49, 55, and 56 indicating the intent to- "Increase Atchafalaya River Influence in Terrebonne Marshes via the GIWW and from the river". Water levels in the northern Terrebonne marshes have been increasing for at least 30 years. This increase in water level has had a negative impact on the fragile thin-mat floating marshes located between Turtle Bayou and Bayou Copasaw. Higher water levels have also created breaches in navigation and canal spoil banks, pipeline spoil banks and natural bayou banks throughout the property. These breaches produce increased water velocity and have resulted in loss of thin-mat floating marsh. Increasing water levels in the basin continue to make maintenance of spoil banks very difficult. These spoil banks provide short and long term protection for these fragile marshes. These conditions were recognized by CWPPRA in 1997 when Project TE-34- Penchant Basin Plan was approved. It was thought that this project would potentially reduce water levels in the northwestern portion of the project area and divert fresh water southeastward to where it is needed. The project is expected to reduce saltwater intrusion and increase fish and wildlife production. Considering the existence of this CWPPRA project to divert water from the area to the southeast, it is confusing to see the Measure 3a-2e as part of this plan. We are requesting

that this Measure-3a-2e be examined carefully and a detailed analysis be provided showing how water levels can be increased in northern Terrebonne without having a negative impact on floating marshes and spoil banks. We understand the need for more freshwater in southern Terrebonne Parish, but to accomplish this objective other alternatives must be evaluated. If more water is needed through the GIWW to the east, the GIWW spoil bank will have to be restored and maintained and major outlets will have to have constrictions to insure that the water moves to the east and not through the floating marshes to the south. Of course any such constriction will have to provide for navigation.

We support the inclusion of the Measure- 3a-6 "Bankline Protection for the GIWW". CWPPRA recognized this problem and the approved Project TE-43 "Bank Restoration of Critical Areas in Terrebonne" in 2001 for Phase I funding. CL&F also submitted a project to CIAP for funding to address this very serious problem. Loss of shoreline along the GIWW in northern Terrebonne exposes thousands of acres of fragile thin-mat floating marsh to breakup and conversion to open water. Protection of the shoreline along this man-made channel will help insure the future of the adjacent wetlands. Protection and restoration of banklines of all man-made navigation channels in the area must be addressed. Some sections of the GIWW in this area are over 2,000 feet wide and most of the Avoca Island Cutoff Channel is also badly eroded.

I have attended several of the CPRA Public Hearings and discussed CL&F's concerns with members of the Integrated Planning Team. Concern about more water in northern Terrebonne was also expressed by a representative of the Terrebonne Parish Coastal Advisory Committee at the December 11, 2006 CPRA Public Hearing in Houma.

Thank you for the opportunity to allow CL&F to submit comments to be considered during your next revision. If you have questions or require additional information, please do not hesitate to contact me (337 519-8006).

Sincerely,

Greg Linscombe

Greg Linscombe
Fee Land Manager

From: Penny Dufrene [pennyd@portofiberia.com]
Sent: Friday, January 05, 2007 10:15 AM
To: comments@louisianacoastalplanning.org
Cc: Roy Pontiff
Subject: Port of Iberia District's Comments

Attachments: CoastalProtectionandRestorationAuthorityLetter.wpd

January 5, 2007

Coastal Protection and Restoration Authority

Intergrated Planning Team

617 North Street - 10th Floor

Baton Rouge, LA 70804

Attn: Jonathan Porthouse

Dear Mr. Porthouse,

Unfortunately I was unable to attend your Public Meeting in Abbeville on December 15th but please accept this letter as comment on the Draft CPRA Comprehensive Coastal Protection Master Plan.

As you are aware, the Port of Iberia and LA-DOTD are local sponsors for the Acadiana Gulf of Mexico Access Channel Project (AGMAC) which will improve access from the Port of Iberia to the Gulf of Mexico for its many tenants and fabricators located in the Port. AGMAC will extend from the Port of Iberia, southerly along Commercial Canal to the Gulf Intracoastal Waterway (GIWW), westerly along the GIWW to Freshwater Bayou and then southerly along Freshwater Bayou to the Gulf of Mexico. The Feasibility Study and EIS ($5M) has been completed and the USACE Chief of Engineers has signed a ‘‘favorable Chief’s Report’’ (December 29, 2006) and the project is now waiting for inclusion in the next WRDA Bill, which hopefully should be approved this year.

In the Draft Master Plan, the State is proposing a Hurricane Protection Levee from the Wax Lake Outlet to the Lafayette Area. This Hurricane Protection Levee, primarily located along the upland/wetland interface, will cross the Commercial Canal between the Port and the Gulf Intracoastal Waterway (GIWW) thereby crossing AGMAC and will require a floodgate in Commercial Canal at that point. Please be aware that the Port of Iberia will require this floodgate to be a minimum of 200 feet wide and 22 feet deep to accommodate AGMAC and the large fabrication units and vessels that navigate in and out of the Port of Iberia on a regular basis.

I’m sure I don’t need to remind you of the significance of the Port of Iberia as one of the Louisiana’s premiere Offshore Oil and Gas support facilities and the fact that LA-DOTD and the State of Louisiana is committed to cost share in this important economic project is proof of this significance.

Therefore, please accept this letter as support of your Master Plan efforts as proposed in your December 15th presentation but note that any restrictions less than those described above in AGMAC, Commercial Canal, GIWW (west of Commercial Canal to Freshwater Bayou) and Freshwater Bayou is not acceptable to the Port of Iberia or any of its 5000 plus employees and that maintaining adequate access from the Port of Iberia to the Gulf of Mexico is vital to Louisiana’s economic viability.

After reviewing this letter, if you have any questions or require any further information on AGMAC or the Port of Iberia, please feel free to call me @ (337) 364 -1065.

Yours truly,

Roy Pontiff
Executive Director
Port of Iberia District

01/14/07

To whom it may concern,

Having attended both meetings in Houma, I would like to commend the efforts to devise a multiuse plan that is such a tremendous undertaking. I do believe that hurricane protection and coastal restoration go "hand and hand."

I realize that no official lines have been drawn; therefore, I would ask the study team reconsider the draft alignment in Terrebonne. It is my understanding that the draft line for the *500 year Protection* travels south along the intracoatal waterway and includes the Chabert Hospital and Houma Airport. I ask that the study team consider including the industrial area of Thompson Road (approx. mile 34-north on the HNC). Within this area, are the fabrication yards, shipyards and service companies that are the largest employers in Terrebonne Parish. This area has hundreds of millions of dollars of infrastructure and provides many of the highest paying jobs.

I also realize there would be additional cost associated with a larger floodgate to accommodate the industries; however, if these facilities are impacted, I feel the impact would be tremendous to the local and state's economy. If this industrial region is lost, there will not be a reason for many to return.

Sincerely,

Roy P. Francis
Director, Governmental Affairs and Business Development
Gulf Island Fabrication, Inc.

From: Jim Boudreaux [mailto:jboudr1@bellsouth.net]
Sent: Thursday, January 25, 2007 10:12 AM
To: Michele Deshotels
Subject: News Press Release: New Idea, Fixing the levees

This invention will save New Orleans. But no one is interested. No one has made any effort to contact Jim Boudreaux. So get ready with the same mud levees that has proven to break for over 50 years. Hurricane season is 5 months away. You have the invention to protect yourself. But pride will not alow it to be built. So more people will lose their lives when it is not necessary when there is a cat-5 hurricane system ready to be built.

News Press Release: New Idea, Fixing The Levees

Everyone is looking for a solution to the levee problem, land restoration problem and the barrier islands problem. I believe they just want to talk about the problem and continue receiving a paycheck. The reason for my belief is very simple. The Lord has provided solutions for all of the above. I know it comes from the Lord because it is very simple. A Box. No need to come up with a design. No need to do a study. No need to wait years for protection. No need to spend a lot of money. It has been protected and cannot be bought off with scratch my back and I'll scratch your back deal. This invention can be in place before the next hurricane season. This invention has been given to you and was made public in Nov. 2005. And yet not a single person has even attempted to build even a small-scale model to see how many benefits this invention has to over. This is not about money to build a category 5-levee protection system. You already have one. With this invention, you are dealing only with one person. How simple can that be? Congress is waiting on a solution from the very same people who cannot come up with a solution for the past 50 years. These same people Congress is waiting on knows about this invention. And yet will not even mention it to Congress. I find that selfish and self-centered and only concerned about themselves. Congress is ready to fund the solution. But the difference is that 80% of the money funded will go directly to building levees, barriers and land restoration as mentioned above. And that is the problem I believe. This invention will save peoples lives, property and restore land that was eroded by water surge and erosion. But the United States of America has turned a deaf ear and a blind eye for there own personal gain. The solution has been given to them ready to be built and save peoples lives. But they are more concerned about who comes up with the solution, rather than where it came from. This is a sad day in America.
There was a news press release of the invention on national TV. So the United States of America is without excuse of not knowing about the solution ready to be built to save peoples lives. When will the talking stop and action begin to be the priority? When will saving peoples lives come first rather than money, power and position.

Click on the website below to view for yourself the News Press Release that was seen in 2006.

"http://www.youtube.com/v/lKyxdMHBZ8E"

Click on the website below to view Jim Boudreaux's invention in details.

http://jboudreaux.page.tl/

From:	Jim Boudreaux
To:	comments@louisianacoastalplanning.org;
CC:	
Subject:	Armored Flood Levee and Barrier Restoration System
Date:	Monday, December 04, 2006 3:33:28 PM
Attachments:	clip_image002.jpg clip_image004.jpg clip_image006.jpg

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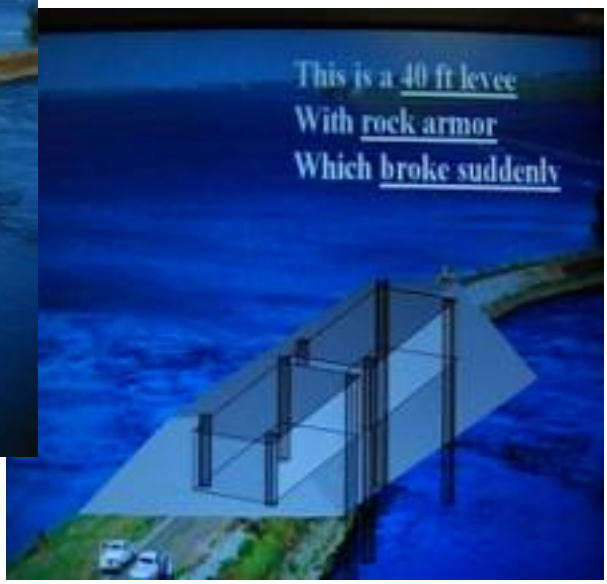
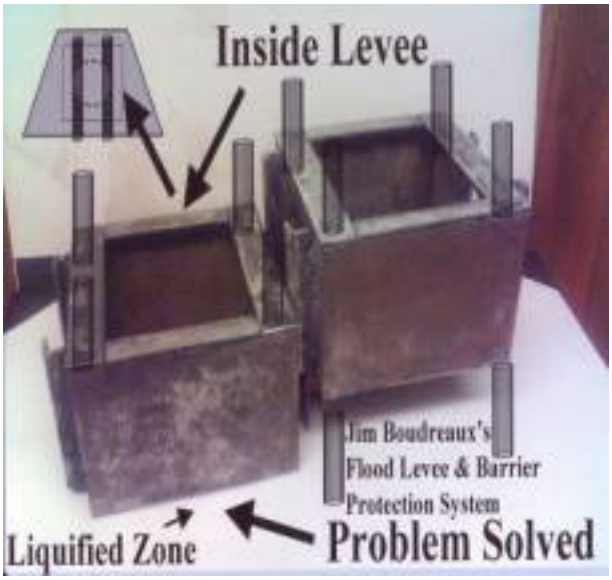
Jim Boudreaux's Flood Levee and Barrier Protection System

Website address: http://jboudreaux.page.tl/

x 4414 Houma, La.





This invention is divine intervention. No human being could have invented the design. Why? Because it is simple. It is ready to be built now. But nobody is listening. The people who make the decision will not get to view my website. I am talking about Congress. Congress wants an Armored levee system. But, this is the problem. An engineering firm or school has to recommend that this is a viable concept and worth pursuing. This design takes an engineer in mud levee and structural engineering. Those who come to mind have no concept of this invention. Five engineering firms have viewed my presentation and could find no vaults in this system. Why? Because its' common sense. That's why. They are afraid to build 100 ft of this system. Because they know it will work and Congress will act on it.
So, if you can get members of Congress to view my

website. At least they would have known that there is an armored levee system already designed and ready to be built. The ball would be in there court. But until then, people's lives are at risk and property will continue to erode away. When that does not have to happen. People in key position are unaware of this system. If you could help, that is where to start. At the top Washington. When Washington would say, test or build this system, then people's lives will be saved and property will begin to be restored. Why? Because everyone will be using the same system but in different areas. Thus the economy will bounce back and people will have courage.
Thanks for taking time to at least read this short message. If you could help thanks. If you cannot, that's ok. The Lord will provide whatever is needed to fulfill His invention. It will be done on His Timing.

Jim Boudreaux

From: Jim Boudreaux [jboudr1@bellsouth.net]
Sent: Tuesday, December 05, 2006 8:58 AM
To: comments@louisianacoastalplanning.org
Subject: Restoration and Coastal protection
"Jim Boudreaux's Flood Levee & Barrier Protection System"

This invention would be of great use if applied the right way.
By that I mean, as a way to protect people's lives and property

It has a steel structural inside of a mud levee.
The structural slides up and down pipes that are driven into the bottom on each corner of the box structural. Thus protecting the mud on the inside from washing away from storm surges
It also addresses the problem of the liquefied zone at the toe wedge, which causes the levee to slide downward. As the box slides downward, add another box on top and regain the original height of the levee.
The weight of the box is 6 tons (10ft x 10ft x 20ft long). (can be built any size)
The mud on the inside weighs 100 tons.
The mud on the inside the box slides downward and corrects the liquefied zone on the bottom.
You will notice the mud level lowing on the top of the levee.
That means the levee problem on the bottom is being corrected. And more mud on the top to maintain the pressure within the box. This is the only system that lets' you monitor the bottom by watching the top of the levee. This system offers an early detection of levee problems.

This system cuts through the red tap of studies and years of waiting before construction can begin. That has to be addressed or even changed. This system is designed to save peoples lives and property. It is based on common sense. We need to put political agendas aside and do whatever needs to be done to save our lives and protect our property. You have to ask yourself this question. Am I really looking for the best levee and restoration design that can protect people and restore property? Or am I waiting for the same people to come up with the same solution except bigger? What's needed is a completely different design. That will not come from within. That design has to come from outside the normal way of addressing the problem. Today you have that design. What is stopping you from doing all that you can to get this system built as soon as possible?

One solution takes time to have protection. (10 to 18 years)
My solution gives you protection instantly. You see your protection. You don't have to wait for protection. Hurricanes don't wait for us to get ready. We have a choice to get ready quickly. Hurricane season will be here in 6 months. Are you ready for another Katrina? At least with my system we will have a good chance to protect peoples' lives and property with the amount of distance my system has been built. More people building my system the greater the distance.

The sad truth is that even if the perfect solution were presented today people would not listen.

They already have their solution that they have been working on for years and pride has blinded them to accept a different solution, even if it will save people's lives and property and can be built quicker.

History will record whether the right decision was made. You can always go back and learn from bad choices but at what price. We learn to live with our choices.

My website is: http://jboudreaux.page.tl/

From: Jim Boudreaux [jboudr1@bellsouth.net]
Sent: Thursday, December 14, 2006 9:01 AM
To: comments@louisianacoastalplanning.org
Subject: An Armored Flood Levee System

The idea of "Boxes", did not come from the Netherlands. The idea came from God. His invention which God intrusted to me to present to you and the world has always been on the internet. The invention is "Boxes" that are connected to each other to form a levee, or a barrier and a locking system. The whole solution is at http://jboudreaux.page.tl/ . But know one is listening. If you watch the "new idea" and view my website, you will see the connection. They are coping someone else's idea and getting the credit. In other words stealing. Man lets you get away with that. But God does not. Where did the Netherland get the idea? God. Now God gave the United States the idea of using "Boxes". I have been saying "Boxes" which is the design of the invention, for the past 16 months. It was viewed on nation wide TV and referred to as "Boxes". It was emailed to every Congressman in Congress. It was faxed to every Corp of Engineer office in the United States. The whole world view my "Boxes". But you got the idea from the Netherland. That sounds more important rather that to say that a nobody from southeast louisiana came up with a solution. On my website, you have a plan, a design, the cost and the time it will take. But know one is listening. They are looking how to make a buck on someone else's idea and get the credit. That's the good old american way. We all will face God and give an account of our life. The Netherland idea works for their country. A catagory 1 or 2 hurricaine would flood them worst than New Orleans. When you ignore God, you will suffer the judgement of God. God designed the multiple lines of protection, not the Netherland nor man. God designed the Barrier Islands then the Coast line and then the land. How can Man take credit for what God has created? This design just enforces what God has done. Anyway, you have the solution at my website. It is evident that man has stolen God's idea and what's to make a profit. God help us all when the next Katrina hits. And it will Hit.

From: Jim Boudreaux [jboudr1@bellsouth.net]
Sent: Wednesday, December 27, 2006 1:47 PM
To: comments@louisianacoastalplanning.org
Subject: An Armored Steel Box Flood Levee and Land Restoration System

I have been making presentations for the past 16 months. Political leaders state and local are all to business pursuing their personal agendas. My invention has been viewed by 5 engineering firms, which concluded that it would work. They all could not find any vaults with my invention. They said that it would be perfect to close the MRGO quickly and cheap. And yet are afraid to bring it up to Congress to see. New Orleans can have category 5-hurricane protection before next hurricane season with a lot of people working together all building the same box. It is that simple. In fact it is so simple a child could understand it and build it.
But grown ups are too intelligent and to smart to admit that this invention solves all four areas of the problems that we have. One box can be used as an Armored Flood Levee System, A Barrier System to be built on the Barrier Islands, A Land Restoration System to restore our coastlines. And a Locking System to keep out storm surges. Maybe it's too simple for mankind. Because it makes common sense. I am not a talker. I am a doer. My invention has already been designed by proven principles and is ready to be built. But no one has contacted me. Are you or your organization talker or doers? If a talker delete this email. If a doer, visit my website and see for yourself the benefits my inventing offers. And then if you have the courage to do so, email me only if you truly care about saving peoples' lives and property as much as I do.

"Jim Boudreaux's Flood Levee & Barrier Protection System"

This invention would be of great use if applied the right way.
By that I mean, as a way to protect people's lives and property

It has a steel structural inside of a mud levee. “Boxes” joined together.
The structural slides up and down pipes that are driven into the bottom on each corner of the box structural. Thus protecting the mud on the inside from washing away from storm surges
It also addresses the problem of the liquefied zone at the toe wedge, which causes the levee to slide downward. As the box slides downward, add another box on top and regain the original height of the levee.
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The mud on the inside weighs 100 tons.
The mud on the inside the box slides downward and corrects the liquefied zone on the bottom.
You will notice the mud level lowing on the top of the levee.
That means the levee problem on the bottom is being corrected. And more mud on the top to maintain the pressure within the box. This is the only system that lets’ you monitor the bottom by watching the top of the levee. This system offers an early detection of levee problems.

This system cuts through the red tap of studies and years of waiting before construction can begin. That has to be addressed or even changed. This system is designed to save peoples

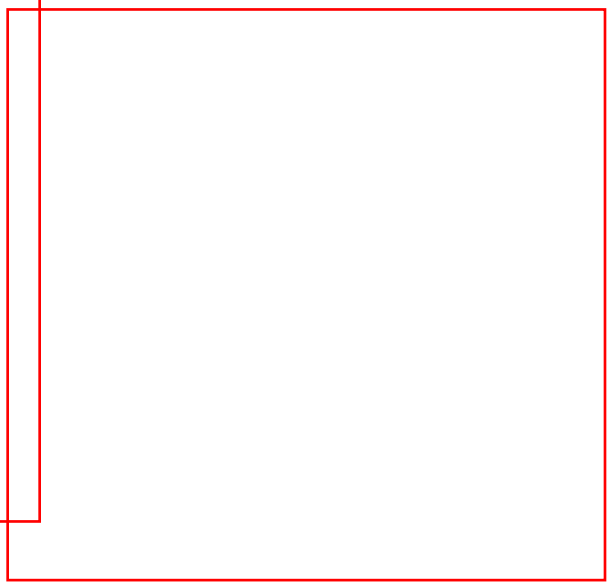
lives and property. It is base
onths. Are you ready for another Katrina? At least with my
system we will have a good chance to protect peoples' lives and property with the amount of distance my system has been built. More people building my system the greater the distance.

The sad truth is that even if the perfect solution were presented today people would not listen. They already have their solution that they have been working on for years and pride has blinded them to accept a different solution, even if it will save people's lives and property and can be built quicker.

History will record whether the right decision was made. You can always go back and learn from bad choices but at what price. We learn to live with our choices.

My website is: http://jboudreaux.page.tl/

Jim Boudreaux's Flood Levee and Barrier Protection System
Website address: http://jboudreaux.page.tl/
P. O. Box 4414 Houma, La. 70361



This invention is divine intervention. No human being could have invented the design. Why? Because it is simple. It is ready to be built now. But nobody is listening. The people who make the decision will not get to view my website. I am talking about Congress. Congress wants an Armored levee system. But, this is the problem. An engineering firm or school of engineering has to recommend that this is a viable concept and worth pursuing. This design takes an engineer in mud levee and structural engineering. Those who come to mind have no concept of this invention. Five engineering firms have viewed my presentation and could find no vaults in this system. Why? Because its' common sense. That's why. They are afraid to build 100 ft of this system. Because they know it will work and Congress will act on it.

So, if you can get members of Congress to view my website. At least they would have known that there is an armored levee system already designed and ready to be built. The ball would be in there court. But until then, people's lives are at risk and property will continue to erode away. When that does not have to happen. People in key position are unaware of this system. If you could help, that is where to start. At the top Washington. When Washington would

say, test or build this system, then people’s lives will be saved and property will begin to be restored. Why? Because everyone will be using the same system but in different areas. Thus the economy will bounce back and people will have courage.
Thanks for taking time to at least read this short message. If you could help thanks. If you cannot, that's ok. The Lord will provide whatever is needed to fulfill His invention. It will be done on His Timing.

From: Wilson Voisin, Jr. [wilson@wilsonsoysters.com]
Sent: Saturday, December 30, 2006 12:46 PM
To: comments@louisianacoastalplanning.org
Subject: Comments: CPRA Preliminary Draft
The following comments are for the Terrebonne Parish Area:

_ Page 3 Para. 2
The re-routing of the Intracoastal Canal would allow sediment & fresh water to flow directly into the marshes of Central and Eastern Terrebonne Parish. This would serve as an INTEGRATED STRATEGY which would nourish the coastal marshes while the levee along the new route of the ICWW could serve as a surge protector or a primary speed bump for hurricanes.

_ Page 3 Para. 3
" ACT 8" of the (2005 First Extraordinary Session) requires and defines Coastal Protection as the combination of Hurricane Protection and Coastal Restoration. The re-routing of the ICWW could accomplish this goal.

_ Page 17 Para. 3
One of the main physical constraints to the central and eastern coast of Terrebonne Parish, La. is the lack of river water and sediment. This need can be easily resolved by the re-routing of the ICWW from the Atchafalaya River through the southern marshes.

_ Pages 18-19-20
These Principles and Objectives can be easily accomplished for Terrebonne Parish by re-routing of the ICWW from the Atchafalaya River.

_ Page 25
These Key Points of the Master Plan would also be accomplished in Terrebonne Parish by the re-routing of the ICWW.

_Page 30
For Terrebonne Parish, the re-routing of the ICWW would provide the most cost effective solution to protect and restore the coast.

_Page 32
The existing route of the ICWW and its' flow into the Houma Navigation Canal has not provided enough fresh water and sediment to achieve any restoration goals. The New Route of the ICWW from Morgan City, utilizing a (Southeasterly Course) to below the communities of Terrebonne Parish, would provide naturally and constantly, enormous amounts of sediment and fresh water. This would nourish, maintain, and build land as is naturally occuring at the mouth of the Atchafalaya River at the Gulf.

_Page 35 Para. 3

Marsh creation would be naturally accomplished by the new ICWW route.

_Page 43

The New Route of the ICWW can be aligned to work in concert with the Morganza to the Gulf Levee System to protect Terrebonne Parish.

_Page 47

The Risks of degrading wetlands outside of the Morganza Levee System would be eliminated by re-routing the ICWW to the south of the levees.

This would also overcome the other negatives stated here.

NEW TERREBONNE PROPOSAL

RE-ROUTING OF INTRACOASTAL WATERWAY (ICWW)

Modern Marvel of Terrebonne Parish, Louisiana

Our fresh water source for Terrebonne Parish is the Atchafalaya River from the West and the Mississippi River from the East. It would be possible to pump more volume of water from one or both rivers to maintain the amount of fresh water flowing into ICWW and thus the outlying marshes.

Benefits of re-routing the ICWW further South:

~ Would provide true hurricane protection to the entire community (residential and industrial areas). The spoil obtained from dredging the new route could be used to build huge levees on the southern bank with floodgates installed at each major waterway running north-south.

~ The fresh water flowing through a new re-routed ICWW located closer to the coast would nourish and help maintain existing marshes south of the new route. This could be further enhanced by installing one-way type valves along the ICWW where needed to supply fresh water to the southern marshes.

~ Would guarantee a stable freshwater source for drinking water.

~ Hazardous and explosive cargo could be routed south of Houma, thus preventing a potential disaster in Houma.

~ Would relieve boat and barge traffic in the inner Houma area.

~ Would relieve auto and truck traffic in the Houma area. Less boat and barge traffic through the existing ICWW would result in much less openings of all bridges, thus allowing auto traffic to move more smoothly.

Re-routing of the ICWW with all of its benefits could be accomplished expeditiously by using several major dredges. This is extremely important because we cannot afford to wait any longer. More hurricanes are inevitably on the horizon. We need to move quickly while we still have something to save.

Costs of re-routing of the ICWW should be paid by the Federal Government because it is a federal intrastate waterway.

Future maintaining of the depth of the new re-routed ICWW would allow for the beneficial use of the silt removed to re-build marshland.

This project would win the support of the majority of the people. It would protect our community and sustain property values, and perhaps lower insurance costs.

Additional Comments:

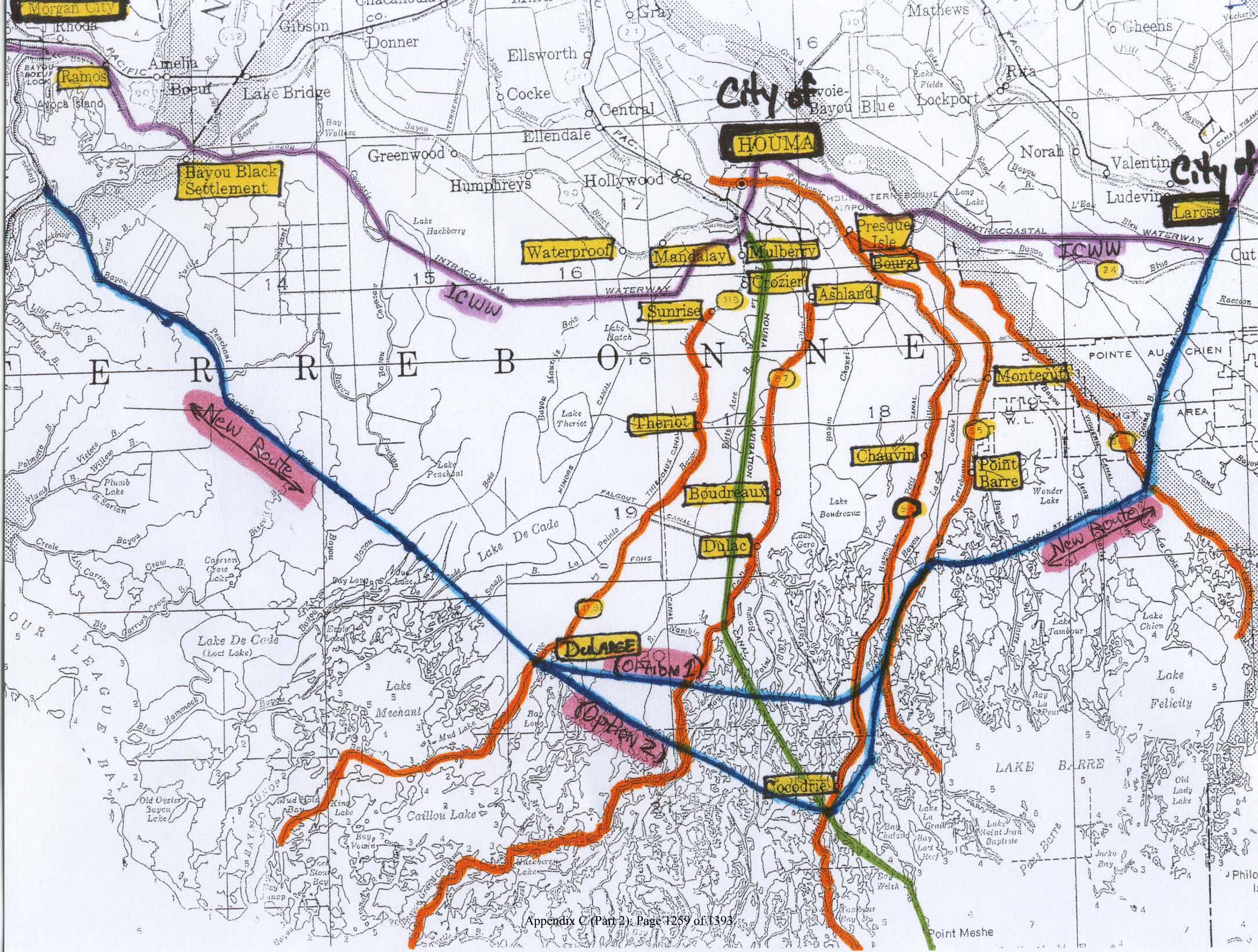
This map as depicted is a concept and it may be modified, if necessary.

~ The new route could be meshed into the present Morganza to the Gulf Levee System.

Or

~ It could be designed as a separate project which would pass south of the Morganza Levee. The spoil levee of the new (ICWW) route would serve as a surge breaker or speed bump in a hurricane event which could also protect the Morganza Levee System.

The fresh water flowing from the Atchafalaya River has been the main factor in the creation of new land and marsh at the mouth of the river at Atchafalaya Bay. The new (ICWW) route would allow a more direct source of the fresh water into the southern and eastern marshes of Terrebonne Parish creating a mixed brackish type water similar to Atchafalaya Bay.



Morgan City
Ramos
Bayou Black Settlement
City of
HOUMA
City of
Larose
Waterproof
Mandalay
Mulberry
Crozier
Presque Isle
Bourg
Ashland
Sunrise
ICWW
ICWW
Montegut
Theriot
Chauvin
Point Barre
Boudreaux
Dulac
New Route
New Route
DuLARGE
(OPTION 1)
(Option 2)
Cocodrie
Gibson
Donner
Ellsworth
Gray
Mathews
Gheens
Amelia
Boeuf
Lake Bridge
Cocke
Central
Bayou Blue
Lockport
Raceland
Ellendale
Greenwood
Norah
Valentine
Humphreys
Hollywood
Ludevine
INTRACOASTAL WATERWAY
T E R R E B O N N E
POINTE AU CHIEN AREA
Lake De Cade
Lake Mechant
Caillou Lake
LAKE BARRE
Lake Felicity
Point Meshe

HARRY BOURG CORPORATION
7477 Grand Caillou Road — Dulac, LA 70353-2703
Phone: 985-563-2254 Fax: 985-563-2222 E-mail: harrybourg@bellsouth.net

Planning Team:

Re: Comments
Preliminary Draft
[illegible]

The Morganza to the Gulf Project;
Terrebonne Parish and Atchafalaya Delta

[illegible]

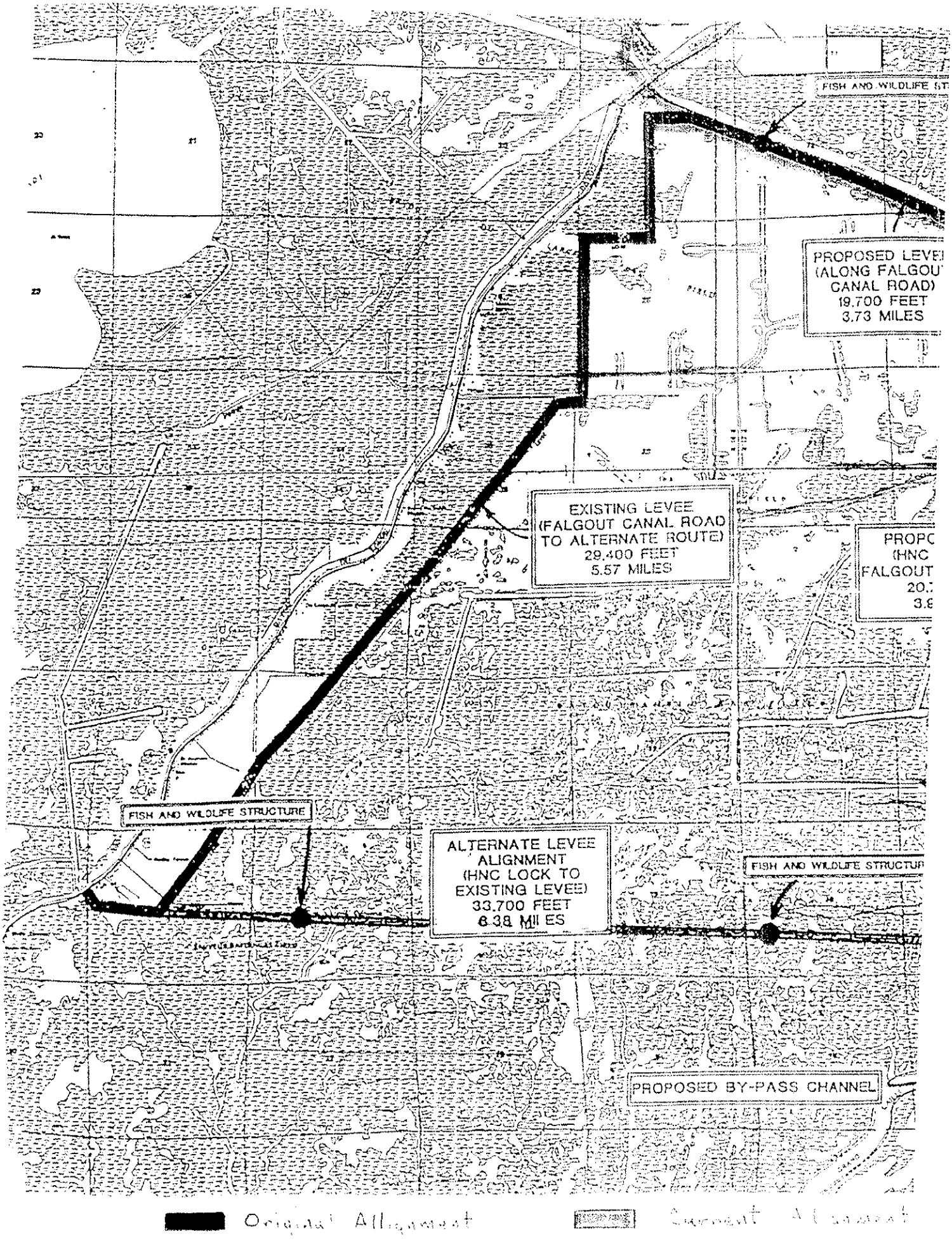
For your consideration, we are again submitting an alternate levee alignment located between the present Navigation Canal Lock Eastward to the bottom of existing Terrebonne Parish levee on Bayou Dularge, (Page 16 Map) of your Preliminary Draft, for the Hurricane Protection Levee for citizens for the Bayou Dularge, at prior public meetings they were excluded from the project.

Attached are letters dated 11/18/01 and 12/6/01 with map showing location of alternate levee alignment submitted to the U.S. Corps of Engineers explaining reasons for a levee re-alignment.

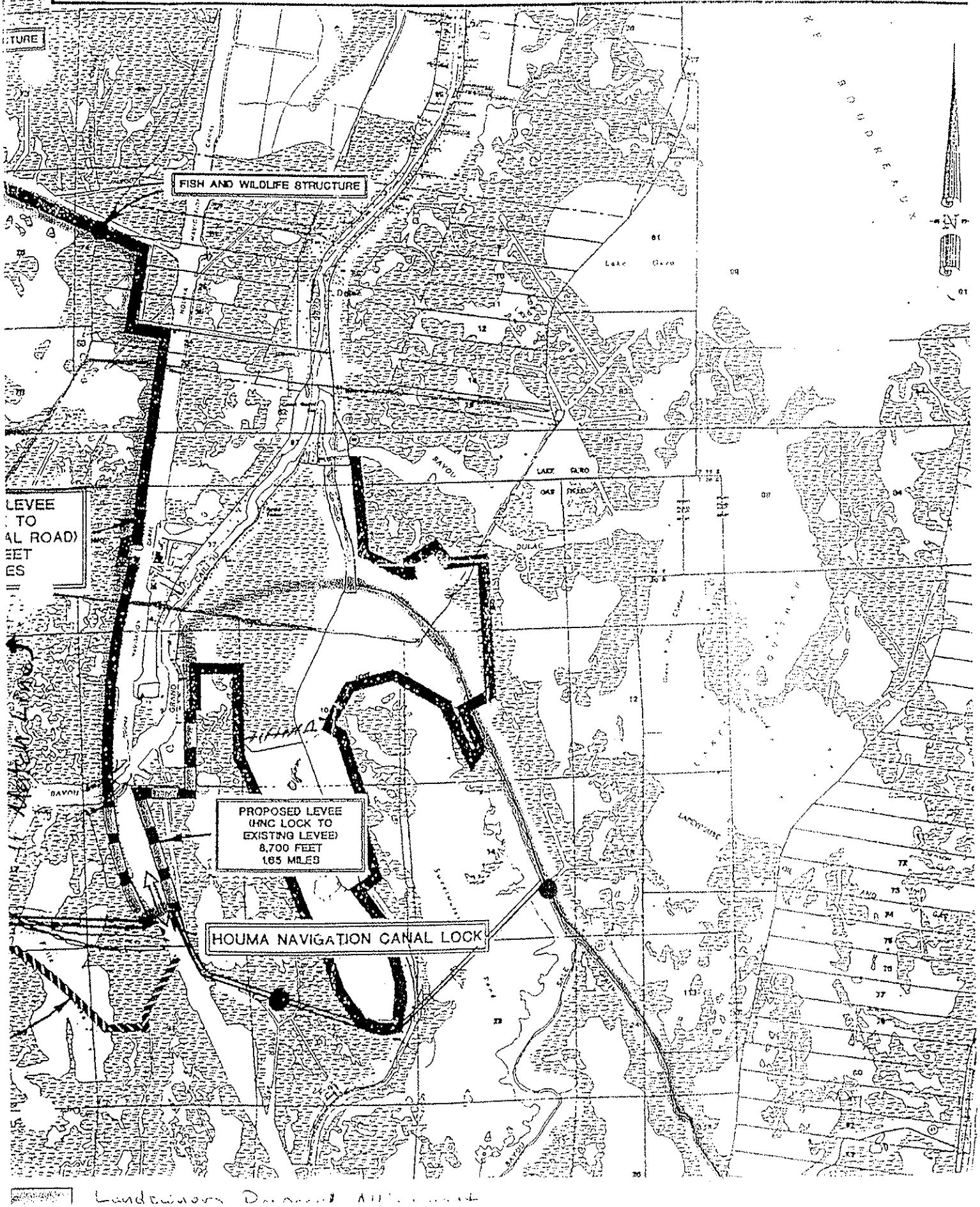
We wish your team reconsider this request

Sincerely yours,

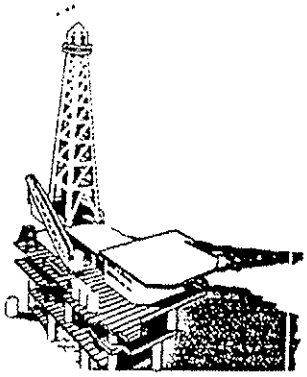
Harry J. Bourg, Jr.
President


FISH AND WILDLIFE ST
PROPOSED LEVE
(ALONG FALGOU
CANAL ROAD)
19,700 FEET
3.73 MILES
EXISTING LEVEE
(FALGOUT CANAL ROAD
TO ALTERNATE ROUTE)
29,400 FEET
5.57 MILES
PROPC
(HNC
FALGOUT
20.
3.
FISH AND WILDLIFE STRUCTURE
ALTERNATE LEVEE
ALIGNMENT
(HNC LOCK TO
EXISTING LEVEE)
33,700 FEET
6.38 MILES
FISH AND WILDLIFE STRUCTUR
PROPOSED BY-PASS CHANNEL
Original Alignment
Current Alignment

PROPOSED AND ALTERNATE LEVEE ALIGNMENTS BETWEEN HNC LOCKS AND LOWER BAYOU DULARGE



Harry Bourg Corporation



7477 Grand Caillou Road
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Adruel Breaux, Vice President
Joyce Bourg Benoit, Secretary-Treasurer

Directors:
Brenda M. Gallier (Carson)
Roland P. Voisin
Harry Bergeron
Louise Martin Price

December 12, 2001

U. S. Army Corps of Engineers
New Orleans District
P. O. Box 60267
New Orleans, Louisiana 70160-0267

RE: Public Meeting
December 12, 2001
Houma, Louisiana

Dear Sir,

The following are our comments on the Morganza to the Gulf of Mexico, Hurricane Protection Levee. More specifically these comments are directed towards the Highway 57 Alignment in Terrebonne Parish, where our company lands will be most effected by placement of a levee across them for nearly four miles. We have tried to work with the ARMY Corp. of Engineers on an alignment solution since 1996. Our attempt to propose input to the feasibility study appears to have been futile, as far as we can determine, from the proposal that has been outlined in the Environmental Impact Statement (EIS).

The resulting project proposal seems to be a directive down from Washington D.C. rather than a proposal which incorporates ideas from local concerns where the project is to be constructed. In our opinion, the process has been politicized and far too much emphasis and concern has been placed on animal populations rather than the human population. In the EIS, you state your agreement with agencies including the National Marine Fisheries Agency (NMFA) and the U.S. Fish and Wildlife Service (USFWS). From our experiences during the process of approving an alignment, the ARMY Corps. have taken their directives from these agencies rather than using them in an advisory capacity.

Our specific proposals were addressed with a hand waving denial based on environmental concerns. No explanation beyond this was given. We wonder what took place in these internal agency meetings where this edict has come down from? We wonder whether it would be possible to read the minutes of these meeting where this denial has taken place? We wonder if it is possible to assign names of agency heads who made these decisions? These and other questions come to mind, with not even a whiff of explanation. More like a stench is left, one which may never fully satisfy us that our concerns were fairly addressed.

The NMFA people have a stated bias against the creation of intermediate marsh, which will result in improving salinity of brackish to more fresh water marsh. The USFWS is gut wrenched to "Mitigate In Kind", to the detriment of improving marsh values for any reason other than increasing numbers of their approved species. Both biases are within the political realm of decision making and this bias should have been left behind for accommodation of State of Louisiana, Terrebonne Parish and property owner concerns.

So, we are left with a plan for a Hurricane Protection Levee that does not meet the needs of local human populations (lower Bayou DuLarge) nor the needs and concerns of landowners. The decision process has left these two groups out. We are left with a plan that does not give landowners the opportunity to mitigate project impacts on their own lands. The intended protective results and benefits of the project will not meet the needs of these two groups in at least Terrebonne Parish, Louisiana. We will be left with a plan that has managed to assuage the egos and reinforces the power plays of all the federal agencies. A plan will result which does not protect or upgrade the marsh in lower Terrebonne Parish. A plan will result which does not meet the needs of the State of Louisiana as far as objectives of the "2050 Plan", which is trying to achieve no net loss of wetlands. A plan will result which the next step is to come right back and ask these same landowners to turn over their lands for the project. A plan will result where people, "yes people", will pass by everyday during the construction phase and ask themselves why they are not important enough to be considered in the Morganza to the Gulf of Mexico, Hurricane Protection Levee.

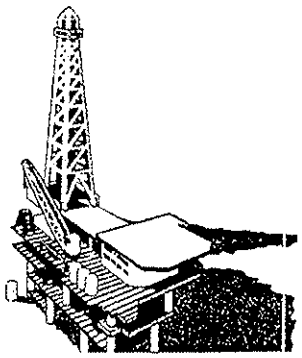
Sincerely,

Cyrus J. Theriot Jr.

Cyrus J. Theriot, Jr., President
HARRY BOURG CORPORATION

CJT:mmb

Harry Bourg Corporation



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Directors:
Brenda M. Gallier (Carson)
Roland P. Voisin
Harry Bergeron
Louise Martin Price

February 7, 2002

Mr. Rodney Greenup
U. S. Army Corps of Engineers
New Orleans District
P. O. Box 60267
New Orleans, Louisiana 70160-0267

RE: Morganza to the Gulf of Mexico
Hurricane Protection Levee, Draft
Feasibility Study, Terrebonne Parish, Louisiana

Dear Mr. Greenup,

The following are our additional comments and recommendations, as stated in our original letter dated December 12, 2001, for levee alignments in the Lower Dulac, Louisiana area. Please record them as part of the Feasibility Study Report for the Morganza to the Gulf of Mexico, Hurricane Protection Levee. Also, note that a map is attached to this letter showing the original alignment plan for lower Dulac, and Bayou Dularge, along with the current accepted alignment and the proposed Landowners Alignment.

In 1996, we began to work with both Terrebonne Levee and Conservation District and the ARMY Corp. of Engineers on our proposals for a preferred alignment for the hurricane protection levee. Our goals were to reduce the overall costs of the project, increase the value of the intermediate marsh land and maximize the commercial value of the most precious resource in Terrebonne Parish. This last goal of maximizing commercial values takes into consideration planning for housing, public facilities, infrastructure, community design, environmental issues, historical sites, anthropological sites, endangered species habitat and other land uses.

Please review our concerns and proposals and submit them into the official record of proceedings in this matter. We are willing to discuss these issues and proposals at your convenience. Thank You.

Sincerely,

Cyrus J. Theriot Jr.

Cyrus J. Theriot, Jr., President
HARRY BOURG CORPORATION

CJT:mmb

Attachment

P.S. Please mail HBC a copy of Volume "THREE" of the Draft Programmatic Environment Impact Statement ("DPEIS") on the Morganza to the Gulf of Mexico, Hurricane Protection Levee.

CC: Federal & State Senators; Federal & State Representatives; LA Governor; Terrebonne Parish President and DNR

Harry Bourg Corporation

Proposal for the Landowners Alignment

for a Hurricane Protection Levee,

Terrebonne Parish, Louisiana

Harry Bourg Corporation
7477 Grand Caillou Road
Dulac, Louisiana 70353

985-563-2254

In 1996, we began to work with both Terrebonne Levee and Conservation District and the ARMY Corp. of Engineers on our proposals for a preferred alignment for the hurricane protection levee. Our goals were to reduce the overall costs of the project, increase the value of the intermediate marsh land and maximize the commercial value of the most precious resource in Terrebonne Parish. This last goal of maximizing commercial values takes into consideration planning for housing, public facilities, infrastructure, community design, environmental issues, historical sites, anthropological sites, endangered species habitat and other land uses.

The original Hurricane Protection Levee alignment (see attached map) was conceived initially to follow existing levees in South Terrebonne Parish. Because of the winding nature of the existing levees, the over all length of a hurricane protection levee became a burden and substantially increased the cost of construction and ROW (right of way) considerations. The Landowners Alignment smoothes out the crooks and turns of the original alignment. The overall length was reduced from nearly 26 miles to 14 miles in length. This is a reduction of almost 50% from the original cost estimate for levee construction. Soil testing along the Landowners Alignment found almost an insignificant difference in cost due to foundation considerations. ROW costs were thought to be lower from the reduction of the number of landowners being asked to negotiate ROW's.

To reduce the cost of constructing the Lower Terrebonne Parish segment of the Hurricane Protection Levee even more, the ARMY Corp. of Engineers decided to support an alignment which isolates communities, and makes a Hurricane Protection Levee lacking in many other aspects. We acknowledge that the current alignment reduces the over all costs but at an expense to the citizens of Terrebonne Parish that is either not known at this time by the ARMY Corps., or that does not serve these people well. At the very least we believe a Hurricane Protection Levee should be constructed seaward of the existing "Human" population.

As proposed, the Landowners Alignment best meets the above goals. Most importantly, it protects communities in Lower Dularge, Four Points and Falgout Canal. Although these populations are small, they are growing and in ten years may be considerably larger. Any approved plan will need to include these communities.

The State of Louisiana's "2050 Plan" has a goal of no net loss of land. The Landowners Alignment not only saves lands but increases the value of marsh interspersed with them. Four Points Area has over 1500 acres of agricultural and farmlands at risk if the current alignment is ultimately constructed. Aquaculture Ponds also exist in the Four Points area. The community of Lower Bayou Dularge has nearly 2500 acres of agriculture land that will be left unprotected.

In between, intermediate salt marsh can be protected and improved for the benefit

of wildlife and fisheries. These intermediate marshes support many uses, both commercial and recreational. By reducing the salinity of this marsh, values will increase allowing for growth of grasses which will help to reduce erosion. Lower salinity will also benefit some animal species, including ducks and other water fowl. As drafted, the Environmental Impact statement seems to have a bias against intermediate marshlands.

Within these intermediate marshes that will be left outside of the current alignment, a number of historical anthropological sites are at risk of being lost to erosion. Two sites associated with Bayou Mound (Bayou LeButte) are known to be burial mounds, where artifacts have been found. Both are located near the confluence of Bayou Mound and Grand Caillou Bayou, and would be protected by a Hurricane Protection Levee following the Landowners Alignment.

Critical habitat for endangered species is being risked if the current alignment is constructed. This critical habitat is precious and precariously situated on the front lines of the erosion front in Terrebonne parish. At least one habitat that we know of, of an American Bald Eagle will be protected by the Landowners Alignment. It is incredible that the EIS does not take this endangered species into account. If left outside of hurricane protection, it will only be a matter of time before this critical habitat will be lost, and this known endangered raptor unit will be in retreat once again. Currently it has been producing offspring on an annual basis.

Numerous public facilities and infrastructures will be left unprotected with the current alignment. Not only street, roads and bridges will be at risk, but pump stations, pipelines, maintenance facilities and drainage levees will also be unprotected. At least three drainage projects are left outside of a hurricane protection levee as currently proposed. The most important drainage project exposed is managed by the Terrebonne Levee and Conservation District. This project includes nearly twelve miles of levee protecting the population of Terrebonne Parish residents in the Lower Bayou Dularge area. In addition to this drainage levee, the Goat Field Drainage Project and the Mayfield Drainage Project will both be exposed to rapidly advancing erosional processes.

Finally, additional historical sites will be lost or will be at risk if the current levee alignment goes forward. Fort Quitman, the Dulac Plantation and Poverty Flats Plantation grounds will all partially be outside of the protective levee, however, all will be fully protected by the Landowners Alignment.

In your decision to construct a Hurricane Protection Levee, we hope the ARMY Corp. of Engineers will decide that the Landowners Alignment is the best alignment. Only with landowners approval of the project and their concerns being addressed up front, will the project be successfully implemented.

Coastal Protection and Restoration Authority
Integrated Planning Team

PUBLIC MEETING COMMENT FORM

Comprehensive Coastal Protection Master Plan for Louisiana
Preliminary Draft

To insure that your written comments are considered, they should be turned in this evening at the reception desks located near the entrance or mailed to the following address so that the comments are received no later than January 5, 2007:

CPRA – IPT
DNR
Post Office Box 94396
Baton Rouge, LA 70804-9396

Email comments may additionally be submitted at: comments@louisianacoastalplanning.org

Please consider the following comments:

The established fact is that Port Fourchon is handling at least 15% of the nations oil import; all efforts should be made to keep hwy 1 open at all times. The next 15–20 yrs will see doubling of the Gulf production and maybe more. I think all resources should be made to improve the Southwest levee system and the elevated hwy 1

(Use the back of this form if more room is needed)

Name: Roland Chauvin Date: 12-25-06

Address: 207 Industrial Park Rd. Lockport, La. 70374

Coastal Protection and Restoration Authority
Integrated Planning Team

PUBLIC MEETING COMMENT FORM

Comprehensive Coastal Protection Master Plan for Louisiana
Preliminary Draft

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DNR
Post Office Box 94396
Baton Rouge, LA 70804-9396

Email comments may additionally be submitted at: comments@louisianacoastalplanning.org

Please consider the following comments:

Thank you for your time in putting together this plan. Please provide for the communities of Larose, Cut Off, Galliano, Golden Meadow, & the LA Hwy 1 which passes through them. This corridor supports the oil & gas industry located in Port Fourchon, and is just as valuable to the state, economically as New Orleans. Therefore, please provide our community with the same equal protection

(Use the back of this form if more room is needed)

Name: [signature] Date: 12/20/06

Address:

Coastal Protection and Restoration Authority
Integrated Planning Team

PUBLIC MEETING COMMENT FORM

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Preliminary Draft

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Post Office Box 94396
Baton Rouge, LA 70804-9396

Email comments may additionally be submitted at: comments@louisianacoastalplanning.org

Please consider the following comments:

Thank you for the work you have put into this. Please look hard at the economic value the oil & gas industry provides this State and make appropriate investment of protecting the infrastructure which allows for this economy.

(Use the back of this form if more room is needed)

Name: Chuckie Cheramie Date: 12/20/06

Address: P.O. Box 1358 Golden Meadow LA 70354

Coastal Protection and Restoration Authority
Integrated Planning Team

PUBLIC MEETING COMMENT FORM

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Preliminary Draft

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Email comments may additionally be submitted at: comments@louisianacoastalplanning.org

Please consider the following comments:

Dear Planning Team Members,

As you are well aware, Louisiana is faced with the huge challenges in protecting itself from the Gulf of Mexico. I applaud your efforts in taking on this daunting task. As Director of Louisiana's most significant energy port on the Gulf, and as someone that has been actively involved in just about every major coastal and infrastructure initiative in this region for over 30 years, I have several comments on the draft Comprehensive Coastal Protection Master Plan. First, the significance to this State and nation of the Lafourche Corridor does not appear to be fully understood and therefore recognized in this plan. This unique geographical feature provides the only road access to the Gulf of Mexico in all of Central and Southeastern Coastal Louisiana. Yet it is the energy significance of this corridor that has played a major role in the recent decision of Congress to share in offshore revenues with this State, which most →

(Use the back of this form if more room is needed)

Name: Ted Falgout Date: 12/20/06

Address: P.O. Drawer 490, Galliano, LA 70354

likely will be the major funding source for implementation of this plan. This ... the Corridor must be properly recognized and given the highest protection in this State in order to protect the "Goose that is laying the Golden Egg". This state and nation are investing hundreds of millions of dollars to build an elevated highway to insure access to the coast and it would be very poor planning at best, not to provide a level of hurricane protection to this critical corridor that would not insure full use of the elevated highway South of the hurricane protection levee System. Finally, I encourage the Team to fully incorporate a secondary line of defense north of the Barrier Islands, just South of the Communities between the Atchafalaya and Mississippi Rivers similar to what is being proposed between Pointe-au-chene and Golden Meadows. If planned properly, this second line of defense could provide additional environmental and economical benefits to the State in that it could incorporate the relocation of the Intracoastal Waterway South of the existing communities and allow for freshwater transport from both major River systems.

Coastal Protection and Restoration Authority
Integrated Planning Team

PUBLIC MEETING COMMENT FORM

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Preliminary Draft

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Email comments may additionally be submitted at: comments@louisianacoastalplanning.org

Please consider the following comments:

Some one in the planning team should get the U.S. Congress to authorize the Core of Engineers to mine sand in the Gulf of Mexico so they may use the sand for building barrier islands.

The planning team should begin to talk about super dredges being built here in Louisiana for the restoring of the barrier islands. The largest dredges in Louisiana are now 36" discharge. I'm talking about super dredges with 120" discharge.

Please consider elevating the South Lafourche Levee Board's level to guarantee traffic flow in time of hurricanes.

(Use the back of this form if more room is needed)

Name: Jim Boulet Date: December 18, 2006

Address: P.O. BOX 267 Larose, LA 70373

Coastal Protection and Restoration Authority
Integrated Planning Team

PUBLIC MEETING COMMENT FORM

Comprehensive Coastal Protection Master Plan for Louisiana
Preliminary Draft

To insure that your written comments are considered, they should be turned in this evening at the reception desks located near the entrance or mailed to the following address so that the comments are received no later than January 5, 2007:

CPRA – IPT
DNR
Post Office Box 94396
Baton Rouge, LA 70804-9396

Email comments may additionally be submitted at: comments@louisianacoastalplanning.org

Please consider the following comments:

1) The Plan must include prompt diversion of ample fresh water into Bayou Lafourche to both Barataria & Terrebonne Basins as well as providing water through Bayou Terrebonne down to and beyond Houma.

2) Attempting to make the flow in the Intracoastal Canal go west is unpractical, maybe impossible.

3) The Houma Navigation Canal is another Miss. R. Gulf Outlet. Unless it is filled in & remediation began on both sides of it Houma will be lost. What will happen to the economy of Houma if it is flooded? That is a certainty in a Rita-like storm that hits just to the west & Terrebonne would

(Use the back of this form if more room is needed)

Name: David D. Prater Date: 12/17/06

Address: 125 Easy St., Thibodaux, LA. 70301

be affected as well, such as Thibodaux and communities to its south along Bayou Lafourche.

4) Create more diversions out of the Atchafalaya R.

5) promptly begin piping sand slurry - but any increase will depend on increasing fresh water into the marshes. Still, land building must be done on all barrier islands, and old ridges (chenier, etc.) should be reinforced and renewed, providing a first + multiple line of defense against storm surge.

6) freshwater needs to be put into the upper Barataria Basin, but not in a large Third Delta Channel; rather in multiple places and allowed to work through and help replenish and nourish the basin swamplands and marshes. WS 90 should be raised in portions between Barataria and Des Allemands to promote better fresh water migration south.

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Integrated Planning Team

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DNR
Post Office Box 94396
Baton Rouge, LA 70804-9396

Email comments may additionally be submitted at: comments@louisianacoastalplanning.org

Please consider the following comments:

If Gov. Blanco does not support attached legislation there will be a huge campaign against her

(Use the back of this form if more room is needed)

Name: Heidi Neal Date: 12-11-06

Address: 105 T-Bob St. Montegut

ENROLLED

Regular Session, 2005

ACT No. 202

HOUSE BILL NO. 197

BY REPRESENTATIVE DOVE AND SENATOR ROMERO

Prefiled pursuant to Article III, Section 2(A)(4)(b)(i) of the Constitution of Louisiana.

AN ACT

To enact R.S. 49:214.9 and 214.10, relative to coastal preservation and restoration; to establish a program for stabilization and restoration of coastal passes; to create the Coastal Passes Stabilization and Restoration Fund as a special fund in the state treasury; to provide for the deposit, use, and investment of monies in the fund; and to provide for related matters.

Be it enacted by the Legislature of Louisiana:

Section 1. R.S. 49:214.9 and 214.10 are hereby enacted to read as follows:

§214.9. Coastal passes stabilization and restoration program

A. The secretary of the Department of Natural Resources shall establish a coastal passes stabilization and restoration program within the Louisiana Coastal Wetlands Conservation and Restoration Program. As part of the coastal passes stabilization and restoration program, the department shall require, when appropriate, that all coastal restoration or preservation projects subject to public bid include provisions for use of dredge material, rocks, or other hard materials to stabilize and restore coastal passes.

B. By September first each year, the governing authority of each parish which has coastal passes shall submit to the secretary a list of coastal passes stabilization and restoration projects requested for that parish. The Department of

CODING: Words in ~~struck through~~ type are deletions from existing law; words underscored are additions.

Natural Resources shall review the projects submitted and by November first of each year shall issue a list which prioritizes those requests.

C. The priority list shall be promulgated and shall be subject to legislative oversight by the House Committee on Natural Resources and the Senate Committee on Natural Resources under the Administrative Procedure Act. Such oversight shall occur prior to March first each year.

D. Funding for the coastal passes stabilization and restoration projects shall be available from the Coastal Passes Stabilization and Restoration Fund. In the event funding from the Coastal Passes Stabilization and Restoration Fund is not appropriated in a given year, the Coastal Passes Stabilization and Restoration Program shall be suspended until funds are appropriated for the program.

§214.10. Coastal Passes Stabilization and Restoration Fund

A. There is hereby created, as a special fund in the state treasury, the Coastal Passes Stabilization and Restoration Fund, hereinafter referred to as the "fund". The source of monies in the fund shall be appropriations, donations, grants, and other monies which may become available for the purposes of the fund.

B. The monies in the fund shall be subject to appropriation and may only be used as provided in Subsection C of this Section. The monies in the fund shall be invested by the treasurer in the same manner as monies in the state general fund, and interest earnings shall be deposited in and credited to the fund. All unexpended or unencumbered monies remaining in the fund at the end of the fiscal year shall remain to the credit of the fund.

C. Monies appropriated from the fund shall be used exclusively by the Department of Natural Resources to support the Coastal Passes Stabilization and Restoration Program within the Louisiana Coastal Wetlands Conservation and Restoration Program, as provided in R.S. 49:214.9.

CODING: Words in ~~struck through~~ type are deletions from existing law; words underscored are additions.

Section 2. This Act shall become effective on July 1, 2005; if vetoed by the governor and subsequently approved by the legislature, this Act shall become effective on July 1, 2005, or on the day following such approval by the legislature, whichever is later.

SPEAKER OF THE HOUSE OF REPRESENTATIVES

PRESIDENT OF THE SENATE

GOVERNOR OF THE STATE OF LOUISIANA

APPROVED: _____

CODING: Words in ~~struck through~~ type are deletions from existing law; words underscored are additions.

ENROLLED

Regular Session, 2004

ACT No. 407

HOUSE BILL NO. 429

BY REPRESENTATIVE DOVE

AN ACT

To enact R.S. 49:214.7, relative to the coastal restoration and preservation program; to establish a program for barrier islands and shorelines stabilization and preservation; and to provide for related matters.

Be it enacted by the Legislature of Louisiana:

Section 1. R.S. 49:214.7 is hereby enacted to read as follows:

§214.7. Barrier islands and shorelines stabilization and preservation

A. The secretary of the Department of Natural Resources shall establish a barrier islands and shorelines stabilization and preservation program within the Louisiana Coastal Wetlands Conservation and Restoration Program. As part of the barrier islands and shorelines program, the department shall require that all projects subject to public bid include appropriate dredges for use to stabilize and preserve barrier islands and shorelines.

B. By September first each year, the governing authority of each parish which has barrier islands and shorelines shall submit to the secretary a list of barrier islands and shorelines stabilization and preservation projects requested for that parish. The Department of Natural Resources shall review the projects submitted and by December first of each year shall issue a list which prioritizes those requests.

C. The priority list shall be promulgated and shall be subject to legislative oversight by the House Committee on Natural Resources and the Senate Committee on Natural Resources under the Administrative Procedure Act. Such oversight shall occur prior to February first each year.

CODING: Words in ~~struck through~~ type are deletions from existing law; words underscored are additions.

D. Funding for the barrier islands and shorelines stabilization and preservation projects shall be available from the Barrier Islands and Shorelines Stabilization and Preservation Fund. In the event funding from the Barrier Islands and Shorelines Stabilization and Preservation Fund is not appropriated in a given year, the barrier islands and shorelines stabilization and preservation program shall be suspended until funds are appropriated for the program.

Section 2. The provisions of this Act shall take effect and become operative if and when the Act which originated as House Bill No. 1034 of this 2004 Regular Session of the Legislature is enacted and becomes effective.

SPEAKER OF THE HOUSE OF REPRESENTATIVES

PRESIDENT OF THE SENATE

GOVERNOR OF THE STATE OF LOUISIANA

APPROVED: _____

CODING: Words in ~~struck through~~ type are deletions from existing law; words underscored are additions.

Kenneth Smith
President
T. Baker Smith, Inc

Don Hingle
Executive Vice President
Whitney Bank

Tony Boudreaux
Vice President
Superior Labor Services

Tony Alford
Secretary
ASLR/Alford Services

Charles Theriot
Treasurer
Charles Theriot, CPA

Chet Morrison
Past President
Chet Morrison Contractors

Leland Robichaux
Advisor
Oil States

Stephanie Hebert
Director
Stephanie Hebert Insurance Agency

Kirk Meche
Director
Gulf Island Fabrication

Dionne Chonest
Director
Edison Chonest Offshore

Otis T. Logue
Managing Director
Southern Technology & Services

Jane Arnette
SCIA
Executive Director

Kathy Doiron
SCIA
Assistant Director

December 11, 2006

Coastal Protection & Restoration Authority (CPRA)
State of Louisiana
Technical Planning Committee
Sidney Coffee, Chair
1051 North 3rd Street Capitol Annex suite 138
Baton Rouge, LA 70802

SCIA Statement

South Central Industrial Association (SCIA) is a tri-parish industrial organization composed of over 200 member companies representing over 36,000 employees, committed to the communities we serve. Now more than ever, Louisiana must be cognizant of the manner in which we approach funding projects, supporting precise planning that focus on coastal issues and hurricane protection, which reflect the highest standards for our people and the state's economy.

The current Morganza to the Gulf Project began with a study in 1992 that was constructively evaluated over the years to meet the critical needs of the people while making a long-term investment in our infrastructure. Our national leaders have echoed the importance of a plan for Louisiana. We have a plan.

Morganza to the Gulf is our plan and will stretch along the coastal reaches of the Terrebonne Basin, from Western Terrebonne to Bayou Lafourche, protecting over 200,000 people and 1,700 square miles of residential and industrial areas, farmland and marshes. It will provide 72 miles of earthen levees with floodgates, water control structures and a lock complex on the Houma Navigational Canal. It will reduce saltwater intrusion, manage fresh water flow, reduce insurance claims and rates, and improve navigation for our industrial-based economy. We have taxed ourselves in support of this project and believe, through 14 years of study and work, this is the best plan for the people, its communities and the economic security of this state.

The Morganza to Gulf Project includes the Houma Navigational Canal Lock Complex, a well-defined project that specifically correlates with the Coastal Impact Assistance Plan authorized in the 2005 Energy Bill. It is the single most comprehensive, long term solution for coastal erosion, affecting the greatest amount of acreage while serving as a means for hurricane protection. The lock will directly mitigate for impacts associated with offshore oil and gas development. As the state approaches the distribution of funds from the Energy Bill, it is important to look closely at projects already meeting the essential criteria.

Equally critical to the survival of coastal Louisiana is the South Lafourche Levee System, which was authorized in 1965 and is 96% complete. Because of increased prices due to the 2005 hurricane damage work, it has become too expensive to complete a needed lock. Over the years, South Lafourche residents have continually dedicated taxes to build the system, including a recent 1 cent sales tax with an 83% approval. The structured plan of the South Lafourche Levee System is vital to industry, as its components serve as a gateway to the Gulf of Mexico.

7910 Main Street, Suite 224 • Post Office Box 2143 • Houma, Louisiana 70361-2143
Phone: (985) 851-2201 • Fax: (985) 851-2202 • Email: scindustrial@bellsouth.net

Drilling mud and fuel that support 75% of deepwater drilling passes through Bayou Lafourche and the conversion of the floodgate to a lock is needed to allow uninterrupted delivery of these supplies to America's busiest inter-model energy port.

Flood protection for south Lafourche and south Terrebonne is most critical protection for the offshore oil industry, the base of our economy, as well as the people who live in and service this area for the state of Louisiana.

The new alignment proposed between Morganza and Larose to Golden Meadow (near Golden Meadow) is advantageous because it serves as additional protection for both systems. Using the analogy of the Louisiana coastline as a bucket, the bucket is broken at the bottom, and this would aid in repairing the bottom of the bucket, and in turn, re-establishing the heavily distressed areas west of Bayou Lafourche and eastern Terrebonne. If designed properly, this can encourage a more diverse wetland situation and re-establish critical brackish marshes.

We, as citizens of this region rely on our area experts to develop the best most comprehensive plan for our region. As community leaders, we have continually been involved in the process to assure the best possible scenario for this area. Terrebonne and Lafourche parishes have proven their commitment by working closely together as a region for the benefit of the people, industry, and our state. SCIA supports those endeavors and the current plans by the Terrebonne Levee & Conservation District and the South Lafourche Levee System.

The CPRA is presenting a draft plan that will be the cornerstone for Louisiana's future. The CPRA plan will be the document submitted by LA Speaks as the state plan for coastal restoration and hurricane protection, which will be presented to the LRA for approval to seek federal funding beyond revenue sharing.

Now more than ever, we must restore and protect what we have. We encourage your support in these endeavors.

Sincerely,

Kenneth Smith
SCIA President

From:	Kenneth W. Smith
To:	comments@louisianacoastalplanning.org;
CC:	Jane Arnette @ SCIA;
Subject:	South Central Industrial Association (SCIA) - LA Coastal Restoration and Hurricane Protection program recently draft state master plan
Date:	Friday, January 05, 2007 7:47:10 AM
Attachments:	

January 5, 2007

Gentlemen,

My name is Kenneth Wm. Smith, P.E.,P.L.S. and I am writing today as the President of the South Central Industrial Association (SCIA). The SCIA is a tri-parish industrial organization composed of over 200 member companies representing over 36,000 employees, committed to the communities we serve (St. Mary, Terrebonne, and Lafourche Parishes, La).

On December 11, 2006 we sent an initial statement regarding the CPRA Plan (copy in current SCIA newsletter). We commend the efforts to devise a workable plan for both hurricane and coastal protection. Upon additional review of the Preliminary Draft of the State's Comprehensive Master Plan, we would like to provide additional comments to reflect the following:

1. In addition to supporting Morganza to the Gulf and the Donaldsonville to the Gulf projects, please consider including Thompson Road in the 500-Year Protection (second line of defense). Several companies were flooded during Hurricane Rita that affected thousands of people. Thompson Road includes multiple businesses that are critical to the economic base of Terrebonne Parish and the state economic base. It is home to fabrication yards, shipyards and service companies that need to be protected.
2. We recommend that the state plan include the highest level of protection for South Lafourche Levee District system due to the significant role LA 1 with its businesses and residents play in the national energy security and revenue flow. The current 100- Year plan is not conducive to the planned elevated height of LA 1 with vehicular tires riding at 20 feet above sea level.
3. Funding is necessary to covert floodgates in Larose and Golden Meadow

into functioning locks for added protection, as well as an industrial navigational source for the inter-modal energy Port Fourchon.

4. An additional levee between Golden Meadow and Pointe-aux-Chenes would provide added protection for the LA 1 corridor.
5. Though the plan includes several individual restoration projects, its lacks both near-term and long range restoration projects that are vital. Long term restoration should seriously be considered for both the Barataria and Terrebonne Basins, including the continued study of the Third Delta Conveyance Channel.

Once again, we commend your efforts and are pleased that citizens and community groups are allowed the opportunity to make suggestions in developing a comprehensive plan.

PO Box 2266
Houma, La 70361
kenneths@tbsmith.com

Thank you and have a great day.

Kenneth Wm. Smith, P.E.,P.L.S.
President & CEO
T. BAKER SMITH, INC.
Direct Line: (985) 223-9248
Main Line: (985) 868-1050
Toll Free: 1(866) 357-1050
Cell: (985) 852-3433
Fax: (985) 868-5843
Webpage: www.tbsmith.com

Coastal Protection and Restoration Authority
Integrated Planning Team

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CPRA – IPT
DNR
Post Office Box 94396
Baton Rouge, LA 70804-9396

Email comments may additionally be submitted at: comments@louisianacoastalplanning.org

Please consider the following comments:

I'm ~~[illegible]~~ [illegible] I'm 67 years old. I have lived in Cut Off, La. all my life. I have seen many hurricanes and I'm sure there are many more to come. If a storm hits direct of us our home & lives will be gone forever. I ask for my grandchildren's future that you reconsider the decision to make each [illegible] to protect all of the PEOPLE of Louisiana.

As our insurance continues to go up at this time with no [illegible] protection [illegible] Is this the plan to force us OUT!?

Tired Cajun Lady

(Use the back of this form if more room is needed)

Name: [illegible] Date: 12/11/06

Address: 115 Lady Dr., Cut Off, LA 70345

Coastal Protection and Restoration Authority
Integrated Planning Team

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Baton Rouge, LA 70804-9396

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Please consider the following comments:

My consulting firm, Axiom Strategy Advisors, L.L.C., is deeply concerned about the future of the Louisiana coast, particularly as it pertains to the statewide flood protection and drainage. We understand that our own financial vitality, as well as that of our clients, is tied to a commitment to and the construction of a sustainable system. For that reason, and on behalf of the consultancy, I vehemently applaud the work of the CPRA, and urge your organization to proceed with tremendous zeal. Indeed, while we understand that this plan is not perfect, and that it may not be totally implemented in its entirety, we do stand with the CPRA as it begins its ambitious work, b/c we know fully that something must be done — and soon.

As a small Louisiana business with a large client base, we would like to do our parts to help mobilize others in supporting this proposal. Please feel free to contact our firm to instruct us on how we might help.

(Use the back of this form if more room is needed)

Name: Gary C. Wappell, Principal, Axiom S.A., LLC Date: 11 December 2006

Address: 1350 Main Blvd., Ste 109, Box 366, Thibodaux, La. 70360

Coastal Protection and Restoration Authority
Integrated Planning Team

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DNR
Post Office Box 94396
Baton Rouge, LA 70804-9396

Email comments may additionally be submitted at: comments@louisianacoastalplanning.org

Please consider the following comments:

Wants one management group in charge – Coordinate all Efforts by DNR – DOTD and Federal Agencies. Both funding and implementation —

Morganza and locks on Houma navigation channel should go first.

(Use the back of this form if more room is needed)

Name: Wilson Gaidry Date: 12/1/

Address: 8911 Park Ave, Houma – 70363

Coastal Protection and Restoration Authority
Integrated Planning Team

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Post Office Box 94396
Baton Rouge, LA 70804-9396

Email comments may additionally be submitted at: comments@louisianacoastalplanning.org

Please consider the following comments:

Extend the 500 year levee proposed from Pointe au Chien to the west side of the South Lafourche Levee System so that it extends to the lower western end of the S.L. Levee System. This would provide some protection from a surge of a storm which hits west of the South Lafourche area. The extension would follow along the lower western end down to the lock at the lower end.
La 1 Hwy must be protected because if the S.L. Levee system is compromised, there is no way of reaching Port Fourchon. The port is a key to the oil & gas industry of the state & nation.

(Use the back of this form if more room is needed)

Name: Jesse Gundry Date: 12/11/06

Address: P.O. Box 1407 Larose, LA 70373

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Integrated Planning Team

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CPRA – IPT
DNR
Post Office Box 94396
Baton Rouge, LA 70804-9396

Email comments may additionally be submitted at: comments@louisianacoastalplanning.org

Please consider the following comments:

My name is Gerald E. Gautreaux. Im a retired resident of South Lafourche. You might say Im in the twilight of my life and it grieves me to know that we'd be penalized for having the foresight to build storm protection on our own — and in the end, left out of further help to improve our system.

South Lafourche is a vital link to our oil production in the Gulf of Mexico. especially in our troubled world of today.

I strongly support any effort to improve our levee system along with any other improvements to our area

(Use the back of this form if more room is needed)

Name: Gerald E Gautreaux Date: 12/11/06

Address: 229 W. 2nd St. Cut Off La. 70345

Mr. Viguerie,

I just received your note this morning, and so it was not read aloud at the public meeting held in Houma yesterday afternoon. However, I have forwarded it to the head of the CPRA, Ms. Sidney Coffee and also to CPRA steering committee members, Secretary Angelle of DNR and Secretary Bradberry of DOTD . In addition, it will be included as part of the record of the public meeting as a written comment. I have also forwarded to the planning team so that your comments may be taken into consideration.

Thank you,
Michele Deshotels

-----Original Message-----
From: John Viguerie [mailto:johnviguerie@yahoo.com]
Sent: Tuesday, November 28, 2006 10:50 PM
To: Michele Deshotels
Subject: Public hearing in Houma : Wednesday, November 29, 2006 Houma Houma Terrebonne Civic Center, Meeting Room 1&2, 346 Civic Center Blvd., Houma, Louisiana 70360

To be read into the public record at the hearing:

To the CPRA:

Recently I discovered a research paper online, published in the Tulane Environmental Law Journal, by Professor Oliver Houck, called "Can We Save New Orleans?"

http://www.law.tulane.edu/Houck_CanWeSaveNewOrleans.pdf

which directly fit the missing piece of the Morganza puzzle in my head.
I feel the professor has uniquely articulated my own concerns about Coastal Louisiana water projects in general and specifically Morganza in the latter third of the report.

As a senior executive and board member of an international technology firm I co-founded, headquartered in Amsterdam, I've been to the Netherlands dozens of times. The Dutch would recognize the Morganza plan as the precipitant of the same kind of inappropriate development that begat the rapid subsidence of New Orleans --- a landfill. Levees, even the "leaky" kind, will drastically alter the hydrology of the wetlands and change the habitat to its great detriment and precipitate Terrebonne's economic decline. Furthermore, the Morganza Plan will not restore even one sqaure foot of wetlands.

I cannot support the Morganza project because it applies failed technology (levees) with untested variations (hydrology gates) which have never been shown to produce any other result than destruction of the estuarial ecology. In this case, especially, the stakes are too high.

A positive solution can only begin at the source of the problem. Efforts to control seasonal flooding in our basin overreached in the early twentieth century, following a pattern of western progress without regard to the unintended consequences of severely altering the hydrology of a complex ecosystem. Current and planned "diversion" efforts are woefully insufficient.

As such I implore the implementation of massive projects for the heads of Bayou Terrebonne and Bayou Lafourche to be opened to allow fresh sedimented water into our basin. It would be better to expend scarce recources on world-class engineering at the root of the devastating symptoms, than to invest in a repittion of failed policies based on failed technology, building levees on the edge of wetlands on peaty, alluvial soil.

I'm convinced that any coastal restoration program must begin with the decommissioning and closure of the Houma Navigational Canal. Several earthen dams strategically placed in the HNC could restore the natural hydrology and salinity profile as a basis for restoration in combination with the mega-diversions.

I would prefer to assist small companies affected by the HNC closure adapt business, develop alternative locations and transportation systems in order to continue operations in Terrebonne Parish, than to spend wastefully on a canal lock which is already being called insufficient at a sill depth of 18 ft.

Closing the Houma Navigational Canal may seem like an extreme measure, but believe me, we are one bad storm away, and one minor flood away from a turn-in-the-tide regarding the Houma Navigational Canal. St. Bernard officials are seeking remedy in Federal Court to force the USACE to finally take action on the MRGO as implement the public's will --- to decommission, close it, and repair the damage. Their momentum is still

building, even though marine transportation interests continue to desperately hang on to the failed MRGO canal.

Chalmette and St. Bernard Parish provide a cautionary tale to Houma-Terrebonne. The lessons are clear: deep canals amplify the most devastating effects of hurricane storm surge and wetlands are the only protection from those effects. As such I urge the immediate decommissioning of the Houma Navigational Canal, and an immediate moratorium on canal cutting, all types of dredging and wheel-washing in the lower Terrebonne wetlands in all jurisdictions.

Sincerely,
John Viguerie, Jr.

From: John Viguerie [mailto:johnviguerie@yahoo.com]
Sent: Thursday, November 30, 2006 12:51 PM
To: Michele Deshotels
Subject: RE: Public hearing in Houma : Wednesday, November 29, 2006 Houma Houma Terrebonne Civic Center, Meeting Room 1&2, 346 Civic Center Blvd., Houma, Louisiana 70360

That's excellent news Ms. Deshotels.

There is a community of environmentalists here in the Bay Area, California who are actively engaged in this process and seek to bulwark the restoration of Louisiana wetlands primarily by embodying the countervaling force to the narrow but powerful oil&Gas and marine transportation interests responsible for destroying the environment. The Environmental Law Clinic at Stanford University nearby has already been engaged in federal action to injunctify the Industrial Canal Lock project with great success. Of course, the MRGO is finally closed, after 40 YEARS of the port interests' "chicken littles" howling doom and gloom.

Having grown up on Bayou Terrebonne in Houma, I am personally and deeply aware of the misguided policies which are responsible for 36 linear miles of lost wetlands in lower Terrebonne. My grandfather DROVE to Timbalier Island in the early 20th century. Since natural gas was discovered in Montegut in 1920, rapacious canal cutting and dredging of the wetlands combined with the impaired hydrology of the sub-basin due to the damming of Bayou Lafourche and Bayou Terrebonne in the early 20th century have put 120,000 residents of a community (including marginalized native and African American populations) that is over 250 years old on the brink of total wipe-out.

In other words...
CLOSE THE HOUMA NAVIGATION CANAL
- it is directly responsible for over 25,000 acres of lost wetlands (as bad or worse than MRGO)
- everything that is WRONG with the MRGO is also WRONG with the HNC

Tell everybody at the DNR and DOTD: I PERSONALLY GUARANTEE, any plan that doesn't include closing the HNC at the GIWW with floodgates, or damming it altogether at or south of Four Point, will end up in federal court.

The judge's decision will be:

1. insufficient environmental impact study performed
2. flawed economic projection
3. changed community priorities

Thanks for all your work on behalf of our great state, Louisiana.Since Houma-Terrebonne is still standing, let's keep it whole and keep the Gulf where it belongs - 36 miles south of Houma - not channeled directly into DOWNTOWN. Sincerely,John Viguerie, Jr.johnviguerie@yahoo.com

From: John Viguerie [johnviguerie@yahoo.com]
Sent: Thursday, January 04, 2007 12:58 PM
To: comments@louisianacoastalplanning.org
Subject: re: WRDA - Mroganza-to-the-Gulf

Morganza must not be allowed to rush ahead of state and federal planning processes by the CPRA.

AS A DEEPLY INVESTED CONSTITUENT, I OFFER MY CONCLUSIONS ABOUT WRDA COMPONENT MORGANZA-TO-THE-GULF, and the HOUMA NAVIGATIONAL CANAL.

This brief is the foundation of the campaign I conducted against the grossly misguided regressive sales tax proposal to locally finance the Houma Navigational Canal Lock, which was defeated in November's election in Terrebonne:

The Morganza-to-the-Gulf project was conceived pre-Katrina and Rita, it obviously doesn't contemplate important findings, data, and other analysis from university, state and federal agency, other NGO's and independent sources which expose deep, inherent flaws in the hydrological and economic characterizations upon which the project is based.

The most important lessons which Morganza ignores:

1. LEVEES DON'T WORK – THEY TURN WETLANDS INTO OPEN WATER OUTSIDE AND KILL THE ECOLOGY INSIDE THE LEVEE - see South Lafourche Levee District and every other levee ever built

2. NAVIGATION CANALS KILL PEOPLE – see St. Bernard and Orleans

3. PROJECTS HAVE BEEN DRIVEN BY PATRONAGE AND POLITICS, NOT SCIENCE AND COMMUNITY WILL – everyone, in their own experience, in this area can personally relate

4. THE MOST IMPORTANT ECONOMY IN THE COMMUNITY IS THE WORKING HOME-OWNING FAMILY- NOT OIL&GAS and MARINE TRANSPORTATION – we were here a long time before oil&gas was discovered, we adapted before and we can again

5. FOR ECONOMIC DEVELOPMENT TO HAPPEN, PEOPLE NEED A PLACE TO LIVE - NOT JUST FAB YARDS – inappropriate over-industrialization of the wetlands must stop

6. THERE IS NO SUCH THING AS A "LEAKY LEVEE" – like the unicorn, it simply doesn't

7. THE BASIN NEEDS WATER, MORGANZA IS “GASOLINE ON THE FIRE” - our land is above sea-level, why sink it like New Orleans did?

8. MORGANZA IS A REPETITION OF PUMP-and-PAVE POLICIES THAT BEGAT ST. BERNARD AND NEW ORLEANS EAST – a project to spur more development in the wetlands

The main feature of Morganza, the Houma Navigational Canal Lock, is the perhaps most offensive aspect of the project out of many. It is simply an indefensible boon to the very narrow interests of a few companies which refuse to contemplate **cheaper** and **better** solutions which would affect HNC traffic minimally.

The HNC is half-as-long as the MRGO, but just as destructive. The direct and indirect wetlands and habitat loss due to the HNC is well-documented and publicized - over 25,000 acres have been lost.

Even worse, the HNC cuts both ways. The Timbalier sub-basin, fed by Bayou Terrebonne, supplying the community's most culturally and ecologically sensitive assets (Point-Aux-Chenes and Isle de Jean Charles) and protected wildlife preserves, is the most hydrologically starved sub-basin in Terrebonne and severely pressured by the South Lafourche Levee District. Atchafalaya and Wax Lake Outlet fresh water never gets to Bayou Terrebonne due to the Houma Navigational Canal.

Worse yet, the HNC is a "triple-whammy" to the sensitive wetlands ecology: salt water intruding up the HNC north of Bayou Grand Calliou doesn't flow back out the HNC- its flows into Bayou Grand Calliou, very efficiently distributing salt-water into the adjacent wetlands.

A wholesale replacement of the basin's hydrology by a series of culvert structures is another indefensible aspect of the Morganza. All evidence and previous experience portends a wholesale degradation of the habitat in such scenarios – 275,000 wetlands acres would be sacrificed in lower Terrebonne due to Morganza.

There is no other alternative to save Terrebonne from the destruction suffered by St. Bernard: the Houma Navigational Canal must be closed - to be clear, "dammed with earth" or controlled with multiple floodgates - for any plan for Terrebonne's coastal protection and restoration to be taken seriously.

The source of the most recent, comprehensive, and thorough communications about these Morganza issues is Professor Oliver Houck's (Tulane University School of Law) stunning research article titled “Can We Save New Orleans?”, published in the Tulane Environmental Law Journal (http://www.law.tulane.edu/Houck_CanWeSaveNewOrleans.pdf), and his response to the CPRA plan submitted in the public review period. I urge policy makers at all levels to subscribe the policy leadership direction outlined by Professor Houck in his research and public response to the CPRA plan.

Kind Regards,

John Viguerie

415 577 5513

johnviguerie@yahoo.com

From:	Craig Vega
To:	comments@louisianacoastalplanning.org;
CC:	
Subject:	comments
Date:	Friday, January 05, 2007 8:13:10 AM
Attachments:	

The level of protection planned for th South Lafourche Levee District system should be greater than the propesed 100 year structural level of protection.
Construct the proposed addition between Golden Meadow and Pointe-aux-Chenes.
Include funds to to converte both the Larose and Golden Meadow floodgates into functioning locks..
Construct both the Morganza to Gulf and the Donaldsonville to Gulf levee system in the Draft Master plan..

Craig Vega
Galliano, LA

From: ojthib@bellsouth.net
Sent: Thursday, January 04, 2007 6:18 AM
To: comments@louisianacoastalplanning.org
Subject: coastal protection

I live on Point-aux-Chene, La. (Montegut). I would like to see the 5 Cat. levy built to save all of Terrebonne parish not just half of it.

Why can't you just build up the barrier islands. Pump all that sand back on the islands, that's all it was before. I've been here all my life (62 yrs.), and we past some big storms when growing up. I realize there is no more marshes, but the barrier islands were our only protection. It seems if it work then it would work now.

Thanks for the opportunity to let me respond.
Oran Thibodaux

From: Leslie Suazo [lsuazo@tpcg.org]
Sent: Thursday, January 04, 2007 4:07 PM
To: comments@louisianacoastalplanning.org
Subject: Terrebonne Parish Council and Coastal Zone Management & Restoration Advisory Committee

Attachments: Comment Cover CPRASchwab.doc; CPRA Preliminary Draft Master Plan Comments.doc

Comments on State Master Plan

Office of Coastal Restoration
and Preservation

January 4, 2007

Ms. Michele Deshotels
Louisiana Department of Natural Resources
CPRA-IPT
P.O. Box 94396
Baton Rouge, LA 70804-9396

Dear Mr. Porthouse:

Enclosed you will find a copy of a resolution passed by the Terrebonne Parish Council at a special meeting held Thursday, December 28, 2006. The resolution specifically addresses the Council's support, in concept, of the State's Master Plan for Comprehensive Coastal Protection and Restoration. The Terrebonne Parish Coastal Zone Management and Restoration Advisory Committee has passed a similar resolution as well.

You may recall, at a public hearings recently held in Houma, Louisiana, oral comments were also provided.

The Terrebonne Parish Council and the Terrebonne Parish Consolidated Government continue to be very active and engaged in the issues and activities that affect our coastal areas. We appreciate the opportunity to provide comment on this significant planning effort in pursuit of our mutual goals of providing maximum hurricane protection to as many of our citizens as we possibly can, while maintaining a healthy and productive ecosystem. In addition, we also appreciate the leadership demonstrated by the State of Louisiana in developing a plan that reflects the need for the integration of hurricane protection and coastal restoration.

Please do not hesitate to contact me should you have any questions or require additional information.

Sincerely,

Leslie R. Suazo, Director
Office of Coastal Restoration and Preservation
lrs

TERREBONNE PARISH CONSOLIDATED GOVERNMENT
COASTAL ZONE MANAGEMENT & RESTORATION ADVISORY COMMITTEE

December 27, 2006

OFFERED BY: LOGAN BABIN

SECOND BY: DR. DENISE REED

WHEREAS, the Coastal Zone Management and Restoration Advisory Committee is committed to providing aggressive leadership, direction and consonance in the development and implementation of comprehensive policies, plans and programs which encourage multiple uses of the coastal zone and achieve a proper balance between the multiple needs of coastal resources in Terrebonne Parish; and

WHEREAS the residents of Terrebonne Parish are in urgent need of immediate Comprehensive Coastal Protection and Restoration; and

WHEREAS the Coastal Protection and Restoration Authority of the State of Louisiana has made available to the public, a preliminary draft plan to provide comprehensive coastal protection and restoration to the Terrebonne Basin and all of coastal Louisiana; and

WHEREAS the preliminary draft plan includes the much anticipated Morganza to the Gulf Hurricane Protection System and the Lower Atchafalaya River Barrier Plan Alignment, an internal hurricane levee alignment and the rehabilitation of our barrier islands; and

WHEREAS the plan includes restoration strategies that are in keeping with the Terrebonne Parish Strategic Plan for Coastal Restoration and the approved Terrebonne Parish Coastal Zone Management Program Document, including marsh creation and shoreline protection, with the possible exception of the addition of freshwater to the marshes of Northern Terrebonne Parish, where the introduction of freshwater into the Southern Marshes of the Parish is a higher priority;

THEREFORE BE IT RESOLVED that the Coastal Zone Management and Restoration Advisory Committee does support, in principle, the Preliminary Draft Plan as presented by the Louisiana Coastal Protection and Restoration Authority and urges the State of Louisiana to continue its leadership role in our common efforts to provide the maximum protection possible to as many of our citizens as possible; and

BE IT FURTHER RESOLVED that the Coastal Zone Management and Restoration Advisory Committee does recommend and request that the Terrebonne Parish Consolidated Government continue its work with the State and Federal Leadership to secure authorization of and funding for Comprehensive Coastal Protection and Restoration in Terrebonne Parish.

There was recorded:

YEAS: 8

NAYS: 0

ABSTAINING: 0

ABSENT: 1

The Chairman, Mr. Nolan Bergeron, declared the resolution adopted, on this 27th day of December 2006.

I, Leslie Suazo, Director of Coastal Restoration, do hereby certify that the foregoing is a true and correct copy of a resolution adopted by the Committee at a Special Meeting on December 27, 2006, at which meeting a quorum was present.

_____

Leslie R. Suazo

OFFERED BY: Mr. C. Voisin.
SECONDED BY: Ms. K. Elfert.

RESOLUTION NO. 06-469

A resolution endorsing the Coastal Zone Management and Restoration Advisory Committee's support, in principle, of the Preliminary Draft Plan for Coastal Restoration as presented by the Louisiana Coastal Protection and Restoration Authority.

WHEREAS, the residents of Terrebonne Parish are in urgent need of immediate Comprehensive Coastal Protection and Restoration, and

WHEREAS, the Coastal Protection and Restoration Authority of the State of Louisiana has made available to the public, a preliminary draft plan to provide comprehensive coastal protection and restoration to the Terrebonne Basin and all of coastal Louisiana, and

WHEREAS, the preliminary draft plan includes the much anticipated Morganza to the Gulf Hurricane Protection System and the Lower Atchafalaya River Barrier Plan Alignment, an internal hurricane levee alignment and the rehabilitation of our barrier islands, and

WHEREAS, the plan also includes restoration strategies that are in keeping with the Terrebonne Parish Strategic Plan for Coastal Restoration and the approved Terrebonne Parish Coastal Zone Management Program Document, including marsh creation and shoreline protection, with the possible exception of the addition of freshwater to the marshes of Northern Terrebonne Parish, where the introduction of freshwater into the Southern Marshes of the Parish is a higher priority, and

WHEREAS, the Terrebonne Parish Coastal Zone Management and Restoration Advisory Committee has reviewed the document and has taken action to support said plan in principle.

NOW, THEREFORE BE IT RESOLVED by the Terrebonne Parish Council, on behalf of the Terrebonne Parish Consolidated Government, that the endorsement by the Terrebonne Parish Coastal Zone Management and Restoration Advisory Committee, in principle, of the Preliminary Draft Plan as presented by the Louisiana Coastal Protection and Restoration Authority is hereby supported and that Louisiana Governor Kathleen Blanco and all members of Terrebonne Parish's Legislative Delegation are hereby urged to continue their leadership role in our common efforts to provide the maximum protection possible to as many of our citizens as possible.

THERE WAS RECORDED:

YEAS: A. Tillman, A. Williams, K. Elfert, T. Cavalier, C. Duplantis, C. Voisin, P. Rhodes and P. Lambert.

NAYS: None.

ABSTAINING: None.

ABSENT: H. Lapeyre.

The Chairman declared the resolution adopted on this, the 28th day of December, 2006.

* * * * * * * * *

I, PAUL A. LABAT, Council Clerk for the Terrebonne Parish Council, do hereby certify that the foregoing is a true and correct copy of a resolution adopted by the Assembled Council in Special Session on December 28, 2006 at which meeting a quorum was present.

GIVEN UNDER MY OFFICIAL SIGNATURE AND SEAL OF OFFICE THIS 29th DAY OF DECEMBER, 2006.

_____
PAUL A. LABAT, COUNCIL CLERK
TERREBONNE PARISH COUNCIL

From: Cathy Smith [crsmith@htdiocese.org]
Sent: Thursday, January 04, 2007 9:46 AM
To: comments@louisianacoastalplanning.org

'comments@louisianacoastalplanning.org'
Subject: coastal planning

To Whom It May Concern:

I believe that it is imperative that these implementations be considered and put into effect:

1. (Please consider**) granting to South Lafourche Levee systems a higher elevation than the 100 year structure level of protection.**

2. (Please consider) **constructing the additional higher levees between Golden Meadow & Pointe au Chien.**

3. **For the Eastside of South Lafourche, we encourage you to utilize the Donaldsonville to Gulf levee alignment**.

Thank you for your consideration.

Sincerely,

Louis and Cathy Smith
P O Boix 534
Larose, LA 70373

From: Thomas Robichaux [trobichaux@charter.net]
Sent: Friday, December 01, 2006 12:27 PM
To: comments@louisianacoastalplanning.org
Subject: Planning Draft Manual
Would you please forward to the address below 5 manuals of the Preliminary Draft of the CPRA. I attended the meeting in Houma, however some of the attendees did not receive the manuals

Thomas Robichaux
412 Fir Drive
Raceland, La. 70394

trobichaux@charter.net

From: Thomas Robichaux [trobichaux@charter.net]
Sent: Friday, December 01, 2006 12:31 PM
To: comments@louisianacoastalplanning.org
Subject: Meeting Houma, 11/30/06

Attachments: Louisiana Coastal Planning.doc

December 1, 2006

Attn: Mr. Jon Porthouse, Project Director

I attended the Public Meeting regarding the Coastal Planning and Restoration. I enjoyed the meeting and respect your commission for presenting a well planned and organized meeting. I know you have additional work to do, planning the final proposal.

Mr. Tom Bingham present manager of Valentine Paper Co. presented opinions and suggestions regarding the Lafourche Parish Bayou Lafourche salt problems. I was a former Vice President and Manager of Valentine Paper prior to retirement in 1992. During my tenure with the company as manager since 1974 to the date of my retirement in 1992 salt water intrusion was actually far worse then as now. Chloride content in the water was at times 13,000 ppm and the mill shut down for weeks at a time. Although your proposal does not address this specific salt water intrusion problem, I will suggest that all deliberate effort should be done to address this problem and ask that you address it as a priority. Mr. Kirk Cheramie was indeed in charge of the Bayou Lafourche Fresh Water Dist. He attempted to get Bayou Lafourche cleaned out and dug and the District was sued for potential damage to Gazebo's and decking along their property. So what is more important? Paying for a few Gazebo's or taking care of the health of many thousands of citizens living along Bayou Lafourche, and protecting jobs and reducing the impact of encroaching salt water. Even today this dredging for at least a few miles from Donaldsonville to Thibodaux would allow raising the level of water flow to 3 to 5 feet above current levels from Donaldsonville south to Lockport or at the least the current maximum flow of the pumps to 400cubic feet per second which would certainly mitigate the intrusion of this salt water. The added flow would also perhaps clean out the bayou of the hydrilla weed infesting it. Mr. Archie Chiasson, Director of the District recently stated that he needed 2 or 3 more of the weed cutters. Then why I must ask does he not get them?. The district has over $1million in cash in their accounts.
Also the issue of the construction of the weir just west of Lockport should have been constructed at the intersection of the intracoastal waterway and the company canal. This also would have prevented salt water intrusion into Lake Fields and Lake Long west of Lockport and the surrounding marshes. Why was this not considered at the time of the installation of this weir. That is why citizens today are cautious about the new proposals and the spending of tax money for projects that do not or will not work.
Would you please send me 5 of the Preliminary Draft proposals so I can give to citizens for their information.
Thanks,

Thomas Robichaux
412 Fir Drive
Raceland, La 70394
Tele: 985 537 6210

trobichaux@charter.net

From: Johnny & Sherry Robichaux [sjrobi@mobiletel.com]
Sent: Wednesday, January 03, 2007 9:22 AM
To: comments@louisianacoastalplanning.org
Subject: coastal planning

To Whom It May Concern:

I believe that it is imperative that these implementations be considered and put into effect:

1. (Please consider**) granting to South Lafourche Levee systems a higher elevation than the 100 year structure level of protection.**

2. (Please consider) **constructing the additional higher levees between Golden Meadow & Pointe au Chien.**

3. **For the Eastside of South Lafourche, we encourage you to utilize the Donaldsonville to Gulf levee alignment**.

Thank you for your consideration.

Sincerely,

Johnny & Sherry Robichaux
14778 West Main St.
Cut Off, La. 70345

From: Veralyn Price [verandjim@charter.net]
Sent: Sunday, December 10, 2006 2:10 PM
To: comments@louisianacoastalplanning.org
Subject: Fw: cat 5 hurricane protection leve

----- Original Message -----
From: Jimmie
To: comments@louisianacoastalplanning.org ; verandjim@charter.net
Sent: Wednesday, December 06, 2006 7:36 AM
Subject: cat 5 hurricane protection leve

we are in favor of following the proposed morganza levee alignment not the proposed allignment following the intracoastal . there have been enough studies the work needs to start immediately. restore the barrier islands is also a priority. jimmie price 4305 bayouside drive houma louisiana 70363 . e-mail jimminator@charter .net

From: Keith Plaisance [keith@guidrybrothers.com]
Sent: Wednesday, December 20, 2006 4:47 PM
To: comments@louisianacoastalplanning.org
Subject: Comments

Keith Plaisance
Security Officer
Guidry Brothers Towing Co.
985-475-6631
985-677-0138-c

To Whom It May Concern: My name is Keith Plaisance , I'm 41 years old I live in Larose LA. In Lafourche Parish along Bayou Lafourche. Where I was born and raised. We really cherish our Cajun heritage and our beautiful area and for that I'm very Grateful and feel blessed. I'm very grateful for the job you' all are doing. I think the plan is awesome, With a few changes we will be well on our way. I ask that you' all push for this our state really needs this project. I really look forward to seeing you' all again.

P.S. Please try to have a meeting
On Bayou Lafourche at the Larose
. I'm on the board I can get the
building

THANKS
GOD BLESS
Keith Plaisance

From: Moore, Jack [jmoore@tpsd.org]
Sent: Thursday, December 21, 2006 11:31 AM
To: comments@louisianacoastalplanning.org
Cc: Berwick Duval; Dan Walker; Jerome Zeringue; Tony Alford; gtalbotsr@internet8.net; Buddy Daisy (buddysseafood@yahoo.com); jodie@southlandinternational.com; kplanetearth@bellsouth.net; Willis Henry (whenry10@bellsouth.net); dagatem@bellsouth.net
Subject: Comments

Please allow me to introduce myself. My name is Jack Moore. I reside at 830 Crochetville Rd., Montegut, LA, 70377. I am employed by Terrebonne Parish School Board and I am a Commissioner of the Terrebonne Levee and Conservation District in Terrebonne Parish.

I wish to thank the Commission for all the work and efforts put into this plan. While I realize there have been other plans that have gone by the wayside, I am of the opinion that this plan, our plan will be and is a guideline to help rebuild Louisiana. It is in that belief that I feel the Commission has undertaken the most serious venture of our lifetime. Our vulnerability has been exposed, not only to us, but to the nation.

I am wary of one thing however. I am wary of Louisiana politics. I am wary of not doing this right. I am wary of what will be if this is not done in the best interest of Louisiana and NOT the best interest of any specific individual or influential contributor. The days of Huey Long and Edwin Edwards must…….I repeat, MUST be put behind us and we MUST do what is right for the citizens of this State. I thank God that we get this additional chance to right ourselves and it is imperative that we do this correctly.

You will receive many comments and likely much pressure to be mindful of special interest issues. I implore each of you to take the high road and bring about the changes necessary that Louisiana is secure from similar catastrophic devastation that was experienced in 2005. I implore each of you to implement the moral value of doing a job right, without scandal and individual concern. I implore that each of you do this job with concern for the masses, with concern for our children and our children's children. I implore you to put the money into real projects, into real construction, into real protection for the people of Louisiana; not into more studies, planning, or other things that will not achieve these objectives.

I realize that this plan is many years in the making; however I further implore you to move the vessel (plan) forward, down the road, and do not let it stop or be delayed for any reason. This plan is the road map to the future of not only South Louisiana, but for Louisiana as a whole. With the passage of the OCS legislation and with the President's signature, our State is set to receive its' fair share of oil and gas revenue. It is critical that we take these newfound monies and re-construct our coast and build sufficient

levee protection to secure our people, our property, and our heritage. And, it is imperative that we do so in expedient fashion, not sidetracked by special interest concerns, and with transparency and accountability so that all our citizens and this entire nation will know that we have performed to the highest standards.

Thank you for your time, thank you for your efforts, and thank you for your interest. I trust that each of you will hold yourself to a higher standard. Our citizens, our communities, and our lives depend on it.

With best wishes,

Jack W. Moore
830 Crochetville Rd.
Montegut, LA 70377

Work Phone: 985-876-7400 Ext. 283

1/3/2007 13:54	HARRY MICHEL, RETIRED, 9712 EAST PARK, , HOUMA, LA, 70363, USA, babsnhar@internet8.net	I CAN REMENBER TERREONNE PARISH BEFORE THE HNC WAS BUILT BY THE PARISH GOV. THE HNC HAS DESTORYED THIS PARISH.(OVER 25,000 ACRES HAVE BEEN LOST)I HAVE SEEN IT WITH MY EYES. IF IT ISN'T CLOSED THERE WILL BE NOTHING LEFT OF THIS PARISH.

From: MT Melvin [mtmlaw@mobiletel.com]
Sent: Sunday, December 03, 2006 8:35 PM
To: comments@louisianacoastalplanning.org; b2fwdpao@usace.army.mil
Subject: A NEW COASTAL PLAN

Attachments: LA COASTAL PLANNING 1.doc

M. T. MELVIN
13970 WEST MAIN ST.
POB 1474
LAROSE, LOUISIANA 70373
PH 985-693-3132; FX 693-3172
mtmlaw@mobiletel.com

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December 4, 2006

CPRA-IPT
DNR
POB 90396
Baton Rouge, LA 70804-9396

Dear Sir:

Why not build a breakwater, varying one to ten miles offshore from just south of the Empire canal to Galveston, Tx.

That would:
- Provide another Intracoastal waterway; with entrances to Empire, Barataria Pass, Port Fourchon, Whiskey Pass, Athchafalaya Bay, Eugene Island, Cameron, Sabine Pass, and Galveston;
- Prevent coastal tidal erosion, and rebuild the beaches of the barrier islands;
- Greatly mitigate saltwater intrusion, and conversely allow fresher brackish water to replenish the estuaries;
- Enhance oyster production, by creating new production areas, and by diminishing the oyster's salt water predators;
- Rebuild the marshes;
- Enhance a closed white shrimp season [which would finally allow the white shrimp to spawn];
- Enhance sport fishing, both inside and outside of the breakwater;

- All of the above would serve to mitigate any hurricane tidal flow from damaging coastal towns.
- Protect and enhance oil production and logistics.

The billions and billions of dollars of economic benefits from such a plan would greatly outweigh its cost.

If I may be of further assistance to you in the matter, please call anytime.

Yours very truly,

M. T. Melvin

cc: Various

M. T. MELVIN
13970 WEST MAIN ST.
POB 1474
LAROSE, LOUISIANA 70373
PH 985-693-3132; FX 693-3172
mtmlaw@mobiletel.com

December 4, 2006

CPRA-IPT
DNR
POB 90396
Baton Rouge, LA 70804-9396

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The billions and billions of dollars of economic benefits from such a plan would greatly outweigh its cost.

If I may be of further assistance to you in the matter, please call anytime.

Yours very truly,

M. T. Melvin

Cc: Various

From: Todd Lyons [mailto:tlyonscpa@charter.net]
Sent: Wednesday, November 29, 2006 5:25 PM
To: Michele Deshotels
Subject: CRPA Meeting on 11/29/06

I today attended a Coastal Restoration and Protection Authority Meeting in Houma, Louisiana. It was so well attended that I was unable to get a copy of the brochure containing a Draft of the Coastal Protection master Plan. Could you please have one mailed to me at the below address: I know I can review it online, but would prefer to see the hard copy for easy reference. Thank you.

Regards,

Todd Lyons, CPA
215 lake Crescent Circle
Houma, LA 70360

From: Michele Deshotels [mailto:MicheleD@dnr.state.la.us]
Sent: Thursday, November 30, 2006 8:11 AM
To: Todd Lyons
Subject: RE: CRPA Meeting on 11/29/06

Mr. Lyons,

We will have one put in the mail today. Thank you for coming yesterday afternoon. I apologize that enough copies were not available at the meeting.

Regards,
Michele Deshotels

-----Original Message-----
From: Todd Lyons [mailto:tlyonscpa@charter.net]
Sent: Wednesday, November 29, 2006 5:25 PM
To: Michele Deshotels
Subject: CRPA Meeting on 11/29/06

I today attended a Coastal Restoration and Protection Authority Meeting in Houma, Louisiana. It was so well attended that I was unable to get a copy of the brochure containing a Draft of the Coastal Protection master Plan. Could you please have one mailed to me at the below address: I know I can review it online, but would prefer to see the hard copy for easy reference. Thank you.

Regards,

Todd Lyons, CPA
215 lake Crescent Circle
Houma, LA 70360

From: Todd Lyons [mailto:tlyonscpa@charter.net]
Sent: Thursday, November 30, 2006 9:01 AM
To: Michele Deshotels
Subject: RE: CRPA Meeting on 11/29/06

Since you responded so promptly, I have a few comments about the meeting and suggestions for future meetings. Please pass them on to interested parties:

1. I felt that the scheduled meeting time of 2 hours was too short.
   A. The moderator went through the draft too quickly, spending only 30 minutes detailing the draft.
      1) Without proper info, participants often only comment or pose questions based on what they have seen in the newspaper, or what special interest groups want them to know.

2. Place a time limit of 5 to 10 minutes for each speaker from the public.
   A. If that's not feasible, devise some method to stop participants from rambling on and on and just repeating the same thing over and over again.
   B. That would make the meetings so much more efficient and allow the Planning Team to hear many more opinions and comments.
   C. That goes especially for those who have already met with CPRA earlier in the day and are there just to repeat their message to the public.
   D. I really believe that you would have more credible participants had a few early speakers not dragged on for so long.

3. Make an announcement that all cell phones are to be turned off!
   A. I believe that yesterday about 1/3 of the people didn't have the sense to turn them off or put them in a silent mode.
   B. It gets pretty aggravating to all, including the panel when there are so many distractions.

4. Schedule the meetings when more can attend.
   A. I understand that the meeting was crowded, but the meetings should be held after normal business hours to allow more interested parties to appear.
   B. After all, it is supposed to be a "Public" Meeting.

After I get the draft, I will review it thoroughly and send you another email with comments concerning it. I have visited the website and read most of what's on it. I will also continue to keep abreast of the situation. This is probably the most important item affecting South Louisiana, and the CPRA Team has an enormous challenge. Any guidance they get can only be helpful.

Thanks,

Todd Lyons, CPA

From: Allen Gautreaux [agautreaux@valentinepaper.com]
Sent: Monday, December 11, 2006 8:32 AM
To: comments@louisianacoastalplanning.org
Subject: Insufficient fresh water put into Bayou Lafourche

Attachments: 20061210, CPRA.doc

Please see attachment.

Thank you,

Allen Gautreaux
QA Manager
Valentine Paper

December 10, 2006

To: CPRA Integrated Planning Team
Department of Natural Resources
Baton Rouge, LA 70804-9396

Subject: Insufficient quantity of fresh water put into Bayou Lafourche

My name is Allen Gautreaux, I live and work in the Lockport area, central part of Lafourche parish. I am native to the area and at age 54 I have witnessed the effects of salt water intrusion in regard to land loss in lower Lafourche. I work at Valentine Paper Co. as Quality Assurance Manager and because our business is so dependent on Bayou Lafourche as our operational fresh water source , I am very aware of chloride levels and fluctuations in the bayou.

In mid October of this year we experienced a significant rise of water chlorides in the bayou which have since fallen off, but still remain higher than usual compared to past years. The actual numbers on chloride levels and their impact on our business and the public water supply was presented to you by our Plant Manager / Tom Bingham at the meeting of Nov. 29th, at the Houma Terrebonne Civic Center.
Calls to the director of the Bayou Lafourche Fresh Water District to get more fresh water put into the bayou at Donaldsonville were responded to with: I can't, or My hands are tied.
I read that the Bayou Lafourche Fresh Water District was established to provide fresh water to Ascension, Assumption, and Lafourche parishes. It is my opinion that the district has been negligent for years in fulfilling it's responsibility and whole reason for existence, reducing Bayou Lafourche to a drainage ditch. Even though Bayou Lafourche doesn't serve the full purpose it did when the area was initially settled, it is still our only source of fresh water.

Conversations on this issue with officials usually end at the same point – we don't have the money to fix it. That comment prompted me to research Federal Subsidies to the Oil Industry. At: "www.moles.org/ProjectUnderground/drillbits/6_09/vs.html" It listed 15 of the largest US Government subsidies to the Oil Industry. Dollar amounts are listed in millions and excluding defense ranges US$4,477 to US$10,889; including defense ranges US$14,936 to US$34,323. How is it the US Government can subsidize the richest industry in the world with billions of dollars, but can't provide money to insure our fresh water supply is not compromised? It is the US Army Corp of Engineers that blocked off Bayou Lafourche from the river creating this problem, it should be incumbent upon them to fix it.

Enough of that. On Nov. 29th I attended the meeting in Houma and had planned on attending the Dec. 11th meeting as well, but company business takes me out of town on that date. After reviewing the preliminary draft of your plan I had the following questions:

re: page 34, Land sustaining diversions; small diversion at Bayou Lafourche.
What is the flow rate of a small diversion? Will it be enough to provide an adequate, sustainable flow of fresh water down the bayou? Will there be laws established to insure no special interest party can change the purpose of it's intended function?

re: page 35, 2nd paragraph of Marsh Creation.
How can you state lower Lafourche's location is difficult to access river water and sediment when that entire area was originally built with river water carrying sediment through Bayou Lafourche?

Thank you,

Allen Gautreaux

From: Phillip Gouaux [lcmsigma@cajunnet.com]
Sent: Friday, January 05, 2007 10:37 AM
To: comments@louisianacoastalplanning.org
Cc: Charlotte Randoff
Subject: comments

Importance: High

Attachments: cpra committee.doc
Please process the attached for review.

L. Phillip Gouaux
1421 Hyland Dr.
Lockport, LA 70374
Phone 985 532 5226
FAX 985 532 4647
CELL 985 209-1499

January 4, 2007

Dear Committee,

I'm Phillip Gouaux, a Lafourche Parish Councilman that represents part of the Tenth Ward as well as the Point Aux Chene area. I have grave concerns about the areas storm protection and the future of the Louisiana's oil industry. I'm requesting that the committee give careful consideration and adopt the following proposals as part of the overall plan.

1. The level of protection in the South Lafourche Levee District should be greater then the 100 year structural level. This levee plays a significant role in protecting LA 1, businesses and residents. This levee system plays a large part in both National Energy Security and in the economics of the State.
2. The level of protection planned for the SLLD system should be greater than the proposed 100 year structural level of protection. The 100 year structural level of protection does not raise the levee height to the height of the planned elevated Louisiana Highway 1, on which vehicles tires will ride at approximately 20 feet above sea level.
3. Sufficient funds should be included to convert both floodgates in Larose and Golden Meadow into functioning locks. Bayou Lafourche as a navigable channel will be very important to America's energy supplies. It is the channel for inland barging of fuel, drilling muds and other commodities to Port Fourchon, America's busiest intermodal energy port.
4. An additional levee needs to be constructed between Golden Meadow and Pointe-aux-Chenes. This additional levee will slow down or eliminate water coming from an incoming storm west of Lafourche. If the LA 1 Corridor is placed on the West side of a hurricane (bad side), the threat of our Nations oil corridor will be at great risk. This alignment would also eliminate the funneling effect and reduce dramatically the amount of water that will get to the existing levee.
5. The construct of both the "Morganza to the Gulf" and the "Donaldsonville to the Gulf" levee systems in the Draft Master Plan is a necessity. The Donaldsonville to the Gulf project has extensive studies underway that avoid the need for additional years of studying another alignment.

I appreciate your time and effort in this very important job you are undertaking and hope that you see the benefits that we see in our wishes.

If you should need additional information or wish to speak with me, I can be reached at lcmsigma@cajunnet.com or by phone 985 209 1499.

Sincerely,

Phillip Gouaux
Lafourche Parish Councilman District #7

From:	John Guidry
To:	comments@louisianacoastalplanning.org;
CC:	
Subject:	Levee Protection
Date:	Friday, January 05, 2007 9:35:58 AM
Attachments:	

Reference the proposed levee protection for lower Lafourche Parish, I am pleading with you to construct the the additional levee between Golden Meadow and Pointe aux Chene. It is obvious that this would provide additional protection to the residents and businesses of the area by protecting the existing levee on the west side of Bayou Lafourche from a hurricane approaching from the west. The vital LA1 corridor needs this higher level of protection.

John Guidry
P.O. Box 184
Larose, La. 70373

From: wjgaidry [mailto:wjgaidry@bellsouth.net]
Sent: Friday, December 01, 2006 9:21 AM
To: Michele Deshotels
Subject: preliminary draft

I think that youall have done a wounderful job and I proposed similar plans for Terrebonne Parish in the 60,s.

The implementation and funding will be another problem, I see a huge waste of money besause there are too many agencies invplved with too many small feel-good projects.
Now that you have consolidated planing we also need to consolidate funding and implementation.

Wilson DOC Gaidry
member NOAA Shrimp Advisory Panel
Commissioner Gulf States Marine Fishery Commission
Member Terrebonne Parish CZM Committee

From: Mary Talbot [marytalbot@c-pex.org] on behalf of Louisiana Speaks [laspeaks@c-pex.org]
Sent: Tuesday, January 02, 2007 3:55 PM
To: comments@louisianacoastalplanning.org
Cc: wafont@cox.net
Subject: FW: Louisiana coast and the Mississippi River

Hi CPRA,

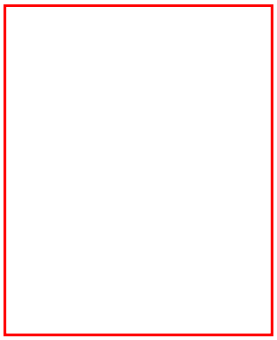
Bill Fontenot sent us the following commentary about the plan, and asked that we send it on to you.

Let me know if there are any questions,

Best,

Mary

Mary Talbot
Center for Planning Excellence
402 N. Fourth Street
Baton Rouge, LA 70802
225.267.6300
marytalbot@c-pex.org



From: William Fontenot [mailto:wafont@cox.net]
Sent: Wednesday, December 20, 2006 5:57 PM
To: Louisiana Speaks
Subject: Louisiana coast and the Mississippi River

Hello Louisiana Speaks,

Thank you for sending out these updates.

I am especially interested in a couple of things which I believe present real challenges and possible opportunities for present and future residents of Louisiana.

Has there been any discussion about the quality and quantity of the material, including gravel, sand and silt which used to be carried down in massive quantities by the Mississippi river. There is obviously a direct link between the reduced

amounts of these materials which used to be deposited in Louisiana and the reduction in these materials behind all of the dams and stabilization projects which have been constructed in the thirty three states in the Mississippi River Basin. My guess is there have been well established links between decisions made elsewhere and adverse results that are happening in Louisiana and along the Gulf of Mexico Coast.

The second point I am concerned about relates to the efforts to maintain the navigational channels in the various bays along the coast, the main shipping outlet from the mississippi River into the Gulf of Mexico and the loss of land and wetlands along our coast. Two of the most disruptive projects would be the Mississippi River Gulf Outlet and the Gulf Intracoastal Water Way which traverses the entire coast of the state.

On top of these channels we have the thousands of miles of access canals and pipeline canals which have totally carved up and chopped away thousands of acres of coastal lands and wetlands. These incredibly numerous projects have caused the loss of many thousands of acres of land and disrupted water flows over a few million acres of coastal wetlands.

Apparently most of the material which is now moved down the Mississippi River is deposited in rather deep waters in the Gulf of Mexico and not helping to compensate for the massive loss of land which has been documented over the last seventy years. The Mississippi River and Tribuitories Flood Protection System which was authorized by the U.S. Congress in 1928 has been very effective in preventing a repeat of the massive flood of 1927. Unfortunately the U.S. Congress has never directed the U.S. Army Corps of Engineers to compensate for the adverse impacts which have been realized as a direct result of the levee and control structures which were erected to control the flows of the Mississippi River. Many studies have also made direct links between the control of the Mississippi and other rivers in Louisiana and the flooding and land loss which has happened as a result of the river flood control projects.

My very limited observations have led me to conclude that for every project which the Corps of Engineers has put in place they need to build at least three or five more projects to compensate for the problems created by the first project. Without corrective projects things like the massive land losses along the Louisiana coast are the direct end result. I also believe the Corps of Engineers is probably the wrong government agency to be assigned with the job of protecting the homes, cities, waterways and wetlands of Louisiana and any other state. The Corpsis a military organization and their training is about challenging an army of people rather than natural enemies. Providing for flood protection and the maintenance of natural systems including rivers, wetlands, bays and lakes should be the mission of a civilian led organization rather than a military organization. We should be looking for ways to "work with nature" rather than "conquer nature". At West Point the future military leaders are trained to overcome the enemy or objective. This sort of aproach might work in a military mission but I believe the mission to protect our natural and human modified natural resources involves much more than "taking the hill". The U.S. Congress either needs to give the Corps very clear orders to protect our cities from floods and to give equal weight to the value of natural systems in the planning and operation of flood control and navigation systems. Otherwise, we will continue to realize massive losses of both natural resources, like our coastal wetlands, and we will also see unacceptable destruction of our cities like the flooding from Katrina.

The flooding of New Orleans from Katrina was very predictable and equally avoidable. A "hurricane flood protection system" for the New Orleans metropolitan area would have cost about seven,7, billion dollars in 2005 dollars. The damages to the N.O. area exceeded one hundred, 100, billion dollars and the losses that will be realized over the next ten or fifteen years will probably be another one hundred, 100, billion dollars. If Katrina had hit the city directly the damages could have exceeded two hundred billion just in the N.O. metropolitan area.

While the Corps has done some excellent work on repairing and updating the hurricane flood protection system for New Orleans the metropolitan area is still very vulnerable. If a Katrina size storm hits New Orleans in 2007 or 2008 the present flood protection system will not be much use in protecting the city.

Again, all of the flooding scenarios are very predictable and very preventable. As long as the Corps of Engineers uses their present Economic Model, which gives no value to protecting already developed land, but lots of value to protecting raw land which will be developed, none of our cities will be protected. I do not understand this "cost-benefit" model but

this is what the Corps is apparently using to make decisions about protecting, or not protecting our homes, businesses, schools and natural resources.

Unless the U.S. Congress and the U.S. Army Corps of Engineers take their responsibilities for protecting the people, their cities and natural resources seriously none of these things will stand a chance in the next storm.

I hope these thoughts may be of some assistance to you. I have attended some of the various meetings on storm problems and how we should be working on the future of our state. Thus far I have found these meetings not to be the best way to figure out how to understand either our current problems or how to move ahead. There are some excellent discussions and some great people trying to lead and focus these discussions. There will always be difficulties in trying to get broad input on extremely complex problems and a variety of possible solutions.

The causes of the destruction of our state from Katrina and Rita are truly national in scope. The answers and solutions need to be national in scope. We are not there but I hope we can get there.

Sincerely yours,
William A. Fontenot
632 Drehr Ave.
Baton Rouge, LA 70806
225-383-5673
wafont@cox.net

12/12/2006 6:20	Miriam Davey, , 9350 W. Inniswold Rd. , , Baton Rouge, LA, 70809, USA, athena_9@bellsouth.net	I have some very broad thoughts on the matter. In restoring Louisiana's coastline, the overarching mission should be for people to live and work along with nature rather than against nature and in ignorance and denial of the forces of nature. Development should never replace and fragment natural systems. People need nature and wildness, and Louisianians need it more than most. For instance, buildings and major roadways south of I-10 should generally be elevated rather ground level, so natural hydrology can occur underneath them. Human development in areas so close to the Gulf and storm-surge areas should either be designed in a manner that can withstand most hurricane storms and winds, or be essentially disposable. Rule of thumb; if an area is so vulnerable that every 50 years or less a major storm devastates it, its insurance rates should reflect such vulnerability. The rest of the state and nation need to decide whether we want to help underwrite that coastal development by sharing the insurance cost with those vulnerable areas, or not. I say not. I would like to see development get away from ever-more-massive and higher ring levees and more toward elevation on platforms, or else retreat to higher ground. Imagine how New Orleans might have fared had there been no levees instead of broken levees. Yes, flooding would have occurred; but it would have been for a matter of days and not weeks. The water would have come up quickly, and gone down quickly, leaving most structures intact instead of rotten and crumbling after weeks or months of mold and rot-producing standing water. Imagine how many fewer buildings and lives would have been destroyed had they simply been off the ground, or, a few feet higher in elevation. Tens of thousands. I would also like to to see a lot more attention paid to diverting sediment from the Mississippi and possibly Atchafalaya Rivers, and rebuilding marshland. Also would like to see closure of oil oilfield canals, cleanup of abandonded oilfield and industrial sites in wetlands, and public access restored to water bodies now illegally closed to the public. Harvesting of coastal forest is basically unsustainable, so consideration for spending some of this money might should be given for landowner remuneration. As global warming melts the polar ice, sea levels will rise sharply. At the same time, geologists tell us the land forms under South Louisiana are sinking, as the upper levels of marsh and wetland compact, AND, are not replenished with silt because of levees and government anti-flood policies. And then there's the oilfield canals, unsustainable cypress mulch harvest and nutria eatouts damaging marsh. So, we have half a dozen major and minor coastal-denigrating forces to contend with at once. Be pragmatic about it. Let's not send good money after bad. Build up, not down and out, or don't build at all.

From:	Kirk Defelice
To:	comments@louisianacoastalplanning.org;
CC:	
Subject:	LA 1 To Port Fourchon
Date:	Thursday, January 04, 2007 3:55:47 PM
Attachments:	

I'm in the commercial trucking claims business.

The South Lafourche area of Louisiana has been impacted greatly by the massive volume of commercial truck traffic which traverses our community. Lives are at risk and have been lost because of the impact offshore drilling has on our community.

The roads are sinking and simply cannot handle the volume of traffic.

We need funding to the greatest extent possible for roads and levees to keep our citizens safe and we could use your prayers.

Sincerely,

Kirk J. DeFelice, AIC
Liability Adjuster
Saia Motor Freight Inc.
P.O. Box A Station 1
Houma, LA 70363
Phone# 1 800 950 7242 x. 2143
Fax# 985 857 2334
kdefelice@saia.com

From:	Hank Danos
To:	comments@louisianacoastalplanning.org;
CC:	
Subject:	south Lafourche levee
Date:	Friday, January 05, 2007 8:14:20 AM
Attachments:	

Please consider the importance of the South Lafourche Levee district as you prepared the state's plan for levee protection.

The importance of the SLLD in protecting the residents and businesses as well as Louisiana Hwy # 1 and access to Port Fourchon can not be over stated. Port Fourchon is critical in supporting the nation's energy supply.

- The levee protection should be at least as high as the proposed evaluation of the new La # 1.
- Please consider adding flood gates in Larose and Golden Meadow as the importance of maintaining Bayou Lafourche as a navigable channel will take on added importance in the coming years.
- The proposed levee from Golden Meadow to Point-au-Chenes will provide additional protection to our citizens and to our highway.
- The Morganza to the Gulf and the Donaldsonville to the Gulf levee systems should also be built. The Donaldsonville to the Gulf project has extensive studies underway and this avoids additional years of studying.

Thank you for your consideration.

Hank Danos

From: Gwen Cheramie [gpcheramie@bellsouth.net]
Sent: Tuesday, December 19, 2006 2:06 PM
To: comments@louisianacoastalplanning.org
Subject: South Lafourche and Terrebonne

I have attended several of the public meetings and participated in Louisiana Speaks sessions. It is obvious that Lafourche and Terrebonne are step children. This is amazing considering the impact that our oil & gas and seafood industries have on the region, the state, and the nation. Once this vital area is lost, it is lost forever. It is ironic that the ancestors of the people that live here took back the North Atlantic into Nova Scotia with nothing but shovels, ingenuity, and hard work. What a shame. With over 200,000 citizens in these parishes, what a shame.

South Lafourche and Terrebonne deserve as much protection as New Orleans and other areas. The 1% proposed is sorry and inadequate. What about conveyance channels for the Barataria estuary? What about other projects that have been thought of, proposed, studied, and talked about over and over-for many years—each promising to help. What about a channel between Port Fourchon and the Houma Navigation Canal? What has happened to these proposals? What about all the money that has been put into the state and federal coffers at our expense?

New Orleans and other areas of the state just do not understand what our area means to the state and the nation. Do you?

We understand it is complicated and expensive, but more will be lost if we are lost. Had Katrina come on shore 40 or 50 miles to the west, we would probably be paying over $5 a gallon. It could still happen.

GP Cheramie

From: Gwen Cheramie [gpcheramie@bellsouth.net]
Sent: Thursday, January 04, 2007 3:04 PM
To: comments@louisianacoastalplanning.org
Cc: 'Henri Boulet'
Subject: CPRA Comments

Good afternoon. Lafourche and Terrebonne Parishes are vital to the economy and viability of the region, state, and US. For these reasons, we are standing together to ask and fervently urge that our area be given much more priority than shown in the first draft document. Once these vital areas are lost, they are lost. Then it will be too late. In addition, even though it is not recognized, we are a buffer for storm problems to our north.

Here are the priority items:

•The state plan should consider the highest level of protection possible for the South Lafourche Levee District (SLLD) system due to the significant role LA 1, businesses, and residents within this system play in both national energy security and the state's future recurring revenue flow.

•The level of protection planned for the South Lafourche Levee District system should be greater than the proposed 100 year structural level of protection. The 100 year structural level of protection does not raise the levee height to the height of the planned elevated Louisiana Highway 1, on which vehicles tires will ride at approximately 20 feet above sea level.

•Include funds necessary to convert both floodgates in Larose and Golden Meadow into functioning locks. Bayou Lafourche as a navigable channel will be of increasing importance to America, necessary to inland barging of fuel, drilling muds and other commodities which make their way down Bayou Lafourche to Port Fourchon, America's busiest intermodal energy port.

•Construct the proposed additional levee between Golden Meadow and Pointe-aux-Chenes. This additional levee will slow water coming from an incoming storm west of Lafourche, which would place the LA 1 Corridor on the bad side of an incoming hurricane. This alignment will reduce dramatically the amount of water that will get to the existing levee, thereby increasing the ability of the present levee system to keep very powerful hurricanes approaching us from the west from flooding the area.

•Construct both the "Morganza to the Gulf" and the "Donaldsonville to the Gulf" levee systems in the Draft Master Plan. The Donaldsonville to the Gulf project has extensive studies underway that avoid the need for additional years of studying another alignment.

Your endeavor has great impact for the future of Louisiana. It is an un-enviable task because the mistakes of the past are plaguing our efforts now. Thank you for all the work you have done and are doing.

Gwen P. Cheramie

From:	Jon Callais
To:	comments@louisianacoastalplanning.org;
CC:	
Subject:	Levee Protection = Nations Energy
Date:	Friday, January 05, 2007 10:38:36 AM
Attachments:	

Not protecting the LA 1 corridor leading down to Port Fourchon with 500 year levee's, is like playing Russian Roulette.
We will spend millions of dollars of public money on an elevated highway to Port Fourchon, www.portfourchon.com, but will not protect the only highway access leading to the area.

Respectfully,

Jon Callais
Chief of Police
Port Fourchon Harbor Police
Phone: (985) 632-1109
Cell: (985) 696-7443
E-Mail: jonc@portfourchon.com

This email and any attachments may contain Law Enforcement Sensitive and/or Classified information.

From: SBrous2416@aol.com
Sent: Tuesday, December 12, 2006 10:34 AM
To: comments@louisianacoastalplanning.org
Subject: Terrebonne Lafourche Levees

Hi:

I made the first meeting held in Houma by the CPRA group. The diagrams shown on video and in the books seemed very complex and extensive in number. I agree with the comments made by your group as well as some of the speakers in the audience; too complex of a group of levee systems will take too long to do. There will be too much politics involved. Too many people changing offices with different views and opinions. What we need is a levee system now!!!! I agree with some of the audience, a large levee system along the coast,along the whole coast of Louisiana and back up levees later on would seem to be a more reasonable solution. Johnny Glover of Co-Co Marina had good ideas. He traveled to Japan and saw how they protected their beaches. He said that what they did was put large metal structures in the water and placed netting between the structures. Water passed through the netting but sand was deposited on the bottom. Build the coast line and repair inland later.

I'm moving from Houma mainly because I feel it's too late to save the coast. I hope I'm wrong but deep inside of me I do not believe I am. Projects that take 20 years to complete should not be considered. I believe we're at the point that we need to begin moving people from low lying areas.

Simon Broussard

From:	BouRegg@aol.com
To:	comments@louisianacoastalplanning.org;
CC:	BouRegg@aol.com;
Subject:	MASTER PLAN
Date:	Friday, January 05, 2007 8:02:30 AM
Attachments:	

REGGIE BOURG
6685 SHRIMPERS ROW
DULAC LA 70353
985 563 2038

LOUISIANACOASTALPLANNING.ORG : I AM A CITIZEN AND MEMBER OF CYBER CITIZENS FOR GOOD GOVERNMENT, REGGIE BOURG.

* WE DO NOT RECOMEND MORGANZA TO THE GULF AS PRIMARY HURRICANE PROTECTION AND COASTAL RESTORATION.

* WE RECOMEND COASTAL AND OR BARRIER ISLAND RESTORATION TO PREVENT STORM SURGE AND THE RETENTION OF FRESH WATER TO RESTRICT SALT WATER INTRUSION AS A FIRST LINE OF DEFENCE AND COASTAL RESTORATION.

* WE STRONGLY OBJECT TO THE CONTINUATION OF WASTEFULL SPENDING ON MITIGATION AND REHABILITATION PROJECTS THAT OFFER NO STORM SURGE PROTECTION - WE CONCIDER THAT A TAX AND SPEND LOUISIANA TAKING CARE OF THE GOOD OLD BOY SYSTEM, ENGINEERS, CONTRACTORS, AND FAT CAT LAND OWNERS - GREEDY DIRTY LOUISIANA POLITICIANS TOO!!
GOD, THE UNITED STATES AND ME ARE WATCHING YOU, REGGIE BOURG

Coastal Protection and Restoration Authority
Integrated Planning Team

PUBLIC MEETING COMMENT FORM

Comprehensive Coastal Protection Master Plan for Louisiana
Preliminary Draft

To insure that your written comments are considered, they should be turned in this evening at the reception desks located near the entrance or mailed to the following address so that the comments are received no later than January 5, 2007:

CPRA – IPT
DNR
Post Office Box 94396
Baton Rouge, LA 70804-9396

Email comments may additionally be submitted at: comments@louisianacoastalplanning.org

Please consider the following comments:

Because of the vital role Louisiana Highway 1 plays in the state's bustling oil and gas industry, I am requesting that the CPRA grant .2% or .3% level of structural protection to the South Lafourche Levee District residents. This protection would cover the highway within the system, which is critical to accessing the planned new elevated highway from Golden Meadow to Port Fourchon.

It would be benficial to construct the proposed additional levee between Golden Meadow and Pointe-au-Chene as well.

All of this will help secure the economy of our state for generations to come. Thank you.

(Use the back of this form if more room is needed)

Name: Johnny Melancon Date: December 13, 2006

Address: 106 East 39th Street Cut Off, LA 70345

Coastal Protection and Restoration Authority
Integrated Planning Team

PUBLIC MEETING COMMENT FORM

Comprehensive Coastal Protection Master Plan for Louisiana
Preliminary Draft

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CPRA – IPT
DNR
Post Office Box 94396
Baton Rouge, LA 70804-9396

Email comments may additionally be submitted at: comments@louisianacoastalplanning.org

Please consider the following comments:

Planning Team Members: Thank you for your efforts to date on this incredible challenge for Louisiana. I am writing to ask that you take a serious look at the role Port Fourchon plays in the state's economy, and sure up this activity for our state coffers to enjoy in future years.

It is critical that we secure the area that LA 1 travels through between Larose and Golden Meadow. Should the South Lafourche Levee System be compromised, any failing could result in LA 1 being under water for weeks, and big oil moving out of our state forever.

With technology, you can work with SLLD Manager Windell Curole to design higher protection for his system. Reserve some funding to widen the base of the levee if needed. We know it can be done. A .2% level of structural protection is achievable when you work at it. It will serve the state well.

(Use the back of this form if more room is needed)

Name: Mr. Larry Griffin Date: December 13, 2006

Address: 123 Callais Lane, Golden Meadow, LA 70357

Coastal Protection and Restoration Authority
Integrated Planning Team

PUBLIC MEETING COMMENT FORM

Comprehensive Coastal Protection Master Plan for Louisiana
Preliminary Draft

To insure that your written comments are considered, they should be turned in this evening at the reception desks located near the entrance or mailed to the following address so that the comments are received no later than January 5, 2007:

CPRA – IPT
DNR
Post Office Box 94396
Baton Rouge, LA 70804-9396

Email comments may additionally be submitted at: comments@louisianacoastalplanning.org

Please consider the following comments:

Thank you for the fine work you have put in to this plan.
I am requesting that you look hard at the economic value the oil and gas economy provides to this state, and make an apprpriate investment of protecting the infrastucture which allows for this economy.
In particular, please consider granting the communities of Larose, Cut Off, Galliano, Golden Meadow, and the Louisiana Highway # 1 which passes through them .2% level of structural protection. Work with our SLLD General Manager Windell Curole using the existing footprint of the levee system, but widening the base and raising the height to achieve a higher level of protection.
This corridor is just as valuable to the state, economically, as New Orleans. Threrfore, we should not be discriminated against in receiving equal protection - no less. We need to take care of the goose that lays the golden egg for our state's economy.

(Use the back of this form if more room is needed) Wilbert Collins

Name: Wilbert Collins Date: December 13, 2006

Address: 113 Harry Street, Golden Meadow, LA 70357

Coastal Protection and Restoration Authority
Integrated Planning Team

PUBLIC MEETING COMMENT FORM

Comprehensive Coastal Protection Master Plan for Louisiana
Preliminary Draft

To insure that your written comments are considered, they should be turned in this evening at the reception desks located near the entrance or mailed to the following address so that the comments are received no later than January 5, 2007:

CPRA – IPT
DNR
Post Office Box 94396
Baton Rouge, LA 70804-9396

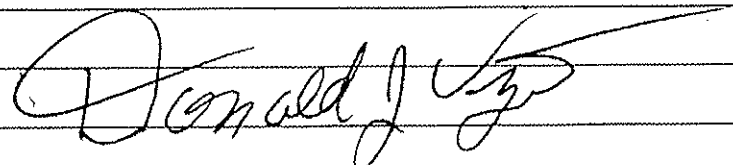
Email comments may additionally be submitted at: comments@louisianacoastalplanning.org

Please consider the following comments:

I would like to ask the CPRA to work with SLLD General Manager Windell Curole in securing the highest protection possible for this system due to the vital role this system plays in the state's economy. LA 1 between Golden Meadow and Larose play's a vital role in delivering 20% of the nation's oil needs, and is a federally recognized "High Priority Corridor."

If you cannot provide the .2% level of structural protection for the SLLD system, then provide something close like.3%. It is necessary to have this level of protection so that we can maintain access to the elevated road from Golden meadow to Port Fourchon.

Also, please construct the proposed additional levee from Golden Meadow to Pointe-au-Chene. This will give 200,000 residents which contribute to the bustling oil/gas industry economy additional protection.



(Use the back of this form if more room is needed)

Name: Donald Vizier Date: December 13, 2006

Address: P.O. Box 580 Galliano, LA 70354

Larry & Darlene Blankenship
147 Bec's Place
Braithwaite, LA 70040

December 4, 2006

Mr. Jon Porthouse
Coastal Resources Scientist Manager
P.O. Box 44027
Baton Rouge, LA 70804-4027

Re: Preliminary Draft of the Comprehensive Coastal Protection Master Plan for Louisiana

Dear Mr. Jon Porthouse:

On November 29, 2006 my husband and I attended a meeting of the C.P.R.A. held in the Lindy Boggs Center at the University of New Orleans. A presentation was made on the Coastal Restoration Plan. After reviewing the plan we were very frustrated.

We live in an area on the East Bank of Plaquemines Parish, specifically from Scarsdale to White Ditch. This area has been left out of your "Category 5" hurricane protection plan. This area is not expendable!

Our decision to live in this area was made because it is 6 feet, **repeat, Six Feet above** sea level. This is one of the highest places in the New Orleans area. It was a no flood area, and it was close to Larry's work at Teco Bulk Terminal.

This is a wonderful area with many nice homes and is an entryway to several major businesses. We have a farm behind our home that provides citrus, as well as summer and winter vegetables to the area. Teco Bulk is not the only business in the area. Bass Oil and Gas, and Associated Terminals have a division just south of us.

Why you would not want to provide a Category 5 protection levee for one of the highest areas in this vicinity is completely beyond our comprehension. If you can provide protection for places below sea level, we know it can be done for us. If you destroy this important area the first line of defense for the area is gone. Think about it!!!

We can only ask that you please take another look at the recommended levee from "Braithwaite to Belair". The current levee from Braithwaite Park past Belair ending at White Ditch has always been one entity and should continue to be one in the future. This entire area should be afforded the highest level of protection.

Sincerely,

Larry Blankenship
Larry Blankenship

Darlene Blankenship
Darlene R. Blankenship

December 1, 2006

Attn: Mr. Jon Porthouse, Project Director

I attended the Public Meeting regarding the Coastal Planning and Restoration. I enjoyed the meeting and respect your commission for presenting a well planned and organized meeting. I know you have additional work to do, planning the final proposal.

Mr. Tom Bingham present manager of Valentine Paper Co. presented opinions and suggestions regarding the Lafourche Parish Bayou Lafourche salt problems. I was a former Vice President and Manager of Valentine Paper prior to retirement in 1992. During my tenure with the company as manager since 1974 to the date of my retirement in 1992 salt water intrusion was actually far worse then as now. Chloride content in the water was at times 13,000 ppm and the mill shut down for weeks at a time. Although your proposal does not address this specific salt water intrusion problem, I will suggest that all deliberate effort should be done to address this problem and ask that you address it as a priority. Mr. Kirk Cheramie was indeed in charge of the Bayou Lafourche Fresh Water Dist. He attempted to get Bayou Lafourche cleaned out and dug and the District was sued for potential damage to Gazebo's and decking along their property. So what is more important? Paying for a few Gazebo's or taking care of the health of many thousands of citizens living along Bayou Lafourche, and protecting jobs and reducing the impact of encroaching salt water. Even today this dredging for at least a few miles from Donaldsonville to Thibodaux would allow raising the level of water flow to 3 to 5 feet above current levels from Donaldsonville south to Lockport or at the least the current maximum flow of the pumps to 400cubic feet per second which would certainly mitigate the intrusion of this salt water. The added flow would also perhaps clean out the bayou of the hydrilla weed infesting it. Mr. Archie Chiasson, Director of the District recently stated that he needed 2 or 3 more of the weed cutters. Then why I must ask does he not get them?. The district has over $1million in cash in their accounts.
Also the issue of the construction of the weir just west of Lockport should have been constructed at the intersection of the intracoastal waterway and the company canal. This also would have prevented salt water intrusion into Lake Fields and Lake Long west of Lockport and the surrounding marshes. Why was this not considered at the time of the installation of this weir. That is why citizens today are cautious about the new proposals and the spending of tax money for projects that do not or will not work.
Would you please send me 5 of the Preliminary Draft proposals so I can give to citizens for their information.
Thanks,

Thomas Robichaux
412 Fir Drive
Raceland, La 70394
Tele: 985 537 6210

trobichaux@charter.net

SJI, LLC

112 West 10th Blvd.
Post Office Box 188
Larose, LA 70373
(985) 693-4567

RECEIVED
2006 DEC 14 PM 3:51
COASTAL MANAGEMENT
DIVISION

December 12, 2006

CPRA – IPT
DNR
Post Office Box 94396
Baton Rouge, Louisiana 70804-9396

We submit these comments on the November 2006, Preliminary Draft of the Comprehensive Coastal Protection Master Plan for Louisiana.

First, let there be no doubt we are in favor of a plan that protects all of Coastal Louisiana. However, we do not believe the plan as currently written recognizes a few facts about the southern portion of Lafourche Parish. The area south of the Intracoastal Waterway down Bayou Lafourche on the east and west bank of the bayou until it reaches the Gulf of Mexico at Fourchon it vital to the oil and gas industry. An industry that for its part supplies 30% of the oil and gas for the United States and an industry that relies heavily on the facilities at Port Fourchon to access and service the Gulf of Mexico operations.

Secondly, since we are so dependent on our coast line and our highways for our survival, as comments following detail, we are greatly concerned about the plans provisions of only 100'year protection for the levee system. The citizens of South Lafourche have taxed them selves for years to provide protection from flooding. They recently renewed the property taxes and in addition passed a 1% sales tax to continue funding of levee maintenance and upgrade. Any funding assistance to raise the current levees is greatly appreciated. However, we believe the levees should be raised to the 500 year protection or the .2% probability rather than the current proposal of 1% probability.

The levees in South Lafourche protect the highways and the people living there. The highways and the people play a vital role in the oil and gas industry's Gulf of Mexico operations. Without the highway they would have to find another port to service the oil fields. Without residents, who provide much of the labor for the industry, living in the proximity of the port, oil companies would have to rely on labor from neighboring states more so than they do today. It makes no sense to propose 500 year levee systems to New Orleans and other areas and not provide the same protection to the South Lafourche Area.

Please allow me to give you some information on our companies and support our argument for stronger levees that better protect the infrastructure of the South Lafourche area. The following builds a case for continued maintenance of LA 1 and one may ask, "Why is LA 1 being brought up?" It is because LA 1 supports all activity south the Intracoastal Waterway and therefore its protection is directly related to the protection of the citizens and commerce in the area.

SJI, LLC owns several subsidiaries identified below which are providing communications services to the area affected by drilling activity in the Central Gulf of Mexico.

Lafourche Telephone Company (Latelco) serves customers in Southern portion of Lafourche Parish beginning approximately 3 miles north of the Intra Coastal Canal in Larose running South on both sides of Bayou Lafourche to the end of LA 1 at the Gulf of Mexico. This area includes the Town of Golden Meadow, the Town of Grand Isle, the communities of Larose, Cut Off, Galliano, Leeville and Fourchon, Louisiana.

Latelco has been providing telephone service to the residents and businesses in this area since 1945 and currently has an investment totaling over $60 million dollars of plant facilities in this area. LA Highway 1 plays a critical role in the delivery of communications services to the area. Latelco's cable facilities, exchange switching offices and remote switching offices are located along LA 1. The farther South one travels, the less land is available to locate facilities. Latelco utilizes the State's Right of Ways to lay its cable. Over the years, as a result of coastal erosion these right of ways have become narrow and the job of maintaining existing plant and deploying new facilities is becoming more difficult.

It is well documented that a major reason for coastal erosion is the drilling activity for oil and gas that has occurred over the last 50 – 60 years and there is no need to address the merits of the argument at this time.

Other communications systems such as cellular and internet rely on Latelco's infrastructure to deliver services to their customers. Those alternative service providers utilize Latelco facilities to connect to their switching facilities or to the World Wide Web.

No one can dispute the vital role that an effective communications system has played in economic development and in building the very fabric of our society. We have become an information society and communications is what facilitated our evolution. At the same time communications allows us to stay in touch with our families who have recently began to move to other areas of this great nation in search of varying occupations that may not always be available in Rural America.

Latelco's subsidiary, Vision Communications provides Cable TV service to this same area and LA1 is critical to their operations.

Latelco's affiliate SJI Networks provides Internet Service to this same area and LA 1 is critical to their operations as well.

SJI affiliates continue to invest in the maintenance of their infrastructure and the deployment of the latest technologies to the tune of millions of dollars annually. We are committed to providing our residential and business customers with communications services that satisfy their needs. We recognize the importance of oil and gas production to our nation and we recognize the role communications play. As stated above LA 1 is vital to our operations.

We are talking about tens of thousands of people who rely on LA 1 to get to their homes, to their work and to their recreation. Without LA 1 these people would not have Electricity, Gas, Water, Communications, or Groceries - you name it - they would not have it.

We need to do every thing possible to keep LA 1 the vital corridor it is not only in service to the residents but also to the Oil and Gas and Fishing industries operating in this area.

We can not imagine what these communities would be like without LA 1 and without adequate levee protection there won't be a LA 1.

Sincerely,

Tony Duet
Vice -President

Thaddeus M Pellegrin
124 Blanche St.
Chauvin, La. 70344

Louisiana Coastal Planning organization
CPRA Public Meetings
Comprehensive Coastal Protection

To whom it may concern,

The following are some of the issues I hope you will consider for the Comprehensive Coastal Protection Master Plan for those residents who live in the southern portions of Terrebonne Parish.

1. Levees constructed for drainage purposes within the five bayou areas should be rebuilt to a height of 10 to 12 feet above sea level.
2. Flood gates for each of the bayous.
3. Morganza-to-the Gulf hurricane protection levee has to be a priority for the State Louisiana.
4. Fresh water and sediment needs to be reintroduced to the wetlands that exist In-between the interim levees and North of Morganza.
5. Create saltwater marshes South of Morganza.
6. Redo the Barrier Islands and make the openings to the Gulf narrower .
7. Locks need to be built on the Houma Navigational Canal.
8. No further dredging should be allowed in the HNC until a Lock system is in place.

Thank you for your time and consideration.

Sincerely,

Thaddeus M Pellegrin

From: Lillian Miller [lillian@sw.rr.com]
Sent: Tuesday, January 16, 2007 12:59 PM
To: comments@louisianacoastalplanning.org
Subject: CPRA Public Comment January 1, 2007
Attachments: CPRA Public Comment January 1, 2007.doc

Lillian Miller
200 Ziegler Avenue
Houma, Louisiana 70360
(985) 876-1810
(985) 381-4099
e-mail: Lillian@sw.rr.com

Public Comment on Master Plan

January 1, 2007

Coastal Protection & Restoration Authority, IPT
DNR
Post Office Box 94396
Baton Rouge, La 70804-9396

We appreciate the unveiling of the Master Plan in the Houma Civic Center. Here are some points I feel the Master Plan must include:

Priority should be given to restoring our barrier islands first as the first line of defense. Many of these islands are bogged down in CWPPRA Projects that seem to be slowed by multiple layers of beauracracy. When constructing a building, the foundation comes first. Coastal restoration must begin with the barrier islands and progress inward.

Louisiana's marshes and swamps need to be filled with sediment from the Atchafalaya and Mississippi Rivers through flexible pipelines that allow for navigation while dredging. The New Orleans District Army Corp demonstrated how this could be done at the mouth of the Mississippi River and this project can be found on New Orleans Army Corp website by going to PAST pages. March 11, 2003 is the date.

The Houma Navigation Channel is for the people of Terrebonne and northern Lafourche a MRGO waiting for one direct hit from a Hurricane Rita...or even a Rita that makes land fall in Intracoastal City. Not only would Houma be flooded but Nichols State University and Thibodaux could see the kind of flooding that St. Bernard, Plaquemines and New Orleans East suffered.

The Master Plan is considering bringing fresh water into Terrebonne from the Atchafalaya River but if this is done the water needs to be directed to Lake Decade not the northern most part of Terrebonne.

The Bayou Lafourche Reintroduction Project is critical not just for a source of fresh water for the people of four parishes but the dredged sediment is expected to rebuild 127,000 acres of wetlands. The offshore

industry depends on fresh water from Terrebonne and Lafourche to mix drilling fluids and cements. For the past few years Terrebonne has tasted salt water intrusion and most of the water comes from Bayou Lafourche.

In Terrebonne Parish a lock in the HNC should be fast tracked while construction is being done on Morganza-to-the-Gulf. Under no circumstances should the HNC be dredged until the lock is built and operational.

Neither should the cost of dredging this channel be lumped into the cost of Morganza. People from other states will vote against Morganza if it is perceived as a dredging project to help large businesses. Pork Barrel spending. Louisiana cannot withstand even the perception that a flood project could be turned into a free ride for industry.

In the summer of 2006 the Army Corp dredged the HNC with no coverage by the media until it was nearly complete. The Army Corp says they did it as an emergency measure for Gulf Island because of Hurricane Rita. Eighty percent of the dredged sediment was given to four major industrial companies. Twenty percent was used to benefit marshes. While Terrebonne Parish was paying 18 dollars per cubic yard for sediment, large industrial companies were provided not only with cost free dredging but also free sediment.

Dredged sediment should be considered a renewable resource and traded on the open market just as gold, silver and oil and gas are traded. The people of Louisiana must let Congress and The Army Corp know this is a precious commodity that could have prevented the deaths of 1600 people in the aftermath of Katrina. Disposing of it off the outer continental shelf is immoral.

I believe the Master Plan is wrong in the alignment of Donaldsonville to the Gulf.

However, Highway 90 could be elevated between Raceland and Des Allemandes to provide and nourish the Barataria Basin with fresh water and nutrients. This will provide another line of defense. It is also a hurricane evacuation route.

Third Delta Conveyance Channel is an idea that Louisiana can no longer afford. We need smaller scale diversions like the Bayou Lafourche Reintroduction but not a monstrosity like Third Delta.

In Terrebonne Parish the interim levees need to be built to eight or ten feet as was proposed in a 2006 GSE Study.

In Lafourche Parish the South Lafourche Levee needs to be increased and locks need to be built in some locations.

Highway One needs to be fast-tracked as it is both a conduit for offshore traffic as well as a hurricane evacuation route.

In St Mary Parish there has been talk about deepening some Channels to -40 feet. Please talk to the people in St. Bernard and lower Terrebonne Parish before the dredging anything that deep.

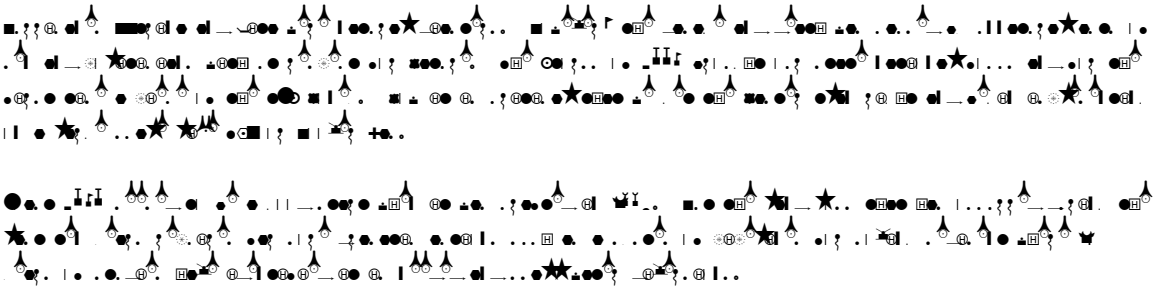
There should be a research bank at the Wetlands Center in Lafayette to prevent duplication and multiple studies by different federal and state agencies. THE LCA 2004 Study is 2,719 pages. The Master Plan is over 600 pages. It is time to stop killing trees and start rebuilding Louisiana.

For 16 years Louisiana has studied our coastal crisis. Now is time to begin implementing large scale projects.

For further information, I can supply footnotes to each paragraph in this letter but I think many other people from Terrebonne and Lafourche have given very similar comments.

Sincerely,

Lillian Miller



12/16/2006 17:40	Allen J. Babineaux, Retired, 118 Avron Dr., , Carencro, Louisiana, 70520, Lafayette Parish, NIXCHIEFAL@CS.COM	I own woodland along Bayou Pourtage in St Martin Parish. A large area of water has filled in a few years due to a process I engineered. I would like to speak to someone about a coastal plan that may be workable for our state.

Coastal Protection and Restoration Authority
Integrated Planning Team

PUBLIC MEETING COMMENT FORM

Comprehensive Coastal Protection Master Plan for Louisiana
Preliminary Draft

To insure that your written comments are considered, they should be turned in this evening at the reception desks located near the entrance or mailed to the following address so that the comments are received no later than January 5, 2007:

CPRA – IPT
DNR
Post Office Box 94396
Baton Rouge, LA 70804-9396

Email comments may additionally be submitted at: comments@louisianacoastalplanning.org

Please consider the following comments:

1- To provide storm surge protection to the communities of Intracoastal City, Esther Island, Weeks Cove and Perry, the Hebert Watershed Project should be incorporated into the final plan. The existing levies that surround the agriculture land are to be lifted with a structure in the Hebert Canal. Engineering and design are complete.

2- The Levee alignment south of Erath should be incorporated into the final plan. The Bayou Sale Project basically follows the agriculture land contour. Alignment could be adjusted to follow the existing agriculture land levy system.

3- The Mermentau Basin is critical to the

(Use the back of this form if more room is needed)

Name: Sherrill Sagrera Date: 12-20-06

Address: 12139 W. La. Hwy 82 - Abbeville, La. 70510

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(12)

Coastal Protection and Restoration Authority
Integrated Planning Team

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Please consider the following comments:

economy of Vermilion Parish Agriculture is the staple of our economy. The intrusion of saltwater into this mandated freshwater system is jeopardizing the integrity of the basin. The levee in Flotth Ward and the stretch between Schooner Bayou Control Structure and Louisiana Highway 82 should be incorporated into the plan. Repair of these breaches can also be another line of defense for the residents of Little Prairie and Forked Island.

4- The footprint already in place by oil field canals. Spoil should be placed on existing spoil banks to create speed bumps to diminish storm surge. A project to plant a variety

(Use the back of this form if more room is needed)

Name: Sherrill Sagrera Date: 12-20-06

Address: 12139 W. La. Hwy. 82 - Abbeville, LA 70510

Page 2066

cont. on page 3066

Coastal Protection and Restoration Authority
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Email comments may additionally be submitted at: comments@louisianacoastalplanning.org

Please consider the following comments:

of trees on these spoil banks is on-going by Vermilion SWCD and Acadiana RC&D.

5– The need to move fresh water from the Red River into the Mermentau Basin Project should be part of our plan. The consent will allow the removal of excess water from the Alexandria area and surface water for irrigation, lessen dependence on ground water, and introduce fresh water to help back salt water in the basin. This extra water is to be regulated as not to introduce excess water to the basin. The project should also have the ability to remove excess water out of the basin and be introduced into the sub-basin to improve water quality.

6– The Rainey marshes seem to be omitted

(Use the back of this form if more room is needed)

Name: Sherrill Sagrera Date: 12-20-06

Address: 12139 W. La. Hwy. 82 – Abbeville, LA 70510

cont on Pg 4 of 6

Coastal Protection and Restoration Authority
Integrated Planning Team

PUBLIC MEETING COMMENT FORM

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Baton Rouge, LA 70804-9396

Email comments may additionally be submitted at: comments@louisianacoastalplanning.org

Please consider the following comments:

for marsh creation. The area should be added along with terraces in Lake Pen marsh and a structure (sill) in Tom's Bayou. It is imperative that this southeast peninsula of Vermilion Parish remain intact. The encroachment of the Gulf of Mexico has some shoreline protection through CWPPRA, State only and CIAP. The plan may complete the shoreline protection portion. The interior marsh break-up could be addressed by terraces and curbing tidal flow through Tom's Bayou.

7— The tidal amplitude in the Vermilion Bay System and surrounding marshes and waterways could be considerably reduced by reducing the opening of Southwest Pass and the re-establishment of

(Use the back of this form if more room is needed)

Name: Sherrill Sagrera Date: 12-20-06

Address: 12139 W. La. Hwy. 82 - Abbeville, LA. 70510

cont. on page 5 of 6

Coastal Protection and Restoration Authority
Integrated Planning Team

PUBLIC MEETING COMMENT FORM

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Post Office Box 94396
Baton Rouge, LA 70804-9396

Email comments may additionally be submitted at: comments@louisianacoastalplanning.org

Please consider the following comments:

the historic reefs from Marrone Point to Marsh Island. Also affording the area another line of defense. The Reef portion can tie in with the Acadiana Bay's Reef Study.

A- Consideration in prioritizing which order projects will be funded. The Chenier Plain should be heavily considered since it now has no storm protection. Continued degradation of the Chenier Plain will have adverse effect on the natural resources. Oil and gas infrastructure, agriculture, human lives, history and culture of the area.

B- Thanks to the IPT Team to allow us

(Use the back of this form if more room is needed)

Name: Sherrill Sagrera Date: 12-20-06

Address: 12139 W. La. Hwy 82- Abbeville, LA 70510

Cont. on Page 6 of 6

Coastal Protection and Restoration Authority
Integrated Planning Team

PUBLIC MEETING COMMENT FORM

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Please consider the following comments:

to be a part of the planning efforts in an effort to afford storm protection and coastal restoration to coastal Louisiana. And with hope that the outcome would give the people a sense of security in the future that their history & culture and livelihood can again be protected and be somewhat stable.

(Use the back of this form if more room is needed)

Name: Sherrill Sagrera Date: 12-20-06

Address: 12139 W. La. Hwy. 82 – Abbeville, LA 70510

Coastal Protection and Restoration Authority
Integrated Planning Team

PUBLIC MEETING COMMENT FORM

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Baton Rouge, LA 70804-9396

Email comments may additionally be submitted at: comments@louisianacoastalplanning.org

Please consider the following comments:

My name is Raywood Faulk, I'm the Coulee Kinney Drainage Board, which is a district parallel to the West side of Vermilion River. I spend two hours before the meeting to try to understand the reason why the levee proposed to be built along Fresh water Bayou would be put on the West side instead of Continuing on the same side as Intracoastal Canal which would be the East side of Fresh Water Bayou. I feel doing this would jeopardize the protection of Intracoastal City and Vermilion River. One reason giving was to protect the Mermentau Basin Basin with the levee on the East side would not only protect the Basin it would also solve a tremendous problem along Vermilion River with one structure on the four mile Canal it would allow Vermilion River and other Bayou to supply fresh water to the Basin. Before Fresh water Bayou was built the Vermilion River would supply the basin with fresh water even with the four mile canal open. We also would need a levee from Fresh Water Lake to Pecan Island Ridge. I have discussed this with Vermilion Parish Police Jury + also with Mr. Oneil P. Malbrough and his assistance which they agreed with my idea.

(Use the back of this form if more room is needed)

Name: Raywood Faulk Date: 12-18-06

Address: 10236 Calcasieu Rd. Kaplan, La. 70570

Phone - 893-5793

From: p.durand@att.net
Sent: Monday, December 18, 2006 10:03 PM
To: comments@louisianacoastalplanning.org
Subject: Coastal Louisiana rebuild aided by Heavy Lift (6,000-28,000 lb payload cap.) Helicopters

Attachments: PD.HEAVY.LIFT.HELICOPTER.OPERATIONS.doc
Subject: Coastal Louisiana rebuild aided by Heavy Lift (6,000–28,000 lb payload cap.) Helicopter proposal

I'm proposing the idea of utilizing military and civilian "heavy lift helicopters" for rapid aid to rebuilding the infrastructure and coast line of coastal Louisiana. Heavy lift helicopters such as the ones in the attached documents, can single lift anywhere from 6,000 – 28,000 lb. gross payloads. These helicopters operating from local coastal heliports could heavy lift large payloads of supplies, equipment, stack-modular: portable hospital buildings, portable living quarters, portable commercial buildings, portable school buildings and large portable generators. Also, they can aid in remote construction of radio, television, cell phone and power-line tower construction. Rebuilding aided by heavy lift helicopters can take place where roadways and bridges are no longer accessible or never existed.

Also, please note the following heavy lift helicopter operational proposals sent to the Louisiana Natural Resources Department & U.S. Corp of Engineers in promotion of heavy lift helicopter utilization.
I believe that heavy lift helicopters, operating as moving sky cranes, could play a vital part in saving Louisiana coastal and wet-lands. Existing heavy lift helicopter listing: Boeing 234 – 28,000 lb. payload, Kawasaki-Vertol 107 – 10,000 lb. payload (both tandem lift rotors), Sikorsky S-64 – 25,000 lb. payload (single lift rotor), Kamov Ka-32 – 10,000 lb. payload (coaxial lift rotors) and the Kaman K-1200 K-Max – 6,000 lb. payload (intermesh lateral lift rotors).

These helicopters with payload ranges of 6,000 lb. through 28,000 lb. capacities can provide spot and lineal build up of soil, plant seeding & nutrients, sand build up, tree seeding, environmental safe select tree cutting and many other services to inaccessible places with the aid of GPS/GIS site locating. In the oil & gas industry heavy lift helicopters can be utilized to prevent further environmental concerns, such as inland canal dredging. Heavy lift helicopters can be used to transport heli-portable inland drilling rigs, bull dozers, location foundation mats, operational support equipment, living quarters and rig personnel crews (Parker Drilling, Inc., Port of Iberia, La. owns some of these rigs). Heavy lift helicopters can also be utilized in the same manner for inland pipeline laying and repairs, thus further preventing the need for canal dredging and further providing the least amount of environmental negative impact.
Sincere regards,

Patrick E. Durand
109 Desire St.
Lafayette, La. 70506

Heavy Lift Helicopters 1.) Top-left Sikorsky S-64 Skycrane (single lift rotor) 25,000 lb. pay load 2.) Top-right Kaman K-1200 KMAX (intermesh lateral lift rotors) 6,000 lb. pay load 3.) Middle: Kamov Ka-32 Helix (coaxial lift rotors) 10,000 lb. pay load and 4.) Bottom: Kawasaki-Vertol 107-2 Sea Knight (tandem lift rotors) 10,000 lb. pay load & Boeing 234 not shown (tandem lift rotors) 28,000 lb. payload, own DVD & VHS videos

Heavy Lift Helicopter Operations

(compiled by Pat Durand, EAA# 435381, p.durand@att.net, ph. 337-984-4969)

1.) Pipeline construction – (Associated Pipeline, Inc., Houston, TX has utilized)
2.) Portable generator remote locating – (Aggreko manufactures & rents these units)
3.) Radio and cell phone tower construction
4.) Remote power-line, wind turbine generator and solar electric panel construction
5.) Sensitive selective logging and tree top cutting
6.) Provide spot and lineal build up of sand, soil, plant seeding and nutrients. Also, tree seeding, environmental safe select tree cutting and many other services to inaccessible places with the aid of GPS/GIS site locating.
7.) Precision remote inland and offshore fire fighting utilizing water and retardants (equipment by Simplex Manufacturing)
8.) Remote forest fire fighting modular crew cabin delivery by long line hook sling
9.) Remote oilfield drilling rig movement – (Parker Drilling, Inc., Tulsa, OK owns some of these rigs)
10.) Remote modular building and high-rise building construction, utilizing stack modular units
11.) Modular square or rectangular tubular skyscraper building construction (like the Sear Tower, Chicago, IL)
12.) Adding additional modular square or rectangular tubular floor levels to existing sky scrappers or high rises
13.) High-rise rooftop HVAC (heating, ventilation & air conditioning) building installations
14.) Offshore heavy lift equipment and supply transports from shore bases, offshore platforms and carrier ships
15.) Portable modular bridge construction
16.) Portable remote road construction utilizing square or rectangular interconnecting mats
17.) All remote mountain top construction
18.) Remote linear long line cable pulling lay down services utilizing spooling reels
19.) Remote high rise roof top concrete cement hauling services
20.) Remote dam construction for hydroelectric generation
21.) Debris removal after natural disasters or building demolitions
22.) Up-righting and aid in removing de-railed train tank cars, box cars and passenger cars
23.) Oil spill burning or dispersant applications – (equipment by Simplex Manufacturing)
24.) Mass mosquito and other pesticide spraying – (equipment by Simplex Manufacturing)
25.) Remote levee breach damming, inland and coastal erosion build up utilizing sling loads of stones, rocks, mats and other types of barrier environmental safe materials
26.) High rise building, offshore vessel, rig or platform personnel emergency evacuation by long line slung multi-person modular cabin

Request for Quote

Please enter the following information to receive a quote for Helicopter Services and return.

Job Location (Address, City, State,
Country or Latitude & Longitude):
Project Owner:
Estimated Number of Lifts:
Estimated Maximum Weight:
Description of Loads (include: H, W & L):
Estimated Flight Distance:
Estimated Elevation above Sea Level:
Preferred lift date (s):
Estimated earliest possible lift date:
Estimated latest possible lift date:

Please enter name and mailing address:
Name
Company Name
Address
Address 2
City, ST Zip
Country

Additional Address Information
Daytime Phone
Fax
Full e-mail address
Question/Comments

Coastal Protection and Restoration Authority
Integrated Planning Team

PUBLIC MEETING COMMENT FORM

Comprehensive Coastal Protection Master Plan for Louisiana
Preliminary Draft

To insure that your written comments are considered, they should be turned in this evening at the reception desks located near the entrance or mailed to the following address so that the comments are received no later than January 5, 2007:

CPRA – IPT
DNR
Post Office Box 94396
Baton Rouge, LA 70804-9396

Email comments may additionally be submitted at: comments@louisianacoastalplanning.org

Please consider the following comments:

P.54 Marsh creation include private oilfield canals as a source of sediment for marsh creation.

Include the Forked Island sp. Community behind the levee on the south side of the ICW Construct a salinity control barrier from Hwy 82 along the old GIWW to the Schooner Bayou Control Str and then north along the east bank of the North Prong of Schooner Bayou to the GIWW (new)

Region 3 & 4 There will be positive impacts from dredging to create marsh

Meeting Response Matrix 6" Last 20 yrs.

(Use the back of this form if more room is needed)

Name: W.P. Judge Edwards Date: 12/15/06

Address: 115 Tivoli St. Abbeville, La. 70510

Coastal Protection and Restoration Authority
Integrated Planning Team

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Post Office Box 94396
Baton Rouge, LA 70804-9396

Email comments may additionally be submitted at: comments@louisianacoastalplanning.org

Please consider the following comments:

I very much appreciate the fact that you are bringing this process to people at the local level while you are in the middle of your design and processing.

(Use the back of this form if more room is needed)

Name: Tim Grant Date: 12/13/06

Address: 800 ML King [illegible]

From: Bryon Richard [bryon@crainbrothers.com]
Sent: Friday, January 05, 2007 2:33 PM
To: comments@louisianacoastalplanning.org
Cc: 'Carla Richard'
Subject: Comments

I as a citizen of the Great State of Louisiana cannot believe that you would make all these efforts to protect this great State, our Culture, our Heritage and leave out coastal communities. From what I see, you want to let Cameron Parish go to the Gulf of Mexico. Let me tell you that Cameron Parish is vital to this state and to this Nation. We have ports which are very vital to the oilfield that drives this state, plus being a leading fishing port and it will be the home to 3 new LNG Plants which are very vital to the whole nation. Lower Cameron Parish is also the home of our Parish Seat and is vital to the cattle industry of this state. I can think of many other things and could go on but will not.

It dumbfounds me that after reading all you want to protect in this State that you would want to wipe us off your map. We are tax paying Americans just like everyone else in this country and there is no way we should be left out.

I personally have ideas that could and should be incorporated.

Thanks,

Bryon K.Richard
262 Beach Road
Cameron, Louisiana 70631
Ph: (337) 538-2411
Fax: (337) 538-2700
Email: bryon@crainbrothers.com

Coastal Protection and Restoration Authority
Integrated Planning Team

PUBLIC MEETING COMMENT FORM

Comprehensive Coastal Protection Master Plan for Louisiana
Preliminary Draft

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CPRA – IPT
DNR
Post Office Box 94396
Baton Rouge, LA 70804-9396

Email comments may additionally be submitted at: comments@louisianacoastalplanning.org

Please consider the following comments:

DEAR SIR'S I AGREE WITH MOST EVERY THING YOU PROPOSE EXCEPT BLOKING OFF CAL RIVER COING INTO THE SOUTH OF CAMERAS. LAKE WHAT IS NEEDED IS SOME KIND OF GATE - LOCK - ROCK BARRIER SOME THING TO STOP SALT WATER FROM COMING IN TO MR. HACKBERRY - CARLYSS - VINCENT SETTEMENT LAKE CHARLES ; IT IS THE ONLY WAY SLOW SALT WATER AT IT SOURCE. I HAVE TALKED WITH BOBERT TISDALE MASTER PLANNER HE DOES NOT SEE TO WANT TO CHANGE ANY THING THEY HAVE PROPOSED. HE ALSO SAID IT WOULD BE TOO EXPENSIVE TO BUILD LOCKS OR GATE ON SHIP CHANNEL I WONDER HOW MUCH MONEY WAS SPENT ON KATRINA - RITA - PARISH FOR RITA TO 3 BILLION

(Use the back of this form if more room is needed)

Name: MORRIS EAST Date: 12-19-06

Address: 328 CHANNEL VIEW DR. HACKBERRY LA 70645

Page 1 of 2

CAMERON TO DEDICATE SOUTH CAM HOSPITAL
I AFRAID WATER FROM THE CHANNEL WILL RISE
NOUGH TO DESTROY THAT HOSPITAL.
ENTLEMEN YOUR CHANNEL HAS DESTROYED
ACRES LAND WATER MARSH N.O.T. TO COUNT ERISON
PECIES OF FISH DUCKS ALLIGATORS TURTLES AND
L THIER HABITAT PROBABLY SOME ENDANGERED
PECIES I HAVE TALKED TOO NUMEROUS PEOPLE
NCE THE MEETING AT LAKE CHARLES AND
Y THE SHIP CHANNEL IS RESPONSIBLE FOR
PERCENT OF THE DAMAGE CAUSED BY HURRICANE
ITA. COULD NAME LOTS OF OTHER REASON
HY THE PEOPLE ARE AGAINST SALTWATER
NTRUSION YOUR PROPOSAL DOES NOTHING FOR
ST HACKBERRY - WEST HACKBERRY WEST OF
A-27 IS 11-15 FT ABOVE SEALEVEL
. AST HACKBERRY IS FROM 4-7 FT ABOVE SEA-
EVEL WHERE THE BIGGEST MAJORITY OF THE
EOPLE LIVE & THINK WE NEED PROTECTION
TOO.

Dennis East

Coastal Protection and Restoration Authority
Integrated Planning Team

PUBLIC MEETING COMMENT FORM

Comprehensive Coastal Protection Master Plan for Louisiana
Preliminary Draft

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CPRA – IPT
DNR
Post Office Box 94396
Baton Rouge, LA 70804-9396

Email comments may additionally be submitted at: comments@louisianacoastalplanning.org

Please consider the following comments:

(1) I hope the various agencies working on La. coastal restoration will be able to work together harmoniously & without waste of resources / duplication of effort. (2) I hope Coastal restoration authorities will give serious consideration of & significant respect to the perspectives & short-term, livelihood-related needs of local people whose short-term interests may conflict with the long-term focus of coastal restoration. Please try & effect compromises so that if local people are to be displaced by or have their livelihoods affected by restoration projects, they will be adequately compensated & given respectful & compassionate assistance. Costs for these vital aspects of coastal restoration (the people side) should be figured into the costs of the projects. (3) That said, I feel Mississippi River diversion →

(Use the back of this form if more room is needed)

Name: Gay Gomez Date: 12/13/06

Address: Po Box 4035 Lake Charles, LA 70606

on a large scale (Mayer Hunt Creek area) will be essential. Using recycled spoil material for retaining existing marina should also be given serious consideration. (4) Sand pumping projects such as the one west of the community of Kelly Beach seem to have proved their worth in Hurricane Ike; the sand behind the engineered breakwaters apparently saved Highway 82 + marina to the north. More such engineering more of these projects. (5) Time and uncertainty about future hurricanes are of great concern to me. It seems to take so long for projects to be authorized + funded + built, + so much additional time for a positive effect to be manifested, that I fear the coast will disappear before it can be restored. Talk + meetings + modeling may make us feel better, but only projects in operation will actually give our coast a fighting chance.

From: Randy Moertle [rmoertle@bellsouth.net]
Sent: Thursday, December 14, 2006 5:15 PM
To: comments@louisianacoastalplanning.org
Cc: Robert Boulet; Edna Stoebner; Greg Currier; John Currier; Martin O., III Miller,; Martmill@aol.com; Paul C. Perret
Subject: Planning Unit 4

CPRA IPT,

The M.O. Miller Estate (owner of 25,000 acres of wetlands in Vermilion and Cameron Parishes) would like to make the following comments concerning the *Comprehensive Coastal Protection Master Plan for Louisiana – Preliminary Draft* (CPRA Plan):

1. Shoreline Stabilization – page 50. We are very much in favor of the shoreline protection component extending from Vermilion Bay to the Sabine River. If Gulf shoreline protection is to become a reality, it is imperative that the Coastal Planning, Protection, and Restoration (CWPPRA) Rockefeller Gulf Shoreline Stabilization (ME-18) and the PPL-16 Southwest Louisiana Gulf Shoreline Nourishment and Protection (ME-24) projects be highlighted for fast-track implementation in the CPRA Plan. It is our opinion, that the CPRA Plan will become the blue print utilized by our legislative delegation for solicitation of funding and by our resource agencies for implementation prioritization. Since both of these projects have been nominated through the CWPPRA process, they should be included in the final plan to whatever detail is available within the Shoreline Stabilization section for Planning Unit 4.
2. Highway Fortification – page 51. We are in support of elevating and protecting the existing LA Hwy 82 and 27. As the plan points out, these highways form a vital "line of defense."
3. Existing Infrastructure Armament and Protection – The Chenier Plain has extensive existing levee systems that could serve as an ideal base for the development of hurricane protection or hurricane dampening levee on an east-west alignment from Freshwater Bayou Canal to the Mermentau River. The alignment could follow the Humble Canal starting at Freshwater Bayou Canal and travel east along the banks of the canal to the eastern boundary of Rockefeller Wildlife Refuge (Rockefeller). The hurricane protection or hurricane dampening levee could be aligned at the Humble Canal and travel west to the eastern boundary of Rockefeller. From there it would follow existing management unit levees to Hog Bayou and then follow the north bank of Hog Bayou to the Mermentau River. Some type of hurricane storm surge protection or storm surge dampening levee would greatly enhance protection of the existing highway system which would in turn protect the interior Mermentau Basin.
4. Managing Water and Sediment – page 55. We are in favor of moving fresh water from the Upper Mermentau Basin into the Lower Mermentau Basin as proposed in the CPRA Plan. The M.O. Miller Estate has actively sought management of the regions wetland resources through the CWPPRA program and have worked closely with local, state, and federal agencies and local stakeholders in support of the Freshwater Introduction South of Hwy. 82 (ME-16), the Little Pecan Bayou Hydrologic Restoration (ME-17), South Grand Chenier Hydrologic Restoration (ME-20), and South Pecan Island Freshwater Introduction (ME- 23) projects that all have freshwater introduction components. The movement of freshwater south will help prevent saltwater intrusion, nourish the Lower Mermentau Basin and allow flood waters to more quickly leave the Upper Basin during flood events.

The M.O. Miller Estate greatly appreciates the opportunity to comment concerning the CPRA Plan that we hope can be implemented and preserve our unique and valuable wetlands.

Thank all of you for your hard work on this project.
Merry Christmas!

Randy

Randy Moertle and Associates, Inc.
1008 Mar Dr.
Lockport, LA 70374
Work/Fax: (985) 532-6388
Mobile: (985) 856-3630
Email: rmoertle@bellsouth.net

From: Randy Moertle [rmoertle@bellsouth.net]
Sent: Monday, January 08, 2007 8:16 AM
To: comments@louisianacoastalplanning.org
Subject: Biloxi Marsh Lands Corporation CPRA comments
Attachments: BMLC - CPRA public comments 12.14.06.doc

Please see attachment. Was out of town and could not send by Jan. 5th deadline. Please accept these late comments.

Randy Moertle and Associates, Inc.
1008 Mar Dr.
Lockport, LA 70374
Work/Fax: (985) 532-6388
Mobile: (985) 856-3630
Email: rmoertle@bellsouth.net

December 14, 2006

CPRA Integrated Planning Team
Department of Natural Resources
P.O. Box 94396
Baton Rouge, LA 70804-9396

RE: Biloxi Marsh Lands Corporation and Lake Eugenie Land Development Company
St. Bernard Parish, Louisiana
Comments concerning Comprehensive Coastal Protection Master Plan for Louisiana – Preliminary Draft

CPRA Integrated Planning Team,

The Biloxi Marsh Lands Corporation and Lake Eugenie Land Development Company (owner of 150,000 acres in St. Bernard Parish) appreciate this opportunity to comment on the Coastal Protection and Restoration Authority (CPRA) Preliminary Draft Master Plan (CPRA Draft Plan). Our comments are as follows:

We began our participation in the Coastal Protection and Restoration Authority (CPRA) planning initiative in March 2006 during the very first 2006 public meetings. On May 26, 2006 we were able to attend a meeting between us and Department of Natural Resources (LDNR) personnel Scott Angelle, Randy Hanchey, and Jon Porterhouse. At this meeting, we were able to present the components of The Biloxi Marsh Stabilization and Restoration Plan[1] (BMP) through a PowerPoint presentation and our Executive Summary. On June 15, 2006, we met with LDNR personnel from their Integrated Planning Team (IPT), Coastal Impact Assistance Program (CIAP), and land rights department. Again we presented a PowerPoint presentation and the completed BMP. On June 16, 2006, we again met with Secretary Scott Angelle and provided him with copies of the BMP.

Following these initial meetings, we had several opportunities to talk with IPT team members Norwyn Johnson, Jean Cowan, and Michele Deshotels along with O'Neil Marlborough (LDNR consultant) about the BMP. In each instance, they assured us that the BMP was being considered by both the IPT team and their select technical expert team that included the Science and Engineering Review Team (SERT), representatives form federal, state, and local agencies, parishes, levee districts, universities, and specialized nongovernmental organizations. These meetings were closed to the public and it was difficult for us to determine how the BMP was actually be integrated into CPRA planning effort. We had asked for landowner representation at these IPT/SERT meetings on several occasions (including the March 2006 public meeting), however, we were not allowed a seat at the table. Only during the Louisiana Landowner Association

[1] http://www.biloximarshlandscorp.com/restorationplan.htm

(LLA) CPRA stakeholder meeting on September 8, 2006, were we able to find out what the CPRA planned for the Pontchartrain Basin. At that meeting, we commented that shoreline protection needed to extend from the Northeast to the Southwest along the entire perimeter of the Biloxi Marsh complex. We were assured at that time that our comments were recorded and would be considered.

On July 27, 2006, the U.S. Army Corps of Engineers (COE) began a series of stakeholder *MRGO Deauthorization Study* meetings for closing of the MRGO to deep draft vessels. According to the COE's definition, deep draft navigation is anything over 15ft. The stakeholders attending these meetings included federal, state, and local governments, landowners, academic and environmental community, navigation interests, and local business interests. Personnel from the COE's Galveston District participated in the discussions and were there to assist in compiling stakeholder comments into the deauthorization study recommendations. From this group came three regional plans (BMP, The Lake Pontchartrain Basin Foundation Plan, and St. Bernard Parish Plan) for hurricane protection and coastal restoration. From these plans and stakeholder comments, this group developed 16 consensus items (Attachment) for hurricane protection and marsh restoration that they wanted included in the *MRGO Deauthorization Study*. At the beginning of these meetings, LDNR was present and listened to all concerns and recommendations of the stakeholders. In September 2006, however, the State of Louisiana joined in a lawsuit by St. Bernard Parish residents and St. Bernard Parish against the COE to close the MRGO and to restore the wetlands. From this point on, LDNR no longer attended the COE stakeholder meetings. This was too bad because I know of no other basin that had such a diverse group of stakeholders that worked through consensus items and asked that they be included in the planning efforts for their basin. At these meetings, there was concern expressed by the stakeholders that the CPRA and the federal Louisiana Coastal Protection and Restoration Act (LACPR) were not working together toward a common goal. Absence from participation by the LDNR IPT near the end of these stakeholder meetings was evident. In our opinion, these stakeholder meetings were probably the most in depth and consensus oriented meetings for any Planning Unit in the State and was exactly what is needed in order to demonstrate a united front to the nation during the funding solicitation process. As you know, finding consensus is painful, but was actually done by this group for the Pontchartrain Basin. We believe these consensus recommendations were supported by all the Pontchartrain Basin stakeholders and should be included as a list within the CPRA Plan. This list can be presented to our congressional delegation in their efforts to solicit funding for Planning Unit 1. In our opinion, the level of consensus for this Planning Unit makes it the ideal region to **begin** our restoration efforts. The stakeholder participation template used for this Planning Unit can then be used to help form consensus within the other planning units.

Our comments concerning specific components of the CPRA Draft Plan are as follows:

1. Barrier Shorelines – The CPRA Draft Plan states that "the Chandeleur Islands are far enough from the mainland that their storm protection function is minimal." The plan only recommends working with the Department of Interior to develop a management plan for continuing to maintain the area as a national wildlife refuge. **We disagree with this assumption**. **We believe that the Chandeleur Islands are essential to the protection of the Biloxi Marsh, St. Bernard Parish, and the New Orleans metropolitan area and need to be restored to historic conditions.** To simply maintain them as a National Wildlife Refuge (NWR) will assuredly call for the total erosion and disappearing of this important barrier island chain. The BMP plan recommends a significant restoration effort of the Chandeleur Island that includes hard structure on the seaward shoreline. If the Chandeleur Islands continue with present management practices, they will disappear. If they disappear, we will completely lose our first "line of defense." If the State takes the position that we going to use the Multiple Lines of Defense strategy (page 23 of CPRA Draft Plan) then they are already giving up on the very first line of defense. The Chandeleur Islands are an integral component for protecting the Pontchartrain Basin, are included in the consensus items for the *MRGO Deauthorization Study,* and their restoration should be included in the CPRA PLAN.

   The importance of this barrier island as the "first line of defense" was reiterated by Paul McIlhenny (McIlhenny Company), Newman Trowbridge (Louisiana Landowners Association), and Junior Rodriguez (St. Bernard Parish President) at the Governor's Coastal Advisory Commission meeting at the CPRA Plan presentation on December 8, 2006. It makes no since to ignore an obvious line of defense that creates the first barrier approximately 55 miles seaward of the first St. Bernard Parish hurricane protection levee. According to the CPRA Plan aggressive coastal restoration and protection would begin in the lower Biloxi Marsh at the Bayou LaLoutre Ridge which is 37 miles inland from the Chandeleur Islands. This would be a retreat for aggressive coastal restoration and protection of 18 miles. Please do not misunderstand that the protection components in the CPRA Plan must remain as shown in the draft, however, the Chandeleur Islands as the "first line of defense" must be included in the final plan.

2. Ridges – The CPRA Draft Plan recommends the restoration of the Bayou LaLoutre Ridge. We are in agreement.

3. Shoreline Stabilization – We agree with the plans shoreline protection on 2/3rds of the Biloxi Marsh, however, we recommend additional shoreline protection to the seaward shoreline both north and south of the MRGO (Figure 1 – yellow line). Again, we believe that the lines of defense need to start at the most seaward reaches of healthy wetlands and not many miles inland. It is

essential that we protect the outer shoreline reaches which will in turn protect interior wetlands. It does not make since to start our protection at the Bayou LaLoutre Ridge and sacrifice all the seaward marshes. Protection of the outer reaches will be much more cost effective over the long term by creating shoreline protection over 10 miles seaward of the Bayou LaLoutre Ridge. The State is taking a position that the erosion of the wetlands southeast of the Bayou LaLoutre Ridge can continue unabated until it reaches the Ridge. In our opinion, this is unacceptable.

4. Navigation Channels – We are in agreement with the CPRA Draft Plan that navigation channels can be used as conduits for freshwater, but they must contain some type of saltwater barrier, either through freshwater flow or water control structures. The CPRA Draft Plan shows some type of barrier in the MRGO at the Bayou LaLoutre Ridge. We agree.
5. Land Sustaining Diversions – We completely agree and are glad to see the recommendation to construct a large Mississippi River Reintroduction near Violet, Louisiana. It was a cornerstone to our plan (BMP) and we believe it is essential to the region. It is also a consensus item of the MRGO Deauthorization Study stakeholders. We would like to see a significant diversion that meets historic habitat salinity ranges for the Biloxi Marsh. This can only be determined by hydrologic modeling.
6. Marsh Creation – We are in support of marsh creation as shown in the CPRA Draft Plan, but we still do not understand why there is no marsh creation recommended for the area between the Bayou LaLoutre Ridge and the MRGO. We recommend expanding the marsh creation component of the plan between the Ridge and the MRGO (Figure 2 – yellow polygon). It makes no sense to leave this area out of the plan. It is obviously very important to the protection of the New Orleans/St. Bernard metropolitan area.
7. Mississippi River Gulf Outlet – We are in support of the MRGO closure plan except we again recommend the shoreline protection and marsh creation components mentioned above.
8. Pontchartrain Barrier – No comment.

Conclusion

Overall we are pleased to see many of the elements of our plan incorporated in the CPRA Draft Plan; however, we are concerned that it does not go far enough in the Pontchartrain Basin. We are cognizant of the effort by the State of Louisiana to control spending, but it is our opinion that the plan leaves out the key components mentioned above, namely protection of Chandeleur Island and more extensive shoreline protection and marsh creation between the Bayou LaLoutre Ridge and the MRGO. This plan is very broad and the components of the plan have no specificity or cost estimates. We believe that the recommendation mentioned need to be an essential part of the plan. If they are not, it will be very difficult for the landowner, local, state, and federal resource agencies to recommend work in these areas because we believe this plan will become the standard for all restoration efforts within the State.

We would again like to thank you for being allowed to present The Biloxi Marsh Stabilization and Restoration Plan to the Secretary of LDNR and to the CPRA planning team. We are also very appreciative that the plan was given careful consideration in the CPRA Preliminary Draft.

December 15, 2006

Coastal Protection and Restoration Authority of Louisiana
CPRA-IPT
DNR
PO BOX 94396
Baton Rouge, LA 70804-9396

RE: Comprehensive Coastal Protection Master Plan for Louisiana Preliminary Draft

Lake Charles Harbor & Terminal District

Post Office Box 3753
Lake Charles, LA 70602
Phone 337-439-3661
Facsimile 337-493-3523

The Port of Lake Charles appreciates this opportunity to comment on the Preliminary Draft Plan cited above. Before doing so, please allow us to provide background information about the Port of Lake Charles and the Calcasieu Ship Channel so that our comments may be read in their proper context.

In 2005, the Port of Lake Charles was the 12th largest port district in the United States by tonnage. A total of 1,020 vessels carried 58 million tons of cargo to be handled by the facilities with the Port District. At current rates, vessel traffic could reach 1,200 ships in 2006.

The 400-foot-wide and 40-foot-deep Calcasieu Ship Channel runs 34 miles from the Gulf of Mexico and is the home of facilities handling such diverse cargoes as chemicals, petroleum products, bulk grain and LNG, to name but a few. The refineries within the District provide the United States with four percent (4%) of the country's gasoline. With new facilities planned and those under construction, the Port of Lake Charles could become the 4th largest U.S. Port by 2010, servicing some 1,700 vessels per year.

The proposed hurricane protection for southwest Louisiana must recognize the needs of the Port, which is the area's premier economic engine.

We understand that the current draft plan includes either a ring levee to protect the Lake Charles metropolitan area or a hurricane barrier to run along the south bank of the Gulf Intercostal Waterway. In either case, a closure structure is planned on the Calcasieu Ship Channel to ensure the integrity of the levee or barrier. The channel structure would only be closed as a storm approached the area. Generally, the structure would remain open so as not to impede ship traffic. However, the existence of

the structure itself, if not properly designed, could severely limit vessel operations on the channel and the potential to expand the ship channel, all to the economic detriment of the entire region.

As such, and after consultation with the Lake Charles Pilots, the Port of Lake Charles strongly urges that any closure structure in the channel meet the following criteria:

1. When in the open position, the structure should provide a minimum width of not less than 600 feet through which vessels can pass, and

2. Any part of the structure which remains in the channel when the structure is open (sills, etc.) should be at a depth not to exceed minus fifty feet (-50 feet) Mean Low Gulf.

Only by meeting these criteria does the Port of Lake Charles believe the Coastal Protection and Restoration Authority can provide hurricane protection for the Lake Charles area; and, at the same time, protect the economic viability of the Calcasieu Ship Channel.

Thank you for allowing the Port of Lake Charles to submit these comments.

Sincerely,

R. Adam McBride,
Port Director

CFH:pac

Gulf Intracoastal Canal Association Comments for the Mississippi River Gulf Outlet De-Authorization Study

By
Raymond Butler
Executive Director
Gulf Intracoastal Canal Association
11/08/06

To the US Army Corps of Engineers Study Team on the Mississippi River Gulf Outlet:

Friends,

The Gulf Intracoastal Canal Association celebrated its 100th Anniversary in August of 2005. Having been the major motivator in its completion in 1949, since its early beginnings, the GICA has been devoted to the protection and efficient operation of the Gulf Intracoastal Waterway. It is the mission of efficient operation of this national transportation asset that causes me to write this letter today. I made a presentation at one of the team's early stakeholder meetings in which the importance of the completion of the now-under-construction Inner Harbor Navigation Canal Lock Project (IHNC) was linked directly to any revision to the current project status of the Mississippi River Gulf Outlet (MRGO). The link between these two projects is of dire importance to the continuous, uninterrupted flow of inland barge traffic to and from many major Gulf Coast as well as inland ports, terminals, and manufacturing locations.

Currently, the MRGO serves as the only alternative route for inland barge traffic when the IHNC is either impassable or congested. Even though it adds some 24 hours to the transit, it is still the most efficient means of moving critical commerce during these periods. This situation routinely arises two to three times every year, for two to three days each, and it lasted for 14 days after the devastation of Hurricane Katrina in the fall of 2005. What makes this situation unique to all the other locks on the waterway is the 1923 completion date of Industrial Lock. The age and reliability of the 83-year-old existing Industrial Lock make it of major concern relative to its future reliability and life. The lock is well beyond its original design life of 50 years, and a catastrophic failure is not beyond reality.

Many seem to address the issues of the MRGO and IHNC as if they were "Louisiana Specific Projects". Nothing could be further from the truth. Our nation learned the painful fact after the storm seasons of 2004 and 2005 that the efficient flow of inland barge traffic on the Intracoastal Waterway is in fact, not only one of multi-state interest, but one of national interest. The most recent Waterborne Commerce Statistics data indicate that approximately twenty million tons of freight move on this reach of the waterway annually. A recent study done by the University of New Orleans for the Port of New Orleans indicates that approximately thirty million tons will make is way on this waterway section by the year 2040. The bulk of this freight is in the form of energy-production related material...gasoline, diesel fuel, coal, and petroleum products. Along with these are petrochemicals, cement, aggregates, and various other dry bulk cargos.

During the brief interruptions after Hurricanes Ivan and Katrina, the importance of continuous, uninterrupted flow of these products to and from all ports east of New Orleans became extremely apparent. Coal was needed within days of causing power production outages at power plants in Mississippi and Florida. The military bases in Florida that rely on inland barges for the aviation fuel were watching the status of waterway restoration and barge scheduling for their livelihoods. Their contract carrier used extraordinary means to re-establish their supply. The State of Florida had already begun expressing concern to the White House for its northern panhandle fuel supply, which comes primarily by inland barge. All of this happened at a time when regions were reeling from the effects of major natural disasters.

The use of the MRGO became the main supply route after Hurricane Katrina for at least 16 days, while efforts were underway to clear IHNC for operation. Major chemical and petroleum producers located on the waterway east of New Orleans (Shell, Chevron-Phillips, Solutia, etc.) relied on the efficient, prompt restoration of inland barge traffic for their operations to resume and supply critical fuel and other products. Others, located in unaffected regions by the storms, found their own operations impacted by waterway status at their customers' locations east of New Orleans. As the GICA logo implies, the waterway is truly a "Connecting Link" that binds the intricate and critical interwoven relationships between producers and consumers along its entire 1300-mile length. When one portion of the waterway is effected, the "ripple effect" is significant and far-reaching.

If the MRGO is totally closed to all traffic and nothing is done at the same time to address the IHNC lock, we significantly increase the risk of having a situation of National Significance. What would life be like if we were to lose the IHNC lock with no MRGO alternative? We found after the hurricanes that it will take days to implement even partially suitable alternative means of handling the loss of the Intracoastal Waterway. The use of the Tennessee Tombigbee Waterway adds at least 14 days to a trip to or from the ports on the canal-east. Arranging for deep draft vessel lighterings to handle fuels for the Florida terminals took several days, and even then required multiple, risk-laden alternative handlings of hazardous cargos to get them to their destinations. There are just not enough trucks to handle the requirements, and rail is strapped to handle the existing freight demands in this region already.

If we make a few basic, conservative assumptions relative to TRANSPORTATION COSTS ONLY, and ignore all downstream and alternative additional cost penalties (which are normally factors of magnitude larger than pure transportation related costs), we can get a very conservative view of the "tip of the iceberg" regarding penalties resulting from a loss of the MRGO and IHNC concurrently. Following these assumptions:

1. 20 million tons per year of freight moved.
2. Average Intracoastal Waterway Tow is 6000 tons.
3. Today's average cost for the average tow is very conservatively $6000 per day without the cost of fuel and lubes.

Doing the math yields a daily CUMULATIVE TRANSPORTATION-ONLY COST PENALTY while vessels wait to transit of approximately fifty five thousand dollars

every twenty four hours. This cost grows cumulatively by the day as more tows arrive, so that after 3 days, for example, we have the original group of tows absorbing 3 days of penalty, the second group absorbing 2 days of penalty, and the final group absorbing a single day, all equating to some three hundred thirty thousand dollars for a three-day outage.

If we take the case of a protracted outage that goes several days, and shippers are forced to use the Tennessee Tommbigbee Route, costs would escalate rapidly. We must understand that there are two "givens" in the operating scenario here:

1. Typical inland towing vessels can not safely operate in "outside" waters. That is to say that no GIWW barge equipment being used today can run safely in the Gulf of Mexico.
2. At least half the amount of equipment now running the existing GIWW route can not make the circuitous Tenn Tommbigbee route due to the strong currents going up the Mississippi River and down the Tenn Tomm Waterway. Actual equipment used in this run would be larger than that contemplated in most of these calculations.
3. While the option of using deep draft vessels may be considered for long term situations, its cost is significant and it does not lend itself to the existing frequency and movement sizes in place today. It is not appropriate for many of the items now being moved by barge. If deep draft were the most economical method, it would be employed today in almost every case.

To ship the same tonnage via this circuitous route would take conservatively three times more equipment, thereby tripling costs immediately. The circuitous route would add 14 days minimum running round-trip. Assuming a very conservative 1400 gallon per day fuel burn at $1.50 per gallon and $6000 per day charter rates, a single tow would add one hundred and fifteen thousand dollars to its tab. Account for this happening ten times every day, and the penalty mounts to over one million dollars every day. These assumptions are very rough, but do approximate, in a conservative manner, the transportation-only penalties of a protracted outage at IHNC with no MRGO alternative.

During this same time, shippers and customers are scrambling, adjusting plant productions, shutting down units, arranging for more expensive alternative transportation, or otherwise incurring significantly larger "downstream costs" due to the interrupted flow of barge traffic. During the Lake Charles oil spill in June of 2006, for instance, the Citgo Refinery incurred losses in excess of 10 million dollars within the first 3 days of their traffic interruption. There were 14 other Lake Charles facilities also affected by inland barge stoppage during the spill. Additional facilities as far away as Cincinnati, Ohio, were affected. The downstream penalties were tremendous. The Coast Guard was able to gather these cost penalties for the very first time in such an event through the use of the just completed Maritime Transportation System Recovery Unit protocol. In a real-world scenarion, we would see this much and more, very quickly, with a total stoppage of Intracoastal Waterway traffic if MRGO and IHNC were impassable for a long period.

I hope this brief endeavor to explain some of the interrelationships of these two critical Intracoastal Waterway projects is somewhat helpful to the Corps' study team. I would be most willing to explain any details or answer any questions.

Sincerely,
Raymond Butler
Executive Director

Gulf Intracoastal Canal Association
281-996-6915
713-882-9750 cell

CPRA/IPT Houma Public Meeting
Monday, December 11, 2006

Below are the notes taken by Mr. Rickey Brouillette during conversations with Mr. Dick Guidry on the Comprehensive Coastal Protection Master Plan for Louisiana Preliminary Draft:

Mr. Guidry is retired with a tug boat business and was a State Representative and a member of the South Lafourche Levee District. He doesn't like Measure PD 3a-2 (Internal Hurricane Levee Alignment (0.2% annual probability)) and thinks that the levee is too far north. He agrees that the future development should consider only elevated structures and homes. Mr. Guidry likes the Pointe au Chiene route (13 miles long) and believes that gates are needed at Point au Chien and at Bayou Blue.

Mr. Guidry was responsible for $4 million in appropriations put into legislation in 1952 to divert freshwater from the Mississippi River into Bayou Lafourche at Donaldsonville, Louisiana.

Mr. Guidry likes the USACE $168 million plan to bypass the water problems associated with the Bayou Lafourche Diversion Plan and appreciates the efforts LDNR has committed to expedite the Bayou Lafourche Diversion project design.

Mr. Guidry stated that the new $12 million Golden Meadow flood gate is sitting in dock near the existing gate. He believes that the new and old gates could both be utilized to configure a lock-like operational feature on Bayou Lafourche. This could be funded locally for roughly $18 million.

Mr. Guidry referenced a November 26 Lafourche Gazette article that reports that the existing levees are authorized to elevation 13 feet but currently are at elevation 11 feet due to settlement. He agrees that the new 100-year levee elevations of 16 or 17 feet are probably an adequate protection level. He related that during Hurricane Rita, the surge height got to elevation 9 feet, which is approximately 2 feet from the top of the existing levee on the western side.

Mr. Guidry related that an advolurum tax for Operations and Maintenance passed by 96% and a sales tax passed by 83%. to elevate the levees to the authorized levels using 100% local funding. He further stated that this tax will not be bonded for the next 4-5 years in the event federal funding was secured to do the work.

Mr. Guidry stated the opinion that the authorizing language that the USACE uses should state a 1% or 0.2% protection level instead of tying the authorization to a specific levee elevation since the elevation is subject to change as storm surge modeling is refined.

Mr. Guidry also stated that recent state legislation increased the ability for the parishes to perform work on levees using parish crews/equipment by increasing the funding limit from $500,000 to $1 million.

From: Bob Bonnette [mailto:moxyjohn@bellsouth.net]
Sent: Friday, January 26, 2007 3:50 PM
To: Michele Deshotels
Subject: [Possible SPAM] Coastal Erosion

I worked for Texaco for 35yrs. from Garden Island Bay, Delta Duck Club (down the river), then to Lafitte Field, Bay De Chene (near Grand Isl.), finally on to Lake Barre, Lake Pelto, Dog Lake, Bay St. Elaine, and when I retired in 1993 at Caillou Island Field.....I have watched our coast and islands fade away during these 35 years....During that time "NO ONE" in the State government worried about this erosion! I wrote Senator Allen Ellender about this and asked why we couldn't let the Mississippi river flow back towards the West and drop sediment as it use to! His answer was that I was an idiot, and that the U.S. Corp of Engs. knew best!!! (HaHa).....but, it is not a laughing matter....."But" it is too late....you will never bring back the marshes like they were unless you have a million years of grace with no Hurricanes and you do turn the river or let it turn on its on to replenish the wetlands.....Louisiana politicians and their civil engs. buddies and contractor buddies want us to believe that will billions of dollars of "FEDERAL" monies we can history.....There will be more corruption than ever before in La. if they get their hands on this money.....Barrier Islands.....there are "no" barrier islands in the gulf.....Timbalier Island at Caillou Isl. field and Terrebonne Bay is just a few inches above wtr. level.....when a normal summer/winter storm comes in this island is awash....The word barrier means a structure that restricts or bars entrance! The islands are not barriers!!!!
I could go on and on and tell you why we (Texaco) paid much monies to L.S.U. for so-called coastal erosion studies.....etc.,etc.. but will hold for later.....Thank You, Robert Bonnette, 101 Hawthorne Dr.,Houma, La. 70360 985-876-6477

Integrated Ecosystem Restoration and Hurricane Protection: Louisiana's Comprehensive Master Plan for a Sustainable Coast

Appendix D: Sustainable Management and Mississippi River Resource Availability

Coastal Protection and Restoration Authority of Louisiana

April 2007

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1.0 Introduction

For thousands of years Louisiana's coast has been in a constant state of change. As the Mississippi River approaches the Gulf of Mexico the hydraulic slope flattens and water from the river spreads over the shallow marshes and estuaries along the Louisiana coast. As the river overflows its banks, sediment transported by the river from the central North American continent begins to settle out. This natural process forms natural levees along the top bank of the river, and elongates the channel into the gulf. The elongation of the channel increases river stages, allowing the natural levee along the top bank to be broken and a new channel to develop. This natural process of channel abandonment has occurred numerous times throughout the geologic history of the coast of Louisiana, but was halted beginning when Europeans settled the region 300 years ago.

European settlers found coastal Louisiana to possess rich soil for agriculture, to provide tremendous fishery resources, and to be on an excellent water transportation system into the inland portions of the continent. More agricultural land, as well as protection from the overflowing river, was needed as population increased along the coast. With better materials available to build levees and more reliable navigation, people moved further into the coastal area. Finally, after the Great Flood of 1927, the United States Congress authorized the Mississippi River and Tributaries (MR&T) project and assigned the U.S. Army Corps of Engineers to provide reliable flood protection and navigation. The MR&T project built higher and more reliable levees. They covered some banks with articulated concrete mat to prevent erosion. A deep navigation channel was constructed. Collectively these measures forced more of the sediment and water to pass beyond the marshes and estuaries into the deep water of the Gulf of Mexico. In the early 1900's the discovery of oil and natural gas also hastened the changes to the natural landscape. Wells were drilled in the marsh, and channels were cut for pipelines to transport the oil and gas to the refineries being built along the river. By the 1960's people realized that the coastal landscape was deteriorating. Salt water intrusion, subsidence and other physical changes to the environment were increasing land loss throughout the coastal zone. Storms were causing significant impacts to populated areas. It become clear that the entire coastal region would continue to deteriorate and all the development would be at increased risk unless the natural processes that built and maintained coastal Louisiana were re-established. The fresh water and sediment carried by the Mississippi River are the basic resources that will provide a sustainable and productive coastal region for the State of Louisiana.

The continued loss of Louisiana's coastal wetlands will have significant ecological, societal, and economic impacts on the region and on the Nation as the tremendous resources supplied from the coastal zone are put at an increasing risk. Appendix D provides an overview of the geologic history, what is at stake, and the actions needed to ensure the long-term sustainability of the Louisiana's coastal zone if implemented in a coordinated and strategic manner. It then presents the volumes of water and sediment that have been delivered by the Mississippi River historically, and lays out a process for formulating the actions necessary to build river diversion projects to provide for the long-term sustainability of the natural landscape and the services that the coastal zone provides to the region and the Nation. Louisiana has a unique and precarious relationship with the river and the sediment it delivers. Significant changes have taken place in the upper Mississippi River Basin that has negatively impacted the availability of sediments. To achieve a truly sustainable coast, the water and sediment resources of the future must be managed very carefully.

2.0 Sustainable Coastal Management

Although the coastal Louisiana ecosystem contains 30 percent of the coastal marsh in the contiguous United States, it suffers 90 percent of the total coastal marsh loss. Since the 1930s, coastal Louisiana has lost over 1.2 million acres (1,875 mi^2), an area nearly the size of Delaware (Barras et al., 2003; and Dunbar et al., 1992). At present, the rate of loss is approximately 15,300 acres per year (23.9 mi^2/ yr), but estimates indicate that coastal Louisiana could experience a net loss of an additional 328,000 acres (513 mi^2/yr) by the year 2050 (Barras et al., 2003).

In addition to this predicted trend, a study by the U.S. Geological Survey (USGS) has reported that the storms of 2005 converted approximately 217 square miles of marsh to water. Of this total, 98 square miles of land were lost in southwestern Louisiana, and 119 square miles were lost in southeastern Louisiana. Analyses of future growing seasons will indicate how much of this damage is permanent, as marsh plants may rebound in some spots and not in others. Regardless of the final outcome, the storms have aggravated an already dire land loss emergency.

The past and continual loss of Louisiana's coastal wetlands will have significant ecological, societal, and economic impacts on the region and the Nation as tremendous resources supported by the coastal zone are put at risk.

2.1 River and Coastal Processes

The Deltaic Plain, found in the southeastern portion of coastal Louisiana, was built by the shifting of the Mississippi River through dynamic and episodic progression of events known as the delta cycle. The delta cycle is the process of alternating periods of delta-building, or the seaward advancement of land, when occupied by the Mississippi River and the subsequent landward retreat of that delta when the river shifts its course. This is also described in the Coast 2050 report (Task Force. 1998). The Mississippi River has built 6 delta lobes (Figure 2.1), including the currently prograding Atchafalaya Delta, along Louisiana’s coast over the past 7,000 years. The modern delta (the Plaquemines-Balize or bird-foot delta) has formed over the last 800-1,000 years (Draut et al., 2005; Roberts, 1997).

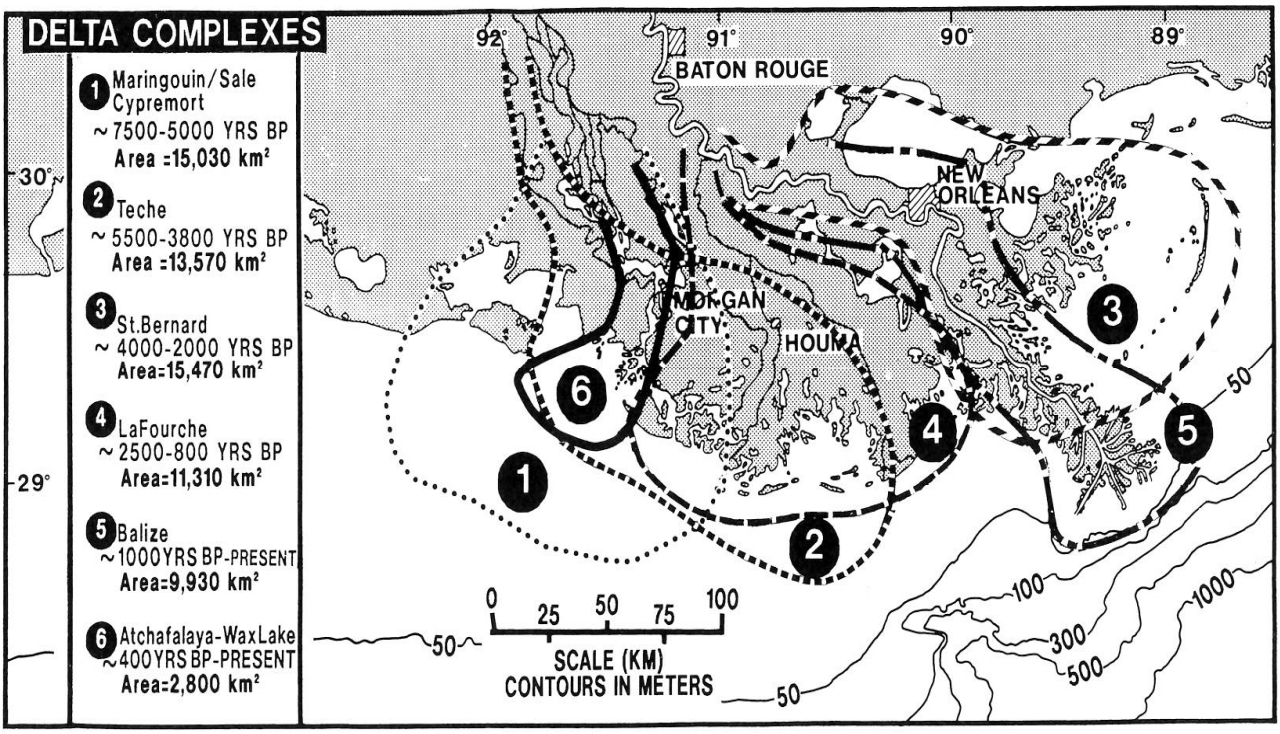

Figure 2.1: Current and historical delta lobes of the Mississippi River (from Roberts, 1997)

In a progading delta, crevassing and overbank flooding promotes sheet flow which introduces freshwater, nutrients and mineral sediments into the wetland ecosystem. The nutrients are removed by plant uptake allowing for an overall increase in vegetation production and biomass. In a sustainable wetland ecosystem, this increase in organic matter production, combined with the enhanced deposition of mineral sediments from the river, allows vertical accretion to counterbalance relative sea level rise (subsidence plus sea level rise), thereby preventing wetland loss.

During delta growth, distributaries continue to branch, and ultimately reduce the efficiency of the delta to transport sediment and water. This decreased hydraulic efficiency is caused by a reduction in the gradient of the channel as the delta lobe advances into the gulf. Eventually, the main channel is captured upriver by a more hydraulically efficient channel, and the once prograding delta is “abandoned” by the river. As nutrient and mineral sediment supplies decrease, the wetlands’ ability to keep pace with changes in relative sea level rise also decreases. This allows Gulf wave action to rework sediments in the delta into a barrier headland (Figure 2.2). As the delta lobe continues to degrade, the barrier headland is converted into barrier islands and, finally, into a submerged shoal.

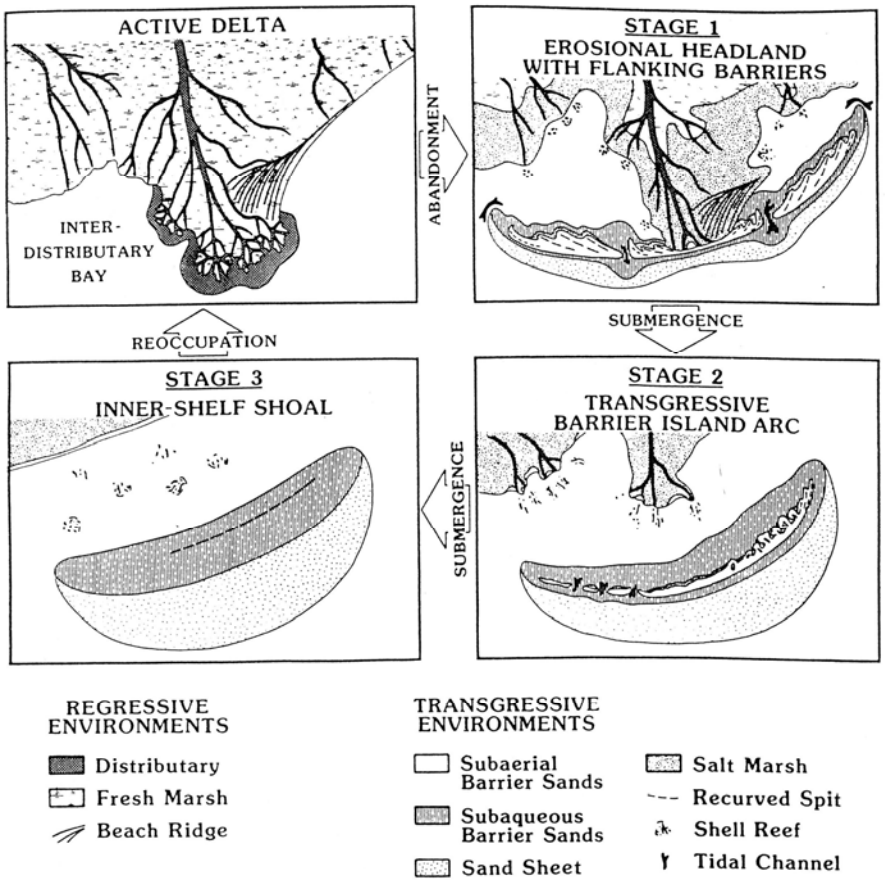

Figure 2.2: Delta Cycle (Penland et al., 1988)

The Chenier Plain, found in the southwestern portion of coastal Louisiana, developed primarily as a result of the interplay of an intermittent mudstream from historic Mississippi River distributaries, smaller coastal rivers, and the Gulf of Mexico. Historically, mudflat progradation resulted from pulses of sediment when a major distributary of the Mississippi River was located in the western portion of the deltaic plain. When this distributary shifted to the east, erosion and physical reworking of mineral sediments winnowed out fine-grained materials, leaving the deposits of sand and shell. This material was worked into elevated ridges by wave energy from the Gulf of Mexico (Figure 2.3). Through repetitions of this process the elevated ridges, called cheniers, were formed, and ultimately supported deciduous vegetation growth (Penland and Suter, 1989; Hoyt, 1969). The predominance of oak trees on these ridges gave the region its name; “chene” is the French word for oak.

In this region, tidal exchange with the saline Gulf of Mexico historically was limited to small river mouths. Salt water influence was minimal with the system being dominated by freshwater inputs from upland runoff delivered by meandering rivers and precipitation. The interior of the Chenier Plain was a low salinity estuary.

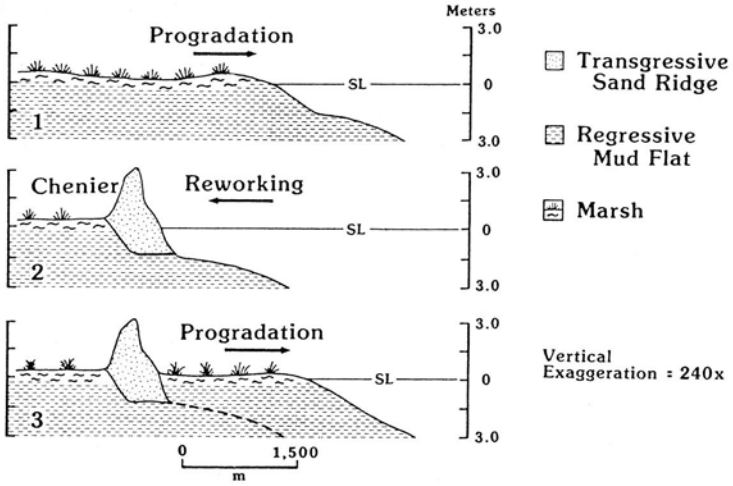

Figure 2.3: Process of Chenier development. (Penland and Sueter, 1989)

In their natural state, wetlands in coastal Louisiana were able to keep pace with relative sea level rise (subsidence and eustatic sea level rise). Subsidence, a natural process in deltas, is the sinking of land due to compaction and dewatering of deposited sediments and the decomposition of organic matter. Eustatic sea level rise is the change in global sea level as a result of such factors as the melting of continental glaciers and ice sheets and the expansion of ocean waters heated by global warming. In a self-sustaining or growing delta, periodic inputs of mineral sediment from external sources and vertical accumulation of organic matter will balance loss due to subsidence. In addition to the energy and material that rivers deliver to their deltaic systems, the associated sediment deposition, nutrient availability and lower salinities increase vegetation production. Loss of wetland sustainability occurs when soil building cannot keep pace with relative sea level rise. In a low sloping landscape such as a river delta, a sea level rise of a few centimeters can be devastating to large areas of marsh. Although global sea levels and subsidence have affected system sustainability throughout geologic time, human intervention has exacerbated this problem.

2.2 Human Intervention

With the arrival of the European settlers came major changes to the natural landscape to create more stable and safe living conditions in this naturally dynamic region. Alterations included construction of levees to render this system even more suitable for habitation, efficient for navigation and agriculturally productive. By 1844, levees were continuous along the banks of the Mississippi River from 20 miles below New Orleans to the mouth of the Arkansas River on the right descending bank and to Baton Rouge on the left (Elliot et al. 1932). However, early levees were privately built and maintained, and they were not sufficient to prevent over topping and crevassing along the banks. Although the number of crevasses formed during floods decreased after federal involvement in levee construction began in 1892, the magnitude and destruction caused by those that did occur continued to increase (Vogel 1930). Thus, the Flood Control Act of 1928, the nation's first comprehensive flood control and navigation act, was passed and the Mississippi River and Tributaries (MR&T) project was authorized (http://www.mvn.usace.army.mil/pao/bro/misstrib.htm). Following the flood of 1927, United States Army Corps of Engineers (USACE) was tasked with building a new levee system that would prevent overbank flooding during river discharges of considerably greater magnitude than experienced in 1927. Since 1928, $12.5 billion has been invested for planning, construction, operation and maintenance of the MR&T Project. An estimated $306 billion in damages have been prevented by this investment, resulting in a 24.5 to 1 return on each dollar invested.

Today, levees, floodways, channel improvements, and tributary basin improvements provide a comprehensive navigation and flood control plan to protect interests along the Mississippi River from catastrophic flooding. No MR&T levee has ever failed or overtopped, and since the completion of the present-day flood protection system, the frequency of overtopping and crevassing of the non- MR&T levees along the lower river has declined markedly (USACE 1965, Templet & Meyer-Ardent 1988).

Successfully containing the Mississippi River within a stabilized channel and implementing erosion control measures in the drainage basin has decreased the sediment load of the Mississippi River. Improved techniques for managing agricultural lands and the construction of reservoirs, since the late 1800's, has caused the suspended sediment load of the Mississippi River to decrease by almost 80 percent. Along with this decrease in concentration, there has been reduction in grain size of the remaining load. Sand carried as bedload down river of Baton Rouge has decreased by approximately 50 percent (Keown et al. 1986). These reductions could play a significant role in the deterioration of the skeletal marsh framework and in the loss of land surrounding the delta front (Kesel 1989). This reduction of available sediment and the disconnection of the Mississippi River from its coastal floodplain severely hamper the ability of marsh to counterbalance sea level rise.

Percy Viosca first documented declines in fish and wildlife species in 1927, and he attributed these changes to building of levees that prevent "flood water from entering the extensive lowland basins where it normally deposited its fertility before the river stages lowered to such an extent that it could find an outlet to the sea." Indeed mineral sediment input to Louisiana's coast has decreased in recent decades because of the levee system along the Mississippi River. This levee system is critical for the continued inhabitance of many portions of coastal Louisiana, and it is critical for the sustainability of many economic services that this region provides to the Nation. But, by preventing overbank flooding and crevassing of the Mississippi River, the surrounding wetlands are now largely deprived of the mineral sediment, freshwater, and nutrients required for offsetting subsidence and sea level rise. The impacts of decreased mineral sediment on a system facing accelerated submergence rates may be catastrophic. Decreased nutrient inputs and increased salinities also stress existing plant species, thereby reducing plant biomass production and associated organic matter that would contribute to vertical accretion. Because of the documented negative impacts of levees, a commitment must be made to ensure that new levee designs allow for hydrologic exchange across these barriers. Such exchange will sustain wetlands on both sides of the levees.

Louisiana's coastal wetlands contain an extraordinary diversity of coastal resources that support many nationally significant economic and environmental services. These services include: protection of inland areas from storm actions; navigation; oil and gas production; fisheries and hunting; agriculture; and internationally important wild bird habitats. These services have been utilized by humans throughout Louisiana's history to support their habitation of the coastal zone.

Additional physical changes to the landscape and the disruption of the land-building and sustaining processes came with the initiation of oil and gas exploration. There are nearly 15,000 miles of pipelines in coastal Louisiana. They service approximately 50,000 oil and gas production facilities (USACE 2004). Some estimates state that as much as 30 percent of coastal marsh loss is attributable to the construction of canals and their associated spoil banks (Mac et al. 1998). Canals also alter hydrology and allow for saltwater intrusion. Their associated spoil banks may cause water to pond and drown wetlands. In fact, Turner (1997) argues that most indirect wetland loss is caused by these effects. Others have asserted that another significant effect of oil and gas activity in the coastal zone is accelerated subsidence caused by fluid (oil & gas) extraction. Peaks in this activity closely correlate with peak measurements of subsidence and land loss rates in the delta plain, and suggest that

accelerations in subsidence rates between the 1950's and 1970's were largely human-induced (Morton et al. 1998; Morton et al. 2002).

There are also 10 major navigation canals in coastal Louisiana. While they serve to transport goods through and out of Louisiana, they also allow saltwater to intrude into and degrade freshwater wetlands (Day et al. 2000). In addition there are cases, such as the Mississippi River-Gulf Outlet where the continued erosion of channel banks has caused the direct loss of substantial amounts of wetland.

These human-induced factors interact with natural factors to create the land loss crisis facing Louisiana's coastal zone today. Causes of loss can be divided into direct causes, such as canal construction, erosion caused by storms or ship wakes, and herbivory; and system-wide causes such as levees, agricultural practices and channel stabilizations works that reduce the sediment load below that needed for long-term sustainability of the coastal wetlands and other landforms.

Direct loss, caused by natural and human factors, refers to immediate destruction or damage to wetlands. Natural erosive forces caused by winter storms and hurricanes result in direct wetland loss. Humans have accelerated this natural process with increased wave energies from commercial navigation activities. The extensive network of oil, gas, and navigation canals throughout the coastal zone has directly removed and buried wetlands. The direct impacts of herbivory have become catastrophic in coastal wetlands since the human introduction of the South American nutria. Historically, muskrat, beaver, deer, and feral pig have contributed to direct wetland loss, but the prolific nutria has an extremely high birth rate that enables its devastation of fresh and brackish wetlands. Between 1993 and 2001, it is estimated that over 100,000 acres of wetlands have been impacted by nutria herbivory (See the Coastwide Nutria Control Program Fact Sheet at: http://data.lacoast.gov/reports/gpfs/LA-03b.pdf).

The low-salinity estuary that existed in the Chenier Plain has been modified to a system of impoundments to support agriculture and to maintain habitats for species that live in freshwater wetlands such as alligators and ducks. The upper Mermentau River Basin is now maintained as a freshwater reservoir utilizing a system of five floodgate complexes and navigation locks. Several State and Federal wildlife refuges also maintain desired water levels and freshwater conditions over large expanses of the area. Coastal restoration projects have traditionally been operated to minimize water level and salinity fluctuations.

In direct opposition to this desire for fresher systems in the Chenier Plain, all of the major rivers in the area have been straightened and their cross-sections increased for deeper draft navigation. These changes provide for more rapid drainage of flood waters. This has the effect of minimizing retention of fresh water in the system which allows for increased marine (saltwater and tidal) influences over the majority of coastal areas that have not already been impounded. Activities to extract oil and gas and harvest the economically important mammals have also exacerbated the situation by creating an extensive series of canals which allows saltwater into sensitive wetlands. Road building has also disrupted the hydrology by disrupting natural drainage patterns on a large scale.

On a geologic scale, maintaining the flow distribution from the Red and Mississippi rivers at constant levels down the Atchafalaya River has prevented the Atchafalaya from capturing the main flow of the Mississippi River. This has limited the level of sediment input that could have been expected via long-shore transport of sediment from an active distributary of a major river, and it has limited the progradation of the eastern Chenier Plain.

These human interventions have altered to balance of natural forces and have contributed to the land loss crisis we face in coastal Louisiana today. Alone, any one of these factors would have caused some degree of land loss in

the coastal zone. Combined, they have had overwhelming effects on the stability of this rich and productive ecosystem.

2.3 Environmental Sustainability

In order to restore coastal Louisiana to a self-sustaining environment, near-term solutions to address immediate needs must be merged with long-term goals to reach system sustainability. Landscape integrity in coastal Louisiana requires the presence of barrier islands, beaches, Chenier ridges, intact saline, brackish and fresh marsh habitat, and healthy swamp forests. To enhance the health and integrity of the coastal Louisiana ecosystem, the altered processes must be restored by mimicking to extent possible the natural processes of a sustainable coast. To restore disconnected and modified hydrologic linkages, regional water management options should reconnect and maintain linkages to sediment and nutrient delivery to interior wetlands while reducing sediment loss to offshore environments. Regional water flow patterns should be restored and maintained by mimicking natural process and cycles, minimizing the impact of artificial waterways. Reduced sediment input should be corrected by the delivery of new sediments to coastal basins using a combination of river diversions and pipeline conveyance of dredged sediment. Additionally, the redistribution of sediments via long-shore currents and redistribution of water using the GIWW and other navigation channels both contribute to rebuilding and maintaining the coastal landscape.

By taking these steps to restore the process of a sustainable coast, fragmentation of the coastal landscape will be reduced and an estuarine gradient and landscape features will be maintained to support an array of habitats for associated plants and animals, including resident and migratory bird communities. Through restoration projects that are of sufficient scale to sustain and expand a variety of coastal wetland and other landscape features, a sustainable environment can be maintained that integrates the function of the ecosystem with the complex needs of the working coast.

2.4 Socio-economic Sustainability

“It is trite to say that Louisiana is culturally diverse. The truth is that few people realize the degree of complexity and variation in the cultures of the state.”

Maida Owens, Louisiana's Traditional Cultures: An Overview, 1999

“Failing to rebuild a viable city would have consequences far beyond Louisiana. New Orleans' two ports are, by tonnage, the nation's biggest. They need to be - the region handles a third of the nation's seafood and more than a quarter of its oil and natural gas. Some 4,000 oil and natural-gas platforms, linked by 33,000 miles of pipeline, spread out along the Louisiana coast. Among the facilities are the four largest refineries in the Western Hemisphere. Southern Louisiana is easily as important to the nation's energy supply as the Persian Gulf.”

Charles Mann, Fortune Magazine, August 2006

“First and foremost, we have to say that this is a human tragedy that....has a potential to be the largest cultural tragedy in the history of this country, because New Orleans is unlike any other city in this country or, indeed, in the world. Fifty percent of the city consists of 20 historic districts containing 37,000 historic structures. There is no greater concentration of historic structures anywhere else in the country.”

Richard Moe, National Trust for Historic Preservation, October 2005

For over 12,000 years people have lived, worked and played in Louisiana, leaving their mark on the landscape. This shaping of the landscape began early in human history as evidenced by over 700 mound sites in Louisiana. Mounds vary in size, shape, and purpose. Some were built as burial sites; others were built for ceremonial purposes; and, in some cases, they served as a base for residential structures. Watson Brake in north Louisiana,

dated to approximately 3400 B.C. (well before Stonehenge), is currently considered to be the oldest mound site in North America. Other mound sites dot the state, including many located along the coast. One of these, the Banana Bayou mound site on Avery Island in south Louisiana dates from about 2500 B.C. (Neuman & Hawkins 1993). The Poverty Point site (ca. 1700 B.C.), located in north Louisiana adjacent to the Mississippi floodplain, is regarded by many as the first true city in North America.

Of interest is the vastness of this site's confirmed trade network. Copper was used from the Great Lakes region, steatite from the Appalachians (as far east as Georgia), and flint from throughout the east and Midwest. Based on identified early Native American sites to date, access to the Mississippi River system and the coast was important to the Poverty Point culture (Gibson 1996), driving community location decisions, including the locations of major settlements along the Vermilion and the Lower Pearl Rivers in south Louisiana. This same access to the Mississippi River system and coast was important also to successive cultures, including the Tchefuncte culture (200 B.C.-A.D.400) who settled along the entire Louisiana coast from Lake Pontchartrain to the cheniers of the west, the Marksville culture (A.D. 100-550) with occupations along the coast including Bayou Teche, and the Troyville culture (A.D. 500-950) with occupations along the Mississippi River and Bayou Lafourche (Goins & Caldwell 1995).

Today, the federally recognized Chitimacha are Louisiana's only indigenous tribe continuing to live on ancestral lands. The Chitimacha have lived on the coast of Louisiana for at least 2,500 years; this documented long-term residency is expressed in their traditional cultural beliefs by the statement, "We have always been here". Based in the community of Charenton, in south Louisiana next to Bayou Teche, they once also had settlements along the lower Mississippi River and at the mouth of Bayou Lafourche (once known as "Lafourche of the Chitimachas"). Bayou Teche takes its name from the Chitimacha word for "snake". The Teche marks, according to tribal lore, the channel dug out by the death throes of a great snake vanquished by the tribe many years ago. The tribe today is focusing its efforts and resources on regaining tribal land, preserving its heritage and preparing its children for competitive jobs in the global marketplace. One element of tribal culture being preserved is the tradition of basket making. Chitimacha baskets are widely regarded as the finest Native American basketry in the Southeast and possibly the nation, with prices for contemporary pieces going for many thousands of dollars. There are only a few basket weavers today and one of the reasons is the limited availability of river cane. River cane (*Arundinaria gigantean*), one of only two bamboos native to the continental United States, is the traditional material used for these baskets as well as other weavings. The Natural Resources Conservation Service has been working with the Chitimacha to reestablish stocks of river cane in order to overcome the shortage and continue an uninterrupted supply of this traditional material.

Access to the coast (for reasons of proximity to natural resources and facilitating long-distance trade) has continued to drive historic and modern decisions in Louisiana regarding community location. This included the 1718 founding of the city of New Orleans at the location of the portage between the Mississippi River and Lake Pontchartrain, along Bayou St. John. Located strategically, New Orleans quickly prospered as a trade city. Validation of the value of New Orleans as a trade center of international importance was proved less than 100 years later in 1803, when Thomas Jefferson authorized negotiations with France for the purchase of New Orleans for up to 10 million dollars. This intent of the purchase was to avert what appeared to be possible conflict between France and Great Britain over access to the port, and assured continued access to the port for the growing nation. The inclusion of the remainder of the Louisiana Purchase for an additional 5 million dollars was an unexpected windfall that not only doubled the size of the United States, but more importantly, ended any future uncertainty over control of trade in the central North American continent.

Perhaps because New Orleans was an early center of international trade, Louisiana has a rich and diverse heritage. Louisiana residents today include, in addition to a continuing strong Native American presence, descendants of European, African and Asian cultures. These include French (Canadian traders, Acadians, French soldiers, French royalists, Bonapartists), Spanish (including Islenos from the Canary Islands), English, Irish, Germans, Italians (including Sicilians), Senegalese, Dahomeans, Congolese, Czechs, Hungarians, Lebanese, Croatians, Filipinos, Chinese, Vietnamese, Laotian, and Thai (Owens 1999). All of these cultures have made a direct recognizable contribution to Louisiana culture. The Louisiana culture, particularly coastal Louisiana, is unique because it is not homogenous (Spitzer 1985). Like gumbo itself, south Louisiana's culture is made up of diverse ingredients from all parts of the world. Each retains its individual identity and flavor, but they come together to make a distinctive "dish" with its own recognizable identity. It is an identity that is strongly embraced by its residents. According to the 2000 census, Louisiana is the state with the highest percentage of native born residents, with 79.4 percent of current residents having been born in Louisiana.

This same census indicated that two million people, or over 65 percent of the population of Louisiana, live within 50 miles of the coast. Based on 2001 census estimates, the total population for the seventeen coastal parishes and the nine adjacent parishes that "connect economically to the coastal parishes" was almost three million (Richardson et al., 2004). Louisiana's economy is concentrated in the southern region of the state. This includes 73.5 percent of total state employment, almost 60 percent of oil and gas employment, 77 percent of pre-hurricanes Katrina/Rita construction employment, and 67 percent of all manufacturing employment in the state (Richardson et al., 2004). Industries directly tied to locations on the coast and major waterways include not only the production of oil and gas, but offshore oil and gas exploration, development and transport; shipbuilding and other manufacturing of transportation equipment; petroleum and chemical refining; and water-borne transportation.

According to 2004 USACE Navigation Data Center statistics, Louisiana has five of the top fifteen ports by tonnage in the United States: the Port of South Louisiana, the Port of New Orleans, the Port of Baton Rouge, the Port of Plaquemines and the Port of Lake Charles. The Port of Louisiana is the top ranked port by tonnage in the United States. The adjacent Louisiana ports of South Louisiana and New Orleans combined are the largest port (by tonnage) in the world. Together, these two ports account for $150 billion and 20 percent of U.S. import/export cargo traffic annually (Department of Commerce, 2005). The Port of Lake Charles is the largest liquid natural gas (LNG) port in the United States.

Gary LaGrange, executive director of the Port of New Orleans, states "Our economists tell us that 380,000 people realize their income as a result of the port of New Orleans, around the nation. Sixty two percent of the consumer-spending public in the United States receive their goods and depend on getting their goods through the gateway at the port of New Orleans" (Flakus, 2006). In spite of a loss in container and terminal capacity after the storms, the Port of New Orleans has increased activity over the past year due to increased steel and rubber shipments coming from various parts of the world. These steel imports reflect both the decline of steel production in the United States and increased demand for steel by various US industries (Flakus 2006). One of the assets of the Port of New Orleans is its connectivity to the rest of the country. Not only is it connected by the Mississippi River and its tributaries, it is the only deepwater port in the United States served by six class one railroads (Canadian National, CSX, Burlington Northern/Santa Fe, Kansas City Southern, Norfolk Southern, and Union Pacific). This and its connection to the interstate roadway system gives port users direct and economical rail and roadway service to or from anywhere in the country.

Supporting the ports of Louisiana is the Gulf Intracoastal Waterway (GIWW) which crosses southern Louisiana from the Texas state line east to the Mississippi state line. In 2000 over 520 million tons were moved by barge

along the GIWW in Louisiana with estimated savings of $4.7 billion in transportation costs compared to non-water based transport (Richardson et al. 2004). Figure 2 illustrates the interstates, federal navigation channels, and railways that are found in coastal Louisiana.

Commercial fishing has a long history in Louisiana. Le Page du Pratz in his 1758 *Histoire de la Louisiane*, wrote of observing shrimp being fished in the lakes south of New Orleans using nets from France. Shrimp were first canned commercially in Louisiana as early as 1867 at Grand Terre Island. Shrimping is a way of life and a family tradition in Louisiana extending well back into the 19th century and earlier, but it does not belong exclusively to one ethnic culture. Filipinos, who first settled in Louisiana in the community of St. Malo in the mid 1700's, were widely known as fishermen and shrimpers. St. Malo was one of the first Asian settlements in what is now the United States. The Filipinos of St. Malo are widely speculated to have been the "Spanish pirates" who fought along side other Louisianans in the Battle of New Orleans.

Today, Louisiana is second only to Alaska in terms of both tonnage and dockside revenues from commercial fishing. Seven of the top 50 seafood landing ports in the United States are in south Louisiana. Three of these ports, Empire-Venice, Intracoastal City and Cameron, are in the top 6 seafood landing ports by tonnage. Almost 75 percent of the fish landed in the Gulf of Mexico come through a Louisiana port (NOAA Fisheries 2005). Louisiana in 1997 had more fishing vessels than any other state except Alaska (Richardson et al. 2004). In addition, in 1999, Louisiana had 122 commercial fish processing plants, as well as 161 wholesalers (Richardson et al. 2004).

The Louisiana coast is widely regarded as one of the top ten recreational fishing spots in the world. Annual expenditures related to recreational salt water fishing in Louisiana can amount to between $279 million (USDI 2001) and $1.2 billion, including equipment, bait, boats (including charter boats), food, lodging and transportation (Gentner et al. 2001).

In the United States, sugar cane is produced, harvested and processed in Florida, Louisiana, Texas and Hawaii. Louisiana's current production is ranked second, just behind Florida. Louisiana's sugar cane production produces about 20 percent of the total sugar grown in the United States from all sources, including sugar produced from beet, as well as cane (American Sugar Cane League 2006). Sugar cane was first planted in Louisiana in 1751 by the Jesuits in what is now the city of New Orleans. Sugar cane is a tropical grass, needing at a minimum a subtropical climate with at least 24 inches of rainfall a year. Sugar cane has been a major crop in Louisiana for over 200 years, and is the number one row crop in Louisiana in terms of value. In 2005, sugar cane was grown in 24 Louisiana parishes with over 500,000 acres in cultivation. Production in 2005 included 1.2 million tons of raw sugar and 6.4 million gallons of molasses. (It should be noted that these figures reflect lowered per acre sugar and molasses production resulting from damages from Hurricane Lili and Tropical Storm Isidore in 2002. Sugar cane is salt sensitive as well as susceptible to wind damage. Because sugar cane is a perennial, damage occurring in one year may continue to be reflected in subsequent harvests.) There are currently 15 sugar mills in Louisiana and approximately 27,000 workers are involved in the production and processing of sugar in Louisiana.

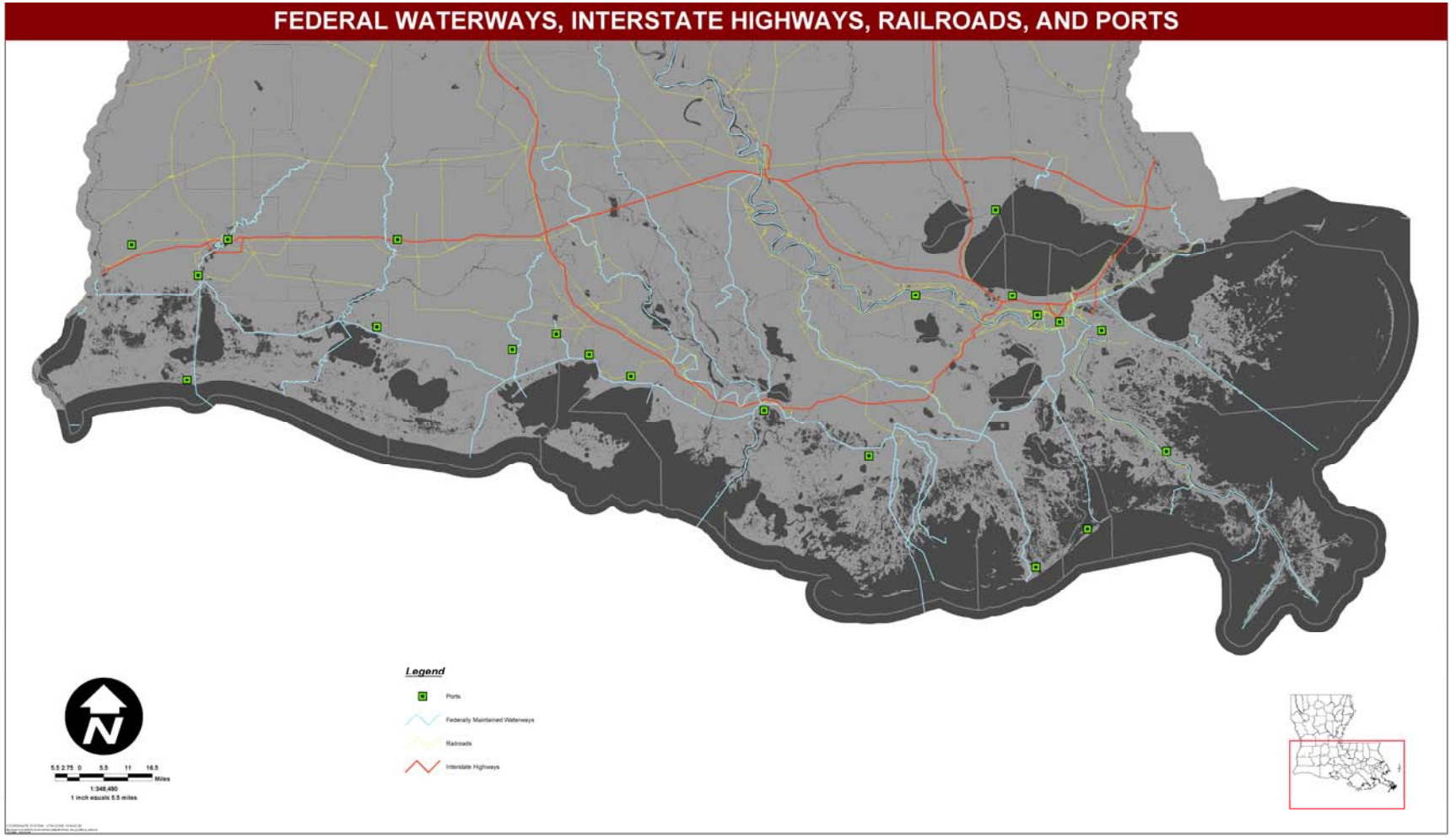

Figure 2.4: Interstates, federal navigation channels, and railways in coastal Louisiana.

There are two sugar refineries in Louisiana with a third refinery being built to begin operation in 2008.

The cattle industry in Louisiana has its roots in the colonial period with the raising of longhorns originally brought in by the Spanish. According to the University of Texas at Austin's, *Handbook of Texas Online*, "Modern scholarship places the birth of the Texas ranching industry in the southeast Texas-southwestern Louisiana area, from where cattle raisers drove herds to market in New Orleans." "By 1802, the Louisiana cattle industry was firmly established and the prairies were the main suppliers of beef to New Orleans and points northeast" (Vidrine 1991). Today, south Louisiana continues this tradition. The western coastal parishes of Vermilion and Calcasieu rank second and third, respectively, in cattle production among the 64 Louisiana parishes (USDA National Agricultural Statistics Service 2006).

Rice has long been a traditional food on the Louisiana table and is an essential component of at least three internationally famous Louisiana dishes: red beans and rice; gumbo; and jambalaya. While grown domestically prior to the 1850's, commercial rice production began in Louisiana in the middle of the nineteenth century. Evidence of rice's rapid rise to a major crop in this time period is that the first newspaper to be published in Plaquemines Parish was named *The Rice Planter*. Louisiana is currently the third highest rice producing state, behind Arkansas and California, even with reduced plantings following Hurricanes Katrina and Rita. According to USDA estimates, in 2006 only 360,000 acres of rice were planted in Louisiana, down 32 percent from 2005 (USDA, June 30, 2006). The three southwestern parishes of Acadia, Jefferson Davis and Vermilion are the top three rice producing parishes in Louisiana. Rice is also an important crop for the southwestern coastal parishes of Cameron and Calcasieu. As crawfish becomes a more important crop, some rice varieties are now being chosen and planted primarily for forage for crawfish (see below). It should be noted that rice is an extremely salt-sensitive crop, and it requires a reliable fresh water source.

Crawfish and Louisiana are often regarded as synonymous. Crawfish has long been both food and symbol in Louisiana—the red crawfish historically was a war emblem of the Houma tribe (and as such was not eaten by the Houma). Others, however, have much enjoyed eating crawfish and Louisiana began experimenting with farming them in ponds in the 1950's. Today, there are about 1,200 crawfish producers cultivating over 115,000 acres of crawfish ponds. Annual harvest from these commercial ponds ranges from 75 to 105 million pounds annually with a value of more than $40 million. There is an additional wild harvest of well over a million pounds annually, primarily from the Atchafalaya Basin, with an economic value of nearly $5 million. Approximately 90 percent of the nation's crawfish is produced in Louisiana, with 70 percent of that being consumed locally (LSU Agricultural Center, 2006). Most farmers in Louisiana raise crawfish as a double crop with rice. This shortens the crawfish production season by one or two months (draining fields early to begin rice planting) and reduces overall yield of crawfish per pond acre from dedicated crawfish only ponds, however, it allows the second commercial crop of rice to be grown. The infrastructure in place for rice— ponds located in clayey soils, water supply and management ability, and the rice plant itself as forage for the crawfish— makes these two crops ideal companions for double cropping. Crawfish processors in south Louisiana add value to the harvest, easing shipment and increasing product availability. There are currently 12 crawfish processors in the state (Mclain et al. 2004).

Alligators have been hunted for centuries in Louisiana. However, by the mid 20th century, intervention was required to protect the species. With protection provided under the Endangered Species Act, alligators have made a successful comeback throughout its range and part of this continued success is the strong management program which includes both harvest from the wild and farming. Louisiana is the nation's top alligator producer. In 2003, the production of Louisiana alligator farmers was valued at over $28 million for the raw products alone (LA DWF 2005). The wild harvest during the 2004 season was valued at $9 million (LA DWF 2005). Alligator farming

allows the taking of eggs from the wild by permit and requires that a portion of farm alligators raised be released to the wild near locations where the eggs were collected. This not only helps to assure numbers in the wild population, it also encourages healthy marsh management. The continued success and increase in production each year has led to the establishment of tanneries in Louisiana, as well as food processing facilities that specialize in alligator meat. These continue to add value to the product after harvest.

Food is important in Louisiana. Good food is enjoyed at home, as well as "eating out." According to the Louisiana Restaurant Association (2006), "The restaurant industry in Louisiana is the state's largest private employer with more than 120,000 employed directly and another 50,000 indirectly employed. Restaurants in Louisiana generate $4.8 billion in annual sales." In testimony before Congress on behalf of the National Restaurant Association, Ralph Brennan pointed out that before Hurricanes Katrina and Rita, the restaurant industry was the number one private employer in New Orleans. It employed 54,000 people directly. Indirectly, another 20,000 people were employed to supply the industry with goods and services. In recognition of this economic importance, and the knowledge and skills that are necessary to be successful in this field, Nicholls State University, which is located in Thibodaux, now offers both associate and Bachelor of Science degrees in culinary arts.

As good food is valued, so is good music. New Orleans is known as the birthplace of jazz, what is not as widely known is that music and music performances have been part of its earliest history. The first documented opera performance in New Orleans was in 1796; one of the earliest opera performances in what is now the United States. While music from all cultures and countries have found a home in Louisiana, south Louisiana is known internationally for its homegrown jazz, blues, Cajun, zydeco, swamp pop, and New Orleans brass band styles. The Louisiana music industry is a 2.2 billion dollar industry that depends on the people, culture and talent of Louisiana to maintain its vitality and to continue (Louisiana Music Commission, July1998). The sharing and playing of music with family, friends and the larger community is imbedded in Louisiana culture. It is this interaction that has allowed Louisiana's music to be preserved, to develop distinctive styles and to flourish. As such, Louisiana's music may be one of the more vulnerable of its industries and cultural legacies to a storm diaspora.

What is more difficult to quantify is the richness of Louisiana's culture, a richness in part driven by the history that is present throughout the state. In coastal Louisiana alone, there are well over 634 properties listed on the National Register of Historic Places, and many of these properties are historic districts containing multiple historic structures. New Orleans held one of the largest collections of historic districts and structures in the United States. Louisiana has also recognized the need to not only preserve structures and the material expressions of culture, but the need to preserve less tangible language and customs as well. With the legislative establishment of the Council for the Development of French in Louisiana over 35 years ago, there has been widespread support for French being taught in Louisiana schools and recognition of the value of cultural preservation. French programming, enthusiastically embraced in the Lafayette area, has spread throughout southern Louisiana with several parishes today offering French language immersion programs. It is this indefinable richness that has made tourism such an important contributor to Louisiana's economy, whether this richness comes from historic architecture, food, music, language or culture. According to the Louisiana Department of Culture, Recreation & Tourism (2004) over $4.4 billion of visitor spending in Louisiana was from New Orleans and Lake Charles. Where coastal Louisianans live, work, and play, is part of their identity. Sustaining Louisiana's coastal culture is dependant on sustaining Louisiana's coast.

2.5 Program Sustainability

Development of sustainable management programs in Louisiana and around the world all face similar challenges, chief among them obtaining and maintaining appropriate funding streams and maintaining political will to enforce laws and regulations put in place to support the goals of the program. A dedicated funding source and a well defined program codified into Federal and State law are keys to successfully restoring sustainability to the natural and human environment in coastal Louisiana.

Reliable funding streams must be obtained for both the federal and non-federal shares of program costs. To date, the State's Coastal Protection and Restoration Fund receives scheduled inputs of $25 million annually to address coastal protection and restoration issues. Without a significant change in cost sharing requirements for federal projects, this level of funding is not adequate to address the problem. Similarly, the federal government dedicates approximately $50 million per year to the restoration program through the Coastal Wetlands Planning, Protection, and Restoration Act (CWPPRA) program. Funding for hurricane protection projects and other coastal restoration activities comes through annual Federal and State appropriations process, and as such, it is subject to fluctuations due to changing priorities. This may slow the pace of critical projects. The State has been fortunate to receive two installments of funding from outer continental shelf oil and gas funds through the first two phases of the Coastal Impact Assistance Program. These two installments total approximately $565 million, but the unpredictable nature of the timing (separated by five years) and magnitude range ($25 million vs. $540 million), make it difficult to plan for long-term implementation.

Because it is likely that overall funding will be limited and unpredictable in the near-term due to reliance on annual Federal and State appropriations processes, there are several mechanisms that must be used to manage implementation costs and ensure maximum efficiency of the program. This can be accomplished in a number of ways.

- Life cycle costs must be minimized. Minimizing operations and maintenance requirements will allow a greater focus on design and construction, and may result in more reliable systems. At least in the near term, these projects, as much as practicable, should be designed for easy adaptation or modification as we continue to reduce uncertainties in program implementation. Specifically, projects should be authorized and constructed with maximum flexibility for environmental operations, and wherever possible, should provide for ready modification to increase protection levels if a risk review determines it is warranted.
- Fluctuation of implementation costs can be managed by minimizing reliance on resources that are either scarce or likely to become scarce in the future. In addition, reliance on technology that uses fossil fuels for operations ensures rising and volatile costs into the foreseeable future. Utilizing less energy intensive techniques, or increasingly relying on renewable energy sources, may stabilize costs into the future.
- It will be necessary to strictly enforce existing, and possibly new, regulations and obtain appropriate easements in the coastal zone, especially in wetlands landward of hurricane protection systems, to maintain these important natural buffer zones. Allowing development of low-lying areas within protected systems not only increases exposure to damages in the event of a system failure, but also diminishes effectiveness of the protection works themselves by removing water storage areas from the system.
- A strong science and technology program that is focused on reducing uncertainties in program implementation can help to ensure effectiveness of projects. Technological advances may also allow for more efficient solutions in the future. This science and technology program will provide a basis for assessing and reporting on program efficiency and effectiveness in order to ensure accountability.

Successful national civil works programs, such as the construction of the Interstate Highway system and the MR&T project, are useful examples of programs that were initiated with great uncertainties as to details of final constructed projects. Both programs, however, were made national priorities and significant and regular funding was made available to implement more certain aspects of the programs even as uncertainties were being reduced in the overall program. Coordinated Federal and State legislation will be necessary to define and implement a program that will be capable of responding to the protection and restoration problems of coastal Louisiana in a timely manner and at appropriate scales. Provision of a reliable source of funds, with strict accountability standards, is necessary to ensure sustainability of program implementation.

2.6 Moving Forward

While humans have been successful in altering the natural system to meet our needs, the unintended consequences of these actions have been realized and steps are now being taken to reverse them. Consequently, the Water Resources Development Act, the CWPPRA Program, and other programs have taken steps to re-introduce freshwater, sediment and nutrients into the coastal ecosystem. This is an excellent example of "adaptive management," and the initial management paradigm of the lower Mississippi River and associated delta plain will continue to evolve as new information becomes available. Implementation of the State Master Plan will take this improved management to the next logical level. It will contribute to an even greater extent to the sustainability of the delta plain coastal wetlands of the nation's largest river system and will provide increased levels of protection to the communities that live and work within them.

3.0 Mississippi River Resources

3.1 Man's Alteration of the River

In the more than 300 years since the Lower Mississippi River Valley was settled by Europeans, the Mississippi River has undergone many changes resulting in decreased sediment loads. The changes in the watersheds of the Mississippi River and its tributaries have included the removal of snags and other navigation obstacles from the river; the stabilization of river banks; the construction of cut-offs; the initiation of river inspections to identify riverbank settlement; and the construction of left and right bank levee systems for effective flood control. The activities have stabilized the river from Cairo, IL to near Head of Passes, LA.

Levee building for flood protection began in the 1700's. The construction of bank stabilization features began in the 1800's, primarily as efforts to protect the integrity of levees. Channel stabilization for navigation purposes did not get serious attention until the early 1950's. Flood control reservoirs were built in the 1950's and 1960's. Today, reservoirs and dams, bank stabilization mattress, locks, dike fields, and levee systems control the Lower Mississippi River and much of its tributary system. Over the past 50 years manmade structures and conservation practices have effected changes in total sediment load and to a lesser degree annual flow hydrographs and bed and bank materials. Before human settlement, the primary areas of land surface erosion in the Mississippi Basin were the uplands that bordered the river. During the early periods of human settlement, upland erosion increased exponentially because of land use practices (Turnbull et al., 1966). However, in recent years, the erosion has been reduced substantially by bank stabilization and better soil conservation practices.

As a result of the cumulative changes, water and sediment budgets have been altered significantly. More than half of historic sediment loads are now circumvented by better land conservation, bank stabilization, and reservoirs throughout the watershed. The Old River Control Structure maintains a 70 percent distribution of flow down the Mississippi River and 30 percent down the Atchafalaya River. The flow from the Red River is a part of the 30 percent in the Atchafalaya River. Engineering practices and new structures have allowed water and sediment to flow down the Atchafalaya River. Two outlets from the floodway are provided. The historic Lower Atchafalaya River flows toward the east, and the Wax Lake Outlet connects to the west side of the floodway. The Lower Atchafalaya River and the Wax Lake Outlet flow into a shallow estuary resulting in active delta building. By contrast, to provide a deep-draft navigation channel, the Mississippi River flows through a jetty and dike field system into deep water off the continental shelf.

3.2 Water Budget

A major constraint on the annual budgeting of river water downstream of New Orleans is the requirement to maintain a minimum magnitude of 250,000 cfs (cubic feet per second) discharge at the Head of Passes, to maintain the leading edge of the riverine saltwater wedge from the Gulf of Mexico no further upstream than the Head of Passes (river mile 0.0).

By comparison, the average annual minimum discharge for the Mississippi River from 1930-2005 was 165,000 cfs at Tarbert Landing, just downstream from the Old River Control Structure complex. Therefore, the saltwater wedge currently moves upstream of the Head of Passes in most years but generally not for long durations and seldom to the point that fresh water supply for large communities is impacted. However, during the 1988 drought the river discharge dropped to approximately 100,000 cfs at New Orleans, and the saltwater wedge was held back only by the construction of a sand sill across the Mississippi River Channel just upstream of Myrtle Grove, LA.

Table 1 provides long-term average values of flow for annual minimum, mean, and maximum flow in the Mississippi River for the period of record 1930–2005 at the Tarbert Landing Gage maintained by the U.S. Army Corps of Engineers. The same table provides flow parameters for each month of the year for the same period of record. The months of March, April, and May provide highest average flows, and the months of August, September, and October provide lowest average flows. However, the average flows could be significantly different in any given year. Table 2 provides the same data for the Simmesport gage on the Atchafalaya River. This gage is also maintained by the U.S. Army Corps of Engineers.

Table 1: Mississippi River Tarbert Landing Discharge, Period of Record 1930 - 2005

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
MIN	120	170	270	290	280	180	125	120	115	100	100	105
AVE	520	620	730	770	710	580	420	290	240	250	290	410
MAX	1240	1390	1380	1480	1440	1290	960	795	550	735	710	1000

Compiled from U.S. Army, Corps of Engineer District, New Orleans, Stage and Discharge Data
Discharge values in 1000 cubic feet per sec (cfs)
Values are averages for the months for period of record
Average Annual Minimum –165,000 cfs
Average Annual Average –486,000 cfs
Average Annual Maximum –1,081,000 cfs

Table 2: Atchafalaya River Simmesport Discharge, Period of Record 1930 - 2005

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
MIN	25	35	80	95	80	45	30	20	20	20	20	25
AVE	205	250	295	325	300	245	180	120	90	100	115	170
MAX	535	565	605	675	740	570	375	350	250	310	335	440

Compiled from U.S. Army, Corps of Engineer District, New Orleans, Stage and Discharge Data
Discharge values in 1000 cubic feet per sec (cfs)
Values are averages for the months for period of record
Average Annual Minimum –41,000 cfs
Average Annual Average –200,000 cfs
Average Annual Maximum –483,000 cfs

Budgeting high river discharges presents a set of possibilities. The river generally transports the largest sediment loads at high water discharges. Thus, it is important to allow that sediment to flow into wetlands at these times, rather than allowing this material to continue to flow into the deep waters of the Gulf of Mexico. However, when there are high river discharges there are generally drainage problems in the receiving area due to local rainfall. The potential for damage from high water will have to be balanced against the benefits of diversions. One constraint to be considered even at high flows, however, is the need to maintain the minimum of 250,000 cfs at Head of Passes.

The upper limit of discharges that can be diverted from the river is approximately 500,000 cfs. If 250,000 cfs is to be maintained at Head of Passes, the total river discharge that is required to divert 500,000 cfs is 750,000 cfs.

The highest, long-term average monthly discharge on record at Tarbert Landing occurs in the month of April. It is 770,000 cfs. Therefore, there have been many years, and a number of days in most other years, when 500,000 cfs discharge was available on a limited basis. For example, the long-term maximum monthly averages for the months of January, February, March, April, May, and June exceed 1,000,000 cubic feet per second. However, the long-term averages of the monthly discharges for those months fall below 750,000 cfs. In summary, a budget of 500,000 cfs may be available periodically, but it will not be a dependable resource month-to-month and year-to-year.

A constraint on the discharge rate at a diversion is the hydraulic head. The head will vary from one location to another along the river. Table 3 provides the average monthly water surface elevation at select locations along the river. If marsh elevation is assumed to be 1 foot, the hydraulic head may be calculated. For example, at mile 100 above Head of Passes, the available head between the Mississippi River and the adjacent marsh is about 9.7 feet in April (10.7 – 1.0 = 9.7). At the same location, for the month of September' 2.4 feet (3.4 –1.0 = 2.4) of hydraulic head would be available.

For a given location, a range of hydraulic heads exists during a given year depending on the river discharge, the gulf elevations and other diversions that might be flowing. As new diversions are added to the river, the hydraulic grade line will change, depending on the magnitude, location and operating scheme of the diversions. The effect on the system should be checked each time a new diversion begins operation. It is possible that with all the planned diversions operating at one time at a combined discharge of 500,000 cfs, those diversions located in the lower reaches would perform well below expectations because of a lack of adequate hydraulic head.

As more and more water is diverted from the river, a point of diminishing return is reached. Specifically, the more water diverted from the river the less water there is in the river and the less head available to divert water from the river. Further as more water is diverted, the ability of the river to transport sediment will decrease.

Ultimately, all of the water and sediment in the river cannot be withdrawn for beneficial uses upstream. A portion of the flow will always reach the gulf at the mouth of the river. At this point the possibility of total diversion of the river for delta building needs to be considered. At some location below New Orleans the river could be diverted to the east and/or west so that all the fresh water and sediment is placed in the coastal zone for delta building. This would be similar to the existing outlets at Wax Lake and the Lower Atchafalaya River. In order to accomplish this, there will have to be accommodations for navigation, such as a sail-thru lock. One advantage of such a system is that the navigation depth, currently limited to 45 ft, could be deepened to as much as 65 ft. Such a major diversion, and currently one is planned in the Mississippi River Delta Management Study, requires extensive study

Table 3 shows the stages for the average monthly discharges at twenty mile intervals from New Orleans to the Head of Passes. These values are from 1972 data. The table was prepared from Figures 84 to 95 in the report, "The Transport of Sediment by Gravity for Coastal Restoration and Wetland Rehabilitation in Louisiana." This report was prepared jointly by the Department of Civil and Environmental Engineering University of New Orleans and Sogreah Ingenierie and Coastal Restoration Consultants, September 15, 1997.

Table 3: Elevation Equivalent to Average Monthly Flow

Miles above Head of Passes	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
20	2.6	2.8	3.5	4	3.6	3.4	2.7	2.3	2.2	2	1.8	2.5
40	3.8	4.1	5.1	5.7	5.2	4.7	3.4	2.7	2.5	2.4	2.5	3.6
60	5	5.3	6.8	7.3	6.8	6	4.2	3.1	2.7	2.8	3.1	4.7
80	6.2	6.6	8.4	9	8.3	7.3	4.7	3.5	3.1	3.3	3.6	5.8
100	7.4	7.9	10	10.7	9.9	8.6	5.2	3.9	3.4	3.7	4.2	6.9
Average Monthly Flow using Period 1972 to 1992.												
	579	599	758	814	745	632	435	326	275	297	355	555

3.3 Sediment Budget

Recognizing the significance of sediment to the sustainability of coastal Louisiana and developing a sediment budget to promote effective utilization of sediment resources available from the Mississippi River is a critical element for the LCCPMP. Notwithstanding the reduction in sediment flowing in the Mississippi River, effective and prudent use of the available sediment is critical for sustaining coastal Louisiana. Measured suspended sediment loads in the Mississippi River have decreased substantially in magnitude over the past 60 years. The Tarbert Landing gage also provides the summary of measured suspended sediment flowing in the Mississippi River. The Simmesport gage provides measured suspended sediments entering the Atchafalaya Floodway. The suspended sediment load of the Red River is included in the reported measurements. Tables 4 and 5 report annual averages of Total Measured Suspended Load, Sand Silt Ratio, Water Year Discharge, and Average Sediment Concentration in parts per million (PPM) for Tarbert Landing for the water year 1949-1950 through water year 2003-2004 and Simmesport for water year 1951-1952 through water year 2003-2004.

Tables 1 and 2 show the presence of a low water period in late summer and early fall. The two main months of low discharge are September and October. The measured suspended sediment loads follow a similar pattern. Over time, large events in either of these two months can be much more than the long-term average. Use of the tables of long-term monthly average discharges and the average measured suspended sediment load can provide a close approximation of the amount of material available for different periods of the year. Monthly distribution of measured suspended sediments generally follows the monthly discharge trends, Table 6.

Table 6 shows monthly sediment concentrations in the Mississippi River at four locations. They are presented from north to south: Arkansas City, Arkansas, Vicksburg, Mississippi, Natchez, Mississippi, and Belle Chase, Louisiana. Data for the first three locations were collected over the period 1968-1974. The Belle Chase data were collected over the period 1977-1995. The two lowest values at both of these gages occurred during the months of September and October. It should be noted that the concentrations were greater in the three upper reaches of the Mississippi River than they were at Belle Chase. This pattern of lower concentrations at Belle Chase is also noted in Table 7 where the annual measured suspended loads at Tarbert Landing are compared with values at Belle Chase.

Table 4: U.S. Army Engineer District, New Orleans Reports Control Symbol (DAEN-CWE-12)
Summary of Measured Suspended Sediment Loads at Main River Stations
Lower Mississippi River at Tarbert Landing, Mississippi

Water Year	Total Measured Suspended Load	Sand		Silt and Clay		Water Discharge	Concentration
OCT-SEP	(1000 Tons)	(1000 Tons)	%	(1000 Tons)	%	(1000 DSF)	(PPM)
1949-50	548,330	107,000	20	440,560	80	245,200	828
1950-51	575,280	67,600	12	507,680	88	224,810	947
1951-52	408,390	73,820	18	334,570	82	200,660	754
1952-53	212,580	28,920	14	183,660	86	142,200	552
1953-54	107,730	14,090	13	93,650	87	88,660	449
1954-55	211,490	39,930	19	171,550	81	137,460	570
1955-56	161,220	25,920	16	135,300	84	127,530	468
1956-57	291,388	53,043	18	238,345	82	172,875	624
1957-58	325,774	95,302	29	230,571	71	195,654	616
1958-59	230,504	78,693	34	151,811	66	129,253	660
1959-60	318,234	77,291	24	241,015	76	163,850	718
1960-61	231,754	71,471	31	160,283	69	168,133	510
1961-62	264,031	94,037	36	169,994	64	191,007	512
1962-63	100,397	23,770	24	76,627	76	105,125	353
1963-64	121,697	18,242	15	103,455	85	124,967	361
1964-65	203,678	41,316	20	162,362	80	150,152	502
1965-66	174,645	46,144	26	128,501	74	138,020	469
1966-67	111,200	15,356	14	95,835	86	131,843	312
1967-68	155,577	36,454	23	119,123	77	163,071	353
1968-69	155,576	39,373	25	116,203	75	167,999	343
1969-70	148,907	48,969	33	99,938	67	151,448	364
1970-71	181,913	75,410	41	106,503	59	147,586	456
1971-72	152,166	47,945	32	104,221	68	151,057	373
1972-73	227,574	75,188	33	152,386	67	266,099	316
1973-74	197,205	47,688	24	149,517	76	230,846	316
1974-75	164,805	40,375	24	124,430	76	203,806	300
1975-76	115,434	20,258	18	95,176	82	145,275	294
1976-77	80,998	9,532	12	71,466	88	113,247	265
1977-78	172,585	33,563	19	139,022	81	184,543	347
1978-79	194,343	53,961	28	140,382	72	244,086	295
1979-80	143,852	26,607	18	117,245	82	180,731	298
1980-81	114,541	14,633	13	99,908	87	129,316	329
1981-82	188,011	27,786	15	160,225	85	179,510	351
1982-83	199,402	37,728	19	161,674	81	254,372	291
1983-84	174,860	27,097	15	145,763	85	217,945	298
1984-85	172,724	32,815	19	139,909	81	205,850	311
1985-86	164,168	14,412	9	149,756	91	183,313	332
1986-87	139,375	4,111	3	135,264	97	186,776	277
1987-88	79,900	2,869	4	77,031	96	138,486	214
1988-89	96,343	3,820	4	92,523	96	204,595	175
1989-90	131,072	19,573	15	111,499	85	218,809	222

Table 4 (Continued): Summary of Measured Suspended Sediment Loads at Main River Stations
Lower Mississippi River at Tarbert Landing, Mississippi

Water Year OCT-SEP	Total Measured Suspended Load (1000 Tons)	Sand (1000 Tons)	%	Silt (1000 Tons)	%	Discharge (1000 DSF)	Average Concentration (PPM)
1990-91	157,029	52,209	33	104,820	67	229,635	253
1991-92	119,115	36,549	31	81,070	69	170,358	259
1992-93	205,054	78,193	38	126,861	62	266,722	285
1993-94	135,537	57,854	43	77,683	57	227,308	221
1994-95	107,026	18,349	17	88,101	83	194,186	204
1995-96	117,233	25,008	21	91,364	79	180,105	241
1996-97	156,751	32,918	21	123,833	79	245,435	237
1997-98	171,267	39,391	23	131,876	77	211,292	300
1998-99	167,622	35,201	21	132,421	79	196,967	315
1999-00	72,649	13,803	19	58,846	81	117,497	229
2000-01	133,389	22,676	17	110,713	83	166,163	297
2001-02	114,426	24,029	21	90,397	79	200,030	212
2002-03	119,575	33,481	28	86,094	72	180,573	245
2003-04	136,773	32,826	24	103,947	76	103,432	265

Note: The sand fraction is the material retained on the No. 230 Sieve (0.062 mm). The silt fraction includes all of the fine material passing the No. 230 Sieve.

Day-Second-Feet (DSF).

Table 5: U.S. Army Engineer District, New Orleans Reports Control Symbol (DAEN-CWE-12)
Summary of Measured Suspended Sediment Loads at Main River Stations
Atchafalaya River at Simmesport, Louisiana

Water Year OCT-SEP	Total Measured Suspended Load (1000 Tons)	Sand (1000 Tons)	%	Silt (1000 Tons)	%	Discharge (1000 DSF)	Average Concentration (PPM)
1951-52	196,460	48,890	25	147,570	75	80,800	900
1952-53	135,230	28,440	21	106,790	79	56,960	880
1953-54	54,130	13,110	24	41,020	76	31,980	627
1954-55	93,360	24,080	26	69,280	74	50,425	686
1955-56	67,175	15,540	23	51,730	77	49,080	507
1956-57	225,474	55,700	25	169,774	75	74,059	1,126
1957-58	214,390	48,082	22	166,308	78	89,413	887
1958-59	83,230	20,944	25	62,286	75	55,729	553
1959-60	131,878	24,153	18	107,725	82	69,333	704
1960-61	133,372	40,524	30	92,848	70	76,814	643
1961-62	151,913	57,675	38	94,238	62	88,881	633
1962-63	44,876	8,610	19	36,266	81	47,060	353
1963-64	52,591	10,414	20	42,177	80	33,177	588
1964-65	108,871	27,472	25	81,399	75	66,444	607
1965-66	88,522	17,468	20	71,055	80	51,024	642
1966-67	55,710	6,794	12	48,916	88	57,314	360
1967-68	121,351	16,727	14	104,624	86	80,105	561
1968-69	115,245	27,170	24	88,075	76	83,329	512
1969-70	75,098	19,790	26	55,308	74	74,278	374
1970-71	72,441	19,625	27	52,816	73	71,721	374
1971-72	89,587	18,732	21	70,855	79	75,407	440
1972-73	124,468	45,363	36	79,105	64	139,951	329
1973-74	142,994	32,235	23	110,759	77	116,972	453
1974-75	157,938	35,106	22	122,832	78	117,129	499
1975-76	56,113	8,464	15	47,649	85	65,925	315
1976-77	57,137	6,050	11	51,087	89	47,800	443
1977-78	71,194	12,497	18	58,697	82	79,737	331
1978-79	112,343	25,548	23	86,795	77	104,824	397
1979-80	67,801	10,652	16	57,149	84	77,609	312
1980-81	51,079	5,343	10	45,736	90	54,995	277
1981-82	104,102	11,403	11	92,699	89	77,494	481
1982-83	100,894	25,055	25	75,839	75	108,584	345
1983-84	73,213	12,349	17	60,864	83	93,081	292
1984-85	116,757	16,995	15	99,762	85	88,848	487
1985-86	81,794	9,289	11	72,505	89	78,649	386
1986-87	71,855	4,173	6	67,682	94	80,288	332
1987-88	57,780	6,556	11	51,224	89	59,347	361
1988-89	52,228	2,545	5	49,683	95	87,867	220
1989-90	91,039	18,288	20	72,751	80	93,720	360
1990-91	92,481	37,094	40	55,387	60	98,300	348
1991-92	69,596	27,098	39	47,589	61	73,248	352
1992-93	97,770	34,037	35	63,733	65	114,087	317
1993-94	61,344	21,057	34	40,287	66	97,453	233

Table 5 (Continued): Summary of Measured Suspended Sediment Loads at Main River Stations
Atchafalaya River at Simmesport, Louisiana

Water Year OCT-SEP	Total Measured Suspended Load (1000 Tons)	Sand (1000 Tons)	%	Silt (1000 Tons)	%	Discharge (1000 DSF)	Average Concentration (PPM)
1994-95	67,748	20,291	30	47,481	70	83,256	301
1995-96	48,909	11,554	24	37,405	76	77,213	235
1996-97	77,213	21,620	28	55,593	72	105,118	272
1997-98	90,067	35,126	39	54,941	61	90,584	368
1998-99	72,803	17,473	24	55,330	76	84,388	320
1999-00	29,582	3,550	12	26,032	88	50,466	217
2000-01	58,884	16,488	28	42,396	72	71,138	307
2001-02	52,625	15,261	29	37,364	71	85,740	227
2002-03	42,633	11,085	26	31,548	74	77,367	204
2003-04	50,150	10,030	20	40,120	80	81,876	227

Note: The sand fraction is the material retained on the No. 230 Sieve (0.062 mm). The silt fraction includes all of the fine material passing the No. 230 Sieve.

Day-Second-Feet (DSF)

Table 6: Measured Suspended Sediment Monthly Average PPM

	Jan	**Feb**	**Mar**	**Apr**	**May**	**June**	**July**	**Aug**	**Sept**	**Oct**	**Nov**	**Dec**
Arkansas City[1]	380	400	310	280	300	300	220	190	110	220	360	310
Vicksburg[1]	370	430	410	360	290	260	250	195	140	270	380	410
Natchez[1]	300	310	310	290	270	230	280	230	150	290	420	340
Belle Chase[2]	233	272	295	267	255	240	215	130	102	124	89	269

Source: [1]U.S. Army Corps of Engineers, Little Rock and Vicksburg Districts. [2] "The Transport of Sediment by Gravity for Coastal Restoration and Wetland Rehabilitation in Louisiana." Department of Civil and Environmental Engineering, University of New Orleans and Sogreah Ingenierie and Coastal Restoration Consultants, September 15, 1997

Table 7: Mississippi River Measured Suspended Sediment

OCT-SEP	Tarbert Landing[1] (PPM)	Belle Chase[2] (PPM)
1977-78	347	263
1978-79	295	274
1979-80	298	224
1980-81	329	259
1981-82	351	314
1982-83	291	217
1983-84	298	242
1984-85	311	203
1985-86	332	205
1986-87	277	172
1987-88	214	162
1988-89	175	133
1989-90	222	212
1990-91	253	152
1991-92	259	199
1992-93	285	226
1993-94	221	130
1994-95	204	187

Source: [1]U.S. Army Engineer District, New Orleans, Reports Control Symbol (DAEN-CWE-12). [2] "The Transport of Sediment by Gravity for Coastal Restoration and Wetland Rehabilitation in Louisiana." Department of Civil and Environmental Engineering University of New Orleans and Sogreah Ingenierie and Coastal Restoration Consultants, September 15, 1997

Another aspect of sediment load transported by rivers and streams is referred to as unmeasured bedload discharge. The term bedload is used as an identifier because this material travels at or near the bed of the river. The bedload material is coarser than that carried in suspension except during major flood discharges. Some estimates indicate that the unmeasured load is approximately 15 to 25 percent of the total measured suspended load. Using data from Tarbert Landing and the partial record of 1971-1972 through 2003-2004, the average measured load is 142,900,000 tons. However, the magnitude and design of the individual diversions may preclude any consideration of the unmeasured load as a part of their discharge, as the sill elevation would need to be deep in individual diversion structures to tap into the unmeasured bedload.

Bedload may be utilized for marsh creation if it is delivered directly to areas of need. Direct delivery, commonly referred to as "pipeline transport", involves dredging and transporting sediments via pipeline. This is a major aspect of the overall plan to effectively utilize the sediments supplied by the Mississippi River. Numerous sandbars characterize the Mississippi River upstream of Baton Rouge. These sandbars are very large and represent a large storage area of coarse material. The Mississippi River downstream of Baton Rouge and particularly downstream of New Orleans has a narrow channel width, deeper depths, and smaller, less visible or submerged sandbars. These reaches of the river do, however, have bend ways. The convex side of the channel in a bend way is a place of deposition. These areas or reaches at and downstream of New Orleans offer opportunities for providing direct delivery of sediment to the wetlands.

Analysis of river charts show potential reaches that may be considered for dredging. In many cases, however, barge and boat anchorages occur in the reach, which either eliminates the reach from consideration or shortens the length of the possible dredging areas, although it may be possible to do some limited dredging in some of

anchorage areas at times. A number of potential reaches were identified. Information in Table 8 notes the potential reaches identified by right or left descending bank and river mile. They are listed from upstream to downstream in direction, and an estimate in miles is shown for the length of each source. In total, four reaches on the right descending bank and six reaches on the left descending bank were identified. The total cumulative length of potential borrow reaches is 26.5 miles. Dredging could be conducted in each area annually, and the excavated area would refill during the next high water period. That scenario depends on the magnitude and duration of high water periods. Annual river maintenance operations would provide information that aid in establishing annual available magnitudes.

Table 8: Potential Areas for Direct Delivery Dredging and/Or Small Diversions, Mississippi River-New Orleans to Head of Passes

1. Left descending bank, River Mile 61.5 to 60.3 ------- 1.2 Miles
2. Left descending bank, River Mile 55.0 to 52.3 ------- 2.7 Miles
3. Right descending bank, River Mile 51.3 to 49.5 ----- 1.8 Miles
4. Left descending bank, River Mile 44.0 to 43.0 ------- 1.0 Miles
5. Left descending bank, River Mile 40.0 to 35.0 ------- 5.0 Miles
6. Right descending bank, River Mile 34.0 to 32.3 ----- 1.7 Miles
7. Left descending bank, River Mile 31.0 to 25.0 ------ 6.0 Miles
8. Right descending bank, River Mile 24.2 to23.0 ------ 1.2 Miles
9. Left descending bank, River Mile 22.0 to 20.0 ------- 2.0 Miles
10. Right descending bank, River Mile 19.0 to 16.0 ----- 3.0 Miles

TOTAL ---------- 25.6 Miles

4 areas – right bank
6 areas – left bank

Conditions that generated historic sediment loads and the natural sediment budget in the river have changed dramatically over time. Measured suspended sediment load of the Mississippi River has decreased significantly over the past half century. Whether the decrease will continue into the future and further impact land building capability is not known.

3.4 Mississippi River Resources Summary

The annual quantities of sediments available from the Mississippi River are significantly reduced from the quantities delivered by the river 50 to 60 years ago. Future rebounding in magnitude of annual supply of sediments is not a reasonable expectation. Plans to better utilize available Mississippi River resources should recognize:

- The maximum water available for simultaneous diversions is generally limited to 500,000 cfs in the winter, spring and early summer. Late summer and early fall will generally offer limited to no availability.
- The magnitude of water available for diversions along the river must consider that the total flow of the river at Head of Passes must be maintained at or above 250,000 cfs to control the salt-water wedge at Head-of-Passes.
- Multiple diversions from the river must be coordinated so that maximum benefit from the available sediment and fresh water is obtained.
- There should be much more diversion capacity built than can be diverted at any given time to allow pulsing and timing of the diversions for land building and habitat benefits.

- On average, there are about 94.3 million cubic yards of measured suspended sediments and an estimated 18 million cubic yards of unmeasured sediment load available for LCCPMP purposes. Suspended sediment can be captured and used by diversions. However, diversions must have deep intakes and be located in sediment rich areas of the river to divert the unmeasured bedload.
- The most effective way to utilize the bedload is by direct delivery/dredging or very large diversions near the mouth of the river.
- Plans that fail to utilize the resources of the Mississippi River will not accomplish a sustainable Louisiana coast

4.0 Formulation of Diversion Projects

4.1 Purpose and Scope

A significant quantity of sediment is being transported past the coastal zone of Louisiana by the present configuration and management of the Mississippi River. In order to address the land loss crisis, the Master Plan calls for the advancement of several diversion concepts that could have major impacts on the future of the management of the river system. The total management of the Mississippi River must achieve not only the Master Plan objectives, but also ensure that navigation on the River is uninterrupted, that the channel remains stable, and that municipal water supplies remain reliable.

The scope of this chapter is to identify processes that must be quantified when locating and sizing diversion projects, to identify the issues that must be addressed when establishing project features, and to propose approaches that will provide decision makers with information needed to make educated decisions about the safety, efficiency, reliability and cost effectiveness of the proposed diversion concept. This chapter addresses the technical issues of hydrology, hydraulics, sedimentation and geomorphology. Environmental and social aspects are other technical issues that must be considered during project formulation. The recommended design and operation of diversions must also adhere to the principles and objectives in the Master Plan.

4.2 Utilizing Riverine Resources for Ecosystem Restoration

In their report to the State of Louisiana, a study team from the University of New Orleans, Sogreah Ingenierie and Coastal Restoration Consultants states:

"The State of Louisiana Department of Wildlife & Fisheries has had good experience with small-scale uncontrolled sediment diversion projects of limited application in the Mississippi Delta off of Cubits Gap and Pass-a-Loutre." (Soileau, et al. 1997)

Perhaps the largest diversion of the Mississippi River is the Old River Control Structure (ORCS), located at the divergence of the Mississippi and Atchafalaya Rivers. This structure is operated to regulate the distribution of water between the two rivers south of the structure at 70% and 30%, respectively. This split has been determined to be most suitable for several reasons, including maintaining the Mississippi channel as the major distributary of river water, maintaining navigation in the Mississippi River and providing adequate municipal water supplies to New Orleans. With increased understanding of how vital the river's resources are to ecosystem sustainability, there is a great deal of interest in reviewing the possibility of altering this distribution to also accommodate ecosystem needs.

The Master Plan also proposes that many diversions of varying scale be located roughly between Donaldsonville and Venice to discharge fresh water, sediment, and nutrients into wetlands and shallow open water to the east and west of the lower Mississippi River. In concept they vary in size from a few thousand cubic feet per second to major diversions of the entire river. These diversions have been broadly categorized in the Master Plan as 'land sustaining' and 'land building'.

Although very large diversions are required for building new land, smaller diversions are also valuable for their ability to sustain existing wetlands. Some diversions may be uncontrolled. Others may be designed with features to allow for alteration of the discharge rate as desired to best meet objectives.

Two land sustaining diversion structures have been built in recent years to utilize Mississippi River water and sediment to manage salinities and combat annual wetland losses. One is on the east bank at Canaveron, and the other is at Davis Pond on the west bank. These projects are expected to help in the battle, but they are small relative to the land loss in the Mississippi delta. However, the existing diversions are relatively small compared to the historical loss of marsh.

As discussed in the previous chapter, the Mississippi River of today does not transport as much sediment as it did in times past, and the majority of sediments currently transported are being deposited beyond the Barataria and Breton Sound estuaries. East and west diversions of the flow into areas in great need of freshwater and sediments could reverse the annual wetland losses that are currently occurring and, over time, would restore areas that have been lost. The Master Plan calls for this major modification to the river by including diversions of the Mississippi River upstream from the present Bird's Foot Delta that are large enough to build new land. These measures will not replace the land sustaining diversions, but be in addition to them.

The precise sizes, locations, and operation of new diversions have not yet been resolved. These questions will be addressed during the feasibility studies, but the concept is to develop these new diversions based on needs in adjacent wetlands, on lessons learned from the existing diversions, and from guidance that is reported in the literature. Through analysis of alternative plans, it will be determined how best to portion out the river's resources between the Breton Sound basin to the east and the Barataria Basin to the west of the river.

With such extensive diversion of the Mississippi River into the marshes, mechanical measures would be needed to continue deep water navigation in the current river channel. Many alternatives will be explored and discussed with all affected parties to arrive at the best solution. One option would be to maintain navigation within the present route through Southwest Pass to deep water off the Continental shelf by utilizing a non – stop lock system. Potential also exists to increase the navigation depth of the Mississippi River to as much as 60 feet.

4.3 Current River Management

Currently the Mississippi River passes through New Orleans and extends southward approximately one hundred miles (100 miles) to the Head of Passes (HOP). At the HOP the flow of the river is divided into three channels: Pass a Loutre to the southeast; South Pass to the south and Southwest Pass to the west. Over the years deep water navigation has used Southwest Pass. To accommodate deeper draft vessels, Southwest Pass was confined with rock jetties and dredged to deeper depths. The current navigation depth is maintained at approximately 45 feet. Greater depths are authorized, but there are no efforts to provide those depths at this time. The navigation channel extends to deep water at the edge of the continental shelf.

The mainline levees of the Mississippi River have protected New Orleans and surrounding communities from river flooding for many years. They extend to Venice, Louisiana, on the west bank and to Pointe a la Hache on the east bank. In addition to the levees, the Bonnet Carre Spillway Structure and Floodway complex is used to divert excess floodwater into Lake Pontchartrain when the river flow exceeds 1,250,000 cubic feet per second.

4.4 Characteristics of Diversions

A diversion has two main components: The river side intake structure and the land side conveyance system. The basic characteristics of the diversions are their location and dimensions. The study team determined that the head needed for gravity transfer is available all along the Mississippi River,

"…however, the total effective length of a diversion canal is directly proportional to the seasonally available head for a given site." (Soileau, et al. 1997)

The primary design consideration is efficiency in diverting and transporting the water-sediment mixture.

The characteristics of diversions also include operational requirements. There will be years and seasons when the water discharge in the Mississippi River less than diversion requirements or when the water quality is not suitable for diversion objectives. During those times it may be desirable to control the diversion using gated structures.

There also may be cases where it is desirable to influence the sediment concentration in the diverted water. Such influence is possible, to some extent, by locating the diversion at geomorphological features that are known to influence the secondary current pattern in the water column. In the report on sediment transport by gravity flow, the study team made the following observation:

"In order to be efficient, the [diverted] flow must carry higher sand concentrations than that of the river flow. To achieve this, it is firstly important to locate the intake structure in a sediment-rich area. Secondly, the design of the intake structure must incorporate features that will help increase the sand intake of the diverted flow.

Artificially increasing the concentration of sediment can also be accomplished by locating the diversion channel close to areas where significant regular dredging activity exists. This would facilitate a controlled manner of injection of dredged sand into the diverted flow.

Sediment concentration can also be increased during the rising leg of flood flows by causing more intense sediment diversion at this time." (Soileau, et al. 1997)

4.5 Phases in Project Formulation

The process of transforming the general concepts of the Master Plan into operational projects is organized into four general phases. The first phase emphasizes the need, the possible alternatives to meet that need, and the most attractive of those alternatives to carry forward to the next phase. The second phase emphasizes the feasibility of developing the most attractive alternative into a project that meets the need. The third phase emphasizes the engineering studies that are needed to identify project features and determine their dimensions. The fourth phase is the preparation of plans and specifications for construction. This chapter mainly focuses on considerations for the first two phases of development of these projects.

Identification of the exact needs is critical to building the project that best addresses all concerns without unintended consequences. In order to ensure successful implementation of larger and more complex projects, more effort is needed in the first phase of alternatives analysis and, once constructed, more intensive monitoring

of project performance is required. Program implementation also must allow for adjustments to operations or even components as needed to ensure that projects perform as intended into the future. The approach to implementing the Master Plan allows for this adaptability.

River diversion projects are good examples of the need for staged formulation, and adaptability in implementation, because these projects are competing for the same, limited water and sediment resources. The allocation of these resources to one diversion project impacts the ability of the system to meet the demands of the other diversion projects as well as other demands on the river's resources, such as navigation and municipal water supplies. Consideration must also be given to both the positive and potential negative impacts to the areas receiving the riverine resources. While the purpose of such projects is to ensure sustainability of the ecosystem and landscape, potential consequences exist that must be acknowledged. Examples of potential consequences include shifts in ecosystem habitats and, thus, locations of commercially important fisheries; and potential degradation of water quality if increased nutrient concentrations in estuaries result in excessive algal blooms. Such potential consequences may be avoided or alleviated if they are recognized during planning and design phases of project development.

4.5.1 Identification of Alternatives

This phase begins by setting the specific goals of the projects that are consistent with the four objectives and principles of the Master Plan. In addition to the project alternatives, the no-action alternative will be analyzed. Computational sedimentation models will be needed to route the water-sediment mixture through the system of diversion projects. Also computational models that simulate the interaction between ships, tows and currents will be needed to study navigation issues. Land change and ecosystem models will also be employed to understand the potential impacts (both desirable and unintended) to the receiving area.

4.5.1.1 Boundaries of Study Area

The geographic area that encompasses all of the proposed diversions, as well as the existing natural diversions in the Bird's Foot delta and the existing manmade diversions along the river, are within the study area. They will function as a system and must be analyzed as such.

The limits of the study area must be outside all components in the system. It is purposed that the upstream limit of the study area will be at the Tarbert Landing Gage. This gage is located at River Mile 306.3 above Head of Passes. The downstream end will include the entire Bird's Foot delta and extend sufficiently far into the Gulf of Mexico to reach geometric and hydrodynamic conditions that will not be altered by processes in the Mississippi River Delta over the next 100 years.

Since multiple diversion sites will add flow to the marsh on each side of the river, one discharge will affect the base level energy at other diversion sites. A change in base level energy at a site that is due to the interaction between that flow and the flow from other diversion sites will affect the diversions at both sites. This creates a feedback loop that must be included in the diversion computations. Therefore, the lateral limits of the system will include the marsh side of each diversion as well as the river side. It will terminate where the diverted water flows into the Gulf of Mexico.

4.5.1.2 The No-Action Alternative

Under current conditions, a portion of the water-sediment mixture flowing in the present Mississippi River channel is already diverted out of the lower portion of the river in the vicinity of the Bird's Foot Delta. These

diversions are into distributaries - natural openings - that have formed in the banks of the present river channel. Water and sediment is diverted to the east through Baptiste Collette Bayou, Cubits Gap, and Pass a Loutre. Flow and sediment are diverted to the west through Grand Pass and Southwest Pass. South Pass conveys a significant portion of the water and sediment. The final diversion point, RM 0, is located at Head of Passes. These natural diversion points are listed in the following table. The location in River Miles above Head of Passes (AHP) is shown in the following table.

Table 9. Natural Diversion Channels in the Mississippi Delta

Diversion to East	AHP
Baptiste Collette Bayou	RM 12.4
Cubits Gap	RM 11.4
Pass a Loutre	RM 0
Diversions to West	AHP
Grand Pass	RM 10.5
Southwest Pass	RM 0
Diversions to South	AHP
South Pass	RM 0

Technology is available to measure the water discharge leaving the main channel. It is more difficult to measure the sediment discharge. An early task will need to be to allocate the percentage of water and sediment yield through each of the distributaries in the existing Bird's Foot Delta. The fraction of sand, silt and clay in the sediment mixture will have to be determined for each distributary. The fate of this sediment - i.e. how much must be dredged; how much will deposit on either side of the conveyance channel; how much will be added to the littoral drift; and how much is actually transported off the continental shelf, will be determined. Sedimentation processes refer to the erosion, entrainment, transportation, deposition and compaction of sediments. (ASCE, 1977) Sedimentation processes are sensitive to the size of sediment particles in motion. In some river morphology studies, it is possible to reach conclusions by analyzing only the bed material. However, in this study it will be important to analyze the full range of particle sizes in transport. These range from clay to sand. In addition to these inorganic sediments, these studies must also include the contribution that organic sediments and nutrients make to the ecosystem. Computer simulations will be needed to quantify the sedimentation processes over long periods of time. Existing work will be reviewed to determine what has been done to date and to recommend what actions are needed to complete this evaluation.

Next, that distribution will be projected for 100 years into the future. After the historical system and future without further action scenario is understood, the analysis can move into the more abstract realm of the Master Plan diversions.

4.5.1.3 Alternative Plans

Once existing conditions have been characterized, the work can begin to identify the best locations in the river to site diversions with consideration for sediment availability at various locations on the river, targeted receiving area, channel stability, navigation, and other issues associated with maintaining the critical services.

Decisions on siting, sizing, and operation of the diversions will be an iterative process. This will include analyses of effects of the diversions, working as a system, on the four Master Plan objectives. Analyses will include impacts to fisheries, water quality, and other ecosystem and societal concerns; testing operational alternatives to best balance ecosystem and societal needs; potential for flooding consequences to communities; navigation impacts; and other concerns identified earlier in the planning phase.

Hydrology, hydraulics and sedimentation processes in the diversions will also be investigated. These analyses will start with preparing a preliminary design of the outflow structure and the conveyance channel for each diversion. Then the capability of the design to supply the water and sediment to the receiving area will be tested in a computational sedimentation model.

The discharge rates into all diversion structures would need to be computed. Computations will include hydraulic parameters of velocity, depth, width, slope and roughness in the outflow channels, and computation of the sedimentation processes that are produced by those hydraulic parameters. This computational analysis requires short time-intervals. An acceptable resolution is expected to be mean daily water discharges. Historical records are available at Tarbert Landing for developing hydrographs of mean daily flows.

In their report on the transport of sediment by gravity, the study team presented several issues to consider in the design of the conveyance canal located downstream of the intake structure *(Soileau et al. 1997).*

"…assure that the average energy gradient (energy line) maintains the given particle sizes of sand in suspension over the design length of the channel."

"…design the channel dimensions and geometry according to the local soil conditions to assure reasonable stability against erosion from the expected flow velocities"

"…for small canals, protect channel side slopes wherever possible with locally available natural material, such as stiff clay; for larger canals, protection should consist of a layer of granular or crushed bedding material large enough to prevent side slope degradation."

"…for short and small channels, build sheet-pile sides; such designs may be used in areas with low soil strength for channels branching out of the main channel."

"…due to the eventual cost of side slope protection for large canals, the use of T-groins (constructed with an appropriate combination of: sheet pile, rockfill, clay and landfill) spaced approximately twice the width of the channel (at the water surface) should be considered."

The annual water yield and sediment yield for the Mississippi River are necessary to create the preliminary design, but they are not sufficient for sizing and locating the diversion structures. A mean daily water discharge

hydrograph will need to be formed from the historical records. The sediment concentrations in, and water temperature of, those mean daily water discharges will be developed from historical records, also. The elevation of the Gulf of Mexico at the downstream boundary of the model will be developed from concurrent records at gages in the Gulf of Mexico. These four hydrographs are the boundary conditions that are needed to route the water-sediment mixture from Tarbert Landing to the Gulf of Mexico. Each hydrograph will be 100-years long. Not only will the routing provide water and sediment in the water column, but also it will compute changes to the cross sections along the river and to cross sections in the marsh due to sedimentation processes.

The water and sediment discharges that the river can deliver may then be computed for potential diversion structures by routing the water and sediment discharges from Tarbert Landing to the Gulf of Mexico. This computation will require a short interval time step. It will provide the heads and discharges at each diversion structure. The model will include the land side of the system as well as the river side.

Multiple iterations will be required to arrive at satisfactory sizes and locations of the diversion structures. However, the result of this analysis will be the range of flows, heads and water surface elevations at each structure. Additional iterations will be required to analyze the potential of operating structures in a pulse mode or time intervals to accommodate other ecosystem or cultural objectives.

The next step is to modify the boundary condition hydrographs for future conditions and repeat the routing computations. The Gulf Elevation Hydrograph would be modified to include sea level rise. The water discharge hydrograph of flows at Tarbert Landing would be modified to reflect the water runoff predicted for the next 100 years. The inflowing sediment concentration and water temperature hydrographs would be changed to future predictions. The simulation will be run again with these predicted future hydrographs, and the computed diversion hydrographs will be compared to the target hydrographs.

In total, the analyses conducted for this study must reveal the potential for the diverted flow to adversely impact existing land forms, existing land uses, existing infrastructure and other diversions. Each of these potential conflicts must be resolved in order to implement the diversions.

The Master Plan also includes the existing, authorized levels of flood protection and navigation. One of the engineering challenges is to blend navigation into the land-building diversions. This is such a significant issue that an entire section of this appendix is devoted to it. Several significant issues are presented. These will be addressed in the first phase of project formulation.

4.5.2 The Determination of Feasibility

This study will address multiple issues. 1) Is it feasible to get sediment out of the river and into the diverted water; 2) is it feasible to restore/create marsh with this diversion; 3) what will be the ecosystem effects of operating diversions; 4) what will be the impacts to local and regional culture, including businesses dependent upon fisheries and navigation. None of these issues can be left to chance.

The diversions must meet the expectation for marsh creation and restoration subject to the existing requirements for flood protection and land use. An engineered solution will be required to ensure that these diversions do not cause flooding or other unintended consequences to existing land use or infrastructure.

Each diversion project can be analyzed separately during this phase because the interaction issue will be known from the system study in the first phase. The range of design heads, stages and durations will be provided by the

system study. The level of study that is required will be simpler for the small projects than it is for the land building diversions. Because of its complexity, a section is devoted to the land building diversions below.

4.5.3 General Design Studies

The design phase will refine the siting, the hydraulic and structural design, and the operation and maintenance procedures for the diversion projects. Siting refers to the details for locating the structures relative to geological, geotechnical and geo-morphological features. The study team reported:

"Future sediment diversion projects will require careful site selection studies involving field verifications and detailed physical and numerical modeling."

Refining hydraulic design features will require physical model studies. Those studies will refine the project features to accommodate local hydrodynamics and sedimentation processes in the river, and they will refine the size and shape of the diversion structures so the river sediment is diverted to the marsh.

4.5.3.1 Land Building Diversions

The land building diversions will be included in first phase of project formulation along with the other diversions. However, it is such a large undertaking that special consideration is given here for the other studies that will be required.

4.5.3.2 Water Budget

Because all of the diversions act collectively as a system, the land building diversions will have significant impact on all the other diversions. Reference is made to Table 4, chapter 3 of this appendix, Mississippi River Tarbert Landing Discharge-period of record 1930-2005. The Tarbert Landing gage and discharge range is located downstream from the inflow channel for the Old River Auxiliary Structure. It represents the most downstream station for long term flow and sediment data for reach of river from Old River to the Gulf which includes New Orleans.

Table 1of this Appendix shows a breakdown of the monthly discharges at Tarberts Landing for the same period of record (1930-2005). For the month of January the minimum discharge in the period of record for that month was 120,000 cfs, the average discharge for that month in the period of record was 520,000cfs and the maximum discharge for that month in the period of record was 1,240,000 cfs. The same data is shown for each month. The largest discharges can be expected in the months of January, February, March, April and May. The lowest months are August and September.

Under average conditions the supply of freshwater is sufficient for the metropolitan area of New Orleans and surrounding communities. However, in 1988 droughts in the upper Mississippi River basin reduced river discharges to a point that the freshwater supply for New Orleans was endangered. As a result of this experience it was determined that a minimum discharge of 250,000 cfs at the Head of Passes allows saltwater to begin to proceed up river moving along the river bottom under the freshwater flow. The number of diversions, the design discharges and the time of expected use should be planned in such a manner as to avoid reducing total discharge of the river to this critical value at any time. Development of the sizing, design, and operation of the major diversions must include an analysis of the salt water interface to insure that unintended consequences will not occur.

4.5.3.3 Sediment Budget

Sediment load denotes the material that is being transported, and it can be divided into bed load and suspended load. The annual total measured suspended loads reported at Tarbert Landing, just downstream of the Old River Auxiliary inflow channel and tabulated in Table 4, chapter 3 of this appendix demonstrates that the measured suspended load does include sand, but it is primarily classified as silt. The unmeasured load would be primarily sand and cannot be reliably measured. The bed load material is estimated and generally expressed as a percentage of the measured suspended load. The percentage is generally reported ranges from 15 to 25 percent of the total measured suspended load. (Soileauil et al., 1997) Using the last 14 years of reported annual total measured suspended load in Table 4 (water years 1990-91 thru 2003-04, a period of 14 years) the average annual measured suspended load was 136,675,000 tons/year. Using the above range, the average unmeasured bed load is computed to be between 20,000,000 (15%) and 35,000,000 (25%) tons per year of unmeasured bed load sediment. Include the unmeasured bed load, and the total sediment delivered to the marsh could be between 156,675,000 and 171,675,000 tons/year.

Assuming an average of 164,175,000 tons of sediment per year, land building potential could be as much as 118 square miles per year assuming a specific weight of 100 lbs/ft^3 for the sediment and a 1-foot, uniform deposition. This does not take into account consolidation or the fact that as much as 1/3 of the sediment load could be clay particles which do not settle readily. Therefore, the reality is the annual rate of land building under the conditions described could be reduced to 2/3 of the square miles stated.

4.5.3.4 Non-Stop Navigation System

In concept, the non-stop navigation system will consist of an upstream lock complex and a downstream lock complex. Two independent channels will connect the upstream and downstream lock complexes. These channels will be immediately adjacent to each other. One lock and channel system will be used by down bound ships and the other will be by up-bound ships. The strategy of two systems is to permit two way traffic without stoppages. Towboats, crewboats, etc. can more easily push into the bank and wait if it is necessary, but it is difficult for downbound ships to pull over and wait. It is believed that the dual system will be safer and more reliable than a single channel system. Also, it may be possible to provide a deeper navigation channel than can be maintained in the existing navigation project.

The non-stop navigation system should be located adjacent to the existing river channel and operational prior to opening or operating the two diversions upstream. As currently envisioned, the diversions would be controlled, and should be operational at the same time as the navigation locks.

4.5.3.5 Operations & Maintenance

The plan should include elements that initiate periodic inspections, describe operational and maintenance procedures, and provide for the disposal of dredged material in the marshes to extend their development beyond the immediate proximity of the diversion channel. The developing deltas should be monitored annually and channels extended as necessary to keep the marsh and delta building process going out into the coastal area.

4.6 System-wide Considerations

There are significant unknowns and risks in a planning and design effort of this complexity and magnitude. Some of the significant issues to be addressed are:

a. The study must have adequate data collected over a sufficient period of time.

b. The sedimentation processes must be understood and adaptively managed to maximize the potential for land building.

c. Salinity will be altered dramatically. The environmental and physical impacts of the dynamic salinity levels must be clearly understood and managed.

d. The existing Bird's Foot Delta may deteriorate rapidly once the land building diversions are implemented. These changes and losses must be anticipated.

e. The barrier islands are key to trapping efficiency of the diversions. The barrier islands and the openings between them will have to be maintained to preserve the sedimentation trapping in the marsh.

f. Currently, the nutrient rich waters of the Mississippi River cause a hypoxic zone in the Gulf of Mexico. Nutrient uptake in the marshes will be essential to reducing the hypoxic zone offshore and ensuring that water quality is not compromised inshore.

g. Diverting the total flow of the Mississippi River will have tremendous impacts on existing infrastructure, historically habitated areas, and the environment. All must be clearly understood and addressed during feasibility analyses.

h. Creating a slack water channel will change the nature of sedimentation problems in the navigation channel.

5.0 Conclusions

For over 12,000 years people have lived, worked and played in Louisiana, leaving their mark on the landscape. Access to the coast, for reasons of proximity to natural resources and facilitating long-distance trade, has continued to drive historic and modern decisions in Louisiana regarding community location. This included the 1718 founding of the city of New Orleans at the location of the portage between the Mississippi River and Lake Pontchartrain, along Bayou St. John.

Nationally important industries are located on the coast and major waterways. These include the production of oil and gas, offshore oil and gas exploration, development and transport; shipbuilding and other manufacturing of transportation equipment; petroleum and chemical refining; and water-borne transportation, as well as seafood production and harvest. Today, nearly 9,300 miles of oil and gas pipelines cross the wetlands of coastal Louisiana (USACE 2004). The network of associated energy facilities produces or transports nearly one-third of the nation's oil and gas supply, and is tied to 50% of the nation's refining capacity (DNR 2006). Additionally, 80% of the nation's offshore domestic oil and gas supply is transported through coastal Louisiana. Coastal Louisiana also supports intermodal transportation that is critical to the viability of the nation. Five of the busiest cargo ports in the United States, ranked by total tons, are located here, handling approximately 19% of the annual U.S. waterborne commerce (USACE 2003).

Louisiana is known as "Sportsman's Paradise" for the diverse habitats found along its coast, which in turn support a vast diversity of fish and wildlife species. Louisiana is by far the nation's largest shrimp, oyster, and blue crab producer and provides 26% (by weight) of the commercial fish landings in the lower 48 states. In fact, Louisiana is second only to Alaska in annual volume of seafood landings. According to National Oceanography and Atmospheric Administration reports (US Department of Commerce 2004; US Department of Commerce 2005), three of the nation's top seafood ports by volume are in Louisiana. Coastal Louisiana's wetlands also provide stopover habitat for millions of threatened and endangered neotropical migratory birds, and more than five million migratory waterfowl. These natural resources provide the state with vital jobs to support the commercial and recreational industries, and the nation with valued seafood.

What is more difficult to quantify is the richness of Louisiana's culture, a richness in part driven by the history that is present throughout the state. Perhaps because New Orleans was an early center of international trade, Louisiana has a rich and diverse heritage. Louisiana residents today include, in addition to a continuing strong Native American presence, descendants of European, African and Asian cultures. All of these cultures have made a direct recognizable contribution to Louisiana culture. What is unique about Louisiana and particularly coastal Louisiana is not that it has a distinct culture, but that what is regarded as "Louisiana culture" is one that is not homogenous (Spitzer 1985). Like gumbo itself, south Louisiana's culture is made up of diverse ingredients from all parts of the world, each retaining its individual identity and flavor, but coming together to make a distinctive dish with its own immediately recognizable identity. It is this indefinable richness that has made tourism such an important contributor to Louisiana's economy, whether this richness comes from historic architecture, food, music, language or culture. According to the Louisiana Department of Culture, Recreation & Tourism over $4.4 billion of visitor spending in Louisiana in 2004 was from New Orleans and Lake Charles. Where coastal Louisianans live, work, and play, is part of their identity. Sustaining Louisiana's coastal culture is dependant on sustaining Louisiana's coast.

However, this unique region is under extreme threat. With the arrival of the European settlers came major changes to the natural landscape to create more stable and safe living conditions in this naturally dynamic region. Alterations included construction of levees to render this system even more suitable for habitation, efficient for

navigation, and agriculturally productive. Additional physical changes to the landscape and the disruption of the land-building and sustaining processes came with the initiation of oil and gas exploration. There are also 10 major navigation canals in coastal Louisiana. While they serve to transport goods through and out of Louisiana, they also allow for saltwater to intrude into and degrade freshwater wetlands

Consequently, although the coastal Louisiana ecosystem contains 30 percent of the coastal marsh in the contiguous United States, it suffers 90 percent of the total coastal marsh loss. The human alterations to the ecosystem interact with natural factors to create the land loss crisis facing Louisiana's coastal zone today. Causes of loss can be divided into direct causes, such as canal construction, erosion caused by storms or ship wakes, and herbivory; and system-wide disruptions to long-term sustainability, that include subsidence, sea level rise, levee construction, and agricultural practices in the basin and channel stabilization practices along the river. These have reduced the sediment load the Mississippi River delivers within coastal Louisiana.

The storms of 2005 called out another extreme vulnerability to the long-term viability of coastal Louisiana – that of the inadequacy of hurricane protection measures in this fragile region. Hurricanes Katrina and Rita caused severe damage to over 200,000 homes, and one year after the storm approximately 440,000 Louisiana citizens were still displaced from their homes. The Congressional Budget Office estimated that losses of physical capital totaled between $70 and $130 billion. Approximately 45% of these losses involved business structures or equipment, including resources owned by national concerns.

This leaves Louisiana’s citizens with an interesting dilemma: how do we protect our communities and nationally significant infrastructure while also providing for the long-term sustainability of the ecosystem? Levees are a crucial aspect of providing for a sustainable coast, given that many south Louisiana communities are situated in the delta plain of one of the world’s major rivers, and are subject to relatively high wave energy and storm surge levels due to their proximity to deep waters of the Gulf of Mexico. Many of these communities are historic and integral to the delivery of essential services to the nation, but they would not exist without levees. In recognition of the need for structural protection, levees are recommended in high risk areas that must be protected to avoid severe consequences for the state and nation.

Yet, as traditionally constructed, levees are in conflict with the need for a healthy ecosystem. Mineral sediment input to Louisiana's coast has decreased in recent decades because of the Mississippi River & Tributaries project that has been very effective in meeting its goals of providing flood control to communities and channel stabilization for safer navigation. This levee system is critical for the continued inhabitance of many portions of the Mississippi River flood plain, including coastal Louisiana, and for the sustainability of many economic services that this region provides to the Nation. But by preventing overbank flooding and crevassing of the Mississippi River, the surrounding wetlands are now largely deprived of the mineral sediment, freshwater, and nutrients required for offsetting subsidence and sea level rise. Although the negative impacts of levees on ecosystem health and sustainability have been documented, levees are an essential to the survival of communities that exist in this naturally subsiding delta plain.

This presents the science and engineering community with the challenge of advancing technology to ensure that new levee designs allow for hydrologic exchange across these barriers, allowing for the sustainability of wetlands on both sides of the levees. The coastal landscape – comprised of barrier islands, Chenier ridges, saline, brackish and fresh marsh habitat, and healthy forested wetlands – and the levee protection of infrastructure and communities that supply the workforce for these industries must co-exist to ensure that the risk from storm damage and supply disruption of these nationally important resources is minimized. For these reasons and more, this region must be sustained for the well being of the state and the nation.

In order to restore the ecosystem of coastal Louisiana to a self-sustaining environment, near-term solutions to address immediate needs must be merged with long-term goals to reach system sustainability. To enhance the health and integrity of the coastal Louisiana ecosystem, the altered processes must be restored by mimicking to the extent possible the natural processes of a sustainable coast. To restore disconnected and modified hydrologic linkages, regional water management options should reconnect and maintain linkages to sediment and nutrient delivery to interior wetlands while reducing sediment loss to offshore environments. Regional water flow patterns should be restored and maintained by mimicking natural process and cycles, minimizing the impact of artificial waterways. Reduced sediment input should be corrected by the delivery of new sediments to coastal basins using a combination of river diversions and pipeline conveyance of dredged sediment. Additionally, the redistribution of sediments via long-shore currents and redistribution of water using the GIWW and other navigation channels both contribute to rebuilding and maintaining the coastal landscape.

To allow the past and current degradation of Louisiana's coastal landscape to continue unchecked into the future would have significant ecological, societal, and economic impacts on the region and the Nation as tremendous resources supported by the coastal zone are put at risk. But by taking these steps to restore the process of a sustainable coast, an estuarine gradient and landscape features will be maintained to support an array of habitats for associated plants and animals, including resident and migratory bird communities. Through restoration projects that are of sufficient scale to sustain and expand a variety of coastal landscape features and integrity, a sustainable environment can be maintained that integrates the function of the ecosystem as well as the complex needs of the working coast.

Integrated Ecosystem Restoration and Hurricane Protection: Louisiana's Comprehensive Master Plan for a Sustainable Coast

Appendix E: Hurricane Surge Evaluations

Coastal Protection and Restoration Authority of Louisiana

April 2007

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1.0 Introduction

In the development of the Comprehensive Coast Protection Master Plan it is vital to have an appreciation of the levels of storm surge flooding risk to coastal Louisiana. For planning purposes, modeling of storm surge propagation for a number of hypothetical hurricane events and paths is one of the most effective methods to estimate surge levels to develop the storm protection strategy.

As part of plan appraisal, both the economic analysis and the selection of levee heights require information on water surface elevations resulting from the hurricane event. Four different processes must be considered in arriving at those elevations. They are:

1) The maximum hurricane-surge water surface elevation for a given annual reoccurrence interval;
2) The wave heights superimposed on surge elevations;
3) Interior flooding elevations due to rainfall-runoff inside of the protected area; and
4) The flood runoff hydrograph entering the protected area from the watershed upstream.

The economic analysis depends on all four of these processes. The hurricane protection levees are dominated by the first two.

The remainder of this Appendix describes the origin, processing and outputs of the hurricane surge data used in developing the Master Plan. Section 2 describes the raw data used for this analysis. Section 3 then sets out the refinements made to the data. Section 4 presents the assessment of CASE1 and CASE2 data. The rationale behind the choice of the final datasets used for the surge analysis is given in Section 5. Section 6 describes the maximum surge elevation outputs from the data. Sections 7 through 9 describe the wave and interior flooding analyses, extrapolation of the results, and the link to the economic analysis undertaken using these results. Section 10 addresses uncertainty in the results.

2.0 Data Source

The New Orleans District of the USACE provided water surface elevations for hurricane events based upon preliminary computational modeling studies provided to CPRA-IPT. The hurricane surge elevations were computed using the Advanced CIRCulation (ADCIRC) computer program (Luettich, Westerink, and Scheffner, 1992). Two datasets were provided, entitled CASE1 and CASE2, representing two complete sets of hurricane surge predictions for a number of event probabilities.

The ADCIRC results contained only surge height elevations. Hypothetical events YR5SURGE through YR500SURGE give the maximum surge height across the state, where YR5 and YR500 correspond to the annual probability of 2.0 percent and 0.2 percent, respectively, that the height will be equaled or exceeded. The historical events give surge heights along the historical tracks. Although these specific cases are not described by name in the documents, the general procedures for surge and wave computations were given in Enclosure F of the US Army Corps of Engineers Report to Congress (USACE, 2006) and in the draft of a report being prepared for the New Orleans District by the Engineering Research and Development Center (ERDC DRAFT, July 2006). According to the ERDC draft report:

"The ADCIRC numerical model was chosen for simulating the long-wave hydrodynamic processes in the study area. When imposing the wind and atmospheric pressure fields, the ADCIRC model can accurately replicate tide induced and storm-surge water levels and currents. The ADCIRC model was developed in the USACE Dredging Research Program (DRP) as a family of two- and three-dimensional finite element-based models (Luettich, Westerink, and Scheffner 1992; Westerink et al. 1992). An important[feature] of the model is that it can simulate tidal circulation and storm-surge propagation over very large computational domains while simultaneously providing high resolution in areas of complex shoreline configuration and bathymetry.

In two dimensions, the model is formulated using the depth-averaged shallow water equations for conservation of mass and momentum. Furthermore, the formulation assumes that the water is incompressible, hydrostatic pressure conditions exist, and that the Boussinesq approximation is valid."

The difference between CASE1 and CASE2 is the length of record used in the statistical analysis (Personal communication with Mr. Carl Anderson, MVN-PM). The CASE1 study utilized storms from 1893 to 2005. The CASE2 period of record was extended backward to 1853.

The storm parameters for both CASE1 and CASE2 hurricane surges were computed using the "Empirical Simulation Technique" (EST) (ERDC DRAFT, July 2006). According to the Coastal and Hydraulics Lab, ERDC, Vicksburg, MS, "This technique assumes [that] the best information is local to the site and utilizes historical storms in the computation. EST uses re-sampling/bootstrap methods to estimate variability (non-parametric), and it uses hypothetical storms to help smooth effects from single large storms in the data set (judgment). EST can accommodate coupled wave-surge models since typically only a small set of events is needed for the computation." ("Estimating Storm Frequency," *Hurricane Protection Design Workshop*, December 20-21, 2005, USACE 2006, Appendix E). Appendix B in the ERDC DRAFT (July 2006) summarizes the Empirical Simulation Technique as follows:

"The Empirical Simulation Technique (EST) or the extended "bootstrap" approach is a statistical resampling, nearest neighbor, random-walk interpolation technique that uses historical data to develop joint probability relationships among the various measured storm parameters. There are no simplifying assumptions concerning the development of probability density functions describing historical events. Thus, the interdependence of

parameters is maintained. In this manner, parameter probabilities are site specific, do not depend on fixed parametric relationships, and do not assume parameter independence. Thus, the EST is distribution free and nonparametric. The EST was first developed to model multi-parameter events such as tropical hurricanes, in which storms can be described in terms of defined storm parameters such as central pressure deficit, radius to maximum winds, maximum winds, minimum distance from the eye of the storm to the location of interest, forward speed of the eye, and tidal phase during the storm event. The extratropical storm events (westerlies) modeled during this study are not well represented by such a parameterization and as such the one-dimensional version of has been adopted. A complete description of the EST may be found in Scheffner and Borgman (1992), Borgman et al. (1992) and Scheffner et al. (1999).

The only assumption in the EST is that future events will be statistically similar in magnitude and frequency to past events. The 1D EST begins with an analysis of historical events that have impacted the region of interest. Fort each event, a storm response is defined for which a frequency-of-occurrence analysis is performed. In the present application, the response is the maximum water-surface elevation induced by the storm, which includes the storm surge computed via ADCIRC, the additional water level increases due to atmospheric pressure (inverted barometer), and the tides. Implementation of the 1D EST begins with the selection of a subset of storm events that is representative of the entire set of historical storms. This subset is referred to as the "training set." The training set usually includes historical events but may include historical storms with a deviation or perturbation, such as a storm with a slightly altered path. Some historical events may also be deleted from the training set if two events are nearly identical such that both would produce the same response. Because the purpose is to fill the parameter space, two similar events are redundant. The training set can be augmented with additional storms contained in the historical data set. Storm events augmenting the training set are referred to as the "statistical set" of storms. Whereas numerical models are used for generating response vectors for those events in the training set, response vectors for the statistical set of storms are interpolated using the training set response vectors. Thus, stage-frequency relationships can be generated using the entire historical data set without need of simulating all storms in that data set."

The hypothetical storms having a probability greater than 1 percent of being equaled or exceeded in any given year were not used in the CPRA-IPT analysis for the following reasons. First, the Federal Emergency Management Agency (FEMA) would not certify levee protection for these more probable events. Secondly, existing levees prevent the higher probability events from damaging concentrated assets. The two storm events that were used in the comparison of CASE1 and CASE2 are listed in Table 2.1.

Table 2.1. Storm Surge Events Considered in this Analysis

Data Set	Probability
CASE1-100yr	1 percent chance that surge height will be equaled or exceeded in any given year
CASE1-500yr	0.2 percent chance that surge height will be equaled or exceeded in any given year
CASE2-100yr	1 percent chance that surge height will be equaled or exceeded in any given year
CASE2-500yr	0.2 percent chance that surge height will be equaled or exceeded in any given year

The CASE1 and CASE2 surge elevations are for existing conditions. The features in the preferred plan are not included in these computations.

2.1 Hurricane Surge Parameters for ADCIRC

The ADCIRC analysis for CASE1 and CASE2 was based on a set of historical storms and a set of hypothetical storms. (Mr. Jay Ratcliff, USACE New Orleans) Mr. Ratcliff provided the list of the historical storms, the set of hypothetical storms and the following brief statement about their approach.

2.1.1 Historical Storms

The historical storms are listed in Table 2.2. The parameters that ADCIRC needed are 1) maximum wind speed, 2) central pressure, 3) forward speed, 4) radius to maximum wind, 5) angle of eye at nearest approach to landfall and 6) tide. The tracks and surge parameters for the historical storms were taken from the HURDAT data base. Table 2.3 shows the data in the data base for Hurricane Andrew.

Table 2.2 Historic Storms

Storm Number	Year	Month	Day	Name	Storm Number	Year	Month	Day	Name
322	1893	10	2	no name	934	1969	8	18	Camille
371	1900	9	9	no name	965	1971	9	16	Edith
381	1901	8	15	no name	966	1971	9	4	Fern
444	1909	7	21	no name	984	1973	9	4	Delia
448	1909	9	20	no name	993	1974	9	8	Carmen
473	1915	8	17	no name	1019	1977	9	5	Babe
476	1915	9	29	no name	1037	1979	7	11	Bob
477	1916	7	5	no name	1041	1979	9	13	Frederic
493	1917	9	28	no name	1071	1982	9	11	Chris
494	1918	8	6	no name	1074	1983	8	18	Alicia
503	1920	9	22	no name	1094	1985	8	15	Danny
538	1926	9	21	no name	1095	1985	9	2	Elena
572	1932	8	13	no name	1100	1985	10	31	Juan
586	1933	8	3	no name	1103	1986	6	26	Bonnie
659	1940	8	7	no name	1121	1988	9	10	Florence
667	1941	9	23	no name	1129	1989	8	1	Chantal
723	1947	9	19	no name	1136	1989	10	16	Jerry
733	1948	9	4	no name	1161	1992	10	28	Andrew
824	1956	9	24	Flossy	1218	1997	7	27	Danny
827	1957	6	27	Audrey	1286	2002	9	27	Isidore
860	1960	9	15	Ethel	1289	2002	8	4	Lill
896	1964	10	4	Hilda	1332	2005	8	29	Katrina
901	1965	9	10	Betsy	1338	2005	9	24	Rita

Table 2.3: Data in Hurdat for Hurricane Andrew (1)

Month	Day	Hour		Lat.	Long.	Dir		Speed				Wind				Pressure		----------Type----------	
August	16	18	UTC	10.8N	35.5W	--	deg	--	mph	--	kph	30	mph	45	kph	1010	mb	Tropical Depression	
August	17	0	UTC	11.2N	37.4W	280	deg	21	mph	35	kph	35	mph	55	kph	1009	mb	Tropical Depression	
August	17	6	UTC	11.7N	39.6W	285	deg	25	mph	40	kph	35	mph	55	kph	1008	mb	Tropical Depression	
August	17	12	UTC	12.3N	42.0W	285	deg	27	mph	44	kph	40	mph	65	kph	1006	mb	Tropical Storm	
August	17	18	UTC	13.1N	44.2W	290	deg	25	mph	40	kph	40	mph	65	kph	1003	mb	Tropical Storm	
August	18	0	UTC	13.6N	46.2W	285	deg	23	mph	37	kph	45	mph	75	kph	1002	mb	Tropical Storm	
August	18	6	UTC	14.1N	48.0W	285	deg	20	mph	33	kph	50	mph	85	kph	1001	mb	Tropical Storm	
August	18	12	UTC	14.6N	49.9W	285	deg	21	mph	35	kph	50	mph	85	kph	1000	mb	Tropical Storm	
August	18	18	UTC	15.4N	51.8W	295	deg	23	mph	37	kph	50	mph	85	kph	1000	mb	Tropical Storm	
August	19	0	UTC	16.3N	53.5W	300	deg	20	mph	33	kph	50	mph	85	kph	1001	mb	Tropical Storm	
August	19	6	UTC	17.2N	55.3W	300	deg	21	mph	35	kph	50	mph	85	kph	1002	mb	Tropical Storm	
August	19	12	UTC	18.0N	56.9W	300	deg	19	mph	31	kph	50	mph	85	kph	1005	mb	Tropical Storm	
August	19	18	UTC	18.8N	58.3W	300	deg	17	mph	27	kph	50	mph	85	kph	1007	mb	Tropical Storm	
August	20	0	UTC	19.8N	59.3W	315	deg	14	mph	24	kph	45	mph	75	kph	1011	mb	Tropical Storm	
August	20	6	UTC	20.7N	60.0W	325	deg	12	mph	20	kph	45	mph	75	kph	1013	mb	Tropical Storm	
August	20	12	UTC	21.7N	60.7W	325	deg	12	mph	20	kph	45	mph	75	kph	1015	mb	Tropical Storm	
August	20	18	UTC	22.5N	61.5W	315	deg	11	mph	18	kph	45	mph	75	kph	1014	mb	Tropical Storm	
August	21	0	UTC	23.2N	62.4W	310	deg	11	mph	18	kph	50	mph	85	kph	1014	mb	Tropical Storm	
August	21	6	UTC	23.9N	63.3W	310	deg	11	mph	18	kph	50	mph	85	kph	1010	mb	Tropical Storm	
August	21	12	UTC	24.4N	64.2W	300	deg	10	mph	16	kph	60	mph	95	kph	1007	mb	Tropical Storm	
August	21	18	UTC	24.8N	64.9W	300	deg	8	mph	12	kph	60	mph	95	kph	1004	mb	Tropical Storm	
August	22	0	UTC	25.3N	65.9W	300	deg	11	mph	18	kph	65	mph	100	kph	1000	mb	Tropical Storm	
August	22	6	UTC	25.6N	67.0W	285	deg	11	mph	18	kph	75	mph	120	kph	994	mb	Hurricane - Category 1	
August	22	12	UTC	25.8N	68.3W	280	deg	12	mph	20	kph	90	mph	150	kph	981	mb	Hurricane - Category 1	
August	22	18	UTC	25.7N	69.7W	265	deg	13	mph	22	kph	110	mph	175	kph	969	mb	Hurricane - Category 2	
August	23	0	UTC	25.6N	71.1W	265	deg	13	mph	22	kph	125	mph	205	kph	961	mb	Major Hurricane - Category 3	
August	23	6	UTC	25.5N	72.5W	265	deg	13	mph	22	kph	150	mph	240	kph	947	mb	Major Hurricane - Category 4	
August	23	12	UTC	25.4N	74.2W	265	deg	17	mph	27	kph	165	mph	270	kph	933	mb	Major Hurricane - Category 5	
August	23	18	UTC	25.4N	75.8W	270	deg	16	mph	25	kph	175	mph	280	kph	922	mb	Major Hurricane - Category 5	
August	23	21	UTC	25.4N	76.6W	270	deg	16	mph	25	kph	160	mph	260	kph	923	mb	Major Hurricane - Category 5	*** Eleuthera, Bahamas
August	24	0	UTC	25.4N	77.5W	270	deg	17	mph	27	kph	145	mph	230	kph	930	mb	Major Hurricane - Category 4	
August	24	1	UTC	25.4N	77.8W	270	deg	17	mph	27	kph	150	mph	240	kph	931	mb	Major Hurricane - Category 4	*** Berry Island, Bahamas
August	24	6	UTC	25.4N	79.3W	270	deg	18	mph	29	kph	150	mph	240	kph	937	mb	Major Hurricane - Category 4	
August	24	9	UTC	25.5N	80.3W	275	deg	19	mph	31	kph	165	mph	270	kph	922	mb	Major Hurricane - Category 5	*** SE Florida, USA
August	24	12	UTC	25.6N	81.2W	275	deg	19	mph	31	kph	130	mph	215	kph	951	mb	Major Hurricane - Category 4	
August	24	18	UTC	25.8N	83.1W	275	deg	19	mph	31	kph	130	mph	215	kph	947	mb	Major Hurricane - Category 4	
August	25	0	UTC	26.2N	85.0W	285	deg	19	mph	31	kph	130	mph	215	kph	943	mb	Major Hurricane - Category 4	
August	25	6	UTC	26.6N	86.7W	285	deg	17	mph	27	kph	130	mph	215	kph	948	mb	Major Hurricane - Category 4	
August	25	12	UTC	27.2N	88.2W	295	deg	16	mph	25	kph	140	mph	220	kph	946	mb	Major Hurricane - Category 4	
August	25	18	UTC	27.8N	89.6W	295	deg	14	mph	24	kph	145	mph	230	kph	941	mb	Major Hurricane - Category 4	

Month	Day	Hour		Lat.	Long.	Dir		Speed				Wind				Pressure		----------Type----------	
August	26	0	UTC	28.5N	90.5W	310	deg	11	mph	18	kph	145	mph	230	kph	937	mb	Major Hurricane - Category 4	
August	26	6	UTC	29.2N	91.3W	315	deg	10	mph	16	kph	140	mph	220	kph	955	mb	Major Hurricane - Category 4	
August	26	8	UTC	29.6N	91.5W	325	deg	10	mph	16	kph	115	mph	185	kph	956	mb	Major Hurricane - Category 3	*** Louisiana, USA
August	26	12	UTC	30.1N	91.7W	340	deg	10	mph	16	kph	90	mph	150	kph	973	mb	Hurricane - Category 1	
August	26	18	UTC	30.9N	91.6W	5	deg	9	mph	14	kph	60	mph	95	kph	991	mb	Tropical Storm	
August	27	0	UTC	31.5N	91.1W	35	deg	8	mph	12	kph	40	mph	65	kph	995	mb	Tropical Storm	
August	27	6	UTC	32.1N	90.5W	40	deg	8	mph	12	kph	35	mph	55	kph	997	mb	Tropical Depression	
August	27	12	UTC	32.8N	89.6W	45	deg	11	mph	18	kph	35	mph	55	kph	998	mb	Tropical Depression	
August	27	18	UTC	33.6N	88.4W	50	deg	13	mph	22	kph	30	mph	45	kph	999	mb	Tropical Depression	
August	28	0	UTC	34.4N	86.7W	60	deg	18	mph	29	kph	25	mph	35	kph	1000	mb	Tropical Depression	
August	28	6	UTC	35.4N	84.0W	65	deg	27	mph	44	kph	25	mph	35	kph	1000	mb	Tropical Depression	

"Hurricane Camille, one of the most intense and destructive storms ever, struck the Mississippi Gulf Coast, but severely affected the lower Louisiana delta region. Camille had a central pressure of 26.61 inches and an average forward speed of about 13 knots. This storm made landfall just east of the Louisiana state line on August 18, 1969. As a Saffir-Simpson category 5 storm, Camille's maximum winds were estimated at 160 mph with gusts up to 200 mph. Peak stages include 11.1 feet, NGVD, at Shell Beach on 17 August and 10.0 feet, NGVD, at GIWW at Paris Road Bridge in the Mississippi River Gulf Outlet (MRGO) on 18 August. In Lake Pontchartrain at West End, a peak stage of 5.2 feet, NGVD, was recorded.

Hurricane Katrina made landfall as a category 4 storm in Plaquemines Parish just south of Buras with 140 mph winds on 29 August 2005 with gusts to over 100 mph in New Orleans. Katrina made a second landfall near the Louisiana/Mississippi state line approximately 4 hours later as a category 3 storm with maximum winds of 125 mph. Precipitation analysis from NOAA's Climate Prediction Center show that rainfall accumulations exceeded 8-10 inches along much of Katrina's path. Katrina flooded virtually all of Plaquemines Parish and St. Bernard Parish. Several floodwalls failed in Orleans Parish along with levees being overtopped in New Orleans East resulting in flooding 80% of the parish. Katrina produced catastrophic damage and untold casualties in the New Orleans area and along the Mississippi Gulf Coast. NWS SLOSH models showed a forecast surge of over 17 ft along a portion of the Louisiana coast. Preliminary measurements of the surge from Hurricane Katrina are about 18 ft along the Mississippi River Gulf Outlet, east of New Orleans. On Mississippi River at New Orleans, the stage rose from about 2 feet, NGVD, to 15.50 feet, NGVD. (USACE, 2005).

Less than one month after Katrina made landfall in southeastern Louisiana, Hurricane Rita came ashore in southwestern Louisiana. Rita made landfall early on 24 September just east of the Texas/Louisiana state line near Johnson's Bayou as a category 3 storm with 120 mph winds. Rita caused devastating storm surge flooding and wind damage in coastal Louisiana and extreme southeastern Texas.

The set of hypothetical storms is shown in Table 2.4. These were developed from the historical storms by varying the landfall parameter and tide. Other parameters are the same as the historical storms. "The angle and tide data are specific to each point location analyzed and we analyzed thousands of points and these data files are very large." (Mr. Jay Ratcliff, USACE New Orleans)

Table 2.4 Hypothetical Storms

Historic Storm	Hypothetical	Description	Position
Rita	RitaP05	Rita + 05 Deg	Longitude
Rita	RitaPl0	Rita + 10 Deg	Longitude
Rita	RitaM05	Rita - 05 Deg	Longitude
Rita	RitaMl0	Rita - 10 Deg	Longitude
Camile	CamileP05	Camile + 05 Deg	Longitude
Camile	CamilePl0	Camile + 10 Deg	Longitude
Camile	CamileM05	Camile - 05 Deg	Longitude
Camile	CamileMl0	Camile - 10 Deg	Longitude
Katrina	KatrinaP05	Katrina + 05 Deg	Longitude
Katrina	KatrinaPl0	Katrina + 10 Deg	Longitude
Katrina	KatrinaM05	Katrina - 05 Deg	Longitude
Katrina	KatrinaMl0	Katrina - 10 Deg	Longitude
Andrew	AndrewP05	Andrew + 05 Deg	Longitude
Andrew	AndrewPl0	Andrew + 10 Deg	Longitude
Andrew	AndrewM05	Andrew - 05 Deg	Longitude
Andrew	AndrewMl0	Andrew - 10 Deg	Longitude
Andrew	AndrewP15	Andrew + 15 Deg	Longitude
Andrew	AndrewP20	Andrew + 20 Deg	Longitude
1893	1893p05	1893 + 05 Deg	Longitude
1893	1893p10	1893 + 10 Deg	Longitude
1893	1893m05	1893 - 05 Deg	Longitude
1893	1893m10	1893 - 10 Deg	Longitude
1893	1893m15	1893 - 15 Deg	Longitude
1893	1893m20	1893 - 20 Deg	Longitude
1893	1893m25	1893 - 25 Deg	Longitude
1893	1893m30	1893 - 30 Deg	Longitude

3.0 Refinements to CASE1 and CASE2

When the USACE provided the CASE1 and CASE2 data sets, USACE representatives cautioned that the datasets were the best available at the time (August 2006). However, this data will not be the final data sets available for planning efforts. A new ADCIRC study is underway to refine the surge and wave heights along the coast of Louisiana.

The USACE is refining both its method for computing the probability of surge heights and the resolution of the model grid. The interaction between surge height and waves was included in CASE1 and CASE2 studies by computing the values externally and adding them to the ADCIRC input data file for the next iteration. In the new study, those interactions will be computed automatically. The new computations will use more storm tracks and more angles with the coastline then was used in the CASE1 and CASE2 analyses (IPET, 10 March 2006).

4.0 Assessment of CASE1 and CASE2 Results

4.1 Output points

The computed surge heights were extracted from the ADCIRC results at 4,800 grid points. These are shown in Figure 4.1. The grid points start just offshore and extend to the northern limits of the ADCIRC grid. The computations used grid S10 (personal communication, Mr. Vann Stutts, MVN-ED-H). The present bird's foot delta is the prominent feature in the southeast corner of this figure. It lies between 89.0 and 89.5 degrees West Longitude and between 28.8 and 29.4 degrees North Latitude.

Profiles of the maximum computed elevations of CASE1 and CASE2 surges were needed along the coastline to compare the two results. Shape polygons are laid out on Figure 4-1 to show where those elevations would be extracted from the data base. The coastline is divided into two parts by the Southwest Pass of the Mississippi River. The shape polygon labeled "Coastal Alignment West of S/W Pass" encloses the grid points from the Texas State line to S/W Pass at which the surge elevations would be extracted. The polygon labeled "Coastal Alignment East of S/W Pass" encloses the grid points between S/W Pass and the Mississippi State line.

Nine inland profiles were plotted. These begin at the coastal polygon and extend inland to high ground. Each is assigned the name of a prominent geographical feature along its path. They start in the east with shape polygon "Pontchartrain Alignment along North Shore" and end in the west with shape polygon "Sabine River Alignment." Each profile is referenced by the latitude and longitude at its intersection with the coastal profile

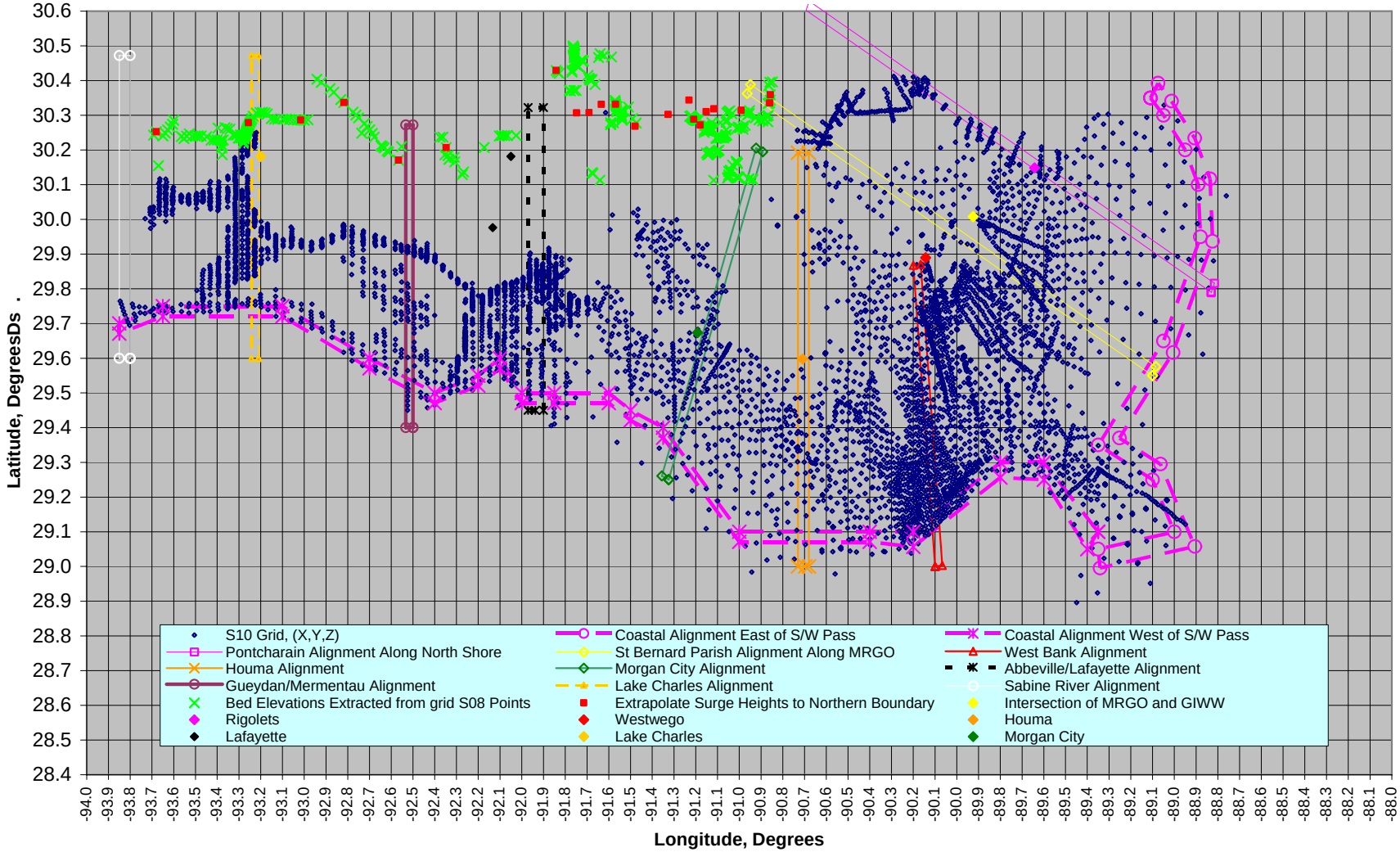


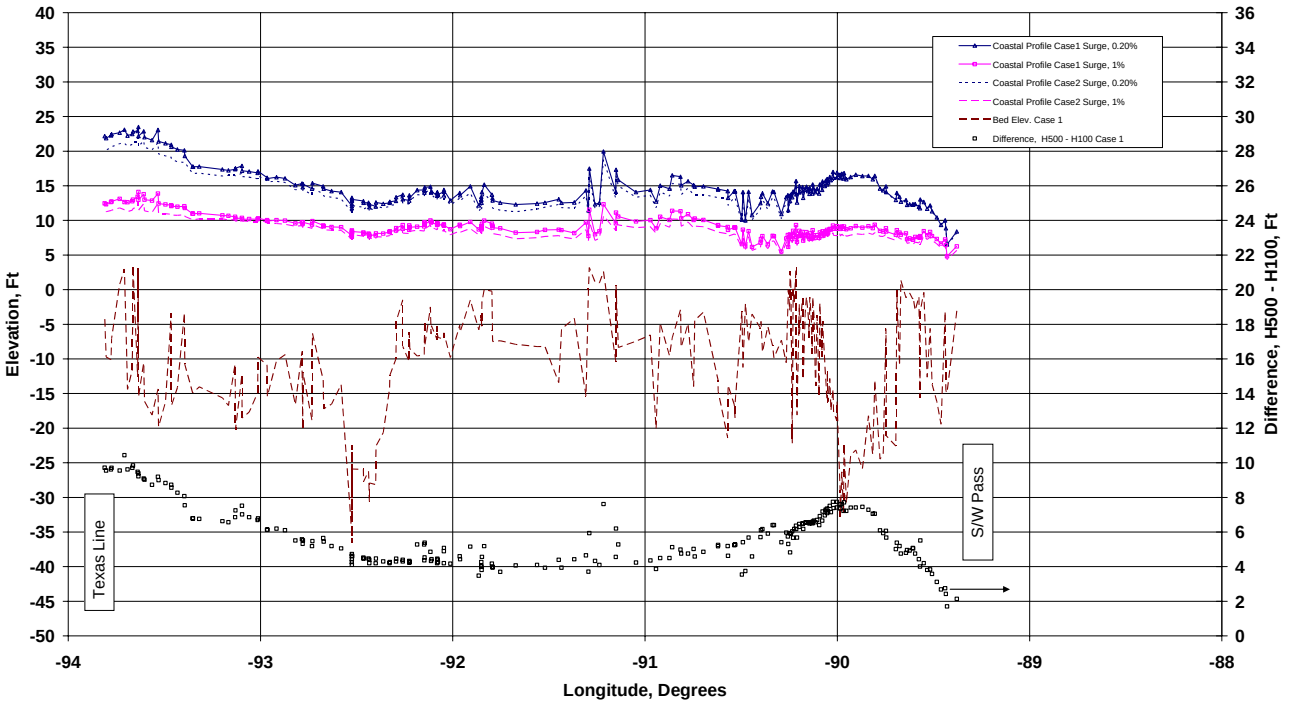
Figure 4.1. Selected Alignments for Surge Height Profiles

4.2 Comparison of CASE1 and CASE2 Surge Heights along Coast

Since no data report was available to describe the ADCIRC analysis at the time of this report, several graphical tests were performed to evaluate the reasonableness of the results. The first test is a comparison of the CASE1 and CASE2 surge heights along the coastline. The values were extracted from the output data file using the shape polygons that are described in Section 4.1.

Generally, the western coastline runs predominately east and west. Surge heights for the CASE1 and CASE2 results are plotted in Figure 4.2 as longitude versus maximum surge height. These elevations are for hurricane intensities having a 1 percent and the 0.2 percent chance of being equaled or exceeded any given year. CASE1 values range up to two feet higher than CASE2 in the western part of the state. The difference decreases at the longitude of the Mississippi River. The difference is approximately equal for both storms.

Bed elevations along the surge profile are also plotted in Figure 4.2. These elevations are from the CASE1 and



CASE2 output files.

Figure 4.2. Case 1 and 2 Surge Heights, Coastal Alignment West of S/W Pass

4.3 Datum

The CASE1 and CASE2 data were used as provided by the USACE. The datum is NGVD29/LMSL. In the future analyses, the recommended datum will be NAVD88 (2004.65). In its evaluation of conditions following hurricane Katrina, the Independent Performance Evaluation Team (IPET) made a special study of datum and published a considerable amount of information for the New Orleans area. One conclusion states the following: "The **Local Mean Sea Level** (LMSL) is roughly 0.2 feet above the North American Vertical Datum of 1988, readjusted for New Orleans in 2004 on the 65 Julian day of that year." (IPET, 1 June 2006). However, adjustments vary along the coast, and the IPET report only presented conditions in the New Orleans area. The datum correction at other places along the coast may need to be adjusted from one to two feet (personal communication, Mr. Vann Stutts, MVN-ED-H). The adjustment may be about the same as the difference between CASE1 and CASE2 surge elevations in the western part of the state. Datum adjustments will be incorporated into the new surge computations being run by the USACE.

5.0 Selection of CASE1 for Planning Study

In general, the 1 percent chance storm surge is at elevation eight to ten feet along the coast between the Calcasieu Ship Channel and Southwest Pass of the Mississippi River for CASE1. That surge height increases to thirteen feet at the Texas state line. This amplification is probably due to the curvature of the Texas coastline as it proceeds west from the Sabine River. Such geometric features concentrate the flow which amplifies the height of the surge.

The surge associated with the 0.2 percent chance event plots from four to ten feet higher than the 1 percent surge height. The greatest difference is at the Texas state line. The amplification is explained using the same argument as stated above for the 1 percent chance surge height. The fact that the more intense event ramps up to a greater height is reasonable since hydrodynamics is a non-linear process.

Figure 4.2 shows CASE2 to be about a foot lower than CASE1 along much of the western coast. However, CASE 1 is being used by the USACE in its preliminary levee design (personal communication with Mr. Larry Banks, USACE Mississippi Valley Division). This reason, coupled with the fact that the NGVD29 datum was used rather than NAVD88, led to the adoption of CASE1 for use in this planning study. These surge heights are being used for planning purposes only. They will be refined as soon as the new ADCIRC analyses are completed.

6.0 Maximum Surge Height Elevations

The maximum surge elevations were converted into digital contour maps. Each map is a composite of the maximum surge heights in all ADCIRC runs for the storm in the figure title. These maximum, computed surge elevations were used in the computation of economic damages and in the computation of levee heights. However, to view the depth of the surge at selected alignments along the coast, surge elevations and bed profiles were plotted by extracting values from the CASE1 data base. The maximum surge elevations for the 1.0 percent annual probability event are shown in Figure 6.1 for the Delta Plain and 6.2 for the Chenier Plain. The 0.2 percent chance event surges are shown in Figures 6.3 for the Delta Plain and 6.4 for the Chenier Plain. These profiles are discussed in the following paragraphs.

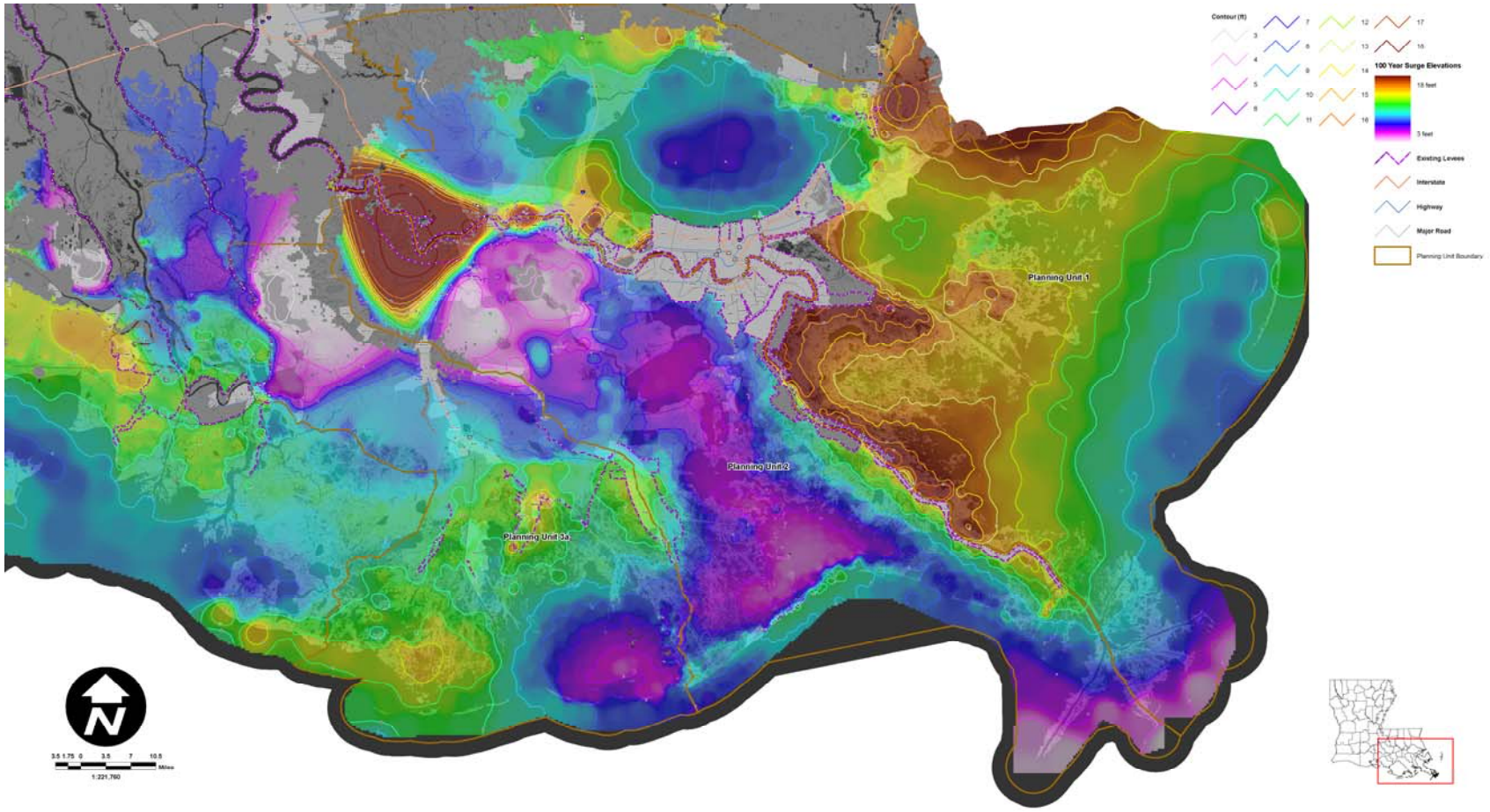


Figure 6.1: Delta Plain Maximum Surge Elevations for 1% Probability Hurricane

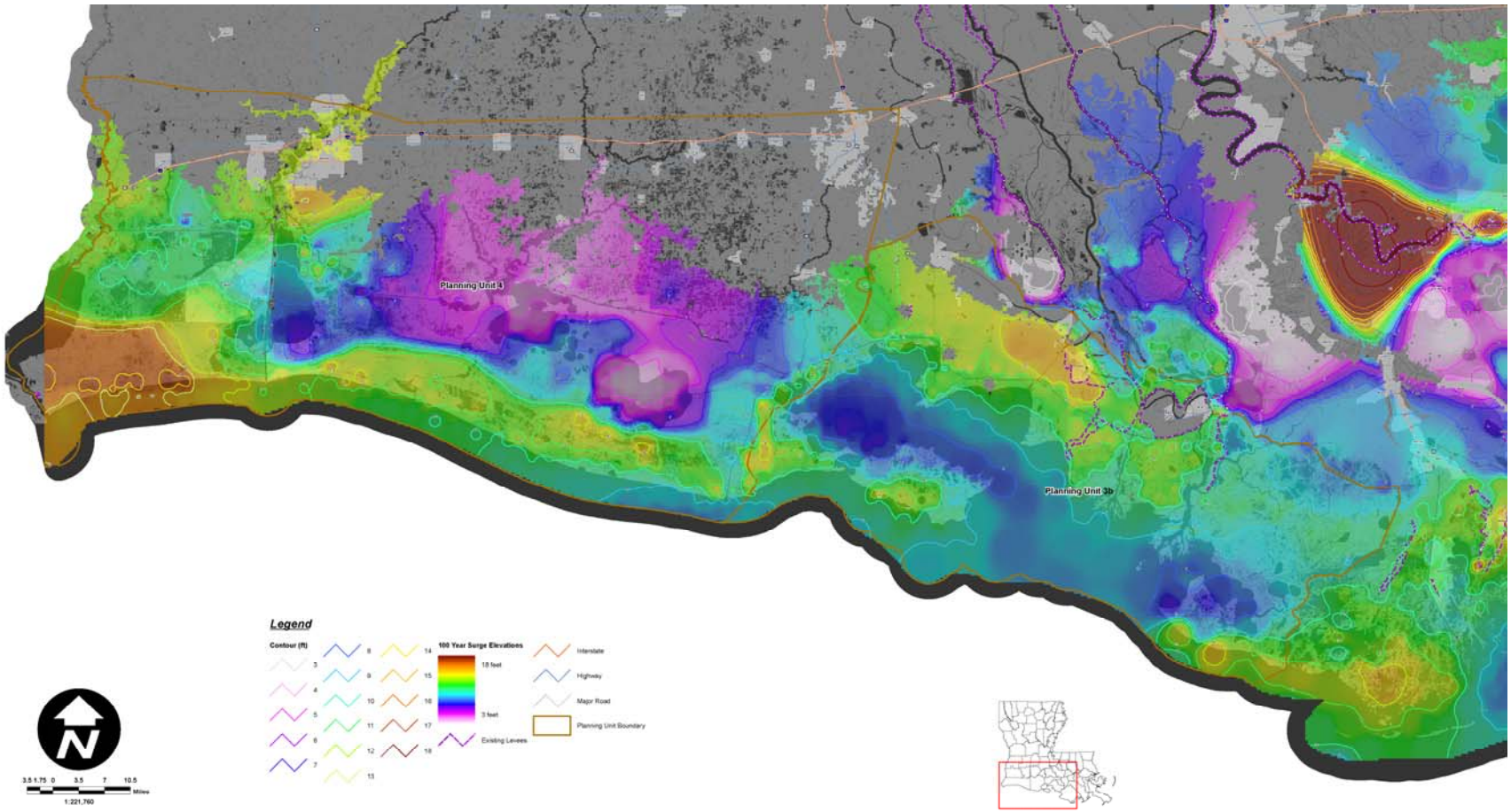


Figure 6.2: Chenier Plain Maximum Surge Elevations for 1% Probability Hurricane

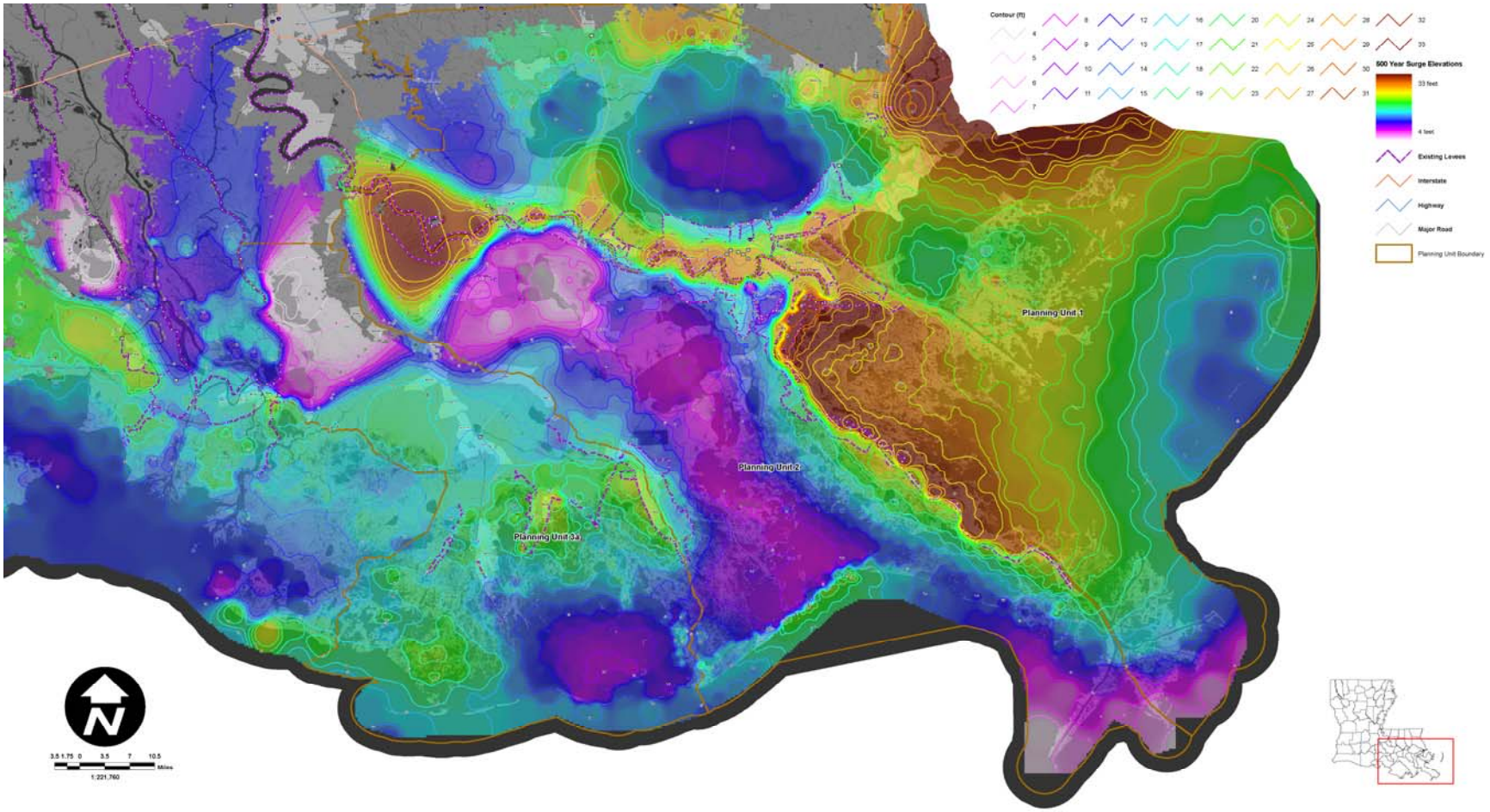


Figure 6.3: Delta Plain Maximum Surge Elevations for 0.2% Probability Hurricane

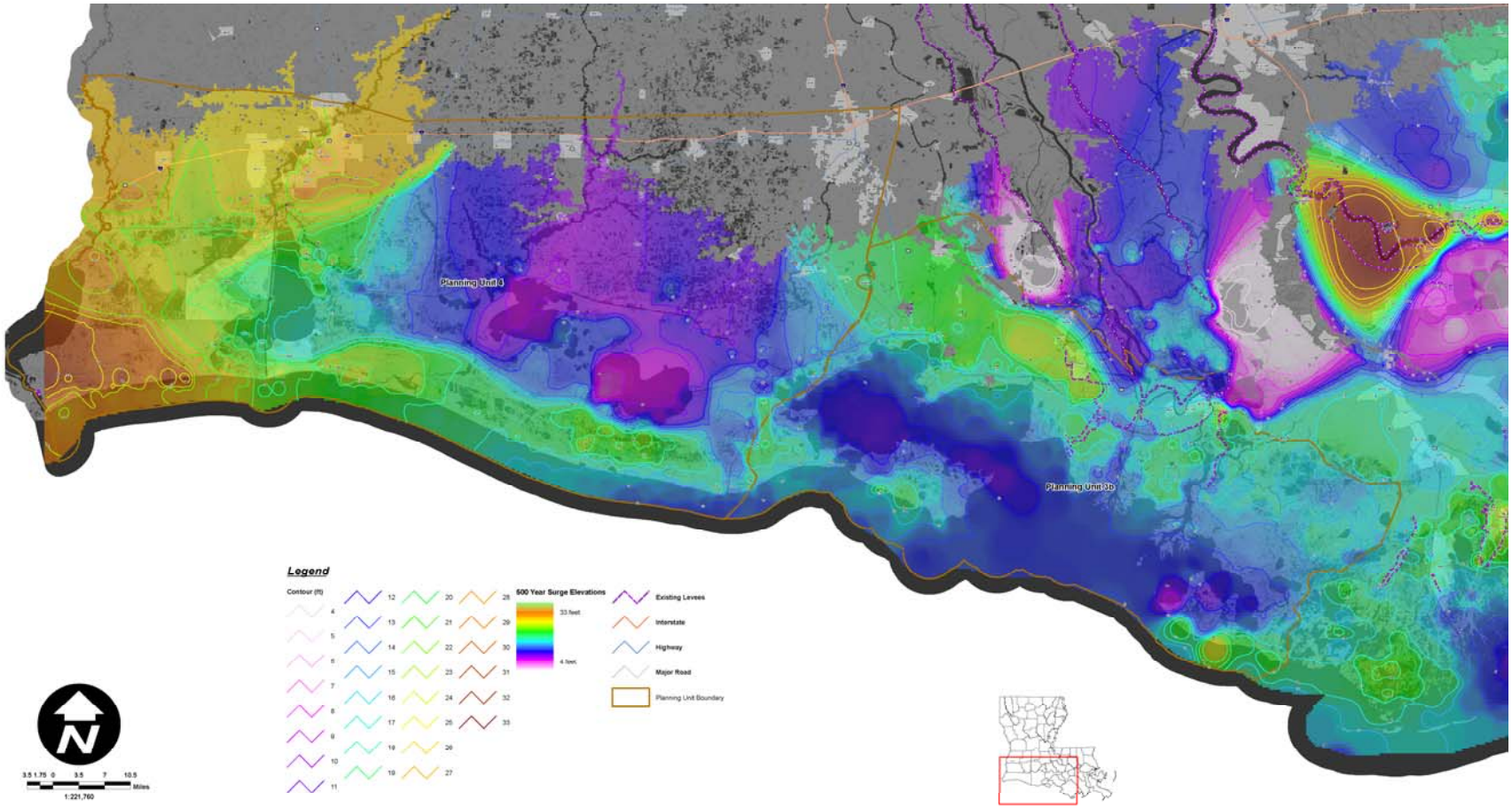


Figure 6.4: Chenier Plain Maximum Surge Elevations for 0.2% Probability Hurricane

6.1 Breton Sound to Coast East of Mississippi River

Figure 6.5 presents the computed surge elevation around the tip of the Mississippi River delta and across Breton Sound to the Pearl River. The surge profiles are for polygon labeled "Coastal Alignment East of S/W Pass" in Figure 4.1. This segment of the coastline is oriented primarily north and south. The surge profiles in Figure 6.5 are plotted as latitude versus maximum surge elevation. As in the extreme western side of the state, there is some amplification in the surge height as it approaches the Mississippi State Line. Computed surge elevations on the land side of the Chandeleur Islands are about 8 and 13 feet for the 1 percent and 0.2 percent chance storms, respectively,. The amplification effect increases the computed elevations to 15 and 29 feet, respectively, at the Mississippi State Line. That predicted amplification may decrease when the new ADCIRC analysis becomes available, but these surge heights are reasonable estimates based on the surge that was experienced during Hurricane Katrina.

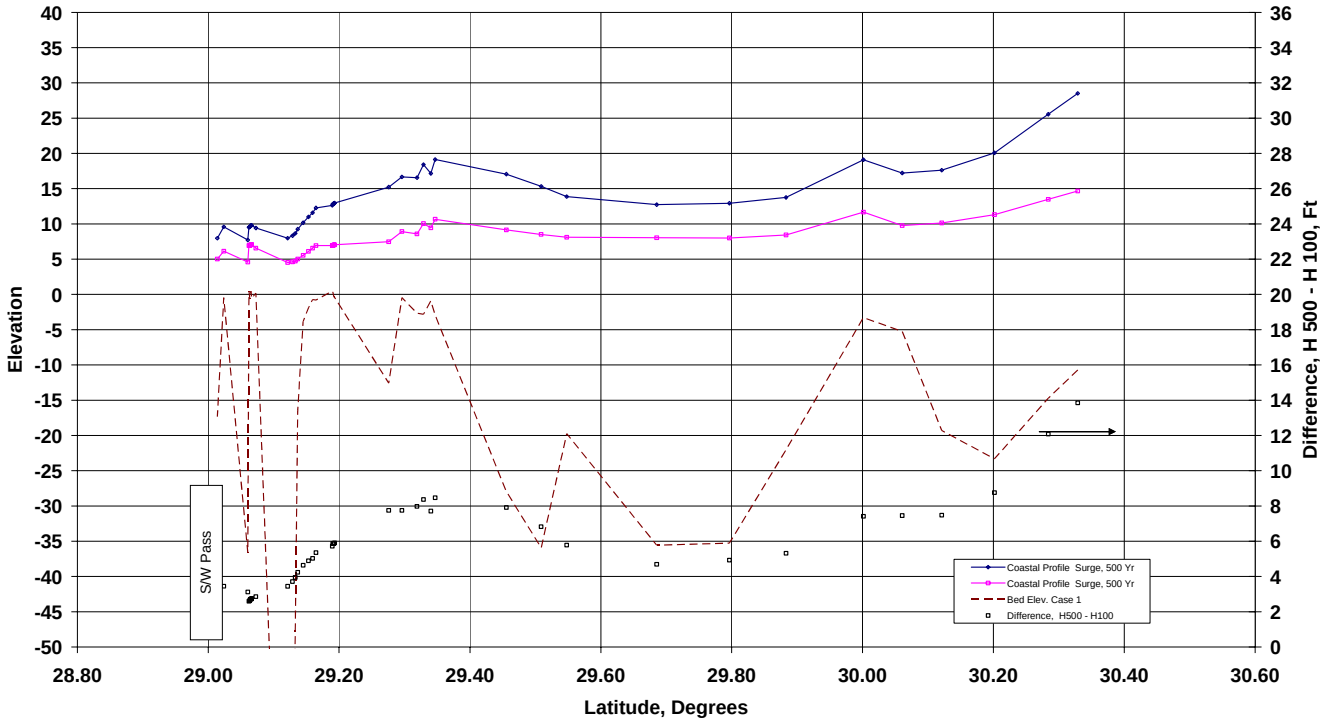


Figure 6.5. Case 1 Surge Heights, Coastal Alignment East of S/W Pass

6.2 North Side of Lake Pontchartrain

Several inland surge profiles were plotted to investigate how the ADCIRC surge elevation changed with distance inland from the coastline. The locations of these surge profiles is discussed in Chapter 4.1 and shown by the polygons in Figure 4.1. The most eastern polygon, which is labeled "Pontchartrain Alignment along North Shore," in Figure 4.1, intersects the coastal polygon at longitude -88.9 degrees. The surge profiles are plotted in Figure 6.6. The abscissa is latitude in degrees, and the maximum surge elevations are in feet. In Figure 6.6, the Pontchartrain Land Bridge lies between 30.1 degrees and 30.2 degrees. The I-55 land bridge is about latitude 30.4 degrees.

Figure 6.6 shows the impact of land forms on surge height. It also provides a graphical procedure for extrapolating the available data to high ground in those cases where ADCIRC output stops short of damage centers. This figure, as well as most others along the coast, shows a strong influence on the water surface elevation as the surge passed over coastal land forms. As the surge profile plot proceeds inland, beyond the last output point, the maximum surge elevation can be projected graphically as a horizontal line.

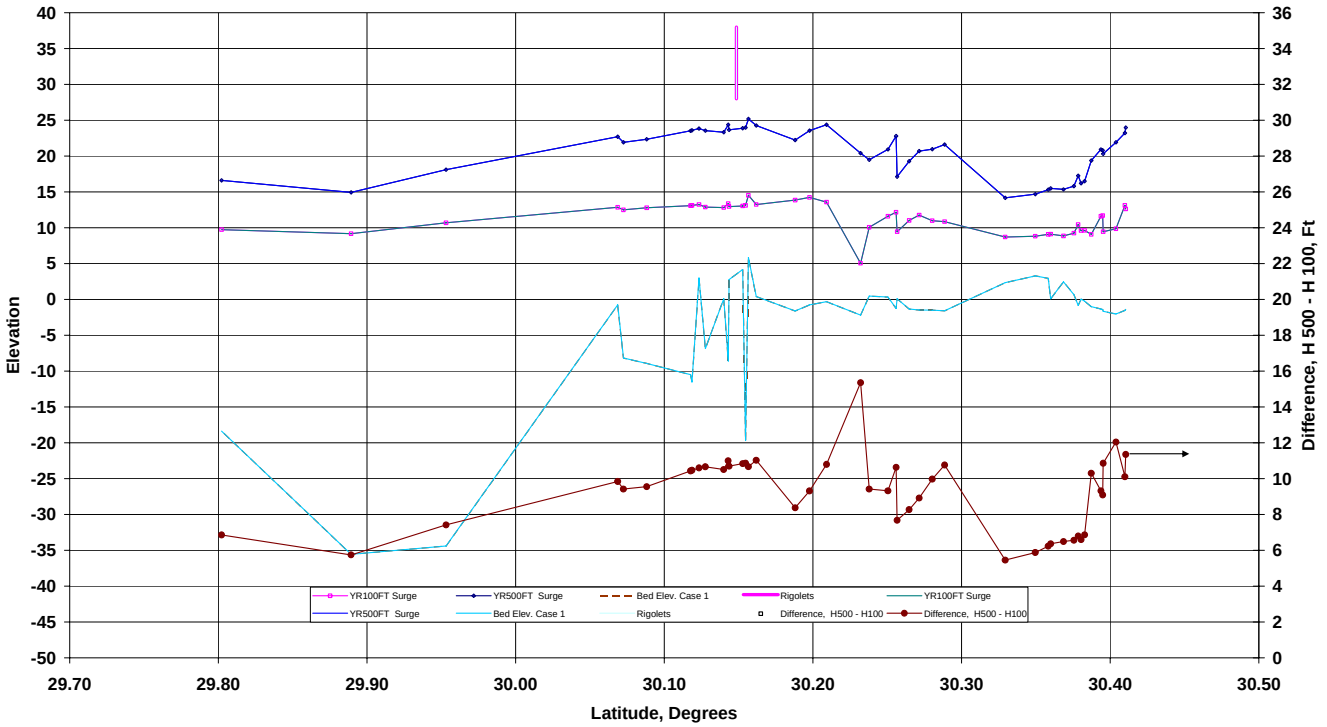


Figure 6.6. Case 1 Surge Height, Pontchartrain Alignment along North Shore

6.3 St. Bernard Parish along the MRGO

This polygon is labeled "St Bernard Parish Alignment along MRGO" in Figure 4.1. It intersects the "Coastal Alignment East of S/W Pass" polygon at longitude -89.1 degrees and runs northwest. The surge heights along this polygon are shown in Figure 6.7. The last data point in the profile is in the vicinity of St Amant.

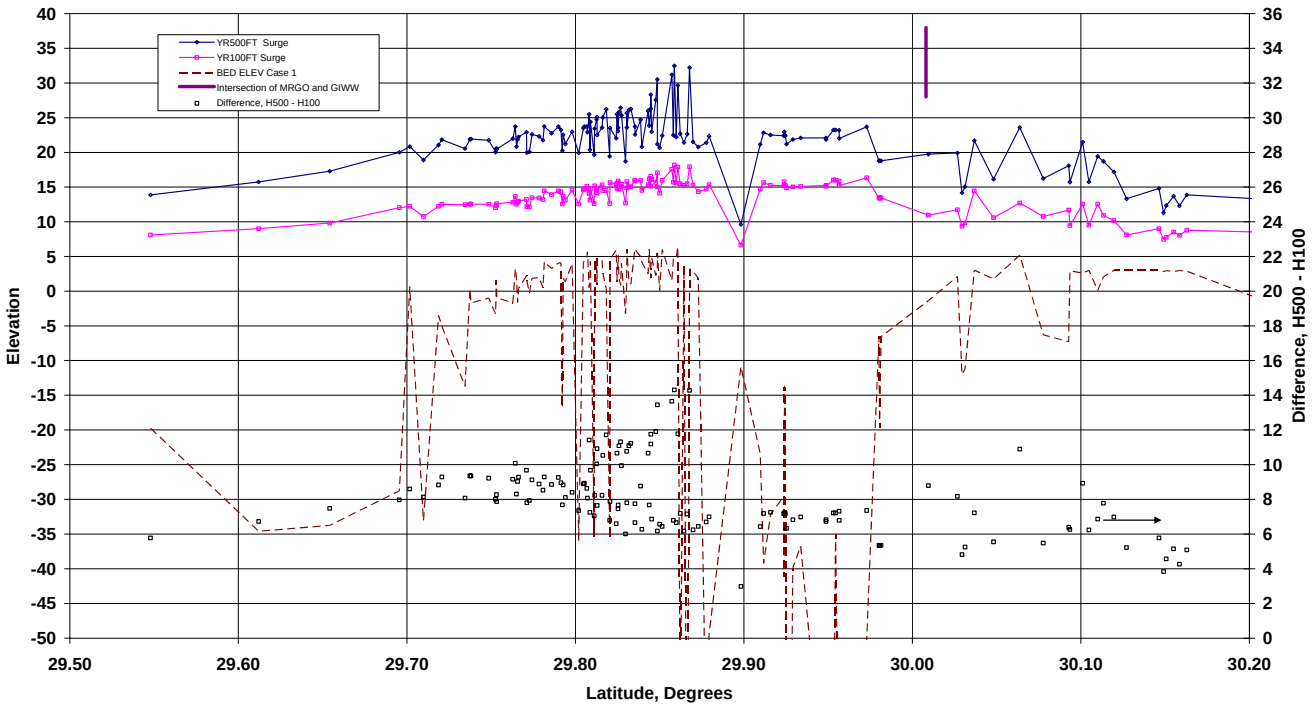


Figure 6.7. Case 1 Surge Height, St Bernard Parish Alignment along MRGO

6.4 West Bank Plot

This polygon is labeled "West Bank Alignment" in Figure 4.1. It intersects the "Coastal Alignment West of S/W Pass" polygon at longitude -90.1 degrees and runs north to the Mississippi River levee. The surge heights are plotted in Figure 6.8. The elevations decrease over the marsh, Latitude 29.2 degrees, but increase again as the surge moves inland. The increase is probably due to the influences of the Mississippi River levee. The last data point on the profile is just south of Estelle.

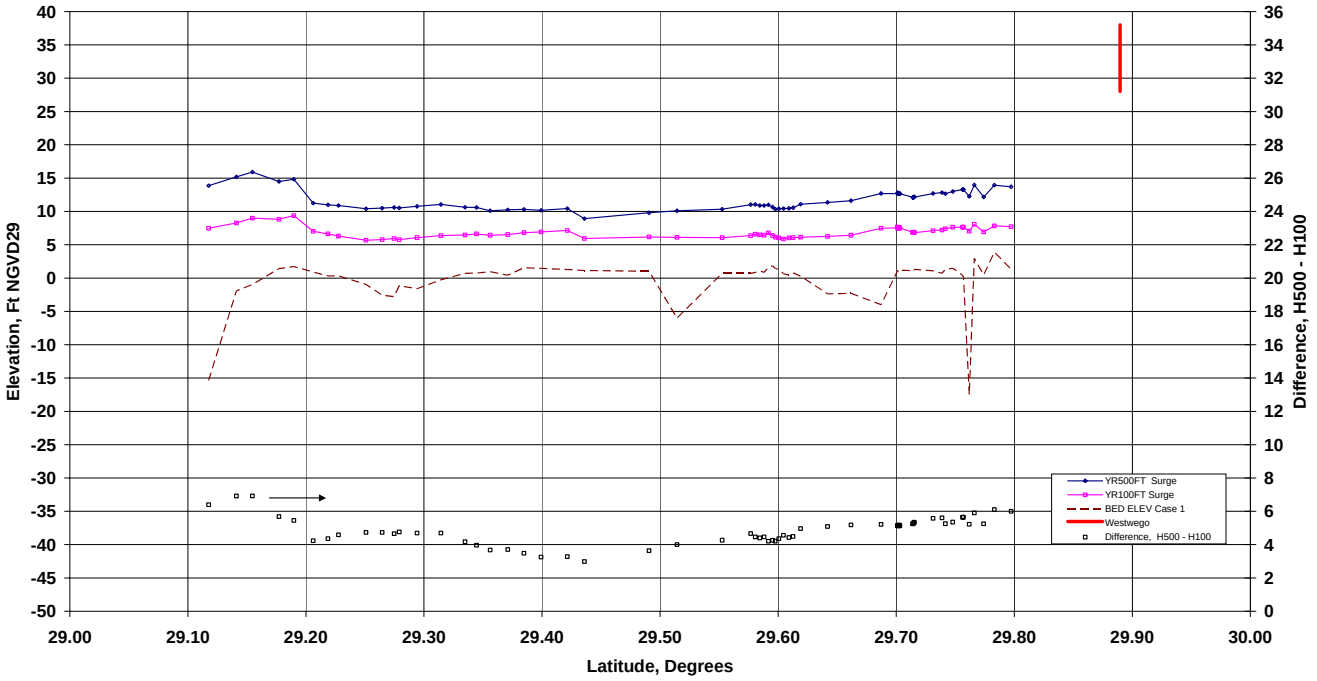


Figure 6.8. Case 1 Surge Height, West Bank Alignment (-90.1 Degrees West)

6.5 Houma Plot

This polygon is labeled "Houma Alignment" in Figure 4.1. It intersects the "Coastal Alignment West of S/W Pass" polygon at longitude -90.7 degrees and runs north, past Houma, to the vicinity of the Mississippi River Levee. The surge heights are plotted in Figure 6.9. The last data point in Figure 6.9 is well south of the Mississippi River. It is in the marsh near the LaFourche Parish line. The large decrease in surge height, proceeding north from Houma in Figure 6.9, is attributed to the large area of marsh and the resolution of the S10 grid.

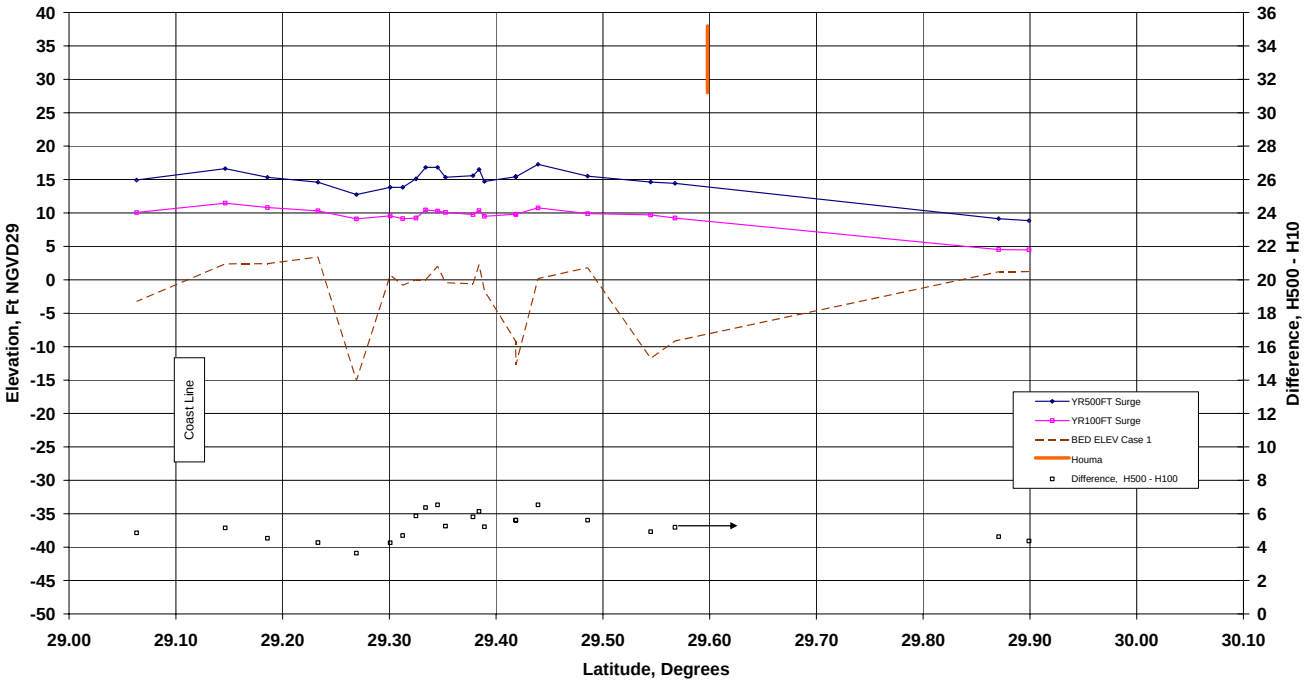


Figure 6.9. Case 1 Surge Height along Houma Alignment (-90.7 Degrees West)

6.6 Morgan City Plot

This polygon is labeled "Morgan City Alignment" in Figure 4.1. It intersects the "Coastal Alignment West of S/W Pass" polygon at longitude -91.3 degrees and runs northeast past Morgan City to the vicinity of the Mississippi River Levee. The surge heights are plotted in Figure 6.10. The last data point is in the marsh southwest of Labadieville. The reduction in surge height, proceeding north of Morgan City in Figure 6.10, is consistent with the pattern of other surge profiles that cross marsh areas.

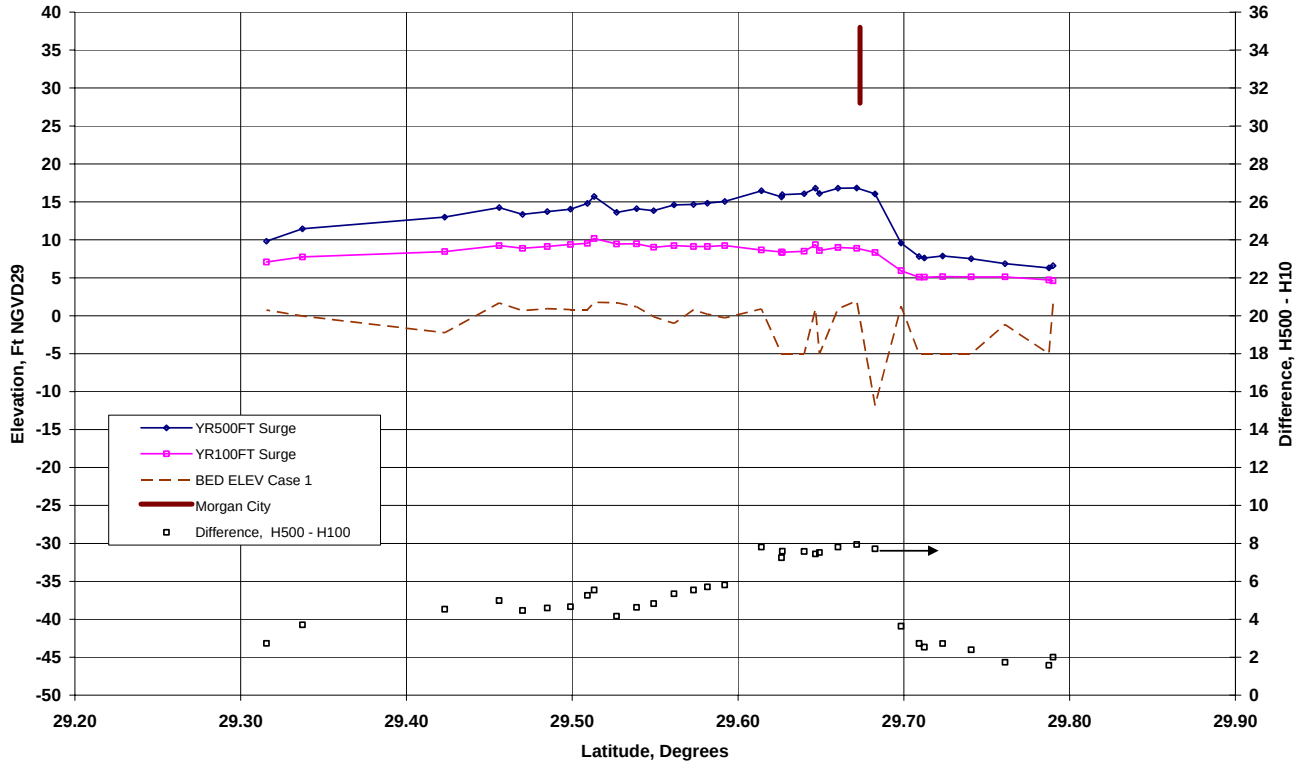


Figure 6.10. Case 1 Surge Height along Morgan City Alignment (-91.3 Degrees West)

6.7 Abbeville-Lafayette-Kaplan Plot

This polygon is labeled "Abbeville/Lafayette Alignment" in Figure 4.1. It intersects the "Coastal Alignment West of S/W Pass" polygon at longitude -91.95 degrees and runs north to the vicinity of Lafayette. The surge heights are plotted in Figure 6.11. The last data point is in the marsh south of Delcambre. Surge heights were extended horizontally from the end of this plot to high ground for use in economic computations. The data for extending the ground profile to high ground, in Figure 6.11, was not available in the S10 grid. It was extracted form the SL15_V3 grid. The 0.2 percent chance surge height profile in Figure 6.11 would intersect the high ground profile north of LA Highway 14.

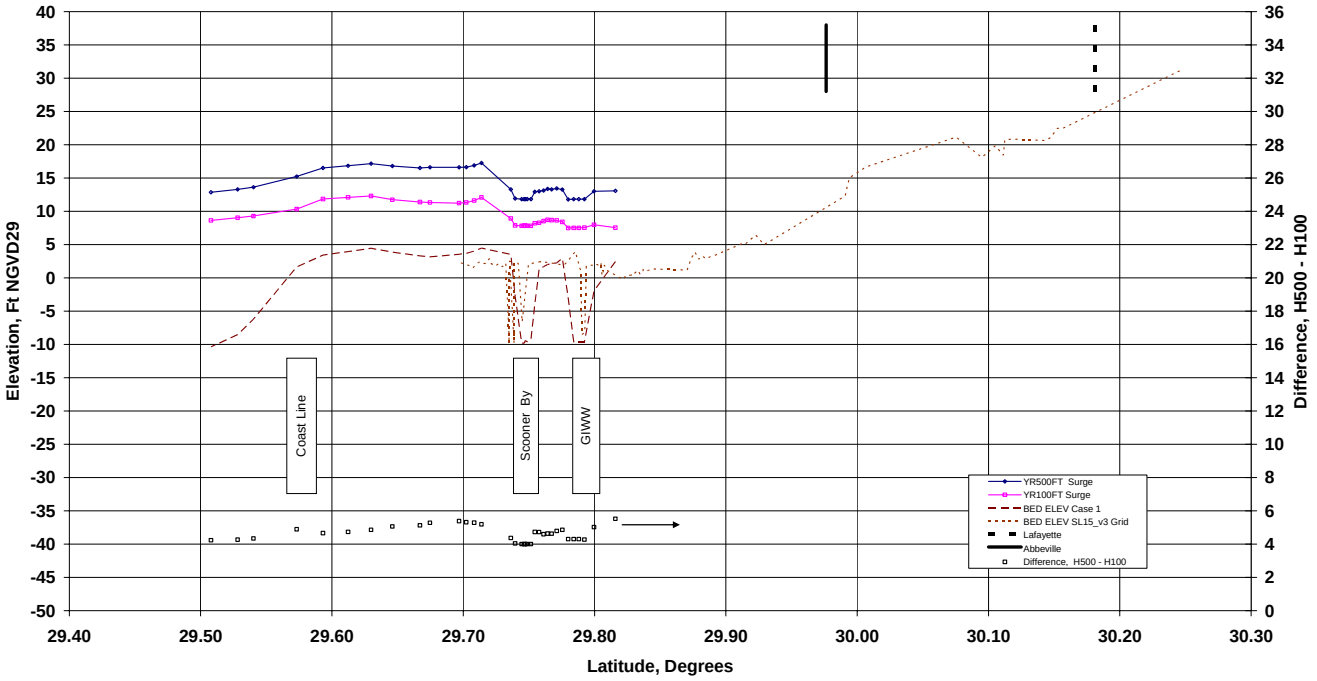


Figure 6.11. Case 1 Surge Height along Abbeville/Lafayette Alignment (-91.95 Degrees West)

6.8 Land Bridge between Grand and White Lakes

This polygon is labeled "Gueydan/Mermentau Alignment" in Figure 4.1. It intersects the "Coastal Alignment West of S/W Pass" polygon at longitude -92.5 degrees and runs north past Gueydan to high ground in the vicinity of I-10. The surge heights are plotted in Figure 6.12. This profile is just east of the land bridge. The final data point is just north of the GIWW. Surge heights were extended horizontally from the end of this plot to high ground for the economic computations. The data for extending the ground profile to high ground, in Figure 6.12, was not available in the S10 grid. It was extracted form the SL15_V3 grid. The 0.2 percent chance surge height profile in Figure 6.12 would intersect the high ground profile south of US Highway 90.

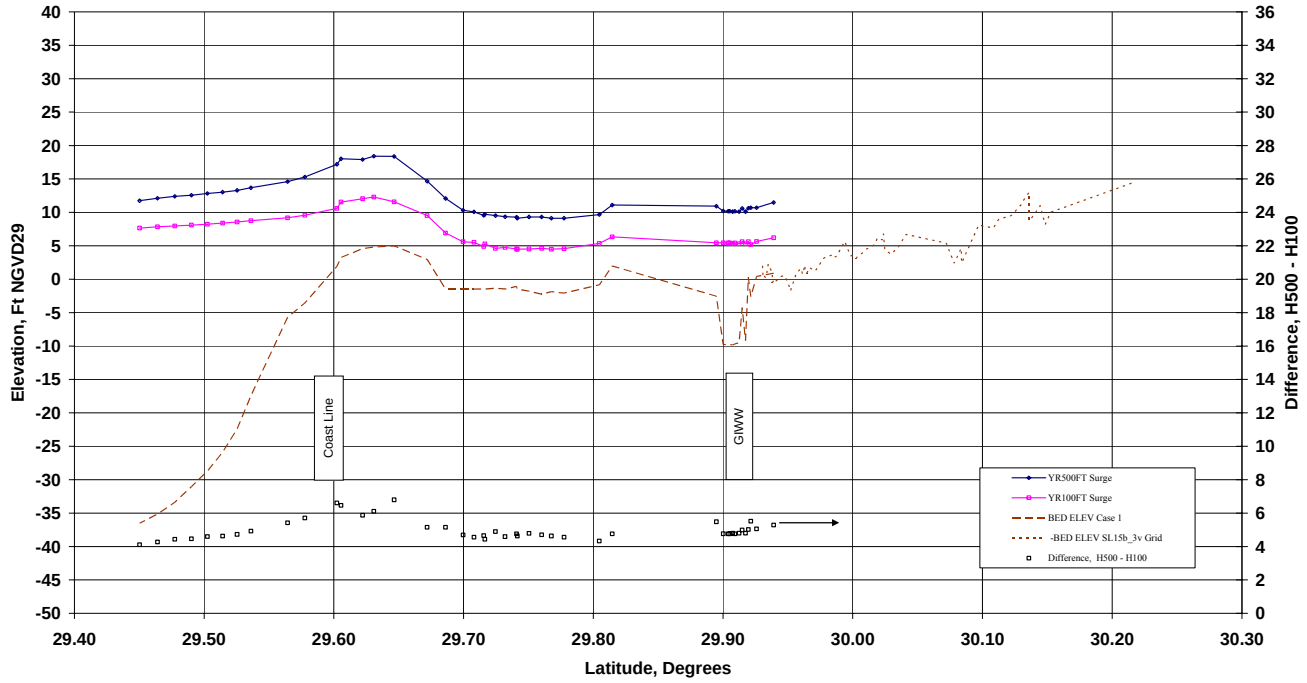


Figure 6.12. Case 1 Surge Height along Gueydan/Mermentau Alignment (-92.5 Degrees West)

6.9 Lake Charles Area

The Lake Charles polygon is labeled "Lake Charles Alignment" in Figure 4.1. It lies just east of the Calcasieu Ship Channel and extends from the "Coastal Alignment West of S/W Pass" to Lake Charles, Figure 6.13. Figure 6.13 shows an increase in surge elevation as it approaches Lake Charles. This is attributed to two causes: the rise in ground elevation at Lake Charles and the amplification of the surge along the coast line near the Texas state line. The ease with which the amplified surge can move through the Sabine River and GIWW combines with movement of the surge up the Calcasieu Ship Channel to increase the surge elevation near Lake Charles. A Surge will propagate up-river at the speed of the backward characteristic (V-c) where V is flow velocity and c is wave celerity. In a 45-foot deep channel, c is 38 feet/second (26 miles/hour). The ship channels connecting Lake Charles to the Gulf of Mexico and the Sabine River and GIWW are efficient conveyance channels between the Gulf of Mexico and Lake Charles for the propagation of surges.

The ADCIRC grid extended sufficiently far inland to provide surge elevations for Lake Charles. These data points are under the label, "Latitude of Lake Charles" in Figure 6.13. However, the results stopped short of some asset areas. The surge elevations were extrapolated horizontally until they intersected the ground elevation in those cases. The data for extending the ground profile to high ground, in Figure 6.13, was not available in the S10 grid. It was extracted form the SL15_V3 grid.

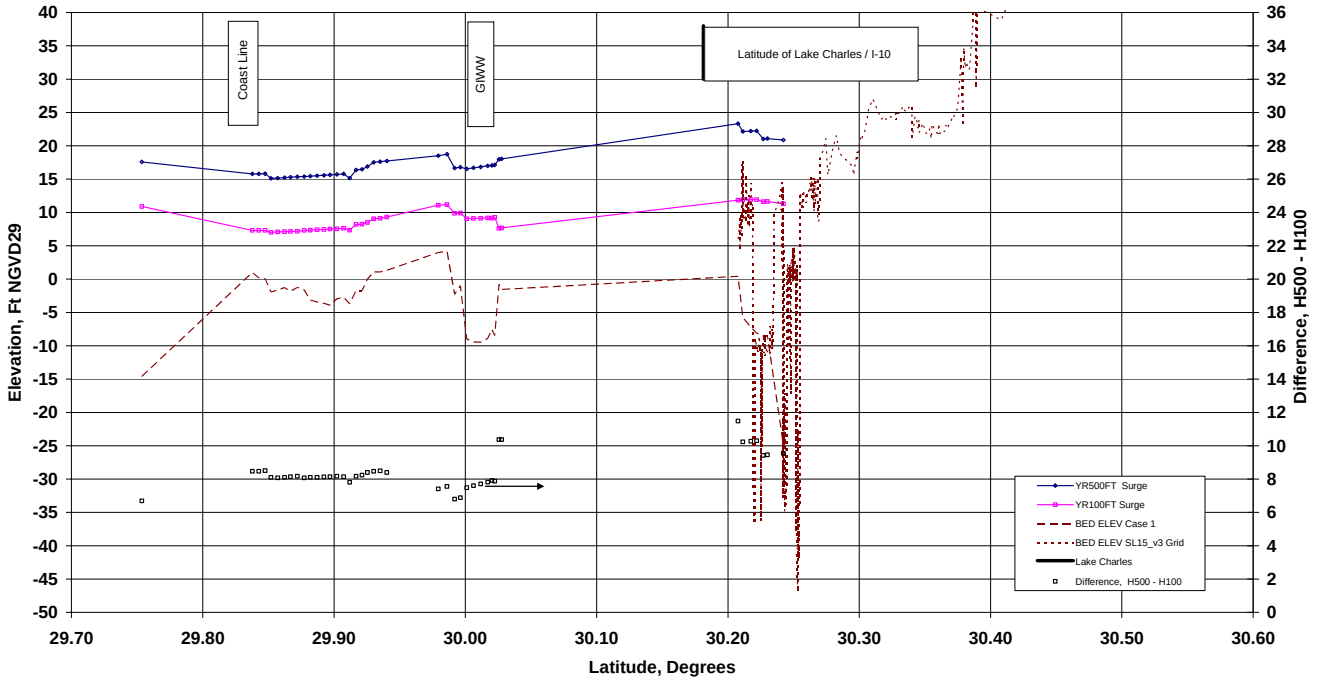


Figure 6.13. Case 1 Surge Height East of Calcasieu Ship Channel (-93.2 Degrees West)

6.10 Sabine River Plot

This polygon is labeled "Sabine River Alignment" in Figure 4.1. It intersects the "Coastal Alignment West of S/W Pass" polygon at longitude -93.8 degrees which is just east of the Sabine River. It runs north past I-10 until it intersects high ground. The surge heights are plotted in Figure 6.14. Output from ADCIRC is available for only a short distance. ADCIRC outputs were extended inland horizontally until they reached natural ground elevation. The data for extending the ground profile to high ground, in Figure 6.14, was not available in the S10 grid. It was extracted form the SL15_V3 grid.

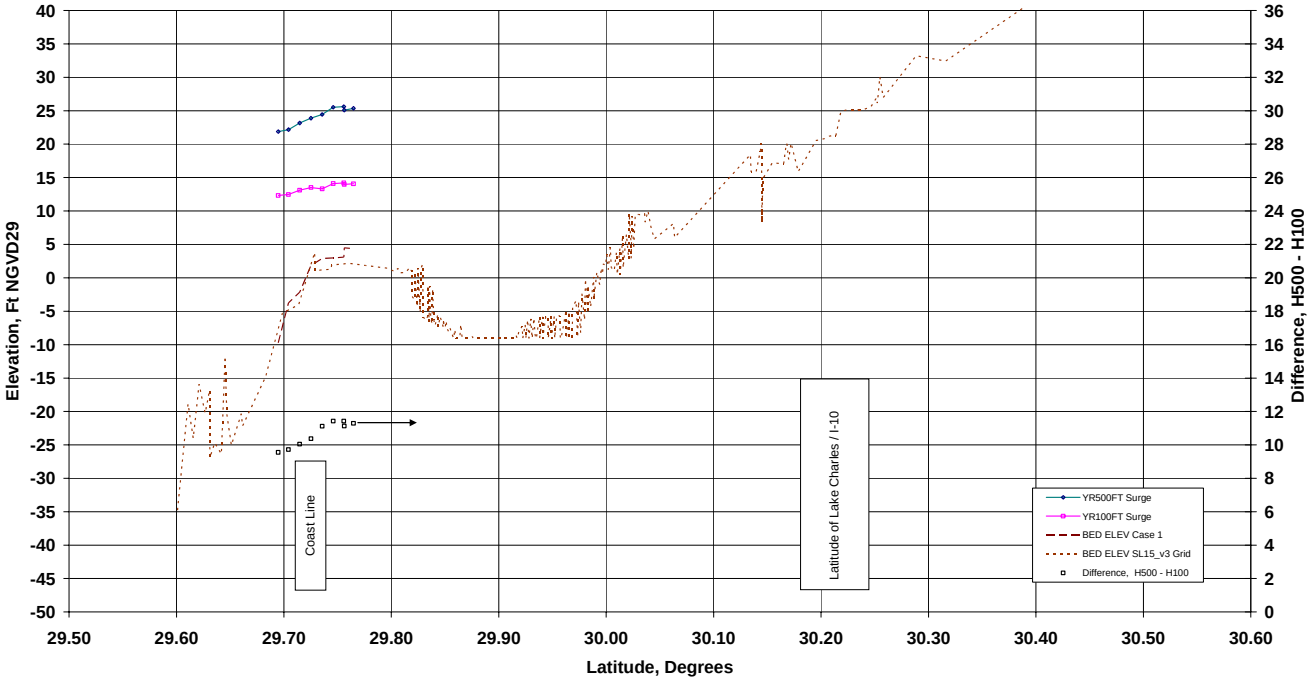


Figure 6.14. Case 1 Surge Height along Sabine River (-93.8 Degrees West)

7.0 Waves and Interior Flooding

The consequences of interior flooding and flood runoff from the watershed were considered using regional rules, but detailed studies were not conducted for this master plan. Waves and interior flooding are necessary to compute total economic damages and to plan the protection features. Detailed studies are being conducted by the Corps of Engineers to quantify the contributions of waves and interior flooding, and the results will be incorporated into the master plan later.

In terms of the significance of interior flooding and flood runoff from the watersheds on the master plan, those processes might tend to reduce economic benefits of a surge protection system. However, the reduction is not expected to be significant enough to change the major decisions being made at the master plan level.

Waves are a different matter. They affect levee height and must be included in the development of the master plan. Waves, interior flooding, and runoff hydrographs must be determined separately from ADCIRC and combined with the ADCIRC surge elevations to provide a complete analysis of the damages from water. Two approaches were developed to estimate wave heights. One approach is referred to as the inland procedure, and the other is referred to as the open coast procedure.

An example of the inland procedure follows:

D	= 13 feet	(D is the depth of surge at toe of levee.)
H_b	= 0.78 D	
	= 0.78 x 13	
	= 10.2 feet	(H_b is the height of breaking wave.)
H_s	= 10.2 x 0.66	
	= 6.76 feet	(H_s is the height of significant wave.)
R/H_s	= 1	(Run up ratio - assume 1.0)
R	= 6.76 feet	(Run up distance)
LE	= D + R + z	(z is ground elevation at toe of levee and LE is levee elevation)
	= 13 + 6.76 + 0	
	= 19.76 ⟶	use 20 feet (Levee elevation)

The open coast approach utilized the computations made by the Corps of Engineers in its report to Congress dated July 2006 computed the ratio between wave height and surge depth. Since most of the levee alignment in the master plan follows one of the alternatives in the USACE report, the same "save points" are used in this master plan as were used in the USACE report. Figures L-13 through L-22 were copied from the USACE's Enclosure, "Engineering Investigations." These figures and a sample table from the Corps of Engineers report are reproduced below. The figures show the location of "save points." Save points, surge heights and computed wave heights are shown in sample table, Table 7.1.

Because the storms in the master plan are different from those in the USACE report to Congress, it is not possible to use either the surge or wave heights from the USACE report directly. Therefore, a conversion factor was computed using the ratio of wave height (W) divided by the surge depth (S). It was applied to the 1 percent and the 0.2 percent chance surge depths to compute wave heights for this master plan. The wave height ratio is computed in the last column in Table 7.1 below. That column of information was not included in the USACE report. The values of W/S range from 0.36 to 0.38. A value of 0.36 was adopted for this plan.

This open coast ratio of wave height to surge can be compared to the inland ratio as follows:

H_s = 0.78 x 0.66 D (height of significant wave)
= 0.51 D

For the inland procedure, the wave height ratio is 0.51.

Table 7.1. Summary of Waves and Water Levels for Modeling Alignment 1 (USACE, July 2006, Table L-8)

Save Points	Surge (ft)	Wave Height (ft)	Wave Period (s)	**Ratio W/S**
1 – 10	33	12	11	**0.36**
11 – 26	36	13	14	**0.36**
27 – 33	33	12	14	**0.36**
34 – 44	30	11	14	**0.37**
45 – 51	33	12	14	**0.36**
52 – 53	36	13	14	**0.36**
54 – 104	40	15	14	**0.38**
105 – 126	36	13	14	**0.36**
127 – 134	33	12	14	**0.36**
135 – 142	30	11	14	**0.37**
200 – 214	13 - 20	9 - 12	8	

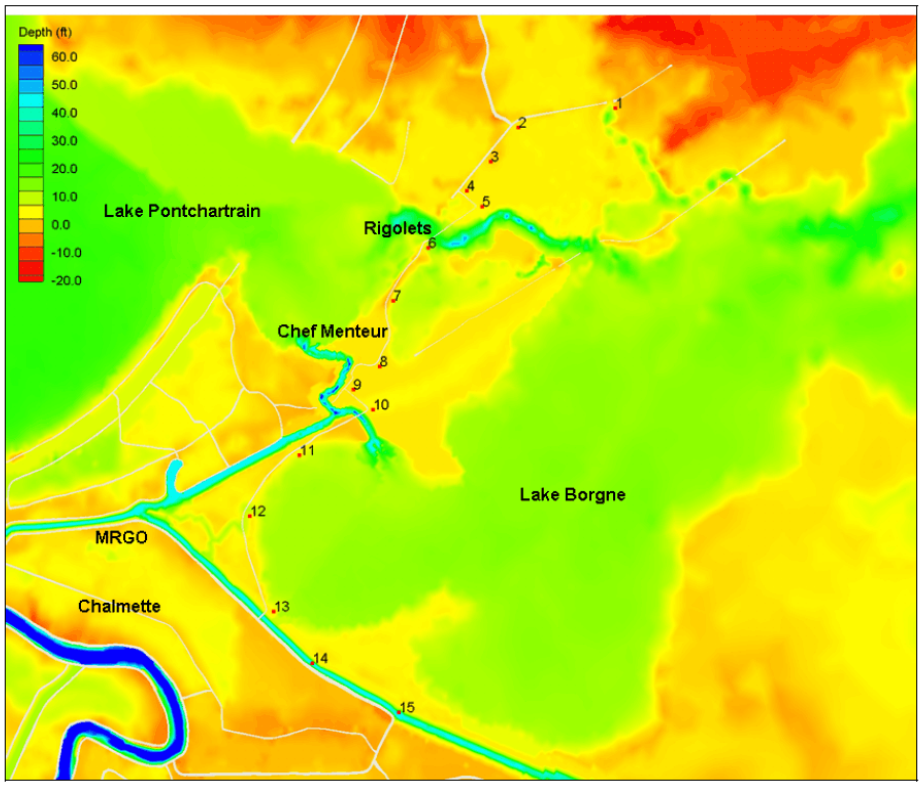


Figure L-13. Save Points 1-15 (STWAVE Southeast grid).

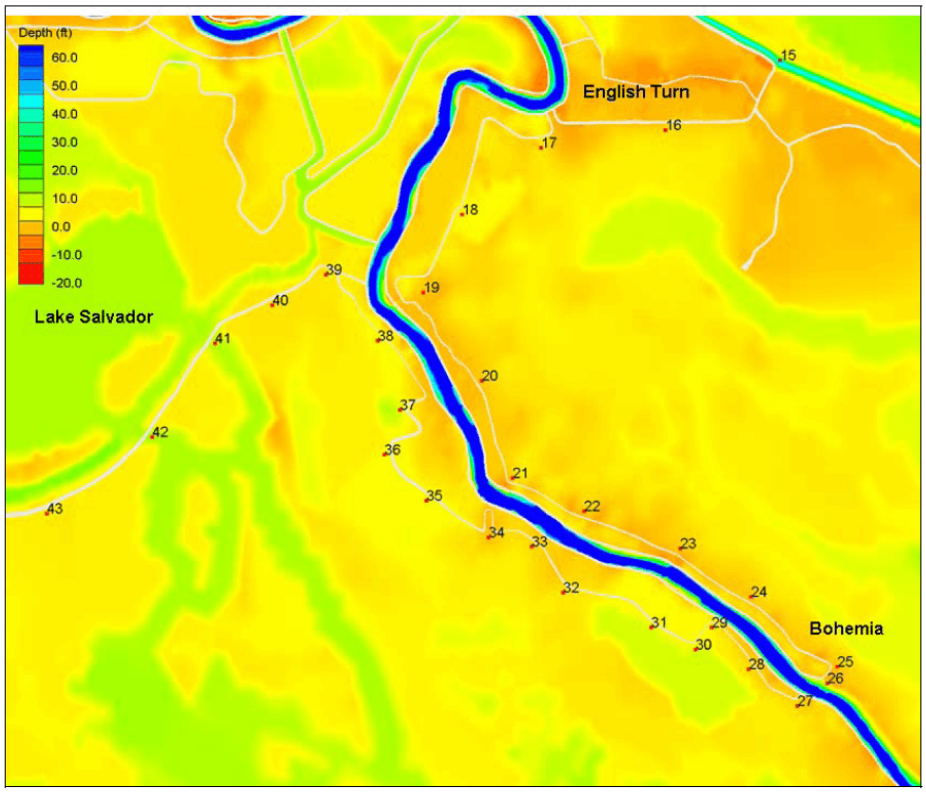


Figure L-14. Save Points 15-26 (STWAVE Southeast grid) and 27 to 43 (STWAVE South grid).

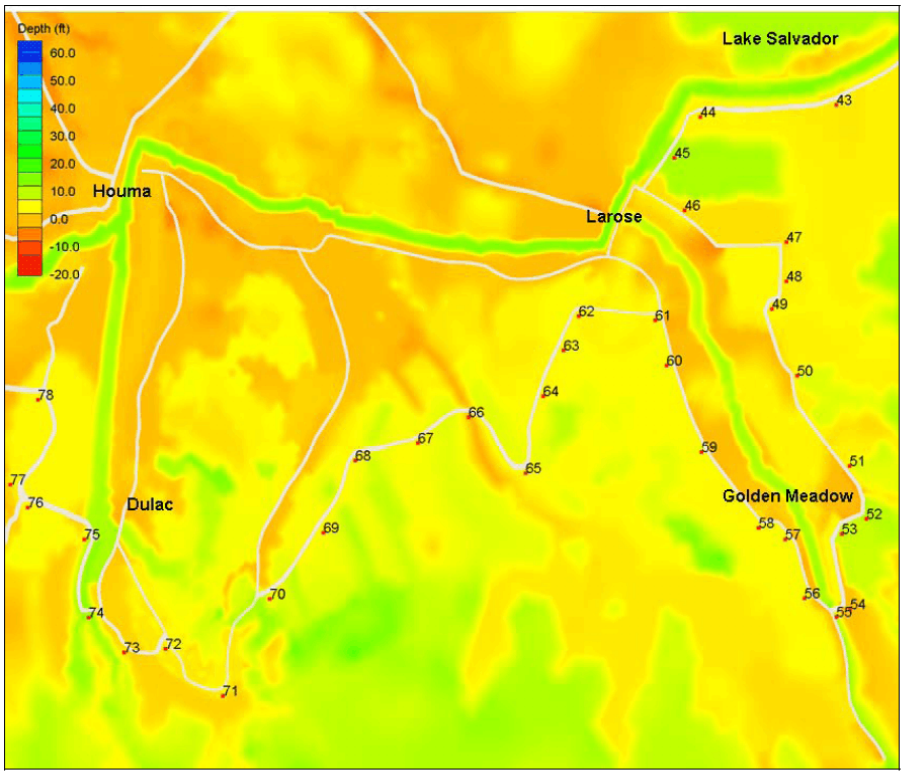


Figure L-15. Save Points 43 to 78 (STWAVE South grid) and 72 to 78 (STWAVE West grid).

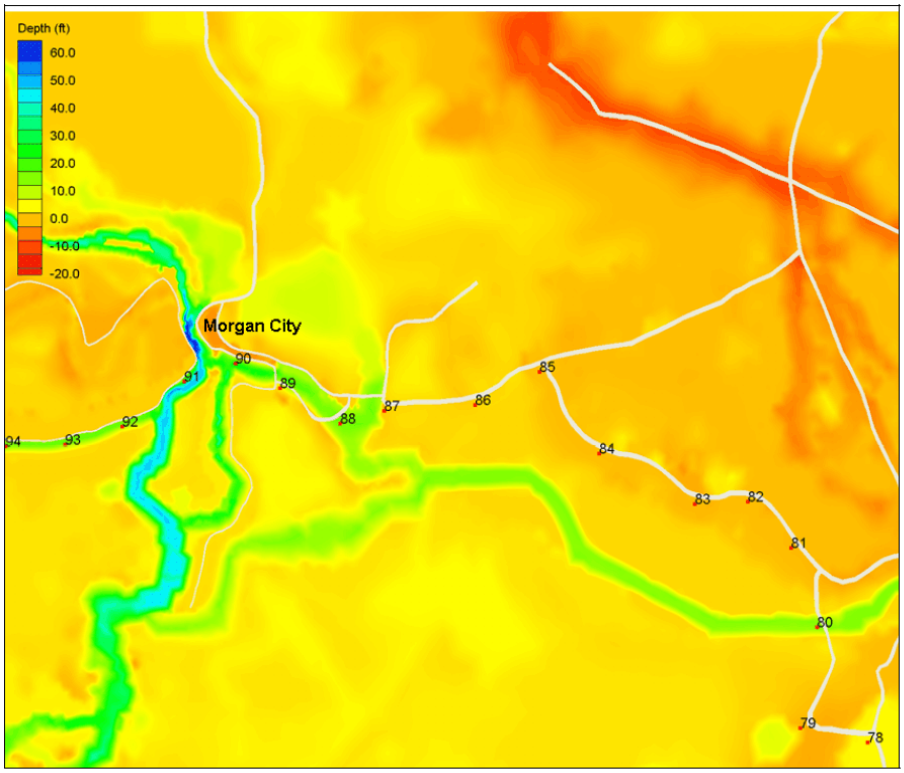


Figure L-16. Save Points 78 to 88 (STWAVE South grid) and 78 to 94 (STWAVE West grid).

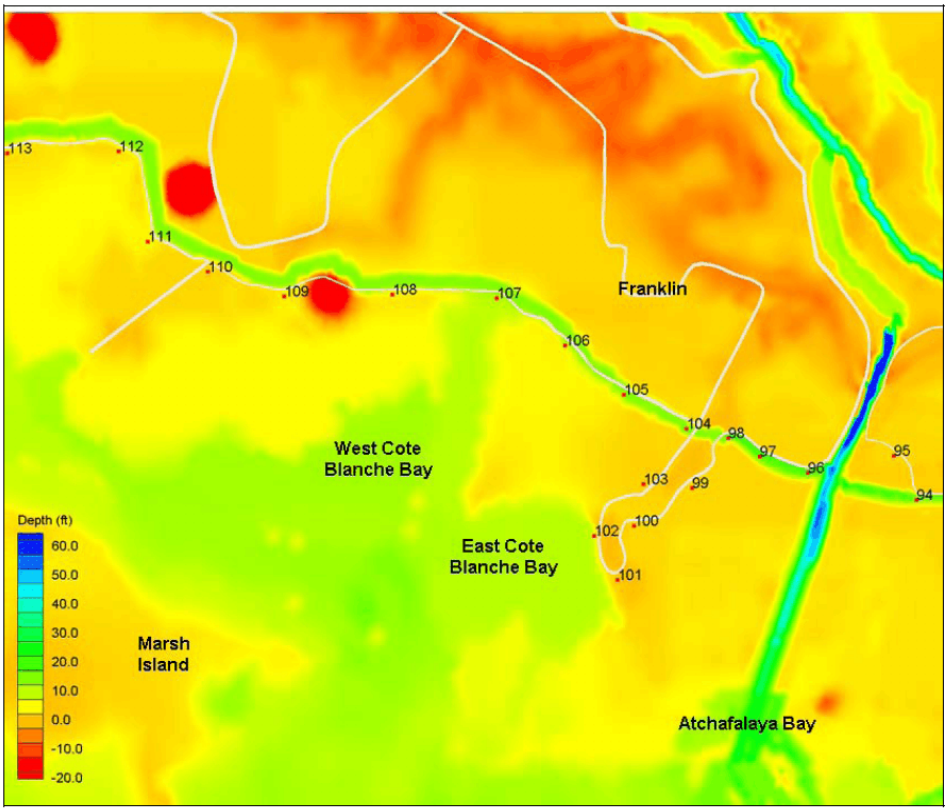


Figure L-17. Points 94 to 113 (STWAVE West grid).

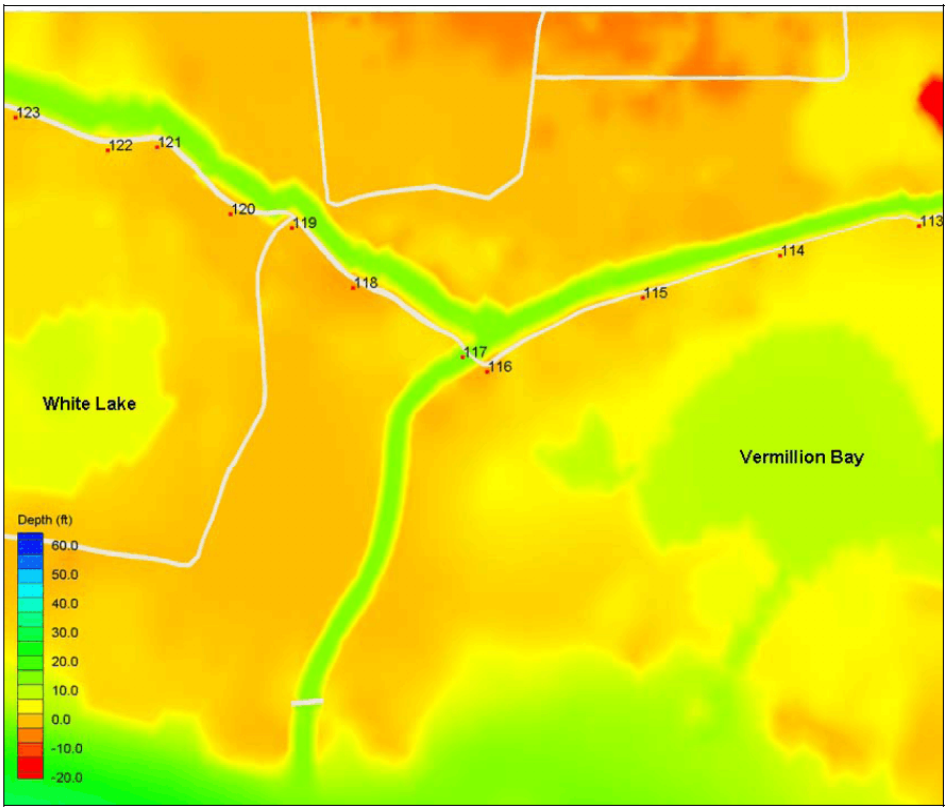


Figure L-18. Points 113 to 123 (STWAVE West grid).

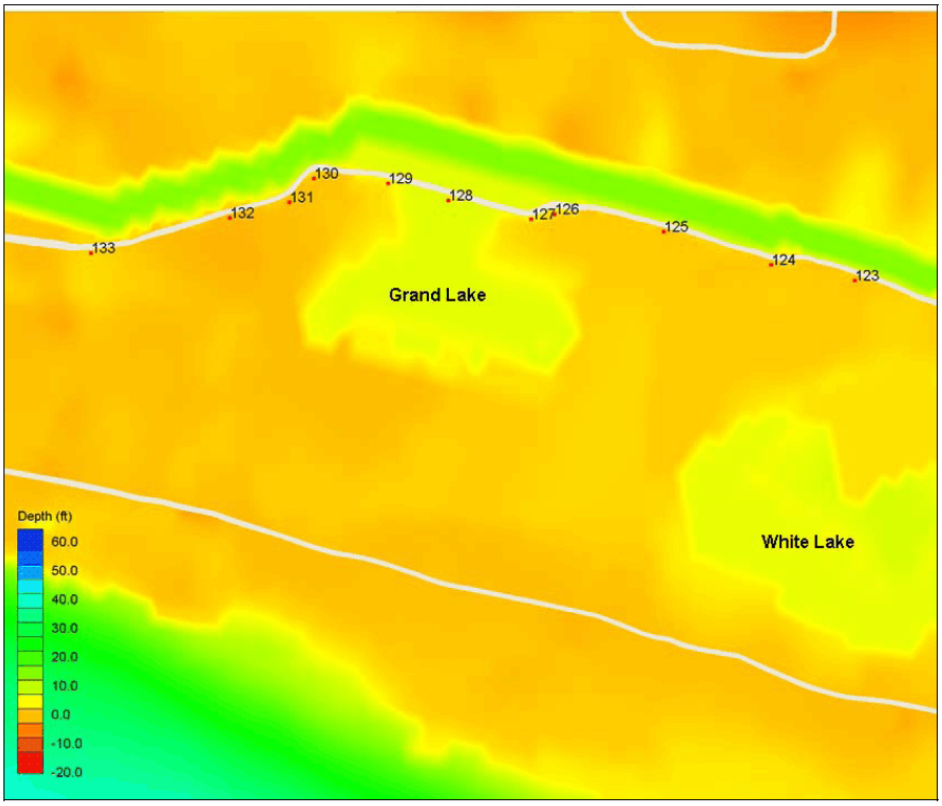


Figure L-19. Points 123 to 133 (STWAVE West grid).

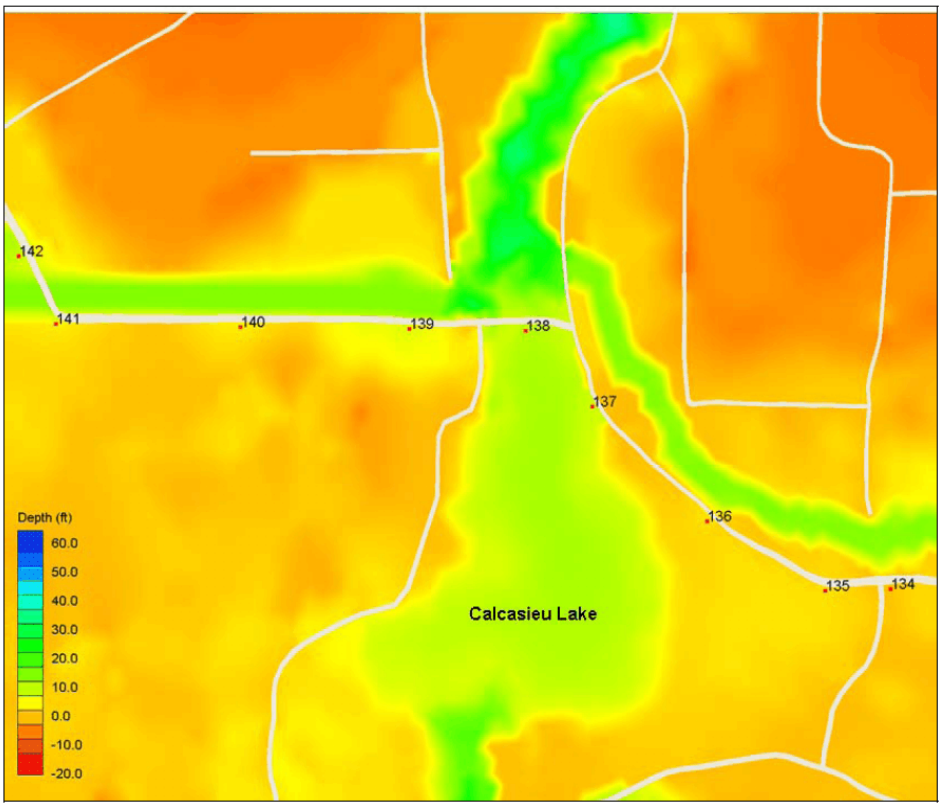


Figure L-20. Points 134 to 142 (STWAVE West grid).

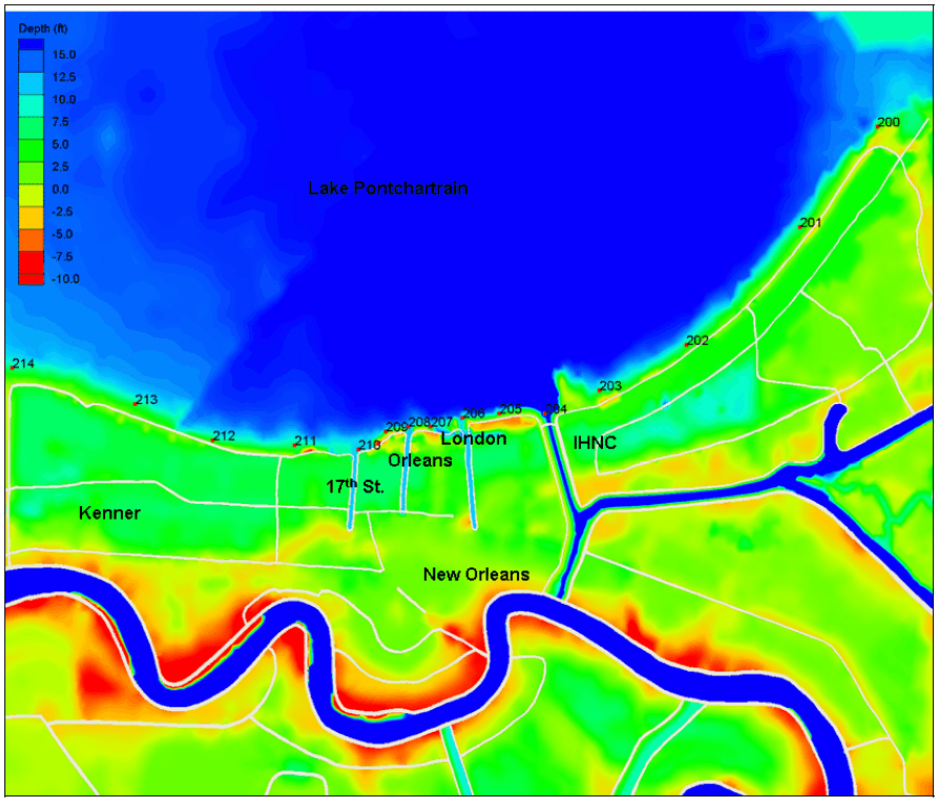


Figure L-21. Points 200 to 214 (STWAVE Pontchartrain grid).

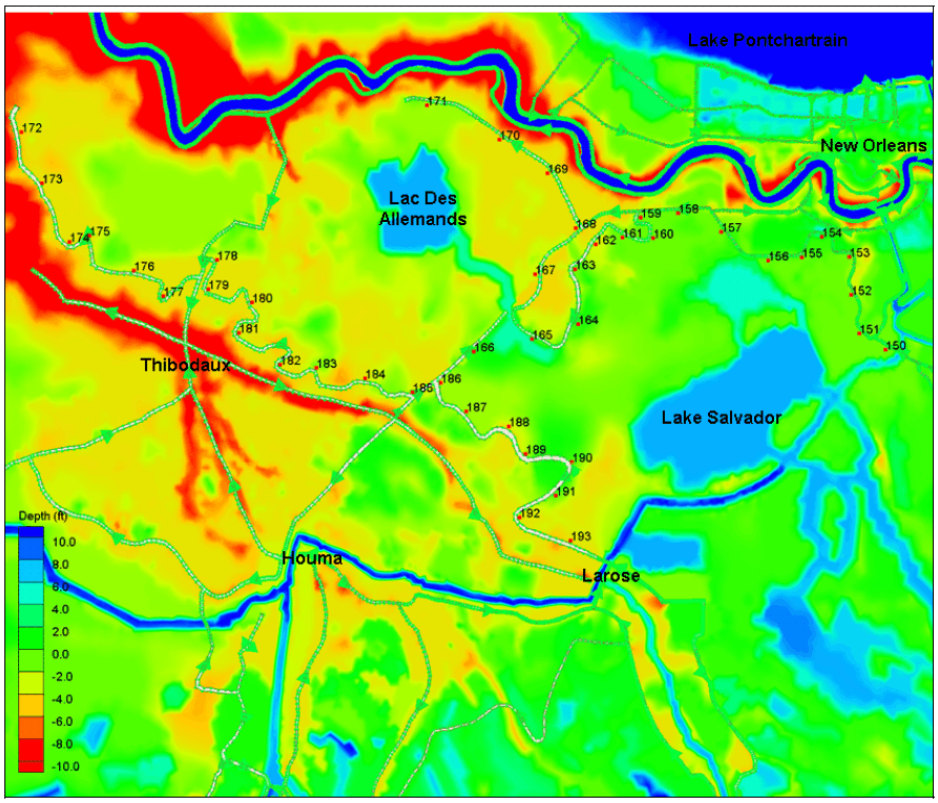


Figure L-22. Points 150-172 (STWAVE South Grid Alternatives 3 and 4).

8.0 Extrapolation of ADCIRC Results

No extrapolation was required to estimate the levee heights. However, many of the census blocks used in the economic computations are located north of the output points where CASE1 ADCIRC results are available. ADCIRC grid S10 did not include those areas, but a more recent ADCIRC grid, SL15v3, does extend to high ground. Model estimates of surge heights are not available on the new grid, but the ground elevations were extracted and plotted on the profiles to establish the northward limit of surge elevations. The bed elevation file was then filtered for display, and the green "Xs" in Figure 4.1 were plotted to show the northward extent of bed or ground elevation.

Surge heights were then extrapolated to the northern limit of the economic census blocks using the profile plots. Figure 4.1 illustrates the northern limit of the extrapolated elevations. The surge heights were extrapolated horizontally.

9.0 Economic Computations

The maximum storm surge elevations in the CASE1 output files were converted into a digital surge elevation map to make the economic computations. The computations were made by census block. This analysis is described in full in Appendix F, Economic Consequences. The economic computations do not include waves, local precipitation, local inflow or pumping. These other components will be important later when design level details are required.

10.0 Risk, Reliability and Uncertainty

In the general sense, risk and reliability analysis is an analytical method that considers the expected performance of the individual components making up a system and the consequences that result if those components fail to perform as expected. The Interagency Performance Evaluation Task Force (IPET) used the following mathematical expression to define risk:

Risk = (Probability of Failure) times (Consequence of Failure)

In the civil engineering community, performance is defined as the probability that specific loads will cause a system to fail, and losses are defined as the adverse impacts if that failure occurs. Losses can be expressed in terms of lives, dollars, area flooded, environmental qualities, social/cultural metrics ... etc. Whatever metric is used, the adverse impact of the loss is called the Consequence of Failure.

At this stage of development, there is not sufficient information to conduct a realistic risk and reliability analysis for the master plan. Instead, a return-period approach for design events has been used because hurricane severity may be ranked using the surrogate parameter, maximum surge height. The best available data at the time of this writing are the CASE1 surge heights for events having annual probabilities of being equaled or exceeded of 1 percent and 0.2 percent. Uncertainties associated with the CASE1 surge heights were not evaluated. Nevertheless, risk and reliability concepts are very useful for identifying the parameters that do contribute uncertainties in a return-period analysis.

10.1 System Conditions Contributing to Uncertainty

The IPET report describes the hurricane protection system as a collection of leveed sub-systems that form hydrologic sub-systems, which they called basins. The basins are independently maintained and operated by local parishes and levee boards.

Components of a the protection system include earthen levees, flood-walls, foundation conditions, pumping stations, canals, wall closures, power supply systems and operations personnel. The hazard that is driving the Probability of Failure in the above expression is the hurricane event. The hurricane loads the levees and flood walls with a peak surge height, effective wave height, effective wave duration, and volume of inflow from local precipitation. The significant parameter for determining the Consequences of Failure is the water level on the protected side of the levee. During Katrina some levees in the hurricane protection system were simply overtopped. In those cases, the water volume entering the protected side could be computed hydraulically. However, levee height was not the only parameter allowing water to enter the protected area. Some levees and flood walls failed, allowing water into protected areas, but the structure was not overtopped. Some were breached when the foundation failed. IPET also discovered that the effectiveness of the system depended on human factors. For example, some components of the sub-system failed because they were stop-logs and gates that had to be physically operated by personnel from the local parish or levee board. In some cases a pumping station became the conduit for letting water into the protected area because the electrical power failed. Therefore, the IPET added operations personnel to their list of system components because their performance during Katrina contributed uncertainty to the performance of the hurricane protection system. They developed the following list of components that contributed uncertainty to the performance of the hurricane system:

- Local jurisdiction
- Flood wall type and cross section

- Levee type and cross section
- Engineering parameters defining structural performance
- Soil strength parameters
- Foundations parameters

The uncertainties listed above are indicative of the factors affecting the design of elements of the protection system that are somewhat independent of the storm uncertainties. To a large extent because the profession has more experience dealing with them, these uncertainties are better understood compared to those associated with storm parameter measurements and modeling.

There are two fundamentally different sources of uncertainty in an analysis of storm related uncertainty. One is the uncertainty of predicting a future event. This is attributed to the randomness of storm events in nature as we know it. Therefore, these storm events are predicted in terms of their likelihood of occurring (e.g., the chance of heads in a coin flip).

The second source of uncertainty is attributed to the lack of knowledge or data regarding the characteristics of the storms. For example, the ability to determine the likelihood of an event (i.e., its rate of occurrence) requires that field measurements of key storm parameters be available in time and space. If a complete data set were available, the uncertainty in the computed rate of occurrence of the storm parameters would be relatively small. However, the more limited the data set, the greater the uncertainty becomes (i.e., statistical confidence intervals on parameter estimates are large). In addition to the uncertainty that results from a lack of data, there is the uncertainty that results from the lack of knowledge. This uncertainty is attributed to the lack of understanding (e.g., knowledge) about the physical processes that must be modeled (e.g., the meteorological processes that generate hurricane events). Both of these sources, lack of knowledge and lack of data, are pertinent in the application of ADCIRC.

10.2 Uncertainties in the Application of ADCIRC

The load on the system due to surge heights is computed by ADCIRC. There are uncertainties associated with the application of ADCIRC in both the calibration and production runs. Uncertainty in knowledge and data affects the computed load on the system. Uncertainty in predicting future conditions affects both the load on the system and the future consequences of failure.

The known sources of uncertainties associated with ADCIRC modeling are presented in column 1 of Table 10.1. The manner in which these uncertainties would contribute to the computations is presented in column 2, and the whether they should be utilized in the design process is stated in column 3. None of these uncertainties were addressed in the master plan. However, they may affect future surge heights computations. Each of those sources is discussed below.

10.2.1 Wind and Pressure Fields

The wind field is the fundamental energy source driving ADCIRC computations. It is computed externally and read into ADCIRC as a boundary condition. Hind casting historical events had revealed uncertainties in both the computed winds and barometric pressure fields. Research to reduce that uncertainty is presently under way using newly acquired, high quality aircraft data communications capability. The benefits from this research will be

applied in the future and is expected to improve the meteorological parameters that drive the ADCIRC computations. This is expected to reduce the uncertainties in the computed surge heights.

10.2.2 Inaccuracies in the ADCIRC Computations

Inaccuracies in the ADCIRC model would be reflected in the statistics computed from the comparisons of the predicted and measured peak surges.

Table 10.1. Sources of Uncertainties in the Overall Process and Their Significance (from Enclosure F, USACE Report to Congress, July 2006)

Uncertainty Source	Uncertainty Origin/ Explanation	Should be an Uncertainty Source in The Design Process?	Comment
Wind and Pressure Fields, Actual vs Model	Variability of Actual Wind Fields	Yes	Inherent in Variability Present in Production Runs
Any Inaccuracies in ADCIRC Model	Complexities in Hydrodynamics	Yes	Inherent in Variability Present in Production Runs
Inaccuracies in Representing Characteristics of Natural System	Complexity of Natural System,: Topography, Vegetation, Roughness, etc	Yes	Inherent in Variability Present in Production Runs
Inaccuracies in Hurricane Tracks	Tracks of Production Runs May Contain Inaccuracies	No, if the Historical Hurricane Data Base is Accurate	Inherent in Variability Present in Production Runs
Wind Stress Coefficients	Canopy Effects, Coefficients at High Wind Speeds, etc	Yes	Inherent in Variability Present in Production Runs
Historical Hurricane Data Base	Limited Number of Severe Strength Storms	Yes	This Will Be a Factor in the Later Design Calculations
Subsidence Effects			Not Inherent in Variability Present in Production Runs. This Will Be a Factor in the Later Design Calculations
Steric Effects	Inherent Variability in Mean Seasonal Water Level Fluctuations	Yes	Variability Not Present in Production Runs
Wave Setup	Not in ADCIRC	Not if Incorporated in ADCIRC	Explicit Incorporation Would Reduce Uncertainty
JPM or EST	Method of Representing Storm Statistics	Yes	Consideration Required in Design Calculations

10.2.3 Inaccuracies in Characterizing Natural System

Efforts were made to characterize the natural system faithfully. This includes bathymetry of water bodies and topography of land features, including vegetation characteristics. However, the vastness of the study area relative to the resolution of a single land form fronting a levee suggests that considerable uncertainty is likely to be present in some computed surge heights. The variability in vegetation characteristics are another source of uncertainty. Changes in geomorphology during a storm event can make a substantial difference in surge heights in the vicinity of the erosion, deposition or debris mass.

The natural system will change over time because of subsidence, erosion, deposition and sea level rise. Those changes will affect the vegetative cover. Predicting these changes is considered to be a significant uncertainty.

10.2.4 Inaccuracies in Hurricane Tracks

Uncertainty is associated with the selection of hurricane tracks. Inaccuracies in a hurricane track are expected to increase the differences between the predicted and measured peak surges. These differences are used to compute the uncertainty for design heights. The resulting design calculations would contain overly conservative results if the uncertainties are too large.

10.2.5 Wind Stress Coefficients

The Garratt wind stress coefficients were incorporated into the ADCIRC calculations. There are relatively few measurements of wind speeds during the more extreme events, and this is an area of active research. Recent investigations suggest that wind stress coefficients may level off – or even decrease, at very high wind speeds. If the wind stress coefficients were constant with increasing wind speed, an inappropriate stress coefficient would be offset through calibration (probably adjusting the wind stress coefficient). However, if the wind stress coefficients vary with wind speed, such an adjustment is only appropriate for the range of speeds in the calibration storms. Surge heights in more extreme hurricanes could tend to be overestimated.

10.2.6 Steric Effects

The steric contributions to mean water level are a result of the seasonally reduced density of the water due to thermal and fresh water effects. Thus, the steric contribution can be characterized by a monthly average and a statistical distribution about that average. As will be evident later, uncertainties in steric effects were avoided in the evaluation data base which comprised the differences between the peak surges (measured and computed) and their respective mean water levels immediately prior to the hurricane induced water levels. In design it will be necessary to include both the mean steric contribution (appropriate for the hurricane season months) and an approximation of the contribution due to the statistical uncertainty in components of steric water levels.

10.2.7 Historical Hurricane Data Base

The record length (time-wise) of the historical hurricane data base is short relative to the time that might be considered appropriate to estimate the occurrence of extreme events needed for this surge height analysis. This will contribute to uncertainties in the return periods of the peak surges.

10.2.8 Subsidence

Subsidence and sea level rise are important future conditions. Subsidence includes both regional effects and local effects. The uncertainty in future rates of subsidence and sea level rise is critical to the prediction of levee elevations.

10.2.9 Wave Setup

Although the basic physics of wave related setup are well understood, to date explicit incorporation into ADCIRC has been precluded by the complexities associated with this incorporation. Wave setup was not included implicitly in the calculated results to date. The issue is being researched.

10.2.10 JPM or EST

The Joint Probability Method (JPM) and the Empirical Simulation Technique (EST) are the two general approaches to incorporating the historical hurricane characteristics into the simulation of a series of storms and computing the return periods of the resulting storm surges. There are questions about which of these two methods is more applicable. The issue is being researched.

Integrated Ecosystem Restoration and Hurricane Protection: Louisiana's Comprehensive Master Plan for a Sustainable Coast

Appendix F: Economic Analysis and Consequences

Coastal Protection and Restoration Authority of Louisiana

April 2007

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1.0 Introduction

This appendix presents a description of the economic consequences of a 1 percent chance and a 0.2 percent chance of hurricane surge under existing conditions and with the various alternatives for hurricane protection considered in the "Comprehensive Coastal Protection Master Plan for Louisiana." The appendix includes the methodology used to determine economic consequences under Pre-Hurricanes Katrina and Rita conditions. The evaluation uses the year 2006 price levels. This evaluation area includes the portions of 24 parishes in south Louisiana at risk from flooding from 1 percent chance and 0.2 percent chance hurricanes (see Appendix E).

2.0 Residential Structures, Non-Residential Structures, Contents, and Vehicles

Elevation-damage relationships for residential structures, non-residential structures, contents and vehicles were derived using a customized GIS application similar to the one used by the Interagency Performance Evaluation Team for the Hurricane Katrina IPET Report (USACE, 2006). The model was used to develop a water elevation-damage relationship for each census block in the evaluation area. Inputs to the model include number and depreciated exposure values of residential and nonresidential structures and contents, depreciated exposure values of vehicles, ground and first floor elevation data, and depth-damage relationships.

2.1 Structure Inventory and Valuation

The general building stock portion of the HAZUS-MH flood model, MR2 Release 44 (© 2006, FEMA), a multi-hazard loss estimation model developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS), was used as a proxy for the structure inventory of the evaluation area. The model provides the total square footage, building count, and the total depreciated exposure value for residential occupancies by census block. The HAZUS-MH model combines data from the 2000 Census and data from the Department of Energy building characteristic reports to assign a total square footage to each of six residential occupancy categories: single-family dwellings, manufactured housing/mobile homes, multi-family dwellings, temporary lodgings, institutional dormitories, and nursing homes.

The HAZUS-MH model combines the square footage for each residential occupancy category with the average age of the buildings in the area and uses a depreciation schedule to compute the depreciated exposure value for that category. These values, which were expressed in 2005 price levels and updated to 2006 price levels using the Marshall and Swift Valuation Service were entered into the GIS model by census block. The number and size of buildings that were provided by the HAZUS-MH model for each residential occupancy category, were entered by census block, also. Based on this information, the depreciated exposure values were increased by 5 percent to reflect the change in prices.

The depreciated exposure values were also adjusted to reflect the underestimation of the HAZUS-MH data as noted in the IPET Report. In that report, the total depreciated exposure value for each census block was compared to the depreciated replacement cost for residential structures as calculated by Corps personnel in previous studies in south Louisiana using field surveys and the Marshall and Swift Valuation Service. The sampled depreciated replacements costs were found to be approximately 16 percent higher than the depreciated exposure values calculated by the HAZUS-MH program. To account for this underestimation, the depreciated exposure values calculated within the HAZUS-MH program were increased by 16 percent.

The GIS model was used to allocate the depreciated exposure values calculated for the residential occupancy category “single-family dwellings” within each census block, among one-story and two-story structures with pier and slab foundations. The estimated percentage of one and two-story residential structures in each parish of the study area was provided by emergency management officials. This step was necessary in order to apply the depth-damage relationships to the different types of single-family dwellings.

It should be noted that the temporary lodgings, institutional dormitories, and nursing homes are normally valued as non-residential structures in Corps studies. In this analysis they were processed as residential structures in the GIS model. Each of these buildings was assigned to the public damage category, and the public occupancy

classification was used to calculate the damages. The average depreciated replacement cost calculated for the public occupancy classification was used for these buildings. The damages for these buildings are displayed in the GIS model as part of the multi-family damage category.

The non-residential structure inventory was compiled using databases obtained from the Louisiana Department of Labor (LDOL) and the Louisiana State University GIS Department. The LDOL database provided a geo-referenced latitude/longitude coordinate for each business property in the study area that had been registered for unemployment insurance. The latitude/longitude coordinates were used in the GIS model to relate the location of each business property to a census block in the study area. The LDOL database provided a North American Industry Classification System (NAICS) code, which describes the type of business occupancy at each location, along with the number of employees. The total wages paid for the second quarter of 2005 (pre-Katrina conditions) for each business unit were also obtained from that data base. Since many small businesses operate out of residential structures, and these structures were included in the residential inventory, only the businesses that employed more than one person were included in this analysis.

The NAICS codes were grouped into four general damage categories (commercial, industrial, agricultural, and public). Each was then assigned to one of eight non-residential occupancy classifications. The eight non-residential occupancy classifications include: eating and recreation, groceries and gas stations, professional buildings, public and semi-public facilities, repairs and home use, retail and personal services, warehouse and contractor services, and industrial facilities. An average depreciated replacement cost using 2006 price levels was calculated for each occupancy classification, except for industrial facilities, based on previous feasibility studies conducted by New Orleans District using the Marshall and Swift Valuation Service. Since the previous feasibility studies did not include a significant number of industrial properties, the Dun and Bradstreet database within the HAZUS program was used to determine the average depreciated replacement cost of industrial buildings.

The LDOL database provided only a single latitude/longitude coordinate for the central reporting office of the schools, post offices, and churches. In order to have a separate location and value for each individual school, church, and post office in the study area, a separate database was obtained from Louisiana State University. The community layer within the LSU GEOLAGIS database provided a geo-referenced latitude/longitude coordinate for each school, church, and post office in the study area and a description of the facility. Each of these buildings was assigned to the public damage category and the public occupancy classification to calculate the damages. The average depreciated replacement cost calculated for the public occupancy classification was used for these buildings.

The following structure values were assigned to each of the non-residential occupancy categories in the GIS Model

Eating & Recreation	$ 166,644
Groceries and Gas Stations	$ 151,613
Professional Buildings	$ 503,583
Public and Semi-Public	$ 699,987
Repair and Home Use	$ 111,812
Retail and Personal Services	$ 263,369
Warehouses and Contractor Services	$ 241,252
Industrial Buildings	$2,728,950

2.2 Residential and Non-Residential Contents Valuation

The contents for residential and non-residential structures were evaluated based on limited field surveys and the experience of a building and insurance panel of experts for three previous studies in the New Orleans District. These studies were Jefferson and Orleans Parishes Feasibility Study in 1996, Lower Atchafalaya Reevaluation and Morganza to the Gulf, Louisiana Feasibility Studies in 1997, and Donaldsonville to the Gulf, Louisiana Feasibility Study in 2006. The value of the contents of each structure category were totaled and then compared to the total value of a structure in order to develop the contents-to-structure value ratios (CSVRs).

The CSVRs and depth-damage relationships developed for the Jefferson and Orleans Studies were applied to residential and non-residential structures located between the Mississippi State Line and the Mississippi River and for all of Jefferson and Orleans parishes on the West Bank. The CSVRs and depth-damage relationships developed for the Donaldsonville to the Gulf Study were used for the remainder of Planning Unit 2. The relationships developed for the Lower Atchafalaya Reevaluation and Morganza to the Gulf Studies were used for Planning Units 3A, 3B, and 4. The CSVRs developed for each of the four residential structure categories and eight non-residential occupancy classifications for the three feasibility studies are shown below:

2.3 Jefferson and Orleans Area

Residential:

One-story	69%
Two-story	59%
Mobile home	79%
Multi-family residence	37%

Commercial:

Eating and Recreation	114%
Grocery and Gas Station	127%
Professional building	43%
Public and Semi-public Building	114%
Repairs and Home Use	206%
Retail and Personal Services	142%
Warehouse and Contractor Services	168%
Industrial	168%

2.4 Donaldsonville to the Gulf Area

Residential:

One-story	69%
Two-story	67%
Mobile home	112%
Multi-family residence	27%

Commercial:

Eating and Recreation	83%
Grocery and Gas Station	397%

Professional building	44%
Public and Semi-public Building	79%
Repairs and Home Use	74%
Retail and Personal Services	367%
Warehouse and Contractor Services	256%
Industrial	256%

2.5 Lower Atchafalaya and Morganza to the Gulf Area

Residential:

One-story	71%
Two-story	50%
Mobile home	148%
Multi-family residence	23%

Commercial:

Eating and Recreation	306%
Grocery and Gas Station	128%
Professional building	78%
Public and Semi-public Building	82%
Repairs and Home Use	251%
Retail and Personal Services	148%
Warehouse and Contractor Services	372%
Industrial	372%

The GIS model used the CSVRs as a percentage of the total depreciated exposure value or total depreciated replacement cost to determine the total value of the contents for each residential and non-residential occupancy classification. The CSVR calculated for warehouses and contractor services was also assigned to the industrial non-residential occupancy classification.

2.6 Ground Elevations

Topographical data obtained from the Lidar digital elevation model (DEM) using the NAVD88 (2004.65) epoch were combined with census block boundaries obtained from the 2000 Census using GIS mapping to determine the mean ground elevation for each census block in the IPET study area. For the portion of the evaluation area outside of the IPET study area, unadjusted NAVD88 datum was used to determine the mean ground elevation for each census block.

2.7 First Floor Elevations

An average height above ground was assigned to the residential structures in each census block based on interviews with parish emergency management personnel. These officials were asked to estimate the percentage of residential structures with pier foundations and with slab foundations and to estimate the average height above ground level for each type of foundation. Mobile homes were assigned an average foundation height of 2.0 feet above ground level based on previous studies. An average height of 1.5 feet above ground was assigned to all

non-residential properties in the study area based on the information obtained during the interviews with parish emergency management.

2.8 Vehicles

Damages to private automobiles are based on the number of automobiles directly impacted per household. The elevation of each automobile is determined by the corresponding ground elevation near the structure. Automobile damages are then calculated by correlating the depth of flooding to the depth-damage relationships for vehicles.

Census data were used to determine the average number of privately owned vehicles per household (owner occupied housing or rental unit) within each census block group in the study area. This relationship was used in the GIS model to determine the average number of vehicles per household within each census block. Based on the Southeast Louisiana and Mississippi Clearance Time Updates for the 2006 Hurricane Season Final Report (prepared by Federal Emergency Management Agency and U.S. Army Corps of Engineers, New Orleans District dated June 1, 2006), and the Southwest Louisiana Hurricane Evacuation Report (prepared by Federal Emergency Management Agency and U.S. Army Corps of Engineers, New Orleans District dated 2003), between 65 and 80 percent of the privately owned vehicles in Southeast Louisiana were used for evacuation from Hurricane Katrina. For this analysis, it was assumed that the average household would use 70 percent of its vehicles to evacuate during a storm event, while the remaining 30 percent of its vehicles would remain parked at the residence.

Residential automobile damages were based on the number of privately owned vehicles not used for evacuation. Each of these vehicles was assigned an average value of $12,217 as reported by the Manheim Used Vehicle Value Index, which is based on over 4 million automobile transactions conducted each year that has been adjusted to reflect the retail replacement value. The depth-damage relationships for vehicles that were developed based on interviews with the owners of automobile dealerships that had experienced flood damage. These interviews were conducted as part of the depth-damage reports and were used to calculate flood damages to vehicles at the various levels of flooding. It was assumed that each automobile was parked one foot below the elevation of slab houses and parked at the ground elevation of houses built on piers.

Commercial vehicle damages were based on the number of commercial licenses as reported by the Louisiana Department of Motor Vehicles for Jefferson and Orleans parishes for October 1999 and the total number of business units for each parish at the end of the third quarter of 1999. Based on these data, it was determined that there was an average of 1.6 vehicles associated with each business unit in the study area. It was assumed that since the business owners were using their privately owned vehicle for evacuation, all commercial vehicles would remain parked at the business. The ground elevation assigned to these vehicles was the same as the ground elevation assigned to the business property. The Manheim average value, $12,217, and the vehicle depth-damage relationships were used to derive the potential damages to commercial vehicles.

2.9 Depth-Damage Relationships

Damages from flooding were calculated for residential and non-residential buildings, their contents, and vehicles based on the depth-damage relationships developed by a panel of building and construction experts for the Jefferson and Orleans Parishes Feasibility Study in 1996, the Lower Atchafalaya Reevaluation and Morganza to the Gulf, Louisiana Feasibility Studies in 1997, and the Donaldsonville to the Gulf, Louisiana Feasibility Study in 2006. Salt-water, long-duration (one-week) depth damage curves were used to indicate the percentage of the structural value that was damaged at each depth of flooding. Damage percentages were determined for each one-

half foot increment from one foot below first-floor elevation to two feet above first floor, and for each 1-foot increment from 2 feet to 15 feet above first-floor elevation.

Depth-damage relationships were developed for one-story and two-story residential structures, mobile homes, and non-residential structures, their contents and vehicles. The panel of experts developed depth-damage relationships for four residential structure categories (one-story, two-story, mobile homes, and multi-family dwellings) and for three commercial structure categories (masonry, wood or steel frame, and metal frame). Depth-damage relationships were also developed for the four residential content categories and for seven commercial content categories. The non-residential depth-damage relationships were assigned to the appropriate structure and content damage category based on the NCAIS code and occupancy classification.

2.10 Stage or Water Elevation-Damage Relationships

Inputs to the GIS model have thus far included elevation data, structure inventory and valuation data, and depth-damage relationships. The model used these inputs to generate a water elevation or stage-damage relationship for each census block. Potential flood damages are calculated at one-foot increments from the beginning damage elevation to an elevation where damages for all the structural categories have reached a maximum. In order to insure that this maximum had been reached, the maximum height of a slab foundation or of a pier foundation in each census block was added to the maximum depth of flooding (15 feet) included in the depth-damage relationships. Damages were calculated for eight general damage categories: single-family residential, multi-family residential, manufactured housing/mobile homes, commercial, industrial, public, agricultural, and vehicles.

The GIS model was used to develop a stage-damage relationship for each of the approximately 64,000 census blocks in the evaluation area. The damages reflect 2006 price levels and have not been adjusted for changes in inventory of residential and non-residential properties and their vehicles that resulted from the devastation caused by Hurricanes Katrina and Rita.

The water/stage elevation data used is described in Appendix E.

3.0 Emergency Costs

Emergency costs are those costs incurred by the community during and immediately following a major storm. They include emergency measures such as sandbagging and police overtime, damages to roads and bridges, and the subsequent cleanup of private and public properties.

A flooded community typically incurs a variety of flood-related costs not associated with structural damages. These include emergency spending by government and non-profit agencies and home and business owners of flooded homes and businesses following a flood event. The first category includes the reduction in the emergency costs of federal, state and local governments, such as debris removal, sandbagging and police overtime, repairs to public property, such as roads and bridges, and overtime for sanitation department employees. The second category includes the reduction of individual evacuation costs including shelter and subsistence expenses. The third category consists of the reoccupation costs required by homeowners in order to move back into their homes. The fourth category consists of commercial clean-up and restoration costs required by business owners in order to become operational once again.

3.1 Reduction of Federal, State, and Local Government Emergency Costs

This category includes emergency costs that would be incurred by federal, state, and local government agencies as a result of a hurricane. The average emergency cost per structure used in this analysis was based on the actual spending by federal agencies following Hurricane Katrina and on the actual spending by state, parish, and municipal entities during and following the May 1995 flood event. According to emergency management officials from New Orleans District, each inundated residential structure created approximately 30 cubic yards of debris and each non-residential structure created approximately 150 cubic yards of debris. The cost to remove this debris ranged from $15 to $25 per cubic yard with an average of $20 per cubic yard. The average cost of debris removal for each residential structure was $600, while the average cost of debris removal for each non-residential structure was $3,000.

State, parish, and municipal agencies spent approximately $24 million on emergency operations during and immediately following the May 1995 flood. This amount divided by the number of structures flooded (40,000) gives the average emergency cost per structure flooded ($600). When price indexed to current values, this amount was increased to $850 per structure. The combined federal, state, parish, and municipal spending averaged $1,450 for inundated residential structures and $3,850 for inundated non-residential structures.

3.2 Evacuation and Subsistence Costs

Evacuation and subsistence costs that would be incurred by FEMA and by non-profit organizations, such as the American Red Cross and the Salvation Army, and by individual evacuees are also emergency costs occurring because of the threat of a hurricane. These costs include the shelter assistance or lodging, meals, clothing, and miscellaneous supplies, such as toiletries, diapers, first aid kits, bottled water, etc., provided for evacuees, as well as the vehicle operation and maintenance costs incurred by the evacuees. The average evacuation and subsistence cost per evacuated household used in the analysis was based on the average government per diem for lodging and subsistence in Dallas, Houston, Shreveport, Monroe, Little Rock, and Memphis. The average daily hotel rate was calculated to be $75.33, and the average daily rate for meals prepared outside of the home was determined to be $47.67 per person. After subtracting out the average daily cost of meals prepared at home per person as reported by the U.S Department of Agriculture ($8.32), the total daily cost of lodging and additional meal expenditure was found to be $232.73 per four-member household. The distance that each household drove from coastal Louisiana

to their evacuation destination was assumed to be approximately 350 miles, or 700 miles round trip. According to the Internal Revenue Service (IRS), the operation and maintenance cost, including gasoline, for each vehicle used in the evacuation process was $0.485 per mile, for a total of $339.50.

Based on data compiled following Hurricane Katrina, the average inundated household spent three months, or 90 days, away from home. Based on this data, the total evacuation and subsistence costs are estimated to be $21, 284 per household at risk from the hurricane.

3.3 Reoccupation Costs

Reoccupation costs are the expenses that homeowners must incur in order to make their homes habitable. These costs include the hours that homeowners spend to gut their homes; to contract, supervise, and inspect repairs; to clean and disinfect their homes; and to complete casualty loss forms for flood insurance and other disaster assistance. Data compiled following Hurricane Katrina were used to determine the average cost per square foot to gut a flooded structure. Interviews with former flood victims in the Amite River and Tributaries project area were used to determine the number of hours spent on the remaining tasks.

For the typical residential structure, an average of 1,000 square feet of each inundated residential structure was gutted following Hurricane Katrina. Based on interviews with contractors, the cost of gutting a residential structure ranged from $2.98 per square foot to $6.43 per square foot with an average value of $4.20 per square foot. This results in a cost of $4,200 for each household at risk.

Based on surveys conducted by the president of the Amite River Citizens Organization, it was reported that each homeowner spent an average of 170 hours cleaning up after the flood. Because the homeowners were forced to forego other activities, including work time, during the flood aftermath, an opportunity cost of $17.25 per hour was assigned based on the year 2006 average hourly wage for Calcasieu, Cameron, and Vermilion parishes for employees covered under the Louisiana Employment Securities Law. Thus, the total reoccupation costs for each household at risk was $17.25 x 170 hours, or $2,933.

When the average cost of gutting a residential structure is added to the average costs incurred by the property owner for repairing and cleaning their home, the most likely reoccupation cost for each residential structure totaled $7,133.

3.4 Commercial Clean-up and Restoration Costs

Commercial clean-up costs are the expenses that business owners must incur in order to make their businesses operational, including the time that business owners had to spend gutting their establishments. These costs include the cleaning and disinfecting of businesses, returning contents to the facility, removing sandbags, and completing casualty loss forms for flood insurance and other disaster assistance.

For each non-residential structure, an average of 2,000 square feet was gutted following Hurricane Katrina. Based on interviews with contractors, the cost of gutting a non-residential structure ranged from $2.98 per square foot to $6.43 per square foot with an average value of $4.20 per square foot. Thus, the most likely gutting cost per non-residential structure totaled $8,400.

The average clean-up costs per structure flooded used in this analysis were based on a survey of 21 commercial business owners in Jefferson Parish after the May 1995 flood event. An average of approximately $5,525 per

non-residential structure was spent by each of these businesses immediately following the flood. When price indexed to current values, this amount was increased to $7,845 per non-residential structure.

When the average cost of gutting a non-residential structure is added to the average costs incurred by the property owner for repairing and cleaning their business, the reoccupation cost for each non-residential structure totaled $16,245.

4.0 Infrastructure Costs

Infrastructure damages or costs are based on data from Hurricane Katrina taken from the IPET Report, and the following description of the development of these damages was also taken from that report.

Infrastructure damage was an important source of direct economic losses from Hurricane Katrina. These damages were estimated as (to the extent information was available) monetary costs for damages, measured by the cost of repair or replacement of significant infrastructure assets. As with other investigations for direct damages or costs attributable to Hurricane Katrina within the framework for IPET studies, the area of consideration was primarily limited to the five (5) parish area of Orleans, St. Bernard, Plaquemines, Jefferson, and St. Charles parishes.

The estimation of impacts to infrastructure from Hurricane Katrina is difficult to estimate for some categories of infrastructure due to the follow-on occurrence of Hurricane Rita. Most impacts from Hurricane Rita were incurred in areas west of the New Orleans metropolitan area with some additional damages imposed by associated rainfall and flooding due to weakened levees and previously saturated ground areas. Available information indicates that for the five (5) parishes, infrastructure damages were due mostly to Hurricane Katrina.

A primary objective for IPET studies was to estimate damages based on effects of flooding but acknowledge other effects such as wind and rainfall associated with hurricane conditions. For some infrastructure items, this posed little difficulty but for others it was extremely difficult or simply not practical. In the case of electrical utilities, a significant loss was due to the downing of utility poles and supported transmission lines plus the destruction of substations. Certainly, some of the loss of utility poles and lines was due to wind alone. In other cases, the saturation of soils compromised the foundational support and led to toppling of above-ground lines.

To provide some context of the magnitude of overall hurricane impacts to infrastructure, statistics on electric service were obtained from Entergy, the primary regional electric public utility. The net total loss of customers (households and businesses) across the five parish area as of December 2005 was approximately 32 percent compared to the pre-Katrina levels. St. Bernard Parish incurred the greatest loss of neighborhood occupancy measured by percentages with a loss customers using electricity of over 99 percent from the pre-Katrina level. Orleans Parish exhibits the greatest absolute loss with total customers declining by more than 97,000.

The dollar value of damage to infrastructure primarily is in terms of full replacement or repair costs in 2005 dollars. The assessment of infrastructure direct damage involved internet searches for information in addition to contact with the Federal Emergency Management Agency (FEMA) and various state-level agencies within the State of Louisiana. It also involved direct contact with representatives of municipalities and Parish governments in addition to contact with companies or entities who own or are charged with management and operation of significant infrastructure assets.

The total infrastructure damages from Hurricane Katrina for the five parish area are summarized below:

Infrastructure Category	Low	High
Roads, Pavements, & Bridges	$890,000,000	$1,119,000,000
Railroad Line Access	$48,000,000	$65,000,000
Regional Airport Facilities	$67,000,000	$73,000,000
Electrical Distribution & Transmission Grid	$860,000,000	$980,000,000
Gas (line) Distribution	$490,000,000	$515,000,000
Drainage, Sewage, & Potable Water Services	$690,000,000	$740,000,000
Telecommunication Networks	$290,000,000	$320,000,000
Public Transit (Vehicles & Equipment)	$690,000,000	$730,000,000
Waterborne Navigation	$140,000,000	$170,000,000
Repair to Floodwall Systems	$1,800,000,000	$2,000,000,000
Total	$5,965,000,000	$6,712,000,000

This data indicates that Hurricane Katrina caused an estimated $6.0 to $6.7 billion dollars in damage to infrastructure in the area. The categories with the most damages are levees and floodwalls, roadway networks and assets of the regional electrical transmission grid. Together, hurricane-related flooding damages to these categories of infrastructure total $3.6 to $4.1 billion dollars.

For this study, all categories of infrastructure from the IPET Report except “Repair to Floodwall Systems” were used and the average damages converted to a per capita value. “Repair to Floodwall Systems” was not used because it was assumed that the repair performed to these floodwall and levees, and the new construction, would be performed in such a manner that they would not be damaged from future hurricanes. The per capita values derived from the IPET Study were applied to the population at risk in the evaluation area to estimate infrastructure damage. The infrastructure damage for the evaluation area was estimated to be $3,181 per capita for the population at risk.

4.1 Agricultural Crop Damage

Agricultural crop damages were calculated on cropland acres in each census block obtained from the HAZUS database. A damage-per-cropland-acre was calculated based on acres of each crop by parish from the National Agricultural Statistics Service (NASS) and crop budgets and damage estimates from Katrina and Rita provided by the LSU Agricultural Center. An average damage of $166 per cropland acre was used to estimate damages to agricultural crops.

5.0 Storm Consequences

5.1 General

Consequences of hurricane surge elevations having probabilities of 1 percent and 0.2 percent of being equaled or exceeded in any given year were estimated under existing conditions and for Alternative 1, Alternative 2, and the Draft Master Plan Alternative for each of the Concentrated Asset (CA) and Distributed Asset (DA) areas in the five Planning Units (see Appendices B, D, and H). Damages to structures, contents, and vehicles were estimated based on the elevation-damage relationships developed in using the HAZUS database discussed earlier in this section. These elevation-damage relationships were combined with storm surge elevations for each census block for the 1 percent chance and 0.2 percent chance storms to develop damages to residential and non-residential structures and contents and vehicles for each CA and DA for each storm. Damages were aggregated into CAs and DAs based on the location of the centroid of the census block.

Damages associated with emergency costs, infrastructure damage, and agricultural crop damage were estimated based on the number of structures, population, and cropland acres in each census block within each CA and DA. Since the damages to structures, contents, and vehicles from the 1 percent chance storm were approximately 75 percent of the damages from the 0.2 percent chance storm, emergency costs, infrastructure damage, and agricultural crop damage for the 1 percent chance storm were assumed to be 75 percent of the damages from the 0.2 percent chance storm.

5.2 Existing Conditions

For Planning Unit 1, it was assumed that under existing conditions, levees were in place to protect from the 1 percent chance storm for (1) Jefferson Parish/New Orleans East Bank (CA 3d), (2) New Orleans East to Highway 11 (CA 3e), and (3) Lower 9th Ward/St. Bernard Parish (CA 3f). All other areas were considered to be unprotected from the 1 percent chance and 0.2 percent chance storms.

For Planning Unit 2, it was assumed that under existing conditions, levees were in place to protect from the 1 percent chance storm for (1) Metro Area West Bank (CA 1), (2) Upper Plaquemines (CA 2), (3) Lower Plaquemines (CA 3), and (4) South Lafourche (East of Bayou Lafourche) (CA 6). All other areas were considered to be unprotected from the 1 percent chance and 0.2 percent chance storms.

For Planning Unit 3A, it was assumed that under existing conditions, levees were in place to protect South Lafourche (West of Bayou Lafourche) (CA 6) from the 1 percent chance storm. All other areas were considered to be unprotected from the 1 percent chance and 0.2 percent chance storms.

For Planning Unit 3B, it was assumed that under existing conditions, levees were in place to protect Berwick/Patterson (CA 1) from the 0.2 percent chance storm. All other areas were considered to be unprotected from the 1 percent chance and 0.2 percent chance storms.

For Planning Unit 4, it was assumed that under existing conditions, there were no levees in place to protect from the 1 percent chance or 0.2 percent chance storms.

Damages for the 1 percent chance and 0.2 percent chance storms under existing conditions are presented in Tables F-1 through F-10. Houses at risk from the 1 percent chance and 0.2 percent chance storms under existing conditions are presented in Tables E-11 through E-20.

5.3 With Project Conditions

Several alternatives were considered during the plan formulation and selection process. These alternatives were identified as Alternative 1, Alternative 2, and the Draft Master Plan Alternative. In the evaluation of damages and houses at risk under the various alternative scenarios, CAs and DAs were sorted based on the level of protection provided by each alternative. These sorted sets were then identified as protected or unprotected from the 1 percent chance and 0.2 percent chance storms.

Tables F-21 through F-25 provides information as to the level of protection of each CA and DA under the various alternatives.

Damages for the 1 percent chance and 0.2 percent chance storms with Alternative 1 are presented in Tables F-26 through F-35. Houses at risk from the 1 percent chance and 0.2 percent chance storms with Alternative 1 are presented in Tables F-36 through F-45.

Damages for the 1% chance and 0.2 percent chance storms with Alternative 2 are presented in Tables F-46 through F-55. Houses at risk from the 1 percent chance and 0.2 percent chance storms with Alternative 2 are presented in Tables F-56 through F-65.

Damages for the 1 percent chance and 0.2 percent chance storms with the Draft Master Plan Alternative are presented in Tables F-66 through F-75. Houses at risk from the 1 percent chance and 0.2 percent chance storms with the Preferred Alternative are presented in Tables F-76 through F-85.

5.4 Summary of Damages

A summary of all the economic consequences (damages) is presented in Table E-86, and a summary of residences at risk is presented in Table F-87. A summary of economic consequences by category and Planning Unit for existing conditions and all alternatives is presented in Table F-88. Each CA and DA was ranked according to the number of residences at risk. These rankings are presented in Table F-89. Areas with protection from the 1 percent chance and 0.2 percent chance storms under existing conditions are indicated in this table.

5.5 Other Consequences

In addition to the planning Unit specific consequences presented in previous sections of this Appendix, there are other significant economic consequences that accrue to the region and to the Nation from hurricanes in south Louisiana. A study completed by the Waldemar S. Nelson Company titled “Economic Impact Assessment Louisiana Coastal Area Comprehensive Coast/wide Ecosystem Restoration Study,” estimated the direct impacts of coastal erosion on oil and natural gas production, transportation and navigation, commercial fishing, and recreational activities. Another study conducted by Dr. James A. Richardson and Dr. Loren C. Scott titled “The Economic Impact of Coastal Erosion in Louisiana on State, Regional, and National Economics,” takes these economic impacts one step further as it looks at what the ripple effects (multiplier effects) will be throughout the economy. Using input-output models developed by the U.S. Department of Commerce, they estimated the loss of jobs, household earnings, and business transactions for the National economy and specific regions of the U.S. economy if disruptions occurred because of coastal erosion. These same disruptions, especially in navigation and oil and natural gas supplies, could be caused by hurricanes that strike south Louisiana. This was witnessed by the impacts on oil and natural gas after Hurricane Katrina. The following paragraphs discuss disruptions in navigation and oil and natural gas supplies in more detail.

5.6 Navigation

The Nelson study generated scenarios involving a 7-day and a 14-day closure on the lower Mississippi River. The 7-day closure would raise shipping costs $50 million while the 14-day closure would raise these costs by $200 million. Using this data as input to their model, Richardson and Loren estimated the following impacts on the economy of the U.S.

Impact of 7-Day Closure

Lost Sales	$80,000,000
Lost Earnings	$22,200,000
Lost Employment (jobs)	663

Impact of 14-Day Closure

Lost Sales	$323,300,000
Lost Earnings	$ 88,600,000
Lost Employment (jobs)	2,653

5.7 Oil Supplies

The Nelson study generated scenarios where disruptions in the oil industry in Louisiana removed 625,000 barrels per day from U.S. oil supplies. In the case of a 3-week disruption, consumers would pay $1.74 billion more for oil products, while a 5-week disruption would cause consumers to pay $2.91 billion more. Using this data as input to their model, Richardson and Loren estimated the following impacts on the economy of the U.S.

Impact of 3-Week Disruption

Lost Sales	$3,676,100,000
Lost Earnings	$1,035,600,000
Lost Employment (jobs)	32,390

Impact of 5-Week Disruption

Lost Sales	$6,148,000,000
Lost Earnings	$1,732,000,000
Lost Employment (jobs)	54,170

5.8 Natural Gas Supplies

The Nelson study generated a scenario where there would be damage to natural gas pipelines, removing them from service for three weeks and causing natural gas prices to rise by 11.4 percent. The impact on the U.S. economy from such a disruption is shown below.

Impact of 3-Week Disruption

Lost Sales	$1,803,100,000
Lost Earnings	$ 455,200,000
Lost Employment (jobs)	12,897

6.0 Summary

It is evident from the data presented in this Appendix, that a 1 percent chance or 0.2 percent chance hurricane in south Louisiana would cause tremendous damages to the properties and people of the local area. These large storms would also result in tremendous losses to the economy of the entire Nation by increasing the costs of goods because of disruptions in navigation and by increasing the costs of natural gas and oil products. Additionally, tremendous burdens are placed on other areas in the region such as Dallas, Houston, Baton Rouge, Shreveport, Monroe, and others by the tremendous number of evacuees that must be provided for because of the need to flee these hurricanes.

Hurricane protection for south Louisiana is critical to the local citizens, the Region, and the Nation. The Master Plan Alternative reduces damages from a hurricane with a 1 percent chance of occurrence by 90 percent and reduces the damages from a 0.2 percent occurrence hurricane by 84 percent. The Master Plan Alternative reduces the number of residences at risk by 96 percent from a 1 percent hurricane and by 80 percent from a 0.2 percent event.

7.0 Tables 1 through 89

Table F-1
Damages to Planning Unit 1
100-Year Storm-Existing Conditions
(Thousands of Dollars)

Sub-Basin		Residential Damage	Comm/Indus, Public & Ag Bldg Damage	Vehicle Damage	Total Damage to Structures/Vehicles	Emergency Costs	Agricultural		Total Damages
Number	Name						Infrastructure Damage	Crop Damage	
3d	JP/NO Eastbank	$28,888,196	$8,300,401	$1,126,314	$38,314,910	$6,055,103	$1,357,456	$440	$45,727,910
3e	NO East to Hwy 11	$5,144,046	$670,271	$138,215	$5,952,532	$790,389	$225,539	$180	$6,968,640
3f	Lower 9th/St. Bernard	$4,710,379	$698,370	$136,095	$5,544,844	$775,641	$204,051	$988	$6,525,524
	Protected From 100-Year Under Existing Conditions	**$38,742,621**	**$9,669,042**	**$1,400,624**	**$49,812,286**	**$7,621,133**	**$1,787,046**	**$1,608**	**$59,222,074**
1a	Florida Parishes & Amite River-Walker	$0	$0	$0	$0	$8,827	$2,484	$84	$11,394
1b	Florida Parishes & Amite River-Port Vincent/French Settlement	$12,258	$2,006	$647	$14,910	$19,745	$4,270	$61	$38,986
2	North Shore	$2,401,548	$396,935	$82,594	$2,881,078	$1,357,314	$355,035	$1,998	$4,595,426
3a	Lutcher, Gramercy	$303,721	$48,897	$10,306	$362,924	$58,088	$16,214	$85	$437,311
3b	Reserve/LaPlace	$1,799,741	$230,446	$38,892	$2,069,079	$319,766	$92,176	$960	$2,481,980
3c	Norce/St. Rose	$1,310,426	$271,204	$32,964	$1,614,593	$188,534	$54,777	$197	$1,858,101
4	Plaquemines Eastbank	$128,126	$53,325	$4,010	$185,460	$22,830	$7,169	$509	$215,968
DA 1-A		$507,409	$115,945	$17,097	$640,451	$310,245	$81,881	$4,343	$1,036,920
DA 1-B		$333,989	$23,621	$7,348	$364,958	$56,966	$9,858	$119	$431,900
DA 1-C		$82,443	$27,050	$2,093	$111,586	$19,512	$3,144	$587	$134,829
DA 1-D		$58	$4,953	$40	$5,050	$53	$10	$0	$5,113
	Unprotected From 100-Year Under Existing Conditions	**$6,879,720**	**$1,174,380**	**$195,990**	**$8,250,090**	**$2,361,879**	**$627,018**	**$8,942**	**$11,247,929**

Table F-2
Damages to Planning Unit 2
100-Year Storm-Existing Conditions
(Thousands of Dollars)

Sub-Basin Number	Sub-Basin Name	Residential Damage	Comm/Indus, Public & Ag Bldg Damage	Vehicle Damage	Total Damage to Structures/Vehicles	Emergency Costs	Infrastructure Damage	Agricultural Crop Damage	Total Damages
1	Metro Area on the West Bank	$14,177,270	$2,267,674	$395,856	$16,840,799	$2,205,008	$607,305	$731	$19,653,843
2	Upper Plaquemines Parish	$191,058	$76,622	$5,820	$273,501	$63,944	$9,689	$576	$347,709
3	Lower Plaquemines Parish	$400,626	$191,635	$16,534	$608,796	$37,704	$26,112	$739	$673,351
6	South Lafourche	$416,140	$210,249	$14,807	$641,196	$44,543	$22,207	$1,451	$709,398
	Protected From 100-Year Under Existing Conditions	**$15,185,095**	**$2,746,180**	**$433,017**	**$18,364,292**	**$2,351,199**	**$665,312**	**$3,498**	**$21,384,301**
4a	Oil and Gas, Fishing, and Tourism Communities	$243,767	$66,158	$3,110	$313,035	$32,622	$3,676	$92	$349,425
4b	Oil and Gas, Fishing, and Tourism Communities	$52	$0	$0	$52	$103,882	$0	$0	$103,934
4c	Oil and Gas, Fishing, and Tourism Communities	$231,692	$56,256	$7,380	$295,328	$42,669	$12,038	$35	$350,071
5	Industrial Communities-Port Fourchon	$2,063	$63,464	$540	$66,067	$67	$60	$0	$66,194
7	Central Lafourche	$61,062	$25,454	$2,970	$89,486	$4,454	$10,662	$1,964	$106,565
8	River Parishes	$387,008	$118,037	$18,264	$523,309	$77,316	$50,311	$5,890	$656,826
9	Upper Lafourche, Assumption, Ascension	$32,206	$9,819	$1,489	$43,513	$40,210	$36,628	$5,682	$126,034
10a	Central Basin Communities	$207,947	$26,724	$7,852	$242,522	$178,301	$18,039	$580	$439,442
10b	Central Basin Communities	$90,431	$43,316	$6,466	$140,213	$129,268	$10,187	$850	$280,518
DA 1-A		$153,447	$34,433	$7,881	$195,761	$47,777	$12,618	$1,751	$257,907
DA 1-B		$736,892	$57,065	$14,094	$808,050	$81,374	$24,153	$591	$914,168
DA 1-C		$1,489	$0	$51	$1,540	$336	$107	$409	$2,393
DA 2-D		$8,816	$4,710	$138	$13,664	$2,098	$165	$102	$16,029
DA 2-E		$2,824	$0	$0	$2,824	$1,075	$0	$83	$3,982
DA 2-F		$19,979	$32,150	$685	$52,815	$5,267	$520	$232	$58,833
DA 2-G		$14,228	$20,609	$271	$35,109	$4,660	$162	$0	$39,931
DA 2-H		$3,227	$51,127	$622	$54,976	$1,923	$24	$65	$56,988
DA 2-I		$3,491	$35,269	$363	$39,123	$1,525	$124	$4	$40,776
	Unprotected From 100-Year Under Existing Conditions	**$2,200,621**	**$644,591**	**$72,176**	**$2,917,388**	**$754,825**	**$179,475**	**$18,330**	**$3,870,018**

Table F-3
Damages to Planning Unit 3A
100-Year Storm-Existing Conditions
(Thousands of Dollars)

Sub-Basin		Residential Damage	Comm/Indus, Public & Ag Bldg Damage	Vehicle Damage	Total Damage to Structures/Vehicles	Emergency Costs	Infrastructure Damage	Agricultural Crop Damage	Total Damages
Number	Name								
6	South Lafourche	$768,829	$603,207	$23,584	$1,395,620	$128,169	$33,885	$1,208	$1,558,882
	Protected From 100-Year Under Existing Conditions	**$768,829**	**$603,207**	**$23,584**	**$1,395,620**	**$128,169**	**$33,885**	**$1,208**	**$1,558,882**
1a	Theriot	$59,168	$15,714	$784	$75,667	$6,370	$1,396	$75	$83,507
1b	Dulac	$61,997	$26,313	$2,071	$90,381	$13,262	$3,905	$17	$107,565
1c	Chauvin	$306,475	$110,313	$9,088	$425,876	$52,528	$15,390	$286	$494,081
1d	Montegut	$93,354	$19,568	$2,581	$115,503	$14,987	$4,337	$142	$134,970
1e	South of Houma	$0	$0	$0	$0	$0	$0	$9	$9
2a	Stephensville	$9,006	$826	$211	$10,043	$1,695	$322	$31	$12,092
2b	Amelia	$28,425	$4,775	$1,263	$34,462	$8,535	$2,643	$1	$45,642
2c	Gibson	$13,107	$8,276	$535	$21,919	$3,054	$725	$2	$25,700
2d	Donner	$4,978	$0	$136	$5,114	$874	$191	$0	$6,178
3	Houma	$2,269,550	$748,155	$70,498	$3,088,203	$601,869	$162,083	$2,426	$3,854,581
4	Thibodaux	$38,873	$12,706	$2,470	$54,049	$207,855	$54,293	$774	$316,971
5	Morgan City	$570,582	$468,526	$27,233	$1,066,341	$135,336	$30,635	$36	$1,232,349
7	Central Lafourche	$341,603	$55,136	$11,526	$408,266	$146,620	$39,978	$2,099	$596,963
8	North Lafourche, Assumption, & Ascension	$25	$0	$0	$25	$68,845	$19,062	$2,696	$90,628
9	Pierre Part	$68,717	$8,991	$2,405	$80,113	$31,060	$7,727	$21	$118,921
DA 3A-A		$563,897	$108,646	$14,897	$687,440	$126,252	$27,260	$0	$840,951
DA 3A-B		$348,065	$133,046	$13,373	$494,484	$98,632	$27,732	$2,287	$623,134
DA 3A-C		$50,698	$164,911	$2,913	$218,521	$10,316	$2,424	$261	$231,523
DA 3A-D		$336,113	$57,938	$7,949	$402,001	$50,757	$16,106	$548	$469,412
DA 3A-E		$443,874	$249,612	$11,909	$705,395	$74,237	$20,744	$1,233	$801,609
DA 3A-F		$61,172	$3,193	$687	$65,052	$10,902	$1,214	$170	$77,338
DA 3A-G		$132,435	75174.60226	$2,039	$209,649	$26,810	$2,417	$153	$239,029
DA 3A-H		$112	$0	$0	$112	$22	$0	$0	$134
	Unprotected From 100-Year Under Existing Conditions	**$5,802,227**	**$2,271,819**	**$184,569**	**$8,258,614**	**$1,690,818**	**$440,586**	**$13,269**	**$10,403,287**

Table F-4
Damages to Planning Unit 3B
100-Year Storm-Existing Conditions
(Thousands of Dollars)

Sub-Basin			Comm/Indus,		Total			Agricultural	
Number	Name	Damage	Public & Ag Bldg Damage	Vehicle Damage	Damage to Structures/Vehicles	Emergency Costs	Infrastructure Damage	Crop Damage	Total Damages
1	Berwick/Patterson	$778,643	$335,632	$26,518	$1,140,792	$148,707	$37,802	$881	$1,328,183
	Protected From 100-Year Under Existing Conditions	**$778,643**	**$335,632**	**$26,518**	**$1,140,792**	**$148,707**	**$37,802**	**$881**	**$1,328,183**
2	Hwy 317	$5,210	$17,203	$303	$22,716	$23,205	$5,845	$108	$51,874
3	Franklin	$268,525	$147,889	$13,133	$429,547	$1,196	$262	$521	$431,527
4	Baldwin	$41,314	$1,379	$1,701	$44,394	$78,007	$19,931	$352	$142,684
4a	Avery Island	$856	$0	$23	$879	$18,623	$5,957	$20	$25,479
4b	Weeks Island	$0	$0	$0	$0	$2,495	$463	$58	$3,017
5	Cherenton	$271	$0	$14	$285	$30	$0	$9	$324
6	Jeanerette	$0	$0	$0	$0	$16,893	$4,638	$306	$21,837
7	Lydia	$40,888	$1,004	$1,244	$43,136	$51,901	$14,307	$48	$109,393
8	New Iberia	$9,643	$462	$244	$10,348	$11,884	$2,574	$90	$24,897
9	Loreauville	$0	$0	$0	$0	$83	$77,830	$82	$77,995
10	Delcambre	$116,003	$61,219	$4,359	$181,581	$6,266	$2,238	$7	$190,091
DA 3B-A		$513,974	$175,491	$17,537	$707,001	$1,873	$83,425	$15,495	$807,794
DA 3B-B		$40,648	$6,350	$1,035	$48,033	$146	$1,696	$1,911	$51,785
DA 3B-C		$433	$16,149	$149	$16,731	$0	$33	$197	$16,962
DA 3B-D		$1,382	$0	$0	$1,382	$1,458	$0	$0	$2,840
DA 3B-E		$50,612	$10,626	$431	$61,669	$4,498	$580	$70	$66,817
DA 3B-F		$3,331	$0	$4	$3,335	$809	$5	$0	$4,149
DA 3B-G		$221	$0	$7	$229	$24,467	$10	$12	$24,717
DA 3B-H		$838	$6,758	$54	$7,650	$704	$74	$13	$8,440
DA 3B-I		$5,105	$0	$0	$5,105	$1,838	$0	$0	$6,942
	Unprotected From 100-Year Under Existing Conditions	**$1,099,255**	**$444,528**	**$40,237**	**$1,584,020**	**$246,374**	**$219,868**	**$19,301**	**$2,069,563**

Table F-5
Damages to Planning Unit 4
100-Year Storm-Existing Conditions
(Thousands of Dollars)

Sub-Basin		Residential Damage	Comm/Indus, Public & Ag Bldg Damage	Vehicle Damage	Total Damage to Structures/Vehicles	Emergency Costs	Infrastructure Damage	Agricultural Crop Damage	Total Damages
Number	Name								
1	Lafayette	$0	$0	$0	$0	$0	$0	$131	$131
2	Abbeville	$0	$0	$0	$0	$0	$0	$98	$98
3	Crowley	$0	$0	$0	$0	$0	$0	$112	$112
4	Jennings	$0	$0	$0	$0	$0	$0	$133	$133
5	Welsh	$0	$0	$0	$0	$0	$0	$386	$386
6	Iowa	$0	$0	$0	$0	$0	$0	$294	$294
7a	Lake Charles	$386,065	$143,606	$19,756	$549,427	$844	$129,697	$319	$680,286
7b	Sulphur	$0	$0	$0	$0	$0	$0	$164	$164
8	Vinton	$0	$0	$0	$0	$0	$0	$67	$67
9	Cameron	$10,794	$8,733	$360	$19,887	$6,796	$496	$78	$27,258
10a	Coastal Communities	$47,464	$18,413	$485	$66,362	$8,834	$499	$0	$75,694
10c	Coastal Communities	$3,477	$63,640	$421	$67,539	$1,845	$81	$42	$69,507
10d	Coastal Communities	$13,938	$20,344	$367	$34,648	$51,181	$489	$259	$86,577
10e	Coastal Communities	$3,272	$0	$95	$3,368	$6,446	$165	$9	$9,987
11a	Western Central CZM Communities	$3,196	$233	$136	$3,565	$34,101	$7,990	$77	$45,733
11b	Western Central CZM Communities	$32	$0	$0	$32	$19,785	$212	$18	$20,047
11c	Western Central CZM Communities	$3,296	$0	$49	$3,345	$2,150	$1,334	$88	$6,917
11d	Western Central CZM Communities	$0	$0	$0	$0	$0	$0	$42	$42
11e	Western Central CZM Communities	$0	$0	$0	$0	$0	$0	$105	$105
11f	Western Central CZM Communities	$28,469	$2,357	$1,327	$32,153	$1,120	$2,181	$89	$35,543
11g	Western Central CZM Communities	$8,248	$17,992	$318	$26,558	$0	$370	$31	$26,959
12a	Agricultural & Crawfish Communities	$0	$0	$0	$0	$0	$0	$16	$16
12b	Agricultural & Crawfish Communities	$0	$0	$0	$0	$0	$0	$130	$130
12c	Agricultural & Crawfish Communities	$0	$0	$0	$0	$0	$0	$5	$5
12d	Agricultural & Crawfish Communities	$4,853	$0	$127	$4,980	$4,413	$4,409	$263	$14,065
12e	Agricultural & Crawfish Communities	$0	$0	$0	$0	$0	$0	$133	$133
12f	Agricultural & Crawfish Communities	$63,699	$14,786	$1,694	$80,179	$25,483	$3,078	$227	$108,966
12g	Agricultural & Crawfish Communities	$0	$0	$0	$0	$0	$0	$149	$149
12h	Agricultural & Crawfish Communities	$0	$0	$0	$0	$0	$0	$80	$80
12j	Agricultural & Crawfish Communities	$0	$0	$0	$0	$0	$0	$0	$0
12k	Agricultural & Crawfish Communities	$0	$0	$0	$0	$0	$0	$69	$69
DA 4-A		$79,272	$6,484	$2,419	$88,175	$99,285	$26,780	$12,390	$226,630
DA 4-B		$377,529	$103,221	$11,548	$492,299	$593,319	$156,522	$4,906	$1,247,045
DA 4-C		$348,954	$97,007	$10,166	$456,127	$711,249	$185,442	$95,531	$1,448,350
DA 4-D		$241,809	$56,424	$7,771	$306,005	$1,177,897	$299,371	$13,297	$1,796,570
DA 4-E		$345,358	$282,605	$11,280	$639,242	$85,097	$15,808	$6,845	$746,993
	Unprotected From 100-Year Under Existing Conditions	**$1,969,726**	**$835,845**	**$68,319**	**$2,873,891**	**$2,829,845**	**$834,922**	**$136,583**	**$6,675,240**

Table F-6
Damages to Planning Unit 1
500-Year Storm-Existing Conditions
(Thousands of Dollars)

Sub-Basin		Residential Damage	Comm/Indus, Public & Ag Bldg Damage	Vehicle Damage	Total Damage to Structures/Vehicles	Emergency Costs	Infrastructure Damage	Agricultural Crop Damage	Total Damages
Number	Name								
1a	Florida Parishes & Amite River-Walker	$0	$0	$739	$739	$11,769	$3,311	$112	$15,932
1b	Florida Parishes & Amite River-Port Vincent/French Settlement	$48,152	$8,601	$1,626	$58,379	$26,326	$5,694	$81	$90,479
2	North Shore	$6,753,941	$1,062,378	$141,261	$7,957,580	$1,809,752	$473,381	$2,665	$10,243,376
3a	Lutcher, Gramercy	$347,133	$63,366	$5,733	$416,232	$77,450	$21,618	$114	$515,414
3b	Reserve/LaPlace	$2,530,392	$386,498	$32,681	$2,949,571	$426,354	$122,901	$1,280	$3,500,106
3c	Norce/St. Rose	$1,590,474	$337,798	$22,434	$1,950,706	$251,379	$73,036	$262	$2,275,383
3d	JP/NO Eastbank	$29,381,156	$8,814,960	$571,206	$38,767,322	$8,073,471	$1,809,941	$587	$48,651,321
3e	NO East to Hwy 11	$5,158,439	$676,777	$62,526	$5,897,742	$1,053,852	$300,719	$240	$7,252,553
3f	Lower 9th/St. Bernard	$4,758,019	$742,368	$66,911	$5,567,298	$1,034,188	$272,068	$1,318	$6,874,871
4	Plaquemines Eastbank	$128,759	$54,937	$1,925	$185,621	$30,440	$9,559	$679	$226,298
DA 1-A		$823,963	$181,618	$26,559	$1,032,140	$413,660	$109,175	$5,790	$1,560,766
DA 1-B		$387,998	$25,302	$3,800	$417,099	$75,955	$13,144	$158	$506,356
DA 1-C		$84,405	$28,112	$1,123	$113,640	$26,017	$4,193	$782	$144,631
DA 1-D		$64	$5,810	$37	$5,911	$70	$13	$0	$5,994
	Unprotected From 500-Year Under Existing Conditions	**$51,992,896**	**$12,388,525**	**$938,558**	**$65,319,979**	**$13,310,683**	**$3,218,752**	**$14,067**	**$81,863,481**

Table F-7
Damages to Planning Unit 2
500-Year Storm-Existing Conditions
(Thousands of Dollars)

Sub-Basin		Residential Damage	Comm/Indus, Public & Ag Bldg Damage	Vehicle Damage	Total Damage to Structures/Vehicles	Emergency Costs	Infrastructure Damage	Agricultural Crop Damage	Total Damages
Number	Name								
1	Metro Area on the West Bank	$14,675,131	$2,445,004	$203,181	$17,323,317	$2,940,011	$809,739	$975	$21,074,041
2	Upper Plaquemines Parish	$198,275	$84,004	$3,252	$285,531	$85,258	$12,918	$768	$384,475
3	Lower Plaquemines Parish	$415,567	$198,817	$8,479	$622,863	$50,272	$34,816	$986	$708,937
4a	Oil and Gas, Fishing, and Tourism Communities	$262,732	$75,480	$1,756	$339,967	$43,495	$4,902	$122	$388,487
4b	Oil and Gas, Fishing, and Tourism Communities	$166	$0	$0	$166	$138,510	$0	$0	$138,676
4c	Oil and Gas, Fishing, and Tourism Communities	$254,570	$64,105	$3,754	$322,430	$56,892	$16,051	$47	$395,420
5	Industrial Communities-Port Fourchon	$3,919	$93,365	$533	$97,817	$90	$80	$0	$97,987
6	South Lafourche	$496,247	$249,946	$8,492	$754,684	$59,391	$29,609	$1,935	$845,619
7	Central Lafourche	$193,283	$75,676	$3,826	$272,786	$5,939	$14,216	$2,619	$295,559
8	River Parishes	$826,239	$276,311	$18,000	$1,120,549	$103,088	$67,081	$7,853	$1,298,571
9	Upper Lafourche, Assumption, Ascension	$229,839	$63,891	$11,047	$304,778	$53,613	$48,838	$7,577	$414,805
10a	Central Basin Communities	$373,771	$46,894	$5,841	$426,506	$237,735	$24,052	$773	$689,066
10b	Central Basin Communities	$190,323	$57,420	$3,697	$251,439	$172,357	$13,583	$1,133	$438,512
DA 1-A		$243,219	$48,337	$4,316	$295,872	$63,703	$16,824	$2,335	$378,733
DA 1-B		$899,049	$71,055	$8,530	$978,634	$108,499	$32,204	$788	$1,120,125
DA 1-C		$1,503	$0	$22	$1,525	$448	$143	$545	$2,661
DA 2-D		$10,141	$5,599	$63	$15,803	$2,798	$219	$136	$18,957
DA 2-E		$3,942	$0	$0	$3,942	$1,434	$0	$110	$5,486
DA 2-F		$21,071	$34,864	$473	$56,408	$7,022	$693	$309	$64,433
DA 2-G		$21,502	$29,188	$214	$50,904	$6,213	$216	$0	$57,333
DA 2-H		$3,649	$52,314	$612	$56,575	$2,564	$32	$86	$59,257
DA 2-I		$3,699	$35,987	$304	$39,990	$2,034	$165	$6	$42,194
	Unprotected From 500-Year Under Existing Conditions	**$19,327,836**	**$4,008,259**	**$286,391**	**$23,622,486**	**$4,141,365**	**$1,126,383**	**$29,103**	**$28,919,337**

Table F-8
Damages to Planning Unit 3A
500-Year Storm-Existing Conditions
(Thousands of Dollars)

Sub-Basin		Residential Damage	Comm/Indus, Public & Ag Bldg Damage	Vehicle Damage	Total Damage to Structures/Vehicles	Emergency Costs	Infrastructure Damage	Agricultural Crop Damage	Total Damages
Number	Name								
1a	Theriot	$60,862	$19,318	$445	$80,625	$8,493	$1,861	$100	$91,079
1b	Dulac	$63,348	$29,124	$895	$93,368	$17,682	$5,207	$23	$116,280
1c	Chauvin	$308,860	$117,456	$4,633	$430,949	$70,037	$20,521	$382	$521,888
1d	Montegut	$93,405	$19,999	$1,376	$114,780	$19,983	$5,783	$190	$140,736
1e	South of Houma	$0	$0	$0	$0	$0	$0	$11	$11
2a	Stephensville	$9,026	$909	$119	$10,054	$2,260	$429	$42	$12,785
2b	Amelia	$34,278	$10,434	$673	$45,386	$11,380	$3,525	$2	$60,292
2c	Gibson	$13,240	$11,411	$294	$24,945	$4,073	$967	$2	$29,987
2d	Donner	$5,168	$0	$58	$5,226	$1,165	$254	$0	$6,645
3	Houma	$4,445,058	$2,133,734	$75,561	$6,654,353	$802,492	$216,111	$3,235	$7,676,191
4	Thibodaux	$349,748	$76,968	$14,370	$441,086	$277,141	$72,390	$1,033	$791,649
5	Morgan City	$669,658	$710,993	$17,699	$1,398,350	$180,448	$40,847	$48	$1,619,693
6	South Lafourche	$843,189	$659,474	$13,957	$1,516,620	$170,893	$45,180	$1,610	$1,734,302
7	Central Lafourche	$1,000,021	$268,779	$14,165	$1,282,965	$195,494	$53,304	$2,799	$1,534,561
8	North Lafourche, Assumption, & Ascension	$6,375	$641	$4,227	$11,243	$91,793	$25,416	$3,595	$132,047
9	Pierre Part	$168,457	$40,389	$2,978	$211,824	$41,413	$10,303	$28	$263,568
DA 3A-A		$683,609	$178,270	$9,108	$870,987	$168,335	$36,346	$0	$1,075,668
DA 3A-B		$630,918	$229,836	$9,888	$870,643	$131,509	$36,976	$3,049	$1,042,177
DA 3A-C		$52,743	$258,363	$2,261	$313,368	$13,754	$3,232	$349	$330,703
DA 3A-D		$437,837	$80,848	$4,894	$523,580	$67,677	$21,475	$731	$613,462
DA 3A-E		$455,267	$274,043	$6,262	$735,572	$98,983	$27,659	$1,644	$863,858
DA 3A-F		$61,198	$3,357	$357	$64,912	$14,536	$1,619	$227	$81,293
DA 3A-G		$142,622	$89,425	$1,311	$233,357	$35,747	$3,222	$204	$272,531
DA 3A-H		$130	$0	$0	$130	$30	$0	$0	$160
	Unprotected From 500-Year Under Existing Conditions	**$10,535,019**	**$5,213,770**	**$185,532**	**$15,934,321**	**$2,425,316**	**$632,628**	**$19,302**	**$19,011,567**

Table F-9
Damages to Planning Unit 3B
500-Year Storm-Existing Conditions
(Thousands of Dollars)

Sub-Basin		Residential Damage	Comm/Indus, Public & Ag Bldg Damage	Vehicle Damage	Total Damage to Structures/Vehicles	Emergency Costs	Infrastructure Damage	Agricultural Crop Damage	Total Damages
Number	Name								
1	Berwick/Patterson	$841,585	$470,546	$15,381	$1,327,512	$198,276	$50,403	$1,174	$1,577,366
	Protected From 500-Year Under Existing Conditions	**$841,585**	**$470,546**	**$15,381**	**$1,327,512**	**$198,276**	**$50,403**	**$1,174**	**$1,577,366**
2	Hwy 317	$5,327	$19,835	$231	$25,394	$30,940	$7,793	$144	$64,271
3	Franklin	$333,593	$247,659	$8,034	$589,286	$1,594	$350	$695	$591,925
4	Baldwin	$84,453	$11,696	$1,386	$97,535	$104,009	$26,574	$470	$228,588
4a	Avery Island	$1,086	$0	$116	$1,202	$24,831	$7,943	$27	$34,003
4b	Weeks Island	$0	$0	$0	$0	$0	$0	$78	$78
5	Cherenton	$41,042	$23,529	$1,216	$65,788	$40	$0	$12	$65,840
6	Jeanerette	$39,809	$3,191	$3,042	$46,042	$22,523	$6,184	$408	$75,158
7	Lydia	$56,272	$2,361	$742	$59,376	$69,202	$19,076	$64	$147,718
8	New Iberia	$403,567	$192,158	$25,088	$620,814	$15,845	$3,432	$121	$640,212
9	Loreauville	$0	$0	$564	$564	$110	$103,774	$109	$104,557
10	Delcambre	$134,143	$110,016	$2,605	$246,764	$8,354	$2,984	$9	$258,111
DA 3B-A		$1,279,981	$554,032	$28,764	$1,862,777	$2,497	$111,233	$20,661	$1,997,168
DA 3B-B		$41,004	$7,056	$545	$48,605	$194	$2,262	$2,548	$53,609
DA 3B-C		$515	$42,456	$147	$43,118	$0	$45	$263	$43,426
DA 3B-D		$1,471	$0	$0	$1,471	$1,944	$0	$0	$3,415
DA 3B-E		$50,675	$11,248	$215	$62,137	$5,997	$773	$94	$69,001
DA 3B-F		$3,331	$0	$1	$3,332	$1,079	$6	$0	$4,418
DA 3B-G		$221	$0	$3	$224	$32,623	$13	$16	$32,876
DA 3B-H		$855	$8,443	$38	$9,337	$938	$99	$17	$10,390
DA 3B-I		$5,107	$0	$0	$5,107	$2,450	$0	$0	$7,557
	Unprotected From 500-Year Under Existing Conditions	**$2,482,453**	**$1,233,681**	**$72,739**	**$3,788,873**	**$325,172**	**$292,541**	**$25,734**	**$4,432,320**

Table F-10
Damages to Planning Unit 4
500-Year Storm-Existing Conditions
(Thousands of Dollars)

Sub-Basin		Residential Damage	Comm/Indus, Public & Ag Bldg Damage	Vehicle Damage	Total Damage to Structures/Vehicles	Emergency Costs	Infrastructure Damage	Agricultural Crop Damage	Total Damages
Number	Name								
1	Lafayette	$0	$0	$28,808	$28,808	$723,859	$165,644	$175	$918,486
2	Abbeville	$270,758	$87,576	$8,700	$367,034	$14,755	$37,956	$130	$419,875
3	Crowley	$0	$0	$4,295	$4,295	$1,058	$25,807	$150	$31,311
4	Jennings	$290	$0	$323	$613	$3,466	$1,571	$178	$5,827
5	Welsh	$0	$0	$82	$82	$1,314	$407	$514	$2,318
6	Iowa	$29,454	$2,891	$1,914	$34,259	$45,344	$8,955	$392	$88,950
7a	Lake Charles	$2,696,782	$1,450,130	$66,457	$4,213,368	$1,125	$172,929	$426	$4,387,848
7b	Sulphur	$991,875	$394,790	$20,711	$1,407,375	$7,736	$61,234	$219	$1,476,564
8	Vinton	$121,393	$21,933	$2,436	$145,762	$27,364	$9,260	$89	$182,475
9	Cameron	$12,084	$8,733	$180	$20,997	$9,062	$662	$104	$30,824
10a	Coastal Communities	$68,118	$18,416	$275	$86,809	$11,778	$665	$0	$99,252
10c	Coastal Communities	$3,483	$87,186	$395	$91,063	$2,460	$108	$56	$93,687
10d	Coastal Communities	$15,683	$20,344	$219	$36,245	$68,241	$652	$346	$105,484
10e	Coastal Communities	$3,670	$0	$44	$3,714	$8,595	$219	$12	$12,541
11a	Western Central CZM Communities	$81,811	$25,912	$2,598	$110,320	$45,468	$10,653	$103	$166,544
11b	Western Central CZM Communities	$5,150	$836	$76	$6,062	$26,379	$283	$24	$32,749
11c	Western Central CZM Communities	$31,753	$1,411	$458	$33,622	$2,867	$1,778	$117	$38,384
11d	Western Central CZM Communities	$246,195	$21,246	$2,373	$269,814	$14,068	$7,160	$55	$291,098
11e	Western Central CZM Communities	$38,217	$16,045	$779	$55,042	$299	$2,370	$140	$57,850
11f	Western Central CZM Communities	$47,867	$3,047	$701	$51,615	$1,493	$2,907	$119	$56,135
11g	Western Central CZM Communities	$10,348	$19,385	$210	$29,944	$0	$493	$42	$30,478
12a	Agricultural & Crawfish Communities	$0	$0	$2,903	$2,903	$6,541	$17,244	$22	$26,710
12b	Agricultural & Crawfish Communities	$0	$0	$452	$452	$161,558	$2,131	$173	$164,314
12c	Agricultural & Crawfish Communities	$10,495	$2,211	$1,811	$14,517	$105,831	$10,357	$6	$130,711
12d	Agricultural & Crawfish Communities	$76,011	$29,129	$1,930	$107,070	$5,884	$5,878	$351	$119,183
12e	Agricultural & Crawfish Communities	$8,777	$0	$169	$8,946	$1,434	$878	$177	$11,435
12f	Agricultural & Crawfish Communities	$70,322	$27,493	$861	$98,677	$33,977	$4,103	$303	$137,060
12g	Agricultural & Crawfish Communities	$0	$0	$12	$12	$765,565	$67	$198	$765,842
12h	Agricultural & Crawfish Communities	$0	$0	$70	$70	$253,711	$414	$106	$254,301
12j	Agricultural & Crawfish Communities	$0	$0	$0	$0	$0	$0	$0	$0
12k	Agricultural & Crawfish Communities	$68	$0	$304	$372	$3,863	$1,632	$92	$5,959
DA 4-A		$429,582	$73,596	$8,325	$511,503	$132,380	$35,707	$16,520	$696,110
DA 4-B		$3,762,341	$1,114,684	$60,165	$4,937,191	$791,092	$208,696	$6,541	$5,943,519
DA 4-C		$976,740	$259,115	$50,201	$1,286,057	$948,332	$247,256	$127,375	$2,609,020
DA 4-D		$617,906	$268,625	$85,244	$971,774	$1,570,529	$399,161	$17,730	$2,959,194
DA 4-E		$426,473	$311,355	$6,489	$744,318	$113,463	$21,077	$9,127	$887,985
	Unprotected From 500-Year Under Existing Conditions	**$11,053,646**	**$4,266,089**	**$360,972**	**$15,680,707**	**$5,910,891**	**$1,466,317**	**$182,111**	**$23,240,026**

Table F-11
Housing Units at Risk
100-Year Storm-Existing Conditions
Planning Unit 1

Sub-Basin		Housing Units	2000 Population
Number	Name		
3d	JP/NO Eastbank	261,260	568,985
3e	NO East to Hwy 11	34,667	94,536
3f	Lower 9th/St. Bernard	33,944	85,529
	Houses Protected by the 100-Year Under Existing Conditions	**329,871**	**749,050**
1a	Florida Parishes & Amite River-Walker	386	1,041
1b	Florida Parishes & Amite River-Port Vincent/French Settlement	866	1,790
2	North Shore	58,664	148,815
3a	Lutcher, Gramercy	2,528	6,796
3b	Reserve/LaPlace	13,923	38,636
3c	Norce/St. Rose	8,137	22,960
4	Plaquemines Eastbank	997	3,005
DA 1-A		13,611	34,321
DA 1-B		2,523	4,132
DA 1-C		859	1,318
DA 1-D		1	4
	Houses Still At Risk From 100-Year Under Existing Conditions	**102,495**	**262,818**

Table F-12
Housing Units at Risk
100-Year Storm-Existing Conditions
Planning Unit 2

Sub-Basin		Housing Units	2000 Population
Number	Name		
1	Metro Area on the West Bank	96,108	254,555
2	Upper Plaquemines Parish	1,418	4,061
3	Lower Plaquemines Parish	4,524	10,945
6	South Lafourche	3,340	9,308
	Houses Protected by the 100-Year Under Existing Conditions	**105,390**	**278,869**
4a	Oil and Gas, Fishing, and Tourism Communities	1,878	1,541
4b	Oil and Gas, Fishing, and Tourism Communities	3	0
4c	Oil and Gas, Fishing, and Tourism Communities	1,961	5,046
5	Industrial Communities-Port Fourchon	180	25
7	Central Lafourche	1,746	4,469
9	River Parishes	7,699	21,088
10	Upper Lafourche, Assumption, Ascension	5,625	15,353
11a	Central Basin Communities	2,815	7,561
11b	Central Basin Communities	1,657	4,270
DA 1-A		2,102	5,289
DA 1-B		3,575	10,124
DA 1-C		15	45
DA 2-D		93	69
DA 2-E		48	0
DA 2-F		221	218
DA 2-G		204	68
DA 2-H		65	10
DA 2-I		58	52
	Houses Still At Risk From 100-Year Under Existing Conditions	**29,945**	**75,228**

Table F-13
Housing Units at Risk
100-Year Storm-Existing Conditions
Planning Unit 3A

Sub-Basin		Housing Units	2000 Population
Number	Name		
6	South Lafourche	5,543	14,203
	Houses Protected by the 100-Year Under Existing Conditions	**5,543**	**14,203**
1a	Theriot	281	585
1b	Dulac	586	1,637
1c	Chauvin	2,304	6,451
1d	Montegut	659	1,818
1e	South of Houma	0	0
2a	Stephensville	75	135
2b	Amelia	377	1,108
2c	Gibson	133	304
2d	Donner	39	80
3	Houma	25,625	67,938
4	Thibodaux	8,974	22,757
5	Morgan City	5,688	12,841
7	Central Lafourche	6,397	16,757
8	North Lafourche, Assumption, & Ascension	2,984	7,990
9	Pierre Part	1,355	3,239
DA 3A-A		5,561	11,426
DA 3A-B		4,297	11,624
DA 3A-C		402	1,016
DA 3A-E		3,253	8,695
DA 3A-F		484	509
DA 3A-G		1,170	1,013
DA 3A-H		1	0
	Houses Still At Risk From 100-Year Under Existing Conditions	**70,645**	**177,923**

Table F-14
Housing Units at Risk
100-Year Storm-Existing Conditions
Planning Unit 3B

Sub-Basin		Housing Units	2000 Population
Number	Name		
1	Berwick/Patterson	6,435	15,845
	Houses Protected by the 100-Year Under Existing Conditions	**6,435**	**15,845**
2	Hwy 317	48	110
3	Franklin	3,352	8,354
4	Baldwin	822	2,497
5	Cherenton	738	1,944
6	Jeanerette	2,272	5,997
7	Lydia	411	1,079
8	New Iberia	12,880	32,623
9	Loreauville	361	938
10	Delcambre	1,003	2,450
DA 3B-A		12,464	34,968
DA 3B-B		305	711
DA 3B-C		7	14
DA 3B-D		10	0
DA 3B-E		407	243
DA 3B-F		30	2
DA 3B-G		2	4
DA 3B-H		8	31
DA 3B-I		37	0
	Houses Still At Risk From 100-Year Under Existing Conditions	**35,157**	**91,965**

Table F-15
Housing Units at Risk
100-Year Storm-Existing Conditions
Planning Unit 4

Sub-Basin		Housing Units	2000 Population
Number	Name		
1	Lafayette	22,614	52,073
2	Abbeville	5,219	11,932
3	Crowley	3,341	8,113
4	Jennings	195	494
5	Welsh	48	128
6	Iowa	1,104	2,815
7a	Lake Charles	24,435	54,363
7b	Sulphur	8,207	19,250
8	Vinton	1,263	2,911
9	Cameron	128	208
10a	Coastal Communities	490	209
10c	Coastal Communities	24	34
10d	Coastal Communities	112	205
10e	Coastal Communities	44	69
11a	Western Central CZM Communities	1,490	3,349
11b	Western Central CZM Communities	37	89
11c	Western Central CZM Communities	257	559
11d	Western Central CZM Communities	890	2,251
11e	Western Central CZM Communities	294	745
11f	Western Central CZM Communities	391	914
11g	Western Central CZM Communities	79	155
12a	Agricultural & Crawfish Communities	2,223	5,421
12b	Agricultural & Crawfish Communities	275	670
12c	Agricultural & Crawfish Communities	1,478	3,256
12d	Agricultural & Crawfish Communities	855	1,848
12e	Agricultural & Crawfish Communities	96	276
12f	Agricultural & Crawfish Communities	467	1,290
12g	Agricultural & Crawfish Communities	10	21
12h	Agricultural & Crawfish Communities	50	130
12j	Agricultural & Crawfish Communities	0	0
12k	Agricultural & Crawfish Communities	217	513
DA 4-A		4,380	11,225
DA 4-B		25,830	65,607
DA 4-C		31,037	77,729
DA 4-D		50,640	125,483
DA 4-E		3,719	6,626
	Houses Still At Risk From 100-Year Under Existing Conditions	**191,939**	**460,961**

Table F-16
Housing Units at Risk
500-Year Storm-Existing Conditions
Planning Unit 1

Sub-Basin		Housing Units	2000 Population
Number	Name		
1a	Florida Parishes & Amite River-Walker	386	1,041
1b	Florida Parishes & Amite River-Port Vincent/French Settlement	866	1,790
2	North Shore	58,664	148,815
3a	Lutcher, Gramercy	2,528	6,796
3b	Reserve/LaPlace	13,923	38,636
3c	Norce/St. Rose	8,137	22,960
3d	JP/NO Eastbank	261,260	568,985
3e	NO East to Hwy 11	34,667	94,536
3f	Lower 9th/St. Bernard	33,944	85,529
4	Plaquemines Eastbank	997	3,005
DA 1-A		13,611	34,321
DA 1-B		2,523	4,132
DA 1-C		859	1,318
DA 1-D		1	4
	Houses Still At Risk From 500-Year Under Existing Conditions	**432,366**	**1,011,868**

Table F-17
Housing Units at Risk
500-Year Storm-Existing Conditions
Planning Unit 2

Sub-Basin		Housing Units	2000 Population
Number	Name		
1	Metro Area on the West Bank	96,108	254,555
2	Upper Plaquemines Parish	1,418	4,061
3	Lower Plaquemines Parish	4,524	10,945
4a	Oil and Gas, Fishing, and Tourism Communities	1,878	1,541
4b	Oil and Gas, Fishing, and Tourism Communities	3	0
4c	Oil and Gas, Fishing, and Tourism Communities	1,961	5,046
5	Industrial Communities-Port Fourchon	180	25
6	South Lafourche	3,340	9,308
7	Central Lafourche	1,746	4,469
9	River Parishes	7,699	21,088
10	Upper Lafourche, Assumption, Ascension	5,625	15,353
11a	Central Basin Communities	2,815	7,561
11b	Central Basin Communities	1,657	4,270
DA 1-A		2,102	5,289
DA 1-B		3,575	10,124
DA 1-C		15	45
DA 2-D		93	69
DA 2-E		48	0
DA 2-F		221	218
DA 2-G		204	68
DA 2-H		65	10
DA 2-I		58	52
	Houses Still At Risk From 500-Year Under Existing Conditions	**135,335**	**354,097**

Table F-18
Housing Units at Risk
500-Year Storm-Existing Conditions
Planning Unit 3A

Sub-Basin		Housing Units	2000 Population
Number	Name		
1a	Theriot	281	585
1b	Dulac	586	1,637
1c	Chauvin	2,304	6,451
1d	Montegut	659	1,818
1e	South of Houma	0	0
2a	Stephensville	75	135
2b	Amelia	377	1,108
2c	Gibson	133	304
2d	Donner	39	80
3	Houma	25,625	67,938
4	Thibodaux	8,974	22,757
5	Morgan City	5,688	12,841
6	South Lafourche	5,543	14,203
7	Central Lafourche	6,397	16,757
8	North Lafourche, Assumption, & Ascension	2,984	7,990
9	Pierre Part	1,355	3,239
DA 3A-A		5,561	11,426
DA 3A-B		4,297	11,624
DA 3A-C		402	1,016
DA 3A-E		3,253	8,695
DA 3A-F		484	509
DA 3A-G		1,170	1,013
DA 3A-H		1	0
	Houses Still At Risk From 500-Year Under Existing Conditions	**76,188**	**192,126**

Table F-19
Housing Units at Risk
500-Year Storm-Existing Conditions
Planning Unit 3B

Sub-Basin		Housing Units	2000 Population
Number	Name		
1	Berwick/Patterson	6,435	15,845
	Houses Protected From the 500-Year Under Existing Conditions	**6,435**	**15,845**
2	Hwy 317	48	110
3	Franklin	3,352	8,354
4	Baldwin	822	2,497
4a	Avery Island	104	194
4b	Weeks Island	0	0
5	Cherenton	738	1,944
6	Jeanerette	2,272	5,997
7	Lydia	411	1,079
8	New Iberia	12,880	32,623
9	Loreauville	361	938
10	Delcambre	1,003	2,450
DA 3B-A		12,464	34,968
DA 3B-B		305	711
DA 3B-C		7	14
DA 3B-D		10	0
DA 3B-E		407	243
DA 3B-F		30	2
DA 3B-G		2	4
DA 3B-H		8	31
DA 3B-I		37	0
	Houses Still At Risk From 500-Year Under Existing Conditions	**35,261**	**92,159**

Table F-20
Housing Units at Risk
500-Year Storm-Existing Conditions
Planning Unit 4

Sub-Basin		Housing Units	2000 Population
Number	Name		
1	Lafayette	22,614	52,073
2	Abbeville	5,219	11,932
3	Crowley	3,341	8,113
4	Jennings	195	494
5	Welsh	48	128
6	Iowa	1,104	2,815
7a	Lake Charles	24,435	54,363
7b	Sulphur	8,207	19,250
8	Vinton	1,263	2,911
9	Cameron	128	208
10a	Coastal Communities	490	209
10c	Coastal Communities	24	34
10d	Coastal Communities	112	205
10e	Coastal Communities	44	69
11a	Western Central CZM Communities	1,490	3,349
11b	Western Central CZM Communities	37	89
11c	Western Central CZM Communities	257	559
11d	Western Central CZM Communities	890	2,251
11e	Western Central CZM Communities	294	745
11f	Western Central CZM Communities	391	914
11g	Western Central CZM Communities	79	155
12a	Agricultural & Crawfish Communities	2,223	5,421
12b	Agricultural & Crawfish Communities	275	670
12c	Agricultural & Crawfish Communities	1,478	3,256
12d	Agricultural & Crawfish Communities	855	1,848
12e	Agricultural & Crawfish Communities	96	276
12f	Agricultural & Crawfish Communities	467	1,290
12g	Agricultural & Crawfish Communities	10	21
12h	Agricultural & Crawfish Communities	50	130
12j	Agricultural & Crawfish Communities	0	0
12k	Agricultural & Crawfish Communities	217	513
DA 4-A		4,380	11,225
DA 4-B		25,830	65,607
DA 4-C		31,037	77,729
DA 4-D		50,640	125,483
DA 4-E		3,719	6,626
	Houses Still At Risk From 500-Year Under Existing Conditions	191,939	460,961

Table F-21
Level of Protection With Various Alternatives Considered
Planning Unit 1

Sub-Basin Number	Sub-Basin Name	Alternative 1	Alternative 2	Preferred Plan
1a	Florida Parishes & Amite River-Walker	500	500	500
1b	Florida Parishes & Amite River-Port Vincent/French Settlement	500	500	500
2	North Shore	100	0	500
3a	Lutcher, Gramercy	500	500	500
3b	Reserve/LaPlace	500	500	500
3c	Norce/St. Rose	500	500	500
3d	JP/NO Eastbank	500	500	500
3e	NO East to Hwy 11	500	500	500
3f	Lower 9th/St. Bernard	500	500	500
4	Plaquemines Eastbank	100	100	100
DA 1-A		500	500	500
DA 1-B		500	500	500
DA 1-C		0	0	0
DA 1-D		0	0	0

Numbers denote level of protection (i.e. 100 is 100-year protection, 500 is 500-year protection, and 0 is less than 100-year protection).

Table F-22
Level of Protection With Various Alternatives Considered
Planning Unit 2

Sub-Basin Number	Sub-Basin Name	Alternative 1	Alternative 2	Preferred Plan
1	Metro Area on the West Bank	500	500	500
2	Upper Plaquemines Parish	500	100	100
3	Lower Plaquemines Parish	100	100	0
4a	Oil and Gas, Fishing, and Tourism Communities	100	0	0
4b	Oil and Gas, Fishing, and Tourism Communities	0	0	0
4c	Oil and Gas, Fishing, and Tourism Communities	500	100	100
5	Industrial Communities-Port Fourchon	0	0	0
6	South Lafourche	500	100	100
7	Central Lafourche	500	100	100
9	River Parishes	500	100	100
10	Upper Lafourche, Assumption, Ascension	500	100	100
11a	Central Basin Communities	500	100	100
11b	Central Basin Communities	500	100	100
DA 1-A		500	100	100
DA 1-B		500	0	100
DA 1-C		0	0	0
DA 2-D		0	0	0
DA 2-E		0	0	0
DA 2-F		0	0	0
DA 2-G		0	0	0
DA 2-H		0	0	0
DA 2-I		0	0	0

Numbers denote level of protection (i.e. 100 is 100-year protection, 500 is 500-year protection, and 0 is less than 100-year protection).

Table F-23
Level of Protection With Various Alternatives Considered
Planning Unit 3A

Sub-Basin		Alternative 1	Alternative 2	Preferred Plan
Number	Name			
1a	Theriot	500	100	100
1b	Dulac	500	100	100
1c	Chauvin	500	100	100
1d	Montegut	500	100	100
1e	South of Houma	500	100	100
2a	Stephensville	500	100	100
2b	Amelia	500	100	100
2c	Gibson	500	500	500
2d	Donner	500	500	500
3	Houma	500	500	500
4	Thibodaux	500	500	500
5	Morgan City	500	100	100
6	South Lafourche	500	100	100
7	Central Lafourche	500	500	500
8	North Lafourche, Assumption, & Ascension	500	500	100
9	Pierre Part	500	100	100
DA 3A-A		500	100	100
DA 3A-B		500	500	500
DA 3A-C		0	0	0
DA 3A-E		500	100	100
DA 3A-F		0	0	0
DA 3A-G		0	0	0
DA 3A-H		0	0	0

Numbers denote level of protection (i.e. 100 is 100-year protection, 500 is 500-year protection, and 0 is less than 100-year protection).

Table F-24
Level of Protection With Various Alternatives Considered
Planning Unit 3B

Sub-Basin		Alternative 1	Alternative 2	Preferred Plan
Number	Name			
1	Berwick/Patterson	500	500	500
2	Hwy 317	500	500	500
3	Franklin	500	500	500
4	Baldwin	500	500	500
4a	Avery Island	500	0	0
4b	Weeks Island	500	0	0
5	Cherenton	500	500	500
6	Jeanerette	500	500	500
7	Lydia	500	500	500
8	New Iberia	500	500	500
9	Loreauville	500	500	500
10	Delcambre	500	500	500
DA 3B-A		500	500	500
DA 3B-B		500	0	0
DA 3B-C		0	0	0
DA 3B-D		0	0	0
DA 3B-E		0	0	0
DA 3B-F		0	0	0
DA 3B-G		0	0	0
DA 3B-H		0	0	0
DA 3B-I		0	0	0

Numbers denote level of protection (i.e. 100 is 100-year protection, 500 is 500-year protection, and 0 is less than 100-year protection).

Table F-25
Level of Protection With Various Alternatives Considered
Planning Unit 4

Sub-Basin		Alternative 1	Alternative 2	Preferred Plan
Number	Name			
1	Lafayette	500	500	500
2	Abbeville	500	500	500
3	Crowley	500	0	100
4	Jennings	500	0	100
5	Welsh	500	0	100
6	Iowa	500	0	500
7a	Lake Charles	500	500	500
7b	Sulphur	500	500	500
8	Vinton	500	500	500
9	Cameron	0	0	0
10a	Coastal Communities	0	0	0
10c	Coastal Communities	500	0	0
10d	Coastal Communities	0	0	0
10e	Coastal Communities	0	0	0
11a	Western Central CZM Communities	500	0	100
11b	Western Central CZM Communities	500	0	100
11c	Western Central CZM Communities	500	0	100
11d	Western Central CZM Communities	500	500	500
11e	Western Central CZM Communities	500	500	500
11f	Western Central CZM Communities	0	0	0
11g	Western Central CZM Communities	0	0	0
12a	Agricultural & Crawfish Communities	500	0	100
12b	Agricultural & Crawfish Communities	500	500	100
12c	Agricultural & Crawfish Communities	500	500	100
12d	Agricultural & Crawfish Communities	500	500	100
12e	Agricultural & Crawfish Communities	500	500	100
12f	Agricultural & Crawfish Communities	500	500	500
12g	Agricultural & Crawfish Communities	500	0	100
12h	Agricultural & Crawfish Communities	500	0	100
12j	Agricultural & Crawfish Communities	500	0	100
12k	Agricultural & Crawfish Communities	500	0	100
DA 4-A		500	0	500
DA 4-B		500	500	500
DA 4-C		500	0	100
DA 4-D		500	500	500
DA 4-E		0	0	0

Numbers denote level of protection (i.e. 100 is 100-year protection, 500 is 500-year protection, and 0 is less than 100-year protection).

Table F-26
Damages to Planning Unit 1
100-Year Storm-Alternative 1
(Thousands of Dollars)

Sub-Basin		Residential Damage	Comm/Indus, Public & Ag Bldg Damage	Vehicle Damage	Total Damage to Structures/Vehicles	Emergency Costs	Infrastructure Damage	Agricultural Crop Damage	Total Damages
Number	Name								
1a	Florida Parishes & Amite River-Walker	$0	$0	$0	$0	$8,827	$2,484	$84	$11,394
1b	Florida Parishes & Amite River-Port Vincent/French Settlement	$12,258	$2,006	$647	$14,910	$19,745	$4,270	$61	$38,986
2	North Shore	$2,401,548	$396,935	$82,594	$2,881,078	$1,357,314	$355,035	$1,998	$4,595,426
3a	Lutcher, Gramercy	$303,721	$48,897	$10,306	$362,924	$58,088	$16,214	$85	$437,311
3b	Reserve/LaPlace	$1,799,741	$230,446	$38,892	$2,069,079	$319,766	$92,176	$960	$2,481,980
3c	Norce/St. Rose	$1,310,426	$271,204	$32,964	$1,614,593	$188,534	$54,777	$197	$1,858,101
3d	JP/NO Eastbank	$28,888,196	$8,300,401	$1,126,314	$38,314,910	$6,055,103	$1,357,456	$440	$45,727,910
3e	NO East to Hwy 11	$5,144,046	$670,271	$138,215	$5,952,532	$790,389	$225,539	$180	$6,968,640
3f	Lower 9th/St. Bernard	$4,710,379	$698,370	$136,095	$5,544,844	$775,641	$204,051	$988	$6,525,524
4	Plaquemines Eastbank	$128,126	$53,325	$4,010	$185,460	$22,830	$7,169	$509	$215,968
DA 1-A		$507,409	$115,945	$17,097	$640,451	$310,245	$81,881	$4,343	$1,036,920
DA 1-B		$333,989	$23,621	$7,348	$364,958	$56,966	$9,858	$119	$431,900
	Protected From 100-Year Under Alternative 1	**$45,539,840**	**$10,811,419**	**$1,594,481**	**$57,945,740**	**$9,963,447**	**$2,410,910**	**$9,964**	**$70,330,061**
DA 1-C		$82,443	$27,050	$2,093	$111,586	$19,512	$3,144	$587	$134,829
DA 1-D		$58	$4,953	$40	$5,050	$53	$10	$0	$5,113
	Unprotected From 100-Year Under Alternative 1	**$82,501**	**$32,002**	**$2,133**	**$116,636**	**$19,565**	**$3,154**	**$587**	**$139,942**

Table F-27
Damages to Planning Unit 2
100-Year Storm-Alternative 1
(Thousands of Dollars)

Sub-Basin		Residential Damage	Comm/Indus, Public & Ag Bldg Damage	Vehicle Damage	Total Damage to Structures/Vehicles	Emergency Costs	Infrastructure Damage	Agricultural Crop Damage	Total Damages
Number	Name								
1	Metro Area on the West Bank	$14,177,270	$2,267,674	$395,856	$16,840,799	$2,205,008	$607,305	$731	$19,653,843
2	Upper Plaquemines Parish	$191,058	$76,622	$5,820	$273,501	$63,944	$9,689	$576	$347,709
4c	Oil and Gas, Fishing, and Tourism Communities	$231,692	$56,256	$7,380	$295,328	$42,669	$12,038	$35	$350,071
6	South Lafourche	$416,140	$210,249	$14,807	$641,196	$44,543	$22,207	$1,451	$709,398
7	Central Lafourche	$61,062	$25,454	$2,970	$89,486	$4,454	$10,662	$1,964	$106,565
9	River Parishes	$387,008	$118,037	$18,264	$523,309	$77,316	$50,311	$5,890	$656,826
10	Upper Lafourche, Assumption, Ascension	$32,206	$9,819	$1,489	$43,513	$40,210	$36,628	$5,682	$126,034
11a	Central Basin Communities	$207,947	$26,724	$7,852	$242,522	$178,301	$18,039	$580	$439,442
11b	Central Basin Communities	$90,431	$43,316	$6,466	$140,213	$129,268	$10,187	$850	$280,518
DA 1-A		$153,447	$34,433	$7,881	$195,761	$47,777	$12,618	$1,751	$257,907
DA 1-B		$736,892	$57,065	$14,094	$808,050	$81,374	$24,153	$591	$914,168
3	Lower Plaquemines Parish	$400,626	$191,635	$16,534	$608,796	$37,704	$26,112	$739	$673,351
4a	Oil and Gas, Fishing, and Tourism Communities	$243,767	$66,158	$3,110	$313,035	$32,622	$3,676	$92	$349,425
	Protected From 100-Year Under Alternative 1	**$17,329,545**	**$3,183,442**	**$502,523**	**$21,015,510**	**$2,985,190**	**$843,625**	**$20,933**	**$24,865,258**
4b	Oil and Gas, Fishing, and Tourism Communities	$52	$0	$0	$52	$103,882	$0	$0	$103,934
5	Industrial Communities-Port Fourchon	$2,063	$63,464	$540	$66,067	$67	$60	$0	$66,194
DA 1-C		$1,489	$0	$51	$1,540	$336	$107	$409	$2,393
DA 2-D		$8,816	$4,710	$138	$13,664	$2,098	$165	$102	$16,029
DA 2-E		$2,824	$0	$0	$2,824	$1,075	$0	$83	$3,982
DA 2-F		$19,979	$32,150	$685	$52,815	$5,267	$520	$232	$58,833
DA 2-G		$14,228	$20,609	$271	$35,109	$4,660	$162	$0	$39,931
DA 2-H		$3,227	$51,127	$622	$54,976	$1,923	$24	$65	$56,988
DA 2-I		$3,491	$35,269	$363	$39,123	$1,525	$124	$4	$40,776
	Unprotected From 100-Year Under Alternative 1	**$56,170**	**$207,329**	**$2,671**	**$266,170**	**$120,834**	**$1,162**	**$895**	**$389,061**

Table F-28
Damages to Planning Unit 3A
100-Year Storm-Alternative 1
(Thousands of Dollars)

Sub-Basin		Residential Damage	Comm/Indus, Public & Ag Bldg Damage	Vehicle Damage	Total Damage to Structures/Vehicles	Emergency Costs	Infrastructure Damage	Agricultural Crop Damage	Total Damages
Number	Name								
1a	Theriot	$59,168	$15,714	$784	$75,667	$6,370	$1,396	$75	$83,507
1b	Dulac	$61,997	$26,313	$2,071	$90,381	$13,262	$3,905	$17	$107,565
1c	Chauvin	$306,475	$110,313	$9,088	$425,876	$52,528	$15,390	$286	$494,081
1d	Montegut	$93,354	$19,568	$2,581	$115,503	$14,987	$4,337	$142	$134,970
1e	South of Houma	$0	$0	$0	$0	$0	$0	$9	$9
2a	Stephensville	$9,006	$826	$211	$10,043	$1,695	$322	$31	$12,092
2b	Amelia	$28,425	$4,775	$1,263	$34,462	$8,535	$2,643	$1	$45,642
2c	Gibson	$13,107	$8,276	$535	$21,919	$3,054	$725	$2	$25,700
2d	Donner	$4,978	$0	$136	$5,114	$874	$191	$0	$6,178
3	Houma	$2,269,550	$748,155	$70,498	$3,088,203	$601,869	$162,083	$2,426	$3,854,581
4	Thibodaux	$38,873	$12,706	$2,470	$54,049	$207,855	$54,293	$774	$316,971
5	Morgan City	$570,582	$468,526	$27,233	$1,066,341	$135,336	$30,635	$36	$1,232,349
6	South Lafourche	$768,829	$603,207	$23,584	$1,395,620	$128,169	$33,885	$1,208	$1,558,882
7	Central Lafourche	$341,603	$55,136	$11,526	$408,266	$146,620	$39,978	$2,099	$596,963
8	North Lafourche, Assumption, & Ascension	$25	$0	$0	$25	$68,845	$19,062	$2,696	$90,628
9	Pierre Part	$68,717	$8,991	$2,405	$80,113	$31,060	$7,727	$21	$118,921
DA 3A-A		$563,897	$108,646	$14,897	$687,440	$126,252	$27,260	$0	$840,951
DA 3A-B		$348,065	$133,046	$13,373	$494,484	$98,632	$27,732	$2,287	$623,134
DA 3A-E		$443,874	$249,612	$11,909	$705,395	$74,237	$20,744	$1,233	$801,609
	Protected From 100-Year Under Alternative 1	**$5,990,526**	**$2,573,809**	**$194,565**	**$8,758,900**	**$1,720,179**	**$452,310**	**$13,344**	**$10,944,733**
DA 3A-C		$50,698	$164,911	$2,913	$218,521	$10,316	$2,424	$261	$231,523
DA 3A-F		$61,172	$3,193	$687	$65,052	$10,902	$1,214	$170	$77,338
DA 3A-G		$132,435	75174.60226	$2,039	$209,649	$26,810	$2,417	$153	$239,029
DA 3A-H		$112	$0	$0	$112	$22	$0	$0	$134
	Unprotected From 100-Year Under Alternative 1	**$244,416**	**$243,279**	**$5,638**	**$493,334**	**$48,050**	**$6,055**	**$584**	**$548,023**

Table F-29
Damages to Planning Unit 3B
100-Year Storm-Alternative 1
(Thousands of Dollars)

Sub-Basin			Comm/Indus,		Total			Agricultural	
Number	Name	Damage	Public & Ag Bldg Damage	Vehicle Damage	Damage to Structures/Vehicles	Emergency Costs	Infrastructure Damage	Crop Damage	Total Damages
1	Berwick/Patterson	$778,643	$335,632	$26,518	$1,140,792	$148,707	$37,802	$881	$1,328,183
2	Hwy 317	$5,210	$17,203	$303	$22,716	$23,205	$5,845	$108	$51,874
3	Franklin	$268,525	$147,889	$13,133	$429,547	$1,196	$262	$521	$431,527
4	Baldwin	$41,314	$1,379	$1,701	$44,394	$78,007	$19,931	$352	$142,684
4a	Avery Island	$856	$0	$23	$879	$18,623	$5,957	$20	$25,479
4b	Weeks Island	$0	$0	$0	$0	$2,495	$463	$58	$3,017
5	Cherenton	$271	$0	$14	$285	$30	$0	$9	$324
6	Jeanerette	$0	$0	$0	$0	$16,893	$4,638	$306	$21,837
7	Lydia	$40,888	$1,004	$1,244	$43,136	$51,901	$14,307	$48	$109,393
8	New Iberia	$9,643	$462	$244	$10,348	$11,884	$2,574	$90	$24,897
9	Loreauville	$0	$0	$0	$0	$83	$77,830	$82	$77,995
10	Delcambre	$116,003	$61,219	$4,359	$181,581	$6,266	$2,238	$7	$190,091
DA 3B-A		$513,974	$175,491	$17,537	$707,001	$1,873	$83,425	$15,495	$807,794
DA 3B-B		$40,648	$6,350	$1,035	$48,033	$146	$1,696	$1,911	$51,785
	Protected From 100-Year Under Alternative 1	**$1,815,975**	**$746,627**	**$66,110**	**$2,628,712**	**$361,308**	**$256,969**	**$19,889**	**$3,266,878**
DA 3B-D		$1,382	$0	$0	$1,382	$1,458	$0	$0	$2,840
DA 3B-C		$433	$16,149	$149	$16,731	$0	$33	$197	$16,962
DA 3B-E		$50,612	$10,626	$431	$61,669	$4,498	$580	$70	$66,817
DA 3B-F		$3,331	$0	$4	$3,335	$809	$5	$0	$4,149
DA 3B-G		$221	$0	$7	$229	$24,467	$10	$12	$24,717
DA 3B-H		$838	$6,758	$54	$7,650	$704	$74	$13	$8,440
DA 3B-I		$5,105	$0	$0	$5,105	$1,838	$0	$0	$6,942
	Unprotected From 100-Year Under Alternative 1	**$61,923**	**$33,533**	**$645**	**$96,101**	**$33,773**	**$701**	**$293**	**$130,868**

Table F-30
Damages to Planning Unit 4
100-Year Storm-Alternative 1
(Thousands of Dollars)

Sub-Basin		Residential Damage	Comm/Indus, Public & Ag Bldg Damage	Vehicle Damage	Total Damage to Structures/Vehicles	Emergency Costs	Infrastructure Damage	Agricultural Crop Damage	Total Damages
Number	Name								
1	Lafayette	$0	$0	$0	$0	$0	$0	$131	$131
2	Abbeville	$0	$0	$0	$0	$0	$0	$98	$98
3	Crowley	$0	$0	$0	$0	$0	$0	$112	$112
4	Jennings	$0	$0	$0	$0	$0	$0	$133	$133
5	Welsh	$0	$0	$0	$0	$0	$0	$386	$386
6	Iowa	$0	$0	$0	$0	$0	$0	$294	$294
7a	Lake Charles	$386,065	$143,606	$19,756	$549,427	$844	$129,697	$319	$680,286
7b	Sulphur	$0	$0	$0	$0	$0	$0	$164	$164
8	Vinton	$0	$0	$0	$0	$0	$0	$67	$67
10c	Coastal Communities	$3,477	$63,640	$421	$67,539	$1,845	$81	$42	$69,507
11a	Western Central CZM Communities	$3,196	$233	$136	$3,565	$34,101	$7,990	$77	$45,733
11b	Western Central CZM Communities	$32	$0	$0	$32	$19,785	$212	$18	$20,047
11c	Western Central CZM Communities	$3,296	$0	$49	$3,345	$2,150	$1,334	$88	$6,917
11d	Western Central CZM Communities	$0	$0	$0	$0	$0	$0	$42	$42
11e	Western Central CZM Communities	$0	$0	$0	$0	$0	$0	$105	$105
12a	Agricultural & Crawfish Communities	$0	$0	$0	$0	$0	$0	$16	$16
12b	Agricultural & Crawfish Communities	$0	$0	$0	$0	$0	$0	$130	$130
12c	Agricultural & Crawfish Communities	$0	$0	$0	$0	$0	$0	$5	$5
12d	Agricultural & Crawfish Communities	$4,853	$0	$127	$4,980	$4,413	$4,409	$263	$14,065
12e	Agricultural & Crawfish Communities	$0	$0	$0	$0	$0	$0	$133	$133
12f	Agricultural & Crawfish Communities	$63,699	$14,786	$1,694	$80,179	$25,483	$3,078	$227	$108,966
12g	Agricultural & Crawfish Communities	$0	$0	$0	$0	$0	$0	$149	$149
12h	Agricultural & Crawfish Communities	$0	$0	$0	$0	$0	$0	$80	$80
12j	Agricultural & Crawfish Communities	$0	$0	$0	$0	$0	$0	$0	$0
12k	Agricultural & Crawfish Communities	$0	$0	$0	$0	$0	$0	$69	$69
DA 4-A		$79,272	$6,484	$2,419	$88,175	$99,285	$26,780	$12,390	$226,630
DA 4-B		$377,529	$103,221	$11,548	$492,299	$593,319	$156,522	$4,906	$1,247,045
DA 4-C		$348,954	$97,007	$10,166	$456,127	$711,249	$185,442	$95,531	$1,448,350
DA 4-D		$241,809	$56,424	$7,771	$306,005	$1,177,897	$299,371	$13,297	$1,796,570
	Protected From 100-Year Under Alternative 1	**$1,512,182**	**$485,402**	**$54,088**	**$2,051,672**	**$2,670,371**	**$814,915**	**$129,271**	**$5,666,229**
9	Cameron	$10,794	$8,733	$360	$19,887	$6,796	$496	$78	$27,258
10a	Coastal Communities	$47,464	$18,413	$485	$66,362	$8,834	$499	$0	$75,694
10d	Coastal Communities	$13,938	$20,344	$367	$34,648	$51,181	$489	$259	$86,577
10e	Coastal Communities	$3,272	$0	$95	$3,368	$6,446	$165	$9	$9,987
11f	Western Central CZM Communities	$28,469	$2,357	$1,327	$32,153	$1,120	$2,181	$89	$35,543
11g	Western Central CZM Communities	$8,248	$17,992	$318	$26,558	$0	$370	$31	$26,959
DA 4-E		$345,358	$282,605	$11,280	$639,242	$85,097	$15,808	$6,845	$746,993
	Unprotected From 100-Year Under Alternative 1	**$457,544**	**$350,443**	**$14,231**	**$822,218**	**$159,474**	**$20,007**	**$7,312**	**$1,009,012**

Table F-31
Damages to Planning Unit 1
500-Year Storm-Alternative 1
(Thousands of Dollars)

Sub-Basin									
Number	Name	Residential Damage	Comm/Indus, Public & Ag Bldg Damage	Vehicle Damage	Total Damage to Structures/Vehicles	Emergency Costs	Infrastructure Damage	Agricultural Crop Damage	Total Damages
1a	Florida Parishes & Amite River-Walker	$0	$0	$739	$739	$11,769	$3,311	$112	$15,932
1b	Florida Parishes & Amite River-Port Vincent/French Settlement	$48,152	$8,601	$1,626	$58,379	$26,326	$5,694	$81	$90,479
3a	Lutcher, Gramercy	$347,133	$63,366	$5,733	$416,232	$77,450	$21,618	$114	$515,414
3b	Reserve/LaPlace	$2,530,392	$386,498	$32,681	$2,949,571	$426,354	$122,901	$1,280	$3,500,106
3c	Norce/St. Rose	$1,590,474	$337,798	$22,434	$1,950,706	$251,379	$73,036	$262	$2,275,383
3d	JP/NO Eastbank	$29,381,156	$8,814,960	$571,206	$38,767,322	$8,073,471	$1,809,941	$587	$48,651,321
3e	NO East to Hwy 11	$5,158,439	$676,777	$62,526	$5,897,742	$1,053,852	$300,719	$240	$7,252,553
3f	Lower 9th/St. Bernard	$4,758,019	$742,368	$66,911	$5,567,298	$1,034,188	$272,068	$1,318	$6,874,871
DA 1-A		$823,963	$181,618	$26,559	$1,032,140	$413,660	$109,175	$5,790	$1,560,766
DA 1-B		$387,998	$25,302	$3,800	$417,099	$75,955	$13,144	$158	$506,356
	Protected From 500-Year Under Alternative 1	**$45,025,726**	**$11,237,287**	**$794,213**	**$57,057,227**	**$11,444,405**	**$2,731,607**	**$9,942**	**$71,243,181**
2	North Shore	$6,753,941	$1,062,378	$141,261	$7,957,580	$1,809,752	$473,381	$2,665	$10,243,376
4	Plaquemines Eastbank	$128,759	$54,937	$1,925	$185,621	$30,440	$9,559	$679	$226,298
DA 1-C		$84,405	$28,112	$1,123	$113,640	$26,017	$4,193	$782	$144,631
DA 1-D		$64	$5,810	$37	$5,911	$70	$13	$0	$5,994
	Unprotected From 500-Year Under Alternative 1	**$6,967,170**	**$1,151,237**	**$144,345**	**$8,262,751**	**$1,866,278**	**$487,145**	**$4,126**	**$10,620,300**

Table F-32
Damages to Planning Unit 2
500-Year Storm-Alternative 1
(Thousands of Dollars)

Sub-Basin									
Number	Name	Residential Damage	Comm/Indus, Public & Ag Bldg Damage	Vehicle Damage	Total Damage to Structures/Vehicles	Emergency Costs	Infrastructure Damage	Agricultural Crop Damage	Total Damages
1	Metro Area on the West Bank	$14,675,131	$2,445,004	$203,181	$17,323,317	$2,940,011	$809,739	$975	$21,074,041
2	Upper Plaquemines Parish	$198,275	$84,004	$3,252	$285,531	$85,258	$12,918	$768	$384,475
4c	Oil and Gas, Fishing, and Tourism Communities	$254,570	$64,105	$3,754	$322,430	$56,892	$16,051	$47	$395,420
6	South Lafourche	$496,247	$249,946	$8,492	$754,684	$59,391	$29,609	$1,935	$845,619
7	Central Lafourche	$193,283	$75,676	$3,826	$272,786	$5,939	$14,216	$2,619	$295,559
8	River Parishes	$826,239	$276,311	$18,000	$1,120,549	$103,088	$67,081	$7,853	$1,298,571
9	Upper Lafourche, Assumption, Ascension	$229,839	$63,891	$11,047	$304,778	$53,613	$48,838	$7,577	$414,805
10a	Central Basin Communities	$373,771	$46,894	$5,841	$426,506	$237,735	$24,052	$773	$689,066
10b	Central Basin Communities	$190,323	$57,420	$3,697	$251,439	$172,357	$13,583	$1,133	$438,512
DA 1-A		$243,219	$48,337	$4,316	$295,872	$63,703	$16,824	$2,335	$378,733
DA 1-B		$899,049	$71,055	$8,530	$978,634	$108,499	$32,204	$788	$1,120,125
	Protected From 500-Year Under Alternative 1	**$18,579,945**	**$3,482,644**	**$273,935**	**$22,336,524**	**$3,886,486**	**$1,085,115**	**$26,802**	**$27,334,927**
3	Lower Plaquemines Parish	$415,567	$198,817	$8,479	$622,863	$50,272	$34,816	$986	$708,937
4a	Oil and Gas, Fishing, and Tourism Communities	$262,732	$75,480	$1,756	$339,967	$43,495	$4,902	$122	$388,487
4b	Oil and Gas, Fishing, and Tourism Communities	$166	$0	$0	$166	$138,510	$0	$0	$138,676
5	Industrial Communities-Port Fourchon	$3,919	$93,365	$533	$97,817	$90	$80	$0	$97,987
DA 1-C		$1,503	$0	$22	$1,525	$448	$143	$545	$2,661
DA 2-D		$10,141	$5,599	$63	$15,803	$2,798	$219	$136	$18,957
DA 2-E		$3,942	$0	$0	$3,942	$1,434	$0	$110	$5,486
DA 2-F		$21,071	$34,864	$473	$56,408	$7,022	$693	$309	$64,433
DA 2-G		$21,502	$29,188	$214	$50,904	$6,213	$216	$0	$57,333
DA 2-H		$3,649	$52,314	$612	$56,575	$2,564	$32	$86	$59,257
DA 2-I		$3,699	$35,987	$304	$39,990	$2,034	$165	$6	$42,194
	Unprotected From 500-Year Under Alternative 1	**$747,890**	**$525,615**	**$12,457**	**$1,285,962**	**$254,879**	**$41,267**	**$2,301**	**$1,584,409**

Table F-33
Damages to Planning Unit 3A
500-Year Storm-Alternative 1
(Thousands of Dollars)

Sub-Basin		Residential Damage	Comm/Indus, Public & Ag Bldg Damage	Vehicle Damage	Total Damage to Structures/Vehicles	Emergency Costs	Infrastructure Damage	Agricultural Crop Damage	Total Damages
Number	Name								
1a	Theriot	$60,862	$19,318	$445	$80,625	$8,493	$1,861	$100	$91,079
1b	Dulac	$63,348	$29,124	$895	$93,368	$17,682	$5,207	$23	$116,280
1c	Chauvin	$308,860	$117,456	$4,633	$430,949	$70,037	$20,521	$382	$521,888
1d	Montegut	$93,405	$19,999	$1,376	$114,780	$19,983	$5,783	$190	$140,736
1e	South of Houma	$0	$0	$0	$0	$0	$0	$11	$11
2a	Stephensville	$9,026	$909	$119	$10,054	$2,260	$429	$42	$12,785
2b	Amelia	$34,278	$10,434	$673	$45,386	$11,380	$3,525	$2	$60,292
2c	Gibson	$13,240	$11,411	$294	$24,945	$4,073	$967	$2	$29,987
2d	Donner	$5,168	$0	$58	$5,226	$1,165	$254	$0	$6,645
3	Houma	$4,445,058	$2,133,734	$75,561	$6,654,353	$802,492	$216,111	$3,235	$7,676,191
4	Thibodaux	$349,748	$76,968	$14,370	$441,086	$277,141	$72,390	$1,033	$791,649
5	Morgan City	$669,658	$710,993	$17,699	$1,398,350	$180,448	$40,847	$48	$1,619,693
6	South Lafourche	$843,189	$659,474	$13,957	$1,516,620	$170,893	$45,180	$1,610	$1,734,302
7	Central Lafourche	$1,000,021	$268,779	$14,165	$1,282,965	$195,494	$53,304	$2,799	$1,534,561
8	North Lafourche, Assumption, & Ascension	$6,375	$641	$4,227	$11,243	$91,793	$25,416	$3,595	$132,047
9	Pierre Part	$168,457	$40,389	$2,978	$211,824	$41,413	$10,303	$28	$263,568
DA 3A-A		$683,609	$178,270	$9,108	$870,987	$168,335	$36,346	$0	$1,075,668
DA 3A-B		$630,918	$229,836	$9,888	$870,643	$131,509	$36,976	$3,049	$1,042,177
DA 3A-E		$455,267	$274,043	$6,262	$735,572	$98,983	$27,659	$1,644	$863,858
	Protected From 500-Year Under Alternative 1	**$9,840,489**	**$4,781,777**	**$176,709**	**$14,798,975**	**$2,293,573**	**$603,079**	**$17,792**	**$17,713,419**
DA 3A-C		$52,743	$258,363	$2,261	$313,368	$13,754	$3,232	$349	$330,703
DA 3A-F		$61,198	$3,357	$357	$64,912	$14,536	$1,619	$227	$81,293
DA 3A-G		$142,622	$89,425	$1,311	$233,357	$35,747	$3,222	$204	$272,531
DA 3A-H		$130	$0	$0	$130	$30	$0	$0	$160
	Unprotected From 500-Year Under Alternative 1	**$256,693**	**$351,145**	**$3,928**	**$611,767**	**$64,067**	**$8,073**	**$779**	**$684,686**

Table F-34
Damages to Planning Unit 3B
500-Year Storm-Alternative 1
(Thousands of Dollars)

Sub-Basin		Residential	Comm/Indus,		Total	Emergency	Infrastructure	Agricultural	Total
Number	Name	Damage	Public & Ag Bldg Damage	Vehicle Damage	Damage to Structures/Vehicles	Costs	Damage	Crop Damage	Damages
1	Berwick/Patterson	$841,585	$470,546	$15,381	$1,327,512	$198,276	$50,403	$1,174	$1,577,366
2	Hwy 317	$5,327	$19,835	$231	$25,394	$30,940	$7,793	$144	$64,271
3	Franklin	$333,593	$247,659	$8,034	$589,286	$1,594	$350	$695	$591,925
4	Baldwin	$84,453	$11,696	$1,386	$97,535	$104,009	$26,574	$470	$228,588
4a	Avery Island	$1,086	$0	$116	$1,202	$24,831	$7,943	$27	$34,003
4b	Weeks Island	$0	$0	$0	$0	$0	$0	$78	$78
5	Cherenton	$41,042	$23,529	$1,216	$65,788	$40	$0	$12	$65,840
6	Jeanerette	$39,809	$3,191	$3,042	$46,042	$22,523	$6,184	$408	$75,158
7	Lydia	$56,272	$2,361	$742	$59,376	$69,202	$19,076	$64	$147,718
8	New Iberia	$403,567	$192,158	$25,088	$620,814	$15,845	$3,432	$121	$640,212
9	Loreauville	$0	$0	$564	$564	$110	$103,774	$109	$104,557
10	Delcambre	$134,143	$110,016	$2,605	$246,764	$8,354	$2,984	$9	$258,111
DA 3B-A		$1,279,981	$554,032	$28,764	$1,862,777	$2,497	$111,233	$20,661	$1,997,168
DA 3B-B		$41,004	$7,056	$545	$48,605	$194	$2,262	$2,548	$53,609
	Protected From 500-Year Under Alternative 1	**$3,261,863**	**$1,642,080**	**$87,715**	**$4,991,658**	**$478,417**	**$342,008**	**$26,518**	**$5,838,602**
DA 3B-D		$1,471	$0	$0	$1,471	$1,944	$0	$0	$3,415
DA 3B-C		$515	$42,456	$147	$43,118	$0	$45	$263	$43,426
DA 3B-E		$50,675	$11,248	$215	$62,137	$5,997	$773	$94	$69,001
DA 3B-F		$3,331	$0	$1	$3,332	$1,079	$6	$0	$4,418
DA 3B-G		$221	$0	$3	$224	$32,623	$13	$16	$32,876
DA 3B-H		$855	$8,443	$38	$9,337	$938	$99	$17	$10,390
DA 3B-I		$5,107	$0	$0	$5,107	$2,450	$0	$0	$7,557
	Unprotected From 500-Year Under Alternative 1	**$62,176**	**$62,147**	**$405**	**$124,727**	**$45,031**	**$935**	**$390**	**$171,084**

Table F-35
Damages to Planning Unit 4
500-Year Storm-Alternative 1
(Thousands of Dollars)

Sub-Basin									
Number	Name	Residential Damage	Comm/Indus, Public & Ag Bldg Damage	Vehicle Damage	Total Damage to Structures/Vehicles	Emergency Costs	Infrastructure Damage	Agricultural Crop Damage	Total Damages
1	Lafayette	$0	$0	$28,808	$28,808	$723,859	$165,644	$175	$918,486
2	Abbeville	$270,758	$87,576	$8,700	$367,034	$14,755	$37,956	$130	$419,875
3	Crowley	$0	$0	$4,295	$4,295	$1,058	$25,807	$150	$31,311
4	Jennings	$290	$0	$323	$613	$3,466	$1,571	$178	$5,827
5	Welsh	$0	$0	$82	$82	$1,314	$407	$514	$2,318
6	Iowa	$29,454	$2,891	$1,914	$34,259	$45,344	$8,955	$392	$88,950
7a	Lake Charles	$2,696,782	$1,450,130	$66,457	$4,213,368	$1,125	$172,929	$426	$4,387,848
7b	Sulphur	$991,875	$394,790	$20,711	$1,407,375	$7,736	$61,234	$219	$1,476,564
8	Vinton	$121,393	$21,933	$2,436	$145,762	$27,364	$9,260	$89	$182,475
10c	Coastal Communities	$3,483	$87,186	$395	$91,063	$2,460	$108	$56	$93,687
11a	Western Central CZM Communities	$81,811	$25,912	$2,598	$110,320	$45,468	$10,653	$103	$166,544
11b	Western Central CZM Communities	$5,150	$836	$76	$6,062	$26,379	$283	$24	$32,749
11c	Western Central CZM Communities	$31,753	$1,411	$458	$33,622	$2,867	$1,778	$117	$38,384
11d	Western Central CZM Communities	$246,195	$21,246	$2,373	$269,814	$14,068	$7,160	$55	$291,098
11e	Western Central CZM Communities	$38,217	$16,045	$779	$55,042	$299	$2,370	$140	$57,850
12a	Agricultural & Crawfish Communities	$0	$0	$2,903	$2,903	$6,541	$17,244	$22	$26,710
12b	Agricultural & Crawfish Communities	$0	$0	$452	$452	$161,558	$2,131	$173	$164,314
12c	Agricultural & Crawfish Communities	$10,495	$2,211	$1,811	$14,517	$105,831	$10,357	$6	$130,711
12d	Agricultural & Crawfish Communities	$76,011	$29,129	$1,930	$107,070	$5,884	$5,878	$351	$119,183
12e	Agricultural & Crawfish Communities	$8,777	$0	$169	$8,946	$1,434	$878	$177	$11,435
12f	Agricultural & Crawfish Communities	$70,322	$27,493	$861	$98,677	$33,977	$4,103	$303	$137,060
12g	Agricultural & Crawfish Communities	$0	$0	$12	$12	$765,565	$67	$198	$765,842
12h	Agricultural & Crawfish Communities	$0	$0	$70	$70	$253,711	$414	$106	$254,301
12j	Agricultural & Crawfish Communities	$0	$0	$0	$0	$0	$0	$0	$0
12k	Agricultural & Crawfish Communities	$68	$0	$304	$372	$3,863	$1,632	$92	$5,959
DA 4-A		$429,582	$73,596	$8,325	$511,503	$132,380	$35,707	$16,520	$696,110
DA 4-B		$3,762,341	$1,114,684	$60,165	$4,937,191	$791,092	$208,696	$6,541	$5,943,519
DA 4-C		$976,740	$259,115	$50,201	$1,286,057	$948,332	$247,256	$127,375	$2,609,020
DA 4-D		$617,906	$268,625	$85,244	$971,774	$1,570,529	$399,161	$17,730	$2,959,194
	Protected From 500-Year Under Alternative 1	**$10,469,403**	**$3,884,808**	**$352,854**	**$14,707,064**	**$5,698,259**	**$1,439,641**	**$172,361**	**$22,017,326**
9	Cameron	$12,084	$8,733	$180	$20,997	$9,062	$662	$104	$30,824
10a	Coastal Communities	$68,118	$18,416	$275	$86,809	$11,778	$665	$0	$99,252
10d	Coastal Communities	$15,683	$20,344	$219	$36,245	$68,241	$652	$346	$105,484
10e	Coastal Communities	$3,670	$0	$44	$3,714	$8,595	$219	$12	$12,541
11f	Western Central CZM Communities	$47,867	$3,047	$701	$51,615	$1,493	$2,907	$119	$56,135
11g	Western Central CZM Communities	$10,348	$19,385	$210	$29,944	$0	$493	$42	$30,478
DA 4-E		$426,473	$311,355	$6,489	$744,318	$113,463	$21,077	$9,127	$887,985
	Unprotected From 500-Year Under Alternative 1	**$584,243**	**$381,281**	**$8,118**	**$973,642**	**$212,632**	**$26,676**	**$9,750**	**$1,222,700**

Table F-36
Housing Units at Risk
100-Year Storm-Alternative 1
Planning Unit 1

Sub-Basin		Housing Units	2000 Population
Number	Name		
1a	Florida Parishes & Amite River-Walker	386	1,041
1b	Florida Parishes & Amite River-Port Vincent/French Settlement	866	1,790
2	North Shore	58,664	148,815
3a	Lutcher, Gramercy	2,528	6,796
3b	Reserve/LaPlace	13,923	38,636
3c	Norce/St. Rose	8,137	22,960
3d	JP/NO Eastbank	261,260	568,985
3e	NO East to Hwy 11	34,667	94,536
3f	Lower 9th/St. Bernard	33,944	85,529
4	Plaquemines Eastbank	997	3,005
DA 1-A		13,611	34,321
DA 1-B		2,523	4,132
	Houses Protected From the 100-Year With Alternative 1	**431,506**	**1,010,546**
DA 1-C		859	1,318
DA 1-D		1	4
	Houses Still At Risk From the 100-Year With Alternative 1	**860**	**1,322**

Table F-37
Housing Units at Risk
100-Year Storm-Alternative 1
Planning Unit 2

Sub-Basin		Housing Units	2000 Population
Number	Name		
1	Metro Area on the West Bank	96,108	254,555
2	Upper Plaquemines Parish	1,418	4,061
4c	Oil and Gas, Fishing, and Tourism Communities	1,961	5,046
6	South Lafourche	3,340	9,308
7	Central Lafourche	1,746	4,469
9	River Parishes	7,699	21,088
10	Upper Lafourche, Assumption, Ascension	5,625	15,353
11a	Central Basin Communities	2,815	7,561
11b	Central Basin Communities	1,657	4,270
DA 1-A		2,102	5,289
DA 1-B		3,575	10,124
3	Lower Plaquemines Parish	4,524	10,945
4a	Oil and Gas, Fishing, and Tourism Communities	1,878	1,541
	Houses Protected From the 100-Year With Alternative 1	**134,448**	**353,610**
4b	Oil and Gas, Fishing, and Tourism Communities	3	0
5	Industrial Communities-Port Fourchon	180	25
DA 1-C		15	45
DA 2-D		93	69
DA 2-E		48	0
DA 2-F		221	218
DA 2-G		204	68
DA 2-H		65	10
DA 2-I		58	52
	Houses Still At Risk From the 100-Year With Alternative 1	**887**	**487**

Table F-38
Housing Units at Risk
100-Year Storm-Alternative 1
Planning Unit 3A

Sub-Basin		Housing Units	2000 Population
Number	Name		
1a	Theriot	281	585
1b	Dulac	586	1,637
1c	Chauvin	2,304	6,451
1d	Montegut	659	1,818
1e	South of Houma	0	0
2a	Stephensville	75	135
2b	Amelia	377	1,108
2c	Gibson	133	304
2d	Donner	39	80
3	Houma	25,625	67,938
4	Thibodaux	8,974	22,757
5	Morgan City	5,688	12,841
6	South Lafourche	5,543	14,203
7	Central Lafourche	6,397	16,757
8	North Lafourche, Assumption, & Ascension	2,984	7,990
9	Pierre Part	1,355	3,239
DA 3A-A		5,561	11,426
DA 3A-B		4,297	11,624
DA 3A-E		3,253	8,695
	Houses Protected From the 100-Year With Alternative 1	**74,131**	**189,588**
DA 3A-C		402	1,016
DA 3A-F		484	509
DA 3A-G		1,170	1,013
DA 3A-H		1	0
	Houses Still At Risk From the 100-Year With Alternative 1	**2,057**	**2,538**

Table F-39
Housing Units at Risk
100-Year Storm-Alternative 1
Planning Unit 3B

Sub-Basin		Housing Units	2000 Population
Number	Name		
1	Berwick/Patterson	6,435	15,845
2	Hwy 317	48	110
3	Franklin	3,352	8,354
4	Baldwin	822	2,497
4a	Avery Island	104	194
4b	Weeks Island	0	0
5	Cherenton	738	1,944
6	Jeanerette	2,272	5,997
7	Lydia	411	1,079
8	New Iberia	12,880	32,623
9	Loreauville	361	938
10	Delcambre	1,003	2,450
DA 3B-A		12,464	34,968
DA 3B-B		305	711
	Houses Protected From the 100-Year With Alternative 1	**41,195**	**107,710**
DA 3B-D		10	0
DA 3B-C		7	14
DA 3B-E		407	243
DA 3B-F		30	2
DA 3B-G		2	4
DA 3B-H		8	31
DA 3B-I		37	0
	Houses Still At Risk From the 100-Year With Alternative 1	**501**	**294**

Table F-40
Housing Units at Risk
100-Year Storm-Alternative 1
Planning Unit 4

Sub-Basin		Housing Units	2000 Population
Number	Name		
1	Lafayette	22,614	52,073
2	Abbeville	5,219	11,932
3	Crowley	3,341	8,113
4	Jennings	195	494
5	Welsh	48	128
6	Iowa	1,104	2,815
7a	Lake Charles	24,435	54,363
7b	Sulphur	8,207	19,250
8	Vinton	1,263	2,911
10c	Coastal Communities	24	34
11a	Western Central CZM Communities	1,490	3,349
11b	Western Central CZM Communities	37	89
11c	Western Central CZM Communities	257	559
11d	Western Central CZM Communities	890	2,251
11e	Western Central CZM Communities	294	745
12a	Agricultural & Crawfish Communities	2,223	5,421
12b	Agricultural & Crawfish Communities	275	670
12c	Agricultural & Crawfish Communities	1,478	3,256
12d	Agricultural & Crawfish Communities	855	1,848
12e	Agricultural & Crawfish Communities	96	276
12f	Agricultural & Crawfish Communities	467	1,290
12g	Agricultural & Crawfish Communities	10	21
12h	Agricultural & Crawfish Communities	50	130
12j	Agricultural & Crawfish Communities	0	0
12k	Agricultural & Crawfish Communities	217	513
DA 4-A		4,380	11,225
DA 4-B		25,830	65,607
DA 4-C		31,037	77,729
DA 4-D		50,640	125,483
	Houses Protected From the 100-Year With Alternative 1	**186,976**	**452,575**
9	Cameron	128	208
10a	Coastal Communities	490	209
10d	Coastal Communities	112	205
10e	Coastal Communities	44	69
11f	Western Central CZM Communities	391	914
11g	Western Central CZM Communities	79	155
DA 4-E		3,719	6,626
	Houses Still At Risk From the 100-Year With Alternative 1	**4,963**	**8,386**

Table F-41
Housing Units at Risk
500-Year Storm-Alternative 1
Planning Unit 1

Sub-Basin		Housing Units	2000 Population
Number	Name		
1a	Florida Parishes & Amite River-Walker	386	1,041
1b	Florida Parishes & Amite River-Port Vincent/French Settlement	866	1,790
3a	Lutcher, Gramercy	2,528	6,796
3b	Reserve/LaPlace	13,923	38,636
3c	Norce/St. Rose	8,137	22,960
3d	JP/NO Eastbank	261,260	568,985
3e	NO East to Hwy 11	34,667	94,536
3f	Lower 9th/St. Bernard	33,944	85,529
DA 1-A		13,611	34,321
DA 1-B		2,523	4,132
	Houses Protected From the 500-Year With Alternative 1	**371,845**	**858,726**
2	North Shore	58,664	148,815
4	Plaquemines Eastbank	997	3,005
DA 1-C		859	1,318
DA 1-D		1	4
	Houses Still At Risk From the 500-Year With Alternative 1	**60,521**	**153,142**

Table F-42
Housing Units at Risk
500-Year Storm-Alternative 1
Planning Unit 2

Sub-Basin		Housing Units	2000 Population
Number	Name		
1	Metro Area on the West Bank	96,108	254,555
2	Upper Plaquemines Parish	1,418	4,061
4c	Oil and Gas, Fishing, and Tourism Communities	1,961	5,046
6	South Lafourche	3,340	9,308
7	Central Lafourche	1,746	4,469
9	River Parishes	7,699	21,088
10	Upper Lafourche, Assumption, Ascension	5,625	15,353
11a	Central Basin Communities	2,815	7,561
11b	Central Basin Communities	1,657	4,270
DA 1-A		2,102	5,289
DA 1-B		3,575	10,124
	Houses Protected From the 500-Year With Alternative 1	**128,046**	**341,124**
3	Lower Plaquemines Parish	4,524	10,945
4a	Oil and Gas, Fishing, and Tourism Communities	1,878	1,541
4b	Oil and Gas, Fishing, and Tourism Communities	3	0
5	Industrial Communities-Port Fourchon	180	25
DA 1-C		15	45
DA 2-D		93	69
DA 2-E		48	0
DA 2-F		221	218
DA 2-G		204	68
DA 2-H		65	10
DA 2-I		58	52
	Houses Still At Risk From the 500-Year With Alternative 1	**7,289**	**12,973**

Table F-43
Housing Units at Risk
500-Year Storm-Alternative 1
Planning Unit 3A

Sub-Basin		Housing Units	2000 Population
Number	Name		
1a	Theriot	281	585
1b	Dulac	586	1,637
1c	Chauvin	2,304	6,451
1d	Montegut	659	1,818
1e	South of Houma	0	0
2a	Stephensville	75	135
2b	Amelia	377	1,108
2c	Gibson	133	304
2d	Donner	39	80
3	Houma	25,625	67,938
4	Thibodaux	8,974	22,757
5	Morgan City	5,688	12,841
6	South Lafourche	5,543	14,203
7	Central Lafourche	6,397	16,757
8	North Lafourche, Assumption, & Ascension	2,984	7,990
9	Pierre Part	1,355	3,239
DA 3A-A		5,561	11,426
DA 3A-B		4,297	11,624
DA 3A-E		3,253	8,695
	Houses Protected From the 500-Year With Alternative 1	**74,131**	**189,588**
DA 3A-C		402	1,016
DA 3A-F		484	509
DA 3A-G		1,170	1,013
DA 3A-H		1	0
	Houses Still At Risk From the 500-Year With Alternative 1	**2,057**	**2,538**

Table F-44
Housing Units at Risk
500-Year Storm-Alternative 1
Planning Unit 3B

Sub-Basin		Housing Units	2000 Population
Number	Name		
1	Berwick/Patterson	6,435	15,845
2	Hwy 317	48	110
3	Franklin	3,352	8,354
4	Baldwin	822	2,497
4a	Avery Island	104	194
4b	Weeks Island	0	0
5	Cherenton	738	1,944
6	Jeanerette	2,272	5,997
7	Lydia	411	1,079
8	New Iberia	12,880	32,623
9	Loreauville	361	938
10	Delcambre	1,003	2,450
DA 3B-A		12,464	34,968
DA 3B-B		305	711
	Houses Protected From the 500-Year With Alternative 1	**41,195**	**107,710**
DA 3B-D		10	0
DA 3B-C		7	14
DA 3B-E		407	243
DA 3B-F		30	2
DA 3B-G		2	4
DA 3B-H		8	31
DA 3B-I		37	0
	Houses Still At Risk From the 500-Year With Alternative 1	**501**	**294**

Table F-45
Housing Units at Risk
500-Year Storm-Alternative 1
Planning Unit 4

Sub-Basin		Housing Units	2000 Population
Number	Name		
1	Lafayette	22,614.0	52,073.0
2	Abbeville	5,219.0	11,932.0
3	Crowley	3,341.0	8,113.0
4	Jennings	195.0	494.0
5	Welsh	48.0	128.0
6	Iowa	1,104.0	2,815.0
7a	Lake Charles	24,435.0	54,363.0
7b	Sulphur	8,207.0	19,250.0
8	Vinton	1,263.0	2,911.0
10c	Coastal Communities	24.0	34.0
11a	Western Central CZM Communities	1,490.0	3,349.0
11b	Western Central CZM Communities	37.0	89.0
11c	Western Central CZM Communities	257.0	559.0
11d	Western Central CZM Communities	890.0	2,251.0
11e	Western Central CZM Communities	294.0	745.0
12a	Agricultural & Crawfish Communities	2,223.0	5,421.0
12b	Agricultural & Crawfish Communities	275.0	670.0
12c	Agricultural & Crawfish Communities	1,478.0	3,256.0
12d	Agricultural & Crawfish Communities	855.0	1,848.0
12e	Agricultural & Crawfish Communities	96.0	276.0
12f	Agricultural & Crawfish Communities	467.0	1,290.0
12g	Agricultural & Crawfish Communities	10.0	21.0
12h	Agricultural & Crawfish Communities	50.0	130.0
12j	Agricultural & Crawfish Communities	0.0	0.0
12k	Agricultural & Crawfish Communities	217.0	513.0
DA 4-A		4,380.0	11,225.0
DA 4-B		25,830.0	65,607.0
DA 4-C		31,037.0	77,729.0
DA 4-D		50,640.0	125,483.0
	Houses Protected From the 500-Year With Alternative 1	**186,976.0**	**452,575.0**
9	Cameron	128.0	208.0
10a	Coastal Communities	490.0	209.0
10d	Coastal Communities	112.0	205.0
10e	Coastal Communities	44.0	69.0
11f	Western Central CZM Communities	391.0	914.0
11g	Western Central CZM Communities	79.0	155.0
DA 4-E		3,719.0	6,626.0
	Houses Still At Risk From the 500-Year With Alternative 1	**4,963.0**	**8,386.0**

Table F-46
Damages to Planning Unit 1
100-Year Storm-Alternative 2
(Thousands of Dollars)

Sub-Basin Number	Sub-Basin Name	Residential Damage	Comm/Indus, Public & Ag Bldg Damage	Vehicle Damage	Total Damage to Structures/Vehicles	Emergency Costs	Infrastructure Damage	Agricultural Crop Damage	Total Damages
1a	Florida Parishes & Amite River-Walker	$0	$0	$0	$0	$8,827	$2,484	$84	$11,394
1b	Florida Parishes & Amite River-Port Vincent/French Settlement	$12,258	$2,006	$647	$14,910	$19,745	$4,270	$61	$38,986
3a	Lutcher, Gramercy	$303,721	$48,897	$10,306	$362,924	$58,088	$16,214	$85	$437,311
3b	Reserve/LaPlace	$1,799,741	$230,446	$38,892	$2,069,079	$319,766	$92,176	$960	$2,481,980
3c	Norce/St. Rose	$1,310,426	$271,204	$32,964	$1,614,593	$188,534	$54,777	$197	$1,858,101
3d	JP/NO Eastbank	$28,888,196	$8,300,401	$1,126,314	$38,314,910	$6,055,103	$1,357,456	$440	$45,727,910
3e	NO East to Hwy 11	$5,144,046	$670,271	$138,215	$5,952,532	$790,389	$225,539	$180	$6,968,640
3f	Lower 9th/St. Bernard	$4,710,379	$698,370	$136,095	$5,544,844	$775,641	$204,051	$988	$6,525,524
DA 1-A		$507,409	$115,945	$17,097	$640,451	$310,245	$81,881	$4,343	$1,036,920
DA 1-B		$333,989	$23,621	$7,348	$364,958	$56,966	$9,858	$119	$431,900
4	Plaquemines Eastbank	$128,126	$53,325	$4,010	$185,460	$22,830	$7,169	$509	$215,968
	Protected From 100-Year Under Alternative 2	**$43,138,292**	**$10,414,484**	**$1,511,886**	**$55,064,662**	**$8,606,133**	**$2,055,875**	**$7,965**	**$65,734,635**
2	North Shore	$2,401,548	$396,935	$82,594	$2,881,078	$1,357,314	$355,035	$1,998	$4,595,426
DA 1-C		$82,443	$27,050	$2,093	$111,586	$19,512	$3,144	$587	$134,829
DA 1-D		$58	$4,953	$40	$5,050	$53	$10	$0	$5,113
	Unprotected From 500-Year Under Alternative 2	**$2,484,049**	**$428,937**	**$84,728**	**$2,997,714**	**$1,376,879**	**$358,189**	**$2,585**	**$4,735,368**

Table F-47
Damages to Planning Unit 2
100-Year Storm-Alternative 2
(Thousands of Dollars)

Sub-Basin Number	Sub-Basin Name	Residential Damage	Comm/Indus, Public & Ag Bldg Damage	Vehicle Damage	Total Damage to Structures/Vehicles	Emergency Costs	Infrastructure Damage	Agricultural Crop Damage	Total Damages
1	Metro Area on the West Bank	$14,177,270	$2,267,674	$395,856	$16,840,799	$2,205,008	$607,305	$731	$19,653,843
2	Upper Plaquemines Parish	$191,058	$76,622	$5,820	$273,501	$63,944	$9,689	$576	$347,709
3	Lower Plaquemines Parish	$400,626	$191,635	$16,534	$608,796	$37,704	$26,112	$739	$673,351
4c	Oil and Gas, Fishing, and Tourism Communities	$231,692	$56,256	$7,380	$295,328	$42,669	$12,038	$35	$350,071
6	South Lafourche	$416,140	$210,249	$14,807	$641,196	$44,543	$22,207	$1,451	$709,398
7	Central Lafourche	$61,062	$25,454	$2,970	$89,486	$4,454	$10,662	$1,964	$106,565
8	River Parishes	$387,008	$118,037	$18,264	$523,309	$77,316	$50,311	$5,890	$656,826
9	Upper Lafourche, Assumption, Ascension	$32,206	$9,819	$1,489	$43,513	$40,210	$36,628	$5,682	$126,034
10a	Central Basin Communities	$207,947	$26,724	$7,852	$242,522	$178,301	$18,039	$580	$439,442
10b	Central Basin Communities	$90,431	$43,316	$6,466	$140,213	$129,268	$10,187	$850	$280,518
DA 1-A		$153,447	$34,433	$7,881	$195,761	$47,777	$12,618	$1,751	$257,907
	Protected From 100-Year Under Alternative 2	**$16,348,887**	**$3,060,220**	**$485,319**	**$19,894,426**	**$2,871,194**	**$815,795**	**$20,250**	**$23,601,665**
4a	Oil and Gas, Fishing, and Tourism Communities	$243,767	$66,158	$3,110	$313,035	$32,622	$3,676	$92	$349,425
4b	Oil and Gas, Fishing, and Tourism Communities	$52	$0	$0	$52	$103,882	$0	$0	$103,934
5	Industrial Communities-Port Fourchon	$2,063	$63,464	$540	$66,067	$67	$60	$0	$66,194
DA 1-B		$736,892	$57,065	$14,094	$808,050	$81,374	$24,153	$591	$914,168
DA 1-C		$1,489	$0	$51	$1,540	$336	$107	$409	$2,393
DA 2-D		$8,816	$4,710	$138	$13,664	$2,098	$165	$102	$16,029
DA 2-E		$2,824	$0	$0	$2,824	$1,075	$0	$83	$3,982
DA 2-F		$19,979	$32,150	$685	$52,815	$5,267	$520	$232	$58,833
DA 2-G		$14,228	$20,609	$271	$35,109	$4,660	$162	$0	$39,931
DA 2-H		$3,227	$51,127	$622	$54,976	$1,923	$24	$65	$56,988
DA 2-I		$3,491	$35,269	$363	$39,123	$1,525	$124	$4	$40,776
	Unprotected From 500-Year Under Alternative 2	**$1,036,828**	**$330,552**	**$19,875**	**$1,387,255**	**$234,830**	**$28,992**	**$1,578**	**$1,652,654**

Table F-48
Damages to Planning Unit 3A
100-Year Storm-Alternative 2
(Thousands of Dollars)

Sub-Basin		Residential Damage	Comm/Indus, Public & Ag Bldg Damage	Vehicle Damage	Total Damage to Structures/Vehicles	Emergency Costs	Infrastructure Damage	Agricultural Crop Damage	Total Damages
Number	Name								
2c	Gibson	$13,107	$8,276	$535	$21,919	$3,054	$725	$2	$25,700
2d	Donner	$4,978	$0	$136	$5,114	$874	$191	$0	$6,178
3	Houma	$2,269,550	$748,155	$70,498	$3,088,203	$601,869	$162,083	$2,426	$3,854,581
4	Thibodaux	$38,873	$12,706	$2,470	$54,049	$207,855	$54,293	$774	$316,971
7	Central Lafourche	$341,603	$55,136	$11,526	$408,266	$146,620	$39,978	$2,099	$596,963
8	North Lafourche, Assumption, & Ascension	$25	$0	$0	$25	$68,845	$19,062	$2,696	$90,628
DA 3A-B		$348,065	$133,046	$13,373	$494,484	$98,632	$27,732	$2,287	$623,134
1a	Theriot	$59,168	$15,714	$784	$75,667	$6,370	$1,396	$75	$83,507
1b	Dulac	$61,997	$26,313	$2,071	$90,381	$13,262	$3,905	$17	$107,565
1c	Chauvin	$306,475	$110,313	$9,088	$425,876	$52,528	$15,390	$286	$494,081
1d	Montegut	$93,354	$19,568	$2,581	$115,503	$14,987	$4,337	$142	$134,970
1e	South of Houma	$0	$0	$0	$0	$0	$0	$9	$9
2a	Stephensville	$9,006	$826	$211	$10,043	$1,695	$322	$31	$12,092
2b	Amelia	$28,425	$4,775	$1,263	$34,462	$8,535	$2,643	$1	$45,642
5	Morgan City	$570,582	$468,526	$27,233	$1,066,341	$135,336	$30,635	$36	$1,232,349
6	South Lafourche	$768,829	$603,207	$23,584	$1,395,620	$128,169	$33,885	$1,208	$1,558,882
9	Pierre Part	$68,717	$8,991	$2,405	$80,113	$31,060	$7,727	$21	$118,921
DA 3A-A		$563,897	$108,646	$14,897	$687,440	$126,252	$27,260	$0	$840,951
DA 3A-E		$443,874	$249,612	$11,909	$705,395	$74,237	$20,744	$1,233	$801,609
	Protected From 100-Year Under Alternative 2	**$5,990,526**	**$2,573,809**	**$194,565**	**$8,758,900**	**$1,720,179**	**$452,310**	**$13,344**	**$10,944,733**
DA 3A-C		$50,698	$164,911	$2,913	$218,521	$10,316	$2,424	$261	$231,523
DA 3A-F		$61,172	$3,193	$687	$65,052	$10,902	$1,214	$170	$77,338
DA 3A-G		$132,435	75174.60226	$2,039	$209,649	$26,810	$2,417	$153	$239,029
DA 3A-H		$112	$0	$0	$112	$22	$0	$0	$134
	Unprotected From 500-Year Under Alternative 2	**$244,416**	**$243,279**	**$5,638**	**$493,334**	**$48,050**	**$6,055**	**$584**	**$548,023**

Table F-49
Damages to Planning Unit 3B
100-Year Storm-Alternative 2
(Thousands of Dollars)

Sub-Basin		Residential Damage	Comm/Indus, Public & Ag Bldg Damage	Vehicle Damage	Total Damage to Structures/Vehicles	Emergency Costs	Infrastructure Damage	Agricultural Crop Damage	Total Damages
Number	Name								
1	Berwick/Patterson	$778,643	$335,632	$26,518	$1,140,792	$148,707	$37,802	$881	$1,328,183
2	Hwy 317	$5,210	$17,203	$303	$22,716	$23,205	$5,845	$108	$51,874
3	Franklin	$268,525	$147,889	$13,133	$429,547	$1,196	$262	$521	$431,527
4	Baldwin	$41,314	$1,379	$1,701	$44,394	$78,007	$19,931	$352	$142,684
5	Cherenton	$271	$0	$14	$285	$30	$0	$9	$324
6	Jeanerette	$0	$0	$0	$0	$16,893	$4,638	$306	$21,837
7	Lydia	$40,888	$1,004	$1,244	$43,136	$51,901	$14,307	$48	$109,393
8	New Iberia	$9,643	$462	$244	$10,348	$11,884	$2,574	$90	$24,897
9	Loreauville	$0	$0	$0	$0	$83	$77,830	$82	$77,995
10	Delcambre	$116,003	$61,219	$4,359	$181,581	$6,266	$2,238	$7	$190,091
DA 3B-A		$513,974	$175,491	$17,537	$707,001	$1,873	$83,425	$15,495	$807,794
	Protected From 100-Year Under Alternative 2	**$1,774,472**	**$740,278**	**$65,052**	**$2,579,801**	**$340,044**	**$248,853**	**$17,899**	**$3,186,597**
4a	Avery Island	$856	$0	$23	$879	$18,623	$5,957	$20	$25,479
4b	Weeks Island	$0	$0	$0	$0	$2,495	$463	$58	$3,017
DA 3B-B		$40,648	$6,350	$1,035	$48,033	$146	$1,696	$1,911	$51,785
DA 3B-C		$433	$16,149	$149	$16,731	$0	$33	$197	$16,962
DA 3B-D		$1,382	$0	$0	$1,382	$1,458	$0	$0	$2,840
DA 3B-E		$50,612	$10,626	$431	$61,669	$4,498	$580	$70	$66,817
DA 3B-F		$3,331	$0	$4	$3,335	$809	$5	$0	$4,149
DA 3B-G		$221	$0	$7	$229	$24,467	$10	$12	$24,717
DA 3B-H		$838	$6,758	$54	$7,650	$704	$74	$13	$8,440
DA 3B-I		$5,105	$0	$0	$5,105	$1,838	$0	$0	$6,942
	Unprotected From 500-Year Under Alternative 2	**$103,427**	**$39,882**	**$1,703**	**$145,012**	**$55,037**	**$8,818**	**$2,282**	**$211,149**

Table F-50
Damages to Planning Unit 4
100-Year Storm-Alternative 2
(Thousands of Dollars)

Sub-Basin Number	Sub-Basin Name	Residential Damage	Comm/Indus, Public & Ag Bldg Damage	Vehicle Damage	Total Damage to Structures/Vehicles	Emergency Costs	Infrastructure Damage	Agricultural Crop Damage	Total Damages
1	Lafayette	$0	$0	$0	$0	$0	$0	$131	$131
2	Abbeville	$0	$0	$0	$0	$0	$0	$98	$98
7a	Lake Charles	$386,065	$143,606	$19,756	$549,427	$844	$129,697	$319	$680,286
7b	Sulphur	$0	$0	$0	$0	$0	$0	$164	$164
8	Vinton	$0	$0	$0	$0	$0	$0	$67	$67
11d	Western Central CZM Communities	$0	$0	$0	$0	$0	$0	$42	$42
11e	Western Central CZM Communities	$0	$0	$0	$0	$0	$0	$105	$105
12b	Agricultural & Crawfish Communities	$0	$0	$0	$0	$0	$0	$130	$130
12c	Agricultural & Crawfish Communities	$0	$0	$0	$0	$0	$0	$5	$5
12d	Agricultural & Crawfish Communities	$4,853	$0	$127	$4,980	$4,413	$4,409	$263	$14,065
12e	Agricultural & Crawfish Communities	$0	$0	$0	$0	$0	$0	$133	$133
12f	Agricultural & Crawfish Communities	$63,699	$14,786	$1,694	$80,179	$25,483	$3,078	$227	$108,966
DA 4-B		$377,529	$103,221	$11,548	$492,299	$593,319	$156,522	$4,906	$1,247,045
DA 4-D		$241,809	$56,424	$7,771	$306,005	$1,177,897	$299,371	$13,297	$1,796,570
	Protected From 100-Year Under Alternative 2	**$1,073,955**	**$318,038**	**$40,896**	**$1,432,889**	**$1,801,955**	**$593,076**	**$19,885**	**$3,847,806**
3	Crowley	$0	$0	$0	$0	$0	$0	$112	$112
4	Jennings	$0	$0	$0	$0	$0	$0	$133	$133
5	Welsh	$0	$0	$0	$0	$0	$0	$386	$386
6	Iowa	$0	$0	$0	$0	$0	$0	$294	$294
9	Cameron	$10,794	$8,733	$360	$19,887	$6,796	$496	$78	$27,258
10a	Coastal Communities	$47,464	$18,413	$485	$66,362	$8,834	$499	$0	$75,694
10c	Coastal Communities	$3,477	$63,640	$421	$67,539	$1,845	$81	$42	$69,507
10d	Coastal Communities	$13,938	$20,344	$367	$34,648	$51,181	$489	$259	$86,577
10e	Coastal Communities	$3,272	$0	$95	$3,368	$6,446	$165	$9	$9,987
11a	Western Central CZM Communities	$3,196	$233	$136	$3,565	$34,101	$7,990	$77	$45,733
11b	Western Central CZM Communities	$32	$0	$0	$32	$19,785	$212	$18	$20,047
11c	Western Central CZM Communities	$3,296	$0	$49	$3,345	$2,150	$1,334	$88	$6,917
11f	Western Central CZM Communities	$28,469	$2,357	$1,327	$32,153	$1,120	$2,181	$89	$35,543
11g	Western Central CZM Communities	$8,248	$17,992	$318	$26,558	$0	$370	$31	$26,959
12a	Agricultural & Crawfish Communities	$0	$0	$0	$0	$0	$0	$16	$16
12g	Agricultural & Crawfish Communities	$0	$0	$0	$0	$0	$0	$149	$149
12h	Agricultural & Crawfish Communities	$0	$0	$0	$0	$0	$0	$80	$80
12j	Agricultural & Crawfish Communities	$0	$0	$0	$0	$0	$0	$0	$0
12k	Agricultural & Crawfish Communities	$0	$0	$0	$0	$0	$0	$69	$69
DA 4-A		$79,272	$6,484	$2,419	$88,175	$99,285	$26,780	$12,390	$226,630
DA 4-C		$348,954	$97,007	$10,166	$456,127	$711,249	$185,442	$95,531	$1,448,350
DA 4-E		$345,358	$282,605	$11,280	$639,242	$85,097	$15,808	$6,845	$746,993
	Unprotected From 500-Year Under Alternative 2	**$895,771**	**$517,808**	**$27,423**	**$1,441,001**	**$1,027,890**	**$241,846**	**$116,698**	**$2,827,435**

Table F-51
Damages to Planning Unit 1
500-Year Storm-Alternative 2
(Thousands of Dollars)

Sub-Basin									
Number	Name	Residential Damage	Comm/Indus, Public & Ag Bldg Damage	Vehicle Damage	Total Damage to Structures/Vehicles	Emergency Costs	Infrastructure Damage	Agricultural Crop Damage	Total Damages
1a	Florida Parishes & Amite River-Walker	$0	$0	$739	$739	$11,769	$3,311	$112	$15,932
1b	Florida Parishes & Amite River-Port Vincent/French Settlement	$48,152	$8,601	$1,626	$58,379	$26,326	$5,694	$81	$90,479
3a	Lutcher, Gramercy	$347,133	$63,366	$5,733	$416,232	$77,450	$21,618	$114	$515,414
3b	Reserve/LaPlace	$2,530,392	$386,498	$32,681	$2,949,571	$426,354	$122,901	$1,280	$3,500,106
3c	Norce/St. Rose	$1,590,474	$337,798	$22,434	$1,950,706	$251,379	$73,036	$262	$2,275,383
3d	JP/NO Eastbank	$29,381,156	$8,814,960	$571,206	$38,767,322	$8,073,471	$1,809,941	$587	$48,651,321
3e	NO East to Hwy 11	$5,158,439	$676,777	$62,526	$5,897,742	$1,053,852	$300,719	$240	$7,252,553
3f	Lower 9th/St. Bernard	$4,758,019	$742,368	$66,911	$5,567,298	$1,034,188	$272,068	$1,318	$6,874,871
DA 1-A		$823,963	$181,618	$26,559	$1,032,140	$413,660	$109,175	$5,790	$1,560,766
DA 1-B		$387,998	$25,302	$3,800	$417,099	$75,955	$13,144	$158	$506,356
	Protected From 500-Year Under Alternative 2	**$45,025,726**	**$11,237,287**	**$794,213**	**$57,057,227**	**$11,444,405**	**$2,731,607**	**$9,942**	**$71,243,181**
4	Plaquemines Eastbank	$128,759	$54,937	$1,925	$185,621	$30,440	$9,559	$679	$226,298
2	North Shore	$6,753,941	$1,062,378	$141,261	$7,957,580	$1,809,752	$473,381	$2,665	$10,243,376
DA 1-C		$84,405	$28,112	$1,123	$113,640	$26,017	$4,193	$782	$144,631
DA 1-D		$64	$5,810	$37	$5,911	$70	$13	$0	$5,994
	Unprotected From 500-Year Under Alternative 2	**$6,967,170**	**$1,151,237**	**$144,345**	**$8,262,751**	**$1,866,278**	**$487,145**	**$4,126**	**$10,620,300**

Table F-52
Damages to Planning Unit 2
500-Year Storm-Alternative 2
(Thousands of Dollars)

Sub-Basin									
Number	Name	Residential Damage	Comm/Indus, Public & Ag Bldg Damage	Vehicle Damage	Total Damage to Structures/Vehicles	Emergency Costs	Infrastructure Damage	Agricultural Crop Damage	Total Damages
1	Metro Area on the West Bank	$14,675,131	$2,445,004	$203,181	$17,323,317	$2,940,011	$809,739	$975	$21,074,041
	Protected From 500-Year Under Alternative 2	**$14,675,131**	**$2,445,004**	**$203,181**	**$17,323,317**	**$2,940,011**	**$809,739**	**$975**	**$21,074,041**
2	Upper Plaquemines Parish	$198,275	$84,004	$3,252	$285,531	$85,258	$12,918	$768	$384,475
3	Lower Plaquemines Parish	$415,567	$198,817	$8,479	$622,863	$50,272	$34,816	$986	$708,937
4c	Oil and Gas, Fishing, and Tourism Communities	$254,570	$64,105	$3,754	$322,430	$56,892	$16,051	$47	$395,420
6	South Lafourche	$496,247	$249,946	$8,492	$754,684	$59,391	$29,609	$1,935	$845,619
7	Central Lafourche	$193,283	$75,676	$3,826	$272,786	$5,939	$14,216	$2,619	$295,559
8	River Parishes	$826,239	$276,311	$18,000	$1,120,549	$103,088	$67,081	$7,853	$1,298,571
9	Upper Lafourche, Assumption, Ascension	$229,839	$63,891	$11,047	$304,778	$53,613	$48,838	$7,577	$414,805
10a	Central Basin Communities	$373,771	$46,894	$5,841	$426,506	$237,735	$24,052	$773	$689,066
10b	Central Basin Communities	$190,323	$57,420	$3,697	$251,439	$172,357	$13,583	$1,133	$438,512
DA 1-A		$243,219	$48,337	$4,316	$295,872	$63,703	$16,824	$2,335	$378,733
4a	Oil and Gas, Fishing, and Tourism Communities	$262,732	$75,480	$1,756	$339,967	$43,495	$4,902	$122	$388,487
4b	Oil and Gas, Fishing, and Tourism Communities	$166	$0	$0	$166	$138,510	$0	$0	$138,676
5	Industrial Communities-Port Fourchon	$3,919	$93,365	$533	$97,817	$90	$80	$0	$97,987
DA 1-B		$899,049	$71,055	$8,530	$978,634	$108,499	$32,204	$788	$1,120,125
DA 1-C		$1,503	$0	$22	$1,525	$448	$143	$545	$2,661
DA 2-D		$10,141	$5,599	$63	$15,803	$2,798	$219	$136	$18,957
DA 2-E		$3,942	$0	$0	$3,942	$1,434	$0	$110	$5,486
DA 2-F		$21,071	$34,864	$473	$56,408	$7,022	$693	$309	$64,433
DA 2-G		$21,502	$29,188	$214	$50,904	$6,213	$216	$0	$57,333
DA 2-H		$3,649	$52,314	$612	$56,575	$2,564	$32	$86	$59,257
DA 2-I		$3,699	$35,987	$304	$39,990	$2,034	$165	$6	$42,194
	Unprotected From 500-Year Under Alternative 2	**$4,652,704**	**$1,563,254**	**$83,211**	**$6,299,169**	**$1,201,354**	**$316,643**	**$28,129**	**$7,845,295**

Table F-53
Damages to Planning Unit 3A
500-Year Storm-Alternative 2
(Thousands of Dollars)

Sub-Basin		Residential Damage	Comm/Indus, Public & Ag Bldg Damage	Vehicle Damage	Total Damage to Structures/Vehicles	Emergency Costs	Infrastructure Damage	Agricultural Crop Damage	Total Damages
Number	Name								
2c	Gibson	$13,240	$11,411	$294	$24,945	$4,073	$967	$2	$29,987
2d	Donner	$5,168	$0	$58	$5,226	$1,165	$254	$0	$6,645
3	Houma	$4,445,058	$2,133,734	$75,561	$6,654,353	$802,492	$216,111	$3,235	$7,676,191
4	Thibodaux	$349,748	$76,968	$14,370	$441,086	$277,141	$72,390	$1,033	$791,649
7	Central Lafourche	$1,000,021	$268,779	$14,165	$1,282,965	$195,494	$53,304	$2,799	$1,534,561
8	North Lafourche, Assumption, & Ascension	$6,375	$641	$4,227	$11,243	$91,793	$25,416	$3,595	$132,047
DA 3A-B		$630,918	$229,836	$9,888	$870,643	$131,509	$36,976	$3,049	$1,042,177
	Protected From 500-Year Under Alternative 2	**$6,450,528**	**$2,721,369**	**$118,563**	**$9,290,460**	**$1,503,666**	**$405,418**	**$13,712**	**$11,213,257**
1a	Theriot	$60,862	$19,318	$445	$80,625	$8,493	$1,861	$100	$91,079
1b	Dulac	$63,348	$29,124	$895	$93,368	$17,682	$5,207	$23	$116,280
1c	Chauvin	$308,860	$117,456	$4,633	$430,949	$70,037	$20,521	$382	$521,888
1d	Montegut	$93,405	$19,999	$1,376	$114,780	$19,983	$5,783	$190	$140,736
1e	South of Houma	$0	$0	$0	$0	$0	$0	$11	$11
2a	Stephensville	$9,026	$909	$119	$10,054	$2,260	$429	$42	$12,785
2b	Amelia	$34,278	$10,434	$673	$45,386	$11,380	$3,525	$2	$60,292
5	Morgan City	$669,658	$710,993	$17,699	$1,398,350	$180,448	$40,847	$48	$1,619,693
6	South Lafourche	$843,189	$659,474	$13,957	$1,516,620	$170,893	$45,180	$1,610	$1,734,302
9	Pierre Part	$168,457	$40,389	$2,978	$211,824	$41,413	$10,303	$28	$263,568
DA 3A-A		$683,609	$178,270	$9,108	$870,987	$168,335	$36,346	$0	$1,075,668
DA 3A-E		$455,267	$274,043	$6,262	$735,572	$98,983	$27,659	$1,644	$863,858
DA 3A-C		$52,743	$258,363	$2,261	$313,368	$13,754	$3,232	$349	$330,703
DA 3A-F		$61,198	$3,357	$357	$64,912	$14,536	$1,619	$227	$81,293
DA 3A-G		$142,622	$89,425	$1,311	$233,357	$35,747	$3,222	$204	$272,531
DA 3A-H		$130	$0	$0	$130	$30	$0	$0	$160
	Unprotected From 500-Year Under Alternative 2	**$3,646,654**	**$2,411,553**	**$62,074**	**$6,120,281**	**$853,974**	**$205,734**	**$4,859**	**$7,184,848**

Table F-54
Damages to Planning Unit 3B
500-Year Storm-Alternative 2
(Thousands of Dollars)

Sub-Basin									
Number	Name	Residential Damage	Comm/Indus, Public & Ag Bldg Damage	Vehicle Damage	Total Damage to Structures/Vehicles	Emergency Costs	Infrastructure Damage	Agricultural Crop Damage	Total Damages
1	Berwick/Patterson	$841,585	$470,546	$15,381	$1,327,512	$198,276	$50,403	$1,174	$1,577,366
2	Hwy 317	$5,327	$19,835	$231	$25,394	$30,940	$7,793	$144	$64,271
3	Franklin	$333,593	$247,659	$8,034	$589,286	$1,594	$350	$695	$591,925
4	Baldwin	$84,453	$11,696	$1,386	$97,535	$104,009	$26,574	$470	$228,588
5	Cherenton	$41,042	$23,529	$1,216	$65,788	$40	$0	$12	$65,840
6	Jeanerette	$39,809	$3,191	$3,042	$46,042	$22,523	$6,184	$408	$75,158
7	Lydia	$56,272	$2,361	$742	$59,376	$69,202	$19,076	$64	$147,718
8	New Iberia	$403,567	$192,158	$25,088	$620,814	$15,845	$3,432	$121	$640,212
9	Loreauville	$0	$0	$564	$564	$110	$103,774	$109	$104,557
10	Delcambre	$134,143	$110,016	$2,605	$246,764	$8,354	$2,984	$9	$258,111
DA 3B-A		$1,279,981	$554,032	$28,764	$1,862,777	$2,497	$111,233	$20,661	$1,997,168
	Protected From 500-Year Under Alternative 2	**$3,219,774**	**$1,635,025**	**$87,053**	**$4,941,852**	**$453,392**	**$331,804**	**$23,865**	**$5,750,913**
4a	Avery Island	$1,086	$0	$116	$1,202	$24,831	$7,943	$27	$34,003
4b	Weeks Island	$0	$0	$0	$0	$0	$0	$78	$78
DA 3B-B		$41,004	$7,056	$545	$48,605	$194	$2,262	$2,548	$53,609
DA 3B-C		$515	$42,456	$147	$43,118	$0	$45	$263	$43,426
DA 3B-D		$1,471	$0	$0	$1,471	$1,944	$0	$0	$3,415
DA 3B-E		$50,675	$11,248	$215	$62,137	$5,997	$773	$94	$69,001
DA 3B-F		$3,331	$0	$1	$3,332	$1,079	$6	$0	$4,418
DA 3B-G		$221	$0	$3	$224	$32,623	$13	$16	$32,876
DA 3B-H		$855	$8,443	$38	$9,337	$938	$99	$17	$10,390
DA 3B-I		$5,107	$0	$0	$5,107	$2,450	$0	$0	$7,557
	Unprotected From 500-Year Under Alternative 2	**$104,265**	**$69,203**	**$1,066**	**$174,534**	**$70,056**	**$11,140**	**$3,043**	**$258,773**

Table F-55
Damages to Planning Unit 4
500-Year Storm-Alternative 2
(Thousands of Dollars)

Sub-Basin									
Number	Name	Residential Damage	Comm/Indus, Public & Ag Bldg Damage	Vehicle Damage	Total Damage to Structures/Vehicles	Emergency Costs	Infrastructure Damage	Agricultural Crop Damage	Total Damages
1	Lafayette	$0	$0	$28,808	$28,808	$723,859	$165,644	$175	$918,486
2	Abbeville	$270,758	$87,576	$8,700	$367,034	$14,755	$37,956	$130	$419,875
7a	Lake Charles	$2,696,782	$1,450,130	$66,457	$4,213,368	$1,125	$172,929	$426	$4,387,848
7b	Sulphur	$991,875	$394,790	$20,711	$1,407,375	$7,736	$61,234	$219	$1,476,564
8	Vinton	$121,393	$21,933	$2,436	$145,762	$27,364	$9,260	$89	$182,475
11d	Western Central CZM Communities	$246,195	$21,246	$2,373	$269,814	$14,068	$7,160	$55	$291,098
11e	Western Central CZM Communities	$38,217	$16,045	$779	$55,042	$299	$2,370	$140	$57,850
12b	Agricultural & Crawfish Communities	$0	$0	$452	$452	$161,558	$2,131	$173	$164,314
12c	Agricultural & Crawfish Communities	$10,495	$2,211	$1,811	$14,517	$105,831	$10,357	$6	$130,711
12d	Agricultural & Crawfish Communities	$76,011	$29,129	$1,930	$107,070	$5,884	$5,878	$351	$119,183
12e	Agricultural & Crawfish Communities	$8,777	$0	$169	$8,946	$1,434	$878	$177	$11,435
12f	Agricultural & Crawfish Communities	$70,322	$27,493	$861	$98,677	$33,977	$4,103	$303	$137,060
DA 4-B		$3,762,341	$1,114,684	$60,165	$4,937,191	$791,092	$208,696	$6,541	$5,943,519
DA 4-D		$617,906	$268,625	$85,244	$971,774	$1,570,529	$399,161	$17,730	$2,959,194
	Protected From 500-Year Under Alternative 2	**$8,911,073**	**$3,433,861**	**$280,897**	**$12,625,831**	**$3,459,510**	**$1,087,759**	**$26,514**	**$17,199,613**
3	Crowley	$0	$0	$4,295	$4,295	$1,058	$25,807	$150	$31,311
4	Jennings	$290	$0	$323	$613	$3,466	$1,571	$178	$5,827
5	Welsh	$0	$0	$82	$82	$1,314	$407	$514	$2,318
6	Iowa	$29,454	$2,891	$1,914	$34,259	$45,344	$8,955	$392	$88,950
9	Cameron	$12,084	$8,733	$180	$20,997	$9,062	$662	$104	$30,824
10a	Coastal Communities	$68,118	$18,416	$275	$86,809	$11,778	$665	$0	$99,252
10c	Coastal Communities	$3,483	$87,186	$395	$91,063	$2,460	$108	$56	$93,687
10d	Coastal Communities	$15,683	$20,344	$219	$36,245	$68,241	$652	$346	$105,484
10e	Coastal Communities	$3,670	$0	$44	$3,714	$8,595	$219	$12	$12,541
11a	Western Central CZM Communities	$81,811	$25,912	$2,598	$110,320	$45,468	$10,653	$103	$166,544
11b	Western Central CZM Communities	$5,150	$836	$76	$6,062	$26,379	$283	$24	$32,749
11c	Western Central CZM Communities	$31,753	$1,411	$458	$33,622	$2,867	$1,778	$117	$38,384
11f	Western Central CZM Communities	$47,867	$3,047	$701	$51,615	$1,493	$2,907	$119	$56,135
11g	Western Central CZM Communities	$10,348	$19,385	$210	$29,944	$0	$493	$42	$30,478
12a	Agricultural & Crawfish Communities	$0	$0	$2,903	$2,903	$6,541	$17,244	$22	$26,710
12g	Agricultural & Crawfish Communities	$0	$0	$12	$12	$765,565	$67	$198	$765,842
12h	Agricultural & Crawfish Communities	$0	$0	$70	$70	$253,711	$414	$106	$254,301
12j	Agricultural & Crawfish Communities	$0	$0	$0	$0	$0	$0	$0	$0
12k	Agricultural & Crawfish Communities	$68	$0	$304	$372	$3,863	$1,632	$92	$5,959
DA 4-A		$429,582	$73,596	$8,325	$511,503	$132,380	$35,707	$16,520	$696,110
DA 4-C		$976,740	$259,115	$50,201	$1,286,057	$948,332	$247,256	$127,375	$2,609,020
DA 4-E		$426,473	$311,355	$6,489	$744,318	$113,463	$21,077	$9,127	$887,985
	Unprotected From 500-Year Under Alternative 2	**$2,142,573**	**$832,227**	**$80,075**	**$3,054,876**	**$2,451,382**	**$378,558**	**$155,597**	**$6,040,413**

Table F-56
Housing Units at Risk
100-Year Storm-Alternative 2
Planning Unit 1

Sub-Basin		Housing Units	2000 Population
Number	Name		
1a	Florida Parishes & Amite River-Walker	386	1,041
1b	Florida Parishes & Amite River-Port Vincent/French Settlement	866	1,790
3a	Lutcher, Gramercy	2,528	6,796
3b	Reserve/LaPlace	13,923	38,636
3c	Norce/St. Rose	8,137	22,960
3d	JP/NO Eastbank	261,260	568,985
3e	NO East to Hwy 11	34,667	94,536
3f	Lower 9th/St. Bernard	33,944	85,529
DA 1-A		13,611	34,321
DA 1-B		2,523	4,132
4	Plaquemines Eastbank	997	3,005
	Houses Protected From the 100-Year With Alternative 2	**372,842**	**861,731**
2	North Shore	58,664	148,815
DA 1-C		859	1,318
DA 1-D		1	4
	Houses Still At Risk From the 100-Year With Alternative 2	**59,524**	**150,137**

Table F-57
Housing Units at Risk
100-Year Storm-Alternative 2
Planning Unit 2

Sub-Basin		Housing Units	2000 Population
Number	Name		
1	Metro Area on the West Bank	96,108	254,555
2	Upper Plaquemines Parish	1,418	4,061
3	Lower Plaquemines Parish	4,524	10,945
4c	Oil and Gas, Fishing, and Tourism Communities	1,961	5,046
6	South Lafourche	3,340	9,308
7	Central Lafourche	1,746	4,469
9	River Parishes	7,699	21,088
10	Upper Lafourche, Assumption, Ascension	5,625	15,353
11a	Central Basin Communities	2,815	7,561
11b	Central Basin Communities	1,657	4,270
DA 1-A		2,102	5,289
	Houses Protected From the 100-Year With Alternative 2	**128,995**	**341,945**
4a	Oil and Gas, Fishing, and Tourism Communities	1,878	1,541
4b	Oil and Gas, Fishing, and Tourism Communities	3	0
5	Industrial Communities-Port Fourchon	180	25
DA 1-B		3,575	10,124
DA 1-C		15	45
DA 2-D		93	69
DA 2-E		48	0
DA 2-F		221	218
DA 2-G		204	68
DA 2-H		65	10
DA 2-I		58	52
	Houses Still At Risk From the 100-Year With Alternative 2	**6,340**	**12,152**

Table F-58
Housing Units at Risk
100-Year Storm-Alternative 2
Planning Unit 3A

Sub-Basin		Housing Units	2000 Population
Number	Name		
2c	Gibson	133	304
2d	Donner	39	80
3	Houma	25,625	67,938
4	Thibodaux	8,974	22,757
7	Central Lafourche	6,397	16,757
8	North Lafourche, Assumption, & Ascension	2,984	7,990
DA 3A-B		4,297	11,624
1a	Theriot	281	585
1b	Dulac	586	1,637
1c	Chauvin	2,304	6,451
1d	Montegut	659	1,818
1e	South of Houma	0	0
2a	Stephensville	75	135
2b	Amelia	377	1,108
5	Morgan City	5,688	12,841
6	South Lafourche	5,543	14,203
9	Pierre Part	1,355	3,239
DA 3A-A		5,561	11,426
DA 3A-E		3,253	8,695
	Houses Protected From the 100-Year With Alternative 2	**74,131**	**189,588**
DA 3A-C		402	1,016
DA 3A-F		484	509
DA 3A-G		1,170	1,013
DA 3A-H		1	0
	Houses Still At Risk From the 100-Year With Alternative 2	**2,057**	**2,538**

Table F-59
Housing Units at Risk
100-Year Storm-Alternative 2
Planning Unit 3B

Sub-Basin		Housing Units	2000 Population
Number	Name		
1	Berwick/Patterson	6,435	15,845
2	Hwy 317	48	110
3	Franklin	3,352	8,354
4	Baldwin	822	2,497
5	Cherenton	738	1,944
6	Jeanerette	2,272	5,997
7	Lydia	411	1,079
8	New Iberia	12,880	32,623
9	Loreauville	361	938
10	Delcambre	1,003	2,450
DA 3B-A		12,464	34,968
	Houses Protected From the 100-Year With Alternative 2	**40,786**	**106,805**
4a	Avery Island	104	194
4b	Weeks Island	0	0
DA 3B-B		305	711
DA 3B-C		7	14
DA 3B-D		10	0
DA 3B-E		407	243
DA 3B-F		30	2
DA 3B-G		2	4
DA 3B-H		8	31
DA 3B-I		37	0
	Houses Still At Risk From the 100-Year With Alternative 2	**910**	**1,199**

Table F-60
Housing Units at Risk
100-Year Storm-Alternative 2
Planning Unit 4

Sub-Basin		Housing Units	2000 Population
Number	Name		
1	Lafayette	22,614	52,073
2	Abbeville	5,219	11,932
7a	Lake Charles	24,435	54,363
7b	Sulphur	8,207	19,250
8	Vinton	1,263	2,911
11d	Western Central CZM Communities	890	2,251
11e	Western Central CZM Communities	294	745
12b	Agricultural & Crawfish Communities	275	670
12c	Agricultural & Crawfish Communities	1,478	3,256
12d	Agricultural & Crawfish Communities	855	1,848
12e	Agricultural & Crawfish Communities	96	276
12f	Agricultural & Crawfish Communities	467	1,290
DA 4-B		25,830	65,607
DA 4-D		50,640	125,483
	Houses Protected From the 100-Year With Alternative 2	**142,563**	**341,955**
3	Crowley	3,341	8,113
4	Jennings	195	494
5	Welsh	48	128
6	Iowa	1,104	2,815
9	Cameron	128	208
10a	Coastal Communities	490	209
10c	Coastal Communities	24	34
10d	Coastal Communities	112	205
10e	Coastal Communities	44	69
11a	Western Central CZM Communities	1,490	3,349
11b	Western Central CZM Communities	37	89
11c	Western Central CZM Communities	257	559
11f	Western Central CZM Communities	391	914
11g	Western Central CZM Communities	79	155
12a	Agricultural & Crawfish Communities	2,223	5,421
12g	Agricultural & Crawfish Communities	10	21
12h	Agricultural & Crawfish Communities	50	130
12j	Agricultural & Crawfish Communities	0	0
12k	Agricultural & Crawfish Communities	217	513
DA 4-A		4,380	11,225
DA 4-C		31,037	77,729
DA 4-E		3,719	6,626
	Houses Still At Risk From the 100-Year With Alternative 2	**49,376**	**119,006**

Table F-61
Housing Units at Risk
500-Year Storm-Alternative 2
Planning Unit 1

Sub-Basin		Housing Units	2000 Population
Number	Name		
1a	Florida Parishes & Amite River-Walker	386	1,041
1b	Florida Parishes & Amite River-Port Vincent/French Settlement	866	1,790
3a	Lutcher, Gramercy	2,528	6,796
3b	Reserve/LaPlace	13,923	38,636
3c	Norce/St. Rose	8,137	22,960
3d	JP/NO Eastbank	261,260	568,985
3e	NO East to Hwy 11	34,667	94,536
3f	Lower 9th/St. Bernard	33,944	85,529
DA 1-A		13,611	34,321
DA 1-B		2,523	4,132
	Houses Protected From the 500-Year With Alternative 2	**371,845**	**858,726**
4	Plaquemines Eastbank	997	3,005
2	North Shore	58,664	148,815
DA 1-C		859	1,318
DA 1-D		1	4
	Houses Still At Risk From the 500-Year With Alternative 2	**60,521**	**153,142**

Table F-62
Housing Units at Risk
500-Year Storm-Alternative 2
Planning Unit 2

Sub-Basin		Housing Units	2000 Population
Number	Name		
1	Metro Area on the West Bank	96,108	254,555
	Houses Protected From the 500-Year With Alternative 2	**96,108**	**254,555**
2	Upper Plaquemines Parish	1,418	4,061
3	Lower Plaquemines Parish	4,524	10,945
4c	Oil and Gas, Fishing, and Tourism Communities	1,961	5,046
6	South Lafourche	3,340	9,308
7	Central Lafourche	1,746	4,469
9	River Parishes	7,699	21,088
10	Upper Lafourche, Assumption, Ascension	5,625	15,353
11a	Central Basin Communities	2,815	7,561
11b	Central Basin Communities	1,657	4,270
DA 1-A		2,102	5,289
4a	Oil and Gas, Fishing, and Tourism Communities	1,878	1,541
4b	Oil and Gas, Fishing, and Tourism Communities	3	0
5	Industrial Communities-Port Fourchon	180	25
DA 1-B		3,575	10,124
DA 1-C		15	45
DA 2-D		93	69
DA 2-E		48	0
DA 2-F		221	218
DA 2-G		204	68
DA 2-H		65	10
DA 2-I		58	52
	Houses Still At Risk From the 500-Year With Alternative 2	**39,227**	**99,542**

Table F-63
Housing Units at Risk
500-Year Storm-Alternative 2
Planning Unit 3A

Sub-Basin		Housing Units	2000 Population
Number	Name		
2c	Gibson	133	304
2d	Donner	39	80
3	Houma	25,625	67,938
4	Thibodaux	8,974	22,757
7	Central Lafourche	6,397	16,757
8	North Lafourche, Assumption, & Ascension	2,984	7,990
DA 3A-B		4,297	4,297
	Houses Protected From the 500-Year With Alternative 2	**48,449**	**120,123**
1a	Theriot	281	585
1b	Dulac	586	1,637
1c	Chauvin	2,304	6,451
1d	Montegut	659	1,818
1e	South of Houma	0	0
2a	Stephensville	75	135
2b	Amelia	377	1,108
5	Morgan City	5,688	12,841
6	South Lafourche	5,543	14,203
9	Pierre Part	1,355	3,239
DA 3A-A		5,561	11,426
DA 3A-E		3,253	8,695
DA 3A-C		402	1,016
DA 3A-F		484	509
DA 3A-G		1,170	1,013
DA 3A-H		1	0
	Houses Still At Risk From the 500-Year With Alternative 2	**27,739**	**64,676**

Table F-64
Housing Units at Risk
500-Year Storm-Alternative 2
Planning Unit 3B

Sub-Basin		Housing Units	2000 Population
Number	Name		
1	Berwick/Patterson	6,435	15,845
2	Hwy 317	48	110
3	Franklin	3,352	8,354
4	Baldwin	822	2,497
5	Cherenton	738	1,944
6	Jeanerette	2,272	5,997
7	Lydia	411	1,079
8	New Iberia	12,880	32,623
9	Loreauville	361	938
10	Delcambre	1,003	2,450
DA 3B-A		12,464	34,968
	Houses Protected From the 500-Year With Alternative 2	**40,786**	**106,805**
4a	Avery Island	104	194
4b	Weeks Island	0	0
DA 3B-B		305	711
DA 3B-C		7	14
DA 3B-D		10	0
DA 3B-E		407	243
DA 3B-F		30	2
DA 3B-G		2	4
DA 3B-H		8	31
DA 3B-I		37	0
	Houses Still At Risk From the 500-Year With Alternative 2	**910**	**1,199**

Table F-65
Housing Units at Risk
500-Year Storm-Alternative 2
Planning Unit 4

Sub-Basin		Housing Units	2000 Population
Number	Name		
1	Lafayette	22,614	52,073
2	Abbeville	5,219	11,932
7a	Lake Charles	24,435	54,363
7b	Sulphur	8,207	19,250
8	Vinton	1,263	2,911
11d	Western Central CZM Communities	890	2,251
11e	Western Central CZM Communities	294	745
12b	Agricultural & Crawfish Communities	275	670
12c	Agricultural & Crawfish Communities	1,478	3,256
12d	Agricultural & Crawfish Communities	855	1,848
12e	Agricultural & Crawfish Communities	96	276
12f	Agricultural & Crawfish Communities	467	1,290
DA 4-B		25,830	65,607
DA 4-D		50,640	125,483
	Houses Protected From the 500-Year With Alternative 2	**142,563**	**341,955**
3	Crowley	3,341	8,113
4	Jennings	195	494
5	Welsh	48	128
6	Iowa	1,104	2,815
9	Cameron	128	208
10a	Coastal Communities	490	209
10c	Coastal Communities	24	34
10d	Coastal Communities	112	205
10e	Coastal Communities	44	69
11a	Western Central CZM Communities	1,490	3,349
11b	Western Central CZM Communities	37	89
11c	Western Central CZM Communities	257	559
11f	Western Central CZM Communities	391	914
11g	Western Central CZM Communities	79	155
12a	Agricultural & Crawfish Communities	2,223	5,421
12g	Agricultural & Crawfish Communities	10	21
12h	Agricultural & Crawfish Communities	50	130
12j	Agricultural & Crawfish Communities	0	0
12k	Agricultural & Crawfish Communities	217	513
DA 4-A		4,380	11,225
DA 4-C		31,037	77,729
DA 4-E		3,719	6,626
	Houses Still At Risk From the 500-Year With Alternative 2	**49,376**	**119,006**

Table F-66
Damages to Planning Unit 1
100-Year Storm-Preferred Plan
(Thousands of Dollars)

Sub-Basin									
Number	Name	Residential Damage	Comm/Indus, Public & Ag Bldg Damage	Vehicle Damage	Total Damage to Structures/Vehicles	Emergency Costs	Infrastructure Damage	Agricultural Crop Damage	Total Damages
1a	Florida Parishes & Amite River-Walker	$0	$0	$0	$0	$8,827	$2,484	$84	$11,394
1b	Florida Parishes & Amite River-Port Vincent/French Settlement	$12,258	$2,006	$647	$14,910	$19,745	$4,270	$61	$38,986
2	North Shore	$2,401,548	$396,935	$82,594	$2,881,078	$1,357,314	$355,035	$1,998	$4,595,426
3a	Lutcher, Gramercy	$303,721	$48,897	$10,306	$362,924	$58,088	$16,214	$85	$437,311
3b	Reserve/LaPlace	$1,799,741	$230,446	$38,892	$2,069,079	$319,766	$92,176	$960	$2,481,980
3c	Norce/St. Rose	$1,310,426	$271,204	$32,964	$1,614,593	$188,534	$54,777	$197	$1,858,101
3d	JP/NO Eastbank	$28,888,196	$8,300,401	$1,126,314	$38,314,910	$6,055,103	$1,357,456	$440	$45,727,910
3e	NO East to Hwy 11	$5,144,046	$670,271	$138,215	$5,952,532	$790,389	$225,539	$180	$6,968,640
3f	Lower 9th/St. Bernard	$4,710,379	$698,370	$136,095	$5,544,844	$775,641	$204,051	$988	$6,525,524
DA 1-A		$507,409	$115,945	$17,097	$640,451	$310,245	$81,881	$4,343	$1,036,920
DA 1-B		$333,989	$23,621	$7,348	$364,958	$56,966	$9,858	$119	$431,900
4	Plaquemines Eastbank	$128,126	$53,325	$4,010	$185,460	$22,830	$7,169	$509	$215,968
	Protected From 100-Year Under Preferred Alternative	**$45,539,840**	**$10,811,419**	**$1,594,481**	**$57,945,740**	**$9,963,447**	**$2,410,910**	**$9,964**	**$70,330,061**
DA 1-C		$82,443	$27,050	$2,093	$111,586	$19,512	$3,144	$587	$134,829
DA 1-D		$58	$4,953	$40	$5,050	$53	$10	$0	$5,113
	Unprotected From 100-Year Under Preferred Alternative	**$82,501**	**$32,002**	**$2,133**	**$116,636**	**$19,565**	**$3,154**	**$587**	**$139,942**

Table F-67
Damages to Planning Unit 2
100-Year Storm-Preferred Plan
(Thousands of Dollars)

Sub-Basin									
Number	Name	Residential Damage	Comm/Indus, Public & Ag Bldg Damage	Vehicle Damage	Total Damage to Structures/Vehicles	Emergency Costs	Infrastructure Damage	Agricultural Crop Damage	Total Damages
1	Metro Area on the West Bank	$14,177,270	$2,267,674	$395,856	$16,840,799	$2,205,008	$607,305	$731	$19,653,843
2	Upper Plaquemines Parish	$191,058	$76,622	$5,820	$273,501	$63,944	$9,689	$576	$347,709
4c	Oil and Gas, Fishing, and Tourism Communities	$231,692	$56,256	$7,380	$295,328	$42,669	$12,038	$35	$350,071
6	South Lafourche	$416,140	$210,249	$14,807	$641,196	$44,543	$22,207	$1,451	$709,398
7	Central Lafourche	$61,062	$25,454	$2,970	$89,486	$4,454	$10,662	$1,964	$106,565
9	River Parishes	$387,008	$118,037	$18,264	$523,309	$77,316	$50,311	$5,890	$656,826
10	Upper Lafourche, Assumption, Ascension	$32,206	$9,819	$1,489	$43,513	$40,210	$36,628	$5,682	$126,034
11a	Central Basin Communities	$207,947	$26,724	$7,852	$242,522	$178,301	$18,039	$580	$439,442
11b	Central Basin Communities	$90,431	$43,316	$6,466	$140,213	$129,268	$10,187	$850	$280,518
DA 1-A		$153,447	$34,433	$7,881	$195,761	$47,777	$12,618	$1,751	$257,907
DA 1-B		$736,892	$57,065	$14,094	$808,050	$81,374	$24,153	$591	$914,168
	Protected From 100-Year Under Preferred Alternative	**$16,685,152**	**$2,925,649**	**$482,878**	**$20,093,680**	**$2,914,865**	**$813,837**	**$20,101**	**$23,842,482**
3	Lower Plaquemines Parish	$400,626	$191,635	$16,534	$608,796	$37,704	$26,112	$739	$673,351
4a	Oil and Gas, Fishing, and Tourism Communities	$243,767	$66,158	$3,110	$313,035	$32,622	$3,676	$92	$349,425
4b	Oil and Gas, Fishing, and Tourism Communities	$52	$0	$0	$52	$103,882	$0	$0	$103,934
5	Industrial Communities-Port Fourchon	$2,063	$63,464	$540	$66,067	$67	$60	$0	$66,194
DA 1-C		$1,489	$0	$51	$1,540	$336	$107	$409	$2,393
DA 2-D		$8,816	$4,710	$138	$13,664	$2,098	$165	$102	$16,029
DA 2-E		$2,824	$0	$0	$2,824	$1,075	$0	$83	$3,982
DA 2-F		$19,979	$32,150	$685	$52,815	$5,267	$520	$232	$58,833
DA 2-G		$14,228	$20,609	$271	$35,109	$4,660	$162	$0	$39,931
DA 2-H		$3,227	$51,127	$622	$54,976	$1,923	$24	$65	$56,988
DA 2-I		$3,491	$35,269	$363	$39,123	$1,525	$124	$4	$40,776
	Unprotected From 100-Year Under Preferred Alternative	**$700,563**	**$465,122**	**$22,316**	**$1,188,001**	**$191,159**	**$30,950**	**$1,726**	**$1,411,837**

Table F-68
Damages to Planning Unit 3A
100-Year Storm-Preferred Plan
(Thousands of Dollars)

Sub-Basin									
Number	Name	Residential Damage	Comm/Indus, Public & Ag Bldg Damage	Vehicle Damage	Total Damage to Structures/Vehicles	Emergency Costs	Infrastructure Damage	Agricultural Crop Damage	Total Damages
2c	Gibson	$13,107	$8,276	$535	$21,919	$3,054	$725	$2	$25,700
2d	Donner	$4,978	$0	$136	$5,114	$874	$191	$0	$6,178
3	Houma	$2,269,550	$748,155	$70,498	$3,088,203	$601,869	$162,083	$2,426	$3,854,581
4	Thibodaux	$38,873	$12,706	$2,470	$54,049	$207,855	$54,293	$774	$316,971
7	Central Lafourche	$341,603	$55,136	$11,526	$408,266	$146,620	$39,978	$2,099	$596,963
DA 3A-B		$348,065	$133,046	$13,373	$494,484	$98,632	$27,732	$2,287	$623,134
1a	Theriot	$59,168	$15,714	$784	$75,667	$6,370	$1,396	$75	$83,507
1b	Dulac	$61,997	$26,313	$2,071	$90,381	$13,262	$3,905	$17	$107,565
1c	Chauvin	$306,475	$110,313	$9,088	$425,876	$52,528	$15,390	$286	$494,081
1d	Montegut	$93,354	$19,568	$2,581	$115,503	$14,987	$4,337	$142	$134,970
1e	South of Houma	$0	$0	$0	$0	$0	$0	$9	$9
2a	Stephensville	$9,006	$826	$211	$10,043	$1,695	$322	$31	$12,092
2b	Amelia	$28,425	$4,775	$1,263	$34,462	$8,535	$2,643	$1	$45,642
5	Morgan City	$570,582	$468,526	$27,233	$1,066,341	$135,336	$30,635	$36	$1,232,349
6	South Lafourche	$768,829	$603,207	$23,584	$1,395,620	$128,169	$33,885	$1,208	$1,558,882
8	North Lafourche, Assumption, & Ascension	$25	$0	$0	$25	$68,845	$19,062	$2,696	$90,628
9	Pierre Part	$68,717	$8,991	$2,405	$80,113	$31,060	$7,727	$21	$118,921
DA 3A-A		$563,897	$108,646	$14,897	$687,440	$126,252	$27,260	$0	$840,951
DA 3A-E		$443,874	$249,612	$11,909	$705,395	$74,237	$20,744	$1,233	$801,609
	Protected From 100-Year Under Preferred Alternative	**$5,990,526**	**$2,573,809**	**$194,565**	**$8,758,900**	**$1,720,179**	**$452,310**	**$13,344**	**$10,944,733**
DA 3A-C		$50,698	$164,911	$2,913	$218,521	$10,316	$2,424	$261	$231,523
DA 3A-F		$61,172	$3,193	$687	$65,052	$10,902	$1,214	$170	$77,338
DA 3A-G		$132,435	$75,175	$2,039	$209,649	$26,810	$2,417	$153	$239,029
DA 3A-H		$112	$0	$0	$112	$22	$0	$0	$134
	Unprotected From 100-Year Under Preferred Alternative	**$244,416**	**$243,279**	**$5,638**	**$493,334**	**$48,050**	**$6,055**	**$584**	**$548,023**

Table F-69
Damages to Planning Unit 3B
100-Year Storm-Preferred Plan
(Thousands of Dollars)

Sub-Basin			Comm/Indus,		Total			Agricultural	
Number	Name	Damage	Public & Ag Bldg Damage	Vehicle Damage	Damage to Structures/Vehicles	Emergency Costs	Infrastructure Damage	Crop Damage	Total Damages
1	Berwick/Patterson	$778,643	$335,632	$26,518	$1,140,792	$148,707	$37,802	$881	$1,328,183
2	Hwy 317	$5,210	$17,203	$303	$22,716	$23,205	$5,845	$108	$51,874
3	Franklin	$268,525	$147,889	$13,133	$429,547	$1,196	$262	$521	$431,527
4	Baldwin	$41,314	$1,379	$1,701	$44,394	$78,007	$19,931	$352	$142,684
5	Cherenton	$271	$0	$14	$285	$30	$0	$9	$324
6	Jeanerette	$0	$0	$0	$0	$16,893	$4,638	$306	$21,837
7	Lydia	$40,888	$1,004	$1,244	$43,136	$51,901	$14,307	$48	$109,393
8	New Iberia	$9,643	$462	$244	$10,348	$11,884	$2,574	$90	$24,897
9	Loreauville	$0	$0	$0	$0	$83	$77,830	$82	$77,995
10	Delcambre	$116,003	$61,219	$4,359	$181,581	$6,266	$2,238	$7	$190,091
DA 3B-A		$513,974	$175,491	$17,537	$707,001	$1,873	$83,425	$15,495	$807,794
	Protected From 100-Year Under Preferred Alternative	**$1,774,472**	**$740,278**	**$65,052**	**$2,579,801**	**$340,044**	**$248,853**	**$17,899**	**$3,186,597**
4a	Avery Island	$856	$0	$23	$879	$18,623	$5,957	$20	$25,479
4b	Weeks Island	$0	$0	$0	$0	$2,495	$463	$58	$3,017
DA 3B-B		$40,648	$6,350	$1,035	$48,033	$146	$1,696	$1,911	$51,785
DA 3B-C		$433	$16,149	$149	$16,731	$0	$33	$197	$16,962
DA 3B-D		$1,382	$0	$0	$1,382	$1,458	$0	$0	$2,840
DA 3B-E		$50,612	$10,626	$431	$61,669	$4,498	$580	$70	$66,817
DA 3B-F		$3,331	$0	$4	$3,335	$809	$5	$0	$4,149
DA 3B-G		$221	$0	$7	$229	$24,467	$10	$12	$24,717
DA 3B-H		$838	$6,758	$54	$7,650	$704	$74	$13	$8,440
DA 3B-I		$5,105	$0	$0	$5,105	$1,838	$0	$0	$6,942
	Unprotected From 100-Year Under Preferred Alternative	**$103,427**	**$39,882**	**$1,703**	**$145,012**	**$55,037**	**$8,818**	**$2,282**	**$211,149**

Table F-70
Damages to Planning Unit 4
100-Year Storm-Preferred Plan
(Thousands of Dollars)

Sub-Basin									
Number	Name	Residential Damage	Comm/Indus, Public & Ag Bldg Damage	Vehicle Damage	Total Damage to Structures/Vehicles	Emergency Costs	Infrastructure Damage	Agricultural Crop Damage	Total Damages
1	Lafayette	$0	$0	$0	$0	$0	$0	$131	$131
2	Abbeville	$0	$0	$0	$0	$0	$0	$98	$98
3	Crowley	$0	$0	$0	$0	$0	$0	$112	$112
4	Jennings	$0	$0	$0	$0	$0	$0	$133	$133
5	Welsh	$0	$0	$0	$0	$0	$0	$386	$386
6	Iowa	$0	$0	$0	$0	$0	$0	$294	$294
8	Vinton	$0	$0	$0	$0	$0	$0	$67	$67
11a	Western Central CZM Communities	$3,196	$233	$136	$3,565	$34,101	$7,990	$77	$45,733
11b	Western Central CZM Communities	$32	$0	$0	$32	$19,785	$212	$18	$20,047
11c	Western Central CZM Communities	$3,296	$0	$49	$3,345	$2,150	$1,334	$88	$6,917
11d	Western Central CZM Communities	$0	$0	$0	$0	$0	$0	$42	$42
11e	Western Central CZM Communities	$0	$0	$0	$0	$0	$0	$105	$105
12a	Agricultural & Crawfish Communities	$0	$0	$0	$0	$0	$0	$16	$16
12b	Agricultural & Crawfish Communities	$0	$0	$0	$0	$0	$0	$130	$130
12c	Agricultural & Crawfish Communities	$0	$0	$0	$0	$0	$0	$5	$5
12d	Agricultural & Crawfish Communities	$4,853	$0	$127	$4,980	$4,413	$4,409	$263	$14,065
12e	Agricultural & Crawfish Communities	$0	$0	$0	$0	$0	$0	$133	$133
12f	Agricultural & Crawfish Communities	$63,699	$14,786	$1,694	$80,179	$25,483	$3,078	$227	$108,966
12g	Agricultural & Crawfish Communities	$0	$0	$0	$0	$0	$0	$149	$149
12h	Agricultural & Crawfish Communities	$0	$0	$0	$0	$0	$0	$80	$80
12j	Agricultural & Crawfish Communities	$0	$0	$0	$0	$0	$0	$0	$0
12k	Agricultural & Crawfish Communities	$0	$0	$0	$0	$0	$0	$69	$69
7a	Lake Charles	$386,065	$143,606	$19,756	$549,427	$844	$129,697	$319	$680,286
7b	Sulphur	$0	$0	$0	$0	$0	$0	$164	$164
DA 4-A		$79,272	$6,484	$2,419	$88,175	$99,285	$26,780	$12,390	$226,630
DA 4-B		$377,529	$103,221	$11,548	$492,299	$593,319	$156,522	$4,906	$1,247,045
DA 4-C		$348,954	$97,007	$10,166	$456,127	$711,249	$185,442	$95,531	$1,448,350
DA 4-D		$241,809	$56,424	$7,771	$306,005	$1,177,897	$299,371	$13,297	$1,796,570
	Protected From 100-Year Under Preferred Alternative	**$1,508,706**	**$421,762**	**$53,666**	**$1,984,133**	**$2,668,526**	**$814,834**	**$129,229**	**$5,596,722**
9	Cameron	$10,794	$8,733	$360	$19,887	$6,796	$496	$78	$27,258
10a	Coastal Communities	$47,464	$18,413	$485	$66,362	$8,834	$499	$0	$75,694
10c	Coastal Communities	$3,477	$63,640	$421	$67,539	$1,845	$81	$42	$69,507
10d	Coastal Communities	$13,938	$20,344	$367	$34,648	$51,181	$489	$259	$86,577
10e	Coastal Communities	$3,272	$0	$95	$3,368	$6,446	$165	$9	$9,987
11f	Western Central CZM Communities	$28,469	$2,357	$1,327	$32,153	$1,120	$2,181	$89	$35,543
11g	Western Central CZM Communities	$8,248	$17,992	$318	$26,558	$0	$370	$31	$26,959
DA 4-E		$345,358	$282,605	$11,280	$639,242	$85,097	$15,808	$6,845	$746,993
	Unprotected From 100-Year Under Preferred Alternative	**$461,021**	**$414,084**	**$14,653**	**$889,757**	**$161,319**	**$20,088**	**$7,354**	**$1,078,518**

Table F-71
Damages to Planning Unit 1
500-Year Storm-Preferred Alternative
(Thousands of Dollars)

Sub-Basin		Residential Damage	Comm/Indus, Public & Ag Bldg Damage	Vehicle Damage	Total Damage to Structures/Vehicles	Emergency Costs	Infrastructure Damage	Agricultural Crop Damage	Total Damages
Number	Name								
1a	Florida Parishes & Amite River-Walker	$0	$0	$739	$739	$11,769	$3,311	$112	$15,932
1b	Florida Parishes & Amite River-Port Vincent/French Settlement	$48,152	$8,601	$1,626	$58,379	$26,326	$5,694	$81	$90,479
2	North Shore	$6,753,941	$1,062,378	$141,261	$7,957,580	$1,809,752	$473,381	$2,665	$10,243,376
3a	Lutcher, Gramercy	$347,133	$63,366	$5,733	$416,232	$77,450	$21,618	$114	$515,414
3b	Reserve/LaPlace	$2,530,392	$386,498	$32,681	$2,949,571	$426,354	$122,901	$1,280	$3,500,106
3c	Norce/St. Rose	$1,590,474	$337,798	$22,434	$1,950,706	$251,379	$73,036	$262	$2,275,383
3d	JP/NO Eastbank	$29,381,156	$8,814,960	$571,206	$38,767,322	$8,073,471	$1,809,941	$587	$48,651,321
3e	NO East to Hwy 11	$5,158,439	$676,777	$62,526	$5,897,742	$1,053,852	$300,719	$240	$7,252,553
3f	Lower 9th/St. Bernard	$4,758,019	$742,368	$66,911	$5,567,298	$1,034,188	$272,068	$1,318	$6,874,871
DA 1-A		$823,963	$181,618	$26,559	$1,032,140	$413,660	$109,175	$5,790	$1,560,766
DA 1-B		$387,998	$25,302	$3,800	$417,099	$75,955	$13,144	$158	$506,356
	Protected From 500-Year Under Preferred Alternative	**$51,779,667**	**$12,299,665**	**$935,474**	**$65,014,807**	**$13,254,157**	**$3,204,988**	**$12,606**	**$81,486,557**
4	Plaquemines Eastbank	$128,759	$54,937	$1,925	$185,621	$30,440	$9,559	$679	$226,298
DA 1-C		$84,405	$28,112	$1,123	$113,640	$26,017	$4,193	$782	$144,631
DA 1-D		$64	$5,810	$37	$5,911	$70	$13	$0	$5,994
	Unprotected From 500-Year Under Preferred Alternative	**$213,229**	**$88,859**	**$3,084**	**$305,172**	**$56,526**	**$13,764**	**$1,461**	**$376,923**

Table F-72
Damages to Planning Unit 2
500-Year Storm-Preferred Alternative
(Thousands of Dollars)

Sub-Basin		Residential Damage	Comm/Indus, Public & Ag Bldg Damage	Vehicle Damage	Total Damage to Structures/Vehicles	Emergency Costs	Infrastructure Damage	Agricultural Crop Damage	Total Damages
Number	Name								
1	Metro Area on the West Bank	$14,675,131	$2,445,004	$203,181	$17,323,317	$2,940,011	$809,739	$975	$21,074,041
	Protected From 500-Year Under Preferred Alternative	**$14,675,131**	**$2,445,004**	**$203,181**	**$17,323,317**	**$2,940,011**	**$809,739**	**$975**	**$21,074,041**
2	Upper Plaquemines Parish	$198,275	$84,004	$3,252	$285,531	$85,258	$12,918	$768	$384,475
4c	Oil and Gas, Fishing, and Tourism Communities	$254,570	$64,105	$3,754	$322,430	$56,892	$16,051	$47	$395,420
6	South Lafourche	$496,247	$249,946	$8,492	$754,684	$59,391	$29,609	$1,935	$845,619
7	Central Lafourche	$193,283	$75,676	$3,826	$272,786	$5,939	$14,216	$2,619	$295,559
9	River Parishes	$826,239	$276,311	$18,000	$1,120,549	$103,088	$67,081	$7,853	$1,298,571
10	Upper Lafourche, Assumption, Ascension	$229,839	$63,891	$11,047	$304,778	$53,613	$48,838	$7,577	$414,805
11a	Central Basin Communities	$373,771	$46,894	$5,841	$426,506	$237,735	$24,052	$773	$689,066
11b	Central Basin Communities	$190,323	$57,420	$3,697	$251,439	$172,357	$13,583	$1,133	$438,512
DA 1-A		$243,219	$48,337	$4,316	$295,872	$63,703	$16,824	$2,335	$378,733
DA 1-B		$899,049	$71,055	$8,530	$978,634	$108,499	$32,204	$788	$1,120,125
3	Lower Plaquemines Parish	$415,567	$198,817	$8,479	$622,863	$50,272	$34,816	$986	$708,937
4a	Oil and Gas, Fishing, and Tourism Communities	$262,732	$75,480	$1,756	$339,967	$43,495	$4,902	$122	$388,487
4b	Oil and Gas, Fishing, and Tourism Communities	$166	$0	$0	$166	$138,510	$0	$0	$138,676
5	Industrial Communities-Port Fourchon	$3,919	$93,365	$533	$97,817	$90	$80	$0	$97,987
DA 1-C		$1,503	$0	$22	$1,525	$448	$143	$545	$2,661
DA 2-D		$10,141	$5,599	$63	$15,803	$2,798	$219	$136	$18,957
DA 2-E		$3,942	$0	$0	$3,942	$1,434	$0	$110	$5,486
DA 2-F		$21,071	$34,864	$473	$56,408	$7,022	$693	$309	$64,433
DA 2-G		$21,502	$29,188	$214	$50,904	$6,213	$216	$0	$57,333
DA 2-H		$3,649	$52,314	$612	$56,575	$2,564	$32	$86	$59,257
DA 2-I		$3,699	$35,987	$304	$39,990	$2,034	$165	$6	$42,194
	Unprotected From 500-Year Under Preferred Alternative	**$4,652,704**	**$1,563,254**	**$83,211**	**$6,299,169**	**$1,201,354**	**$316,643**	**$28,129**	**$7,845,295**

Table F-73
Damages to Planning Unit 3A
500-Year Storm-Preferred Alternative
(Thousands of Dollars)

Sub-Basin									
Number	Name	Residential Damage	Comm/Indus, Public & Ag Bldg Damage	Vehicle Damage	Total Damage to Structures/Vehicles	Emergency Costs	Infrastructure Damage	Agricultural Crop Damage	Total Damages
2c	Gibson	$13,240	$11,411	$294	$24,945	$4,073	$967	$2	$29,987
2d	Donner	$5,168	$0	$58	$5,226	$1,165	$254	$0	$6,645
3	Houma	$4,445,058	$2,133,734	$75,561	$6,654,353	$802,492	$216,111	$3,235	$7,676,191
4	Thibodaux	$349,748	$76,968	$14,370	$441,086	$277,141	$72,390	$1,033	$791,649
7	Central Lafourche	$1,000,021	$268,779	$14,165	$1,282,965	$195,494	$53,304	$2,799	$1,534,561
DA 3A-B		$630,918	$229,836	$9,888	$870,643	$131,509	$36,976	$3,049	$1,042,177
	Protected From 500-Year Under Preferred Alternative	**$6,444,153**	**$2,720,728**	**$114,336**	**$9,279,217**	**$1,411,873**	**$380,002**	**$10,118**	**$11,081,210**
1a	Theriot	$60,862	$19,318	$445	$80,625	$8,493	$1,861	$100	$91,079
1b	Dulac	$63,348	$29,124	$895	$93,368	$17,682	$5,207	$23	$116,280
1c	Chauvin	$308,860	$117,456	$4,633	$430,949	$70,037	$20,521	$382	$521,888
1d	Montegut	$93,405	$19,999	$1,376	$114,780	$19,983	$5,783	$190	$140,736
1e	South of Houma	$0	$0	$0	$0	$0	$0	$11	$11
2a	Stephensville	$9,026	$909	$119	$10,054	$2,260	$429	$42	$12,785
2b	Amelia	$34,278	$10,434	$673	$45,386	$11,380	$3,525	$2	$60,292
5	Morgan City	$669,658	$710,993	$17,699	$1,398,350	$180,448	$40,847	$48	$1,619,693
6	South Lafourche	$843,189	$659,474	$13,957	$1,516,620	$170,893	$45,180	$1,610	$1,734,302
8	North Lafourche, Assumption, & Ascension	$6,375	$641	$4,227	$11,243	$91,793	$25,416	$3,595	$132,047
9	Pierre Part	$168,457	$40,389	$2,978	$211,824	$41,413	$10,303	$28	$263,568
DA 3A-A		$683,609	$178,270	$9,108	$870,987	$168,335	$36,346	$0	$1,075,668
DA 3A-E		$455,267	$274,043	$6,262	$735,572	$98,983	$27,659	$1,644	$863,858
DA 3A-C		$52,743	$258,363	$2,261	$313,368	$13,754	$3,232	$349	$330,703
DA 3A-F		$61,198	$3,357	$357	$64,912	$14,536	$1,619	$227	$81,293
DA 3A-G		$142,622	$89,425	$1,311	$233,357	$35,747	$3,222	$204	$272,531
DA 3A-H		$130	$0	$0	$130	$30	$0	$0	$160
	Unprotected From 500-Year Under Preferred Alternative	**$3,653,029**	**$2,412,194**	**$66,302**	**$6,131,524**	**$945,766**	**$231,151**	**$8,454**	**$7,316,895**

Table F-74
Damages to Planning Unit 3B
500-Year Storm-Preferred Alternative
(Thousands of Dollars)

Sub-Basin		Residential Damage	Comm/Indus, Public & Ag Bldg Damage	Vehicle Damage	Total Damage to Structures/Vehicles	Emergency Costs	Infrastructure Damage	Agricultural Crop Damage	Total Damages
Number	Name								
1	Berwick/Patterson	$841,585	$470,546	$15,381	$1,327,512	$198,276	$50,403	$1,174	$1,577,366
2	Hwy 317	$5,327	$19,835	$231	$25,394	$30,940	$7,793	$144	$64,271
3	Franklin	$333,593	$247,659	$8,034	$589,286	$1,594	$350	$695	$591,925
4	Baldwin	$84,453	$11,696	$1,386	$97,535	$104,009	$26,574	$470	$228,588
5	Cherenton	$41,042	$23,529	$1,216	$65,788	$40	$0	$12	$65,840
6	Jeanerette	$39,809	$3,191	$3,042	$46,042	$22,523	$6,184	$408	$75,158
7	Lydia	$56,272	$2,361	$742	$59,376	$69,202	$19,076	$64	$147,718
8	New Iberia	$403,567	$192,158	$25,088	$620,814	$15,845	$3,432	$121	$640,212
9	Loreauville	$0	$0	$564	$564	$110	$103,774	$109	$104,557
10	Delcambre	$134,143	$110,016	$2,605	$246,764	$8,354	$2,984	$9	$258,111
DA 3B-A		$1,279,981	$554,032	$28,764	$1,862,777	$2,497	$111,233	$20,661	$1,997,168
	Protected From 500-Year Under Preferred Alternative	**$3,219,774**	**$1,635,025**	**$87,053**	**$4,941,852**	**$453,392**	**$331,804**	**$23,865**	**$5,750,913**
4a	Avery Island	$1,086	$0	$116	$1,202	$24,831	$7,943	$27	$34,003
4b	Weeks Island	$0	$0	$0	$0	$0	$0	$78	$78
DA 3B-B		$41,004	$7,056	$545	$48,605	$194	$2,262	$2,548	$53,609
DA 3B-C		$515	$42,456	$147	$43,118	$0	$45	$263	$43,426
DA 3B-D		$1,471	$0	$0	$1,471	$1,944	$0	$0	$3,415
DA 3B-E		$50,675	$11,248	$215	$62,137	$5,997	$773	$94	$69,001
DA 3B-F		$3,331	$0	$1	$3,332	$1,079	$6	$0	$4,418
DA 3B-G		$221	$0	$3	$224	$32,623	$13	$16	$32,876
DA 3B-H		$855	$8,443	$38	$9,337	$938	$99	$17	$10,390
DA 3B-I		$5,107	$0	$0	$5,107	$2,450	$0	$0	$7,557
	Unprotected From 500-Year Under Preferred Alternative	**$104,265**	**$69,203**	**$1,066**	**$174,534**	**$70,056**	**$11,140**	**$3,043**	**$258,773**

Table F-75
Damages to Planning Unit 4
500-Year Storm-Preferred Alternative
(Thousands of Dollars)

Sub-Basin		Residential Damage	Comm/Indus, Public & Ag Bldg Damage	Vehicle Damage	Total Damage to Structures/Vehicles	Emergency Costs	Infrastructure Damage	Agricultural Crop Damage	Total Damages
Number	Name								
1	Lafayette	$0	$0	$28,808	$28,808	$723,859	$165,644	$175	$918,486
2	Abbeville	$270,758	$87,576	$8,700	$367,034	$14,755	$37,956	$130	$419,875
6	Iowa	$29,454	$2,891	$1,914	$34,259	$45,344	$8,955	$392	$88,950
8	Vinton	$121,393	$21,933	$2,436	$145,762	$27,364	$9,260	$89	$182,475
12f	Agricultural & Crawfish Communities	$70,322	$27,493	$861	$98,677	$33,977	$4,103	$303	$137,060
7a	Lake Charles	$2,696,782	$1,450,130	$66,457	$4,213,368	$1,125	$172,929	$426	$4,387,848
7b	Sulphur	$991,875	$394,790	$20,711	$1,407,375	$7,736	$61,234	$219	$1,476,564
DA 4-A		$429,582	$73,596	$8,325	$511,503	$132,380	$35,707	$16,520	$696,110
DA 4-B		$3,762,341	$1,114,684	$60,165	$4,937,191	$791,092	$208,696	$6,541	$5,943,519
	Protected From 500-Year Under Preferred Alternative	**$8,372,508**	**$3,173,093**	**$198,377**	**$11,743,978**	**$1,777,633**	**$704,483**	**$24,793**	**$14,250,887**
3	Crowley	$0	$0	$4,295	$4,295	$1,058	$25,807	$150	$31,311
4	Jennings	$290	$0	$323	$613	$3,466	$1,571	$178	$5,827
5	Welsh	$0	$0	$82	$82	$1,314	$407	$514	$2,318
9	Cameron	$12,084	$8,733	$180	$20,997	$9,062	$662	$104	$30,824
10a	Coastal Communities	$68,118	$18,416	$275	$86,809	$11,778	$665	$0	$99,252
10c	Coastal Communities	$3,483	$87,186	$395	$91,063	$2,460	$108	$56	$93,687
10d	Coastal Communities	$15,683	$20,344	$219	$36,245	$68,241	$652	$346	$105,484
10e	Coastal Communities	$3,670	$0	$44	$3,714	$8,595	$219	$12	$12,541
11a	Western Central CZM Communities	$81,811	$25,912	$2,598	$110,320	$45,468	$10,653	$103	$166,544
11b	Western Central CZM Communities	$5,150	$836	$76	$6,062	$26,379	$283	$24	$32,749
11c	Western Central CZM Communities	$31,753	$1,411	$458	$33,622	$2,867	$1,778	$117	$38,384
11d	Western Central CZM Communities	$246,195	$21,246	$2,373	$269,814	$14,068	$7,160	$55	$291,098
11e	Western Central CZM Communities	$38,217	$16,045	$779	$55,042	$299	$2,370	$140	$57,850
11f	Western Central CZM Communities	$47,867	$3,047	$701	$51,615	$1,493	$2,907	$119	$56,135
11g	Western Central CZM Communities	$10,348	$19,385	$210	$29,944	$0	$493	$42	$30,478
12a	Agricultural & Crawfish Communities	$0	$0	$2,903	$2,903	$6,541	$17,244	$22	$26,710
12b	Agricultural & Crawfish Communities	$0	$0	$452	$452	$161,558	$2,131	$173	$164,314
12c	Agricultural & Crawfish Communities	$10,495	$2,211	$1,811	$14,517	$105,831	$10,357	$6	$130,711
12d	Agricultural & Crawfish Communities	$76,011	$29,129	$1,930	$107,070	$5,884	$5,878	$351	$119,183
12e	Agricultural & Crawfish Communities	$8,777	$0	$169	$8,946	$1,434	$878	$177	$11,435
12g	Agricultural & Crawfish Communities	$0	$0	$12	$12	$765,565	$67	$198	$765,842
12h	Agricultural & Crawfish Communities	$0	$0	$70	$70	$253,711	$414	$106	$254,301
12j	Agricultural & Crawfish Communities	$0	$0	$0	$0	$0	$0	$0	$0
12k	Agricultural & Crawfish Communities	$68	$0	$304	$372	$3,863	$1,632	$92	$5,959
DA 4-C		$976,740	$259,115	$50,201	$1,286,057	$948,332	$247,256	$127,375	$2,609,020
DA 4-D		$617,906	$268,625	$85,244	$971,774	$1,570,529	$399,161	$17,730	$2,959,194
DA 4-E		$426,473	$311,355	$6,489	$744,318	$113,463	$21,077	$9,127	$887,985
	Unprotected From 500-Year Under Preferred Alternative	**$2,681,138**	**$1,092,996**	**$162,594**	**$3,936,729**	**$4,133,259**	**$761,834**	**$157,318**	**$8,989,139**

Table F-76
Housing Units at Risk
100-Year Storm-Preferred Plan
Planning Unit 1

Sub-Basin		Housing Units	2000 Population
Number	Name		
1a	Florida Parishes & Amite River-Walker	386	1,041
1b	Florida Parishes & Amite River-Port Vincent/French Settlement	866	1,790
2	North Shore	58,664	148,815
3a	Lutcher, Gramercy	2,528	6,796
3b	Reserve/LaPlace	13,923	38,636
3c	Norce/St. Rose	8,137	22,960
3d	JP/NO Eastbank	261,260	568,985
3e	NO East to Hwy 11	34,667	94,536
3f	Lower 9th/St. Bernard	33,944	85,529
DA 1-A		13,611	34,321
DA 1-B		2,523	4,132
4	Plaquemines Eastbank	997	3,005
	Houses Protected From the 100-Year With Preferred Alternative	**431,506**	**1,010,546**
DA 1-C		859	1,318
DA 1-D		1	4
	Houses Still At Risk From the 100-Year With Preferred Alternative	**860**	**1,322**

Table F-77
Housing Units at Risk
100-Year Storm-Preferred Plan
Planning Unit 2

Sub-Basin		Housing Units	2000 Population
Number	Name		
1	Metro Area on the West Bank	96,108	254,555
2	Upper Plaquemines Parish	1,418	4,061
4c	Oil and Gas, Fishing, and Tourism Communities	1,961	5,046
6	South Lafourche	3,340	9,308
7	Central Lafourche	1,746	4,469
9	River Parishes	7,699	21,088
10	Upper Lafourche, Assumption, Ascension	5,625	15,353
11a	Central Basin Communities	2,815	7,561
11b	Central Basin Communities	1,657	4,270
DA 1-A		2,102	5,289
DA 1-B		3,575	10,124
	Houses Protected From the 100-Year With Preferred Alternative	**128,046**	**341,124**
3	Lower Plaquemines Parish	4,524	10,945
4a	Oil and Gas, Fishing, and Tourism Communities	1,878	1,541
4b	Oil and Gas, Fishing, and Tourism Communities	3	0
5	Industrial Communities-Port Fourchon	180	25
DA 1-C		15	45
DA 2-D		93	69
DA 2-E		48	0
DA 2-F		221	218
DA 2-G		204	68
DA 2-H		65	10
DA 2-I		58	52
	Houses Still At Risk From the 100-Year With Preferred Alternative	**7,289**	**12,973**

Table F-78
Housing Units at Risk
100-Year Storm-Preferred Plan
Planning Unit 3A

Sub-Basin		Housing Units	2000 Population
Number	Name		
2c	Gibson	133	304
2d	Donner	39	80
3	Houma	25,625	67,938
4	Thibodaux	8,974	22,757
7	Central Lafourche	6,397	16,757
DA 3A-B		4,297	11,624
1a	Theriot	281	585
1b	Dulac	586	1,637
1c	Chauvin	2,304	6,451
1d	Montegut	659	1,818
1e	South of Houma	0	0
2a	Stephensville	75	135
2b	Amelia	377	1,108
5	Morgan City	5,688	12,841
6	South Lafourche	5,543	14,203
8	North Lafourche, Assumption, & Ascension	2,984	7,990
9	Pierre Part	1,355	3,239
DA 3A-A		5,561	11,426
DA 3A-E		3,253	8,695
	Houses Protected From the 100-Year With Preferred Alternative	**74,131**	**189,588**
DA 3A-C		402	1,016
DA 3A-F		484	509
DA 3A-G		1,170	1,013
DA 3A-H		1	0
	Houses Still At Risk From the 100-Year With Preferred Alternative	**2,057**	**2,538**

Table F-79
Housing Units at Risk
100-Year Storm-Preferred Plan
Planning Unit 3B

Sub-Basin		Housing Units	2000 Population
Number	Name		
1	Berwick/Patterson	6,435	15,845
2	Hwy 317	48	110
3	Franklin	3,352	8,354
4	Baldwin	822	2,497
5	Cherenton	738	1,944
6	Jeanerette	2,272	5,997
7	Lydia	411	1,079
8	New Iberia	12,880	32,623
9	Loreauville	361	938
10	Delcambre	1,003	2,450
DA 3B-A		12,464	34,968
	Houses Protected From the 100-Year With Preferred Alternative	**40,786**	**106,805**
4a	Avery Island	104	194
4b	Weeks Island	0	0
DA 3B-B		305	711
DA 3B-C		7	14
DA 3B-D		10	0
DA 3B-E		407	243
DA 3B-F		30	2
DA 3B-G		2	4
DA 3B-H		8	31
DA 3B-I		37	0
	Houses Still At Risk From the 100-Year With Preferred Alternative	**910**	**1,199**

Table F-80
Housing Units at Risk
100-Year Storm-Preferred Plan
Planning Unit 4

Sub-Basin		Housing Units	2000 Population
Number	Name		
1	Lafayette	22,614	52,073
2	Abbeville	5,219	11,932
3	Crowley	3,341	8,113
4	Jennings	195	494
5	Welsh	48	128
6	Iowa	1,104	2,815
8	Vinton	1,263	2,911
11a	Western Central CZM Communities	1,490	3,349
11b	Western Central CZM Communities	37	89
11c	Western Central CZM Communities	257	559
11d	Western Central CZM Communities	890	2,251
11e	Western Central CZM Communities	294	745
12a	Agricultural & Crawfish Communities	2,223	5,421
12b	Agricultural & Crawfish Communities	275	670
12c	Agricultural & Crawfish Communities	1,478	3,256
12d	Agricultural & Crawfish Communities	855	1,848
12e	Agricultural & Crawfish Communities	96	276
12f	Agricultural & Crawfish Communities	467	1,290
12g	Agricultural & Crawfish Communities	10	21
12h	Agricultural & Crawfish Communities	50	130
12j	Agricultural & Crawfish Communities	0	0
12k	Agricultural & Crawfish Communities	217	513
7a	Lake Charles	24,435	54,363
7b	Sulphur	8,207	19,250
DA 4-A		4,380	11,225
DA 4-B		25,830	65,607
DA 4-C		31,037	77,729
DA 4-D		50,640	125,483
	Houses Protected From the 100-Year With Preferred Alternative	**186,952**	**452,541**
9	Cameron	128	208
10a	Coastal Communities	490	209
10c	Coastal Communities	24	34
10d	Coastal Communities	112	205
10e	Coastal Communities	44	69
11f	Western Central CZM Communities	391	914
11g	Western Central CZM Communities	79	155
DA 4-E		3,719	6,626
	Houses Still At Risk From the 100-Year With Preferred Alternative	**4,987**	**8,420**

Table F-81
Housing Units at Risk
500-Year Storm-Preferred Plan
Planning Unit 1

Sub-Basin		Housing Units	2000 Population
Number	Name		
1a	Florida Parishes & Amite River-Walker	386	1,041
1b	Florida Parishes & Amite River-Port Vincent/French Settlement	866	1,790
2	North Shore	58,664	148,815
3a	Lutcher, Gramercy	2,528	6,796
3b	Reserve/LaPlace	13,923	38,636
3c	Norce/St. Rose	8,137	22,960
3d	JP/NO Eastbank	261,260	568,985
3e	NO East to Hwy 11	34,667	94,536
3f	Lower 9th/St. Bernard	33,944	85,529
DA 1-A		13,611	34,321
DA 1-B		2,523	4,132
	Houses Protected From the 500-Year With Preferred Alternative	**430,509**	**1,007,541**
4	Plaquemines Eastbank	997	3,005
DA 1-C		859	1,318
DA 1-D		1	4
	Houses Still At risk From the 500-Year With Preferred Alternative	**1,857**	**4,327**

Table F-82
Housing Units at Risk
500-Year Storm-Preferred Plan
Planning Unit 2

Sub-Basin		Housing Units	2000 Population
Number	Name		
1	Metro Area on the West Bank	96,108	254,555
	Houses Protected From the 500-Year With Preferred Alternative	**96,108**	**254,555**
2	Upper Plaquemines Parish	1,418	4,061
4c	Oil and Gas, Fishing, and Tourism Communities	1,961	5,046
6	South Lafourche	3,340	9,308
7	Central Lafourche	1,746	4,469
9	River Parishes	7,699	21,088
10	Upper Lafourche, Assumption, Ascension	5,625	15,353
11a	Central Basin Communities	2,815	7,561
11b	Central Basin Communities	1,657	4,270
DA 1-A		2,102	5,289
DA 1-B		3,575	10,124
3	Lower Plaquemines Parish	4,524	10,945
4a	Oil and Gas, Fishing, and Tourism Communities	1,878	1,541
4b	Oil and Gas, Fishing, and Tourism Communities	3	0
5	Industrial Communities-Port Fourchon	180	25
DA 1-C		15	45
DA 2-D		93	69
DA 2-E		48	0
DA 2-F		221	218
DA 2-G		204	68
DA 2-H		65	10
DA 2-I		58	52
	Houses Still At risk From the 500-Year With Preferred Alternative	**39,227**	**99,542**

Table F-83
Housing Units at Risk
500-Year Storm-Preferred Plan
Planning Unit 3A

Sub-Basin		Housing Units	2000 Population
Number	Name		
2c	Gibson	133	304
2d	Donner	39	80
3	Houma	25,625	67,938
4	Thibodaux	8,974	22,757
7	Central Lafourche	6,397	16,757
DA 3A-B		4,297	11,624
	Houses Protected From the 500-Year With Preferred Alternative	**45,465**	**119,460**
1a	Theriot	281	585
1b	Dulac	586	1,637
1c	Chauvin	2,304	6,451
1d	Montegut	659	1,818
1e	South of Houma	0	0
2a	Stephensville	75	135
2b	Amelia	377	1,108
5	Morgan City	5,688	12,841
6	South Lafourche	5,543	14,203
8	North Lafourche, Assumption, & Ascension	2,984	7,990
9	Pierre Part	1,355	3,239
DA 3A-A		5,561	11,426
DA 3A-E		3,253	8,695
DA 3A-C		402	1,016
DA 3A-F		484	509
DA 3A-G		1,170	1,013
DA 3A-H		1	0
	Houses Still At risk From the 500-Year With Preferred Alternative	**30,723**	**72,666**

Table F-84
Housing Units at Risk
500-Year Storm-Preferred Plan
Planning Unit 3B

Sub-Basin		Housing Units	2000 Population
Number	Name		
1	Berwick/Patterson	6,435	15,845
2	Hwy 317	48	110
3	Franklin	3,352	8,354
4	Baldwin	822	2,497
5	Cherenton	738	1,944
6	Jeanerette	2,272	5,997
7	Lydia	411	1,079
8	New Iberia	12,880	32,623
9	Loreauville	361	938
10	Delcambre	1,003	2,450
DA 3B-A		12,464	34,968
	Houses Protected From the 500-Year With Preferred Alternative	**40,786**	**106,805**
4a	Avery Island	104	194
4b	Weeks Island	0	0
DA 3B-B		305	711
DA 3B-C		7	14
DA 3B-D		10	0
DA 3B-E		407	243
DA 3B-F		30	2
DA 3B-G		2	4
DA 3B-H		8	31
DA 3B-I		37	0
	Houses Still At risk From the 500-Year With Preferred Alternative	**910**	**1,199**

Table F-85
Housing Units at Risk
500-Year Storm-Preferred Plan
Planning Unit 4

Sub-Basin		Housing Units	2000 Population
Number	Name		
1	Lafayette	22,614	52,073
2	Abbeville	5,219	11,932
6	Iowa	1,104	2,815
7a	Lake Charles	24,435	54,363
7b	Sulphur	8,207	19,250
8	Vinton	1,263	2,911
12f	Agricultural & Crawfish Communities	467	1,290
DA 4-A		4,380	11,225
DA 4-B		25,830	65,607
	Houses Protected From the 500-Year With Preferred Alternative	**93,519**	**221,466**
3	Crowley	3,341	8,113
4	Jennings	195	494
5	Welsh	48	128
9	Cameron	128	208
10a	Coastal Communities	490	209
10c	Coastal Communities	24	34
10d	Coastal Communities	112	205
10e	Coastal Communities	44	69
11a	Western Central CZM Communities	1,490	3,349
11b	Western Central CZM Communities	37	89
11c	Western Central CZM Communities	257	559
11d	Western Central CZM Communities	890	2,251
11e	Western Central CZM Communities	294	745
11f	Western Central CZM Communities	391	914
11g	Western Central CZM Communities	79	155
12a	Agricultural & Crawfish Communities	2,223	5,421
12b	Agricultural & Crawfish Communities	275	670
12c	Agricultural & Crawfish Communities	1,478	3,256
12d	Agricultural & Crawfish Communities	855	1,848
12e	Agricultural & Crawfish Communities	96	276
12g	Agricultural & Crawfish Communities	10	21
12h	Agricultural & Crawfish Communities	50	130
12j	Agricultural & Crawfish Communities	0	0
12k	Agricultural & Crawfish Communities	217	513
DA 4-C		31,037	77,729
DA 4-D		50,640	125,483
DA 4-E		3,719	6,626
	Houses Still At risk From the 500-Year With Preferred Alternative	**98,420**	**239,495**

Table F-86
Summary of Consequences of 100 and 500-Year Storms
(Thousands of Dollars)

100-Year Storm Consequences							
Planning Unit	Existing Conditions	Preferred Alternative	Reduction	Alternative 1	Reduction	Alternative 2	Reduction
1	$11,247,929	$139,942	$11,107,987	$139,942	$11,107,987	$4,735,367	$6,512,562
2	$3,870,018	$1,411,836	$2,458,182	$389,061	$3,480,957	$1,652,655	$2,217,363
3A	$10,403,287	$548,023	$9,855,264	$548,023	$9,855,264	$548,023	$9,855,264
3B	$2,069,563	$211,149	$1,858,414	$130,868	$1,938,695	$211,149	$1,858,414
4	$6,675,241	$1,078,518	$5,596,723	$1,009,011	$5,666,230	$2,827,435	$3,847,806
Total	$34,266,038	$3,389,468	$30,876,570	$2,216,905	$32,049,133	$9,974,629	$24,291,409

500-Year Storm Consequences							
Planning Unit	Existing Conditions	Preferred Alternative	Reduction	Alternative 1	Reduction	Alternative 2	Reduction
1	$81,863,481	$376,923	$81,486,558	$10,620,300	$71,243,181	$10,620,300	$71,243,181
2	$28,919,337	$7,845,295	$21,074,042	$1,584,409	$27,334,928	$7,845,295	$21,074,042
3A	$19,011,567	$7,316,895	$11,694,672	$684,686	$18,326,881	$7,184,848	$11,826,719
3B	$4,432,320	$258,773	$4,173,547	$171,084	$4,261,236	$258,773	$4,173,547
4	$23,240,026	$8,989,139	$14,250,887	$1,222,700	$22,017,326	$6,040,413	$17,199,613
Total	$157,466,731	$24,787,025	$132,679,706	$14,283,179	$143,183,552	$31,949,629	$125,517,102

Table F-87
Residences At Risk
Existing, Preferred Alternatives, Alternative 1, and Alternative 2
100-Year and 500-Year Storms

	100-Year				500-Year			
Planning Unit	Existing	Preferred Alternative	Alt 1	Alt 2	Existing	Preferred Alternative	Alt 1	Alt 2
PU 1	102,495	860	860	59,542	432,366	1,857	60,521	60,521
PU 2	29,945	7,289	887	6,340	135,335	39,227	7,289	39,227
PU 3A	70,645	2,057	2,057	2,057	76,188	30,723	2,057	27,739
PU 3B	35,261	910	501	910	35,261	910	501	910
PU 4	191,939	4,987	4,963	49,376	191,939	98,420	4,963	49,376
Total	**430,285**	**16,103**	**9,268**	**118,225**	**871,089**	**171,137**	**75,331**	**177,773**

Table F-88
Summary of Damages From the 100 and 500-Year Storms by Planning Unit and Category
Existing Conditions, Preferred Alternatives, Alternative 1, and Alternative 2
(Thousands of Dollars)

Planning Unit 1

	100-Year Storm				500-Year Storm			
Category	Existing	Preferred Alternative	Alt 1	Alt 2	Existing	Preferred Alternative	Alt 1	Alt 2
Damage to Structures	$8,250,090	$116,636	$116,636	$2,997,714	$65,319,979	$305,172	$8,262,751	$8,262,751
Damage to Agricultural Crops	$8,942	$587	$587	$2,585	$14,067	$1,461	$4,126	$4,126
Damage to Infrastructure	$627,018	$3,154	$3,154	$358,189	$3,218,752	$13,764	$487,145	$487,145
Emergency Costs	$2,361,879	$19,565	$19,565	$1,376,879	$13,310,683	$56,526	$1,866,278	$1,866,278
Total	$11,247,929	$139,942	$139,942	$4,735,367	$81,863,481	$376,923	$10,620,300	$10,620,300

Planning Unit 2

	100-Year Storm				500-Year Storm			
Category	Existing	Preferred Alternative	Alt 1	Alt 2	Existing	Preferred Alternative	Alt 1	Alt 2
Damage to Structures	$2,917,388	$1,188,001	$266,170	$1,387,255	$23,622,486	$6,299,169	$1,285,962	$6,299,169
Damage to Agricultural Crops	$18,330	$1,726	$895	$1,578	$29,103	$28,129	$2,301	$28,129
Damage to Infrastructure	$179,475	$30,950	$1,162	$28,992	$1,126,383	$316,643	$41,267	$316,643
Emergency Costs	$754,825	$191,159	$120,834	$234,830	$4,141,365	$1,201,354	$254,879	$1,201,354
Total	$3,870,018	$1,411,836	$389,061	$1,652,655	$28,919,337	$7,845,295	$1,584,409	$7,845,295

Planning Unit 3A

	100-Year Storm				500-Year Storm			
Category	Existing	Preferred Alternative	Alt 1	Alt 2	Existing	Preferred Alternative	Alt 1	Alt 2
Damage to Structures	$8,258,614	$493,334	$493,334	$493,334	$15,934,321	$6,131,524	$611,767	$6,120,281
Damage to Agricultural Crops	$13,269	$584	$584	$584	$19,302	$8,454	$779	$4,859
Damage to Infrastructure	$440,586	$6,055	$6,055	$6,055	$632,628	$231,151	$8,073	$205,734
Emergency Costs	$1,690,818	$48,050	$48,050	$48,050	$2,425,316	$945,766	$64,067	$853,974
Total	$10,403,287	$548,023	$548,023	$548,023	$19,011,567	$7,316,895	$684,686	$7,184,848

Planning Unit 3B

	100-Year Storm				500-Year Storm			
Category	Existing	Preferred Alternative	Alt 1	Alt 2	Existing	Preferred Alternative	Alt 1	Alt 2
Damage to Structures	$1,584,020	$145,012	$96,191	$145,012	$3,788,873	$174,534	$124,727	$174,534
Damage to Agricultural Crops	$19,301	$2,282	$293	$2,282	$25,734	$3,043	$390	$3,043
Damage to Infrastructure	$219,868	$8,818	$701	$8,818	$292,541	$11,140	$935	$11,140
Emergency Costs	$246,374	$55,037	$33,773	$55,037	$325,172	$70,056	$45,031	$70,056
Total	$2,069,563	$211,149	$130,958	$211,149	$4,432,320	$258,773	$171,083	$258,773

Planning Unit 4

	100-Year Storm				500-Year Storm			
Category	Existing	Preferred Alternative	Alt 1	Alt 2	Existing	Preferred Alternative	Alt 1	Alt 2
Damage to Structures	$2,873,891	$889,757	$822,218	$1,441,001	$15,680,707	$3,936,729	$973,642	$3,054,876
Damage to Agricultural Crops	$136,583	$7,354	$7,312	$116,698	$182,111	$157,318	$9,750	$155,597
Damage to Infrastructure	$834,922	$20,088	$20,007	$241,846	$1,466,317	$761,834	$26,676	$378,558
Emergency Costs	$2,829,845	$161,319	$159,474	$1,027,890	$5,910,891	$4,133,259	$212,632	$2,451,382
Total	$6,675,241	$1,078,518	$1,009,011	$2,827,435	$23,240,026	$8,989,140	$1,222,700	$6,040,413

Total	**$34,266,038**	**$3,389,468**	**$2,216,995**	**$9,974,629**	**$157,466,731**	**$24,787,026**	**$14,283,178**	**$31,949,629**

Table F-89

Ranking of Concentrated Asset Areas by Number of Housing Units at Risk Under Existing Conditions

Yellow Indicates These Areas Are Protectected From the 100-Year Storm Under Existing Conditions

Green Indicates These Areas Are Protected From the 100-Year and 500-Year Storms Under Existing Conditions

PU	CA	Name	Housing Units	Population	Damage to Structures and Vehicles	
					500-Year Damage	100-Year Damage
1	3d	Jefferson Parish/NO Eastbank	261,260	568,985	$39,325,676	$38,314,910
2	1	Metro Area on the West Bank	96,108	254,555	$17,577,742	$16,875,942
1	2	North Shore	58,664	148,815	$7,999,547	$2,881,078
1	3e	NO East to Hwy 11	34,667	94,536	$5,973,562	$5,952,532
1	3f	Lower 9th/St Bernard	33,944	85,529	$5,636,641	$5,544,844
3a	3	Houma	25,625	67,938	$6,703,461	$3,088,203
4	7a	Lake Charles	24,435	54,363	$4,262,390	$549,427
4	1	Lafayette	22,614	52,073	$0	$0
1	3b	Reserve/LaPlace	13,923	38,636	$2,974,294	$2,069,079
3b	8	New Iberia	12,880	32,623	$616,771	$10,348
3a	4	Thibodaux	8,974	22,757	$441,891	$54,049
4	7b	Sulphur	8,207	19,250	$1,422,447	$0
1	3c	Norce/St Rose	8,137	22,960	$1,965,142	$1,614,593
2	8	River Parishes	7,699	21,088	$1,136,480	$523,309
3b	1	Berwick/Patterson	6,435	15,845	$1,339,482	$1,140,792
3a	7	Central Lafourche	6,397	16,757	$1,295,034	$408,266
3a	5	Morgan City	5,688	12,841	$1,409,861	$1,066,341
2	9	North Lafourche	5,625	15,353	$307,203	$43,513
3a	6	South Lafourche	5,543	14,203	$1,526,286	$1,395,620
4	2	Abbeville	5,219	11,932	$372,447	$0
2	3	Lower Plaquemine Parish	4,524	10,945	$662,259	$634,563
3b	3	Franklin	3,352	8,354	$596,313	$429,547
4	3	Crowley	3,341	8,113	$0	$0
2	6	South Lafourche	3,340	9,308	$761,000	$641,196
3a	8	North Lafourche, Assumption, & Ascension	2,984	7,990	$7,315	$25
2	10a	Central Basin Communities	2,815	7,561	$431,494	$242,522
1	3a	Lutcher	2,528	6,796	$421,026	$362,924
3a	1c	Chauvin	2,304	6,451	$435,404	$425,876
3b	6	Jeaneratte	2,272	5,997	$45,277	$0
4	12a	Agricultural & Crawfish Communities	2,223	5,421	$0	$0
2	4c	Oil and Gas, Fishing, and Tourism Communities	1,961	5,046	$326,055	$295,328
2	4a	Oil and Gas, Fishing, and Tourism Communities	1,878	1,541	$341,322	$313,035
2	7	Central Lafourche	1,746	4,469	$276,074	$89,486
2	10b	Central Basin Communities	1,657	4,270	$254,209	$140,213
4	11a	Western Central CZM Communities	1,490	3,349	$111,358	$3,565
4	12c	Agricultural & Crawfish Communities	1,478	3,256	$12,920	$0
2	2	Upper Plaquemine Parish	1,418	4,061	$288,099	$273,501
3a	9	Stephensville & Pierre Part	1,355	3,239	$214,314	$80,113
4	8	Vinton	1,263	2,911	$147,977	$0
4	6	Iowa	1,104	2,815	$33,750	$0
3b	10	Delcambre	1,003	2,450	$248,606	$181,581
1	4	Plaquemines Eastbank	997	3,005	$187,706	$185,460
4	11d	Western Central CZM Communities	890	2,251	$271,184	$0
1	1b	Florida Parishes & Amite River - Port Vincent/French Settlement	866	1,790	$59,023	$14,910

PU	CA	Name	Housing Units	Population	Damage to Structures and Vehicles	
					500-Year Damage	100-Year Damage
4	12d	Agricultural & Crawfish Communities	855	1,848	$108,765	$4,980
3b	4	Baldwin	822	2,497	$99,289	$44,394
3b	5	Charenton	738	1,944	$66,202	$285
3a	1d	Montegut	659	1,818	$115,985	$115,503
3a	1b	Dulac	586	1,637	$94,543	$90,381
4	10a	Coastal Communiteis	490	209	$87,019	$66,362
4	12f	Agricultural & Crawfish Communities	467	1,290	$99,526	$80,179
3b	7	Lydia	411	1,079	$60,155	$43,136
4	11f	Western Central CZM Communities	391	914	$52,241	$32,153
1	1a	Florida Parishes & Amite River - Walker	386	1,041	$0	$0
3a	2b	Amelia	377	1,108	$45,976	$34,462
3b	9	Loreauville	361	938	$0	$0
4	11e	Western Central CZM Communities	294	745	$55,505	$0
3a	1a	Theroit	281	585	$80,964	$75,667
4	12b	Agricultural & Crawfish Communities	275	670	$0	$0
4	11c	Western Central CZM Communities	257	559	$33,987	$3,345
4	12k	Agricultural & Crawfish Communities	217	513	$73	$0
4	4	Jennings	195	494	$297	$0
2	5	Industrial Communities - Port Fouchon	180	25	$111,516	$73,188
3a	2c	Gibson	133	304	$25,186	$21,919
4	9	Cameron	128	208	$21,177	$19,887
4	10d	Coastal Communiteis	112	205	$36,393	$34,648
3b	4a	Avery Island	104	194	$1,111	$879
4	12e	Agricultural & Crawfish Communities	96	276	$9,006	$0
4	11g	Western Central CZM Communities	79	155	$30,052	$26,558
3a	2a	Stephensville	75	135	$10,146	$10,043
4	12h	Agricultural & Crawfish Communities	50	130	$0	$0
3b	2	HWY 317	48	110	$25,466	$22,716
4	5	Welsh	48	128	$0	$0
4	10e	Coastal Communiteis	44	69	$3,766	$3,368
3a	2d	Donner	39	80	$5,304	$5,114
4	11b	Western Central CZM Communities	37	89	$6,128	$32
4	10c	Coastal Communiteis	24	34	$91,090	$67,539
4	12g	Agricultural & Crawfish Communities	10	21	$0	$0
2	4b	Oil and Gas, Fishing, and Tourism Communities	3	0	$166	$52
4	12j	Agricultural & Crawfish Communities	0	0	$0	$0
3a	1e	South of Houma	0	0	$0	$0
3b	4b	Weeks Island	0	0	$0	$0

Integrated Ecosystem Restoration and Hurricane Protection: Louisiana's Comprehensive Master Plan for a Sustainable Coast

Appendix G: Coastal Louisiana Ecosystem Assessment and Restoration (CLEAR) Report

Coastal Protection and Restoration Authority of Louisiana

April 2007

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1.0 Introduction

1.1 Background

The Coastal Louisiana Ecosystem Assessment and Restoration (CLEAR) model was created for and used during the development of the Louisiana Coastal Area (LCA) study, conducted by the U.S. Army Corps of Engineers and the State of Louisiana, through the Department of Natural Resources. Since that time, several improvements have been made, and are discussed in the following sections.

It is important to note that this appendix only details improvements that were incorporated into the CLEAR model since the time of the LCA modeling effort; all foundation information and core details of the models, including assumptions, may be found in the November 2004, LCA Report - Appendix C: Hydrodynamic and Ecological Modeling.

http://www.clear.lsu.edu/Reports/Appdx%20C_LCA.pdf

Outputs of these most recent model runs were used by the Coastal Protection and Restoration Authority, Integrated Planning Team (CPRA IPT) to analyze two alternative scenarios. Model output included land change, habitat type, productivity, and habitat use. Model outputs have been compiled into summary tables which are located in the last section of this report (*Section VI.C. CLEAR Output Used for Scoring*).

1.2 Input

The CLEAR model grid used in the CPRA IPT alternative runs consists of 501,000 cells (500 m x 500 m) that cover the Louisiana coastal and near-shore areas from Texas to Mississippi. In contrast, the LCA modeling effort used a grid with 1 km^2 cells. The CLEAR model assumed construction and operation at year 0 for all diversions, marsh creation (pipeline conveyance), and beneficial use land areas. This assumption allowed the evaluation of the long-term effects of various restoration options. The CLEAR model has no algorithms specific to marsh creation, so the marsh creation foot prints provided by CPRA IPT were used to define these areas. The CLEAR model then applied the historic loss rate for a particular region to areas of created marsh, assuming that the processes that caused the loss in the past are still operating. Loss rates are reduced if a created land area is in the nourishment sphere of a diversion as described in the LCA report.

In terms of dredged material or hard breakwaters proposed as shoreline protection, while LCA modeling only included hard structures (modeled as reducing the land loss by 50% in the cell that they were in), the current CLEAR model assumes these structures are permeable, not restricting the flow of water. Hard structures were incorporated in the land change model with the assumption that they reduced land loss in the landward cells adjacent to them by 50%. CLEAR did not differentiate between various engineering techniques for bankline stabilization, shoreline protection and breakwaters as the model inputs were not available to consider their effects differently. No decision has been made on how to incorporate soft shoreline protection structures. Utilization of sediment/sand for shoreline improvements were not incorporated in the landscape change module, because inputs were not available to simulate how they would perform in this capacity

During the LCA modeling work, bathymetry was built into the model very simply, by assuming depths of 0.5 m for marsh ponds and 1.5 m for open water. The CLEAR model currently incorporates coastwide bathymetry data (Figure I.A.), which allows for better estimations of the diversion fill volumes for land building.

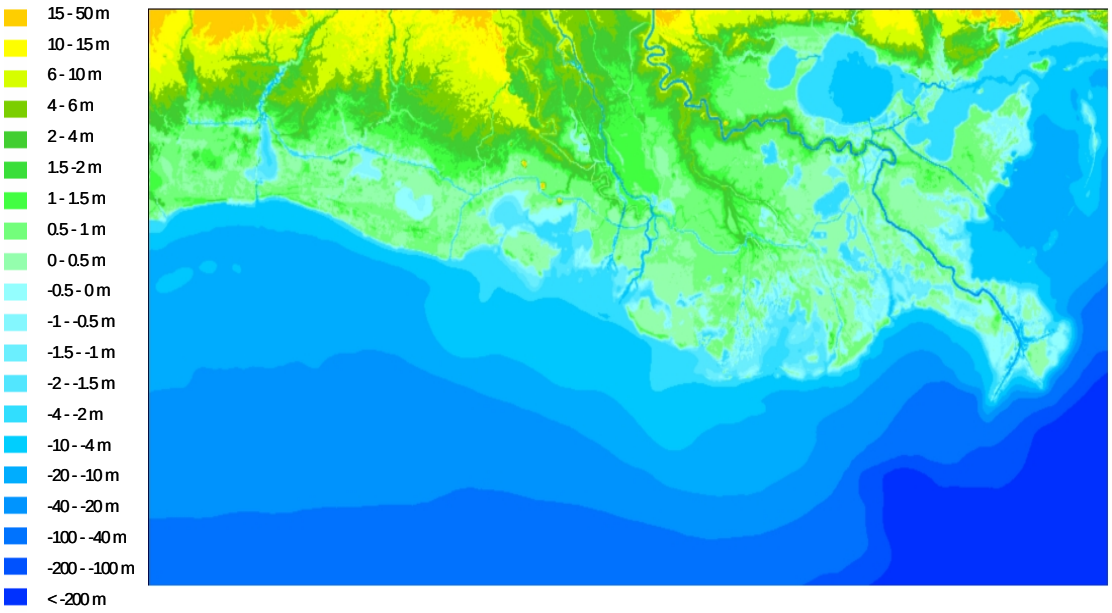

Figure 1.1 Bathymetry used for CLEAR model runs.

2.0 CLEAR Modeling for Alternatives 1 and 2

2.1 Measures Considered as Input Data to the CLEAR Model for CPRA Alternatives 1 and 2 as of October 2006

CLEAR considered the spatial data provided by the CPRA IPT, as referenced below by a particular measure number. Because measures are defined only to the detail required for planning, spatial data provided may not encompass all features which will make up that measure once engineering and design is completed.

The following list contains the full list of measures in both alternative plans. Not all measures could be incorporated into the CLEAR model, usually because they are studies or because they were too conceptual to be adequately described for modeling purposes. The color code, below, was developed to catalog which measures were included in the model.

Black = Considered as spatial input data.
Red = Not considered because CLEAR did not receive spatial input data or was told to exclude the feature from consideration.
Grey = Not considered because the feature was conceptual or too small to incorporate into a landscape scale, system response model.
Blue = Conceptual; not a specific measure.
Green = Not considered because CLEAR used a 'box salinity' approach in lieu of a hydrodynamic model approach to generate coastwide salinity values.

2.1.1 Planning Unit 1, Alternative I

1-1. Levee alignment No 1 from Pearl River to Caernarvon (30ft storm surge at coastline) and Hurricane Protection from Caernarvon to Pointe-a-la-Hache (20ft Storm Surge at Coastline)
1-2. West Shore Lake Pontchartrain Study Levee Alignment
1-3. Re-evaluate levee protection at south shore of Lake Pontchartrain (from LaBranche to Hwy 11 – including fronting and hardening pump stations and construction of 3 new pump stations and the Seabrook Floodgate) for 30 ft Storm Surge at Coastline
1-4. Resolve/close MRGO to deep draft navigation
1-5. Complete/accelerate the LCA Near Term Plan including:
   a. MRGO Environmental Restoration Features
   b. Small diversion at Hope Canal
   c. Small diversion at Convent/Blind River
   d. Increase Amite River Diversion Canal Influence by gapping banks
   e. Medium Diversion at Whites' Ditch
   f. Modification at Caernarvon Diversion
   g. Louisiana/Mississippi Hydrodynamic Study
   h. Mississippi River Hydrodynamic Study
   i. Mississippi River Delta Management Study
1-6. Restore Chandeleur Islands
1-7. Maintain and restore Biloxi Landbridge and Barrier reefs – south (reefs not considered)
1-8. Restore Bayou LaLoutre ridge
1-9. Construct Jefferson Parish Fringe Buffer
1-10. Maintain Lake Borgne Landbridge
1-11. Sediment Delivery by Pipeline at American/California Bay
1-12. Sediment Delivery by Pipeline at Central Wetlands
1-13. Sediment Delivery by Pipeline at Golden Triangle
1-14. Sediment Delivery by Pipeline at LaBranche

1-15. Benneys Bay Sediment Diversion.
1-16. Restore Main Pass Ridge with dredged material
1-17. Add new bankline stabilization (Lake Borgne Corner at GIWW to Verret)
1-18. Goose Point / Pointe Platte marsh creation
1-19. Adaptive management through maintenance of existing crevasses and construction of new crevasses
1-20. Maximize beneficial use of dredged material where feasible
1-21. Strategize and implement plan to elevate and/or relocate assets located outside the hurricane protection plans
1-22. Maintain and Restore Breton land bridge

2.1.2 Planning Unit 1, Alternative II

1-1. Levee Alignment No. 1 from Pearl River to Caernarvon (30 ft surge at coastline) and Hurricane Protection from Caernarvon to Point-a-la-Hache (20 ft Storm Surge at coastline)
1-2. West Shore Lake Pontchartrain Study Levee Alignment
1-3. Re-evaluate levee protection at south shore of Lake Pontchartrain (from LaBranche to Hwy 11 – including fronting and hardening pump stations and construction of 3 new pump stations and Seabrook Floodgate) for 30 ft storm surge at coastline
1-4. Resolve/close MRGO to deep draft navigation
1-5. Complete/accelerate the LCA Near Term Plan including:
   a. MRGO Environmental Restoration Features
   b. Small diversion at Hope Canal
   c. Small diversion at Convent/Blind River
   d. Increase Amite River Diversion Canal influence by gapping banks
   e. Medium Diversion at Whites' Ditch
   f. Modification at Caernarvon Diversion
   g. Louisiana/Mississippi Hydrodynamic Study
   h. Mississippi River Hydrodynamic Study
   i. Mississippi River Delta Management Study
1-6. Restore Chandeleur Islands
1-7. Maintain and restore Biloxi Landbridge and Barrier reefs – south (reefs not considered)
1-8. Maintain and restore Biloxi Landbridge and Barrier reefs – north (reefs not considered)
1-9. Restore Bayou LaLoutre ridge
1-10. Construct Jefferson Parish Fringe Buffer
1-11. Maintain Lake Borgne Landbridge
1-12. Maintain critical marsh shorelines and ridges of the East Orleans Landbridge
1-13. Construct Violet reintroduction to maintain target salinity in LA and MS
1-14. Diversion at American/California Bay with sediment enrichment
1-15. Benneys Bay Sediment Diversion
1-16. Add breakwater (in Lake Borgne from southwest corner to Biloxi Wildlife Management Area
1-17. St. Tammany Marsh Restoration and shoreline protection with dredge material and vegetative plantings
1-18. Adaptive management through maintenance of existing crevasses and construction of new crevasses
1-19. Maximize beneficial use of dredged material
1-20. Strategize and implement plan to elevate and/or relocate assets located outside the hurricane protection plans

2.1.3 Planning Unit 2, Alternative I

2-1. USACE Levee Alignment No. 1 Hurricane Protection (30 ft surge at coastline) along the GIWW south from Golden Meadow to City Price, modified to include Lafitte and Barataria
2-2. New Orleans to Venice Hurricane Protection Project: City Price to Venice segment – Improve existing levees to provide 100 yr storm frequency level of protection
2-3. Grand Isle and Vicinity Project: provide max technically feasible hurricane protection
2-4. Complete/accelerate the LCA Near Term Plan including:
   a. Barataria Basin Barrier Shoreline Restoration (Caminada Headland and Shell Island)
   b. Small Bayou Lafourche Reintroduction
   c. Medium Diversion with Dedicated Dredging at Myrtle Grove
   d. Re-authorization of Davis Pond - Optimize for Marsh Creation
   e. Mississippi River Hydrodynamic Study
   f. Mississippi River Delta Management Study
   g. Third Delta Study
2-5. Barrier shoreline restoration projects - restoring the Barataria barrier islands
2-6. Adaptive management through maintenance of W. Bay crevasse
2-7. Pipeline conveyance of sediment to create strategic marsh platforms in Fringing Marsh and Middle Basin Marsh areas, including the LA-1 Marsh Creation Project area
2-8. Back fill and/or plug non-essential oil and gas canals
2-9. Develop a watershed management plan that redirects freshwater and sediment, storm water, and treated sewage water to sustain upper basin swamps and middle basin freshwater marsh
2-10. Small diversions at strategic locations in upper basin
2-11. Maximize beneficial use of dredged material where feasible
2-12. Strategize and implement plan to elevate and/or relocate assets located outside the hurricane protection plans

2.1.4 Planning Unit 2, Alternative II

2-1. West Bank Hurricane Protection Levee from Davis Pond to Oakville: improve Existing Levee to Provide Hurricane Protection (30 ft surge at coastline)
2-2. USACE Levee Alignment No. 3 - Provide 100 yr storm protection via the Highway 90 alignment from Golden Meadow to Davis Pond segment and from Oakville to Venice in the Plaquemines Parish segment
2-3. Ring Levees around Lafitte, Barataria, and Crown Point, Provide Maximum Technically Feasible Hurricane Protection
2-4. Complete/accelerate the LCA Near Term Plan including:
   a. Barataria Basin Barrier Shoreline Restoration (Caminada Headland and Shell Island)
   b. Small Bayou Lafourche Reintroduction
   c. Medium Diversion with Dedicated Dredging at Myrtle Grove
   d. Re-authorization of Davis Pond - Optimize for Marsh Creation
   e. Mississippi River Hydrodynamic Study
   f. Mississippi River Delta Management Study
   g. Third Delta Study
2-5. Barrier shoreline restoration projects - restoring the Barataria barrier islands
2-6. Adaptive management through maintenance of W. Bay crevasse
2-7. Pipeline conveyance of sediment to create strategic marsh platforms in Fringing Marsh and Middle Basin Marsh areas, including the LA-1 Marsh Creation Project area
2-8. Back fill and/or plug non-essential oil and gas canals
2-9. Develop a watershed management plan that redirects freshwater and sediment, storm water, and treated sewage water to sustain upper basin swamps and middle basin freshwater marsh
2-10. Small diversions at strategic locations in upper basin

2-11. Maximize beneficial use of dredged material where feasible
2-12. Strategize and implement plan to elevate and/or relocate assets located outside the hurricane protection plans
2-11. Small diversions at Port Sulphur
2-12. Restore ridges including: Bayou Lafourche, Bayou L'ours, Bayou Grand Cheniere, Caminada Cheniere, Bayou Dupont, Bayou Barataria, Bayou Long-Bayou Fontanelle (Empire Westway), and Bayou Grand Liard
2-13. North Barataria Bay Shoreline Wave Breaks

2.1.5 Planning Unit 3a, Alternative I

3a-1 Morganza to the Gulf Hurricane protection levee alignment (30 ft surge at coastline)
3a-2. Complete/accelerate the LCA Near Term Plan including:
  a. Small Bayou Lafourche Reintroduction
  b. Multi-Purpose Operation of Houma Navigation Canal (HNC) Lock
  c. Terrebonne Basin Barrier shoreline restoration
  d. Maintain Landbridge between Caillou Land and the Gulf of Mexico
  e. Convey Atchafalaya River Water to Northern Terrebonne marshes
  f. Third Delta Study
  g. Upper Atchafalaya Basin Study
3a-3 Pipeline conveyance of sediments to create strategic marsh platforms
3a-4. Plugging and/or backfilling oil and gas canals to restore hydrology and regulate salt water movement (assume polygon for twin pipeline project)
3a-5 Bankline Protection for Houma Navigation Canal (HNC)
3a-6 Bankline Protection for GIWW
3a-7. Protection to distributed assets south of the Morganza to Gulf Hurricane Protection alignment by elevated structures and protected evacuation routes
3a-8. Strategize and implement plan to evaluate and/or relocate assets outside the hurricane protection plans
3a-9. Implement the Chacahoula Basin Plan and other projects to alleviate inundation issues in the Verret Sub-basin
3a-10. Maximize beneficial use of dredge material where possible

2.1.6 Planning Unit 3a, Alternative II

3a-1. Morganza to the Gulf Hurricane protection levee alignment (20 ft surge at coastline)
3a-2. Internal hurricane levee alignment (30 ft surge at coastline)
3a-3. Complete/accelerate the LCA Near Term Plan including:
  a. Small Bayou Lafourche Reintroduction
  b. Multi-Purpose Operation of Houma Navigation Canal (HNC) Lock
  c. Terrebonne Basin Barrier shoreline restoration
  d. Maintain Landbridge between Caillou Land and the Gulf of Mexico
  e. Convey Atchafalaya River Water to Northern Terrebonne marshes
  f. Third Delta Study
  g. Upper Atchafalaya Basin Study
3a-4. Pipeline conveyance of sediments to create strategic marsh platforms
3a-5. Implement the Chacahoula Basin Plan and other projects to alleviate inundation issues in the Verret Sub-basin
3a-6. Freshwater Introduction via Blue Hammock Bayou
3a-7. Freshwater Introduction to South of Lake Decade and Shoreline Protection
3a-8. Penchant Basin Plan

3a-9. Protection to distributed assets south of the Morganza to Gulf Hurricane Protection alignment by elevated structures and protected evacuation routes
3a-10. Strategize and implement plan to evaluate and/or relocate assets outside the hurricane protection plans
3a-11. Stabilize/Maintain Northern Shoreline of Terrebonne/Timbalier Bay
3a-12. Short-term Freshwater Redirections to Nourish and Sustain Intermediate Marshes that are being affected by salt water
3a-13. Protect and Maintain Ridges
3a-14. Maximize beneficial use of dredge material where feasible
3a-15. Bankline stabilization for the Houma Navigation Canal
3a-16. Bankline stabilization for the GIWW

2.1.7 Planning Unit 3b, Alternative I

3b-1. Construct Hurricane Protection (30 ft surge at coastline) for Berwick and Patterson and levee Alignment south of the GIWW from the Wax lake outlet to Freshwater Bayou
3b-2. Complete/accelerate the LCA Near Term Plan including:
  a. Stabilize Gulf shoreline at Pointe Au Fer Island
  b. Convey Atchafalaya River Water to northern Terrebonne Marshes
  c. Acadiana Bays Estuarine Restoration Feasibility Study
  d. Upper Atchafalaya Basin Study
3b-3. Create marsh at Weeks Bay
3b-4. Restore marsh at Marsh Island south shoreline and Rainey Marsh via dedicated dredging
3b-5. Maintain north shore of East Cote Blanche Bay at Point Marone
3b-6. Restore Vermilion Bay and West Cote Blanche Bay shorelines via beneficial uses of dredged material and/or detached breakwaters
3b-7. Maintain Vermilion Bay, East and West Cote Blanche Bay as brackish environments
3b-8. Strategize and implement plan to elevate and/or relocate assets located outside the hurricane protection plans
3b-9. Freshwater Bayou Bank Stabilization – Belle Isle to Lock

2.1.8 Planning Unit 3b, Alternative II

3b-1. Construct Hurricane Protection (30 ft surge at coastline) for Berwick and Patterson and levee alignment from the Wax lake outlet to the Vermilion River following the USACE levee alignment 3A
3b-2. Complete/accelerate the LCA Near Term Plan including:
  a. Stabilize Gulf shoreline at Pointe Au Fer Island
  b. Convey Atchafalaya River Water to northern Terrebonne Marshes
  c. Acadiana Bays Estuarine Restoration Feasibility Study
  d. Upper Atchafalaya Basin Study
3b-3. Increase sediment transport from Atchafalaya River down Wax Lake Outlet
3b-4. Stabilize Banks of Southwest Pass off Marsh Island
3b-5. Stabilize Banks of the GIWW
3b-6. Stabilize shorelines from Planning Unit 4 boundary past Tigre Point to Southwest Pass
3b-7. Stabilize shorelines across south shoreline of Marsh Island from Lighthouse Point to South Point (east of Mound Point) using dredged sediments and/or breakwaters
3b-8. Beneficial use of dredged material and dedicated dredging material wherever possible to rebuild marsh shorelines, historic reefs, and barrier islands (reefs not considered)
3b-9. Stabilize and implement plan to evaluate and/or relocate assets outside of the hurricane protection plan
3b-10. Freshwater Bayou Bank Stabilization - Belle Isle to Lock

2.1.9 Planning Unit 4, Alternative I

4-1. Proposed hurricane protection levee (30 ft surge at coastline)
4-2. Complete/Accelerate the Chenier Plain Freshwater and Sediment Management and Allocation Reassessment Study which was included in the LCA Near-Term Plan
4-3. Maximize freshwater inflow from Sabine River
4-4. Salinity Control Structures along the east shoreline of Sabine Lake near Blue Buck Point and Black Bayou
4-5. Beneficial uses of dredged material program: utilize sediment form Sabine Ship Channel and dedicated dredging for marsh enhancement and construction of terraces
4-6. Salinity Control Structure at Sabine Pass Near Hwy 82 Causeway
4-7. Stabilize Gulf Shoreline and beach west of the Calcasieu River to Sabine River using dredged sediment or breakwaters
4-8. Stabilize Gulf Shoreline and beach east of the Calcasieu River to Freshwater Bayou using dredged sediment or breakwaters
4-9. Salinity Control Structure in Calcasieu Ship Channel near ferry
4-10. Beneficial use of dredged material program: utilize sediment and dedicated dredging for marsh enhancement and construction of terraces in Calcasieu Lake.
4-11. Salinity Control Structures at points on east side of Calcasieu Lake
4-12. Maximize freshwater inflow to tributaries of the Mermentau River from outside sources
4-13. Maximize freshwater inflow to Mermentau River from outside sources
4-14. Stabilize Grand Lake Shoreline and Landbridge
4-15. Freshwater Introduction/Retention Structure or Sill on Little Pecan Bayou
4-16. Freshwater Introduction/Retention Structure or Sill on Rollover Bayou
4-17. Stabilize White Lake Shoreline and Landbridge
4-18. Stabilize banks from Schooner Bayou to GIWW along Freshwater Bayou and GIWW near White Lake
4-19. Salinity Control Structure on Black Lake Bayou near Hackberry
4-20. Build new chamber for navigation at Calcasieu Lock on GIWW and use old lock to evacuate excess water
4-21. Stabilize West Banks of Freshwater Bayou
4-22. Stabilize Eastern Shore of Lake Calcasieu
4-23. Develop a plan to elevate and/or relocate assets located outside the hurricane protection levee
4-24. Maintain Hwy 82 for hurricane evacuation and marsh protection
4-25. Provide water control structures at strategic locations along Hwys 82 and 27
4-26. Manage watershed to reduce rapid inflows into Mermentau Sub-Basin
4-27. Restore marsh by filling abandoned canals
4-28. Utilize freshwater inflow from Atchafalaya River
4-29. Improve hydrology of the old Mermentau River Channel between Mud Lake and Gulf of Mexico
4-30. Stabilize banks of GIWW

2.1.10 Planning Unit 4, Alternative II

4-1. Storm surge protection for Lake Charles Metropolitan Area using ring levee
4-2. Storm surge protection for Lafayette
4-3. Storm surge protection around Gueydan, Kaplan, and Vinton
4-4. Complete/Accelerate the Chenier Plain Freshwater and Sediment Management and Allocation Reassessment Study which was included in the LCA Near-Term Plan
4-5. Maximize freshwater inflow from Sabine River
4-6. Beneficial uses of dredged material program: utilize sediment from Sabine Ship Channel and dedicated dredging for marsh enhancement and construction of terraces

4-7. Allow Calcasieu Lake and surrounding area to become and remain brackish to saline – no action needed
4-8. Stabilize Gulf Shoreline and beach east of the Calcasieu River to Louisiana Point using dredged sediment or breakwaters
4-9. Stabilize Gulf Shoreline and beach east of the Calcasieu River to Freshwater Bayou using dredged sediment or breakwaters
4-10. Stabilize Grand Lake Shoreline and Landbridge
4-11. Stabilize White Lake Shoreline and Landbridge
4-12. Beneficial use of dredged material program: utilize sediment and dedicated dredging for marsh enhancement and construction of terraces in Calcasieu Lake
4-13. Dedicated dredging from the Gulf of Mexico for Marsh creation and enhancement
4-14. Stabilize West Banks of Freshwater Bayou
4-15. Manage watershed to reduce rapid inflows into Mermentau sub-basin
4-16. Stabilize banks from Schooner Bayou to GIWW along Freshwater Bayou and GIWW near White Lake
4-17. Maintain Hwy 82 for hurricane evacuation and marsh protection
4-18. Provide water control structures at strategic locations along Hwys 82 and 27
4-19. Develop a plan to elevate and/or relocate assets located outside the hurricane protection levee
4-20. Stabilize Banks of the GIWW
4-21. Utilize freshwater inflow from Atchafalaya River
4-22. Build new chamber for navigation at Calcasieu Lock on GIWW and use old lock to evacuate excess water

2.2 Diversion Hydrographs used to Generate Sediment Loads

In order to generate sediment loads for each diversion, daily hydrographs were created for each diversion based on actual Mississippi River flow (based on data from 1980 to 2005 which are repeated to create 50 years of flow), and are presented below for each alternative plan. At times of low river flow, diversion flows were decreased accordingly. All hydrographs take into consideration the average head differential between the river and the wetlands. These hydrographs are provided on the next two pages.

Alternative 1:

Measure name / location and monthly flow, cubic feet per second (cfs)

Measure name / location	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Benneys Bay Sediment Diversion	12794	16337	21255	22060	22096	18380	14373	9142	4307	2121	4164	13175
Medium Diversion at White's Ditch	8905	9056	10639	10642	10733	9354	8121	6455	4876	4616	5874	10188
Small Diversion at Hope Canal	210	598	855	854	792	603	435	261	120	44	32	91
Small Div. at Convent/Blind River	210	598	855	854	792	603	435	261	120	44	32	91
Modification of Caenarvon Diversion	146685	168269	199263	192094	183578	151002	124335	95516	73324	75485	102304	174283
Re-authorization of Davis Pond – Optimize for Marsh Creation	6800	8194	9785	9384	8879	7230	5907	4517	3443	3446	4452	7276
Small diversions at strategic locations in upper basin.	850	950	1150	1142	1114	914	717	478	276	228	401	941
Small diversions at strategic locations in upper basin.	850	950	1150	1142	1114	914	717	478	276	228	401	941
Small B.u Lafourche Reintroduction	289	323	391	388	379	311	244	163	94	78	136	320
Medium Diversion with Dedicated Dredging at Myrtle Grove	7871	9996	12791	13040	12853	10551	8190	5269	2725	1874	3530	9295
Convey Atchafalaya River Water to Northern Terrebonne marshes	155	182	215	210	201	167	136	100	73	75	107	200
As above	155	182	215	210	201	167	136	100	73	75	107	200
As above	155	182	215	210	201	167	136	100	73	75	107	200
As above	155	182	215	210	201	167	136	100	73	75	107	200
As above	155	182	215	210	201	167	136	100	73	75	107	200
Small B. Lafourche Reintroduction	433	485	577	574	559	463	365	240	138	114	201	489
Convey Atchafalaya River Water to northern Terrebonne Marshes	5812	6818	8058	7867	7548	6259	5111	3763	2754	2800	4009	7500
Maximize freshwater inflow to Mermentau River from outside sources	2798	2681	2336	1872	1342	1640	1375	832	1204	1962	3195	2045
Maximize freshwater inflow from Sabine River	12275	13044	15327	11192	8887	7281	6389	4417	4053	3089	4437	8782
Maximize freshwater inflow to tributaries of the Mermentau River from outside sources.	0	0	0	0	0	0	0	0	0	0	0	0
West Bay Sediment Diversion	14106	19207	25468	26496	26340	21518	16186	9293	2916	57	1519	11551

Alternative 2:

Measure name / location and monthly flow, cubic feet per second (cfs)

Measure name / location	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Benneys Bay Sediment Diversion	12075	15282	20344	20906	20163	17252	13601	8642	4268	2120	4056	11501
Medium Diversion at White's Ditch	8414	8470	10181	10085	9791	8780	7683	6109	4836	4615	5737	8937
Small Diversion at Hope Canal	194	556	815	806	717	562	407	243	118	44	29	75
Small Div. at Convent/Blind River	194	556	815	806	717	562	407	243	118	44	29	75
Modification of Caenarvon Diversion	138532	157430	190736	182099	167588	141766	117707	90445	72739	75464	99928	153037
Construct Violet Reintroduction	689	783	950	906	832	705	583	448	363	377	497	758
Diversion at American/California Bay	120787	152853	203473	209103	201680	172552	136064	86458	42684	21204	40580	115070
Re-authorization of Davis Pond – Optimize for Marsh Creation	6546	7816	9551	9070	8264	6919	5700	4360	3483	3514	4434	6515
Small diversions at strategic locations in upper basin.	4016	4443	5502	5413	5083	4290	3392	2259	1366	1140	1954	4123
As above	4016	4443	5502	5413	5083	4290	3392	2259	1366	1140	1954	4123
Small B. Lafourche Reintroduction	802	887	1099	1081	1015	857	677	450	273	228	390	822
Medium Div. at Myrtle Grove	10805	14146	18711	18906	17883	15002	11619	7313	3769	2427	4745	11773
Small diversion at Port Sulphur	1575	2155	2934	3012	2856	2359	1729	914	213	0	240	1489
Convey Atchafalaya River Water to Northern Terrebonne marshes	382	449	537	525	503	414	337	251	184	187	267	488
As above	382	449	537	525	503	414	337	251	184	187	267	488
As above	382	449	537	525	503	414	337	251	184	187	267	488
As above	382	449	537	525	503	414	337	251	184	187	267	488
As above	764	899	1074	1049	1006	829	674	501	367	373	534	977
Small B. Lafourche Reintroduction	433	485	577	574	559	463	365	240	138	114	201	489
Freshwater Intro. Blue Hammock B.	764	899	1074	1049	1006	829	674	501	367	373	534	977
Small B.Lafourche Reintroduction	433	485	577	574	559	463	365	240	138	114	201	489
Convey Atchafalaya River Water to northern Terrebonne Marshes	7645	9000	10745	10490	10063	8294	6748	5014	3672	3733	5340	9785
Increase sediment transport down Wax Lake Outlet	57346	67505	80585	78675	75475	62211	50612	37606	27542	28000	40053	73401
Maximize freshwater inflow to Mermentau River	2185	1978	2621	1970	1361	1680	1869	1525	1521	1224	1112	2118
West Bay Sediment Diversion	13309	17967	24377	25111	24038	20196	15317	8777	2885	57	1469	10045

2.3 Hydrodynamics / Salinity

Base-line (No Increased Action) salinity values (Section II.A.) were generated at the Ecosystem Unit level (Figure II.A) for coastal Louisiana using historical data from monitoring stations across the coast (Section II.B). In locations where monitoring stations were unavailable, salinity values were interpolated from existing stations to yield reasonable coast-inland gradients (using best professional judgment). The resulting salinity values were altered accordingly for CPRA Alternative 1 and Alternative 2, given a dilution of the volume of water (beginning at X ppt) in each Ecosystem Unit with a volume of fresh water (0 ppt) calculated to flow into that Ecosystem Unit from nearby diversions. Diversion volumes used were the average of 1997 (high flow year) and 2000 (low flow year), See Section II.C.

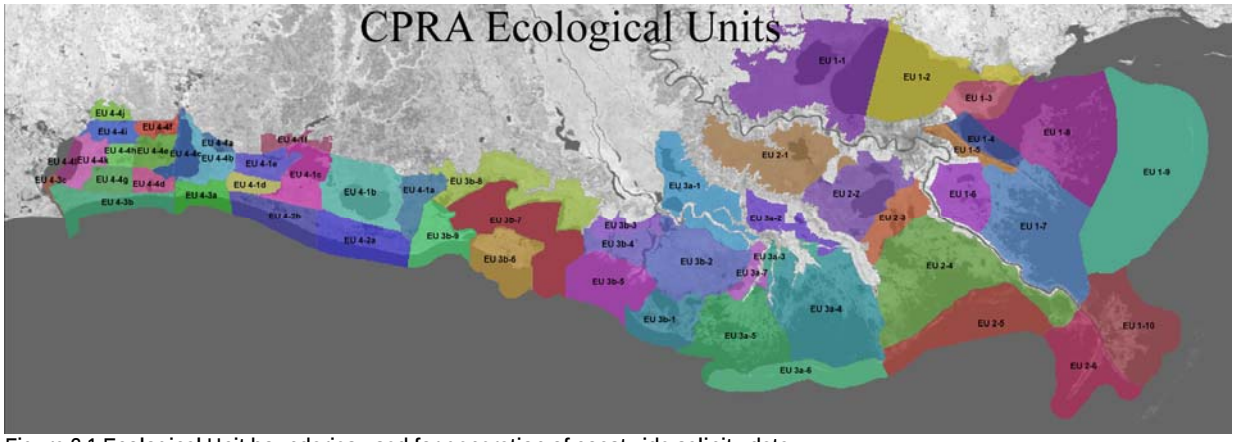

Figure 2.1 Ecological Unit boundaries used for generation of coastwide salinity data.

The following is an example of the calculations involved:

1997 and 2000 monthly average hydro value for diversion = DIVERSION_FT3_SEC_JAN

DIVERSION_FT3_SEC_JAN * 0.02832 = DIVERSION_M3_SEC_JAN

DIVERSION_M3_SEC_JAN * 60secs*60mins*24hours = DIVERSION_M3_DAY_JAN

WATER_VOLUME_M3 / DIVERSION_M3_DAY_JAN = REPLACEMENT_TIME_DAYS_JAN

100 * (DIVERSION_M3_DAY_JAN / WATER_VOLUME_M3) = REPLACEMENT_TIME_PERCENT_DAY_JAN

((REPLACEMENT_TIME_PERCENT_DAY_JAN * DAYS_OPERATION_JAN) / 100) * BASE_SALINITY_JAN = SALINITY_DECREASE_JAN

BASE_SALINITY_JAN - SALINITY_DECREASE_JAN = NEW_SALINITY_JAN

If the volume from a diversion replaced the volume of an Ecosystem Unit, the balance flowed to the adjacent cell, and that volume would then dilute that cell. A '90% connectivity rule' was incorporated to allow flow between Ecosystem Units (Section II.D).

To reduce the abrupt edge effect between Ecosystem Units, a smoothing procedure was applied within 5 km on either side of each Ecosystem Unit boundary. This smoothing procedure replaced the salinity of each cell in this 10 km wide strip with the average of 120 surrounding neighbors (cells near the upland boundary of an Ecosystem Unit may have had fewer surrounding neighbors).

This approach provides a static picture of the salinity in each box, not allowing for changes over time. For example, assume a box had a base salinity of 10 ppt in October and 12 ppt in November. A diversion is added, and the salinity in October drops to 8 ppt. The current model calculates the November salinity using the base of 12 ppt, but in reality the November base should be less than 12 ppt since the October flow has gone into the box. A more realistic model would incorporate this. To achieve this, in addition to the data used (areas, depths, and volumes), simulated forcing functions (coastal salinity and water level, precipitation, and evapotranspiration) would also need to be incorporated.

2.4 Base (No Increased Action) Coastwide Salinity Values Used as Input into the CLEAR Model

Base (No Increased Action):
Salinity, ppt

ECO_UNIT	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
EU 1-1	1.5	1.5	1.0	1.3	1.3	1.5	1.0	1.7	3.3	2.6	2.3	2.1
EU 1-2	5.6	5.0	4.4	3.7	3.3	3.4	4.2	5.2	6.9	6.9	6.4	6.4
EU 1-3	5.3	5.9	4.8	4.0	4.3	5.1	5.9	7.0	9.8	9.3	8.8	7.2
EU 1-4	6.1	4.9	5.5	5.0	6.0	7.8	9.2	9.3	8.8	8.3	8.0	7.9
EU 1-5	5.3	5.9	4.8	4.0	4.3	5.1	5.9	7.0	9.8	9.3	8.8	7.2
EU 1-6	0.8	0.7	0.4	0.5	0.7	0.7	0.6	0.9	1.8	1.7	1.4	1.5
EU 1-7	10.2	8.1	9.2	8.3	9.9	12.9	15.4	15.5	14.7	13.8	13.3	13.2
EU 1-8	6.1	4.9	5.5	5.0	6.0	7.8	9.2	9.3	8.8	8.3	8.0	7.9
EU 1-9	10.2	8.1	9.2	8.3	9.9	12.9	15.4	15.5	14.7	13.8	13.3	13.2
EU 1-10	2.1	0.8	0.8	0.9	0.9	1.4	2.0	3.1	5.8	7.4	5.4	2.6
EU 2-1	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.3	0.2	0.3	0.6
EU 2-2	3.7	3.2	2.7	2.7	3.1	3.2	4.0	4.4	5.4	5.5	6.1	4.7
EU 2-3	6.9	6.3	5.9	5.8	6.0	5.6	6.1	6.9	8.0	9.6	10.2	8.5
EU 2-4	10.0	9.5	9.1	8.9	8.9	8.1	8.3	9.4	10.6	13.6	14.2	12.2
EU 2-5	21.3	20.3	19.1	17.5	15.9	15.1	18.2	19.0	20.2	23.7	24.6	22.7
EU 2-6	2.1	0.8	0.8	0.9	0.9	1.4	2.0	3.1	5.8	7.4	5.4	2.6
EU 3a-1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
EU 3a-2	0.2	0.2	0.2	0.3	0.3	0.2	0.1	0.3	1.6	1.5	1.1	0.4
EU 3a-3	0.2	0.2	0.2	0.3	0.3	0.2	0.1	0.3	1.6	1.5	1.1	0.4

Base (No Increased Action):
Salinity, ppt (continued)

ECO_UNIT	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
EU 3a-4	5.8	5.7	6.0	7.1	6.8	6.4	5.7	6.0	7.8	9.9	9.6	7.7
EU 3a-5	9.0	8.8	9.9	10.0	10.6	9.3	7.3	9.2	13.1	15.2	15.7	12.6
EU 3a-6	24.5	25.0	23.3	23.4	22.7	22.0	22.3	24.2	25.3	27.5	27.8	27.7
EU 3a-7	3.1	1.2	0.9	0.8	0.9	0.8	1.0	1.2	5.7	4.5	5.5	2.4
EU 3b-1	6.1	5.9	7.1	5.4	5.7	6.3	4.9	5.2	10.9	12.6	12.9	8.7
EU 3b-2	0.7	0.7	0.6	0.5	0.6	0.5	0.6	0.5	0.6	0.5	0.6	0.6
EU 3b-3	0.7	0.7	0.6	0.5	0.6	0.5	0.6	0.5	0.6	0.5	0.6	0.6
EU 3b-4	0.7	0.7	0.6	0.5	0.6	0.5	0.6	0.5	0.6	0.5	0.6	0.6
EU 3b-5	3.1	2.5	2.5	1.9	1.6	1.6	2.9	4.2	4.4	4.8	4.9	3.6
EU 3b-6	8.2	8.0	7.7	7.5	8.1	8.1	10.2	10.6	8.4	8.6	8.6	9.0
EU 3b-7	3.8	2.6	2.4	1.9	1.3	1.8	2.5	4.3	4.0	4.4	4.7	4.3
EU 3b-8	4.6	3.1	2.8	3.1	4.6	3.9	2.9	3.0	3.3	5.3	2.7	2.2
EU 3b-9	8.2	8.0	7.7	7.5	8.1	8.1	10.2	10.6	8.4	8.6	8.6	9.0
EU 4-1a	0.7	0.6	1.2	1.9	1.6	1.2	1.0	1.1	1.7	2.1	2.1	1.3
EU 4-1b	0.8	0.8	0.9	0.8	0.8	1.4	1.4	1.4	2.0	2.0	2.1	0.8
EU 4-1c	1.7	0.5	1.3	1.9	3.0	2.7	1.9	2.0	2.7	4.3	4.5	2.6
EU 4-1d	0.3	0.3	0.8	0.8	0.8	1.5	1.5	1.6	1.6	1.6	1.6	0.3
EU 4-1e	0.1	0.1	0.5	0.5	0.5	1.1	1.1	1.1	1.1	1.1	1.1	0.1
EU 4-1f	0.1	0.1	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2
EU 4-2a	6.3	6.3	8.5	6.3	6.4	8.6	8.0	7.9	9.2	8.6	15.0	6.3
EU 4-2b	8.0	8.0	9.7	8.1	8.2	11.3	10.8	10.9	11.8	11.4	16.2	8.0
EU 4-3a	6.7	4.8	6.7	6.5	9.9	12.5	12.2	13.1	16.1	18.1	19.6	20.4
EU 4-3b	6.1	4.0	5.1	5.3	8.6	9.6	9.8	12.3	12.4	14.2	16.0	16.8
EU 4-3c	6.1	4.0	5.1	5.3	8.6	9.6	9.8	12.3	12.4	14.2	16.0	16.8
EU 4-4a	0.0	0.0	0.5	0.5	0.5	1.0	1.0	1.0	1.0	1.0	1.0	0.0
EU 4-4b	5.4	5.1	5.7	5.1	4.3	5.2	6.1	6.0	6.1	6.8	8.3	6.7
EU 4-4c	6.7	4.7	6.6	6.5	10.1	12.7	12.4	13.3	16.5	18.6	20.3	21.6
EU 4-4d	5.0	4.1	5.0	5.6	7.9	9.6	9.5	10.3	12.1	14.2	16.1	17.6
EU 4-4e	5.9	4.4	5.9	6.1	9.1	11.3	11.0	11.8	14.5	16.6	18.4	19.8
EU 4-4f	5.9	4.4	5.9	6.1	9.1	11.3	11.1	11.8	14.5	16.6	18.4	19.8
EU 4-4g	3.6	2.4	2.4	3.3	4.6	5.7	6.1	6.7	7.3	9.8	11.5	12.7
EU 4-4h	3.5	2.4	2.3	3.2	4.5	5.6	6.0	6.4	7.2	9.6	11.4	12.6
EU 4-4i	3.3	2.2	2.2	3.2	4.4	5.6	6.0	6.6	7.0	9.0	10.4	11.3
EU 4-4j	3.0	1.9	2.0	3.0	4.2	5.4	5.9	6.6	6.5	8.2	9.2	9.7
EU 4-4k	3.2	2.1	2.1	3.1	4.4	5.6	6.0	6.7	6.8	8.6	9.8	10.4
EU 4-4l	3.1	2.0	2.1	3.1	4.4	5.6	6.1	6.9	6.7	8.2	9.1	9.4
GULF	30.0	27.1	26.6	25.8	22.8	24.6	23.1	24.1	25.5	27.3	29.2	30.5
INS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

2.5 Monitoring Stations Used to Generate Base-line (No Increased Action) Coastwide Salinity Values for Input into the CLEAR Model

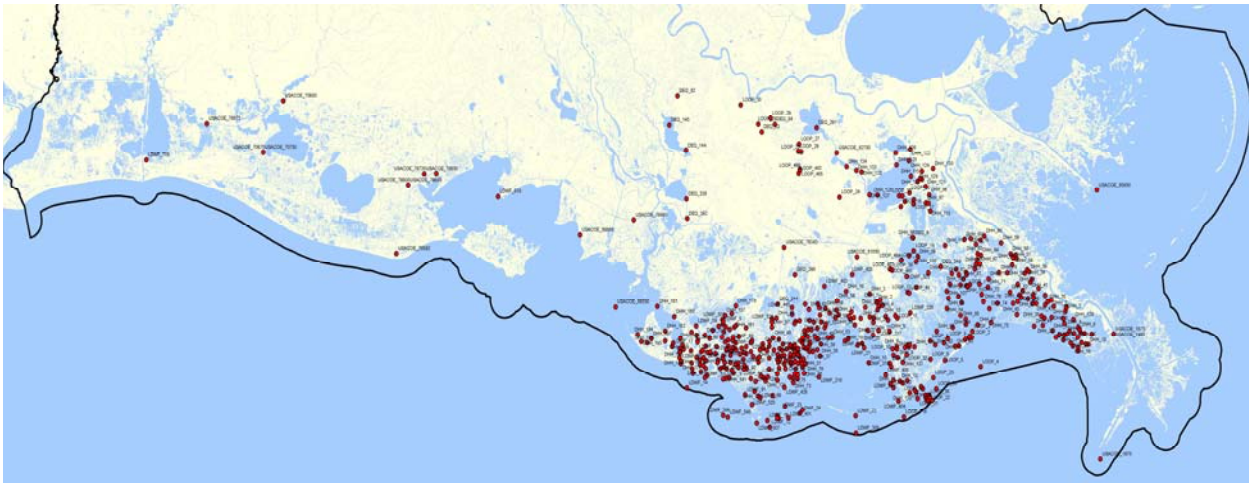

Figure 2.2 Map showing the monitoring stations used to generate base-line (No Increased Action) coastwide salinity values.

2.6 Alternative 1: Diversion Hydrographs by Ecosystem Unit (Average of 1997 and 2000) and Resulting Salinity

Alternative 1:
Diversion hydrographs (cfs) by ecosystem unit

ECO UNIT	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
EU 1-1	451	1262	1953	2020	1793	1436	1009	598	282	100	77	205
EU 1-2	406	1136	1758	1818	1613	1293	908	538	254	90	69	184
EU 1-3	0	0	0	0	0	0	0	0	0	0	0	0
EU 1-4	0	0	0	0	0	0	0	0	0	0	0	0
EU 1-5	0	0	0	0	0	0	0	0	0	0	0	0
EU 1-6	170704	188126	239680	239561	220357	190819	153295	116568	92054	91251	127614	211216
EU 1-7	153633	169314	215712	215605	198321	171737	137966	104911	82849	82126	114853	190094
EU 1-8	0	0	0	0	0	0	0	0	0	0	0	0
EU 1-9	85352	94063	119840	119781	110178	95410	76648	58284	46027	45625	63807	105608
EU 1-10	65238	73791	96176	97935	91162	79117	62625	45422	32686	29791	43199	78477
EU 2-1	1857	2003	2627	2701	2525	2176	1661	1094	649	520	946	2156
EU 2-2	9127	10494	13538	13519	12342	10562	8332	6149	4638	4394	6104	10269
EU 2-3	8214	9445	12184	12168	11107	9506	7499	5534	4174	3955	5494	9242
EU 2-4	16336	19453	26019	26819	25001	21480	16512	11191	7075	5782	9271	19340
EU 2-5	8168	9727	13009	13409	12500	10740	8256	5595	3537	2891	4635	9670
EU 2-6	15460	20411	29083	31307	29869	25605	18736	10624	3432	65	1795	13268
EU 3a-1	0	0	0	0	0	0	0	0	0	0	0	0
EU 3a-2	493	601	657	675	636	545	415	274	162	130	237	557

Alternative 1:

Diversion hydrographs (cfs) by ecosystem unit

ECO UNIT	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
EU 3a-3	177	225	245	247	229	197	155	114	86	85	126	228
EU 3a-4	585	721	787	805	756	647	498	338	215	185	314	683
EU 3a-5	177	225	245	247	229	197	155	114	86	85	126	228
EU 3a-6	381	473	516	526	493	422	327	226	151	135	220	456
EU 3a-7	194	248	269	272	252	216	171	126	95	94	138	251
EU 3b-1	2790	3561	3868	3902	3623	3104	2453	1806	1366	1344	1988	3600
EU 3b-2	6974	8901	9669	9755	9057	7761	6133	4515	3415	3360	4971	9000
EU 3b-3	0	0	0	0	0	0	0	0	0	0	0	0
EU 3b-4	2092	2670	2901	2926	2717	2328	1840	1355	1025	1008	1491	2700
EU 3b-5	2092	2670	2901	2926	2717	2328	1840	1355	1025	1008	1491	2700
EU 3b-6	0	0	0	0	0	0	0	0	0	0	0	0
EU 3b-7	0	0	0	0	0	0	0	0	0	0	0	0
EU 3b-8	0	0	0	0	0	0	0	0	0	0	0	0
EU 3b-9	0	0	0	0	0	0	0	0	0	0	0	0
EU 4-1a	0	0	0	0	0	0	0	0	0	0	0	0
EU 4-1b	1618	1518	1636	976	434	1171	477	218	774	546	315	1101
EU 4-1c	4624	4338	4675	2789	1240	3345	1364	623	2210	1561	900	3147
EU 4-1d	462	434	467	279	124	335	136	62	221	156	90	315
EU 4-1e	925	868	935	558	248	669	273	125	442	312	180	629
EU 4-1f	0	0	0	0	0	0	0	0	0	0	0	0
EU 4-2a	0	0	0	0	0	0	0	0	0	0	0	0
EU 4-2b	1156	1084	1169	697	310	836	341	156	553	390	225	787
EU 4-3a	0	0	0	0	0	0	0	0	0	0	0	0
EU 4-3b	0	0	0	0	0	0	0	0	0	0	0	0
EU 4-3c	5574	5977	7092	6167	7116	4008	1901	2293	2963	3436	4359	5158
EU 4-4a	0	0	0	0	0	0	0	0	0	0	0	0
EU 4-4b	0	0	0	0	0	0	0	0	0	0	0	0
EU 4-4c	0	0	0	0	0	0	0	0	0	0	0	0
EU 4-4d	0	0	0	0	0	0	0	0	0	0	0	0
EU 4-4e	2064	2214	2627	2284	2636	1485	704	849	1097	1273	1615	1910
EU 4-4f	3441	3690	4378	3807	4393	2474	1174	1415	1829	2121	2691	3184
EU 4-4g	0	0	0	0	0	0	0	0	0	0	0	0
EU 4-4h	0	0	0	0	0	0	0	0	0	0	0	0
EU 4-4i	13762	14759	17510	15228	17570	9897	4695	5661	7316	8484	10763	12735
EU 4-4j	15291	16399	19456	16920	19523	10997	5216	6290	8129	9426	11959	14150
EU 4-4k	6881	7380	8755	7614	8785	4949	2347	2831	3658	4242	5382	6368
EU 4-4l	6193	6642	7880	6853	7907	4454	2113	2548	3292	3818	4844	5731
GULF	0	0	0	0	0	0	0	0	0	0	0	0
INS	0	0	0	0	0	0	0	0	0	0	0	0

Alternative 1:
Salinity, ppt

ECO UNIT	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
EU 1-1	5.56	4.87	4.21	3.55	3.22	3.31	4.15	5.15	6.85	6.93	6.38	6.38
EU 1-2	5.56	4.87	4.21	3.55	3.22	3.31	4.15	5.15	6.85	6.93	6.38	6.38
EU 1-3	5.01	5.03	3.60	3.03	3.33	4.19	5.17	6.42	9.48	9.22	8.72	7.01
EU 1-4	6.11	4.86	5.52	4.95	5.96	7.77	9.24	9.28	8.79	8.28	7.98	7.90
EU 1-5	5.31	5.89	4.80	4.04	4.33	5.10	5.94	6.95	9.82	9.34	8.80	7.20
EU 1-6	0.77	0.68	0.40	0.47	0.72	0.75	0.60	0.87	1.75	1.66	1.42	1.48
EU 1-7	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
EU 1-8	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
EU 1-9	10.19	8.10	9.21	8.26	9.94	12.95	15.40	15.46	14.65	13.80	13.30	13.16
EU 1-10	0.33	0.11	0.01	0.01	0.01	0.08	0.44	1.26	3.17	3.95	2.02	0.01
EU 2-1	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
EU 2-2	2.56	2.20	1.48	1.49	1.79	2.03	2.83	3.61	4.82	5.06	5.18	2.99
EU 2-3	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
EU 2-4	3.43	2.78	0.01	0.23	0.73	1.94	3.14	5.11	7.09	9.15	7.93	2.88
EU 2-5	16.40	15.09	11.87	10.85	10.12	10.51	13.79	15.88	18.16	21.73	21.42	16.32
EU 2-6	1.89	0.74	0.68	0.80	0.75	1.20	1.78	2.89	5.57	7.12	5.14	2.35
EU 3a-1	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.04	0.01	0.01
EU 3a-2	0.18	0.15	0.22	0.28	0.25	0.18	0.14	0.31	1.62	1.45	1.08	0.41
EU 3a-3	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
EU 3a-4	5.70	5.59	5.91	7.02	6.71	6.29	5.61	5.94	7.72	9.85	9.52	7.63
EU 3a-5	8.41	8.17	9.03	9.12	9.66	8.63	6.86	8.81	12.82	14.88	15.13	11.56
EU 3a-6	24.33	24.86	23.16	23.22	22.50	21.88	22.15	24.07	25.22	27.41	27.64	27.46
EU 3a-7	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.10	2.36	2.06	0.79	0.01
EU 3b-1	5.87	5.67	6.81	5.12	5.49	6.11	4.75	5.12	10.72	12.40	12.56	8.29
EU 3b-2	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
EU 3b-3	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
EU 3b-4	0.68	0.70	0.62	0.51	0.60	0.53	0.60	0.52	0.59	0.52	0.57	0.60
EU 3b-5	2.74	2.14	2.09	1.62	1.33	1.41	2.62	3.88	4.12	4.50	4.53	3.06
EU 3b-6	5.93	5.41	4.67	4.62	5.16	5.65	7.64	8.63	7.25	7.43	6.93	5.75
EU 3b-7	3.75	2.58	2.38	1.91	1.30	1.77	2.46	4.30	4.01	4.45	4.71	4.26
EU 3b-8	4.59	3.11	2.81	3.08	4.56	3.90	2.93	2.97	3.29	5.32	2.69	2.24
EU 3b-9	8.15	8.02	7.66	7.47	8.14	8.11	10.16	10.55	8.37	8.60	8.61	9.03
EU 4-1a	0.66	0.58	1.21	1.87	1.56	1.20	1.03	1.07	1.68	2.11	2.10	1.26
EU 4-1b	0.77	0.77	0.89	0.82	0.83	1.44	1.43	1.44	1.98	1.97	2.15	0.77
EU 4-1c	0.01	0.01	0.01	0.51	2.01	0.32	1.21	1.69	1.14	2.47	3.44	0.37
EU 4-1d	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
EU 4-1e	0.01	0.01	0.01	0.01	0.24	0.01	0.41	0.80	0.02	0.32	0.67	0.01

Alternative 1:
Salinity, ppt

ECO UNIT	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
EU 4-1f	0.01	0.01	0.01	0.01	0.03	0.01	0.00	0.15	0.01	0.01	0.08	0.01
EU 4-2a	6.27	6.27	8.49	6.33	6.44	8.59	7.98	7.92	9.19	8.64	15.03	6.27
EU 4-2b	7.98	7.98	9.69	8.08	8.16	11.28	10.82	10.88	11.81	11.40	16.17	7.98
EU 4-3a	5.82	4.23	5.78	6.03	9.56	11.35	11.71	12.85	15.08	17.26	19.14	18.62
EU 4-3b	6.08	3.97	5.09	5.31	8.63	9.61	9.77	12.28	12.37	14.19	15.99	16.82
EU 4-3c	6.08	3.97	5.09	5.31	8.63	9.61	9.77	12.28	12.37	14.19	15.99	16.82
EU 4-4a	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
EU 4-4b	5.40	5.07	5.74	5.09	4.34	5.20	6.09	5.96	6.10	6.85	8.26	6.71
EU 4-4c	6.73	4.68	6.63	6.48	10.14	12.69	12.35	13.32	16.46	18.62	20.31	21.59
EU 4-4d	5.03	4.06	5.04	5.56	7.87	9.58	9.51	10.25	12.13	14.19	16.14	17.62
EU 4-4e	5.91	4.40	5.91	6.07	9.07	11.28	11.05	11.83	14.48	16.60	18.42	19.82
EU 4-4f	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
EU 4-4g	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
EU 4-4h	3.46	2.40	2.33	3.24	4.47	5.63	6.02	6.41	7.15	9.65	11.41	12.64
EU 4-4i	3.28	2.22	2.23	3.18	4.44	5.64	6.04	6.60	6.97	9.05	10.44	11.28
EU 4-4j	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
EU 4-4k	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
EU 4-4l	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
GULF	29.96	27.08	26.63	25.84	22.80	24.60	23.06	24.14	25.52	27.34	29.19	30.51
INS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

2.7 Alternative 2: Diversion Hydrographs by Ecosystem Unit (Average of 1997 and 2000) and Resulting Salinity

Alternative 2:
Diversion hydrographs (cfs) by ecosystem unit

ECO UNIT	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
EU 1-1	491	1540	1953	2020	1808	1438	1009	598	282	100	77	216
EU 1-2	0	0	0	0	0	0	0	0	0	0	0	0
EU 1-3	0	0	0	0	0	0	0	0	0	0	0	0
EU 1-4	0	0	0	0	0	0	0	0	0	0	0	0
EU 1-5	0	0	0	0	0	0	0	0	0	0	0	0
EU 1-6	180324	228126	239680	239561	221766	190935	153295	116568	92054	91251	127614	216421
EU 1-7	162292	205313	215712	215605	199589	171841	137966	104911	82849	82126	114853	194779
EU 1-8	0	0	0	0	0	0	0	0	0	0	0	0

Alternative 2:

Diversion hydrographs (cfs) by ecosystem unit

ECO UNIT	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
EU 1-9	90162	114063	119840	119781	110883	95467	76648	58284	46027	45625	63807	108210
EU 1-10	68928	89449	96176	97935	91748	79165	62625	45422	32686	29791	43199	80431
EU 2-1	1972	2446	2627	2701	2545	2178	1661	1094	649	520	946	2213
EU 2-2	9658	12743	13538	13519	12425	10569	8332	6149	4638	4394	6104	10526
EU 2-3	8673	11444	12158	12141	11157	9491	7483	5524	4167	3949	5484	9452
EU 2-4	17265	23573	25995	26794	25144	21475	16497	11181	7069	5777	9262	19812
EU 2-5	8633	11787	12998	13397	12572	10738	8248	5591	3534	2889	4631	9906
EU 2-6	16355	24701	29083	31307	30062	25621	18736	10624	3432	65	1795	13623
EU 3a-1	0	0	0	0	0	0	0	0	0	0	0	0
EU 3a-2	493	611	657	675	636	545	415	274	162	130	237	557
EU 3a-3	177	229	245	247	229	197	155	114	86	85	126	228
EU 3a-4	585	734	787	805	756	647	498	338	215	185	314	683
EU 3a-5	177	229	245	247	229	197	155	114	86	85	126	228
EU 3a-6	381	481	516	526	493	422	327	226	151	135	220	456
EU 3a-7	194	252	269	272	252	216	171	126	95	94	138	251
EU 3b-1	2790	3623	3868	3902	3623	3104	2453	1806	1366	1344	1988	3600
EU 3b-2	6974	9058	9669	9755	9057	7761	6133	4515	3415	3360	4971	9000
EU 3b-3	0	0	0	0	0	0	0	0	0	0	0	0
EU 3b-4	2092	2717	2901	2926	2717	2328	1840	1355	1025	1008	1491	2700
EU 3b-5	2092	2717	2901	2926	2717	2328	1840	1355	1025	1008	1491	2700
EU 3b-6	0	0	0	0	0	0	0	0	0	0	0	0
EU 3b-7	0	0	0	0	0	0	0	0	0	0	0	0
EU 3b-8	0	0	0	0	0	0	0	0	0	0	0	0
EU 3b-9	0	0	0	0	0	0	0	0	0	0	0	0
EU 4-1a	0	0	0	0	0	0	0	0	0	0	0	0
EU 4-1b	2123	2875	1316	1617	1067	493	592	369	355	340	326	297
EU 4-1c	6067	8215	3761	4621	3048	1408	1693	1054	1013	972	931	847
EU 4-1d	607	822	376	462	305	141	169	105	101	97	93	85
EU 4-1e	1213	1643	752	924	610	282	339	211	203	194	186	169
EU 4-1f	0	0	0	0	0	0	0	0	0	0	0	0
EU 4-2a	0	0	0	0	0	0	0	0	0	0	0	0
EU 4-2b	1517	2054	940	1155	762	352	423	263	253	243	233	212
EU 4-3a	0	0	0	0	0	0	0	0	0	0	0	0
EU 4-3b	0	0	0	0	0	0	0	0	0	0	0	0
EU 4-3c	0	0	0	0	0	0	0	0	0	0	0	0
EU 4-4a	0	0	0	0	0	0	0	0	0	0	0	0
EU 4-4b	0	0	0	0	0	0	0	0	0	0	0	0
EU 4-4c	0	0	0	0	0	0	0	0	0	0	0	0
EU 4-4d	0	0	0	0	0	0	0	0	0	0	0	0
EU 4-4e	0	0	0	0	0	0	0	0	0	0	0	0
EU 4-4f	0	0	0	0	0	0	0	0	0	0	0	0

Alternative 2:
Diversion hydrographs (cfs) by ecosystem unit

ECO UNIT	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
EU 4-4g	0	0	0	0	0	0	0	0	0	0	0	0
EU 4-4h	0	0	0	0	0	0	0	0	0	0	0	0
EU 4-4i	0	0	0	0	0	0	0	0	0	0	0	0
EU 4-4j	0	0	0	0	0	0	0	0	0	0	0	0
EU 4-4k	0	0	0	0	0	0	0	0	0	0	0	0
EU 4-4l	0	0	0	0	0	0	0	0	0	0	0	0
GULF	0	0	0	0	0	0	0	0	0	0	0	0
INS	0	0	0	0	0	0	0	0	0	0	0	0

Alternative 2:
Salinity, ppt

ECO UNIT	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
EU 1-1	1.43	1.38	0.92	1.24	1.26	1.40	0.99	1.68	3.30	2.63	2.24	2.09
EU 1-2	5.60	4.97	4.36	3.67	3.32	3.39	4.22	5.20	6.89	6.94	6.39	6.40
EU 1-3	5.31	5.89	4.80	4.04	4.33	5.10	5.94	6.95	9.82	9.34	8.80	7.20
EU 1-4	6.11	4.86	5.52	4.95	5.96	7.77	9.24	9.28	8.79	8.28	7.98	7.90
EU 1-5	5.31	5.89	4.80	4.04	4.33	5.10	5.94	6.95	9.82	9.34	8.80	7.20
EU 1-6	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
EU 1-7	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
EU 1-8	6.11	4.86	5.52	4.95	5.96	7.77	9.24	9.28	8.79	8.28	7.98	7.90
EU 1-9	7.64	5.70	6.04	5.51	6.78	9.52	12.01	12.87	12.78	11.99	10.95	9.08
EU 1-10	0.67	0.15	0.02	0.03	0.06	0.30	0.72	1.67	3.94	5.14	3.12	0.48
EU 2-1	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.03	0.17	0.16	0.11	0.01
EU 2-2	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	1.25	1.37	0.01	0.01
EU 2-3	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
EU 2-4	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.68	4.60	7.08	3.62	0.01
EU 2-5	18.72	17.13	15.50	14.16	13.00	12.80	15.98	17.43	19.17	22.73	23.03	19.44
EU 2-6	1.70	0.61	0.53	0.61	0.57	0.97	1.54	2.71	5.57	7.36	5.32	2.22
EU 3a-1	0.05	0.04	0.04	0.03	0.04	0.04	0.03	0.03	0.04	0.05	0.05	0.05
EU 3a-2	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.21	0.41	0.01	0.01
EU 3a-3	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
EU 3a-4	5.57	5.44	5.72	6.80	6.50	6.13	5.49	5.86	7.67	9.80	9.42	7.43
EU 3a-5	8.82	8.63	9.66	9.75	10.31	9.11	7.16	9.05	13.01	15.06	15.46	12.24
EU 3a-6	24.18	24.67	22.95	23.02	22.31	21.73	22.02	23.98	25.17	27.37	27.56	27.25
EU 3a-7	0.75	0.10	0.01	0.01	0.01	0.12	0.32	0.57	3.61	2.81	2.55	0.01
EU 3b-1	3.22	2.55	2.34	1.85	2.13	3.03	2.81	3.59	8.39	9.66	8.56	3.25
EU 3b-2	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
EU 3b-3	0.68	0.70	0.62	0.51	0.60	0.53	0.60	0.52	0.59	0.52	0.57	0.60
EU 3b-4	0.23	0.14	0.03	0.04	0.06	0.14	0.24	0.29	0.40	0.35	0.30	0.07

Alternative 2:
Salinity, ppt

ECO UNIT	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
EU 3b-5	2.74	2.14	2.09	1.62	1.33	1.41	2.62	3.88	4.12	4.50	4.53	3.06
EU 3b-6	8.15	8.02	7.66	7.47	8.14	8.11	10.16	10.55	8.37	8.60	8.61	9.03
EU 3b-7	3.75	2.58	2.38	1.91	1.30	1.77	2.46	4.30	4.01	4.45	4.71	4.26
EU 3b-8	4.59	3.11	2.81	3.08	4.56	3.90	2.93	2.97	3.29	5.32	2.69	2.24
EU 3b-9	8.15	8.02	7.66	7.47	8.14	8.11	10.16	10.55	8.37	8.60	8.61	9.03
EU 4-1a	0.66	0.58	1.21	1.87	1.56	1.20	1.03	1.07	1.68	2.11	2.10	1.26
EU 4-1b	0.01	0.01	0.01	0.01	0.08	0.86	0.71	0.99	1.41	1.40	1.58	0.58
EU 4-1c	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.37	0.65	1.05	1.35	0.88
EU 4-1d	0.01	0.01	0.01	0.01	0.01	0.13	0.01	0.46	0.54	0.55	0.63	0.13
EU 4-1e	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.04	0.11	0.12	0.19	0.01
EU 4-1f	0.14	0.15	0.15	0.20	0.26	0.26	0.26	0.27	0.26	0.26	0.21	0.18
EU 4-2a	6.27	6.27	8.49	6.33	6.44	8.59	7.98	7.92	9.19	8.64	15.03	6.27
EU 4-2b	7.14	6.91	9.03	7.43	7.71	11.00	10.49	10.67	11.60	11.20	15.90	7.86
EU 4-3a	6.66	4.75	6.66	6.52	9.91	12.50	12.18	13.08	16.05	18.05	19.63	20.44
EU 4-3b	6.08	3.97	5.09	5.31	8.63	9.61	9.77	12.28	12.37	14.19	15.99	16.82
EU 4-3c	6.08	3.97	5.09	5.31	8.63	9.61	9.77	12.28	12.37	14.19	15.99	16.82
EU 4-4a	0.01	0.01	0.50	0.50	0.50	1.00	1.00	1.00	1.00	1.00	1.00	0.01
EU 4-4b	5.40	5.07	5.74	5.09	4.34	5.20	6.09	5.96	6.10	6.85	8.26	6.71
EU 4-4c	6.73	4.68	6.63	6.48	10.14	12.69	12.35	13.32	16.46	18.62	20.31	21.59
EU 4-4d	5.03	4.06	5.04	5.56	7.87	9.58	9.51	10.25	12.13	14.19	16.14	17.62
EU 4-4e	5.91	4.40	5.91	6.07	9.07	11.28	11.05	11.83	14.48	16.60	18.42	19.82
EU 4-4f	5.92	4.40	5.91	6.08	9.08	11.29	11.06	11.84	14.50	16.62	18.44	19.83
EU 4-4g	3.59	2.42	2.39	3.26	4.60	5.71	6.11	6.65	7.28	9.75	11.50	12.68
EU 4-4h	3.46	2.40	2.33	3.24	4.47	5.63	6.02	6.41	7.15	9.65	11.41	12.64
EU 4-4i	3.28	2.22	2.23	3.18	4.44	5.64	6.04	6.60	6.97	9.05	10.44	11.28
EU 4-4j	3.02	1.94	1.98	2.98	4.21	5.42	5.86	6.58	6.52	8.22	9.24	9.69
EU 4-4k	3.19	2.08	2.12	3.08	4.37	5.55	5.98	6.69	6.78	8.64	9.83	10.43
EU 4-4l	3.08	1.96	2.09	3.06	4.41	5.62	6.06	6.94	6.71	8.22	9.11	9.39
GULF	29.96	27.08	26.63	25.84	22.80	24.60	23.06	24.14	25.52	27.34	29.19	30.51
INS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

2.8 Assumptions for Box Connectivity

Assumptions were made in order to incorporate a ‘90% connectivity rule’ to generate coastwide salinity values. This rule was applied in those Ecosystem Units where volumes were completely overloaded with diversion input, and thereby were completely (or nearly) freshened.

2.8.1 Alternative 1

- 90% of EU1-6 diversion flow into EU1-7
- 80% of EU1-6 diversion flow exits EU1-7 and based on length of boundary shared, 50% into EU1-9 and 30% into EU1-10
- 90% of EU2-1 diversion flow into EU2-2 and thus is added to existing diversion flow in EU2-2
- 80% of EU2-1 diversion flow exits EU2-2 and enters 2-3 so this is added to 90% of diversion flow originally in EU2-2 to get a total entering EU2-3.
- 90% of the above calculated total entering EU2-3 exits and is added to current diversion load in EU2-4
- 90% of EU3a-2 diversion flow into EU3a-4
- 90% of EU3a-3 diversion flow exits and put 80% into EU3a-4 and 10% into EU3a-7 (based on boundary shared)
- 90% of EU3b-2 diversion flow exits and put 40% into EU3b-1 and 30% into EU3b-5 and 30% into EU3b-4 (based on boundary shared)
- 90% of EU4-1c diversion flow exits and put 35% into EU4-1b and 25% into EU4-2b and 10% into EU4-1d and 20% into EU4-1e (based on boundary shared)
- 90% of EU4-4j diversion flow into EU4-4i
- 90% of EU4-4i diversion flow exits and put 15% into EU4- 4e and 25% into EU4-4f and 50% into EU4-4k (based on boundary shared)
- 90% of EU4-4k diversion flow into EU4-4l
- 90% of EU4-4l diversion flow into EU4-3c

2.8.2 Alternative 2

- 90% of EU1-6 diversion flow into EU1-7
- 80% of EU1-6 diversion flow exits EU1-7 and based on length of boundary shared, 50% into EU1-9 and 30% into EU1-10
- 90% of EU2-1 diversion flow into EU2-2 and thus is added to existing diversion flow in EU2-2
- 80% of EU2-1 diversion flow exits EU2-2 and enters 2-3 so this is added to 90% of diversion flow originally in EU2-2 to get a total entering EU2-3
- 90% of the above calculated total entering EU2-3 exits and is added to current diversion load in EU2-4
- 90% of EU3a-2 diversion flow into EU3a-4
- 90% of EU3a-3 diversion flow exits and put 80% into EU3a-4 and 10% into EU3a-7 (based on boundary shared)
- 90% of EU3b-2 diversion flow exits and put 40% into EU3b-1 and 30% into EU3b-5 and 30% into EU3b-4 (based on boundary shared)
- 90% of EU4-1c diversion flow exits and put 35% into EU4-1b and 25% into EU4-2b and 10% into EU4-1d and 20% into EU4-1e (based on boundary shared)

3.0 Desktop Modules

3.1 Landscape Change

http://www.clear.lsu.edu/Reports/LCAVol1-pdf/Vol%201_Chpt08.pdf

http://www.clear.lsu.edu/Reports/LCAVol2-pdf/Vol%20II_Chpt20.pdf

Current CLEAR landscape change output is not comparable to that produced during LCA modeling due to a difference in the model domain. The LCA model domain was restricted to the Louisiana Coastal Zone Boundary, while the CLEAR model domain covers a much larger area. In the process of merging multiple datasets to patch holes in TX, MS (National Land Cover Dataset), and the upper portion of the state (GAP Land Cover Dataset), a slight re-sampling error occurred which biased the land use/land cover data. In general, the error led to an over-representation of water. Because this error affected the Alternative 1 and Alternative 2 landscapes consistently, the alternative scorings were unaffected (See Appendix A for scoring process and results). Comparing each alternative to the "no increased action" (and to one another) still yielded information regarding the effectiveness of the alternative as the error affected both equally. This error will be corrected before the Preliminary Draft Plan is modeled.

The CLEAR model is calibrated on 1978-2000 land loss rate. Although the rate is assumed to remain constant through the 50-year projection, it is applied on a yearly basis. This results in a decreasing amount of loss over time (See Figure III.A). It should be noted that land loss rates were determined from relatively small polygons with similar pattern of loss created by Barras et al. (2003).

The current CLEAR model uses discharge data from 1980-2005 to generate daily hydrographs for each diversion as a means of calculating the daily sediment load diverted. All daily loads are summed over 5-year increments (i.e., YR 0 - 5; YR 5 – 10; YR 10 – 15, etc.), and the total sediment diverted in each 5-year time segment is used in the model to generate landscape change output at 5-year intervals. Model output is essentially a 'snapshot' of the landscape every 5 years.

The model still uses the same assumption as in the LCA runs with 15% of the load retained and the remaining weight of sediment transformed to a volume of sediment based on the bulk density of deltaic soils. In addition, the assumption of 35% of the cell remaining open to account for deltaic channels remained. The resulting volume is then distributed over available volume in the cells closest to the diversion point. In contrast to the LCA modeling effort, the current model uses a coastwide bathymetry dataset (Figure I.A.) to calculate the volume available for fill in each cell.

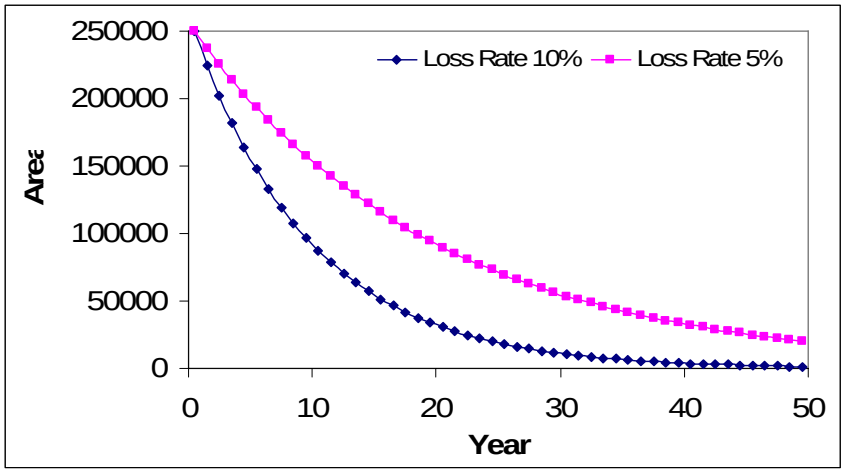

Figure 3.1 Effects of a constant loss rate applied annually on land area change.

CLEAR did not address any limitations on sediment availability for marsh creation features; all features were included exactly as requested by CPRA IPT.

3.2 Habitat Switching, Including Productivity

No changes have been made since the LCA reporting. Details may be found on the following website:

http://www.clear.lsu.edu/Reports/LCAVol1-pdf/Vol%201_Chpt09.pdf

3.3 Habitat Suitability

No changes have been made since the LCA reporting; however, the CPRA IPT scoring did not consider model output for large mouth bass. Details may be found on the following website:

http://www.clear.lsu.edu/Reports/LCAVol1-pdf/Vol%201_Chpt10.pdf

http://www.clear.lsu.edu/Reports/LCAVol1-pdf/Vol%201_Chpt12.pdf

4.0 Model Output for Alternatives 1 and 2

4.1 CLEAR Output Used by CPRA-IPT for Scoring

Model output was compiled into summary statistic tables at coastwide, planning unit and ecosystem unit scales. Summary tables were provided to CPRA for use during their scoring process. The four types of model output (and summary scale requested) are as follows:

1. **Land change:** coastwide, planning unit, and ecosystem unit
2. **Habitat type:** coastwide and planning unit
3. **Productivity:** coastwide, planning unit, and ecosystem unit
4. **Habitat suitability:** coastwide and planning unit

Summary tables of these model outputs are included on the following pages.

4.2 Land Change

4.2.1 Background

In this section, model output for land change is presented. Land change is presented as a rate in units of square kilometers (km^2). In addition, the change in rate at two different time steps (year 0 to 10 and year 40 to 50), and the percent change this represents, is provided at the coast wide, planning unit, and ecosystem unit scales.

Resulting from a model coding error, the Wax Lake Outlet delta was omitted from the landscape change output in the Alternative 2 model analysis, and therefore the total wetland area in ecosystem unit 3b-5 was drastically reduced. To alleviate this problem, output from Alternative 1 (which contains a comparable suite of projects) was substituted in the place of Alternative 2 output in ecosystem unit 3b-5. The new values for ecosystem unit 3b-5 were used when calculating values at the planning unit and coastwide scales for Alternative 2.

The following is a key to the first column of each land change table:

Cw = coastwide

Pl = planning unit

Eu = ecosystem unit

Area = entire area in the CLEAR model domain

Upl = area of upland land

Wetland = area of wetland land

Wetland 00 = wetland area land change at year 0

Wetland 05 = wetland area land change at year 5

Wetland 10 = wetland area land change at year 10

Wetland 15 = wetland area land change at year 15

Wetland 20 = wetland area land change at year 20

Wetland 25 = wetland area land change at year 25

Wetland 30 = wetland area land change at year 30

Wetland 35 = wetland area land change at year 35

Wetland 40 = wetland area land change at year 40

Wetland 45 = wetland area land change at year 45

Wetland 50 = wetland area land change at year 50

ch_0_10 = amount of wetland area change between year 0 to year 10

ch_40_50 = amount of wetland area change between year 40 to year 50

ch_0_10 (%) = percent of wetland area change between year 0 and year 10

ch_40_50 (%) = percent of wetland area change between year 40 and year 50

4.2.2 Coastwide

COASTWIDE LAND CHANGE SUMMARY

	No Action	Alt 1	Alt 2
cw_area	125261.55	125261.55	125261.55
cw_upl	16917.71	16917.71	16917.715
cw_wetland00	18175.51	18175.51	18175.508
cw_wetland05	17842.14	18513.46	18715.5
cw_wetland10	17522.87	18372.50	18602.648
cw_wetland15	17225.60	18258.91	18521.479
cw_wetland20	16941.11	18137.90	18410.273
cw_wetland25	16670.25	18020.64	18301.17
cw_wetland30	16419.02	17906.71	18199.183
cw_wetland35	16177.97	17792.85	18095.19
cw_wetland40	15944.26	17694.89	18016.645
cw_wetland45	15714.98	17593.30	17933.224
cw_wetland50	15496.76	17490.40	17835.848
cw_ch_0_10	-652.64	196.99	427.14
cw_ch_40_50	-447.50	-204.48	-180.80
cw_ch_0_10 (%)	-3.59	1.08	2.35
cw_ch_40_50 (%)	-2.81	-1.16	-1.00

4.2.3 Planning Unit

PLANNING UNIT LAND CHANGE SUMMARY

Planning Unit	1	1	1	2	2	2	4	4	4
Scenario	No Action	Alt 1	Alt 2	No Action	Alt 1	Alt 2	No Action	Alt 1	Alt 2
pl_area	12979.71	12979.71	12979.71	6694.71	6694.71	6694.71	6250.20	6250.20	6250.20
pl_upl	150.16	150.16	150.16	130.23	130.23	130.23	385.90	385.90	385.90
pl_wetland00	2839.26	2839.26	2839.26	2476.92	2476.92	2476.92	2962.44	2962.44	2962.44
pl_wetland05	2755.38	2962.79	3016.509	2413.15	2528.24	2579.787	2899.54	2998.13	3030.532
pl_wetland10	2675.54	2944.77	3007.184	2351.36	2493.07	2547.423	2838.48	2955.21	2985.163
pl_wetland15	2600.41	2941.81	3015.169	2292.71	2461.23	2521.635	2779.18	2913.10	2940.73
pl_wetland20	2527.43	2921.63	2991.267	2236.02	2428.40	2491.843	2721.59	2871.94	2897.325
pl_wetland25	2456.78	2900.41	2963.069	2181.50	2396.15	2462.438	2665.63	2831.63	2854.948
pl_wetland30	2389.03	2879.78	2937.998	2129.53	2365.07	2434.119	2611.24	2792.13	2813.539
pl_wetland35	2324.16	2857.54	2911.022	2079.33	2334.30	2406.141	2558.36	2753.54	2773.096
pl_wetland40	2262.06	2847.08	2904.869	2031.61	2306.73	2385.356	2506.93	2715.79	2733.581
pl_wetland45	2202.28	2831.03	2891.865	1985.89	2279.58	2366.402	2456.91	2678.83	2694.919
pl_wetland50	2145.03	2811.13	2868.209	1941.84	2253.41	2343.428	2408.22	2642.70	2657.146
pl_ch_0_10	-163.73	105.51	167.92	-125.57	16.15	70.50	-123.97	-7.23	22.72
pl_ch_40_50	-117.03	-35.96	-36.66	-89.77	-53.32	-41.93	-98.71	-73.09	-76.43
pl_ch_0_10 (%)	-5.77	3.72	5.91	-5.07	0.65	2.85	-4.18	-0.24	0.77
pl_ch_40_50 (%)	-5.17	-1.26	-1.26	-4.42	-2.31	-1.76	-3.94	-2.69	-2.80

PLANNING UNIT LAND CHANGE SUMMARY

Planning Unit	3a	3a	3a	3b	3b	3b
Scenario	No Action	Alt 1	Alt 2	No Action	Alt 1	Alt 2
pl_area	5271.14	5271.14	5271.14	6204.31	6204.31	6204.313
pl_upl	153.28	153.28	153.28	73.25	73.25	73.251
pl_wetland00	1782.92	1782.92	1782.92	2442.85	2442.85	2442.849
pl_wetland05	1721.37	1897.47	1959.607	2390.77	2442.46	2449.556
pl_wetland10	1662.83	1859.14	1936.885	2342.04	2426.66	2442.932
pl_wetland15	1607.12	1822.99	1915.234	2302.67	2417.51	2442.116
pl_wetland20	1554.08	1788.11	1894.375	2267.41	2417.50	2445.201
pl_wetland25	1503.55	1755.09	1873.756	2236.92	2419.16	2453.507
pl_wetland30	1455.39	1723.31	1854.639	2216.44	2420.51	2462.409
pl_wetland35	1409.47	1693.04	1836.659	2197.35	2420.86	2469.16
pl_wetland40	1365.67	1664.73	1819.012	2176.29	2419.29	2471.813
pl_wetland45	1323.86	1638.38	1801.877	2152.09	2416.94	2473.273
pl_wetland50	1283.94	1612.76	1785.448	2130.86	2414.69	2473.745
pl_ch_0_10	-120.08	76.23	153.97	-100.81	-16.19	0.08
pl_ch_40_50	-81.73	-51.97	-33.56	-45.43	-4.60	1.93
pl_ch_0_10 (%)	-6.74	4.28	8.64	-4.13	-0.66	0.00
pl_ch_40_50 (%)	-5.98	-3.12	-1.85	-2.09	-0.19	0.08

4.2.4 Ecosystem Unit

ECO UNIT LAND CHANGE SUMMARY

eco_unit	EU 1-1	EU 1-1	EU1_1	EU 1-10	EU 1-10	EU1_10	EU 1-2	EU 1-2	EU1_2
	No Action	Alt1	Alt2	No Action	Alt1	Alt2	No Action	Alt1	Alt2
eu_area	2177.16	2177.16	2177.16	1216.54	1216.54	1216.54	1280.04	1280.04	1280.16
eu_upl	56.26	56.26	56.11	2.58	2.58	2.58	14.24	14.24	10.76
eu_wetland00	1215.35	1215.35	1216.30	188.89	188.89	188.89	101.57	101.57	101.57
eu_wetland05	1169.32	1201.89	1196.51	180.20	186.12	186.10	100.19	109.14	117.02
eu_wetland10	1125.19	1185.33	1177.35	171.93	183.05	183.02	98.83	108.13	115.46
eu_wetland15	1082.87	1169.27	1158.82	164.04	180.50	180.46	97.49	107.16	113.93
eu_wetland20	1042.28	1153.72	1140.90	156.52	177.97	177.92	96.17	106.22	112.41
eu_wetland25	1003.35	1138.61	1123.53	149.36	175.71	175.09	94.87	105.32	110.93
eu_wetland30	966.01	1123.96	1106.76	142.53	173.30	172.64	93.59	104.45	109.46
eu_wetland35	930.20	1109.78	1090.58	136.01	170.79	170.35	92.33	103.50	108.02
eu_wetland40	895.84	1096.03	1074.96	129.96	169.87	169.33	91.09	102.50	106.60
eu_wetland45	862.87	1082.72	1059.88	124.04	168.32	167.61	89.87	101.40	105.20
eu_wetland50	831.24	1069.84	1045.34	118.56	167.01	165.72	88.66	100.23	103.82
pl_ch_0_10	-90.16	-30.02	-38.95	-16.96	-5.84	-5.86	-2.74	6.56	13.89
pl_ch_40_50	-64.59	-26.19	-29.62	-11.41	-2.86	-3.62	-2.43	-2.28	-2.78
pl_ch_0_10 (%)	-7.42	-2.47	-3.20	-8.98	-3.09	-3.10	-2.70	6.46	13.68
pl_ch_40_50 (%)	-7.21	-2.39	-2.76	-8.78	-1.68	-2.14	-2.67	-2.22	-2.61

ECO UNIT LAND CHANGE SUMMARY

eco_unit	EU 1-3 No Action	EU 1-3 Alt1	EU1_3 Alt2	EU 1-4 No Action	EU 1-4 Alt1	EU1_4 Alt2	EU 1-5 No Action	EU 1-5 Alt1	EU1_5 Alt2
eu_area	394.04	394.04	394.34	294.00	294.00	294.12	192.53	192.53	192.54
eu_upl	5.58	5.58	2.61	0.24	0.24	0.18	40.91	40.91	40.91
eu_wetland00	111.47	111.47	111.47	46.46	46.46	46.46	83.22	83.22	83.22
eu_wetland05	106.08	107.93	128.58	44.50	55.35	55.61	81.74	91.37	84.91
eu_wetland10	101.04	104.71	123.30	42.62	54.37	54.40	80.27	91.65	83.78
eu_wetland15	96.32	101.77	118.33	40.83	53.44	53.23	78.85	91.85	82.80
eu_wetland20	91.90	99.08	113.65	39.11	52.55	52.12	77.58	92.00	81.60
eu_wetland25	87.77	96.61	109.24	37.47	51.68	51.06	76.28	92.09	80.41
eu_wetland30	83.89	94.38	105.08	35.89	50.86	50.04	75.00	92.11	79.25
eu_wetland35	80.25	92.35	101.15	34.39	50.07	49.07	73.86	92.10	78.12
eu_wetland40	76.84	90.48	97.44	32.95	49.31	48.14	72.62	92.05	77.03
eu_wetland45	73.64	88.77	93.94	31.57	48.59	47.41	71.58	91.98	75.97
eu_wetland50	70.64	87.17	90.64	30.30	47.91	46.56	70.48	91.91	74.95
pl_ch_0_10	-10.43	-6.75	11.83	-3.83	7.92	7.94	-2.95	8.42	0.55
pl_ch_40_50	-6.21	-3.32	-6.81	-2.65	-1.40	-1.58	-2.14	-0.14	-2.08
pl_ch_0_10 (%)	-9.36	-6.06	10.61	-8.25	17.04	17.10	-3.55	10.12	0.67
pl_ch_40_50 (%)	-8.08	-3.67	-6.99	-8.03	-2.85	-3.27	-2.95	-0.15	-2.70

ECO UNIT LAND CHANGE SUMMARY

eco_unit	EU 1-6 No Action	EU 1-6 Alt1	EU1_6 Alt2	EU 1-7 No Action	EU 1-7 Alt1	EU1_7 Alt2	EU 1-8 No Action	EU 1-8 Alt1	EU1_8 Alt2
eu_area	581.80	581.80	581.80	1858.35	1858.35	1858.35	2028.51	2028.51	2028.51
eu_upl	7.63	7.63	7.63	21.55	21.55	21.55	1.17	1.17	1.17
eu_wetland00	327.25	327.25	327.25	395.07	395.07	395.07	349.11	349.11	349.11
eu_wetland05	332.52	360.83	340.67	387.68	414.54	428.42	333.77	378.87	421.45
eu_wetland10	338.04	370.28	349.65	380.54	432.06	464.22	319.11	362.56	402.91
eu_wetland15	344.61	379.58	358.48	373.64	462.47	514.69	305.09	346.97	385.19
eu_wetland20	349.74	388.63	367.03	366.97	474.16	531.70	291.69	332.05	368.25
eu_wetland25	353.95	397.43	375.32	360.50	483.19	543.04	278.88	317.79	352.06
eu_wetland30	357.94	405.89	383.25	354.24	491.76	555.53	266.64	304.15	336.68
eu_wetland35	361.67	414.05	390.87	348.17	497.67	564.20	254.94	291.14	322.19
eu_wetland40	365.11	421.81	398.09	342.44	512.20	589.64	243.75	279.34	309.81
eu_wetland45	368.31	428.83	404.88	336.73	521.01	607.48	233.05	268.35	298.10
eu_wetland50	371.25	435.41	411.25	331.21	525.44	614.64	222.83	257.42	286.18
pl_ch_0_10	10.80	43.03	22.40	-14.53	36.99	69.15	-30.01	13.45	53.80
pl_ch_40_50	6.14	13.60	13.16	-11.23	13.24	25.00	-20.92	-21.91	-23.63
pl_ch_0_10 (%)	3.30	13.15	6.85	-3.68	9.36	17.50	-8.59	3.85	15.41
pl_ch_40_50 (%)	1.68	3.22	3.31	-3.28	2.58	4.24	-8.58	-7.85	-7.63

ECO UNIT LAND CHANGE SUMMARY

eco_unit	EU 1-9	EU 1-9	EU1_9	EU 2-1	EU 2-1	EU2_1	EU 2-2	EU 2-2	EU2_2
	No Action	Alt1	Alt2	No Action	Alt1	Alt2	No Action	Alt1	Alt2
eu_area	2956.75	2956.75	2956.75	1111.35	1111.35	1111.35	970.83	970.83	970.83
eu_upl	0.00	0.00	0.00	52.46	52.46	52.46	25.91	25.91	25.91
eu_wetland00	20.88	20.88	20.88	930.50	930.50	930.50	571.99	571.99	571.99
eu_wetland05	19.37	56.75	57.24	921.01	940.38	941.16	561.42	563.17	561.74
eu_wetland10	17.97	52.63	53.10	911.24	947.55	949.14	550.93	554.36	551.67
eu_wetland15	16.67	48.80	49.25	901.43	954.01	958.84	540.67	546.80	543.90
eu_wetland20	15.46	45.26	45.69	891.67	958.83	965.17	530.66	538.55	534.33
eu_wetland25	14.35	41.97	42.38	881.97	962.35	969.94	520.86	530.67	525.48
eu_wetland30	13.31	38.92	39.32	872.32	965.31	974.71	511.35	522.96	516.24
eu_wetland35	12.35	36.10	36.47	862.69	967.38	977.91	502.20	515.25	507.35
eu_wetland40	11.45	33.48	33.83	853.13	969.84	982.98	493.41	508.36	500.88
eu_wetland45	10.63	31.05	31.39	843.65	971.52	986.64	484.97	501.10	496.20
eu_wetland50	9.86	28.79	29.12	834.29	972.56	988.67	476.84	494.36	489.94
pl_ch_0_10	-2.91	31.74	32.21	-19.26	17.05	18.64	-21.06	-17.64	-20.32
pl_ch_40_50	-1.60	-4.68	-4.72	-18.84	2.72	5.69	-16.57	-14.00	-10.93
pl_ch_0_10 (%)	-13.95	151.99	154.25	-2.07	1.83	2.00	-3.68	-3.08	-3.55
pl_ch_40_50 (%)	-13.93	-13.99	-13.94	-2.21	0.28	0.58	-3.36	-2.75	-2.18

ECO UNIT LAND CHANGE SUMMARY

eco_unit	EU 2-3 No Action	EU 2-3 Alt1	EU2_3 Alt2	EU 2-4 No Action	EU 2-4 Alt1	EU2_4 Alt2	EU 2-5 No Action	EU 2-5 Alt1	EU2_5 Alt2
eu_area	426.05	426.05	426.05	2119.64	2119.64	2119.64	1119.79	1119.79	1119.79
eu_upl	9.91	9.91	9.91	20.76	20.76	20.76	9.16	9.16	9.16
eu_wetland00	257.59	257.59	257.59	578.63	578.63	578.63	62.20	62.20	62.20
eu_wetland05	249.06	253.21	254.11	548.81	595.62	645.88	58.33	101.33	102.38
eu_wetland10	240.88	248.38	249.41	520.70	574.39	626.79	54.72	95.52	97.52
eu_wetland15	233.05	243.70	244.88	494.21	554.46	608.91	51.35	90.07	92.93
eu_wetland20	225.55	239.19	240.50	469.24	535.78	592.14	48.20	84.96	88.59
eu_wetland25	218.36	234.77	236.22	445.68	518.23	576.42	45.25	80.17	84.50
eu_wetland30	211.47	230.50	232.07	423.47	501.76	561.76	42.50	75.67	80.64
eu_wetland35	204.86	226.34	228.02	402.53	486.30	548.42	39.93	71.46	76.99
eu_wetland40	198.52	222.32	224.09	382.77	471.84	537.22	37.53	67.50	73.54
eu_wetland45	192.44	218.39	220.25	364.13	458.69	527.26	35.29	63.79	70.28
eu_wetland50	186.60	214.57	216.51	346.54	446.53	516.23	33.19	60.31	67.19
pl_ch_0_10	-16.71	-9.22	-8.18	-57.93	-4.24	48.16	-7.48	33.31	35.31
pl_ch_40_50	-11.92	-7.75	-7.59	-36.23	-25.31	-20.99	-4.35	-7.20	-6.35
pl_ch_0_10 (%)	-6.49	-3.58	-3.18	-10.01	-0.73	8.32	-12.03	53.56	56.77
pl_ch_40_50 (%)	-6.00	-3.48	-3.39	-9.47	-5.36	-3.91	-11.58	-10.66	-8.63

ECO UNIT LAND CHANGE SUMMARY

eco_unit	EU 2-6	EU 2-6	EU2_6	EU 3a-1	EU 3a-1	EU3a_1	EU 3a-2	EU 3a-2	EU3a_2
	No Action	Alt1	Alt2	No Action	Alt1	Alt2	No Action	Alt1	Alt2
eu_area	947.05	947.05	947.05	939.30	939.30	939.30	359.35	359.35	359.35
eu_upl	12.03	12.03	12.03	21.02	21.02	21.02	98.25	98.25	98.25
eu_wetland00	76.00	76.00	76.00	691.47	691.47	691.47	202.89	202.89	203.06
eu_wetland05	74.51	74.52	74.52	681.17	686.70	687.20	194.74	202.11	203.59
eu_wetland10	72.88	72.88	72.88	671.10	681.34	682.34	186.97	201.14	204.01
eu_wetland15	72.02	72.19	72.19	661.23	676.01	677.24	179.54	200.36	204.59
eu_wetland20	70.71	71.10	71.10	651.58	670.27	672.23	172.45	199.40	204.94
eu_wetland25	69.38	69.95	69.88	642.12	664.71	666.67	165.68	198.43	205.21
eu_wetland30	68.41	68.86	68.70	632.85	658.79	661.33	159.22	197.49	205.44
eu_wetland35	67.12	67.56	67.46	623.76	652.89	655.91	153.04	196.52	205.64
eu_wetland40	66.25	66.87	66.65	614.86	647.20	650.75	147.13	195.64	205.85
eu_wetland45	65.41	66.09	65.79	606.12	641.42	645.31	141.49	194.71	206.01
eu_wetland50	64.39	65.08	64.88	597.55	635.72	640.04	136.10	193.80	206.11
pl_ch_0_10	-3.12	-3.12	-3.12	-20.37	-10.13	-9.13	-15.92	-1.75	0.95
pl_ch_40_50	-1.86	-1.78	-1.76	-17.30	-11.48	-10.71	-11.04	-1.84	0.26
pl_ch_0_10 (%)	-4.11	-4.10	-4.10	-2.95	-1.46	-1.32	-7.85	-0.86	0.47
pl_ch_40_50 (%)	-2.81	-2.67	-2.64	-2.81	-1.77	-1.65	-7.50	-0.94	0.13

ECO UNIT LAND CHANGE SUMMARY

eco_unit	EU 3a-3 No Action	EU 3a-3 Alt1	EU3a_3 Alt2	EU 3a-4 No Action	EU 3a-4 Alt1	EU3a_4 Alt2	EU 3a-5 No Action	EU 3a-5 Alt1	EU3a_5 Alt2
eu_area	108.52	108.52	108.52	1832.37	1832.37	1832.75	1156.30	1156.30	1156.30
eu_upl	10.17	10.17	10.17	16.30	16.30	16.30	2.09	2.09	2.09
eu_wetland00	78.47	78.47	78.47	390.87	390.87	390.87	307.86	307.86	307.86
eu_wetland05	75.87	79.16	79.19	368.65	436.02	462.02	294.14	354.42	388.39
eu_wetland10	73.39	79.64	79.70	347.84	415.57	448.95	281.06	344.27	384.52
eu_wetland15	71.02	80.05	80.05	328.34	396.51	436.90	268.58	334.65	380.82
eu_wetland20	68.77	80.39	80.34	310.08	378.77	425.56	256.67	325.52	377.33
eu_wetland25	66.61	80.63	80.57	292.96	362.26	414.79	245.31	316.86	374.06
eu_wetland30	64.55	80.86	80.79	276.91	346.87	404.57	234.47	308.60	370.99
eu_wetland35	62.58	81.08	80.99	261.87	332.50	394.94	224.12	300.76	368.13
eu_wetland40	60.69	81.26	81.15	247.75	319.08	385.87	214.24	293.33	365.51
eu_wetland45	58.89	81.54	81.35	234.51	306.56	377.41	204.81	286.27	363.12
eu_wetland50	57.16	81.71	81.50	222.09	294.88	369.35	195.81	279.54	360.94
pl_ch_0_10	-5.08	1.17	1.23	-43.03	24.70	58.08	-26.80	36.42	76.66
pl_ch_40_50	-3.53	0.45	0.35	-25.67	-24.20	-16.53	-18.43	-13.78	-4.56
pl_ch_0_10 (%)	-6.47	1.50	1.56	-11.01	6.32	14.86	-8.70	11.83	24.90
pl_ch_40_50 (%)	-5.82	0.55	0.43	-10.36	-7.58	-4.28	-8.60	-4.70	-1.25

ECO UNIT LAND CHANGE SUMMARY

eco_unit	EU 3a-6	EU 3a-6	EU3a_6	EU 3a-7	EU 3a-7	EU3a_7	EU 3b-1	EU 3b-1	EU3b_1
	No Action	Alt1	Alt2	No Action	Alt1	Alt2	No Action	Alt1	Alt2
eu_area	710.26	710.26	710.26	165.04	165.04	165.04	593.26	593.26	593.26
eu_upl	1.06	1.06	1.06	4.38	4.38	4.38	0.57	0.57	0.57
eu_wetland00	15.42	15.42	15.42	95.95	95.95	95.95	209.29	209.29	209.29
eu_wetland05	14.57	42.72	42.72	92.23	96.35	96.49	199.58	199.80	218.05
eu_wetland10	13.78	40.45	40.45	88.70	96.73	96.92	190.35	190.78	214.87
eu_wetland15	13.03	38.31	38.32	85.36	97.10	97.31	181.57	182.27	211.86
eu_wetland20	12.33	36.31	36.32	82.20	97.45	97.65	173.22	178.98	209.16
eu_wetland25	11.68	34.43	34.44	79.19	97.77	98.02	165.27	172.68	206.38
eu_wetland30	11.06	32.66	32.67	76.34	98.04	98.85	157.72	165.37	203.63
eu_wetland35	10.48	31.00	31.01	73.63	98.30	100.05	150.53	160.18	201.06
eu_wetland40	9.94	29.43	29.45	71.05	98.78	100.44	143.68	157.96	198.60
eu_wetland45	9.43	27.97	27.98	68.61	99.92	100.71	137.17	156.89	196.36
eu_wetland50	8.95	26.58	26.60	66.28	100.51	100.91	131.29	154.55	194.15
pl_ch_0_10	-1.64	25.03	25.04	-7.25	0.78	0.97	-18.94	-18.51	5.58
pl_ch_40_50	-0.99	-2.85	-2.85	-4.78	1.73	0.47	-12.39	-3.41	-4.45
pl_ch_0_10 (%)	-10.64	162.37	162.40	-7.55	0.81	1.01	-9.05	-8.84	2.67
pl_ch_40_50 (%)	-9.97	-9.68	-9.67	-6.72	1.75	0.47	-8.62	-2.16	-2.24

ECO UNIT LAND CHANGE SUMMARY

eco_unit	EU 3b-2 No Action	EU 3b-2 Alt1	EU3b_2 Alt2	EU 3b-3 No Action	EU 3b-3 Alt1	EU3b_3 Alt2	EU 3b-4 No Action	EU 3b-4 Alt1	EU3b_4 Alt2
eu_area	1038.09	1038.09	1038.09	180.01	180.01	180.01	325.79	325.79	325.79
eu_upl	1.07	1.07	1.07	0.40	0.40	0.40	1.97	1.97	1.97
eu_wetland00	717.76	717.76	717.76	124.84	124.84	124.84	233.49	233.49	233.49
eu_wetland05	690.47	718.04	723.33	124.61	124.63	129.85	238.51	239.10	238.12
eu_wetland10	664.47	718.59	724.57	125.38	125.66	133.63	241.01	241.43	239.96
eu_wetland15	639.90	720.65	725.71	125.84	126.20	135.90	242.75	242.99	243.18
eu_wetland20	616.67	718.79	726.86	126.36	127.84	137.08	243.82	244.64	244.43
eu_wetland25	594.77	716.68	728.23	128.18	131.35	139.45	245.08	245.86	246.08
eu_wetland30	574.01	714.02	728.20	130.99	133.34	140.81	245.99	247.04	247.90
eu_wetland35	554.31	710.80	728.14	132.63	134.11	141.95	246.80	248.14	248.92
eu_wetland40	535.64	707.75	728.07	133.31	134.90	142.40	247.54	249.12	251.39
eu_wetland45	517.94	704.49	728.47	133.82	134.94	142.73	248.28	251.50	254.60
eu_wetland50	501.14	701.28	728.33	133.86	135.15	143.02	249.58	254.68	257.23
pl_ch_0_10	-53.29	0.84	6.82	0.54	0.82	8.79	7.52	7.94	6.48
pl_ch_40_50	-34.51	-6.47	0.26	0.55	0.25	0.62	2.04	5.57	5.84
pl_ch_0_10 (%)	-7.42	0.12	0.95	0.43	0.65	7.04	3.22	3.40	2.77
pl_ch_40_50 (%)	-6.44	-0.91	0.04	0.42	0.18	0.43	0.82	2.24	2.32

ECO UNIT LAND CHANGE SUMMARY

eco_unit	EU 3b-5 No Action	EU 3b-5 Alt1	EU 3b-5 Alt2
eu_area	760.26	760.26	760.26
eu_upl	0.18	0.18	0.18
eu_wetland00	48.15	48.15	48.15
eu_wetland05	56.28	57.90	57.90
eu_wetland10	66.62	73.75	73.75
eu_wetland15	84.61	94.64	94.64
eu_wetland20	104.70	121.36	121.36
eu_wetland25	125.53	150.80	150.80
eu_wetland30	153.43	182.30	182.30
eu_wetland35	181.80	211.80	211.80
eu_wetland40	207.11	235.67	235.67
eu_wetland45	227.48	256.37	256.37
eu_wetland50	248.54	276.60	276.60
pl_ch_0_10	18.46	25.59	25.59
pl_ch_40_50	41.43	40.93	40.93
pl_ch_0_10 (%)	38.35	53.15	53.15
pl_ch_40_50 (%)	20.00	17.37	17.37

ECO UNIT LAND CHANGE SUMMARY

eco_unit	EU 3b-6 No Action	EU 3b-6 Alt1	EU3b_6 Alt2	EU 3b-7 No Action	EU 3b-7 Alt1	EU3b_7 Alt2	EU 3b-8 No Action	EU 3b-8 Alt1	EU3b_8 Alt2
eu_area	634.03	634.03	634.03	1175.75	1175.75	1175.75	1008.36	1008.36	1008.36
eu_upl	0.66	0.66	0.66	0.35	0.35	0.35	64.22	64.22	64.22
eu_wetland00	226.02	226.02	226.02	2.32	2.32	2.32	654.72	654.72	654.72
eu_wetland05	222.72	233.90	222.83	2.32	7.24	2.32	633.93	639.28	634.55
eu_wetland10	219.48	230.61	219.70	2.32	7.12	2.32	613.93	619.79	615.12
eu_wetland15	216.28	227.36	216.60	2.32	7.01	2.32	594.68	601.02	596.42
eu_wetland20	213.13	224.17	213.56	2.33	6.90	2.33	576.15	582.95	578.41
eu_wetland25	210.02	221.02	210.55	2.33	6.80	2.34	558.32	565.54	561.07
eu_wetland30	206.96	217.91	207.59	2.34	6.70	2.35	541.15	548.77	544.35
eu_wetland35	203.95	214.85	204.68	2.35	6.62	2.36	524.62	532.61	528.26
eu_wetland40	200.98	211.84	201.80	2.38	6.52	2.37	508.71	517.04	512.74
eu_wetland45	198.06	208.87	198.97	2.38	6.56	2.37	493.38	502.03	497.79
eu_wetland50	195.18	205.94	196.18	2.37	6.76	2.36	478.62	487.56	483.38
pl_ch_0_10	-6.54	4.59	-6.32	0.00	4.81	0.00	-40.79	-34.93	-39.60
pl_ch_40_50	-5.80	-5.90	-5.62	-0.01	0.24	0.00	-30.09	-29.47	-29.36
pl_ch_0_10 (%)	-2.90	2.03	-2.80	0.08	207.71	0.15	-6.23	-5.33	-6.05
pl_ch_40_50 (%)	-2.89	-2.78	-2.79	-0.22	3.61	-0.19	-5.92	-5.70	-5.73

ECO UNIT LAND CHANGE SUMMARY

eco_unit	EU 3b-9	EU 3b-9	EU3b_9	EU 4-1	EU 4-1	EU 4-1	EU 4-2	EU 4-2	EU 4-2
	No Action	Alt1	Alt2	No Action	Alt1	Alt2	No Action	Alt1	Alt2
eu_area	488.78	488.78	488.78	2230.68	2230.68	2230.68	1142.53	1142.53	1142.53
eu_upl	3.83	3.83	3.83	180.72	180.72	180.72	16.81	16.81	16.81
eu_wetland00	226.27	226.27	226.27	1278.23	1278.23	1278.23	466.37	466.37	466.37
eu_wetland05	222.35	222.57	222.61	1251.41	1269.02	1273.80	452.26	453.04	483.24
eu_wetland10	218.50	218.93	219.02	1225.32	1254.42	1264.77	438.77	440.28	469.70
eu_wetland15	214.73	215.37	215.49	1199.93	1239.99	1255.60	425.85	428.03	456.72
eu_wetland20	211.03	211.87	212.02	1175.22	1225.76	1246.42	413.48	416.29	444.26
eu_wetland25	207.41	208.43	208.62	1151.16	1211.72	1237.29	401.62	405.02	432.30
eu_wetland30	203.85	205.06	205.28	1127.73	1197.89	1228.17	390.26	394.19	420.80
eu_wetland35	200.36	201.75	202.00	1104.92	1184.29	1219.10	379.36	383.79	409.75
eu_wetland40	196.94	198.49	198.77	1082.69	1170.91	1210.09	368.90	373.79	399.13
eu_wetland45	193.58	195.30	195.61	1061.04	1157.73	1201.09	358.85	364.17	388.90
eu_wetland50	190.29	192.16	192.50	1039.94	1144.77	1192.18	349.20	354.92	379.06
pl_ch_0_10	-7.77	-7.33	-7.25	-52.90	-23.81	-13.45	-27.60	-26.09	3.33
pl_ch_40_50	-6.65	-6.33	-6.27	-42.75	-26.14	-17.91	-19.69	-18.87	-20.07
pl_ch_0_10 (%)	-3.43	-3.24	-3.21	-4.14	-1.86	-1.05	-5.92	-5.59	0.71
pl_ch_40_50 (%)	-3.38	-3.19	-3.16	-3.95	-2.23	-1.48	-5.34	-5.05	-5.03

ECO UNIT LAND CHANGE SUMMARY

eco_unit	EU 4-3 No Action	EU 4-3 Alt1	EU 4-3 Alt2	EU 4-4 No Action	EU 4-4 Alt1	EU 4-4 Alt2
eu_area	817.28	817.28	817.28	2059.71	2059.71	2059.71
eu_upl	82.39	82.39	82.39	105.98	105.98	105.98
eu_wetland00	207.49	207.49	207.49	1010.36	1010.36	1010.36
eu_wetland05	203.71	203.97	203.97	992.16	1072.10	1069.52
eu_wetland10	200.02	200.52	200.52	974.37	1059.99	1050.17
eu_wetland15	196.41	197.15	197.15	956.99	1047.92	1031.26
eu_wetland20	192.89	193.85	193.85	940.01	1036.04	1012.79
eu_wetland25	189.44	190.62	190.62	923.41	1024.27	994.75
eu_wetland30	186.07	187.45	187.45	907.17	1012.59	977.12
eu_wetland35	182.78	184.36	184.36	891.30	1001.10	959.88
eu_wetland40	179.56	181.32	181.32	875.78	989.77	943.04
eu_wetland45	176.41	178.35	178.35	860.60	978.58	926.57
eu_wetland50	173.33	175.44	175.44	845.75	967.57	910.47
pl_ch_0_10	-7.47	-6.96	-6.96	-35.99	49.63	39.80
pl_ch_40_50	-6.23	-5.88	-5.88	-30.03	-22.20	-32.57
pl_ch_0_10 (%)	-3.60	-3.36	-3.36	-3.56	4.91	3.94
pl_ch_40_50 (%)	-3.47	-3.25	-3.25	-3.43	-2.24	-3.45

4.3 Habitat Type: Coastwide and Planning Unit Summary

In this section, model output for habitat type is presented. Habitat type is presented as a rate in units of square kilometers (km^2). In addition, the change in rate at different time steps (years 0 to 10 and years 0 to 50), and the percent change this represents, is provided at the coastwide and planning unit scales. No increased action output is compared to that of Alternative 1 and Alternative 2 at these time steps as well.

The following is a key to the first column of the habitat type table:

Coastwide Yr 10 vs NO Action = coastwide habitat type area at year 10 (under either Alternative 1 or 2) compared to that at year 10 under the no increased action scenario

Coastwide Yr 50 vs NO Action = coastwide habitat type area at year 50 (under either Alternative 1 or 2) compared to that at year 50 under the no increased action scenario

PU = planning unit

BRM = brackish marsh

FAM = fresh marsh

INM = intermediate marsh

SAW = salt marsh

SWF = swamp forest

Habitat Type Summary

Coastwide Yr 10											
vs NO Action	Net Alt 1	%	Net Alt 2	%	**vs Yr 0**	Net Alt 1	%	Net Alt 2	%	No Action	%
BRM	-846	-22	-517	-13	BRM	-5354	-64	-5025	-60	-4508	-54
FAM	8991	41	7204	33	FAM	6135	25	4348	17	-2856	-11
INM	-2423	-19	-1025	-8	INM	132	1	1530	15	2555	24
SAW	-2552	-25	-553	-6	SAW	2248	43	4247	81	4800	92
SWF	147	1	165	1	SWF	-609	-3	-591	-2	-756	-3
	Number '-	3		3		Number '-	1		1		2
	Number '+	1		1		Number '+	2		3		2

Coastwide Yr 50											
vs NO Action	Net Alt 1	%	Net Alt 2	%	**vs Yr 0**	Net Alt 1	%	Net Alt 2	%	No Action	%
BRM	-546	-17	-257	-8	BRM	-5664	-68	-5375	-64	-5118	-61
FAM	10630	52	9783	48	FAM	6085	24	5238	21	-4545	-18
INM	-3628	-30	-2077	-17	INM	-1964	-19	-413	-4	1664	16
SAW	-1437	-27	702	13	SAW	-1284	-25	855	16	153	3
SWF	333	1	347	1	SWF	-777	-3	-763	-3	-1110	-5
	Number '-	3		2		Number '-	3		1		2
	Number '+	1		2		Number '+	1		2		1

PU 1 Yr 10												
vs NO Action	Net Alt 1	%	Net Alt 2	%		**vs Yr 0**	Net Alt 1	%	Net Alt 2	%	No Action	%
BRM	-470	-87	-410	-76		BRM	-2308	-97	-2248	-95	-1838	-77
FAM	2638	156	2563	152		FAM	3143	266	3068	260	505	43
INM	-435	-22	-404	-21		INM	-545	-27	-514	-25	-110	-5
SAW	-680	-22	-182	-6		SAW	660	38	1158	67	1340	77
SWF	11	0	26	1		SWF	-84	-2	-69	-2	-95	-2
	Number '-	3		3			Number '-	2		2		1
	Number '+	1		1			Number '+	2		2		1

PU 1 Yr 50												
vs NO Action	Net Alt 1	%	Net Alt 2	%		**vs Yr 0**	Net Alt 1	%	Net Alt 2	%	No Action	%
BRM	-405	-81	-396	-80		BRM	-2285	-96	-2276	-96	-17	-1
FAM	3094	183	3438	203		FAM	3606	305	3950	334	7	1
INM	-65	-5	-78	-6		INM	-738	-36	-751	-37	-133	-6
SAW	-743	-44	-735	-44		SAW	-807	-47	-799	-46	-388	-22
SWF	90	2	100	2		SWF	-174	-4	-164	-4	-74	-2
	Number '-	3		2			Number '-	3		3		2
	Number '+	1		1			Number '+	1		1		0

PU 2 Yr 10												
vs NO Action	Net Alt 1	%	Net Alt 2	%		**vs Yr 0**	Net Alt 1	%	Net Alt 2	%	No Action	%
BRM	-106	-96	-106	-96		BRM	-811	-100	-811	-100	-705	-87
FAM	3463	525	3566	540		FAM	1441	54	1544	58	-2022	-75
INM	-1481	-44	-1115	-33		INM	681	56	1047	86	2162	178
SAW	-1428	-82	-1426	-82		SAW	-1024	-77	-1022	-77	404	30
SWF	123	3	124	3		SWF	-71	-2	-70	-2	-194	-5
	Number '-	3		3			Number '-	2		2		2
	Number '+	1		1			Number '+	2		2		2

PU 2 Yr 50												
vs NO Action	Net Alt 1	%	Net Alt 2	%		**vs Yr 0**	Net Alt 1	%	Net Alt 2	%	No Action	%
BRM	-81	-95	-81	-95		BRM	-811	-100	-811	-100	-730	-90
FAM	3163	494	3369	526		FAM	1121	42	1327	49	-2042	-76
INM	-1964	-65	-1624	-53		INM	-139	-11	201	17	1825	150
SAW	-231	-54	-228	-53		SAW	-1137	-85	-1134	-85	-906	-68
SWF	121	3	122	3		SWF	-90	-2	-89	-2	-211	-5
	Number '-	3		3			Number '-	3		2		3
	Number '+	1		1			Number '+	1		2		1

PU 3a Yr 10												
vs NO Action	Net Alt 1	%	Net Alt 2	%		**vs Yr 0**	Net Alt 1	%	Net Alt 2	%	No Action	%
BRM	18	62	46	159		BRM	-777	-94	-749	-91	-795	-96
FAM	139	17	139	17		FAM	41	4	41	4	-98	-11
INM	6	1	28	4		INM	183	40	205	45	177	39
SAW	846	49	1352	79		SAW	1229	92	1735	130	383	29
SWF	11	0	11	0		SWF	-27	-1	-27	-1	-38	-1
	Number '-	0		0			Number '-	1		1		2
	Number '+	4		4			Number '+	2		2		2

PU 3a Yr 50												
vs NO Action	Net Alt 1	%	Net Alt 2	%		**vs Yr 0**	Net Alt 1	%	Net Alt 2	%	No Action	%
BRM	62	2067	148	4933		BRM	-759	-92	-673	-82	-821	-100
FAM	423	72	439	75		FAM	80	9	96	10	-343	-37
INM	192	60	243	76		INM	54	12	105	23	-138	-30
SAW	488	125	1665	427		SAW	-454	-34	723	54	-942	-71
SWF	92	3	92	3		SWF	-49	-1	-49	-1	-141	-4
	Number '-	0		0			Number '-	2		1		4
	Number '+	4		4			Number '+	2		3		0

PU 3b Yr 10												
vs NO Action	Net Alt 1	%	Net Alt 2	%		**vs Yr 0**	Net Alt 1	%	Net Alt 2	%	No Action	%
BRM	-286	-18	-184	-11		BRM	-797	-37	-695	-33	-511	-24
FAM	183	5	294	7		FAM	-312	-7	-201	-4	-495	-11
INM	683	27	720	28		INM	1035	47	1072	49	352	16
SAW	-476	-45	-598	-57		SAW	275	93	153	52	751	254
SWF	-2	0	-1	0		SWF	-21	-1	-20	-1	-19	-1
	Number '-	2		2			Number '-	2		2		2
	Number '+	1		2			Number '+	2		2		2

PU 3b Yr 50												
vs NO Action	Net Alt 1	%	Net Alt 2	%		**vs Yr 0**	Net Alt 1	%	Net Alt 2	%	No Action	%
BRM	-137	-10	-32	-2		BRM	-851	-40	-746	-35	-714	-33
FAM	1139	38	1492	50		FAM	-399	-9	-46	-1	-1538	-34
INM	-599	-18	-242	-7		INM	460	21	817	37	1059	48
SAW	-229	-30	-335	-44		SAW	236	80	130	44	465	157
SWF	11	1	12	1		SWF	-40	-3	-39	-3	-51	-3
	Number '-	3		3			Number '-	2		1		2
	Number '+	1		1			Number '+	2		2		2

PU 4 Yr 10												
vs NO Action	Net Alt 1	%	Net Alt 2	%	**vs Yr 0**	Net Alt 1	%	Net Alt 2	%	No Action	%
BRM	-2	0	137	9	BRM	-645	-29	-506	-23	-643	-29
FAM	2527	63	606	15	FAM	1151	21	-770	-14	-1376	-26
INM	-1196	-26	-254	-6	INM	-1147	-25	-205	-5	49	1
SAW	-814	-34	301	12	SAW	1077	206	2192	420	1891	362
SWF	7	11	-1	-2	SWF	-6	-8	-14	-19	-13	-18
	Number '-	2		1		Number '-	3		3		3
	Number '+	2		3		Number '+	2		1		1

PU 4 Yr 50												
vs NO Action	Net Alt 1	%	Net Alt 2	%	**vs Yr 0**	Net Alt 1	%	Net Alt 2	%	No Action	%
BRM	15	1	104	8	BRM	-942	-43	-853	-39	-957	-43
FAM	2667	73	908	25	FAM	958	18	-801	-15	-1709	-32
INM	-1192	-28	-376	-9	INM	-1526	-34	-710	-16	-334	-7
SAW	-722	-35	335	16	SAW	847	162	1904	365	1569	301
SWF	8	13	0	0	SWF	-6	-8	-14	-19	-14	-19
	Number '-	2		1		Number '-	3		4		4
	Number '+	2		3		Number '+	2		1		1

4.4 Productivity

4.4.1 Background

In this section, model output for productivity is presented. Productivity evaluates the effect of salinity and inundation on a particular habitat, based on measures of productivity including total biomass, stem/leaf elongation, photosynthesis, etc. Productivity is presented as an index. In addition, the change in rate at two different time steps (year 0 to 10 and year 40 to 50), and the percent change this represents, is provided at the coastwide, planning unit, and ecosystem unit scales.

The following is a key to the first column of each land change table:

Cw = coastwide

Pl = planning unit

Eu = ecosystem unit

Ppa = productivity

ppa00 = productivity at year 0

ppa05 = productivity at year 5

ppa10 = productivity at year 10

ppa 15 = productivity at year 15

ppa 20 = productivity at year 20

ppa 25 = productivity at year 25

ppa 30 = productivity at year 30

ppa 35 = productivity at year 35

ppa 40 = productivity at year 40

ppa 45 = productivity at year 45

ppa 50 = productivity at year 50

ppa _0_10 = productivity change between year 0 to year 10

ppa _40_50 = productivity change between year 40 to year 50

ppa _0_10 (%) = percent productivity change between year 0 and year 10

ppa _40_50 (%) = percent productivity change between year 40 and year 50

4.4.2 Coastwide

COASTWIDE PRODUCTIVITY

	NIA	ALT1	ALT2
cw_ppa00	5833.79	5833.79	5833.79
cw_ppa05	6121.91	6718.40	6935.49
cw_ppa10	5961.67	6611.99	6847.58
cw_ppa15	5806.04	6529.28	6791.62
cw_ppa20	5653.96	6429.36	6707.66
cw_ppa25	5497.98	6338.80	6636.14
cw_ppa30	5356.86	6217.05	6507.51
cw_ppa35	5209.39	6120.46	6426.70
cw_ppa40	5065.61	6029.06	6360.93
cw_ppa45	4917.75	5900.47	6190.42
cw_ppa50	4788.05	5806.72	6111.24
cw_ppa_0_10	127.89	778.20	1013.79
cw_ppa_40_50	-277.55	-222.34	-249.70
% 0-10	2.2	13.3	17.4
%40-50	-5.5	-3.7	-3.9

4.4.3 Planning Unit

PLANNING UNIT PRODUCTIVITY SUMMARY

	NIA	ALT1	ALT2	NIA	ALT1	ALT2	NIA	ALT1	ALT2
PLAN_UNIT	1	1	1	2	2	2	3a	3a	3a
pl_ppa00	838.53	838.53	838.53	592.83	592.83	592.83	371.62	371.62	371.62
pl_ppa05	853.82	973.32	1023.62	695.82	826.42	899.30	376.46	467.11	536.67
pl_ppa10	824.46	964.85	1016.28	665.20	795.56	869.61	348.37	445.68	523.63
pl_ppa15	793.39	961.73	1020.22	637.18	778.67	855.45	322.52	430.89	517.15
pl_ppa20	762.57	951.76	1010.35	609.35	752.53	831.28	297.19	412.12	505.89
pl_ppa25	730.05	939.07	997.90	581.04	733.91	815.33	272.11	399.17	499.78
pl_ppa30	699.70	927.39	972.59	557.00	704.53	773.03	249.23	364.81	478.12
pl_ppa35	667.70	912.37	959.55	533.73	689.82	760.72	227.31	350.13	465.78
pl_ppa40	636.03	902.99	957.08	512.80	672.25	747.05	208.21	338.85	458.67
pl_ppa45	605.34	869.86	878.39	491.12	660.69	734.14	187.26	315.45	444.93
pl_ppa50	579.40	852.49	863.16	473.02	643.82	718.64	167.92	306.59	438.78
pl_ppa_0_10	-14.08	126.32	177.74	72.37	202.74	276.79	-23.25	74.05	152.01
pl_ppa_40_50	-56.63	-50.50	-93.92	-39.78	-28.43	-28.41	-40.29	-32.27	-19.89
% 0-10	-1.7	15.1	21.2	12.2	34.2	46.7	-6.3	19.9	40.9
%40-50	-8.9	-5.6	-9.8	-7.8	-4.2	-3.8	-19.4	-9.5	-4.3

PLANNING UNIT PRODUCTIVITY SUMMARY

	NIA	ALT1	ALT2	NIA	ALT1	ALT2
PLAN_UNIT	3b	3b	3b	4	4	4
pl_ppa00	1089.71	1089.71	1089.71	1381.95	1381.95	1381.95
pl_ppa05	1108.77	1169.73	1206.44	1481.27	1659.94	1628.79
pl_ppa10	1076.58	1148.03	1194.67	1442.95	1632.45	1600.33
pl_ppa15	1046.71	1125.92	1182.57	1404.57	1604.19	1571.93
pl_ppa20	1017.47	1105.32	1169.65	1367.86	1577.66	1544.56
pl_ppa25	986.37	1084.18	1158.81	1331.13	1550.82	1517.49
pl_ppa30	960.60	1063.65	1145.51	1295.30	1523.12	1490.55
pl_ppa35	932.13	1040.77	1132.25	1256.08	1492.68	1460.32
pl_ppa40	902.00	1017.07	1119.81	1216.42	1461.48	1429.45
pl_ppa45	871.83	995.92	1101.60	1174.34	1420.99	1381.80
pl_ppa50	846.75	974.15	1087.90	1135.27	1390.95	1352.53
pl_ppa_0_10	-13.13	58.33	104.96	61.00	250.50	218.38
pl_ppa_40_50	-55.25	-42.92	-31.92	-81.15	-70.53	-76.92
% 0-10	-1.2	5.4	9.6	4.4	18.1	15.8
%40-50	-6.1	-4.2	-2.9	-6.7	-4.8	-5.4

4.4.4 Ecosystem Unit

ECOSYSTEM UNIT PRODUCTIVITY SUMMARY

	NIA	ALT1	ALT2	NIA	ALT1	ALT2	NIA	ALT1	ALT2
ECO_UNIT	EU1_1	EU1_1	EU1_1	EU1_10	EU1_10	EU1_10	EU1_2	EU1_2	EU1_2
eu_ppa00	175.01	175.01	175.01	57.01	57.01	57.01	38.31	38.31	38.31
eu_ppa05	174.51	173.91	175.49	70.38	67.52	67.60	43.71	48.08	53.68
eu_ppa10	167.58	170.01	171.05	64.12	65.51	65.58	42.79	47.37	52.70
eu_ppa15	161.19	166.57	167.08	57.99	63.21	63.28	41.85	46.63	51.65
eu_ppa20	154.58	162.77	162.83	52.53	61.05	61.12	40.67	45.67	50.55
eu_ppa25	148.42	159.33	158.91	46.07	58.88	58.76	39.72	44.95	49.49
eu_ppa30	142.50	156.17	155.27	39.80	57.11	56.86	38.77	44.23	48.42
eu_ppa35	136.81	152.90	151.64	33.72	54.90	54.89	37.91	43.54	47.45
eu_ppa40	131.08	149.61	148.01	28.32	53.53	53.53	37.00	42.77	46.48
eu_ppa45	125.70	146.63	144.61	23.01	51.85	51.72	36.25	42.08	45.07
eu_ppa50	120.41	143.52	141.23	18.42	49.98	49.67	35.57	41.42	44.30
eu_ppa_0_10	-7.43	-5.00	-3.96	7.11	8.50	8.57	4.48	9.06	14.40
eu_ppa_40_50	-10.67	-6.09	-6.78	-9.90	-3.55	-3.86	-1.43	-1.35	-2.18
% 0-10	-4.2	-2.9	-2.3	12.5	14.9	15.0	11.7	23.6	37.6
%40-50	-8.1	-4.1	-4.6	-35.0	-6.6	-7.2	-3.9	-3.2	-4.7

ECOSYSTEM UNIT PRODUCTIVITY SUMMARY

	NIA	ALT1	ALT2	NIA	ALT1	ALT2	NIA	ALT1	ALT2	NIA	ALT1	ALT2
ECO_UNIT	EU1_3	EU1_3	EU1_3	EU1_4	EU1_4	EU1_4	EU1_5	EU1_5	EU1_5	EU1_6	EU1_6	EU1_6
eu_ppa00	37.28	37.28	37.28	15.70	15.70	15.70	31.18	31.18	31.18	173.83	173.83	173.83
eu_ppa05	40.44	40.05	54.44	15.49	19.74	24.03	36.69	40.84	38.18	166.81	200.42	187.92
eu_ppa10	37.50	37.82	52.11	14.42	19.37	23.37	35.80	41.04	37.36	169.99	207.90	195.19
eu_ppa15	34.13	35.81	49.81	13.12	18.65	22.68	34.93	41.13	36.57	173.31	215.20	202.21
eu_ppa20	31.25	33.86	47.79	11.70	17.81	22.10	33.91	41.08	35.67	175.52	221.55	208.27
eu_ppa25	27.47	31.15	45.65	10.45	17.21	21.54	33.10	41.11	34.91	177.91	228.11	214.55
eu_ppa30	23.55	28.12	29.30	9.04	16.40	20.77	32.24	41.22	34.09	180.26	234.49	220.61
eu_ppa35	19.81	25.48	28.14	7.73	15.92	20.08	31.41	41.19	33.30	182.43	240.69	226.50
eu_ppa40	15.95	22.57	27.56	6.74	15.43	19.72	30.46	41.07	32.38	184.48	247.22	232.69
eu_ppa45	13.46	21.08	25.33	5.49	14.30	14.45	29.79	39.93	31.76	186.29	252.99	238.31
eu_ppa50	12.72	20.92	24.78	4.72	13.77	14.37	29.10	39.90	31.11	188.64	258.32	243.50
eu_ppa_0_10	0.22	0.54	14.83	-1.28	3.67	7.67	4.62	9.86	6.19	-3.83	34.08	21.36
eu_ppa_40_50	-3.23	-1.65	-2.77	-2.02	-1.66	-5.35	-1.36	-1.17	-1.27	4.16	11.10	10.81
% 0-10	0.6	1.4	39.8	-8.1	23.4	48.9	14.8	31.6	19.8	-2.2	19.6	12.3
%40-50	-20.2	-7.3	-10.1	-30.0	-10.8	-27.1	-4.5	-2.8	-3.9	2.3	4.5	4.6

ECOSYSTEM UNIT PRODUCTIVITY SUMMARY

	NIA	ALT1	ALT2	NIA	ALT1	ALT2	NIA	ALT1	ALT2	NIA	ALT1	ALT2
ECO_UNIT	EU1_7	EU1_7	EU1_7	EU1_8	EU1_8	EU1_8	EU1_9	EU1_9	EU1_9	EU2_1	EU2_1	EU2_1
eu_ppa00	148.44	148.44	148.44	158.54	158.54	158.54	3.25	3.25	3.25	151.30	151.30	151.30
eu_ppa05	155.87	197.81	196.86	147.05	173.22	213.38	2.87	11.71	12.06	150.40	154.62	161.71
eu_ppa10	152.91	203.04	206.69	136.74	161.94	201.03	2.60	10.86	11.19	148.89	156.52	164.03
eu_ppa15	149.32	214.48	228.17	125.63	150.06	188.38	1.91	10.00	10.39	147.24	158.40	167.51
eu_ppa20	144.44	217.99	235.05	116.89	140.73	177.33	1.08	9.25	9.62	145.72	159.74	169.80
eu_ppa25	140.53	221.04	240.30	105.79	128.72	164.86	0.59	8.58	8.93	144.29	160.94	171.69
eu_ppa30	136.50	222.87	245.25	96.66	118.83	153.72	0.39	7.95	8.29	142.73	162.06	173.73
eu_ppa35	131.39	222.55	247.22	86.50	107.82	142.63	0.00	7.38	7.70	141.23	162.62	174.99
eu_ppa40	126.90	227.85	259.09	75.10	96.12	130.48	0.00	6.84	7.15	139.66	163.87	177.59
eu_ppa45	122.24	229.67	265.59	63.11	64.98	55.20	0.00	6.34	6.34	138.09	164.70	179.28
eu_ppa50	117.70	230.24	267.77	52.12	54.43	46.42	0.00	0.00	0.00	136.71	165.20	180.30
eu_ppa_0_10	4.48	54.60	58.25	-21.80	3.40	42.49	-0.65	7.61	7.95	-2.41	5.23	12.74
eu_ppa_40_50	-9.20	2.39	8.69	-22.98	-41.69	-84.05	0.00	-6.84	-7.15	-2.95	1.33	2.70
% 0-10	3.0	36.8	39.2	-13.8	2.1	26.8	-20.0	234.2	244.5	-1.6	3.5	8.4
%40-50	-7.3	1.0	3.4	-30.6	-43.4	-64.4	#DIV/0!	-100.0	-100.0	-2.1	0.8	1.5

ECOSYSTEM UNIT PRODUCTIVITY SUMMARY

	NIA	ALT1	ALT2	NIA	ALT1	ALT2	NIA	ALT1	ALT2	NIA	ALT1	ALT2
ECO_UNIT	EU2_2	EU2_2	EU2_2	EU2_3	EU2_3	EU2_3	EU2_4	EU2_4	EU2_4	EU2_5	EU2_5	EU2_5
eu_ppa00	163.76	163.76	163.76	91.08	91.08	91.08	160.02	160.02	160.02	8.15	8.15	8.15
eu_ppa05	249.98	267.27	273.17	105.19	137.43	142.34	161.84	226.61	281.03	7.23	20.49	21.05
eu_ppa10	245.12	262.95	268.07	100.99	133.56	138.41	143.78	208.84	264.87	5.90	14.48	15.01
eu_ppa15	240.14	258.53	262.83	97.49	130.91	135.74	127.49	194.66	252.54	5.13	17.62	18.27
eu_ppa20	235.58	254.53	258.06	93.75	127.81	132.61	111.47	180.25	240.14	3.73	12.06	12.53
eu_ppa25	230.83	250.33	253.06	89.72	124.30	129.03	95.52	166.61	229.24	2.77	14.64	15.20
eu_ppa30	225.84	245.82	247.76	86.08	121.30	125.99	83.15	149.03	198.93	2.02	9.99	10.35
eu_ppa35	220.80	241.16	242.34	82.38	117.94	122.43	71.01	139.67	191.93	1.60	12.59	13.18
eu_ppa40	216.61	237.28	237.89	78.52	114.55	118.98	60.60	132.30	188.08	1.18	8.68	9.09
eu_ppa45	212.10	233.12	233.10	74.27	110.43	114.69	50.12	126.45	180.50	0.86	11.06	11.78
eu_ppa50	207.56	228.84	228.22	70.49	107.05	111.23	42.67	122.28	177.89	0.49	6.03	6.66
eu_ppa_0_10	81.36	99.20	104.31	9.91	42.47	47.33	-16.24	48.82	104.85	-2.25	6.33	6.86
eu_ppa_40_50	-9.06	-8.44	-9.67	-8.03	-7.50	-7.75	-17.93	-10.02	-10.19	-0.69	-2.65	-2.44
% 0-10	49.7	60.6	63.7	10.9	46.6	52.0	-10.1	30.5	65.5	-27.6	77.7	84.1
%40-50	-4.2	-3.6	-4.1	-10.2	-6.5	-6.5	-29.6	-7.6	-5.4	-58.8	-30.5	-26.8

ECOSYSTEM UNIT PRODUCTIVITY SUMMARY

	NIA	ALT1	ALT2	NIA	ALT1	ALT2	NIA	ALT1	ALT2	NIA	ALT1	ALT2
ECO_UNIT	EU2_6	EU2_6	EU2_6	EU3a_1	EU3a_1	EU3a_1	EU3a_2	EU3a_2	EU3a_2	EU3a_3	EU3a_3	EU3a_3
eu_ppa00	18.52	18.52	18.52	77.60	77.60	77.60	69.84	69.84	69.84	13.28	13.28	13.28
eu_ppa05	21.18	19.99	20.00	76.63	80.92	85.37	68.41	73.73	76.28	13.50	14.64	15.23
eu_ppa10	20.52	19.21	19.22	74.75	80.96	85.50	65.17	73.63	76.65	13.01	14.74	15.33
eu_ppa15	19.70	18.54	18.55	72.73	80.80	85.33	62.28	73.37	76.97	12.45	14.83	15.40
eu_ppa20	19.09	18.13	18.14	71.03	80.90	85.66	59.22	73.02	77.14	12.04	14.90	15.46
eu_ppa25	17.92	17.10	17.10	69.13	81.05	85.60	56.68	72.74	77.35	11.53	15.09	15.71
eu_ppa30	17.18	16.33	16.28	67.51	80.92	85.62	54.01	72.54	77.40	11.13	15.28	15.90
eu_ppa35	16.72	15.84	15.85	66.14	80.68	85.46	51.23	72.15	77.68	10.70	15.41	15.95
eu_ppa40	16.23	15.56	15.41	65.03	80.44	85.42	48.69	71.78	77.73	10.28	15.46	15.99
eu_ppa45	15.68	14.93	14.79	63.59	80.24	85.29	45.16	71.61	77.91	9.87	15.50	16.02
eu_ppa50	15.11	14.41	14.34	62.52	80.00	85.11	40.68	71.32	78.02	8.50	15.67	16.17
eu_ppa_0_10	2.00	0.69	0.70	-2.85	3.36	7.90	-4.67	3.79	6.81	-0.27	1.46	2.05
eu_ppa_40_50	-1.13	-1.15	-1.07	-2.51	-0.44	-0.31	-8.01	-0.46	0.28	-1.78	0.21	0.18
% 0-10	10.8	3.7	3.8	-3.7	4.3	10.2	-6.7	5.4	9.8	-2.0	11.0	15.4
%40-50	-6.9	-7.4	-7.0	-3.9	-0.5	-0.4	-16.5	-0.6	0.4	-17.3	1.4	1.1

ECOSYSTEM UNIT PRODUCTIVITY SUMMARY

	NIA	ALT1	ALT2	NIA	ALT1	ALT2	NIA	ALT1	ALT2	NIA	ALT1	ALT2
ECO_UNIT	EU3a_4	EU3a_4	EU3a_4	EU3a_5	EU3a_5	EU3a_5	EU3a_6	EU3a_6	EU3a_6	EU3a_7	EU3a_7	EU3a_7
eu_ppa00	94.76	94.76	94.76	73.13	73.13	73.13	2.36	2.36	2.36	40.67	40.67	40.67
eu_ppa05	96.70	124.30	148.74	79.04	118.17	154.09	2.17	9.91	9.92	40.00	45.44	47.04
eu_ppa10	84.42	112.87	140.80	71.44	111.24	151.56	1.80	6.54	6.54	37.78	45.69	47.24
eu_ppa15	73.48	102.69	134.04	64.05	104.56	149.20	1.63	8.84	8.85	35.90	45.79	47.36
eu_ppa20	62.51	92.99	127.31	56.85	98.84	147.26	1.40	5.87	5.87	34.14	45.60	47.19
eu_ppa25	52.34	84.15	120.37	49.29	92.27	145.33	1.16	7.89	7.89	31.99	45.98	47.52
eu_ppa30	43.31	60.98	106.49	42.16	83.93	139.99	1.00	5.22	5.23	30.11	45.94	47.49
eu_ppa35	34.81	52.67	98.64	35.52	75.78	132.88	0.69	7.11	7.11	28.22	46.32	48.06
eu_ppa40	27.87	48.87	94.76	29.50	71.35	132.06	0.61	4.71	4.71	26.24	46.25	47.98
eu_ppa45	20.96	43.48	90.78	23.85	52.33	120.92	0.48	6.37	6.37	23.37	45.92	47.63
eu_ppa50	16.53	41.72	88.26	18.83	49.41	121.12	0.43	2.68	2.68	20.44	45.78	47.42
eu_ppa_0_10	-10.34	18.11	46.05	-1.69	38.12	78.43	-0.55	4.18	4.19	-2.88	5.02	6.57
eu_ppa_40_50	-11.33	-7.15	-6.50	-10.67	-21.94	-10.94	-0.18	-2.03	-2.03	-5.81	-0.47	-0.56
% 0-10	-10.9	19.1	48.6	-2.3	52.1	107.3	-23.4	177.6	177.9	-7.1	12.4	16.2
%40-50	-40.7	-14.6	-6.9	-36.2	-30.8	-8.3	-29.8	-43.1	-43.1	-22.1	-1.0	-1.2

ECOSYSTEM UNIT PRODUCTIVITY SUMMARY

	NIA	ALT1	ALT2	NIA	ALT1	ALT2	NIA	ALT1	ALT2	NIA	ALT1	ALT2
ECO_UNIT	EU3b_1	EU3b_1	EU3b_1	EU3b_2	EU3b_2	EU3b_2	EU3b_3	EU3b_3	EU3b_3	EU3b_4	EU3b_4	EU3b_4
eu_ppa00	108.42	108.42	108.42	354.65	354.65	354.65	17.74	17.74	17.74	109.71	109.71	109.71
eu_ppa05	102.96	100.78	116.29	339.16	383.29	399.69	19.38	19.99	23.19	114.36	119.27	124.66
eu_ppa10	96.07	94.12	114.03	321.36	380.97	400.53	19.92	20.01	25.03	115.58	119.72	125.66
eu_ppa15	88.93	87.06	111.76	303.85	378.05	400.64	20.25	19.96	26.02	116.29	120.30	127.42
eu_ppa20	82.18	80.42	109.65	285.38	375.59	400.71	20.57	19.91	26.47	116.82	120.66	128.08
eu_ppa25	75.05	73.45	107.22	264.85	372.90	401.47	21.41	19.86	27.53	117.51	121.03	129.02
eu_ppa30	68.50	67.01	104.85	244.88	369.79	400.43	22.79	19.75	28.19	118.11	121.74	130.11
eu_ppa35	60.76	59.64	101.97	222.81	365.49	399.46	23.64	19.78	28.71	118.67	122.00	130.78
eu_ppa40	53.34	52.34	99.63	200.45	359.32	397.96	23.98	19.82	28.87	118.82	122.04	132.13
eu_ppa45	46.66	45.74	91.50	180.06	355.56	397.43	24.30	20.05	29.07	118.99	122.08	133.80
eu_ppa50	39.23	38.60	89.28	166.31	352.71	395.81	24.40	20.08	29.22	119.33	121.83	134.91
eu_ppa_0_10	-12.35	-14.30	5.61	-33.29	26.32	45.88	2.18	2.27	7.29	5.87	10.00	15.94
eu_ppa_40_50	-14.11	-13.74	-10.34	-34.15	-6.62	-2.15	0.43	0.26	0.35	0.50	-0.20	2.78
% 0-10	-11.4	-13.2	5.2	-9.4	7.4	12.9	12.3	12.8	41.1	5.4	9.1	14.5
%40-50	-26.5	-26.2	-10.4	-17.0	-1.8	-0.5	1.8	1.3	1.2	0.4	-0.2	2.1

ECOSYSTEM UNIT PRODUCTIVITY SUMMARY

	NIA	***ALT1***	***ALT2***	**NIA**	**ALT1**	**ALT2**	**NIA**	**ALT1**	**ALT2**	**NIA**	**ALT1**	**ALT2**
ECO_UNIT	EU3b_5	EU3b_5	EU3b_5	EU3b_6	EU3b_6	EU3b_6	EU3b_7	EU3b_7	EU3b_7	EU3b_8	EU3b_8	EU3b_8
eu_ppa00	13.64	13.64	13.64	121.84	121.84	121.84	0.43	0.43	0.43	245.26	245.26	245.26
eu_ppa05	21.61	17.99	18.35	127.87	135.07	131.10	0.43	3.35	0.45	259.99	265.58	266.80
eu_ppa10	26.68	18.66	19.04	125.82	133.01	129.05	0.50	3.35	0.52	250.30	256.42	257.17
eu_ppa15	33.94	19.32	19.73	123.73	130.83	127.07	0.50	3.28	0.52	241.31	247.62	248.31
eu_ppa20	42.19	20.29	20.78	121.51	128.68	124.85	0.51	3.21	0.53	232.67	239.30	239.80
eu_ppa25	50.40	21.31	22.11	119.29	126.40	122.54	0.51	3.15	0.53	224.17	231.16	231.55
eu_ppa30	61.85	21.86	22.79	117.09	124.15	120.43	0.52	3.08	0.54	215.93	223.38	223.40
eu_ppa35	74.03	22.51	24.12	115.32	122.26	118.67	0.58	3.08	0.60	207.51	215.13	215.18
eu_ppa40	84.85	23.67	25.66	113.07	119.94	116.42	0.59	3.03	0.61	200.04	207.85	207.78
eu_ppa45	93.54	24.92	26.75	110.90	117.88	114.23	0.59	2.97	0.62	192.06	199.65	199.83
eu_ppa50	102.41	26.11	28.64	108.85	115.78	112.28	0.60	2.92	0.63	183.12	191.08	191.04
eu_ppa_0_10	13.04	5.02	5.40	3.97	11.17	7.21	0.07	2.91	0.09	5.04	11.15	11.91
eu_ppa_40_50	17.56	2.44	2.98	-4.22	-4.16	-4.13	0.01	-0.11	0.01	-16.92	-16.77	-16.74
% 0-10	95.5	36.8	39.6	3.3	9.2	5.9	15.3	672.6	19.9	2.1	4.5	4.9
%40-50	20.7	10.3	11.6	-3.7	-3.5	-3.6	2.0	-3.6	2.0	-8.5	-8.1	-8.1

ECOSYSTEM UNIT PRODUCTIVITY SUMMARY

	NIA	ALT1	ALT2	NIA	ALT1	ALT2	NIA	ALT1	ALT2	NIA	ALT1	ALT2
ECO_UNIT	EU3b_9	EU3b_9	EU3b_9	EU4_1a	EU4_1a	EU4_1a	EU4_1b	EU4_1b	EU4_1b	EU4_1c	EU4_1c	EU4_1c
eu_ppa00	118.00	118.00	118.00	117.26	117.26	117.26	252.00	252.00	252.00	99.21	99.21	99.21
eu_ppa05	123.01	124.41	125.90	115.42	116.09	117.30	251.55	274.09	273.56	102.12	122.66	121.39
eu_ppa10	120.35	121.79	123.63	113.68	114.38	115.59	246.75	269.64	269.02	100.30	122.98	121.81
eu_ppa15	117.90	119.49	121.09	111.93	112.65	113.87	242.44	265.55	265.00	98.26	122.92	121.81
eu_ppa20	115.66	117.26	118.78	110.20	110.96	112.19	238.32	261.91	261.27	96.42	123.12	122.22
eu_ppa25	113.17	114.92	116.84	108.20	109.12	110.36	234.14	258.06	257.40	94.92	123.20	122.23
eu_ppa30	110.93	112.88	114.77	106.56	107.56	108.80	229.84	254.11	253.36	93.16	123.23	122.44
eu_ppa35	108.81	110.88	112.76	104.76	105.78	107.03	225.84	250.11	249.35	91.48	123.05	122.52
eu_ppa40	106.85	109.06	110.77	103.06	104.10	105.36	221.52	245.90	245.13	89.49	122.48	122.20
eu_ppa45	104.72	107.06	108.36	101.21	102.32	103.58	217.14	241.73	240.96	87.75	121.96	121.89
eu_ppa50	102.51	105.03	106.10	99.56	100.55	101.81	213.10	237.77	237.00	85.79	121.50	121.59
eu_ppa_0_10	2.35	3.78	5.63	-3.58	-2.88	-1.67	-5.25	17.64	17.02	1.09	23.77	22.60
eu_ppa_40_50	-4.34	-4.02	-4.67	-3.50	-3.55	-3.54	-8.42	-8.13	-8.13	-3.70	-0.97	-0.61
% 0-10	2.0	3.2	4.8	-3.1	-2.5	-1.4	-2.1	7.0	6.8	1.1	24.0	22.8
%40-50	-4.1	-3.7	-4.2	-3.4	-3.4	-3.4	-3.8	-3.3	-3.3	-4.1	-0.8	-0.5

ECOSYSTEM UNIT PRODUCTIVITY SUMMARY

	NIA	ALT1	ALT2	NIA	ALT1	ALT2	NIA	ALT1	ALT2	NIA	ALT1	ALT2
ECO_UNIT	EU4_1d	EU4_1d	EU4_1d	EU4_1e	EU4_1e	EU4_1e	EU4_1f	EU4_1f	EU4_1f	EU4_2a	EU4_2a	EU4_2a
eu_ppa00	60.85	60.85	60.85	101.44	101.44	101.44	45.73	45.73	45.73	157.24	157.24	157.24
eu_ppa05	62.13	67.78	67.60	96.44	115.75	116.19	44.16	46.98	48.38	166.03	167.04	179.91
eu_ppa10	60.38	66.07	66.87	91.62	114.06	116.34	42.79	46.66	49.05	158.75	160.05	172.67
eu_ppa15	58.75	64.64	66.27	86.61	111.89	116.38	41.07	46.11	50.01	151.71	153.17	165.55
eu_ppa20	57.06	62.95	65.29	82.44	110.32	116.47	39.57	45.96	51.04	144.90	146.37	158.52
eu_ppa25	55.41	61.31	64.56	77.83	108.43	116.64	37.63	45.57	51.94	137.81	139.65	151.57
eu_ppa30	53.88	59.87	63.83	73.62	106.34	116.70	35.95	44.97	52.94	131.35	133.36	145.06
eu_ppa35	52.02	58.31	62.94	69.13	104.71	116.98	34.75	44.98	53.65	122.54	124.91	136.57
eu_ppa40	50.18	56.55	62.16	64.92	102.84	117.08	33.41	44.93	54.33	112.24	115.13	126.57
eu_ppa45	48.46	54.98	61.27	59.98	99.55	116.37	31.96	44.78	55.29	101.00	104.12	114.25
eu_ppa50	46.39	53.11	60.01	54.89	97.43	116.59	30.58	44.48	55.76	92.46	96.16	106.13
eu_ppa_0_10	-0.48	5.21	6.01	-9.82	12.62	14.89	-2.94	0.92	3.31	1.50	2.81	15.43
eu_ppa_40_50	-3.79	-3.44	-2.15	-10.03	-5.41	-0.49	-2.83	-0.45	1.44	-19.78	-18.97	-20.44
% 0-10	-0.8	8.6	9.9	-9.7	12.4	14.7	-6.4	2.0	7.2	1.0	1.8	9.8
%40-50	-7.5	-6.1	-3.5	-15.5	-5.3	-0.4	-8.5	-1.0	2.6	-17.6	-16.5	-16.1

ECOSYSTEM UNIT PRODUCTIVITY SUMMARY

	NIA	ALT1	ALT2	NIA	ALT1	ALT2	NIA	ALT1	ALT2	NIA	ALT1	ALT2
ECO_UNIT	EU4_2b	EU4_2b	EU4_2b	EU4_3a	EU4_3a	EU4_3a	EU4_3b	EU4_3b	EU4_3b	EU4_3c	EU4_3c	EU4_3c
eu_ppa00	89.91	89.91	89.91	21.34	21.34	21.34	66.88	66.88	66.88	0.07	0.07	0.07
eu_ppa05	91.04	92.56	103.36	29.86	30.39	29.96	70.38	70.51	70.66	0.07	0.07	0.07
eu_ppa10	88.64	90.44	100.90	29.03	29.78	29.36	69.06	69.33	69.48	0.07	0.07	0.07
eu_ppa15	86.31	88.35	98.48	28.30	28.89	28.47	67.81	68.18	68.35	0.07	0.07	0.07
eu_ppa20	83.96	86.28	96.10	27.65	28.27	27.86	66.44	66.95	67.11	0.07	0.07	0.07
eu_ppa25	81.93	84.36	93.88	26.81	27.46	27.07	65.24	65.76	65.92	0.07	0.07	0.07
eu_ppa30	79.84	82.36	91.28	25.96	26.76	26.37	64.01	64.58	64.74	0.00	0.00	0.00
eu_ppa35	77.20	80.04	88.70	25.24	26.05	25.67	62.74	63.41	63.57	0.00	0.00	0.00
eu_ppa40	75.02	77.98	86.39	24.43	25.38	25.01	61.62	62.34	62.49	0.00	0.00	0.00
eu_ppa45	72.99	76.17	80.94	23.83	24.86	24.50	60.51	61.35	61.50	0.00	0.00	0.00
eu_ppa50	70.48	73.93	78.63	22.98	24.08	23.73	59.53	60.33	60.48	0.00	0.00	0.00
eu_ppa_0_10	-1.27	0.53	10.99	7.69	8.44	8.02	2.18	2.45	2.59	0.00	0.01	0.00
eu_ppa_40_50	-4.54	-4.05	-7.76	-1.45	-1.30	-1.28	-2.09	-2.01	-2.01	0.00	0.00	0.00
% 0-10	-1.4	0.6	12.2	36.0	39.5	37.6	3.3	3.7	3.9	-0.3	7.4	0.1
%40-50	-6.1	-5.2	-9.0	-5.9	-5.1	-5.1	-3.4	-3.2	-3.2	0.0	0.0	0.0

ECOSYSTEM UNIT PRODUCTIVITY SUMMARY

	NIA	ALT1	ALT2	NIA	ALT1	ALT2	NIA	ALT1	ALT2	NIA	ALT1	ALT2
ECO_UNIT	EU4_4a	EU4_4a	EU4_4a	EU4_4b	EU4_4b	EU4_4b	EU4_4c	EU4_4c	EU4_4c	EU4_4d	EU4_4d	EU4_4d
eu_ppa00	10.89	10.89	10.89	55.57	55.57	55.57	0.90	0.90	0.90	50.63	50.63	50.63
eu_ppa05	11.03	11.11	11.11	64.87	74.95	79.40	1.02	1.05	1.02	61.43	60.95	61.50
eu_ppa10	10.68	10.76	10.76	61.98	71.67	75.96	1.00	1.04	1.00	60.47	59.99	60.54
eu_ppa15	10.43	10.49	10.49	58.51	67.96	72.01	0.92	0.96	0.93	59.44	58.97	59.51
eu_ppa20	10.29	10.36	10.36	55.28	64.45	68.40	0.91	0.94	0.91	58.27	57.81	58.34
eu_ppa25	10.08	10.15	10.15	52.16	61.02	64.83	0.88	0.93	0.88	57.24	56.78	57.31
eu_ppa30	9.88	9.95	9.95	48.79	57.39	61.10	0.86	0.92	0.87	56.32	55.87	56.38
eu_ppa35	9.59	9.66	9.66	44.89	53.16	56.65	0.85	0.91	0.86	55.34	54.90	55.41
eu_ppa40	9.47	9.53	9.53	41.59	49.61	53.00	0.79	0.84	0.80	54.45	54.01	54.51
eu_ppa45	9.21	9.27	9.27	38.25	40.10	39.63	0.78	0.83	0.79	53.30	52.87	53.37
eu_ppa50	8.97	9.03	9.02	34.95	36.66	36.38	0.77	0.80	0.78	52.31	51.88	52.37
eu_ppa_0_10	-0.20	-0.13	-0.13	6.41	16.10	20.38	0.10	0.14	0.11	9.84	9.36	9.91
eu_ppa_40_50	-0.51	-0.51	-0.51	-6.64	-12.95	-16.61	-0.02	-0.04	-0.02	-2.14	-2.13	-2.15
% 0-10	-1.9	-1.2	-1.2	11.5	29.0	36.7	11.5	15.4	11.7	19.4	18.5	19.6
%40-50	-5.3	-5.3	-5.3	-16.0	-26.1	-31.3	-2.7	-5.3	-2.6	-3.9	-3.9	-3.9

ECOSYSTEM UNIT PRODUCTIVITY SUMMARY

	NIA	ALT1	ALT2	NIA	ALT1	ALT2	NIA	ALT1	ALT2	NIA	ALT1	ALT2
ECO_UNIT	EU4_4e	EU4_4e	EU4_4e	EU4_4f	EU4_4f	EU4_4f	EU4_4g	EU4_4g	EU4_4g	EU4_4h	EU4_4h	EU4_4h
eu_ppa00	32.47	32.47	32.47	4.33	4.33	4.33	76.06	76.06	76.06	5.53	5.53	5.53
eu_ppa05	53.57	81.28	69.27	11.24	35.69	28.80	81.10	82.23	81.23	15.32	17.17	15.32
eu_ppa10	52.58	80.01	68.04	10.84	35.07	28.15	79.76	80.88	79.88	15.03	16.99	15.03
eu_ppa15	51.66	78.66	66.90	10.43	34.45	27.50	78.26	79.36	78.38	14.67	16.97	14.67
eu_ppa20	50.58	77.12	65.65	10.13	33.92	26.96	76.78	77.83	76.90	14.33	16.77	14.32
eu_ppa25	49.76	75.88	64.61	9.92	33.47	26.57	75.44	76.48	75.56	13.98	16.50	13.98
eu_ppa30	48.89	74.60	63.51	9.53	32.81	25.95	74.19	75.21	74.31	13.71	16.38	13.71
eu_ppa35	47.77	73.01	62.18	9.27	32.30	25.51	72.83	73.82	72.94	13.32	16.05	13.31
eu_ppa40	46.50	71.24	60.76	8.94	31.72	24.96	71.43	72.41	71.54	13.05	15.86	13.05
eu_ppa45	45.61	69.93	59.66	8.52	30.99	24.31	70.12	71.08	70.23	12.73	15.69	12.73
eu_ppa50	44.88	68.83	58.71	8.33	30.57	23.84	68.65	69.57	68.75	12.41	15.73	12.41
eu_ppa_0_10	20.10	47.54	35.57	6.51	30.75	23.82	3.70	4.82	3.83	9.50	11.47	9.50
eu_ppa_40_50	-1.62	-2.41	-2.05	-0.61	-1.14	-1.12	-2.79	-2.84	-2.79	-0.64	-0.13	-0.64
% 0-10	61.9	146.4	109.5	150.5	710.7	550.6	4.9	6.3	5.0	172.0	207.5	171.9
%40-50	-3.5	-3.4	-3.4	-6.8	-3.6	-4.5	-3.9	-3.9	-3.9	-4.9	-0.8	-4.9

ECOSYSTEM UNIT PRODUCTIVITY SUMMARY

	NIA	ALT1	ALT2	NIA	ALT1	ALT2	NIA	ALT1	ALT2	NIA	ALT1	ALT2
ECO_UNIT	EU4_4i	EU4_4i	EU4_4i	EU4_4j	EU4_4j	EU4_4j	EU4_4k	EU4_4k	EU4_4k	EU4_4l	EU4_4l	EU4_4l
eu_ppa00	42.75	42.75	42.75	21.33	21.33	21.33	69.54	69.54	69.54	0.00	0.00	0.00
eu_ppa05	50.79	65.78	50.91	33.18	38.58	33.22	68.50	87.21	68.64	0.00	0.00	0.00
eu_ppa10	49.73	67.37	49.85	32.47	37.84	32.52	67.34	87.38	67.47	0.00	0.00	0.00
eu_ppa15	48.95	69.24	49.07	32.05	37.45	32.10	66.00	87.28	66.13	0.00	0.00	0.00
eu_ppa20	48.17	71.11	48.29	31.43	36.95	31.48	64.68	87.23	64.81	0.00	0.00	0.00
eu_ppa25	47.40	72.96	47.53	30.84	36.42	30.89	63.43	87.22	63.55	0.00	0.00	0.00
eu_ppa30	46.72	74.26	46.84	30.29	35.95	30.34	61.95	86.65	62.08	0.00	0.00	0.00
eu_ppa35	45.92	75.42	46.05	29.72	35.51	29.77	60.89	86.58	61.00	0.00	0.00	0.00
eu_ppa40	45.06	76.96	45.19	29.34	35.15	29.39	59.89	86.51	60.01	0.00	0.00	0.00
eu_ppa45	43.97	78.18	44.09	28.67	34.46	28.72	58.34	85.77	58.45	0.00	0.00	0.00
eu_ppa50	43.13	79.31	43.26	28.06	33.88	28.11	57.06	85.33	57.17	0.00	0.00	0.00
eu_ppa_0_10	6.98	24.62	7.10	11.13	16.51	11.18	-2.20	17.84	-2.07	0.00	0.00	0.00
eu_ppa_40_50	-1.93	2.34	-1.93	-1.28	-1.26	-1.28	-2.83	-1.18	-2.84	0.00	0.00	0.00
% 0-10	16.3	57.6	16.6	52.2	77.4	52.4	-3.2	25.7	-3.0	0	0	0
%40-50	-4.3	3.0	-4.3	-4.4	-3.6	-4.4	-4.7	-1.4	-4.7	0	0	0

4.5 Habitat Suitability: Coastwide and Planning Unit Summary

In this section, model output for habitat suitability is presented. Habitat suitability is determined by first rating individual factors (e.g., water temperature) from zero to one (quality value) in spatial cells, then the ratings of multiple factors in each spatial cell are combined to obtain a single value for each cell. Finally, the values are summed over spatial cells to obtain an overall quality-weighted habitat use index value for a particular spatial area. Information below also contains the change in rate at different time steps (years 0 to 10 and years 0 to 50), and the percent change this represents, is provided at the coastwide and planning unit scales. No increased action output is compared to that of Alternative 1 and Alternative 2 at these time steps as well.

The following is a key to the first column of the habitat suitability table:

PU = planning unit

Croaker = Atlantic croaker

Trout = spotted sea trout

Menhaden = Gulf menhaden

Br Sh = brown shrimp

Wh Sh = white shrimp

Oyster = oyster

Mink = mink

Otter = otter

Muskrat = muskrat

Allig = American alligator

Duck = dabbling ducks

Habitat Suitability Summary

Coastwide											
vs No Action	net Alt 1 Yr 10	%	net Alt 2 Yr 10	%	**vs Yr 0**	net Alt 1 Yr 10	%	net Alt 2 Yr 10	%	No Action	%
Croaker	-11286	-11	-10857	-11	Croaker	-5911	-6	-5482	-6	5375	6
Trout	-22676	-7	-19759	-6	Trout	-21018	-7	-18101	-6	1658	1
Menhaden	-19025	-18	-16459	-16	Menhaden	-13830	-14	-11264	-11	5195	5
Br Sh	-15909	-12	-14431	-10	Br Sh	-11059	-8	-9580	-7	4851	4
Wh Sh	-13239	-10	-11735	-8	Wh Sh	-5959	-5	-4455	-3	7280	6
Oyster	-15265	-6	-14243	-6	Oyster	-14472	-6	-13450	-6	793	0
Mink	-585	-3	-1006	-5	Mink	2720	15	2299	13	3305	18
Otter	-714	-3	-1123	-5	Otter	1972	10	1563	8	2686	14
Muskrat	1364	4	2844	7	Muskrat	-122	0	1359	3	-1486	-4
Allig	1629	10	1522	9	Allig	3050	20	2943	19	1421	9
Duck	3212	18	2431	13	Duck	3659	21	2878	16	447	3
	Number '-	6		6		Number '-	5		5		0
	Number '+	2		3		Number '+	4		4		5

vs No Action	net Alt 1 Yr 50	%	net Alt 2 Yr 50	%	**vs Yr 0**	net Alt 1 Yr 50	%	net Alt 2 Yr 50	%	No Action	%
Croaker	-14613	-14	-14191	-13	Croaker	-3252	-3	-2829	-3	11362	12
Trout	-22931	-7	-19775	-6	Trout	-20468	-7	-17311	-6	2463	1
Menhaden	-20511	-19	-17593	-16	Menhaden	-12507	-13	-9589	-10	8003	8
Br Sh	-17696	-13	-15655	-11	Br Sh	-9331	-7	-7290	-5	8365	6
Wh Sh	-16353	-11	-14041	-10	Wh Sh	-3491	-3	-1179	-1	12862	10
Oyster	-15761	-7	-14662	-6	Oyster	-13540	-6	-12441	-5	2221	1
Mink	-909	-5	-950	-5	Mink	-701	-4	-742	-4	208	1
Otter	-1031	-6	-958	-5	Otter	-1651	-9	-1579	-8	-621	-3
Muskrat	2914	9	5058	15	Muskrat	-4067	-10	-1924	-5	-6981	-18
Allig	-1968	-10	-492	-2	Allig	2469	16	3945	26	4438	29
Duck	182	1	691	3	Duck	5239	29	5749	32	5058	28
	Number '-	8		6		Number '-	6		3		1
	Number '+	1		1		Number '+	2		2		6

PU1										
vs No Action	net Alt 1 Yr 10	%	net Alt 2 Yr 10	%	**vs Yr 0**	net Alt 1 Yr 10	%	net Alt 2 Yr 10	%	No Action	%
Croaker	-3891	-12	-3854	-12	Croaker	-2606	-8	-2569	-8	1285	4
Trout	-9656	-28	-9467	-28	Trout	-9475	-28	-9286	-27	181	1
Menhaden	-7782	-20	-7539	-19	Menhaden	-6309	-17	-6065	-16	1474	4
Br Sh	-5247	-27	-4898	-25	Br Sh	-3892	-21	-3543	-20	1355	7
Wh Sh	-4563	-18	-4100	-17	Wh Sh	-2341	-10	-1878	-8	2222	10
Oyster	-7644	-36	-7711	-36	Oyster	-7517	-36	-7584	-36	127	1
Mink	-256	-7	-313	-8.6	Mink	922	37	866	35	1178	48
Otter	-237	-7	-359	-9.9	Otter	512	18	390	14	750	26
Muskrat	336	5	779	12.5	Muskrat	-244	-4	199	3	-580	-8
Allig	592	23	349	13.3	Allig	346	12	102	4	-246	-9
Duck	1212	45	1150	42.4	Duck	1262	47	1200	45	50	2
	Number '-	8		8		Number '-	6		6		2
	Number '+	2		3		Number '+	4		3		4

vs No Action	net Alt 1 Yr 50	%	net Alt 2 Yr 50	%	**vs Yr 0**	net Alt 1 Yr 50	%	net Alt 2 Yr 50	%	No Action	%
Croaker	-4908	-14	-4645	-14	Croaker	-2411	-7.7	-2148	-6.8	2497	8
Trout	-9746	-28	-9456	-28	Trout	-9532	-28	-9242	-27	214	1
Menhaden	-8116	-20	-7650	-19	Menhaden	-6249	-16	-5783	-15	1867	5
Br Sh	-5528	-28	-4910	-25	Br Sh	-3722	-20	-3103	-17	1807	10
Wh Sh	-5023	-20	-4149	-16	Wh Sh	-2014	-8.9	-1141	-5	3009	13
Oyster	-7737	-36	-7759	-36	Oyster	-7340	-35	-7362	-35	397	2
Mink	519	27	596	31.4	Mink	-49	-2	28	1	-568	-23
Otter	392	20	468	23.6	Otter	-499	-17	-423	-15	-891	-31
Muskrat	820	17	1055	21.8	Muskrat	-1162	-17	-926	-14	-1981	-29
Allig	225	9	678	26.4	Allig	-80	-2.8	373	13	-305	-11
Duck	393	10	981	25.4	Duck	1589	59.7	2177	81.8	1196	45
	Number '-	6		6		Number '-	8		7		4
	Number '+	5		5		Number '+	1		2		4

PU2											
vs No Action	net Alt 1 Yr 10	%	net Alt 2 Yr 10	%	**vs Yr 0**	net Alt 1 Yr 10	%	net Alt 2 Yr 10	%	No Action	%
Croaker	-4213	-26	-4258	-26	Croaker	-3253	-21	-3297	-22	960	6
Trout	-9681	-58	-9693	-58	Trout	-9326	-57	-9338	-57	355	2
Menhaden	-6164	-36	-6119	-36	Menhaden	-5318	-33	-5272	-32	846	5
Br Sh	-6608	-58	-6594	-58	Br Sh	-5907	-55	-5892	-55	701	7
Wh Sh	-4393	-33	-4374	-33	Wh Sh	-3337	-27	-3318	-27	1056	9
Oyster	-5193	-55	-5199	-55	Oyster	-5041	-54	-5046	-54	152	2
Mink	-220	-8	-310	-11	Mink	538	27	447	23	757	39
Otter	-282	-10	-407	-14	Otter	495	24	370	18	777	37
Muskrat	224	5	427	9.24	Muskrat	-387	-7	-184	-4	-611	-12
Allig	468	21	975	43.8	Allig	1100	69	1607	101	631	40
Duck	1256	80	1401	88.9	Duck	1020	56	1165	64	-236	-13
	Number '-	8		8		Number '-	7		6		2
	Number '+	2		3		Number '+	4		4		6

vs No Action	net Alt 1 Yr 50	%	net Alt 2 Yr 50	%	**vs Yr 0**	net Alt 1 Yr 50	%	net Alt 2 Yr 50	%	No Action	%
Croaker	-5082	-30	-5162	-30	Croaker	-3036	-20	-3116	-21	2046	13
Trout	-9665	-57	-9669	-58	Trout	-9301	-57	-9304	-57	364	2
Menhaden	-6490	-37	-6434	-37	Menhaden	-5347	-33	-5291	-32	1143	7
Br Sh	-6841	-59	-6758	-58	Br Sh	-5998	-56	-5916	-55	843	7.9
Wh Sh	-5105	-37	-4977	-36	Wh Sh	-3566	-29	-3439	-28	1539	13
Oyster	-5418	-56	-5430	-56	Oyster	-4957	-53	-4969	-54	461	5
Mink	-1053	-41	-1049	-40	Mink	-420	-21	-415	-21	633	32
Otter	-1010	-39	-1006	-39	Otter	-507	-24	-503	-24	503	24
Muskrat	707	20	974	28.2	Muskrat	-1069	-20	-803	-15	-1777	-34
Allig	-819	-29	-385	-14	Allig	381	23.9	815	51.1	1200	75
Duck	406	17	697	29.8	Duck	932	51.5	1224	67.6	527	29
	Number '-	9		9		Number '-	9		9		1
	Number '+	2		2		Number '+	2		2		8

PU3a											
vs No Action	net Alt 1 Yr 10	%	net Alt 2 Yr 10	%	**vs Yr 0**	net Alt 1 Yr 10	%	net Alt 2 Yr 10	%	No Action	%
Croaker	-553	-4	-780	-5.9	Croaker	163	1	-64	-1	716	5.7
Trout	-212	-2	-218	-1.7	Trout	-153	-1	-159	-1	59	0.5
Menhaden	-261	-2	-291	-2.3	Menhaden	81	1	51	0	342	2.8
Br Sh	-171	-2	-183	-2	Br Sh	165	2	152	2	336	3.8
Wh Sh	-226	-2	-250	-2.4	Wh Sh	328	3	303	3	553	5.7
Oyster	-444	-6	-531	-7.1	Oyster	-360	-5	-448	-6	83	1.1
Mink	-185	-9	-230	-11	Mink	352	23	307	20	537	35
Otter	-163	-8	-197	-10	Otter	189	12	155	10	352	22
Muskrat	700	21	1154	35.4	Muskrat	221	6	676	18	-478	-13
Allig	408	38	-96	-9	Allig	432	42	-71	-7	25	2.4
Duck	246	19	-55	-4.1	Duck	220	16	-81	-6	-26	-1.9
	Number '-	3		5		Number '-	0		3		1
	Number '+	3		1		Number '+	5		3		4

vs No Action	net Alt 1 Yr 50	%	net Alt 2 Yr 50	%	**vs Yr 0**	net Alt 1 Yr 50	%	net Alt 2 Yr 50	%	No Action	%
Croaker	-980	-7	-1418	-10	Croaker	656	5.24	219	2	1637	13
Trout	-246	-2	-250	-1.9	Trout	-222	-1.7	-226	-2	24	0.2
Menhaden	-444	-3	-481	-3.7	Menhaden	3	0.02	-34	0	447	3.6
Br Sh	-241	-3	-142	-1.6	Br Sh	7	0.08	106	1	248	2.8
Wh Sh	-405	-4	-319	-3.1	Wh Sh	236	2.42	322	3	641	6.6
Oyster	-450	-6	-618	-8.1	Oyster	-169	-2.3	-337	-5	281	3.8
Mink	-177	-9	-208	-10	Mink	294	19.4	263	17	471	31
Otter	-126	-7	-129	-7.1	Otter	102	6.43	99	6	228	14
Muskrat	789	41	1793	93.6	Muskrat	-1032	-28	-27	-1	-1821	-49
Allig	8	1	33	3.43	Allig	-62	-6	-37	-4	-70	-6.7
Duck	-177	-11	-163	-10	Duck	102	7.57	116	9	279	21
	Number '-	5		5		Number '-	2		0		2
	Number '+	1		1		Number '+	3		3		5

PU3b										
vs No Action	net Alt 1 Yr 10	%	net Alt 2 Yr 10	%	**vs Yr 0**	net Alt 1 Yr 10	%	net Alt 2 Yr 10	%	No Action	%
Croaker	-809	-5	-910	-6.1	Croaker	131	1	29	0	940	7
Trout	-308	-4	-350	-5	Trout	-27	0	-69	-1	281	4
Menhaden	-1486	-9	-1564	-9.8	Menhaden	-410	-3	-488	-3	1076	7
Br Sh	-1559	-16	-1662	-17	Br Sh	-423	-5	-525	-6	1136	13
Wh Sh	-1924	-14	-2065	-15	Wh Sh	-356	-3	-497	-4	1569	13
Oyster	-654	-21	-646	-21	Oyster	-545	-18	-537	-18	109	4
Mink	89	3	78	3	Mink	419	15	408	15	330	12
Otter	104	3	114	3	Otter	418	13	428	13	314	10
Muskrat	-219	-3	-129	-2	Muskrat	-264	-4	-173	-3	-45	-1
Allig	336	9	324	8.85	Allig	1015	34	1003	34	679	23
Duck	-69	-2	-72	-2	Duck	451	15	448	15	520	17
	Number '-	4		5		Number '-	1		2		0
	Number '+	1		1		Number '+	4		4		8

vs No Action	net Alt 1 Yr 50	%	net Alt 2 Yr 50	%	**vs Yr 0**	net Alt 1 Yr 50	%	net Alt 2 Yr 50	%	No Action	%
Croaker	-1044	-7	-1337	-8.4	Croaker	861	6.17	568	4	1905	14
Trout	-311	-4	-372	-5.1	Trout	199	2.94	137	2	510	7.5
Menhaden	-1706	-10	-1830	-11	Menhaden	120	0.81	-3	0	1827	12
Br Sh	-2271	-20	-2377	-21	Br Sh	306	3.5	200	2	2577	29
Wh Sh	-3044	-20	-3200	-21	Wh Sh	524	4.38	368	3	3568	30
Oyster	-707	-21	-706	-21	Oyster	-414	-14	-413	-14	293	9.6
Mink	59	3	15	0.67	Mink	-466	-17	-510	-18	-525	-19
Otter	54	2	25	0.95	Otter	-538	-17	-567	-18	-592	-18
Muskrat	62	1	461	7.9	Muskrat	-654	-10	-255	-4	-716	-11
Allig	-619	-13	-282	-5.7	Allig	1309	43.8	1646	55	1928	65
Duck	-295	-7	-124	-2.7	Duck	1202	39.8	1373	45	1497	50
	Number '-	7		6		Number '-	4		3		3
	Number '+	0		1		Number '+	3		2		8

PU4

vs No Action	net Alt 1 Yr 10	%	net Alt 2 Yr 10	%	**vs Yr 0**	net Alt 1 Yr 10	%	net Alt 2 Yr 10	%	No Action	%
Croaker	-1764	-13	-1027	-7.3	Croaker	-554	-4	183	1	1210	9
Trout	-2819	-24	-31	-0.3	Trout	-2037	-18	751	7	782	7
Menhaden	-3489	-22	-1110	-7.1	Menhaden	-2033	-14	347	2	1457	10
Br Sh	-2326	-22	-1096	-10	Br Sh	-1004	-11	226	2	1322	14
Wh Sh	-2148	-16	-961	-7	Wh Sh	-268	-2	919	8	1880	16
Oyster	-1358	-20	-185	-2.7	Oyster	-1037	-16	137	2	322	5
Mink	153	5	-136	-4.3	Mink	365	12	76	3	212	7
Otter	17	0	-186	-4.8	Otter	238	7	35	1	221	6
Muskrat	305	4	592	8	Muskrat	323	4	611	8	19	0
Allig	-120	-3	5	0	Allig	98	2	223	5	218	5
Duck	678	21	75	2	Duck	520	15	-84	-2	-158	-5
	Number '-	6		4		Number '-	4		0		0
	Number '+	1		1		Number '+	3		3		7

vs No Action	net Alt 1 Yr 50	%	net Alt 2 Yr 50	%	**vs Yr 0**	net Alt 1 Yr 50	%	net Alt 2 Yr 50	%	No Action	%
Croaker	-2283	-15	-1377	-8.8	Croaker	483	4	1390	10.8	2766	22
Trout	-2964	-24	-28	-0.2	Trout	-1613	-15	1323	12	1351	12
Menhaden	-3912	-23	-1361	-8.1	Menhaden	-1192	-8.4	1359	10	2720	19
Br Sh	-2816	-23	-1469	-12	Br Sh	74	1	1421	15.4	2891	31
Wh Sh	-2792	-17	-1411	-8.8	Wh Sh	1314	11.1	2695	22.7	4106	35
Oyster	-1477	-20	-177	-2.4	Oyster	-688	-11	611	9	788	12
Mink	112	4	-81	-2.7	Mink	205	7	12	0	93	3
Otter	-4	0	-112	-3.1	Otter	22	1	-87	-2.4	26	1
Muskrat	460	7	693	10	Muskrat	-394	-5	-160	-2	-853	-11
Allig	-574	-10	-426	-7.6	Allig	942	23.1	1089	26.8	1515	37
Duck	283	6	-443	-9.9	Duck	1322	38.6	597	17.4	1040	30
	Number '-	7		6		Number '-	3		0		1
	Number '+	2		1		Number '+	4		8		8

5.0 Landscape Change Simulation Model for the Preliminary Draft Master Plan

The CLEAR landscape change simulation model is used to forecast the effects of different restoration scenarios on the amount of wetland area along the coast for 50 years into the future. This module uses a combination of empirical relationships and landscape analogs to reflect the complex processes controlling land change in the Louisiana coastal zone.

Several changes were made to the landscape change simulation model following the analyses of Alternatives 1 and 2 in October 2006. This chapter reports on changes that were made to the landscape change simulation model for analyzing the Preliminary Draft Master Plan (PDMP), and the results of the landscape change analysis for the PDMP. Ecosystem benefits have not yet been analyzed. For specific model details, see Chapter 2.

5.1 Measures Considered as Input Data to the CLEAR Model for the Preliminary Draft Master Plan as of January 2007

CLEAR considered the spatial data provided by the Coastal Protection and Restoration Authority Integrated Planning Team (CPRA IPT), as referenced below by a particular measure number. Because measures are defined only to the detail required for planning, spatial data provided may not encompass all features which will make up that measure once engineering and design is completed.

The following list contains the full list of measures included as input data into the CLEAR model. Not all measures could be incorporated into the CLEAR model, usually because they are studies or because they were too conceptual to be adequately described for modeling purposes. The color code, below, was developed to catalog which measures were actually included in the model.

Black = Considered as spatial input data.

Red = Not considered as CLEAR did not receive spatial input data or was told to exclude the feature from consideration.

Orange = Not considered as the feature was too small or impossible at this stage to incorporate into a landscape scale, system response model.

Magenta = Feature effect is typically captured by the hydrodynamic module; however, given the difficulties associated at this time with the model, the feature is not represented in model output.

Blue = Conceptual (not a specific measure).

5.1.1 Planning Unit 1

1-1. Levee from Pearl River to Braithwaite (0.2% annual probability) and from Braithwaite to Belair (1.0% annual probability) Maintain existing levees from Phoenix to Bohemia (Levee effect on salinity and hydrodynamic flow was not measured)

1-1a. Hurricane Protection from Caernarvon to Pearl River (0.2% annual Probability) (Levee effect on salinity and hydrodynamic flow was not measured)
1-1b. Ring Levees from Belair to Caernarvon (1.0% annual probability). (Levee effect on salinity and hydrodynamic flow was not measured)
1-1c. Maintain Existing Levees from Pointe a la Hache to Phoenix
1-1d. Raise St. Bernard 40 Arpent Levee System and Connect through Verret. (Feature effect on salinity and hydrodynamic flow was not measured)
1-2. West Shore of Lake Pontchartrain Levee (Levee effect on salinity and hydrodynamic flow was not measured)
1-3. Re-Evaluate Raising Levee Protection at Southshore of Lake Pontchartrain to function with measure PD 1-1 to provide protection equivalent to 0.2% annual probability
1-4. Evaluate the Impact of a 0.2% Annual Probability Storm on the Communities Surrounding Lake Pontchartrain and Lake Maurepas with Measure PD 1-1 in Place and Provide Structural Protection Where Needed or Elevate/Relocate Assets at Risk
1-5. Raise/Maintain Evacuation Routes Located Outside Hurricane Protection Plans (Feature effect on salinity and hydrodynamic flow was not measured)
1-6. Small Diversion at Hope Canal
1-7. Small Diversion at Convent/Blind River
1-8. Bankline Stabilization along Maurepas Landbridge (Lake Maurepas and Lake Pontchartrain)
1-9. St. Tammany Marsh Restoration and Shoreline Protection with Dredge Material and Vegetation Planting
1-10. Shoreline Protection on South Shore of Lake Pontchartrain at Jefferson Parish
1-11. Maintain Critical Marsh Shorelines and Ridges of the East Orleans Landbridge
1-12. Close Mississippi River Gulf Outlet (MRGO) at Bayou La Loutre ridge (Feature effect on salinity and hydrodynamic flow was not measured)
1-13. Mississippi River Gulf Outlet (MRGO) Shoreline Stabilization
1-14. Sediment Delivery by Pipeline at Central Wetlands and Establishment of Cypress Swamp through Hydraulic Management
1-15. Sediment Delivery by Pipeline at Golden Triangle
1-16. Construct Large Violet Diversion to Sustain Biloxi Marshes
1-17. Maintain MRGO-Lake Borgne Landbridge Including Landbridge Shoreline Protection
1-18. Modify Authorization of Caernarvon Diversion (8,500 cfs)
1-19. Maintain and Restore the Breton Sound Marshes
1-20. Medium Diversion at White Ditch
1-21. Maintain and Restore Biloxi Landbridge and Barrier Reefs
1-22. Restore Bayou LaLoutre Ridge
1-23. Medium Diversion at Bayou Lamoque
1-24. Complete Construction of the Inner Harbor Navigation Lock

5.1.2 Planning Unit 2

2-1. Levee Along GIWW from Golden Meadow to Oakville, including Lafitte and Barataria (Protection from 1% annual probability surge in Lafourche and Central Basin; Protection from 0.2% annual probability surge in West Bank) (Levee effect on salinity and hydrodynamic flow was not measured)
2-2. Levee from Oakville to Myrtle Grove (1% annual probability) (Levee effect on salinity and hydrodynamic flow was not measured)
2-2a. Maintain Existing Levees from Myrtle Grove to Venice
2-3. Grand Isle and Vicinity Project
2-4. Raise/Maintain Evacuation Routes Outside the Hurricane Protection Plans
2-5. Upper Barataria Hydrologic Improvements at Highway 90

2-6. Develop a Watershed Management Plan for Upper Barataria Basin to Improve Storm Water Drainage/Hydrology North of Highway 90 and Redirect Freshwater, Sediment, Storm Water, and Treated Sewage Water to Sustain Upper Basin Swamps and Middle Basin Freshwater Marsh
2-7. Move Freshwater to Terrebonne Basin from Barataria Basin via Gulf Intracoastal Waterway (GIWW)
2-8. Small Diversion at Bayou Lafourche
2-9. Small Diversions at Strategic Locations in Upper Basin *(these diversions were excluded from model runs due to errors stemming from the abundance of water flowing into the basin behind a levee)*
2-10. Modify Authorization of Davis Pond Diversion
2-11. Medium Diversion with Dedicated Dredging at Myrtle Grove
2-12. Medium Diversion at West Point a la Hache
2-13. Pipeline Conveyance of Sediment to Create Strategic Marsh Platforms in Fringing Marsh and Middle Basin Marsh Areas
2-14. Ridge Restoration in the Barataria Basin
2-15. Barataria Basin Barrier Shoreline Restoration Caminada Headland to Sandy Point
2-16. Bankline Protection for Gulf Intracoastal Waterway (GIWW)

5.1.3 Planning Unit 3a

3a-1. Morganza to the Gulf Hurricane Protection and Lower Atchafalaya River (LAR) Barrier Plan Alignment (1% annual probability) (Levee effect on salinity and hydrodynamic flow was not measured)
3a-2. Internal Hurricane Levee Alignment (0.2% annual probability) (Levee effect on salinity and hydrodynamic flow was not measured)
3a-3. Raise/Maintain Evacuation Routes Located outside the Hurricane Protection Plans (Feature effect on salinity and hydrodynamic flow was not measured)
3a-4. Bankline Protection for Houma Navigation Canal (HNC)
3a-5. Multipurpose Operation of the Houma Navigation Canal Lock
3a-6. Bankline protection for Gulf Intracoastal Waterway (GIWW)
3a-7. Pipeline Conveyance of Sediment to Create Strategic Marsh Platforms
3a-8. Implement Chacahoula Basin Plan and Other Projects to Alleviate Inundation Issues in the Verret Sub-basin
3a-9. Freshwater Introduction via Blue Hammock Bayou
3a-10. Protect and Maintain Ridges
3a-11. Maintain Landbridge between Caillou Lake and Gulf of Mexico
3a-12. Terrebonne Basin Barrier Shoreline Protection
3a-13. Develop a Watershed Management Plan for Upper Terrebonne Basin to Improve Storm Water Drainage/Hydrology and Redirect Freshwater, Sediment, Storm Water, and Treated Sewage Water to Sustain Upper Basin Swamps and Middle Basin Freshwater Marsh
2-7. Move Freshwater to Terrebonne Basin from Barataria Basin via the Gulf Intracoastal Waterway (GIWW)
3b-3. Convey Atchafalaya River Water to Terrebonne Marshes

5.1.4 Studies and Common Measures for Planning Units 1, 2, and 3a

D-1. Louisiana/Mississippi Hydrodynamic Study
D-2. Mississippi River Hydrodynamic and Delta Management Study
D-3. Third Delta Study
D-4. Upper Atchafalaya Basin Study
D-5. Maximize Beneficial Use of Dredged Material Where Feasible

D-6. Strategize and Implement Plan to Elevate and/or Relocate Assets Located Outside the Hurricane Protection Plans
D-7. Backfill and/or Plug Non-essential Oil and Gas Canals

5.1.5 Planning Unit 3b

3b-3. Increase Atchafalaya River Water Influence in Terrebonne Marshes via the Gulf Intracoastal Waterway (GIWW)
3b-4. Freshwater Bayou Bank Stabilization - Belle Isle Bayou to Freshwater Bayou Canal Lock
3b-5. Increase Sediment Transport Down Wax Lake Outlet
3b-6. Stabilize Banks of Southwest Pass off Marsh Island
3b-7. Stabilize Gulf Shorelines - Lighthouse Point to South Point/Marsh Island
3b-8. Stabilize Banks of Gulf Intracoastal Waterway (GIIWW)
3b-9. Stabilize Gulf Shorelines from Freshwater Bayou to Southwest Pass
3b-10. Convey Atchafalaya River Water Westward to St. Mary, Iberia and Vermilion Marshes
3b-11. Create Marsh at Weeks Bay
3b-12. Restore Marsh at Marsh Island via Dedicated Dredging
3b-13. Pipeline Conveyance of Sediment to Create Strategic Marsh Platform, including Beneficial Use of Dredged Material from the Atchafalaya River Navigation Channel
3b-14. Stabilize Shoreline of Vermilion Bay and East and West Cote Blanche Bays
3b-15. Freshwater Management for Penchant Basin
3b-16 Raise/Maintain Evacuation Routes Located outside the Hurricane Protection Plans (Feature effect on salinity and hydrodynamic flow was not measured)
3b-17. Fortify Spoil Banks on GIWW in St. Mary and Vermilion Parish, Freshwater Bayou Canal
3b-18. Maintain Existing Levees from Atchafalaya River to Franklin

5.1.6 Planning Unit 4

4-1. Hurricane Surge Protection for Lake Charles Metropolitan Area and Vinton Using Ring Levee (0.2% annual probability) (Levee effect on salinity and hydrodynamic flow was not measured)
3b-1. Levee Protection from Franklin to West of Abbeville (0.2% annual probability) (Levee effect on salinity and hydrodynamic flow was not measured)
4-3. Hurricane Surge Protection from Vermilion River to GIWW/Calcasieu River Lock (1% annual probability) (Levee effect on salinity and hydrodynamic flow was not measured)
4-4. Raise and Maintain Highways 82 and 27 for Hurricane Surge Protection, Hurricane Evacuation and Marsh Protection
4-5. Provide Water Control Structures at Strategic Locations along Highways 82 and 27
4-6. Stabilize Banks of Gulf Intracoastal Waterway (GIWW)
4-7. Stabilize Grand Lake Shoreline
4-8. Stabilize White Lake Shoreline
4-9. Bank Stabilization of Freshwater Bayou
4-10. Salinity Control Structure in Calcasieu Ship Channel near Ferry
4-11. Stabilize Gulf Shoreline and Beach from Sabine River to Calcasieu River
4-12. Stabilize Gulf Shoreline and Beach East Of Calcasieu River to Freshwater Bayou Using Dredged Sediments and/or Breakwaters
4-13. Build New Chamber for Navigation at Calcasieu Lock on GIWW and Use Old Lock to Evacuate Excess Water from Mermentau River

4-14. Dedicated Dredging from the Gulf of Mexico for Marsh Creation and Enhancement
4-15. Beneficial Uses of Dredged Material from Calcasieu Ship Channel
4-16. Salinity Control Structure at Sabine Pass near Highway 82 Causeway

3b-10. Convey Atchafalaya River Water Westward to St. Mary, Iberia, and Vermilion Marshes
3b-17. Fortify Spoil Banks on GIWW in St. Mary and Vermilion Parish, Freshwater Bayou Canal

5.1.7 Studies and Common Measures for Planning Units 3b and 4

C-1. Develop a Plan to Elevate and/or Relocate Assets Located Outside of the Hurricane Protection Plan
C-4. Maintain Mermentau Basin as Fresh Water Basin: Complete/Accelerate the Chenier Plain Freshwater and Sediment Management and Allocation Reassessment Study which was Included in the LCA Near-Term Plan
C-5. Maintain Mermentau Basin as Freshwater Basin: Manage Watershed to Reduce Rapid Inflows into Mermentau Sub-Basin
C-6. Maximize Freshwater Inflow from Sabine River

5.2 Diversion Hydrographs Used to Generate Sediment Loads

In order to generate sediment loads for each diversion, daily hydrographs were created for each diversion based on actual Mississippi River flow. Flow is based on data from 1980 to 2005 which are repeated to create 50 years of flow. At times of low river flow, diversion flows were decreased accordingly. All hydrographs take into consideration the average head differential between the river and the wetlands. As an example, monthly hydrographs are provided for 2002 (i.e., an 'average flow year'). Diversion ID's marked with an * indicate that discharge was set to 0 cfs because any level of flow created instability in the model. Instability of this nature occurred in Diversions 6 and 7, resulting from too much sediment being diverted into an area impounded by a levee. Discharge from Diversion 13 was removed from its original location (i.e., northern most point of Bayou Lafourche) and added to the discharge of Diversion 16 (i.e., mouth of Bayou Lafourche); therefore, Diversion 16 actually had the combined discharge of Diversion 13 and Diversion 16.

Monthly hydrograph for PDMP diversions in an 'average discharge year,' 2002.

Monthly Hydrograph for PDMP Diversions in an Average Discharge Year (2002)												
Diversion ID	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
1	5804	7319	7774	8164	7580	6495	5127	3753	2858	2812	4160	6504
2	63882	80513	85584	89807	83375	71444	56421	41315	31439	30930	45764	71674
3	286	366	382	409	379	325	256	185	143	141	208	317
4	286	366	382	409	379	325	256	185	143	141	208	317
5	286	366	382	409	379	325	256	185	143	141	208	317
***6**	0	0	0	0	0	0	0	0	0	0	0	0
***7**	0	0	0	0	0	0	0	0	0	0	0	0
8	576	732	770	816	758	649	511	372	286	281	416	641
10	7323	9455	10379	10300	9414	7997	6351	4798	3765	3647	4879	7962
11	3072	3679	4093	4207	3965	3394	2588	1704	1011	810	1474	3469
12	3072	3679	4093	4207	3965	3394	2588	1704	1011	810	1474	3469
***13**	0	0	0	0	0	0	0	0	0	0	0	0
14	5596	7614	8958	9451	8997	7705	5814	3695	1968	1309	2555	6734
15	9562	11756	12798	12767	11785	10113	8094	6142	4855	4837	6788	11547
16	922	1104	1228	1262	1189	1018	776	511	303	243	442	1041
17	9716	10594	11440	11841	11535	10488	8850	6949	5405	4952	6525	11306
18	479	1452	1907	1973	1765	1404	985	584	275	98	75	217
19	1198	3631	4768	4931	4413	3510	2463	1460	689	244	187	541
20	5419	6662	7252	7235	6678	5731	4587	3481	2752	2741	3847	6543
21	31875	39187	42660	42558	39282	33710	26979	20472	16183	16123	22627	38489
22	7354	10059	12035	12924	12504	10851	8249	5182	2514	1198	2437	7722
23	161730	219260	150710	319170	304520	252390	73467	54665	60202	104050	101420	99727
24	16355	23849	29083	31307	30062	25621	18736	10624	3432	65	1795	13687

5.3 Modification to the landscape change simulation model between October 2006 and January 2007

5.3.1 Marsh Creation and Barrier Island Maintenance

Several of the restoration measures proposed under the PDMP included marsh creation and/or barrier island restoration. The created areas and timing of creations were obtained from the CPRA IPT. These areas were included in Year 0, and land change rates of neighboring cells (historic and nourishment) were applied to them over the 50 year simulation period. A maintenance schedule was included for both habitat types: marsh creation areas were restored to a land:water ratio of 65:35 at Year 25, and barrier islands were restored to a land:water ratio of 90:10 upon degradation of the land:water ratio to 50:50.

5.3.2 Land Loss Rates

Land loss rates have been modified slightly from earlier CLEAR Model runs. An overestimation of coastwide land loss rates initially occurred when the CLEAR Model cell size was reduced from 1km^2 to 0.25km^2. This issue has been resolved for the analysis of the PDMP. The reference provided in Chapter III for coastwide land loss rates is still applicable.

5.4 Results

5.4.1 Maps

The CLEAR Landscape Change Simulation Model was used to predict land change over 50 years under a scenario of no increased action (NIA) and under the PDMP scenario. As expected, the PDMP resulted in an increase of wetland area and reduction in wetland loss from Year 0 to Year 50 (Figure 1) when compared to a future of NIA (Figure 2). It is worth noting that both Figure 1 and 2 depicts *change* in wetland area, not *total* wetland area. See Figure 3 for total wetland area at Year 0 (current landscape), Figure 4 for total wetland area at Year 50 under an NIA scenario, and Figure 5 for total wetland area at Year 50 under the PDMP.

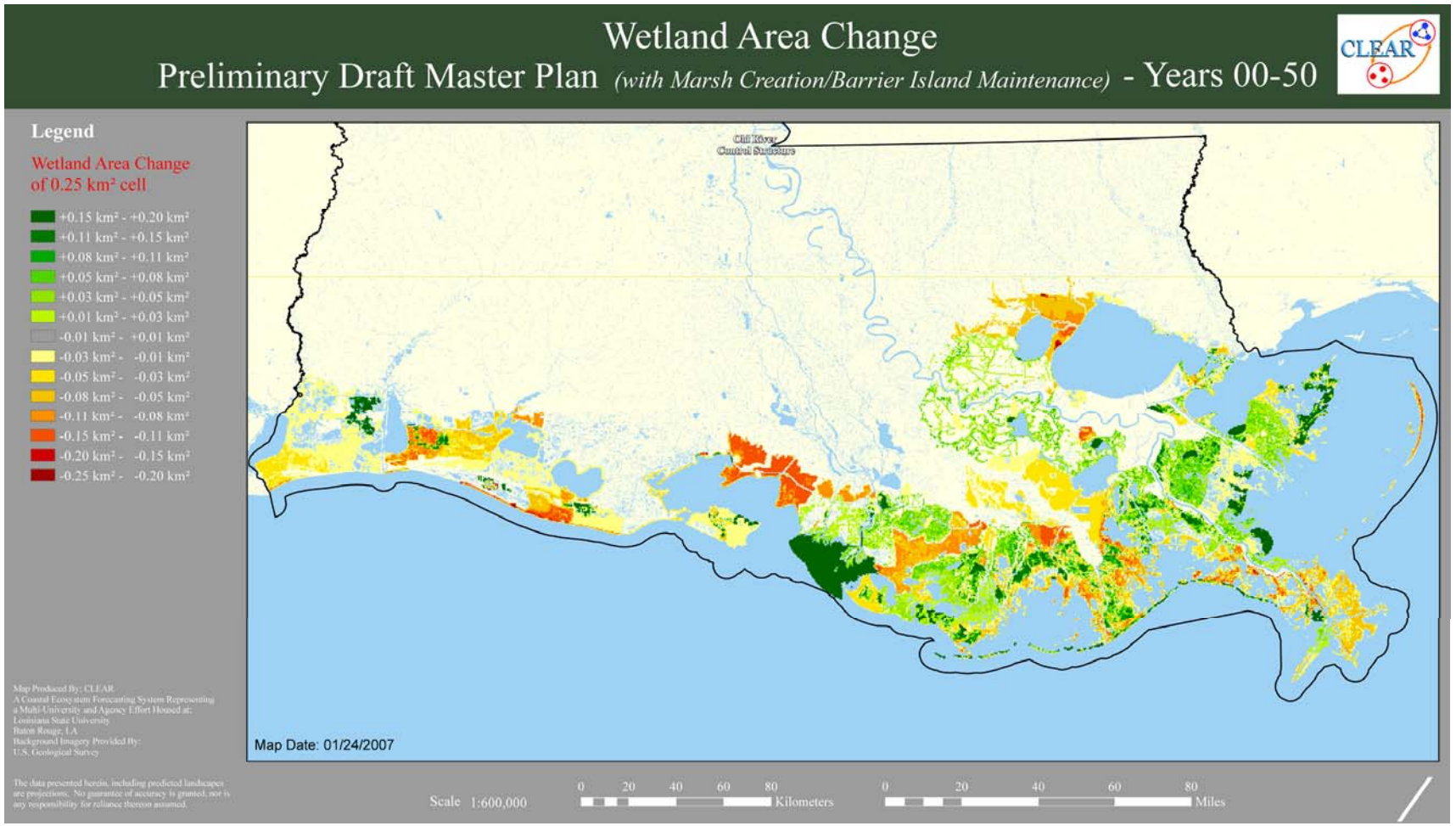

Figure 5.1. Change in wetland area over 50 years as a result of the suite of projects proposed by the Louisiana CPRA IPT PDMP.

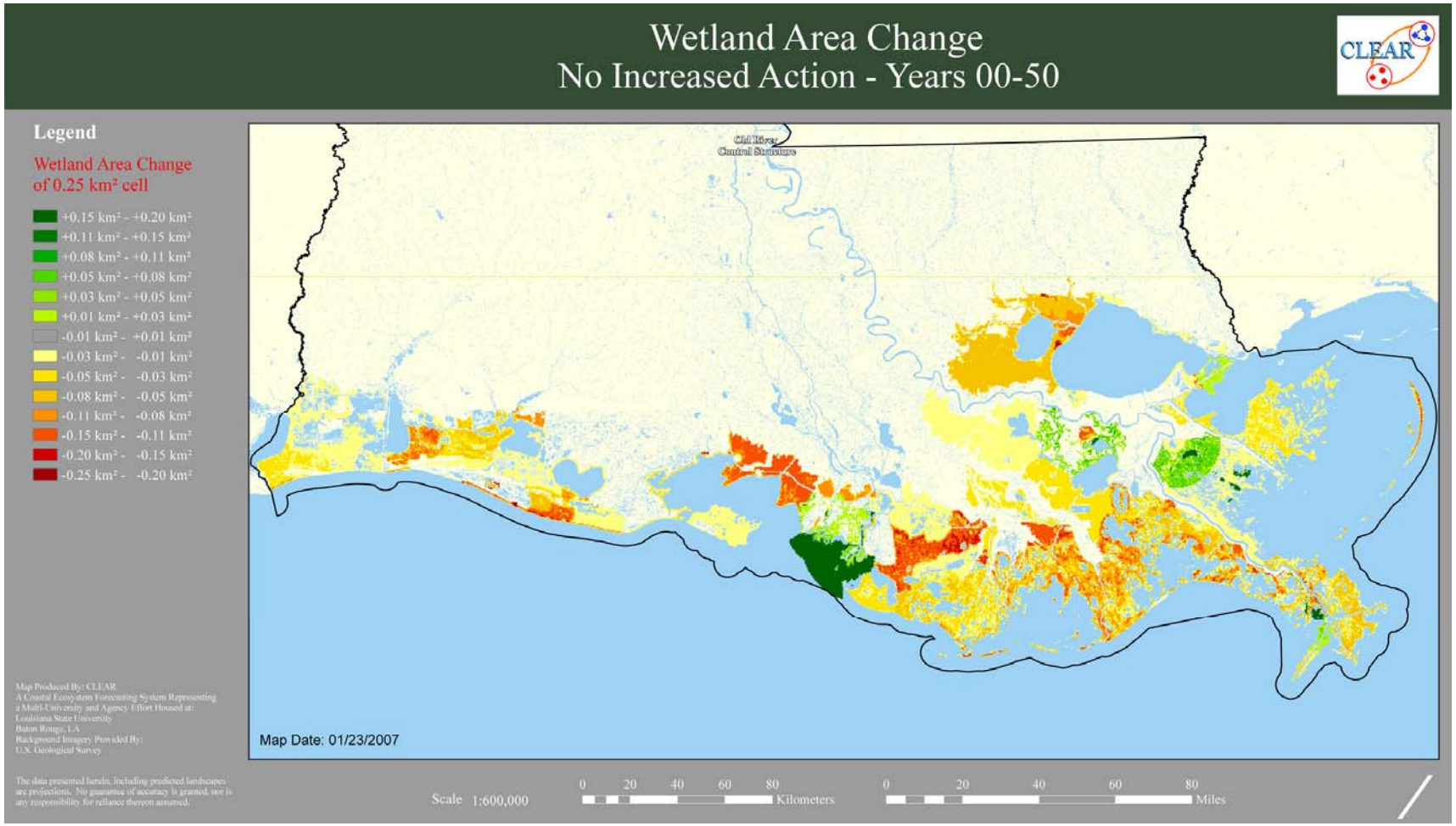

Figure 5.2. Change in wetland area over 50 years under a future of no increased restorative action.

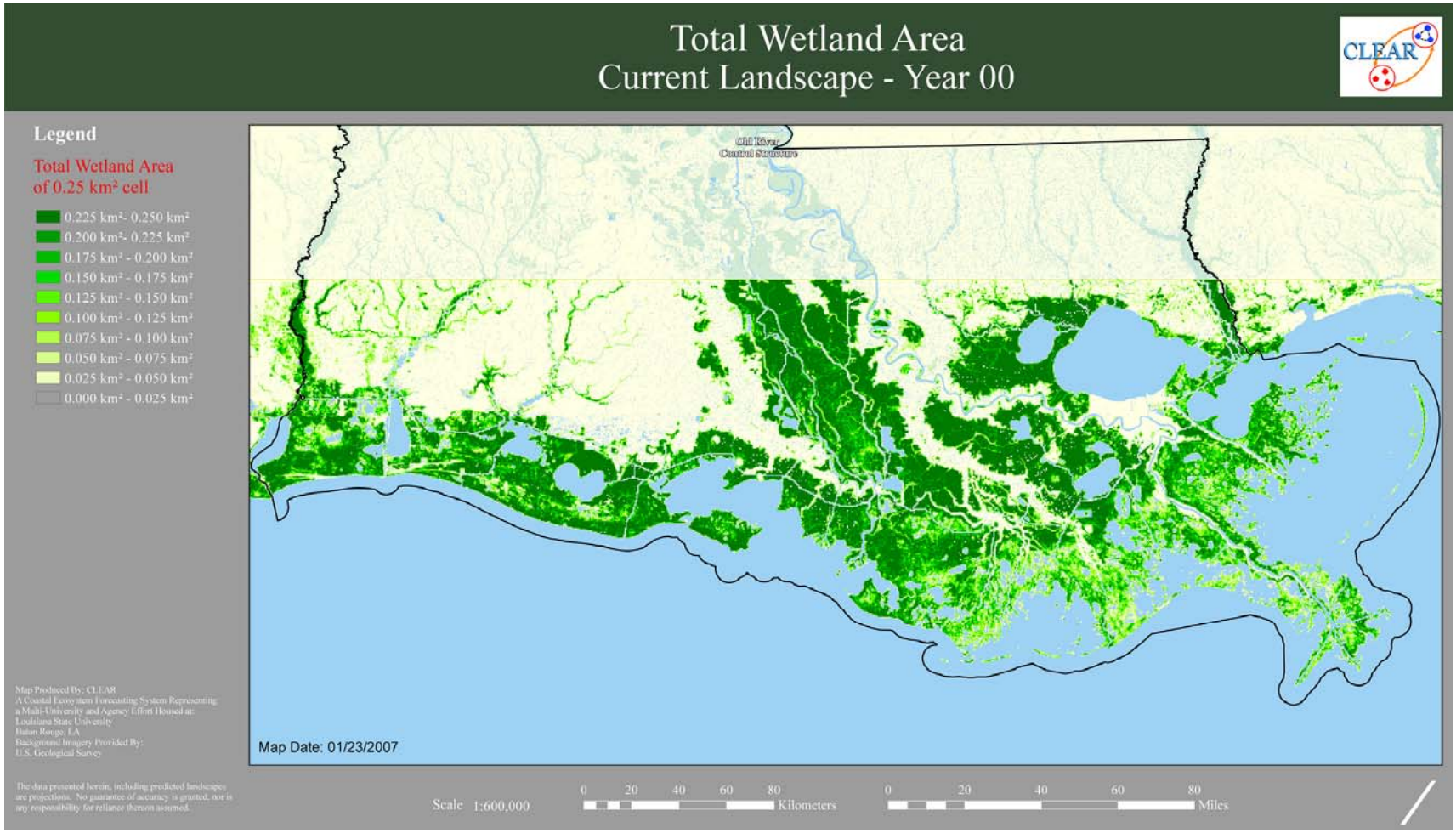

Figure 5.3. Total wetland area at Year 0.

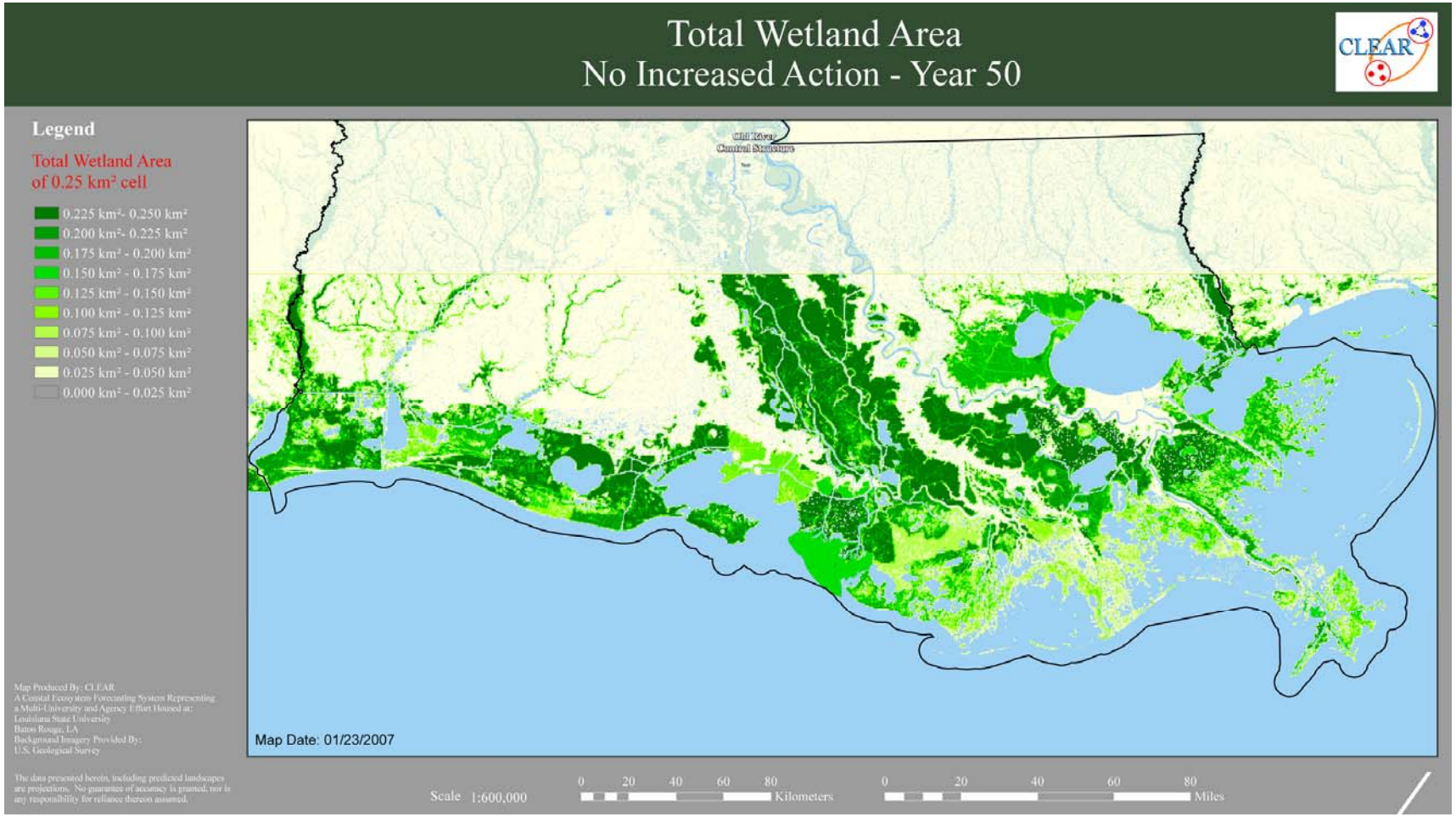

Figure 5.4. Total wetland area at Year 50 under a no increased action scenario.

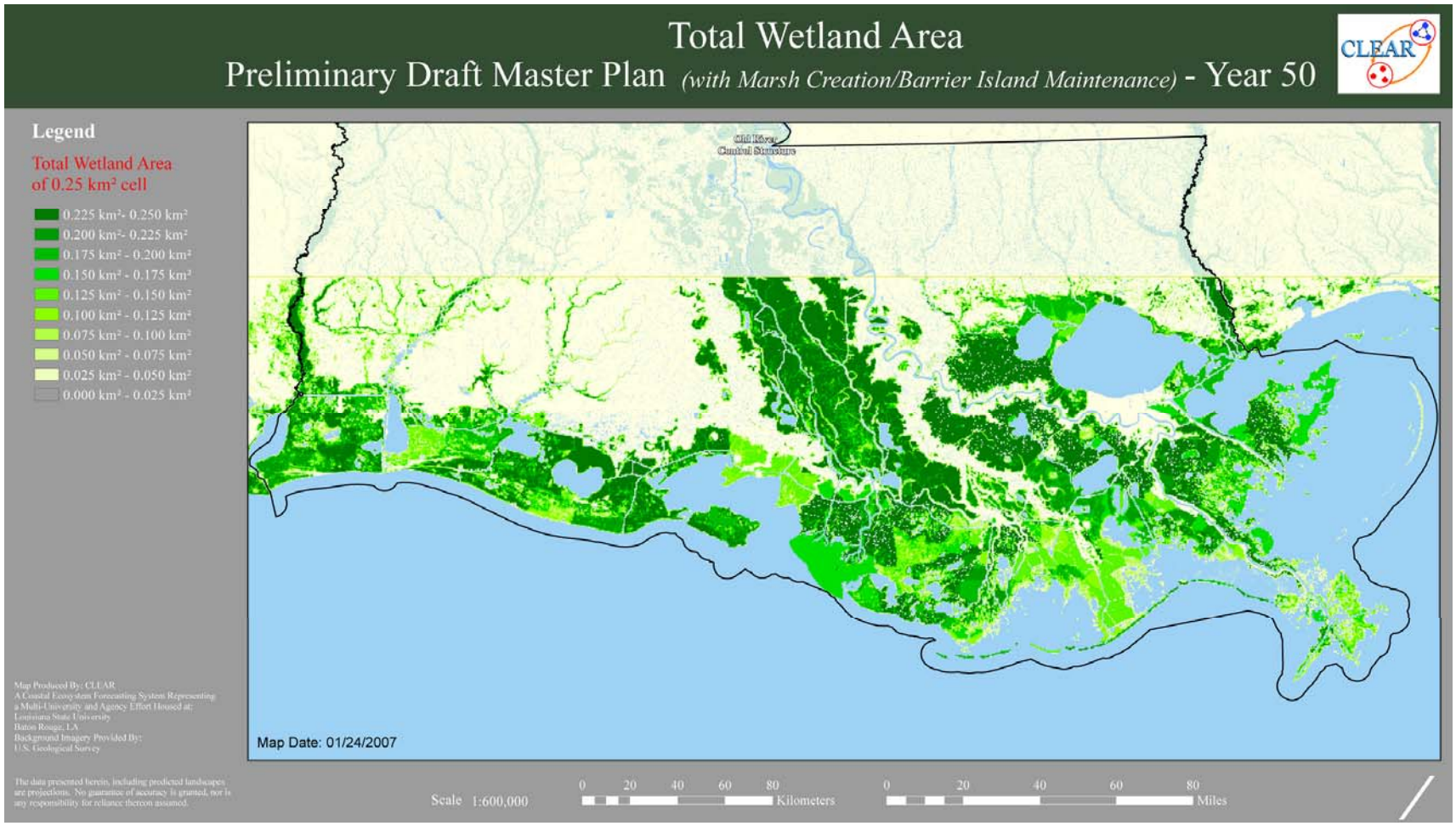

Figure 5.5. Total wetland area at Year 50 under a scenario containing the suite of projects proposed by the Louisiana CPRA IPT PDMP.

5.4.2 Summary Statistics

Total wetland area and wetland change is also presented in the form of summary statistics for a 50 year simulation under both an NIA and e PMDP scenario. Wetland area is presented in units of square kilometers (km^2), and wetland change is presented as a rate in units of square kilometers (km^2). In addition, the change in rate at three different time steps (year 0 to 10, year 40 to 50, and year 0 to 50), and the percent change this represents, is provided at the coast wide (Table 2), planning unit (Table 3), and ecosystem unit (Table 4) scales.

The following list is a key to the first column of each wetland area / change table:

Cw = coast wide
Pl = planning unit
Eu = ecosystem unit
Area = entire area in the CLEAR model domain
Upl = area of uplands
Wetland = area of wetlands
Wetland 00 = total wetland area at year 0 (km^2)
Wetland 05 = total wetland area at year 5 (km^2)
Wetland 10 = total wetland area at year 10 (km^2)
Wetland 15 = total wetland area at year 15 (km^2)
Wetland 20 = total wetland area at year 20 (km^2)
Wetland 25 = total wetland area at year 25 (km^2)
Wetland 30 = total wetland area at year 30 (km^2)
Wetland 35 = total wetland area at year 35 (km^2)
Wetland 40 = total wetland area at year 40 (km^2)
Wetland 45 = total wetland area at year 45 (km^2)
Wetland 50 = total wetland area at year 50 (km^2)
ch_0_10 = amount of wetland area change between year 0 to year 10 (km^2)
ch_40_50 = amount of wetland area change between year 40 to year 50 (km^2)
ch_0_50 = amount of wetland area change between year 0 to year 50 (km^2)
ch_0_10 (%) = percent of wetland area change between year 0 and year 10 (%)
ch_40_50 (%) = percent of wetland area change between year 40 and year 50 (%)
ch_0_50 (%) = percent of wetland area change between year 0 and year 50 (%)

5.4.2.1 Coastwide land change summary.

Total Wetland Area Inside Louisiana Coastal Zone:								
Planning Unit Boundaries (excluding fastlands)								
Unit of Measure	**Square Kilometers**			**Square Miles**			**Acres**	
Scenario	**NIA**	**PDMP**		**NIA**	**PDMP**		**NIA**	**PDMP**
cw_wetland00	13,466	13,466		5,199	5,199		3,327,348	3,327,348
cw_wetland05	13,175	14,135		5,087	5,458		3,255,651	3,492,841
cw_wetland10	12,915	13,993		4,986	5,403		3,191,300	3,457,742
cw_wetland15	12,699	13,900		4,903	5,367		3,137,959	3,434,774
cw_wetland20	12,498	13,813		4,826	5,333		3,088,302	3,413,243
cw_wetland25	12,300	13,875		4,749	5,357		3,039,445	3,428,483
cw_wetland30	12,111	13,756		4,676	5,311		2,992,523	3,399,070
cw_wetland35	11,935	13,645		4,608	5,268		2,949,023	3,371,782
cw_wetland40	11,782	13,574		4,549	5,241		2,911,447	3,354,060
cw_wetland45	11,639	13,511		4,494	5,217		2,875,981	3,338,519
cw_wetland50	11,489	13,431		4,436	5,186		2,838,854	3,318,737
cw_ch_0_10	-551	528		-213	204		-136,047	130,394
cw_ch_40_50	-294	-143		-113	-55		-72,593	-35,323
cw_ch_0_50	-1,977	-35		-763	-13		-488,494	-8,610
cw_ch_0_10 (%)	-4.1	3.9		-4.1	3.9		-4.1	3.9
cw_ch_40_50 (%)	-2.5	-1.1		-2.5	-1.1		-2.5	-1.1
cw_ch_0_50 (%)	-14.7	-0.3		-14.7	-0.3		-14.7	-0.3

5.4.2.2. Planning unit land change summary.

Planning Unit Land Change Summary (square kilometers)										
Planning Unit	**PU 1**		**PU 2**		**PU 3a**		**PU 3b**		**PU 4**	
Scenario	**NIA**	**PDMP**	**NIA**	**PDMP**	**NIA**	**PDMP**	**NIA**	**PDMP**	**NIA**	**PDMP**
pl_wetland00	3,093	3,093	2,673	2,673	1,961	1,961	2,600	2,600	3,138	3,138
pl_wetland05	3,039	3,261	2,605	2,864	1,899	2,193	2,537	2,610	3,095	3,207
pl_wetland10	2,988	3,255	2,542	2,820	1,842	2,160	2,489	2,594	3,055	3,164
pl_wetland15	2,941	3,263	2,484	2,779	1,788	2,128	2,470	2,608	3,016	3,122
pl_wetland20	2,894	3,265	2,430	2,745	1,738	2,100	2,457	2,620	2,979	3,083
pl_wetland25	2,847	3,238	2,380	2,806	1,692	2,150	2,438	2,617	2,943	3,064
pl_wetland30	2,802	3,228	2,332	2,762	1,648	2,119	2,419	2,621	2,909	3,025
pl_wetland35	2,758	3,220	2,288	2,722	1,608	2,088	2,405	2,626	2,876	2,989
pl_wetland40	2,717	3,219	2,252	2,702	1,570	2,062	2,400	2,635	2,844	2,955
pl_wetland45	2,676	3,219	2,216	2,677	1,534	2,044	2,399	2,649	2,814	2,922
pl_wetland50	2,635	3,219	2,178	2,645	1,500	2,021	2,391	2,656	2,784	2,890
pl_ch_0_10	-105	162	-131	147	-120	199	-112	-6	-83	26
pl_ch_40_50	-82	0	-74	-58	-69	-42	-9	21	-60	-64
pl_ch_0_50	-458	125	-495	-28	-461	59	-209	56	-353	-247
pl_ch_0_10 (%)	-3.4	5.2	-4.9	5.5	-6.1	10.1	-4.3	-0.2	-2.7	0.8
pl_ch_40_50 (%)	-3.0	0.0	-3.3	-2.1	-4.4	-2.0	-0.4	0.8	-2.1	-2.2
pl_ch_0_50 (%)	-14.8	4.1	-18.5	-1.1	-23.5	3.0	-8.0	2.2	-11.3	-7.9

5.4.2.3 Ecosystem Unit Land Change Summary

Ecosystem Unit Land Change Summary														
Ecosystem Unit	**EU 1-1**		**EU 1-2**		**EU 1-3**		**EU 1-4**		**EU 1-5**		**EU 1-6**		**EU 1-7**	
Scenario	**NIA**	**PDMP**	**NIA**	**PDMP**	**NIA**	**PDMP**	**NIA**	**PDMP**	**NIA**	**PDMP**	**NIA**	**PDMP**	**NIA**	**PDMP**
eu_wetland00	1260	1260	121	121	127	127	55	55	93	93	362	362	443	443
eu_wetland05	1222	1246	121	126	125	143	54	70	93	104	373	391	438	455
eu_wetland10	1186	1232	120	126	125	143	53	70	92	104	383	406	433	460
eu_wetland15	1150	1219	120	125	126	144	51	70	92	104	394	421	429	478
eu_wetland20	1116	1205	119	125	126	144	50	73	91	104	400	431	427	491
eu_wetland25	1083	1192	119	124	127	138	49	72	91	108	406	419	425	494
eu_wetland30	1052	1180	118	123	127	136	48	73	91	108	411	428	422	498
eu_wetland35	1021	1168	118	123	127	137	48	74	90	107	416	437	420	502
eu_wetland40	992	1156	117	122	128	137	47	77	90	107	419	446	419	511
eu_wetland45	963	1145	117	122	128	137	46	79	90	106	423	454	418	522
eu_wetland50	936	1134	116	121	128	138	45	80	89	106	426	462	416	532
eu_ch_0_10	-75	-28	-1	4	-2	16	-2	15	-1	11	21	45	-9	18
eu_ch_40_50	-56	-22	-1	-1	1	1	-2	4	-1	-1	6	16	-3	21
eu_ch_0_50	-325	-127	-5	0	1	11	-10	26	-4	13	64	100	-26	90
eu_ch_0_10 (%)	-5.9	-2.2	-0.8	3.6	-1.2	12.9	-3.9	28.2	-0.6	12.3	5.8	12.3	-2.1	4.0
eu_ch_40_50 (%)	-5.6	-1.9	-0.8	-0.8	0.5	0.6	-3.9	4.6	-0.9	-1.0	1.5	3.6	-0.7	4.1
eu_ch_0_50 (%)	-25.8	-10.0	-4.1	-0.1	1.0	8.5	-18.1	46.7	-3.9	13.8	17.6	27.7	-5.9	20.3

Ecosystem Unit Land Change Summary														
Ecosystem Unit	**EU 1-8**		**EU 1-9**		**EU 1-10**		**EU 2-1**		**EU 2-2**		**EU 2-3**		**EU 2-4**	
Scenario	**NIA**	**PDMP**	**NIA**	**PDMP**	**NIA**	**PDMP**	**NIA**	**PDMP**	**NIA**	**PDMP**	**NIA**	**PDMP**	**NIA**	**PDMP**
eu_wetland00	390	390	24	24	218	218	945	945	599	599	273	273	683	683
eu_wetland05	384	494	22	22	209	209	941	956	595	595	267	282	641	836
eu_wetland10	377	494	19	19	200	200	937	963	590	591	262	281	603	802
eu_wetland15	371	494	17	17	191	191	932	969	585	588	258	279	567	771
eu_wetland20	365	494	15	15	183	183	927	973	581	584	253	278	534	743
eu_wetland25	358	503	14	14	176	176	922	977	576	580	249	274	504	814
eu_wetland30	352	502	12	12	168	168	917	979	570	575	245	272	476	782
eu_wetland35	346	501	11	11	161	161	912	981	565	571	241	270	450	753
eu_wetland40	340	499	10	10	155	155	907	983	561	567	237	268	426	727
eu_wetland45	335	498	8	8	148	148	902	985	556	563	233	265	403	703
eu_wetland50	329	496	8	8	142	142	897	986	551	558	230	263	382	680
eu_ch_0_10	-13	104	-5	-5	-18	-18	-9	18	-9	-7	-10	8	-80	119
eu_ch_40_50	-11	-3	-2	-2	-12	-12	-10	3	-10	-8	-7	-4	-43	-47
eu_ch_0_50	-61	106	-17	-17	-76	-76	-48	41	-48	-41	-43	-9	-301	-2
eu_ch_0_10 (%)	-3.4	26.6	-21.1	-21.1	-8.4	-8.4	-0.9	1.9	-1.5	-1.2	-3.8	3.1	-11.7	17.5
eu_ch_40_50 (%)	-3.4	-0.6	-20.8	-20.8	-8.0	-8.0	-1.1	0.3	-1.8	-1.5	-3.0	-1.6	-10.2	-6.4
eu_ch_0_50 (%)	-15.7	27.2	-69.2	-69.2	-34.8	-34.8	-5.1	4.3	-8.0	-6.8	-15.6	-3.4	-44.0	-0.4

Ecosystem Unit Land Change Summary														
Ecosystem Unit	**EU 2-5**		**EU 2-6**		**EU 3a-1**		**EU 3a-2**		**EU 3a-3**		**EU 3a-4**		**EU 3a-5**	
Scenario	**NIA**	**PDMP**	**NIA**	**PDMP**	**NIA**	**PDMP**	**NIA**	**PDMP**	**NIA**	**PDMP**	**NIA**	**PDMP**	**NIA**	**PDMP**
eu_wetland00	79	79	95	95	712	712	214	214	83	83	469	469	362	362
eu_wetland05	69	102	92	92	709	713	209	209	80	81	437	600	350	437
eu_wetland10	60	92	90	90	705	713	205	205	77	80	408	575	339	438
eu_wetland15	53	83	89	89	702	712	200	201	74	79	381	552	328	439
eu_wetland20	47	80	88	88	699	712	196	197	72	77	357	531	318	441
eu_wetland25	42	75	87	87	696	712	192	193	70	76	334	586	308	437
eu_wetland30	38	68	86	86	694	711	188	189	68	75	313	563	298	439
eu_wetland35	34	62	86	86	691	711	185	185	66	74	294	540	289	440
eu_wetland40	31	68	90	90	689	710	181	182	64	73	276	520	280	442
eu_wetland45	28	68	93	93	687	710	178	178	62	72	260	501	271	443
eu_wetland50	26	65	92	92	685	710	174	175	60	70	245	483	263	445
eu_ch_0_10	-18	13	-5	-5	-7	0	-9	-9	-6	-2	-61	106	-23	76
eu_ch_40_50	-5	-4	2	2	-4	-1	-7	-7	-3	-2	-31	-37	-17	4
eu_ch_0_50	-53	-14	-3	-3	-28	-3	-40	-39	-22	-12	-224	14	-99	83
eu_ch_0_10 (%)	-23.4	16.4	-5.0	-5.0	-1.0	0.0	-4.3	-4.2	-6.8	-3.0	-13.0	22.6	-6.3	21.0
eu_ch_40_50 (%)	-17.0	-5.4	2.0	2.0	-0.6	-0.1	-3.8	-3.7	-5.3	-3.1	-11.3	-7.1	-6.1	0.8
eu_ch_0_50 (%)	-67.2	-18.0	-3.1	-3.1	-3.9	-0.4	-18.5	-18.2	-26.7	-14.6	-47.7	3.0	-27.4	22.9

Ecosystem Unit Land Change Summary														
Ecosystem Unit	**EU 3a-6**		**EU 3a-7**		**EU 3b-1**		**EU 3b-2**		**EU 3b-3**		**EU 3b-4**		**EU 3b-5**	
Scenario	**NIA**	**PDMP**	**NIA**	**PDMP**	**NIA**	**PDMP**	**NIA**	**PDMP**	**NIA**	**PDMP**	**NIA**	**PDMP**	**NIA**	**PDMP**
eu_wetland00	17	17	104	104	226	226	772	772	132	132	245	245	54	54
eu_wetland05	15	39	99	114	219	234	740	776	132	133	248	250	58	58
eu_wetland10	14	38	94	112	212	232	711	776	132	133	250	252	72	71
eu_wetland15	12	34	89	111	205	230	684	774	133	133	252	254	113	113
eu_wetland20	11	33	85	109	200	229	659	770	133	133	254	256	155	155
eu_wetland25	10	37	81	108	194	229	636	762	133	133	255	258	188	184
eu_wetland30	9	36	77	107	188	227	615	757	133	133	256	259	218	217
eu_wetland35	9	32	74	106	182	226	595	752	133	133	257	260	250	250
eu_wetland40	8	31	71	105	177	225	576	747	133	133	257	261	289	285
eu_wetland45	7	36	69	104	172	224	559	742	132	133	258	262	330	324
eu_wetland50	7	34	66	103	167	223	544	737	132	133	259	263	360	355
eu_ch_0_10	-3	20	-11	8	-14	6	-61	4	0	1	5	7	19	18
eu_ch_40_50	-1	3	-5	-2	-10	-2	-33	-10	0	0	1	2	71	70
eu_ch_0_50	-11	17	-38	-1	-59	-3	-228	-35	0	1	14	17	306	301
eu_ch_0_10 (%)	-20.1	117.3	-10.2	7.7	-6.3	2.7	-7.8	0.5	0.1	0.5	2.0	2.8	34.6	33.0
eu_ch_40_50 (%)	-14.8	10.2	-7.2	-1.5	-5.6	-0.9	-5.7	-1.3	-0.2	-0.2	0.5	0.6	24.4	24.6
eu_ch_0_50 (%)	-61.2	98.9	-36.4	-1.1	-26.1	-1.4	-29.6	-4.6	0.2	0.6	5.6	7.1	571.1	561.9

Ecosystem Unit Land Change Summary														
Ecosystem Unit	**EU 3b-6**		**EU 3b-7**		**EU 3b-8**		**EU 3b-9**		**EU 4-1a**		**EU 4-1b**		**EU 4-1c**	
Scenario	**NIA**	**PDMP**	**NIA**	**PDMP**	**NIA**	**PDMP**	**NIA**	**PDMP**	**NIA**	**PDMP**	**NIA**	**PDMP**	**NIA**	**PDMP**
eu_wetland00	236	236	3	3	695	695	238	238	213	213	499	499	213	213
eu_wetland05	234	251	3	3	667	670	237	237	213	213	497	497	212	212
eu_wetland10	232	249	3	3	640	643	236	236	213	213	494	494	211	211
eu_wetland15	231	247	3	3	616	618	235	235	212	212	492	492	210	210
eu_wetland20	229	246	3	3	592	595	234	234	212	212	490	490	209	209
eu_wetland25	227	242	2	3	570	573	233	233	211	211	488	488	208	208
eu_wetland30	225	240	2	3	550	553	232	232	211	211	486	486	207	207
eu_wetland35	224	238	2	3	531	533	231	231	211	211	484	484	206	206
eu_wetland40	222	236	2	3	513	515	230	230	210	210	482	482	205	205
eu_wetland45	220	235	2	3	496	498	229	229	210	210	480	481	204	204
eu_wetland50	219	233	2	3	480	483	228	228	210	210	479	479	203	203
eu_ch_0_10	-4	13	0	0	-55	-52	-2	-2	-1	-1	-4	-4	-2	-2
eu_ch_40_50	-3	-4	0	0	-33	-33	-2	-2	-1	-1	-4	-4	-2	-2
eu_ch_0_50	-17	-3	0	0	-215	-213	-9	-9	-4	-4	-20	-20	-11	-11
eu_ch_0_10 (%)	-1.5	5.7	-2.2	4.8	-7.9	-7.5	-0.8	-0.8	-0.3	-0.3	-0.9	-0.9	-1.0	-1.0
eu_ch_40_50 (%)	-1.5	-1.5	-2.2	-2.3	-6.4	-6.4	-0.8	-0.8	-0.3	-0.3	-0.8	-0.8	-1.0	-1.0
eu_ch_0_50 (%)	-7.3	-1.3	-8.5	-2.0	-30.9	-30.6	-3.9	-3.9	-1.7	-1.7	-4.1	-4.0	-4.9	-4.9

Ecosystem Unit Land Change Summary														
Ecosystem Unit	**EU 4-1d**		**EU 4-1e**		**EU 4-1f**		**EU 4-2a**		**EU 4-2b**		**EU 4-3a**		**EU 4-3b**	
Scenario	**NIA**	**PDMP**	**NIA**	**PDMP**	**NIA**	**PDMP**	**NIA**	**PDMP**	**NIA**	**PDMP**	**NIA**	**PDMP**	**NIA**	**PDMP**
eu_wetland00	120	120	197	197	94	94	311	311	184	184	69	69	146	146
eu_wetland05	119	119	192	196	91	91	301	317	180	192	68	68	144	144
eu_wetland10	117	117	188	191	89	89	291	307	177	187	66	66	142	142
eu_wetland15	116	116	184	187	87	87	282	297	175	184	65	65	140	140
eu_wetland20	115	115	179	183	85	85	273	288	172	181	64	64	138	138
eu_wetland25	114	114	175	179	83	83	265	283	170	185	62	62	136	136
eu_wetland30	112	112	171	175	81	81	258	274	168	181	61	61	135	135
eu_wetland35	111	111	167	171	80	80	250	266	167	178	60	60	133	133
eu_wetland40	110	110	163	167	78	78	243	259	165	175	59	59	131	131
eu_wetland45	109	109	160	163	76	76	237	252	164	173	58	58	129	129
eu_wetland50	107	107	156	159	75	75	231	246	163	172	57	57	128	128
eu_ch_0_10	-3	-3	-9	-6	-5	-5	-20	-4	-7	4	-3	-3	-4	-4
eu_ch_40_50	-2	-2	-7	-8	-3	-3	-13	-13	-3	-4	-2	-2	-3	-3
eu_ch_0_50	-13	-13	-41	-38	-19	-19	-80	-65	-21	-12	-12	-12	-18	-18
eu_ch_0_10 (%)	-2.3	-2.3	-4.6	-2.8	-4.9	-4.9	-6.4	-1.4	-3.6	2.0	-4.1	-4.1	-2.7	-2.7
eu_ch_40_50 (%)	-2.2	-2.2	-4.5	-4.6	-4.0	-4.0	-5.3	-5.2	-1.6	-2.1	-3.2	-3.2	-2.6	-2.6
eu_ch_0_50 (%)	-10.6	-10.6	-20.8	-19.1	-20.4	-20.4	-25.8	-21.0	-11.5	-6.6	-16.9	-16.9	-12.6	-12.6

Ecosystem Unit Land Change Summary														
Ecosystem Unit	**EU 4-3c**		**EU 4-4a**		**EU 4-4b**		**EU 4-4c**		**EU 4-4d**		**EU 4-4e**		**EU 4-4f**	
Scenario	**NIA**	**PDMP**	**NIA**	**PDMP**	**NIA**	**PDMP**	**NIA**	**PDMP**	**NIA**	**PDMP**	**NIA**	**PDMP**	**NIA**	**PDMP**
eu_wetland00	1	1	26	26	168	168	10	10	125	125	129	129	42	42
eu_wetland05	1	1	26	26	160	180	10	10	124	124	128	156	42	75
eu_wetland10	1	1	25	25	153	171	10	10	124	124	127	155	42	75
eu_wetland15	1	1	25	25	146	164	10	10	123	123	127	154	42	75
eu_wetland20	1	1	25	25	140	156	10	10	122	122	126	154	41	75
eu_wetland25	1	1	25	25	134	157	10	10	122	122	126	154	41	75
eu_wetland30	1	1	24	24	128	150	10	10	121	121	125	153	41	75
eu_wetland35	1	1	24	24	123	143	10	10	121	121	124	152	41	75
eu_wetland40	1	1	24	24	118	137	10	10	120	120	124	152	41	75
eu_wetland45	1	1	24	24	113	131	10	10	119	119	123	151	41	74
eu_wetland50	1	1	23	23	108	126	9	9	119	119	123	150	41	74
eu_ch_0_10	0	0	-1	-1	-15	3	0	0	-1	-1	-1	26	0	33
eu_ch_40_50	0	0	-1	-1	-9	-11	0	0	-1	-1	-1	-1	0	0
eu_ch_0_50	0	0	-3	-3	-60	-42	0	0	-6	-6	-6	22	-1	32
eu_ch_0_10 (%)	0.0	0.0	-2.2	-2.2	-8.9	2.1	-1.0	-1.0	-1.0	-1.0	-1.0	20.6	-0.7	79.3
eu_ch_40_50 (%)	0.0	0.0	-2.1	-2.1	-7.9	-8.2	-0.9	-0.9	-1.0	-1.0	-1.0	-1.0	-0.7	-0.6
eu_ch_0_50 (%)	0.0	0.0	-10.4	-10.4	-35.4	-25.2	-4.5	-4.5	-4.9	-4.9	-4.7	16.9	-3.3	76.6

Ecosystem Unit Land Change Summary												
Ecosystem Unit	**EU 4-4g**		**EU 4-4h**		**EU 4-4i**		**EU 4-4j**		**EU 4-4k**		**EU 4-4l**	
Scenario	**NIA**	**PDMP**	**NIA**	**PDMP**	**NIA**	**PDMP**	**NIA**	**PDMP**	**NIA**	**PDMP**	**NIA**	**PDMP**
eu_wetland00	183	183	50	50	121	121	76	76	161	161	1	1
eu_wetland05	181	181	50	50	120	120	76	76	160	160	1	1
eu_wetland10	180	180	50	50	119	120	75	75	159	159	1	1
eu_wetland15	178	178	50	50	119	119	75	75	157	157	1	1
eu_wetland20	176	176	50	50	118	118	74	74	156	156	1	1
eu_wetland25	175	175	50	50	118	118	74	74	155	155	1	1
eu_wetland30	173	173	50	50	117	117	74	74	154	154	1	1
eu_wetland35	172	172	49	49	116	117	73	73	152	152	1	1
eu_wetland40	170	170	49	49	116	116	73	73	151	151	1	1
eu_wetland45	169	169	49	49	115	115	73	73	150	150	1	1
eu_wetland50	167	167	49	49	115	115	72	72	149	149	1	1
eu_ch_0_10	-3	-3	0	0	-1	-1	-1	-1	-3	-3	0	0
eu_ch_40_50	-3	-3	0	0	-1	-1	-1	-1	-2	-2	0	0
eu_ch_0_50	-16	-16	0	0	-6	-6	-4	-4	-12	-12	0	0
eu_ch_0_10 (%)	-1.8	-1.8	-0.1	-0.1	-1.0	-0.9	-1.0	-1.0	-1.6	-1.6	-0.3	-0.3
eu_ch_40_50 (%)	-1.8	-1.8	-0.1	-0.1	-1.0	-1.0	-1.0	-1.0	-1.6	-1.6	-0.3	-0.3
eu_ch_0_50 (%)	-8.7	-8.7	-0.4	-0.4	-5.0	-5.0	-5.0	-5.0	-7.7	-7.7	-1.5	-1.5

Integrated Ecosystem Restoration and Hurricane Protection: Louisiana's Comprehensive Master Plan for a Sustainable Coast

Appendix H: May 2006 Alternative Plan Formulation Process

Coastal Protection and Restoration Authority of Louisiana

April 2007

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1.0 Overview

1.1 Introduction

Appendix H presents the initial stages of development of the Master Plan, which led to the definition of two complete alternative plans for appraisal. Section 1.2 presents the process and alternative plans. Section 1.3 details the appraisal process applied to evaluate the features and issues of the Louisiana coastal area. Section 1.4 discusses the rationales used in defining the two alternative plans for initial appraisal. Sections 2 to 6 present descriptions of each of the five planning units, including details of the alternative plans. These sections are supported by a comprehensive set of 25 figures, numerous maps, and 50 tables for planning units.

The subsequent analyses of the alternative plans and the decision process that led to the definition of the November 2006 Preliminary Draft Master Plan may be found in Appendix B.

Following an initial period of data collection and review, the first notable stakeholder interaction was at an Interdisciplinary Technical Team (ITT) meeting held in May 2006. At this meeting stakeholders were asked to review the data collected and appraise the inputs used in defining alternative plans. Chapter 7 of this appendix presents a summary of the May IPT-ITT Plan Refinement Workshop.

1.2 Plan Formulation Process

Figure 1.1, below, illustrates the process by which existing knowledge and understanding of the Louisiana coast was used to define the alternative plans that were carried forward for analysis.

The Louisiana coast was initially divided into five planning units, each representing a coastal hydrologic region. The planning units divide the coast into manageable sections and provide a consistency with the breakdown previously used for the Louisiana Coastal Area, Louisiana Ecosystem Restoration Study (LCA).

Step 1. The ***baseline understanding*** portion of the process began with the collation and review of existing knowledge to address and document the problems to be addressed in the Master Plan. Existing knowledge defined the current level of risk for the human environment and the process disruptions for the natural environment. The human environment was considered in two categories: Concentrated and Distributed Assets. Concentrated Assets include urban areas and other concentrations of community assets. Distributed Assets include built assets external to urban concentrations, such as highways, waterways and oil and gas facilities. Review of these assets considered each in their place and their present level of flood risk and protection. The natural environment review considered the status of ecosystem units (sub-units of the planning units) and any disrupting processes presenting threats to the units (e.g. subsidence, disruptions to the natural hydrologic processes, etc.).

The coastwide baseline understanding was been summarized into an overview for each planning unit, presenting the status of the planning unit and its assets.

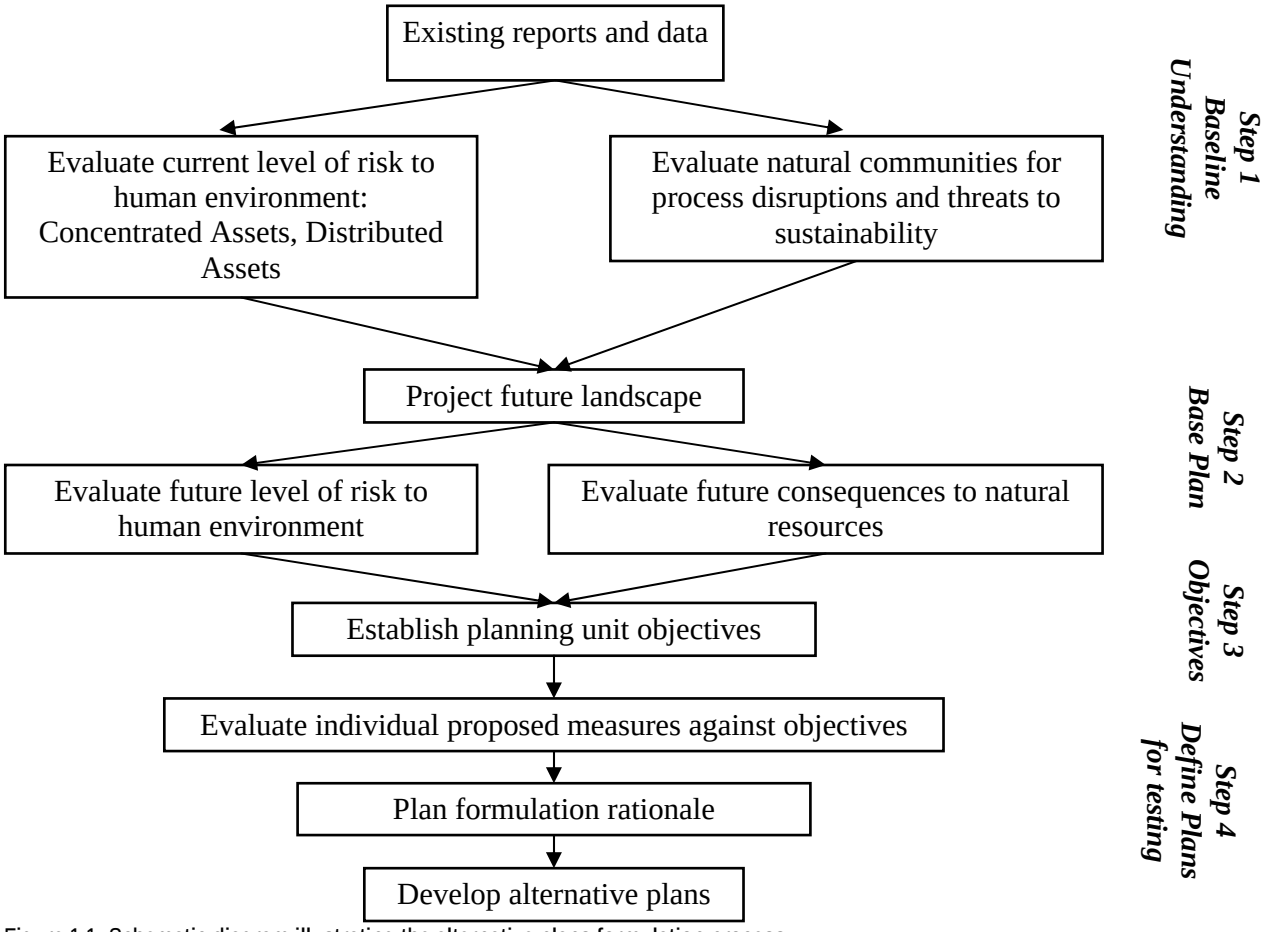


Figure 1.1: Schematic diagram illustrating the alternative plans formulation process

Step 2. The current level of risk for the human environment and the process disruptions for the natural environment were used to project the future landscape in order to develop a ***base plan***. The base plan describes how the coast would evolve over the next 100 years, assuming existing levels of protection are maintained (with repairs to pre-Katrina levels) and CWPPRA projects authorized for construction. Assessment of the base plan has considered the physical evolution of the coast to forecast its future landscape and hence the implications for natural and human assets respectively. This assessment was then used to evaluate the future level of risk to the human environment and evaluate future consequences to natural resources.

Step 3. The base plan implications were used as the basis for defining specific ***planning unit objectives***. These objectives address the specific future risks and impacts identified. These objectives do not define rules for the Master Plan. Rather, the objectives describe aspirations that the plan aims to achieve (while accepting that it may not be possible to achieve all objectives). The objectives cover both hurricane protection and coastal restoration.

Step 4. The possible ways of achieving these objectives are then used to ***define alternative plans for testing***. From the existing knowledge and reports, a list of known proposed measures has been compiled, to define a list of options for future management of the coast. For each planning unit, the objectives are presented in an “Objectives

vs. Measures Table." In the tables, a list of measures is evaluated against the planning unit objectives to identify those measures that might achieve a positive result. Measures that may have a negative impact on objective aims are also identified.

This appreciation of the potential benefits and impacts of the measures was used to define two alternative coastwide plans based upon the **plan formulation rationales**. These two alternative plans represented the first attempt to define a consistent plan for the coast. After consultation with SERT, ITT, stakeholders, and the public, aspects of the two alternatives were merged into a single plan. This resulting plan was then taken forward for detailed modeling and evaluation.

1.3 Rationale and Scoring Criteria

The preceding information points to the need for a specific rationale for planning the future of Coastal Louisiana. Decisions have been made regarding ways for evaluate all of the critical factors that make up the coastal environment (human and natural), as well as the overall purpose, the plan objectives, and the time-frames for implementation.

First, a long-term time-frame in which to carry out recovery, protection, and restoration of the coastal zone was set at a 100-year horizon. This horizon incorporates all the short, intermediate, and long-term projects and measures that could be planned, implemented, and maintained within the Master Plan.

Second, boundaries for five planning units were established based on hydrologic basins and watersheds using the existing LCA study. The four sub-provinces defined for the LCA Study were carried forward as planning units. However, the third sub-province defining the Atchafalaya River basin was divided into two additional planning units: 3a and 3b. The region was divided based on the relative influence of the Atchafalaya River. Additionally, system disruptions, as well as opportunities for restoration, are different in these two areas. The five planning units are (1) East of the Mississippi River, (2) Mississippi River to Bayou Lafourche, (3a) Bayou Lafourche to Bayou de West, (3b) Bayou de West to Freshwater Bayou, and (4) Freshwater Bayou to Sabine River. These planning units are illustrated in Figure 1.2.

Third, a consistent set of criteria was developed to allow for a first-cut appraisal of the human and natural environment assets and risks to progress in a transparent, coordinated, and open way. This set of criteria was applied equally across all the coastal planning units. The human and natural environment appraisals were recorded in a tabular format for each unit along with planning unit descriptions providing additional context. This method ensured consistent reporting across all planning units.

The appraisal provided the basis for definition of planning unit objectives against which potential measures could be evaluated. All appraisals were based upon reviews of existing reports and data, both in terms of the current status, as well as in relation to possible future threats. Alternative plans developed from this exercise would be carried forward for detailed modeling, to better determine each plan's ability to meet objectives.

Numerous sources of data were used to determine the baseline coastal conditions, including geographic data for Louisiana and the Gulf of Mexico. A Geographical Information System (GIS) was used to create and store spatially related layers from a variety of datasets and rapidly analyze and deploy information regarding the Master Plan. This tool allowed experts to coordinate, analyze, and depict geographic features and spatial (geographic) relationships between Louisiana's human and natural resources.

10 5 0 10
Miles

1:633,600
1 inch equals 10 miles

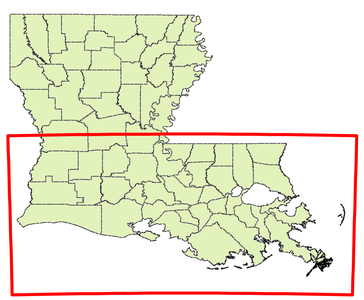
Planning Unit 4

Planning Unit 3b

Planning Unit 3a

Planning Unit 2

Planning Unit 1



Legend

- Land
- Water
- Parish Boundary
- Planning Unit Boundary

Coordinate system: Louisiana South State Plane feet, NAD83, FIPS Zone 1702

Map Document: (K:\DNR\GIS_Documents\Project_Maps\MXD\dnr_0001_area_boundaries.mxd)
4/13/2006 - 8:48:38 AM

LOUISIANA COMPREHENSIVE COASTAL PROTECTION MASTER PLAN

FIGURE 1.2

PLANNING UNITS

The following sections present the definitions, process, and assumptions used to appraise the planning unit assets and risks, and define planning unit objectives.

1.3.1 Human Environment

Review of the human environment focused upon those built assets important for human habitation in the Louisiana coastal zone. The assessment was divided into Concentrated Assets and Distributed Assets. Concentrated Assets represent significant groupings of built assets such as cities, towns, communities, or important industrial/infrastructure areas. Distributed Assets then identify the other important artificial structures outside concentrated areas within the planning unit, such as highways. The planning unit overview text for each unit identifies the linkages and synergies between the assets set out in the two sets of tables.

A. Definition of Concentrated and Distributed Assets

Identification of the Concentrated Asset groupings was undertaken using the following rationale:

- consistent groupings between planning units;
- consistent land elevation;
- consistent flood risk exposure; and
- broadly consistent character (to include whole communities).

The Distributed Asset groups were then defined using separate rationale:

- important built assets outside the Concentrated groupings;
- consistent landforms and elevation;
- consistent potential surge impacts

Together, the Concentrated and Distributed Asset groupings provide a complete geographical coverage of the coastal zone within each planning unit. A map indicating these groupings is provided for each planning unit.

Flooding and Land Loss Risks

For each of the Concentrated and Distributed Asset groupings within a planning unit, an appraisal was made of the current level of flooding risk under a range of possible storm surge elevations. This provides a description of the vulnerability of these assets to damage under various storm surge conditions.

The Saffir/Simpson storm surge category is defined by pressure, wind and storm surge. There is not a one-to-one relationship among these elements. The central pressure ranges of hurricanes on the Saffir/Simpson Hurricane Scale (SSHS) would usually agree fairly well with the wind ranges in that category. However, storm surge is strongly dependent on the slope of the continental shelf (shoaling factor). This factor can change the height of the surge by a factor of two for a given central pressure and/or maximum wind. Because this potential variation in surge levels, the primary cause of flooding damages for any particular Hurricane Category, produces such a wide variety of flood impacts, risks under specific surge heights were considered instead.

For the baseline assessments, the likely extent of flooding damage under surges of 5, 10, 15, 20, 25 and 30 feet was modeled. To quickly assess the impacts of such storm surge at the coast and to give some information on risks to assets, a Sea, Lake and Overland Surges from Hurricanes (SLOSH) model was run for all five planning units for each of the six storm surge levels.

B. Relative Damage from Storm Surges (Tables 1 and 3 in each PU chapter)

For each of the Concentrated and Distributed Asset groupings within a planning unit, an appraisal was made of the current level of flooding risk. Risk was described in terms of the proportion of assets likely to be damaged or destroyed by flooding under each surge level. Combining records of historic damages with knowledge of the communities and pre-defined terminology, relative damages and risks were established for a qualitative risk assessment. Relative damages to a particular asset grouping were described using the terminology listed below:

Band		Description
EL	Extremely Low	Some flooding of low-lying roadways and uninhabited areas; minor erosion.
L	Low	Flooding of low-lying roadways and uninhabited areas; flood damage to a smaller structures; minor to moderate erosion.
M	Medium	Flooding near the coast impacts smaller structures; larger structures receive some damage; moderate erosion.
H	High	Flooding severely impacts; larger structures receive damage; high erosion.
EH	Extremely High	Flooding destroys smaller structures; larger structures are severely impacted; floodwaters overtop tidal levees; high erosion; saline water impact coastal resources.

Tables presenting the **Relative Damage from Storm Surge** to Concentrated and Distributed Asset groupings are provided for each planning unit.

These assessments assume that existing flood defense structures are in place to pre-Katrina levels of protection. The surges levels were used only as a means to define the overall level of risk. At this baseline stage, no attempt was made to attribute a probability of occurrence to particular surge levels. The flood risk assessments provide the basis upon which to consider current requirements for improved flood defense, and to identify those assets at the greatest risk.

1.3.2 Human Asset Scoring Criteria

Alongside the appraisals of flooding risk, an assessment of the relative importance of each Concentrated and Distributed Asset grouping was made using consistent scoring systems. The scoring was not used to prioritize or rank locations. Rather, it helped in discerning the relative importance of the flooding risks described above. The following sections describe the basis of the scoring systems used.

A. Concentrated Assets Scoring (Table 2 in each PU chapter)

The scoring of Concentrated Asset groupings was based upon an assessment of the nature and extent of the assets present. A score out of 100 is given for each grouping based upon the following features:

Residences	25
Industry	20
Infrastructure	15
Institutional and Publicly Owned Facilities	15
Strategic Resources	25
Maximum Score	**100**

A table presenting the Concentrated Assets Scoring is provided for each planning unit.

The individual scores for each of these features are based on set definitions, as set out below. These scores allow comparison of significance across the coast.

i. Residences

This category represents the concentration of residences (houses, apartments, etc) present in the grouping. Residential concentration is taken as an indicator of community size—a governing factor for determining the appropriate level of coastal protection. The probability for catastrophic disaster in terms of human life and infrastructure is commensurate with the population and tax base required to support a high level of hurricane protection.

On a scale of 1-25, the score for residences is based upon the total number of housing units within the grouping (taken from census data). No strict scoring rationale are defined, Rather a consistent, relative approach was used. Typical examples of the scores given, for a range of communities on the Louisiana coast, are given below:

- New Orleans – 25
- Lake Charles – 20
- Houma – 17
- Thibodaux or Morgan City – 15
- Franklin or New Iberia – 12
- Jeanerette – 8
- Delcambre - 5

ii. Industries

The industries category represents the economic status of the asset grouping. The following are a list of industries included in the analysis:

- Oil & gas infrastructure (excluding refineries)
- Agricultural land and buildings
- Fishing and Hunting
- Construction, Manufacturing and Fabrication
- Commercial Industry (wholesale and retail)
- Professional Services
- Hotel, Restaurant and Tourism
- Public Services

As with residences, no strict scoring rationale was defined; however, the Industry score (out of 20) was based upon the importance of the industries present. The following criteria defined the importance of an industry:

- Employment – number of direct employees
- Criticality to recovery
- Environmental consequences
- National significance
- State significance

- Local significance

iii. Infrastructure

The infrastructure category is used to inventory the public infrastructure, right-of-ways, and services sustaining the community and enabling economic activity. The following is a list of infrastructure catalogued in the appraisal of community assets:

- Forced drainage levees
- Highways, roads and bridges
- Internal pump stations
- Navigation Channels
- Pipelines
- Ports
- Railroads
- Schools
- State/Federal Research Facilities
- Waterlines

No strict scoring rationale was defined; however, the Infrastructure score (out of 15) was based upon the importance of the assets present. The following criteria defined the importance of an infrastructure component:

- National significance
- State significance
- Local significance
- Criticality to Recovery

iv. Institutional and Publicly-Owned Facilities

This category is used to represent the local support facilities, which are vital to concentrated asset areas. This category includes the following facilities:

- Military bases
- Penal institutions
- Police stations
- Sheriff's Department
- State and Local Government facilities
- Universities/Community Colleges
- EMS Stations
- Fire Stations
- Heliports
- Hospitals

Because institutional and publicly owned facilities can also be classified as infrastructure, the same criteria and ranking system as used for infrastructure was used to rank the facilities in this section. Thus the score (out of 15) is based upon the following criteria:

- National significance

- State significance
- Local significance
- Criticality to Recovery

v. Strategic Resources

The Strategic Resources category represents nationally important assets and features critical to the recovery of the area after a major storm. This category includes the following strategic resources:

- Major Pump Stations
- Major Strategic ports
- Evacuation Highways
- Telecommunications towers and stations
- Wastewater treatment plants
- Airports (Civilian and Military)
- Drinking Water Plants
- Henry Hub
- LOOP
- Refineries

No strict scoring rationale was defined; however, the Strategic Resources score (out of 25) was based upon the same criteria as the above two feature groups, listed below:

- National significance
- State significance
- Local significance
- Criticality to Recovery

B. Distributed Assets Scoring (Tables 4 and 5 in each PU chapter)

The scoring of Distributed Asset groupings is based upon an assessment of the nature and extent of the assets present. The assets included in these groupings are specific to each planning unit, and presented under the following headings:

- Oil & Gas Fields
- Oil & Gas Pipelines
- Highway, Bridges & Transportation
- Evacuation Routes
- Ports, Waterway & Infrastructure
- Other Strategic Assets

A score out of 100 is given for each grouping based upon the importance of these assets under the following criteria:

National Significance	25
State Significance	25
Local Significance	25

Critical to Recovery	25
Maximum Score	**100**

A table presenting the Distributed Assets Scoring and another identifying the Distributed Assets present within each grouping are provided for each planning unit.

The scores are based on a set of definitions, as shown below.

i. National Significance

The first component of the Distributed Assets Scoring System is National Significance. This criterion is given a maximum weight of 25 points. National Significance describes the value of strategic resources on the Nation's people, economy, environment, and homeland security. This criterion provides an indicator of the value of strategic resources to the Nation.

ii. State Significance

State Significance is the second criterion of the Distributed Assets Scoring System. State Significance, weighted with a maximum of 25 points, describes the value of strategic resources (by planning unit) to the State's people, economy, environment and homeland security.

iii. Local Significance

The third criterion, Local Significance, represents the value of strategic resources to the local people, economy, environment as well as local homeland security.

vi. Critical to Recovery

The final criterion in the Distributed Assets Scoring System is Critical to Recovery. This criterion represents how significant a particular resource is to the recovery of an area after a crisis or natural disaster. This criterion has been deemed very important to the functional value (i.e. importance) of infrastructure resources, thus infrastructure that is rated as more significant to an area's recovery would have a greater "Critical to Recovery" score.

1.4 Natural Environment

To describe the problems within, and risks to, the natural environment, the planning units were first divided into subunits, referred to as ecosystem units, according to three decision points. The primary division was made according to vegetation types, based on Chabreck and Linscombe marsh type (Coastal Louisiana Vegetative Type Characterization Data, 2001) and the USGS Louisiana GAP imagery (Louisiana Gap Analysis Project, United States Geological Survey, 1998). Adjustments were then made according to locations of major landforms (e.g., ridges, major water bodies). Final adjustments were made to correlate with Coast 2050 mapping unit breaks whenever possible, to allow for greater ease in using information from the report.

Note that the ecosystem units derived for this assessment usually encompassed multiple Coast 2050 mapping units. In cases where ecosystem subunits covered multiple Coast 2050 mapping units, averages of mapping unit information were used to fill out the tables.

1.4.1 Existing Conditions and Problems Identification Tables (Table 6 in each PU chapter)

The relative influence of major function disruptions on each of the ecosystem units was described in relative terms to provide an easily discernable description of the major process disruptions within any particular ecosystem unit. This is presented in a table for each planning unit. These tables are not intended to prioritize between ecosystem units, but only to understand the major drivers within a unit that should be addressed to increase landscape stability.

The major function disruptions that were considered are defined as follows:

Subsidence

Rates were taken from figure 4-5 of the Coast 2050 report (Louisiana Coastal Wetlands Conservation and Restoration Task Force and the Wetlands Conservation and Restoration Authority, 1998). These were described in the report to reflect true subsidence, as benchmark elevations were not referenced to tide gauges. For the purposes of this exercise, the rates were classified as follows:

No Impact	0 feet/century
Low	0 – 1 feet/century
Moderate	1.1 – 2 feet/century
High	2.1 – 3.5 feet/century
Very High	>3.5 feet/century

Tidal Exchange

This category was used to describe the deleterious effects of increased daily tidal energy exposure on wetlands. It was assumed that such energy is more harmful to historically fresh/intermediate wetlands, and less harmful—or even beneficial to—historically brackish/saline wetlands. Thus, the wetland conversion information found in the Coast 2050 report was used to populate this portion of the table.

Sediment Disruptions

Disconnections from historic sources of sediment were captured in this category. This could include disruptions to direct connections to rivers or other waterways that historically nourished an area, or disruptions to riverine plumes that travel along the coast and serve as sediment sources for coastal shorelines.

Saltwater Intrusion

Causes of increased salinities to coastal wetlands are captured in this category. Causes include land retreat which allows encroachment of the Gulf of Mexico inland, saltwater movement up man-made canals and navigation channels, encroachment into natural water bodies because of decreased freshwater outflow, etc. Historic, present, and projected future habitat information found in the Coast 2050 report was used for this category, as well as maps showing extent of man-made canals and navigation channels.

Altered Inundation

Altered frequency or duration of inundation that is not related to relative sea level rise (subsidence plus sea level rise), was described in this category. Such alterations generally included disconnections from freshwater sources and impoundments.

Wave/wake Energy

Causes of increases in wave/wake energy include expansion of lake diameters, which increases fetch, and boat/ship wakes within canals. Storm energy is also included in this category.

Direct Removal

This category is defined as dredging of wetlands or covering by spoil banks and levees. Generally, this category describes historic actions; however, some isolated areas of the coast continue to be subjected to direct removal, and such losses are incorporated.

1.4.2 Changes in Natural Resources, 1990-2050 (Table 7 in each PU chapter)

The natural resources at risk if no further action is taken to protect them were described in relative terms. Tables show risk of loss to major habitat types, as well as representative fish and wildlife species for each of those specific habitat types. This information was taken directly from the Coast 2050 report, without exception. Projected percent loss of the habitats was presented in the Coast 2050 report, but was converted to relative terms for this table. Translations to the relative terms are found in the "Wetland Key" on the tables. Projected losses of fish and wildlife species were presented in the Coast 2050 report in relative terms, and those relative terms were used in this table to the extent possible.

Loss of storm attenuation was also described in this table. This field was populated by considering the projected land loss in an ecosystem unit as well as the current capacity of that landmass to attenuate storm energy. The former was taken from the Coast 2050 report, but the latter was largely professional judgment. For example, although the projected land loss is high for the Chandeleur Islands, it was determined that they are already so removed from the next closest land mass that their current ability to abate storm energy is relatively low. Therefore, the projected loss of storm attenuation was determined to be moderate. Conversely, projected high loss of the fringing marshes of planning unit 3a was considered to translate to high loss of storm attenuation capacity because of their proximity to the barrier islands as well as communities and infrastructure.

Future Risks to Human Assets

The changing climate and continuing loss of wetlands, ongoing subsidence, and increased frequency of storms, all serve to greatly increase the risk to coastal human assets. The changes in natural resources identified from the tables described above, would form the basis for this assessment of future risks to human assets.

For the purpose of creating alternative plans, quantification of the future risk, or differentiation between the changes in risk between assets was not necessary. However, the assessment identified where the future risk is likely to be similar to, or greater than, at present. The assessment also identified if the future natural resource changes or sea level rise would result in a step change in risks, such as a loss of protective landforms. All the assumptions used in formulating alternative plans were tested while being assessed for the ability to meet coastwide objectives, and during the modeling of the plans.

Objectives and Measures Tables

For each planning unit, a series of planning unit objectives were defined based upon the risks to human and natural assets. These are set out in an "Objectives vs. Measures Table" which sets out the planning unit objectives, the coastwide objectives they reflect, and the possible measures that could be applied to achieve them. Each table has seven main columns:

1. Identifies if the location defined covers Concentrated Assets, Distributed Assets or Natural Assets.
2. Identifies the specific Geographic Location under consideration.
3. Summarizes the current status of the human or natural assets in that location, as defined in the baseline understanding.
4. Summarizes the future risks and impacts to assets under the base plan.
5. Sets the specific objective(s) to address the future risks/impacts to the assets in that location.
6. Identifies the coastwide objective that the planning unit objective relates to.
7. List of Potential Measures to meet objectives.

1.5 Plan Formulation Rationales

Two plan formulation rationales were developed for each planning unit based on all of the above discussed factors, criteria, rankings, and scores. In the first rationale, the strategy for selection of protection and restoration measures is summarized as follows:

> *"Provides for maximum structural protection, without constraints by local (asset) benefit/costs. Landscape features will be created and sustained using mechanical means. Long-term O&M costs are not a constraint at this stage of plan formulation."*

Specifically, this rationale was applied using the following parameters:

1. Maximum hurricane protection for all communities where technically feasible (using judgment at this stage).
2. Minimize overall length of flood protection features regardless of primary wetland impacts (with regard to technical feasibility and maximizing efficiency). Measures would be designed to avoid, minimize, or mitigate primary wetland impacts of any alignment.
3. Ecosystem restoration projects or combinations maximize acres of wetlands and other coastal features in the near term (e.g. long distance pipeline of material for creation of land). Sustainability would be provided by mechanical methods.

In the second rationale, the strategy for selection of protection and restoration measures and alternatives is summarized as follows:

> *"Provides for variable levels of structural protection with non-structural alternatives for protection (e.g. coastal restoration, evacuation planning, raising or relocating assets). Measures will reflect benefit/cost constraints and include self-sustaining environmental options. Long-term O&M costs will be minimized."*

Specifically, this rationale was applied using the following parameters:

1. Variable hurricane protection for all communities where feasible; level of protection defined by assessment of risk to the human economic assets (based on analyses of concentrated and distributed assets).

2. Minimize overall system impacts by minimizing flood protection project disruptions to wetland ecosystems (e.g. minimize acres of wetlands impounded, minimize constrictions to normal hydrologic exchange, maximize non-structural solutions, and use natural landforms).
3. Ecosystem restoration projects or combinations ensure self-sustaining processes are restored (i.e. large-scale diversions to build and sustain wetlands, or combine marsh creation with smaller diversions to sustain wetlands).

Alternative plans were defined based on the plan formulation process and the inputs provided during the Interdisciplinary Technical Team (ITT) workshop held on 1 May 2006. These are set out in Chapters 2 through 6 of this Appendix.

2.0 Planning Unit 1: East of the Mississippi River

2.1 Overview

Planning Unit 1 (PU 1), representing the entire Lake Pontchartrain Basin, is the most densely populated planning unit in Coastal Louisiana and stretches from the East Bank of the Mississippi River to the Mississippi State Line.

Located in PU 1 is a majority of the New Orleans Metropolitan Area (New Orleans) located east of the Mississippi River. New Orleans has unique heritage, including architectural and cultural resources, and it plays a major role within the world trade and tourism industries.

Within PU 1, three ports are of national significance: (1) The Port of South Louisiana, (2) the Port of New Orleans and (3) Port of Plaquemines. In addition, the region has many economic benefits due to its diverse infrastructure that provides jobs and is a substantial part of the life within the PU.

Besides the Mississippi River, the Gulf Intracoastal Waterway (GIWW) and the Mississippi River Gulf Outlet (MRGO) are major waterways which influence the economy in the region, but have also produced a negative impact on the region by directly removing otherwise healthy habitat, altering the natural hydrology and promoting saltwater intrusion into fresher habitat. Therefore, finding a long-term solution is a high priority. In addition, the numerous highly developed and diversified industrial and residential centers located throughout PU 1 have dramatically altered much of the natural environment.

The solution to the critical problems facing this planning unit must include flood protection structures and coastal landscape features that work together to ensure the long-term sustainability of the natural and human environment and at the same time recognizes the needs of the economy.

Compared to historic conditions, very little fresh water, nutrients, and sediment are being introduced into PU 1. Most remaining connections with fresh water are in the Lake Maurepas and North Shore areas where several bayous and rivers empty into Lake Pontchartrain. Additionally, the Caernarvon Diversion provides freshwater and nutrients into Upper Breton Marshes. Other system stressors include direct removal of habitat by dredging or burial; increased tidal amplitude into fresher, inland areas; accelerated shoreline erosion; and relative sea level rise. In combination these stressors serve to decrease habitat crucial to the productivity of commercially and recreationally important fish and wildlife species. Another crucial issue is the very rapid destruction of wetlands within the Lake Borgne vicinity, Breton Sound, Biloxi Marshes, Orleans Land Bridge, and Chandeleur Island Chain, which buffer New Orleans against storm surge.

Developing natural and man-made measures to ensure hurricane storm surge and flood protection is critical for a sustainable solution for the future. Reintroduction of sediments, nutrients, and fresh water from the Mississippi River into all areas of Planning Unit 1 is vital to the future of this region. Additionally, strengthening and maintaining the critical landmasses between Lakes Maurepas and Pontchartrain, and Lakes Pontchartrain and Lake Borgne; and restoring and maintaining the Chandeleur Islands should be considered.

Both Alternative Plan 1 and Alternative Plan 2 must include completion or acceleration of the measures within the Louisiana Coastal Authority (LCA) near-term plan as follows:

- MRGO Environmental Restoration Features
- Small Diversion at Hope Canal
- Small Diversion at Convent/Blind River

- Increase Amite River Diversion Canal Influence by Gapping Banks
- Medium Diversion at Whites' Ditch
- Modification at Caernarvon Diversion
- Louisiana/Mississippi Hydrodynamic Study
- Mississippi River Hydrodynamic Study
- Mississippi River Delta Management Study

2.2 Alternative Plan One

To provide the maximum structural protection for PU 1, Alternative Plan One comprises the USACE Levee Alignment 1, with an alternative alignment (East Levee Alignment 6) on the eastern end along the GIWW. Alignment 1 includes the Hurricane Barrier Plan and a Ring-levee around Plaquemine Eastbank along the Mississippi River.

The Hurricane Barrier Plan provides a levee protection system for a 30-ft storm surge at the coastline. It originates on the north shore of Lake Pontchartrain in Slidell, LA, and extends across the land bridge between Lake Pontchartrain and Lake Borgne. The system continues around the Lake Borgne shoreline to the vicinity of the existing Bayou Dupre structure. From that point, it coincides with the existing levee system around St. Bernard Parish and terminates at the Mississippi River Levee. It includes major structures at Rigolets Pass, Chef Menteur Pass, the GIWW, and the MRGO. It also includes structures and pumping stations at the outfalls of the 17th Street Canal, Orleans Avenue Canal, London Avenue Canal, and the Seabrook flood gate at the INHC. These structures would keep surges generated solely in Lake Pontchartrain from moving up these canals. The re-evaluated levee protection along the south shore of Lake Pontchartrain, which would continue along US Highway 11 (through Bayou Sauvage National Wildlife Refuge) and tie-into Alignment 1 and Chef Menteur Pass, would protect to the level needed for surges generated within Lake Pontchartrain.

Therefore, Levee Alignment 1, in combination with the south shore levee, would provide a maximum structural level of protection for New Orleans, North Shore and communities throughout the Lake Pontchartrain Basin, including the Plaquemine Eastbank.

Coastal restoration measures chosen for this alternative are significant landscape features, such as Barrier Island, Southern Biloxi Marsh Landbridge, and Lake Borgne Landbridge restoration. These measures have broad stakeholder support and enhance hurricane protection and ecosystem protection function.

A post-authorization change for the MRGO to exclude deep draft navigation, to include environmental restoration features is a major need in this planning unit. Due to the negative impacts of the MRGO to flood protection, as experienced during last year's hurricane season, this has to be addressed within any alternative chosen.

Sediment delivery via pipeline was chosen in various locations (LaBranche Wetlands, Central Wetlands, Golden Triangle, and American/ California Bay) as an immediate solution to enhance and restore critical wetlands that are sediment deprived, fragmented and/or deteriorated from saltwater intrusion and wave/wake impacts. The diversion at Benneys Bay also fulfills the goal of wetland restoration and the design is 30 percent complete under CWPPRA funding (CWPPRA Project No. PPL 10). These measures offer an implementable solution within the delta region.

Ridge restoration is an important feature in the goal of enhancing natural landscapes, habitats and natural hydrology, which is defined as coastwide objectives. The Bayou La Loutre Ridge and Main Pass Ridge are recommended projects, both being well supported by stakeholders. The Main Pass Ridge project provides synergy with the chosen Benneys Bay diversion and marsh creation project.

All of the LCA near-term plan measures are included in Alternative Plan One.

Besides hurricane protection and coastal restoration features, it is necessary to implement a strategic plan to elevate and/or relocate assets located outside the hurricane protection plans. This effort, in combination with the described features above, would provide a holistic approach to coastal protection as defined in Act 8.

2.3 Alternative Plan Two

For Planning Unit 1 Alternative Plan Two comprises the USACE Levee Alignment 1, with a lesser protection level from Caernarvon to Point a la Hache (20 ft storm surge at coastline) and no structures at the Rigolets Pass and Chef Menteur Pass. The existing levee along the south shore of Lake Pontchartrain would still be tied into Alignment 1 at Chef Menteur Pass and would be upgraded to the protection level determined from modeling results of the Hurricane Barrier Plan (without the Rigolets floodgate). This system would provide a maximum structural level of protection to the densely populated regions of the New Orleans and North Shore, which incorporate many concentrated assets, while offering a feasible protection to other areas.

Coastal restoration features chosen for this Alternative Plan provide a basis for a sustainable ecosystem while providing the most possible natural protection for the region. All recommended features have broad stakeholder acceptance.

Barrier islands provide the first line of defense against storm surge from the Gulf of Mexico and coastal stakeholders have long supported barrier island restoration as a coastal protection need. As well as offering storm surge reduction and retarding saltwater intrusions barrier islands serve valuable ecosystem functions and offer unique habitat.

A post-authorization change for the MRGO to exclude deep draft navigation, to include environmental restoration features is a major need in this planning unit. Due to the negative impacts of the MRGO to flood protection, as experienced during last years hurricane season, this needs to be addressed within any alternative chosen.

The Marshes within the Breton Sound, the Biloxi and Lake Borgne Landbridges have suffered from saltwater intrusion and have deteriorated over time due to limited freshwater introduction to these marshes. Subsidence and wave energy have also caused habitat degradation and loss. The past hurricane season accelerated the loss of these critical marsh habitats. There is consensus among coastal experts and the general public to protect these particular habitats due to their proximity to flood protection features and inhabited communities and their storm attenuation abilities. The marshes are also a substantial part of the livelihood of many residents in the vicinity.

To restore historic hydrologic conditions, target salinity gradients, and to nourish deteriorating marsh habitats and landbridges, several diversions/reintroductions (Convent/Blind River, Hope Canal, Violet, Caernarvon, American/California Bay, and Benneys Bay) of various magnitudes are integrated in this rational. The Caernarvon and American/California Bay diversions would also provide sediments to the deprived Breton Landbridge and Fringing Marsh area south of Point a la Hache. The Benneys Bay sediment diversion enhances

the area between Baptiste Colette Pass and Main Pass within the delta region with needed sediments from the Mississippi River.

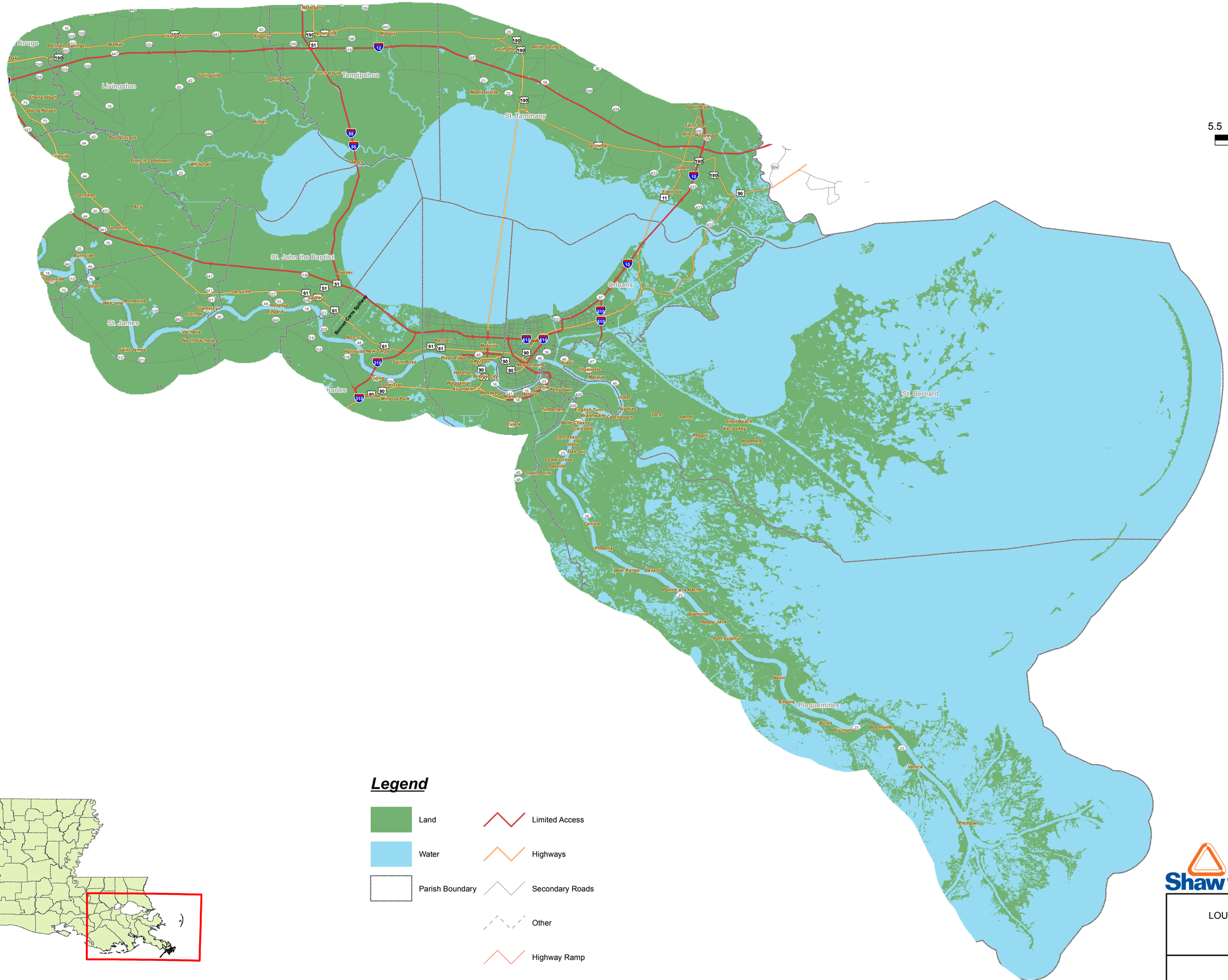
All of the LCA near-term plan measures are included in Alternative Plan Two.

Besides hurricane protection and coastal restoration features, it would also be necessary to implement a strategic plan to elevate and/or relocate assets located outside the hurricane protection plans. This effort, in combination with the described features above, would provide a holistic and sustainable approach to coastal protection as defined in Act 8.

2.4 Supporting Documentation

Supporting documentation for Planning Unit 1 Alternative Plan formulation includes the following:

Figure 2.1	Boundary and Base Map
Figure 2.2	Concentrated and Distributed Assets Map
Table 2.1	Relative Damage from Storm Surge for Concentrated Assets
Table 2.2	Concentrated Assets Scoring
Table 2.3	Relative Damage from Storm Surge for Distributed Assets
Table 2.4	Distributed Assets Scoring
Table 2.5	Distributed Assets Identification
Table 2.6	Existing Conditions and Problem Identification Table
Table 2.7	Changes in Natural Resources, 1990-2050 Table
Figure 2.3	Ecosystem Units and Natural Resources Map
Table 2.8a	Objectives and Measures Table - Concentrated Assets
Table 2.8b	Objectives and Measures Table - Distributed Assets
Table 2.8c	Objectives and Measures Table – Ecosystem Units
Figure 2.4	Alternative One Map
Figure 2.5	Alternative Two Map



Legend

- Land
- Water
- Parish Boundary
- Limited Access
- Highways
- Secondary Roads
- Other
- Highway Ramp

Coordinate system: Louisiana South State Plane feet, NAD83, FIPS Zone 1702

Map Document: (K:\DNR\GIS_Documents\Project_Maps\MXD\Area 1\Final\hr_area_1_0001_bate.mxd)
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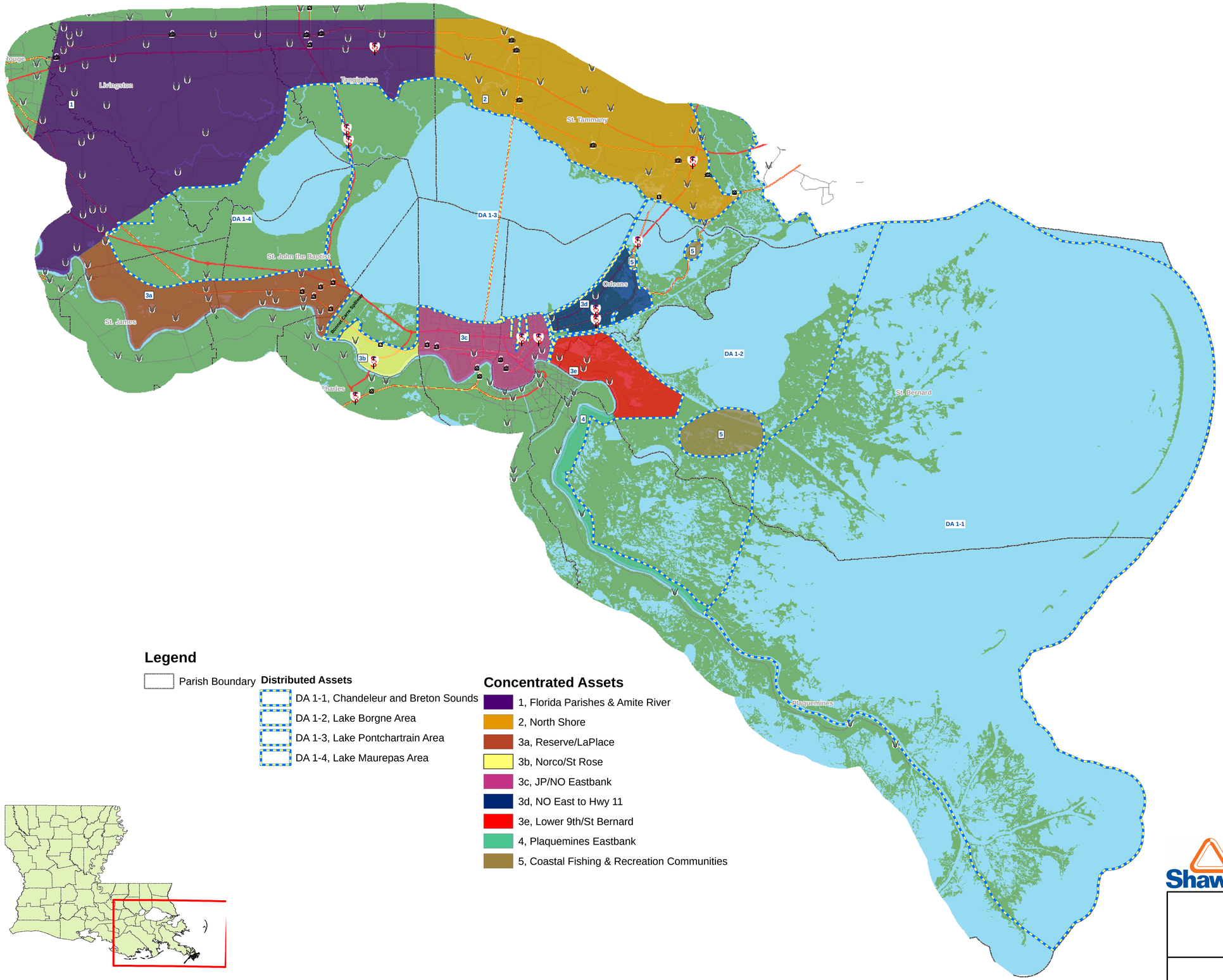
LOUISIANA COMPREHENSIVE COASTAL PROTECTION MASTER PLAN

FIGURE 2.1

PLANNING UNIT 1
BOUNDARY AND BASE MAP



5.5 2.75 0 5.5 11 Miles

1:348,480
1 inch equals 5.5 miles

Legend

Parish Boundary

Distributed Assets

- DA 1-1, Chandeleur and Breton Sounds
- DA 1-2, Lake Borgne Area
- DA 1-3, Lake Pontchartrain Area
- DA 1-4, Lake Maurepas Area

Concentrated Assets

- 1, Florida Parishes & Amite River
- 2, North Shore
- 3a, Reserve/LaPlace
- 3b, Norco/St Rose
- 3c, JP/NO Eastbank
- 3d, NO East to Hwy 11
- 3e, Lower 9th/St Bernard
- 4, Plaquemines Eastbank
- 5, Coastal Fishing & Recreation Communities

Coordinate system: Louisiana South State Plane feet, NAD83, FIPS Zone 1702

Map Document: (K:\DNR\GIS_Documents\Project_Maps\MXD\Area 1\Final\dnr_area_1_0002_Concentrated_AssetsFinal.mxd)
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LOUISIANA COMPREHENSIVE COASTAL PROTECTION MASTER PLAN

FIGURE 2.2

PLANNING UNIT 1
CONCENTRATED ASSETS AND DISTRIBUTED ASSETS

PLANNING UNIT 1 - East of the Mississippi River

Table 2.1 Relative Damages from Storm Surge to Concentrated Assets

Proportion of assets damaged or destroyed due to storm surge: EL = Extremely Low (0-5%) L = Low (5 - 15%) M = Medium (15 - 25%) H = High (25 - 50%) EH = Extremely High (>50%)	**Storm Surge at Coastline (Feet)**	**Florida Parishes & Amite River**	**North Shore**	**New Orleans Metro Area**					**Plaquemines Eastbank**	**Coastal Fishing & Recreation Communities (Outside Levees)**
				3a Reserve/ Laplace	**3b** Norco/ St. Rose	**3c** JP / NO Eastbank	**3d** NO East to Hwy 11	**3e** Lower 9th/ St. Bernard		
	5	EL	L	EL	EL	EL	EL	EL	L	L
	10	L	M	EL	EL	EL	EL	EL	M	L
	15	L	H	EL	EL	EL	EL	EL	H	EH
	20	M	EH	EH	EH	EH	EH	EH	EH	EH
	25	H	EH	EH	EH	EH	EH	EH	EH	EH
	30	EH	EH	EH	EH	EH	EH	EH	EH	EH

Table 2.2 Concentrated Assets Scoring

Scoring Criteria	**Maximum Score for Resource**	**Florida Parishes & Amite River**	**North Shore**	**New Orleans Metro Area**					**Plaquemines Eastbank**	**Coastal Fishing & Recreation Communities (Outside Levees)**
				3a Reserve/ Laplace	**3b** Norco/ St. Rose	**3c** JP/NO Eastbank	**3d** NO East to Hwy 11	**3e** Lower 9th/ St. Bernard		
1. Residences	**25**	10	20	15	20	25	25	25	10	5
2. Industry	**20**	15	15	20	20	20	20	15	5	5
3. Infrastructure	**15**	15	15	15	15	15	15	15	8	10
4. Institutional & Publicly Owned Facilities	**15**	15	15	15	15	15	15	15	10	2
5. Strategic Resources	**25**	15	25	25	25	25	25	25	5	2
Total Score	**100**	**70**	**90**	**90**	**95**	**100**	**100**	**95**	**38**	**24**

Table 2.3 Relative Damages from Storm Surge to Distributed Assets[1]

Proportion of assets damaged or destroyed due to storm surge: EL = Extremely Low (0-5%) L = Low (5 - 15%) M = Medium (15 - 25%) H = High (25 - 50%) EH = Extremely High (>50%)	**Storm Surge at Coastline (Feet)**	**DA1-1** Chandeleur and Brenton Sounds	**DA1-2** Lake Borgne Area	**DA1-3** Lake Pontchartrain Area	**DA1-4** Lake Maurepas Area
	5	L	EL	EL	EL
	10	M	L	EL	EL
	15	H	H	L	L
	20	EH	EH	M	M
	25	EH	EH	H	H
	30	EH	EH	EH	EH

[1] Assets outside of the defined concentrated areas (see Concentrated and Distributed Assets Map)

Table 2.4 Scoring of Distributed Assets

Scoring Criteria	**Maximum Score for Resources**	**DA1-1** Chandeleur and Brenton Sounds	**DA1-2** Lake Borgne Area	**DA1-3** Lake Pontchartrain Area	**DA1-4** Lake Maurepas Area
National Significance	**25**	5	25	25	5
State Significance	**25**	5	20	15	15
Local Significance	**25**	15	20	20	10
Critical to Recovery	**25**	25	25	25	25
Total Score	**100**	**50**	**90**	**85**	**55**

TABLE 2.5. DISTRIBUTED ASSETS FOR PLANNING UN IT 1

The land outside the defined communities was divided into areas of surge impact commonality. For Planning Unit 1 these are defined by the significant water bodies that impact these areas:

Chandeleur and Breton Sounds	= DA 1-1
Lake Borgne	= DA 1-2
Lake Pontchartrain	= DA 1-3
Lake Maurepas	= DA 1-4

Within these areas following assets are comprised:

	Assets	Oil & Gas	Pipelines	Highway, Bridges & Transportation	Evacuation Routes	Ports, Waterway & Infrastructure	Other Strategic Assets
DA 1-1	Oil & Gas Fields and Pipelines	X	X				
	MRGO					X	
	US Coast Guard Tower						X
DA 1-2	Oil & Gas Fields and Pipelines	X	X				
	Hwy 11			X	X		
	I-10			X	X		
	Hwy 190			X	X		
	Twin Span			X	X		
	Hwy 11 Bridge			X	X		
	Rigolet Bridge			X	X		
	Jeff Pass Bridge			X	X		
	GIWW					X	
	MRGO					X	
DA 1-3	I-55			X	X		
	I-10			X	X		
	I-310			X	X		
	Causeway Bridge			X	X		
DA 1-4	I-10			X	X		
	Hwy 61 (Airline Hwy)			X	X		

Table 2.6. Planning Unit 1 Existing Conditions/ Problem Identification

NOTE: Rankings are only relatable within an ecosystem unit; the purpose is not to prioritize between units, but rather to prioritize function disruptions within ecosystem units

	Ecosystem Unit									
Function Disruption (System Threat)	**EU 1-1 Upper Basin Swamps**	**EU 1-2 North and South Shore of Lake Pontchartrain**	**EU 1-3 Orleans Land Bridge**	**EU 1 -4 Southern Lk Borgne Rim - Includes MRGO**	**EU 1-5 Central Wetlands - Includes MRGO disposal area**	**EU 1-6 Upper Breton Marshes**	**EU 1-7 Fringing Marshes**	**EU 1-8 Biloxi Marshes**	**EU 1-9 Barrier Chain & Sound**	**EU 1-10 Delta**
Subsidence	M	L	L	M	M	H	H	L	M	VH
Tidal Exchange	NI	M	L	M	NI	L	M	L	NI	H
Sediment Disruptions	H	L	L	H	H	M	H	M	NI	VH
Salt Water Intrusion	L	M	L	H	L	L	M	L	NI	VH
Altered Inundation	VH	L	M	M	H	L	L	M	NI	NI
Wave/Wake Energy	L	H	H	VH	NI	VH	H	M	H	H
Direct Removal	L	L	L	H	M	M	M	M	L	L

No Impact	NI
Low	L
Moderate	M
High	H
Very High	VH

Subsidence = true subsidence; benchmark elevations not referenced to tide gauges
Tidal Exchange = Damage caused by daily tide energy; assumed to be more destructive to historically fresh/intermediate wetlands, more beneficial to brackish/saline wetlands
Sediment Disruptions = disconnection from riverine sources
Saltwater Intrusion = due to encroachment of Gulf on landscape edge or movement up canals & channels
Altered Inundation = altered frequency or duration of inundation, not related to RSLR; e.g., impoundments
Wave/Wake Energy = includes storm energy
Direct Removal = dredging sediments or covering by spoil banks & levees.

Table 2.7. Planning Unit 1 Changes in Natural Resources, 1990 - 2050 (From Coast 2050 Report; LCA Land Change Map)

Resource	Ecosystem Unit									
	EU 1-1 Upper Basin Swamps	EU 1-2 North and South Shore of Lake Pontchartrain	EU 1-3 Orleans Land Bridge	EU 1-4 Southern Lk Borgne Rim	EU 1-5 Central Wetlands	EU 1-6 Upper Breton Marshes	EU 1-7 Fringing Marshes	EU 1-8 Biloxi Marshes	EU 1-9 Barrier Chain & Sound**	EU 1-10 Delta
Swamp	H	H	NA*	NA	NA*	NA	NA	NA	NA	NA
Fresh/Intermediate Marsh	I	H	L	NA	NA	L	NA	NA	NA	M
Brackish/Saline Marsh	NA	L	L	M	L	NA*	M	M	NA	NA
Beach/Dune/Back Barrier Marsh	NA	NA	NA	NA	NA	NA	NA	NA	H	NA
Sessile Estuarine (Oysters)	NI	NI	S	D	D	I	S	S	U	S
Saltwater (Red Drum)	NI	D	D	D	S	I	S	D	U	D
Freshwater (Largemouth Bass)	S	S	D	NI	NI	I	NI	NI	U	S
Estuarine (Spotted Seatrout)	NI	D	D	D	S	S	S	D	U	D
Estuarine (Shrimp)	S	D	D	D	S	I	S	D	U	D
Woodland Edge (Deer)	D	S	S	D	D	S	NI	NI	U	S
Woodland Avifauna	D	D	NI	U	S	NI	NI	NI	U	U
Fresh Wetlands (Alligator)	I	S	I	D	D	S	S	D	NI	S
Muskrat	S	S	S	D	D	S	S	D	NI	S
Shore Birds	D	S	D	D	S	S	D	D	U	D
Loss of Storm Attenuation* **	M	H	L	M	L	L	M	M	M	M

Wetland Key		% Change
No Impact	NI	0
Low Loss	L	1-15
Moderate Loss	M	16-49
High Loss	H	>50
Increase	I	
Not Applicable	NA	

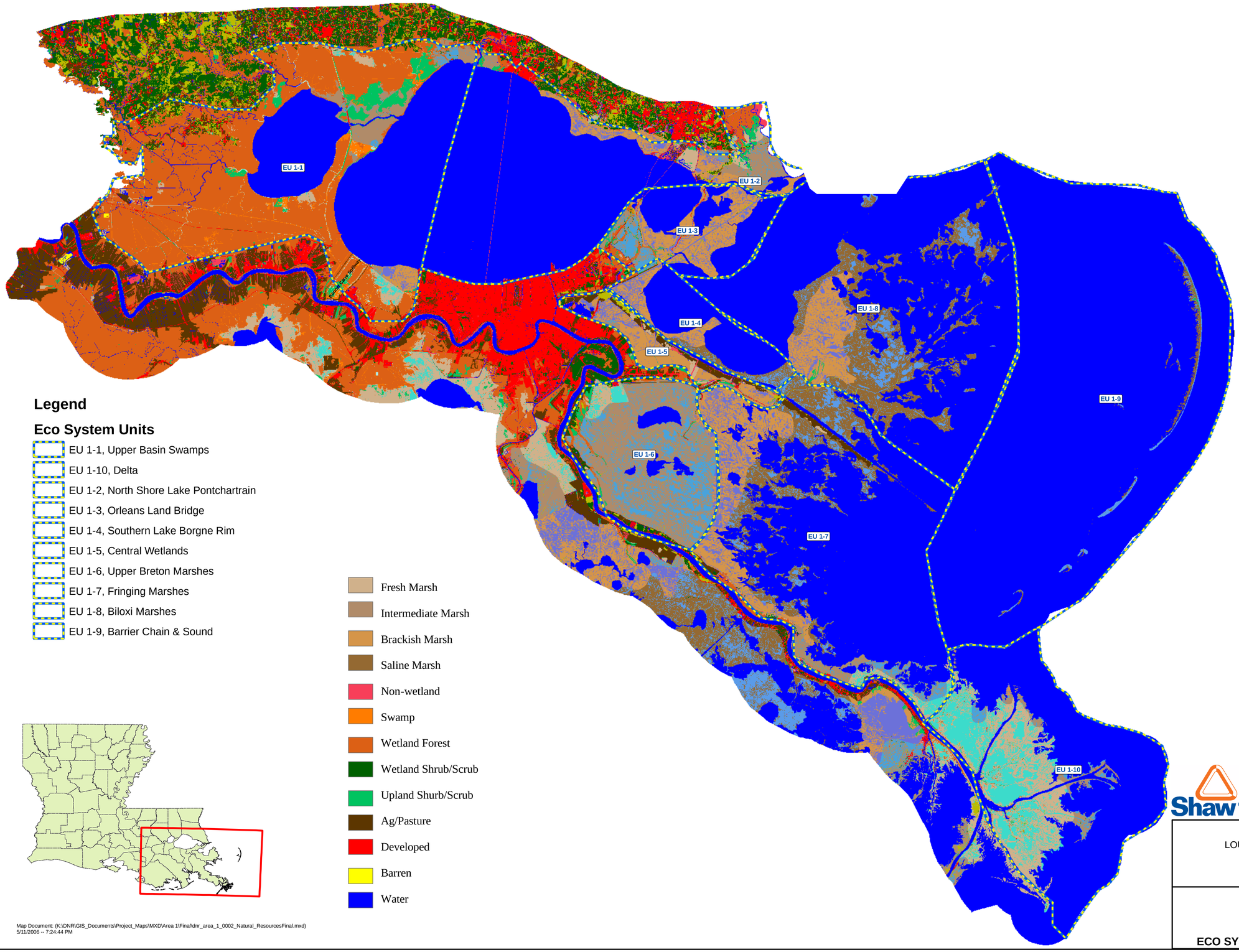
Fish & Wildlife Key	
No Impact/Not historically present	NI
Steady	S
Decrease	D
Increase	I
Unknown (No information)	U

NOTES:

* = Small acreage by percentage w\in ecosystem unit

** = Lake Pontchartrain Atlas

*** = Using land change as the surrogate for changes in storm attenuation capacity



5.5 2.75 0 5.5
Miles

1 inch equals 5.290570 miles

Legend

Eco System Units

- EU 1-1, Upper Basin Swamps
- EU 1-10, Delta
- EU 1-2, North Shore Lake Pontchartrain
- EU 1-3, Orleans Land Bridge
- EU 1-4, Southern Lake Borgne Rim
- EU 1-5, Central Wetlands
- EU 1-6, Upper Breton Marshes
- EU 1-7, Fringing Marshes
- EU 1-8, Biloxi Marshes
- EU 1-9, Barrier Chain & Sound

- Fresh Marsh
- Intermediate Marsh
- Brackish Marsh
- Saline Marsh
- Non-wetland
- Swamp
- Wetland Forest
- Wetland Shrub/Scrub
- Upland Shurb/Scrub
- Ag/Pasture
- Developed
- Barren
- Water

Map Document: (K:\DNR\GIS_Documents\Project_Maps\MXD\Area 1\Final\dnr_area_1_0002_Natural_ResourcesFinal.mxd)
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LOUISIANA COMPREHENSIVE COASTAL PROTECTION MASTER PLAN

FIGURE 2.3

PLANNING UNIT 1
ECO SYSTEM UNITS/NATURAL RESOURCES

Table 2.8a Planning Unit 1: Objectives and Measures Table - Concentrated Assets

	Geographic Location		Current Issues*	Future Risk/Impact	Planning Unit Objective	Coastal Objectives	Measures																											
							1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
							Levee Alignment No. 1 (Alternate East Levee Alignment 6)	Re-evaluation of south shore of Lake Pontchartrain Levee Alignment and connection to Levee Alignment 1	Open-System Pontchartrain Basin Hurricane Protection Levee Alignment Alternative incl.	Suggested Modification of Lake Pontchartrain Basin Barrier Plan Levee Alignment	Construct New Floodgate at Bohemia (Mississippi River)	Raise Both Sides of Levee on Mississippi R. (Bohemia to just north of Caernarvon)	Raise 40 Arpent Levee to 17.5' (from Industrial Canal to Verret with tie-in at Verret)	Construct New MRGO Lock and Extend MRGO Eastbank Levee	Enhance Levees along the Intracoastal (north towards Lake Pontchartrain), the GIWW, the Industrial Canal, and the MRGO	Construct a Sill at Seabrook (Industrial Canal at Lake Pontchartrain)	Maintain the MRGO - Lake Borgne Landbridge including Shoreline Protection/Restoration Features	Restore the Bayou LaLoutre Ridge (Includes Construction of MRGO to GIWW Dimensions)	Restore the Chandeleur Barrier Islands	Construct the Jefferson Parish Fringe Marsh Buffer	Construct the Violet Reintroduction to Maintain Target Salinity in Louisiana and Mississippi	Maintain and Restore Biloxi Marsh Landbridge and Barrier Reefs - South	Maintain and Restore Biloxi Marsh Landbridge and Barrier Reefs - North	Maintain Critical Marsh Shorelines and Ridges of the East Orleans Landbridge	Modification of Caernarvon Diversion (Maintain Breton Landbridge)	Maintain and Enhance the Maurepas Landbridge with Maurepas Reintroduction	1,000 cfs Diversion at Convent/Blind River	5,000 cfs Diversion at Convent/Blind River	10,000 cfs Diversion at Convent/Blind River	1,000 cfs Diversion at Hope Canal	1,000 cfs Diversion at Reserve Relief Canal	5,000 cfs Diversion at Bonnet Carre Spillway (incl. Diversion into LaBranche Wetlands)	10,000 cfs Diversion at Bonnet Carre Spillway (Ind. Diversion into LaBranche Wetlands)	6,000 cfs Diversion at White's Ditch	10,000 cfs Diversion at White's Ditch	15,000 cfs Diversion at American/California Bay
							Alt 1** Alt 2**	Alt 1, Alt 2									Alt 1, Alt 2	Alt 1, Alt 2	Alt 1, Alt 2	Alt 1, Alt 2	Alt 2	Alt 1, Alt 2	Alt 2	Alt 2	Alt 1, Alt 2		Alt 1, Alt 2			Alt 1, Alt 2			Alt 1, Alt 2		
Concentrated Assets	Florida Parishes and Amite River		High flood risk to Concentrated Assets with storm surges over 25 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to Florida Parishes and Amite River Concentrated Assets.	A	+			+														+		+										
	North Shore		High level of flood risk to Concentrated Assets with storm surges over 15 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to North Shore Concentrated Assets.	A	+			+															+											
	New Orleans Metro Area	Reserve/LaPlace	Extremely high flood risk to Concentrated Assets with storm surges over 20 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to Reserve/LaPlace Concentrated assets.	A	+			+												+	+	+												
		Norco/St. Rose	Extremely high level of flood risk to Concentrated Assets with storm surges over 20 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to Reserve/LaPlace Concentrated assets.	A	+			+												+	+	+												
		JP/NO Eastbank	Extremely high level of flood risk to Concentrated Assets with storm surges over 20 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to JP/NO Eastbank Concentrated Assets.	A	+	+	+	+	+				+	+		+	+	+		+	+	+												
		NO East to Hwy 11	Extremely high flood risk to Concentrated Assets with storm surges over 20 ft.	Increased flood risk due to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to NO East to Hwy 11 Concentrated Assets.	A	+	+	+	+	+				+	+	+	+	+			+	+	+												
		Lower 9th/St. Bernard	Extremely high flood risk to Concentrated Assets with storm surges over 20 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to Lower 9th/St. Bernard Concentrated Assets.	A	+		+	+	+	+	+		+	+	+	+	+			+	+		+											
	Plaquemines Eastbank		High flood risk to Concentrated Assets with storm surges over 15 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to Plaquemines Eastbank Concentrated Assets.	A	+			+	+	+						+	+			+	+		+											
	Coastal Fishing and Recreation (Outside Levees)		Extremely high flood risk to Concentrated Assets with storm surges over 15 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to Coastal Fishing and Recreation Areas outside levees.	A	+		-	+								+	+			+	+	+	+											

(Continued on Page 2)

* Current issues, percent flooded: H = High (25-50%); EH= Extremely High (> 50%)

** Alternative Plan (Measure used in Alternative Plans)

Coastwide Objectives:
A - Reduce storm damage vulnerability of coastal communities, resources, and infrastructure.
B - Minimize exposure of traditional flood protection measures to open Gulf conditions.
C - Increase sediment input from sources outside estuarine basins, and manage existing sediment resources within estuarine basines, to sustain and rejuvenate existing wetlands, rebuild marsh substrate and construct flood protections projects.
D - Maintain or establish natural landscape features and hydrologic processes that are critical to sustainable ecosystems structure and function, including dissipation of storm energy.
E - Establish or maintain dynamic salinity gradients that reflect natural cycles of freshwater availabilty and marine forcing (fluctuation related to normal daily and seasonal tide action or exchange).
F - Sustain productive and diverse wildlife habitats.
G - Maximize retention of river-borne sediments and nutrients within coastal wetlands.

Concentrated Assets Table Legend

Page 1	Page 2	Page 3

Table 2.8a Planning Unit 1: Objectives and Measures Table - Concentrated Assets

	Geographic Location		Current Issues*	Future Risk/Impact	Planning Unit Objective	Coastal Objectives	Measures																															
							31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60				
							110,000 cfs Diversion at American/California Bay with Sediment Enrichment	250,000 cfs Diversion at American/California Bay with Sediment Enrichment	12,000 cfs Diversion at Bayou Lamoque	15,000 cfs Diversion at Fort St. Phillip	26,000 cfs Diversion at Fort St. Phillip with Sediment Enrichment	52,000 cfs Diversion at Fort St. Phillip with Sediment Enrichment	Sediment Delivery by Pipeline at American/California Bay	Sediment Delivery by Pipeline at Central Wetlands	Sediment Delivery by Pipeline at Fort St. Phillips	Sediment Delivery by Pipeline at Golden Triangle	Sediment Delivery by Pipeline at LaBranche	Sediment Delivery by Pipeline at Quarantine Bay	Increase Amite River Influence by Gapping Dredged Material Banks on Diversion Canals	Rehabilitate Violet Siphon and Post Authorization Change for the Diversion of Water through Inner Harbor Navigation Canal for Enhanced Influence to the Central Wetlands	Opportunistic Use of the Bonnet Carre Spillway	Restore Main Pass Ridge with Dredge Material	Remove Old Grand Prairie Levee	Add New Bank Line Stabilization (Lake Borgne Corner at GIWW to Verret)	Add Breakwater (in Lake Borgne from Southwest Corner to Biloxi Wildlife Management Area)	Resolve/Close the MRGO to Deep Draft Navigation	Create Marsh in Interior Open Water Areas and Install Shore Protection Features on the North Shore of Lake Pontchartrain.	Construct 3 or 4 Small Mississippi River Spillways through the Protected Corridor between Carlisle and Bohemia.	Remove the Gates from the Existing Bayou Lamoque Diversion Structure.	Construct two 5,000 cfs Diversions into the Maurepas Swamps	Construct a Bend of Marsh Across the Basin from Point-a-la-Hache Northeastward to MRGO Spoilbank at the Heads of the Major Bays and Lakes.	Goose Point / Point Platte Marsh Creation	LaBranche Wetlands Terracing, Planting, Shoreline Protection		Periodic Introduction of Sediment and Nutrients at Selected Diversion Sites Demonstration (half in PU-1)	Mississippi River Sediment Trap (half in PU-1)				
							Alt 2**						Alt 1	Alt 1		Alt 1	Alt 1		Alt 1, Alt 2			Alt 1	Alt 2	Alt 1, Alt 2						Alt 1								
Concentrated Assets	Florida Parishes and Amite River		High flood risk to Concentrated Assets with storm surges over 25 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to Florida Parishes and Amite River Concentrated Assets.	A																																		
	North Shore		High level of flood risk to Concentrated Assets with storm surges over 15 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to North Shore Concentrated Assets.	A																					+					+								
	New Orleans Metro Area	Reserve/LaPlace	Extremely high flood risk to Concentrated Assets with storm surges over 20 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to Reserve/LaPlace Concentrated assets.	A																																		
		Norco/St. Rose	Extremely high level of flood risk to Concentrated Assets with storm surges over 20 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to Reserve/LaPlace Concentrated assets.	A																																		
		JP/NO Eastbank	Extremely high level of flood risk to Concentrated Assets with storm surges over 20 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to JP/NO Eastbank Concentrated Assets.	A																				+							+							
		NO East to Hwy 11	Extremely high flood risk to Concentrated Assets with storm surges over 20 ft.	Increased flood risk due to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to NO East to Hwy 11 Concentrated Assets.	A																		+	+	+														
		Lower 9th/St. Bernard	Extremely high flood risk to Concentrated Assets with storm surges over 20 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to Lower 9th/St. Bernard Concentrated Assets.	A																		+	+	+														
	Plaquemines Eastbank		High flood risk to Concentrated Assets with storm surges over 15 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to Plaquemines Eastbank Concentrated Assets.	A																																		
	Coastal Fishing and Recreation (Outside Levees)		Extremely high flood risk to Concentrated Assets with storm surges over 15 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to Coastal Fishing and Recreation Areas outside levees.	A																				+														

(Continued on Page 3)

* Current issues, percent flooded: H = High (25-50%); EH= Extremely High (> 50%)
** Alternative Plan (Measure used in Alternative Plans)

Coastwide Objectives:
A - Reduce storm damage vulnerability of coastal communities, resources, and infrastructure.
B - Minimize exposure of traditional flood protection measures to open Gulf conditions.
C - Increase sediment input from sources outside estuarine basins, and manage existing sediment resources within estuarine basines, to sustain and rejuvenate existing wetlands, rebuild marsh substrate and construct flood protections projects.
D - Maintain or establish natural landscape features and hydrologic processes that are critical to sustainable ecosystems structure and function, including dissipation of storm energy.
E - Establish or maintain dynamic salinity gradients that reflect natural cycles of freshwater availabilty and marine forcing (fluctuation related to normal daily and seasonal tide action or exchange).
F - Sustain productive and diverse wildlife habitats.
G - Maximize retention of river-borne sediments and nutrients within coastal wetlands.

Concentrated Assets Table Legend

Page 1	Page 2	Page 3

Table 2.8a Planning Unit 1: Objectives and Measures Table - Concentrated Assets

	Geographic Location		Current Issues*	Future Risk/Impact	Planning Unit Objective	Coastal Objectives	Measures																															
							61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82												
							Lake Borgne Shoreline Protection at Bayou Dupre	Bayou Benvenue Pump Station Diversion and Terracing (Deauthorized)	Eden Isles East Marsh Restoration (Deauthorized)	Red Mud Demonstration (Deauthorized)	Bennetys Bay Sediment Diversion	Maintain Shoreline Integrity of Lake Pontchatrain	Resolve/Close MRGO to Deep Draft Navigation	Stabilize the Entire North Bank of the MRGO	Dedicated Delivery of Sediment for Marsh Building (Tchefuncte, Tangipahoa, and Pearl River Mouths. Eloi Bay and Biloxi Marshes)	Diversion from Jefferson Parish Drainage into La Branche Wetlands	Provide Diversion-Related Flood Protection where needed in the Upper Basin.	Small (<2,000 cfs) Diversion at Reserve Relief Canal with Outfall Management	Restore St. Tammany Marsh	Reconstruct Madisonville Bulkhead	Improve St. Tammany Parish Drainage	Lake Lery Marsh Restoration and Freshwater Diversion	Mississippi River Delta Management Study	Mississippi River Gulf Outlet Environmental Features and Salinity Control Study	Strategize and Implement Plan to Elevate and/or Relocate Assets Located Outside the Hurricane Protection Plans	Acquire management through maintenance of existing crevasses and construction of new crevassesMississippi River Gulf Outlet Environmental Features and Salinity Control Study.	Maximize beneficial use of dredge material where feasible.	Louisiana/Mississippi hydrodynamic Study												
											Alt 1** Alt 2**								Alt 2				Alt 1, Alt 2	Alt 1, Alt 2	Alt 1, Alt 2	Alt 1, Alt 2	Alt 1, Alt 2	Alt 1, Alt 2												
Concentrated Assets	Florida Parishes and Amite River		High flood risk to Concentrated Assets with storm surges over 25 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to Florida Parishes and Amite River Concentrated Assets.	A						+					+									+	+												
	North Shore		High level of flood risk to Concentrated Assets with storm surges over 15 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to North Shore Concentrated Assets.	A			+			+			+				+	+	+					+	+												
	New Orleans Metro Area	Reserve/LaPlace	Extremely high flood risk to Concentrated Assets with storm surges over 20 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to Reserve/LaPlace Concentrated assets.	A				+		+					+																						
		Norco/St. Rose	Extremely high level of flood risk to Concentrated Assets with storm surges over 20 ft.	CA3	Provide coastal protection to Reserve/LaPlace Concentrated assets.	A						+																												
		JP/NO Eastbank	Extremely high level of flood risk to Concentrated Assets with storm surges over 20 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to JP/NO Eastbank Concentrated Assets.	A						+	+											+				+												
		NO East to Hwy 11	Extremely high flood risk to Concentrated Assets with storm surges over 20 ft.	Increased flood risk due to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to NO East to Hwy 11 Concentrated Assets.	A		+				+	+		+									+				+												
		Lower 9th/St. Bernard	Extremely high flood risk to Concentrated Assets with storm surges over 20 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to Lower 9th/St. Bernard Concentrated Assets.	A		+					+		+									+				+												
	Plaquemines Eastbank		High flood risk to Concentrated Assets with storm surges over 15 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to Plaquemines Eastbank Concentrated Assets.	A																	+			+	+	+												
	Coastal Fishing and Recreation (Outside Levees)		Extremely high flood risk to Concentrated Assets with storm surges over 15 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to Coastal Fishing and Recreation Areas outside levees.	A						+											+	+	+	+	+	+												

* Current issues, percent flooded: H = High (25-50%); EH= Extremely High (> 50%)
** Alternative Plan (Measure used in Alternative Plans)

Coastwide Objectives:
A - Reduce storm damage vulnerability of coastal communities, resources, and infrastructure.
B - Minimize exposure of traditional flood protection measures to open Gulf conditions.
C - Increase sediment input from sources outside estuarine basins, and manage existing sediment resources within estuarine basines, to sustain and rejuvenate existing wetlands, rebuild marsh substrate and construct flood protections projects.
D - Maintain or establish natural landscape features and hydrologic processes that are critical to sustainable ecosystems structure and function, including dissipation of storm energy.
E - Establish or maintain dynamic salinity gradients that reflect natural cycles of freshwater availabilty and marine forcing (fluctuation related to normal daily and seasonal tide action or exchange).
F - Sustain productive and diverse wildlife habitats.
G - Maximize retention of river-borne sediments and nutrients within coastal wetlands.

Concentrated Assets Table Legend

Page 1	Page 2	Page 3

Table 2.8b Planning Unit 1: Objectives and Measures Table - Distributed Assets

	Geographic Location	Current Issues*	Future Risk/Impact	Planning Unit Objective	Coastal Objectives	Measures																												
						1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
						Levee Alignment No. 1 (Alternate East Levee Alignment 6)	Re-evaluation of south shore of Lake Pontchartrain Levee Alignment and connection to Levee Alignment 1	Open-System Pontchartrain Basin Hurricane Protection Levee Alignment Alternative incl.	Suggested Modification of Lake Pontchartrain Basin Barrier Plan Levee Alignment	Construct New Floodgate at Bohemia (Mississippi River)	Raise Both Sides of Levee on Mississippi R. (Bohemia to just north of Caernarvon)	Raise 40 Arpent Levee to 17.5' (from Industrial Canal to Verret with tie-in at Verret)	Construct New MRGO Lock and Extend MRGO Eastbank Levee	Enhance Levees along the Intracoastal (north towards Lake Pontchatrain), the GIWW, the Industrial Canal, and the MRGO	Construct a Sill at Seabrook (Industrial Canal at Lake Pontchartrain)	Maintain the MRGO - Lake Borgne Landbridge including Shoreline Protection/Restoration Features	Restore the Bayou LaLoutre Ridge (Includes Construction of MRGO to GIWW Dimensions)	Restore the Chandeleur Barrier Islands	Construct the Jefferson Parish Fringe Marsh Buffer	Construct the Violet Reintroduction to Maintain Target Salinity in Louisiana and Mississippi	Maintain and Restore Biloxi Marsh Landbridge and Barrier Reefs - South	Maintain and Restore Biloxi Marsh Landbridge and Barrier Reefs - North	Maintain Critical Marsh Shorelines and Ridges of the East Orleans Landbridge	Modification of Caernarvon Diversion (Maintain Breton Landbridge)	Maintain and Enhance the Maurepas Landbridge with Maurepas Reintroduction	1,000 cfs Diversion at Convent/Blind River	5,000 cfs Diversion at Convent/Blind River	10,000 cfs Diversion at Convent/Blind River	1,000 cfs Diversion at Hope Canal	1,000 cfs Diversion at Reserve Relief Canal	5,000 cfs Diversion at Bonnet Carre Spillway (incl. Diversion into LaBranche Wetlands)	10,000 cfs Diversion at Bonnet Carre Spillway (incl. Diversion into LaBranche Wetlands)	6,000 cfs Diversion at White's Ditch	10,000 cfs Diversion at White's Ditch	15,000 cfs Diversion at American/California Bay
						Alt 1** Alt 2**	Alt 1, Alt 2									Alt 1, Alt 2	Alt 1, Alt 2	Alt 1, Alt 2	Alt 1, Alt 2	Alt 2	Alt 1, Alt 2	Alt 2	Alt 2	Alt 1, Alt 2		Alt 1, Alt 2			Alt 1, Alt 2				Alt 1, Alt 2		
Distributed Assets	DA1-1 Chandeleur and Breton Sound	High level of flood risk to Distributed Assets with storm surges over 15 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to oil and gas fields and pipelines.	A													+																
				Reduce storm surge impacts from the MRGO to increase coastal protection.	A	+			+									+																	
				Provide coastal protection to strategic assets; US Coast Guard Tower.	A													+																	
	DA1-2 Lake Borgne Area	High level of flood risk to Distributed Assets with storm surges over 15 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to highways and evacuation routes including I-10 and Hwy 11 and Hwy 90.	A	+			+									+			+	+	+												
				Provide coastal protection to bridges including Twin Span, Hwy 11 bridge, Rigolet Bridge, and Chef Pass Bridge.	A	+			+									+			+	+	+												
				Provide coastal protection to ports, waterways, and infrastructure. i.e. GIWW.	A	+			+							+		+			+	+	+	+											
				Reduce storm surge impacts from the MRGO to increase coastal protection.	A	+			+									+																	
	DA1-3 Lake Pontchartrain Area	High level of flood risk to Distributed Assets with storm surges over 25 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to highways and evacuation routes including I-55.	A	+			+									+			+	+	+												
				Provide coastal protection to the Causeway Bridge.	A	+			+									+			+	+	+												
	DA1-4 Lake Maurepas Area	High level of flood risk to Distributed Assets with storm surges over 25 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to highways and evacuation routes including I-10 and Hwy 61.	A	+			+									+						+											

(Continued on Page 5)

* Current issues, percent flooded: H = High (25-50%); EH= Extremely High (> 50%)
** Alternative Plan (Measure used in Alternative Plans)

Coastwide Objectives:
A - Reduce storm damage vulnerability of coastal communities, resources, and infrastructure.
B - Minimize exposure of traditional flood protection measures to open Gulf conditions.
C - Increase sediment input from sources outside estuarine basins, and manage existing sediment resources within estuarine basines, to sustain and rejuvenate existing wetlands, rebuild marsh substrate and construct flood protections projects.
D - Maintain or establish natural landscape features and hydrologic processes that are critical to sustainable ecosystems structure and function, including dissipation of storm energy.
E - Establish or maintain dynamic salinity gradients that reflect natural cycles of freshwater availabilty and marine forcing (fluctuation related to normal daily and seasonal tide action or exchange).
F - Sustain productive and diverse wildlife habitats.
G - Maximize retention of river-borne sediments and nutrients within coastal wetlands.

Distributed Assets Table Legend

Page 4	Page 5	Page 6

Table 2.8b Planning Unit 1: Objectives and Measures Table - Distributed Assets

	Geographic Location	Current Issues*	Future Risk/Impact	Planning Unit Objective	Coastal Objectives	Measures																														
						31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
						110,000 cfs Diversion at American/California Bay with Sediment Enrichment	250,000 cfs Diversion at American/California Bay with Sediment Enrichment	12,000 cfs Diversion at Bayou Lamoque	15,000 cfs Diversion at Fort St. Phillip	26,000 cfs Diversion at Fort St. Phillip with Sediment Enrichment	52,000 cfs Diversion at Fort St. Phillip with Sediment Enrichment	Sediment Delivery by Pipeline at American/California Bay	Sediment Delivery by Pipeline at Central Wetlands	Sediment Delivery by Pipeline at Fort St. Phillips	Sediment Delivery by Pipeline at Golden Triangle	Sediment Delivery by Pipeline at LaBranche	Sediment Delivery by Pipeline at Quarantine Bay	Increase Amite River Influence by Capping Dredged Material Banks on Diversion Canals	Reinstitute Tidal Exchange and Post Authorization Change for the Diversion of Water through Inner Harbor Navigation Canal for Enhanced Influence to the Central Wetlands	Opportunistic Use of the Bonnet Carre Spillway	Restore Main Pass Ridge with Dredge Material	Remove Old Grand Prairie Levee	Add New Bank Line Stabilization (Lake Borgne Corner at GIWW to Verret)	Add Breakwater (in Lake Borgne from Southwest Corner to Biloxi Wildlife Management Area)	Resolve/Close the MRGO to Deep Draft Navigation	Create Marsh in Interior Open Water Areas and Install Shore Protection Features on the North Shore of Lake Pontchartrain.	Construct 3 or 4 Small Mississippi River Spillways through the Protected Corridor between Carlisle and Bohemia.	Remove the Gates from the Existing Bayou Lamoque Diversion Structure.	Construct two 5,000 cfs Diversions into the Maurepas Swamps	Construct a Band of Marsh Across the Basin from Point-a-la-Hache Northeastward to MRGO Spoilbank at the Heads of the Major Bays and Lakes.	Goose Point / Point Platte Marsh Creation	LaBranche Wetlands Terracing, Planting, Shoreline Protection	Pass-a-Loutre Crevasse (Deauthorized)	Periodic Introduction of Sediment and Nutrients at Selected Diversion Sites Demonstration (ref in PU-1)	Mississippi River Sediment Trap (half in PU-1)
						Alt 2**						Alt 1	Alt 1			Alt 1		Alt 1, Alt 2			Alt 1			Alt 1, Alt 2						Alt 1					
Distributed Assets	DA1-1 Chandeleur and Breton Sound	High level of flood risk to Distributed Assets with storm surges over 15 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to oil and gas fields and pipelines.	A					+	+	+		+			+				+														
				Reduce storm surge impacts from the MRGO to increase coastal protection.	A																																
				Provide coastal protection to strategic assets; US Coast Guard Tower.	A					+	+	+		+			+				+																
	DA1-2 Lake Borgne Area	High level of flood risk to Distributed Assets with storm surges over 15 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to highways and evacuation routes including I-10 and Hwy 11 and Hwy 90.	A								+		+																+					
				Provide coastal protection to bridges including Twin Span, Hwy 11 bridge, Rigolet Bridge, and Chef Pass Bridge.	A																																
				Provide coastal protection to ports, waterways, and infrastructure. i.e. GIWW.	A	+	+																+	+	+												
				Reduce storm surge impacts from the MRGO to increase coastal protection.	A	+	+								+															+							
	DA1-3 Lake Pontchartrain Area	High level of flood risk to Distributed Assets with storm surges over 25 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to highways and evacuation routes including I-55.	A											+																				
				Provide coastal protection to the Causeway Bridge.	A																																
	DA1-4 Lake Maurepas Area	High level of flood risk to Distributed Assets with storm surges over 25 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to highways and evacuation routes including I-10 and Hwy 61.	A																															

(Continued on Page 6)

* Current issues, percent flooded: H = High (25-50%); EH= Extremely High (> 50%)
** Alternative Plan (Measure used in Alternative Plans)

Coastwide Objectives:
A - Reduce storm damage vulnerability of coastal communities, resources, and infrastructure.
B - Minimize exposure of traditional flood protection measures to open Gulf conditions.
C - Increase sediment input from sources outside estuarine basins, and manage existing sediment resources within estuarine basines, to sustain and rejuvenate existing wetlands, rebuild marsh substrate and construct flood protections projects.
D - Maintain or establish natural landscape features and hydrologic processes that are critical to sustainable ecosystems structure and function, including dissipation of storm energy.
E - Establish or maintain dynamic salinity gradients that reflect natural cycles of freshwater availabilty and marine forcing (fluctuation related to normal daily and seasonal tide action or exchange).
F - Sustain productive and diverse wildlife habitats.
G - Maximize retention of river-borne sediments and nutrients within coastal wetlands.

Distributed Assets Table Legend

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Table 2.8b Planning Unit 1: Objectives and Measures Table - Distributed Assets

	Geographic Location	Current Issues*	Future Risk/Impact	Planning Unit Objective	Coastal Objectives	Measures																															
						61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82												
						Lake Borgne Shoreline Protection at Bayou Dupre	Bayou Bienvenue Pump Station Diversion and Terracing (Deauthorized)	Eden Isles East Marsh Restoration (Deauthorized)	Red Mud Demonstration (Deauthorized)	Benneys Bay Sediment Diversion	Maintain Shoreline Integrity of Lake Pontchartrain	Resolve/Close MRGO to Deep Draft Navigation	Stabilize the Entire North Bank of the MRGO	Dedicated Delivery of Sediment for Marsh Building (Tchefuncte, Tangipahoa, and Pearl River Mouths. Eloi Bay and Biloxi Marshes)	Diversion from Jefferson Parish Drainage into La Branche Wetlands	Provide Diversion-Related Flood Protection where needed in the Upper Basin.	Small (<2,000 cfs) Diversion at Reserve Relief Canal with Outfall Management	Restore St. Tammany Marsh	Reconstruct Madisonville Bulkhead	Improve St. Tammany Parish Drainage	Lake Lery Marsh Restoration and Freshwater Diversion	Mississippi River Delta Management Study	Mississippi River Gulf Outlet Environmental Features and Salinity Control Study	Strategize and Implement Plan to Elevate and/or Relocate Assets Located Outside the Hurricane Protection Plains	Postpone management through maintenance of existing crevasses and construction of new crevassesMississippi River Gulf Outlet Environmental Features and Salinity Control Study.	Maximize beneficial use of dredge material where feasible.	Louisiana/Mississippi hydrodynamic Study											
										Alt 1, Alt 2								Alt 2				Alt 1, Alt 2	Alt 1, Alt 2	Alt 1, Alt 2	Alt 1, Alt 2	Alt 1, Alt 2	Alt 1, Alt 2											
Distributed Assets	DA1-1 Chandeleur and Breton Sound	High level of flood risk to Distributed Assets with storm surges over 15 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to oil and gas fields and pipelines.	A									+										+													
				Reduce storm surge impacts from the MRGO to increase coastal protection.	A																					+	+											
				Provide coastal protection to strategic assets; US Coast Guard Tower.	A									+											+													
	DA1-2 Lake Borgne Area	High level of flood risk to Distributed Assets with storm surges over 15 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to highways and evacuation routes including I-10 and Hwy 11 and Hwy 90.	A									+										+													
				Provide coastal protection to bridges including Twin Span, Hwy 11 bridge, Rigolet Bridge, and Chef Pass Bridge.	A									+										+													
				Provide coastal protection to ports, waterways, and infrastructure. i.e. GIWW.	A	+	+					+		+									+	+			+										
				Reduce storm surge impacts from the MRGO to increase coastal protection.	A							+		+											+	+											
	DA1-3 Lake Pontchartrain Area	High level of flood risk to Distributed Assets with storm surges over 25 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to highways and evacuation routes including I-55.	A										+									+													
				Provide coastal protection to the Causeway Bridge.	A																			+													
	DA1-4 Lake Maurepas Area	High level of flood risk to Distributed Assets with storm surges over 25 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to highways and evacuation routes including I-10 and Hwy 61.	A									+		+	+							+													

* Current issues, percent flooded: H = High (25-50%); EH= Extremely High (> 50%)
** Alternative Plan (Measure used in Alternative Plans)

Coastwide Objectives:
A - Reduce storm damage vulnerability of coastal communities, resources, and infrastructure.
B - Minimize exposure of traditional flood protection measures to open Gulf conditions.
C - Increase sediment input from sources outside estuarine basins, and manage existing sediment resources within estuarine basines, to sustain and rejuvenate existing wetlands, rebuild marsh substrate and construct flood protections projects.
D - Maintain or establish natural landscape features and hydrologic processes that are critical to sustainable ecosystems structure and function, including dissipation of storm energy.
E - Establish or maintain dynamic salinity gradients that reflect natural cycles of freshwater availabilty and marine forcing (fluctuation related to normal daily and seasonal tide action or exchange).
F - Sustain productive and diverse wildlife habitats.
G - Maximize retention of river-borne sediments and nutrients within coastal wetlands.

Distributed Assets Table Legend

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Table 2.8c Planning Unit 1: Objectives and Measures Table - Ecosystem Units

	Geographic Location	Current Issues	Future Risk/Impact*	Planning Unit Objective	Coastal Objectives	Measures																																
						1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
						Levee Alignment No. 1 (Alternate East Levee Alignment 6)	Re-evaluation of south shore of Lake Pontchartrain Levee Alignment and connection to Levee Alignment 1	Open-System Pontchartrain Basin Hurricane Protection Levee Alignment Alternative incl.	Suggested Modification of Lake Pontchartrain Basin Barrier Plan Levee Alignment	Construct New Floodgate at Bohemia (Mississippi River)	Raise Both Sides of Levee on Mississippi R. (Bohemia to just north of Caernarvon)	Raise 40 Arpent Levee to 17.5' (from Industrial Canal to Verret with tie-in at Verret)	Construct New MRGO Lock and Extend MRGO Eastbank Levee	Enhance Levees along the Intracoastal (north towards Lake Pontchatrain), the GIWW, the Industrial Canal, and the MRGO	Construct a Sill at Seabrook (Industrial Canal at Lake Pontchartrain)	Maintain the MRGO - Lake Borgne Landbridge including Shoreline Protection/Restoration Features	Restore the Bayou LaLoutre Ridge (Includes Construction of MRGO to GIWW Dimensions)	Restore the Chandeleur Barrier Islands	Construct the Jefferson Parish Fringe Marsh Buffer	Construct the Violet Reintroduction to Maintain Target Salinity in Louisiana and Mississippi	Maintain and Restore Biloxi Marsh Landridge and Barrier Reefs - South	Maintain and Restore Biloxi Marsh Landridge and Barrier Reefs - North	Maintain Critical Marsh Shorelines and Ridges of the East Orleans Landridge	Modification of Caernarvon Diversion (Maintain Breton Landbridge)	Maintain and Enhance the Maurepas Landbridge with Maurepas Reintroduction	1,000 cfs Diversion at Convent/Blind River	5,000 cfs Diversion at Convent/Blind River	10,000 cfs Diversion at Convent/Blind River	1,000 cfs Diversion at Hope Canal	1,000 cfs Diversion at Reserve Relief Canal	5,000 cfs Diversion at Bonnet Carre Spillway (incl. Diversion into LaBranche Wetlands)	10,000 cfs Diversion at Bonnet Carre Spillway (incl. Diversion into LaBranche Wetlands)	6,000 cfs Diversion at White's Ditch	10,000 cfs Diversion at White's Ditch	15,000 cfs Diversion at American/California Bay
						Alt 1** , Alt 2**	Alt 1, Alt 2									Alt 1, Alt 2	Alt 1, Alt 2	Alt 1, Alt 2	Alt 1, Alt 2	Alt 2	Alt 1, Alt 2	Alt 2	Alt 2	Alt 1, Alt 2		Alt 1, Alt 2			Alt 1, Alt 2				Alt 1, Alt 2					
Ecosystem Units	**EU1-1 Upper Basin Swamps**	Function disruption due to subsidence, altered inundation, and sediment disruption.	High loss of swamp and fresh/intermediate habitats, decreased avifauna, decreased fisheries, and moderate reduction in storm attenuation.	Increase sediment, freshwater, and nutrient introduction to Upper Basin Swamps.	C																				+	+	+	+	+	+	+	+			
				Improve natural hydrology within the Upper Basin Swamps.	D																				+	+	+	+	+	+	+	+			
				Sustain productive fish and wildlife habitats in the Upper Basin Swamps.	F																				+	+	+	+	+	+	+	+			
	EU1-2 North and South Shore of Lake Pontchartrain	Function disruption due to subsidence, wave/wake energy, saltwater intrusion, and tidal exchange.	High loss of swamp and fresh/intermediate habitats, decreased avifauna, decreased fisheries, and significant reduction in storm attenuation.	Allow for natural tidal exchange in Lake Pontchartrain.	D, E	+		+	+					+							+	+	+													
				Stabilize shoreline North and South of Lake Pontchartrain.	B														+																	
				Sustain productive fish and wildlife habitats in the north and south shore of Lake Pontchartrain area.	F														+																	
	EU1-3 Orleans Landbridge	Function disruption due to subsidence, wave/wake energy, and altered inundation.	Low loss of fresh/intermediate and brackish/saline habitats, decreased avifauna, decreased fisheries, and reduction in storm attenuation.	Reduce wave/wake energy impacts to Orleans Landbridge.	B												+				+	+	+													
				Sustain productive fish and wildlife habitats in the Orleans Landbridge area.	F	-			-											+			+													
	EU1-4 Southern Lake Borgne Rim Including MRGO	Function disruption due to subsidence, wave/wake energy, saltwater intrusion, sediment disruption, and direct removal.	Moderate loss of brackish/saline habitats, decreased wildlife, decreased fisheries, and moderate reduction in storm attenuation.	Reduce wave/wake energy impacts to the Southern Lake Borgne Rim area.	B											+	+				+	+													
				Increase sediment, freshwater, and nutrient introduction to the Southern Lake Borgne Rim area.	C, G											+				+															
				Reduce saltwater intrusion into the Southern Lake Borgne Rim area.	E								+			+	+	+		+	+	+													
				Reduce wave/wake energy impacts to areas surrounding MRGO.	B								+				+	+																	
				Reduce storm surge impacts from the MRGO.	A	+			+				+					+																	
				Reduce saltwater intrusion through the MRGO.	E	+							+							+															
				Sustain productive fish and wildlife habitats in the Southern Lake Borgne Rim area.	F	-										+	+	+		+															
	EU1-5 Central Wetlands Including MRGO Disposal Area	Function disruption due to subsidence, wave/wake energy, sediment disruption, and direct removal.	High loss of brackish/saline habitats, decreased wildlife, decreased fisheries, and significant reduction in storm attenuation.	Improve natural hydrology within the Central Wetlands (incl. Bayou la Loutre vicinity).	D	-			-			-		-						+				+											
				Increase sediment, freshwater, and nutrient introduction to the Central Wetlands.	C, G															+				+											
				Sustain productive fish and wildlife habitats in the Central Wetlands.	F	-			-											+				+											
	EU1-6 Upper Breton Marshes	Function disruption due to subsidence, wave/wake energy, sediment disruption, and direct removal.	High loss of fresh and intermediate habitats, and low reduction in storm attenuation.	Reduce wave/wake energy impacts to the Upper Breton Marshes.	B													+						+											
				Increase introduction of sediment, freshwater, and nutrients into Upper Breton Marshes.	C, G	-					-													+									+	+	

(Continued on Page 8)

(Continued on Page 10)

* Ecosystems Unit Future Risk, percent changed: L= Low Loss (1-15); M = Moderate Loss (16-49); H = High Loss (< 5); Increase (I); Not Applicable (NA); Steady (S); Decrease (D); Increase (I); Unknown (U)
** Alternative Plan (Measure used in Alternative Plans)

Coastwide Objectives:
A - Reduce storm damage vulnerability of coastal communities, resources, and infrastructure.
B - Minimize exposure of traditional flood protection measures to open Gulf conditions.
C - Increase sediment input from sources outside estuarine basins, and manage existing sediment resources within estuarine basines, to sustain and rejuvenate existing wetlands, rebuild marsh substrate and construct flood protections projects.
D - Maintain or establish natural landscape features and hydrologic processes that are critical to sustainable ecosystems structure and function, including dissipation of storm energy.
E - Establish or maintain dynamic salinity gradients that reflect natural cycles of freshwater availabilty and marine forcing (fluctuation related to normal daily and seasonal tide action or exchange).
F - Sustain productive and diverse wildlife habitats.
G - Maximize retention of river-borne sediments and nutrients within coastal wetlands.

Ecosystem Units Table Legend

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Page 10	Page 11	Page 12

Table 2.8c Planning Unit 1: Objectives and Measures Table - Ecosystem Units

	Geographic Location	Current Issues	Future Risk/Impact*	Planning Unit Objective	Coastal Objectives	Measures																																
						31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60					
						110,000 cfs Diversion at American/California Bay with Sediment Enrichment	250,000 cfs Diversion at American/California Bay with Sediment Enrichment	12,000 cfs Diversion at Bayou Lamoque	15,000 cfs Diversion at Fort St. Phillip	26,000 cfs Diversion at Fort St. Phillip with Sediment Enrichment	52,000 cfs Diversion at Fort St. Phillip with Sediment Enrichment	Sediment Delivery by Pipeline at American/California Bay	Sediment Delivery by Pipeline at Central Wetlands	Sediment Delivery by Pipeline at Fort St. Phillips	Sediment Delivery by Pipeline at Golden Triangle	Sediment Delivery by Pipeline at LaBranche	Sediment Delivery by Pipeline at Quarantine Bay	Increase Amite River Influence by Capping Dredged Material Banks on Diversion Canals	Reinstitute Violet Siphon and Post Authorization Change for the Diversion of Water through Inner Harbor Navigation Canal for Enhanced Influence to the Central Wetlands	Opportunistic Use of the Bonnet Carre Spillway	Restore Main Pass Ridge with Dredge Material	Remove Old Grand Prairie Levee	Add New Bank Line Stabilization (Lake Borgne Corner at GIWW to Verret)	Add Breakwater (in Lake Borgne from Southwest Corner to Biloxi Wildlife Management Area)	Resolve/Close the MRGO to Deep Draft Navigation	Create Marsh in Interior Open Water Areas and Install Shore Protection Features on the North Shore of Lake Pontchartrain.	Construct 3 or 4 Small Mississippi River Spillways through the Protected Corridor between Carlisle and Bohemia.	Remove the Gates from the Existing Bayou Lamoque Diversion Structure.	Construct two 5,000 cfs Diversions into the Maurepas Swamps	Construct a Band of Marsh Across the Basin from Point-a-la-Hache Northeastward to MRGO Spoilbank at the Heads of the Major Bays and Lakes.	Goose Point / Point Platte Marsh Creation	LaBranche Wetlands Terracing, Planting, Shoreline Protection	Pass-a-Loutre Crevasse (Deauthorized)	Periodic Introduction of Sediment and Nutrients at Selected Diversion Sites Demonstration (ref in PU-1)	Mississippi River Sediment Trap (half in PU-1)					
						Alt 2**						Alt 1	Alt 1		Alt 1	Alt 1		Alt 1, Alt 2		Alt 1			Alt 1	Alt 2	Alt 1, Alt 2					Alt 1									
Ecosystem Units	**EU1-1 Upper Basin Swamps**	Function disruption due to subsidence, altered inundation, and sediment disruption.	High loss of swamp and fresh/intermediate habitats, decreased avifauna, decreased fisheries, and moderate reduction in storm attenuation.	Increase sediment, freshwater, and nutrient introduction to Upper Basin Swamps.	C											+		+		+									+			+								
				Improve natural hydrology within the Upper Basin Swamps.	D													+		+									+											
				Sustain productive fish and wildlife habitats in the Upper Basin Swamps.	F											+		+		+									+			+								
	EU1-2 North and South Shore of Lake Pontchartrain	Function disruption due to subsidence, wave/wake energy, saltwater intrusion, and tidal exchange.	High loss of swamp and fresh/intermediate habitats, decreased avifauna, decreased fisheries, and significant reduction in storm attenuation.	Allow for natural tidal exchange in Lake Pontchartrain.	D, E																																		
				Stabilize shoreline North and South of Lake Pontchartrain.	B																				+							+								
				Sustain productive fish and wildlife habitats in the north and south shore of Lake Pontchartrain area.	F																				+							+								
	EU1-3 Orleans Landbridge	Function disruption due to subsidence, wave/wake energy, and altered inundation.	Low loss of fresh/intermediate and brackish/saline habitats, decreased avifauna, decreased fisheries, and reduction in storm attenuation.	Reduce wave/wake energy impacts to Orleans Landbridge.	B																																		
				Sustain productive fish and wildlife habitats in the Orleans Landbridge area.	F																																			
	EU1-4 Southern Lake Borgne Rim Including MRGO	Function disruption due to subsidence, wave/wake energy, saltwater intrusion, sediment disruption, and direct removal.	Moderate loss of brackish/saline habitats, decreased wildlife, decreased fisheries, and moderate reduction in storm attenuation.	Reduce wave/wake energy impacts to the Southern Lake Borgne Rim area.	B											+								+	+	+														
				Increase sediment, freshwater, and nutrient introduction to the Southern Lake Borgne Rim area.	C, G											+										+														
				Reduce saltwater intrusion into the Southern Lake Borgne Rim area.	E											+								+	+	+														
				Reduce wave/wake energy impacts to areas surrounding MRGO.	B											+								+	+	+														
				Reduce storm surge impacts from the MRGO.	A																					+														
				Reduce saltwater intrusion through the MRGO.	E																					+														
				Sustain productive fish and wildlife habitats in the Southern Lake Borgne Rim area.	F											+								+		+														
	EU1-5 Central Wetlands Including MRGO Disposal Area	Function disruption due to subsidence, wave/wake energy, sediment disruption, and direct removal.	High loss of brackish/saline habitats, decreased wildlife, decreased fisheries, and significant reduction in storm attenuation.	Improve natural hydrology within the Central Wetlands (incl. Bayou la Loutre vicinity).	D														+																				
				Increase sediment, freshwater, and nutrient introduction to the Central Wetlands.	C, G								+						+																				
				Sustain productive fish and wildlife habitats in the Central Wetlands.	F								+						+																				
	EU1-6 Upper Breton Marshes	Function disruption due to subsidence, wave/wake energy, sediment disruption, and direct removal.	High loss of fresh and intermediate habitats, and low reduction in storm attenuation.	Reduce wave/wake energy impacts to the Upper Breton Marshes.	B																														+				
				Increase introduction of sediment, freshwater, and nutrients into Upper Breton Marshes.	C, G																						+			+				+					

(Continued on Page 9)

(Continued on Page 11)

* Ecosystems Unit Future Risk, percent changed: L= Low Loss (1-15); M = Moderate Loss (16-49); H = High Loss (< 5); Increase (I); Not Applicable (NA); Steady (S); Decrease (D); Increase (I); Unknown (U)
** Alternative Plan (Measure used in Alternative Plans)

Coastwide Objectives:
A - Reduce storm damage vulnerability of coastal communities, resources, and infrastructure.
B - Minimize exposure of traditional flood protection measures to open Gulf conditions.
C - Increase sediment input from sources outside estuarine basins, and manage existing sediment resources within estuarine basines, to sustain and rejuvenate existing wetlands, rebuild marsh substrate and construct flood protections projects.
D - Maintain or establish natural landscape features and hydrologic processes that are critical to sustainable ecosystems structure and function, including dissipation of storm energy.
E - Establish or maintain dynamic salinity gradients that reflect natural cycles of freshwater availabilty and marine forcing (fluctuation related to normal daily and seasonal tide action or exchange).
F - Sustain productive and diverse wildlife habitats.
G - Maximize retention of river-borne sediments and nutrients within coastal wetlands.

Ecosystem Units Table Legend

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Table 2.8c Planning Unit 1: Objectives and Measures Table - Ecosystem Units

	Geographic Location	Current Issues	Future Risk/Impact*	Planning Unit Objective	Coastal Objectives	Measures																																
						61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82													
						Lake Borgne Shoreline Protection at Bayou Dupre	Bayou Bienvenue Pump Station Diversion and Terracing (Deauthorized)	Eden Isles East Marsh Restoration (Deauthorized)	Red Mud Demonstration (Deauthorized)	Benneys Bay Sediment Diversion	Maintain Shoreline Integrity of Lake Pontchartrain	Resolve/Close MRGO to Deep Draft Navigation	Stabilize the Entire North Bank of the MRGO	Dedicated Delivery of Sediment for Marsh Building (Tchefuncte, Tangipahoa, and Pearl River Mouths. Eloi Bay and Biloxi Marshes)	Diversion from Jefferson Parish Drainage into La Branche Wetlands	Provide Diversion-Related Flood Protection where needed in the Upper Basin.	Small (<2,000 cfs) Diversion at Reserve Relief Canal with Outfall Management	Restore St. Tammany Marsh	Reconstruct Madisonville Bulkhead	Improve St. Tammany Parish Drainage	Lake Lery Marsh Restoration and Freshwater Diversion	Mississippi River Delta Management Study	Mississippi River Gulf Outlet Environmental Features and Salinity Control Study	Strategize and Implement Plan to Elevate and/or Relocate Assets Located Outside the Hurricane Protection Plans	Postpone Management through Maintenance of existing crevasses and construction of new crevassesMississippi River Gulf Outlet Environmental Features and Salinity Control Study.	Maximize beneficial use of dredge material where feasible.	Louisiana/Mississippi Hydrodynamic Study.												
										Alt 1**, Alt 2**								Alt 2				Alt 1, Alt 2	Alt 1, Alt 2	Alt 1, Alt 2	Alt 1, Alt 2	Alt 1, Alt 2	Alt 1, Alt 2												
Ecosystem Units	**EU1-1 Upper Basin Swamps**	Function disruption due to subsidence, altered inundation, and sediment disruption.	High loss of swamp and fresh/intermediate habitats, decreased avifauna, decreased fisheries, and moderate reduction in storm attenuation.	Increase sediment, freshwater, and nutrient introduction to Upper Basin Swamps.	C										+		+				+																	
				Improve natural hydrology within the Upper Basin Swamps.	D										+		+				+																	
				Sustain productive fish and wildlife habitats in the Upper Basin Swamps.	F										+		+				+																	
	EU1-2 North and South Shore of Lake Pontchartrain	Function disruption due to subsidence, wave/wake energy, saltwater intrusion, and tidal exchange.	High loss of swamp and fresh/intermediate habitats, decreased avifauna, decreased fisheries, and significant reduction in storm attenuation.	Allow for natural tidal exchange in Lake Pontchartrain.	D, E																																	
				Stabilize shoreline North and South of Lake Pontchartrain.	B			+			+			+				+	+																			
				Sustain productive fish and wildlife habitats in the north and south shore of Lake Pontchartrain area.	F			+						+				+																			
	EU1-3 Orleans Landbridge	Function disruption due to subsidence, wave/wake energy, and altered inundation.	Low loss of fresh/intermediate and brackish/saline habitats, decreased avifauna, decreased fisheries, and reduction in storm attenuation.	Reduce wave/wake energy impacts to Orleans Landbridge.	B						+			+																							
				Sustain productive fish and wildlife habitats in the Orleans Landbridge area.	F																																
	EU1-4 Southern Lake Borgne Rim Including MRGO	Function disruption due to subsidence, wave/wake energy, saltwater intrusion, sediment disruption, and direct removal.	Moderate loss of brackish/saline habitats, decreased wildlife, decreased fisheries, and moderate reduction in storm attenuation.	Reduce wave/wake energy impacts to the Southern Lake Borgne Rim area.	B	+	+					+										+															
				Increase sediment, freshwater, and nutrient introduction to the Southern Lake Borgne Rim area.	C, G		+															+															
				Reduce saltwater intrusion into the Southern Lake Borgne Rim area.	E		+					+										+															
				Reduce wave/wake energy impacts to areas surrounding MRGO.	B	+	+					+										+															
				Reduce storm surge impacts from the MRGO.	A							+										+															
				Reduce saltwater intrusion through the MRGO.	E							+										+															
				Sustain productive fish and wildlife habitats in the Southern Lake Borgne Rim area.	F		+					+										+															
	EU1-5 Central Wetlands Including MRGO Disposal Area	Function disruption due to subsidence, wave/wake energy, sediment disruption, and direct removal.	High loss of brackish/saline habitats, decreased wildlife, decreased fisheries, and significant reduction in storm attenuation.	Improve natural hydrology within the Central Wetlands (incl. Bayou la Loutre vicinity).	D																+															
				Increase sediment, freshwater, and nutrient introduction to the Central Wetlands.	C, G																+															
				Sustain productive fish and wildlife habitats in the Central Wetlands.	F							+										+															
	EU1-6 Upper Breton Marshes	Function disruption due to subsidence, wave/wake energy, sediment disruption, and direct removal.	High loss of fresh and intermediate habitats, and low reduction in storm attenuation.	Reduce wave/wake energy impacts to the Upper Breton Marshes.	B																															
				Increase introduction of sediment, freshwater, and nutrients into Upper Breton Marshes.	C, G																															

(Continued on Page12)

* Ecosystems Unit Future Risk, percent changed: L= Low Loss (1-15); M = Moderate Loss (16-49); H = High Loss (< 5); Increase (I); Not Applicable (NA); Steady (S); Decrease (D); Increase (I); Unknown (U)
** Alternative Plan (Measure used in Alternative Plans)

Coastwide Objectives:
A - Reduce storm damage vulnerability of coastal communities, resources, and infrastructure.
B - Minimize exposure of traditional flood protection measures to open Gulf conditions.
C - Increase sediment input from sources outside estuarine basins, and manage existing sediment resources within estuarine basines, to sustain and rejuvenate existing wetlands, rebuild marsh substrate and construct flood protections projects.
D - Maintain or establish natural landscape features and hydrologic processes that are critical to sustainable ecosystems structure and function, including dissipation of storm energy.
E - Establish or maintain dynamic salinity gradients that reflect natural cycles of freshwater availabilty and marine forcing (fluctuation related to normal daily and seasonal tide action or exchange).
F - Sustain productive and diverse wildlife habitats.
G - Maximize retention of river-borne sediments and nutrients within coastal wetlands.

Ecosystem Units Table Legend

Page 7	Page 8	Page 9
Page 10	Page 11	Page 12

Table 2.8c Planning Unit 1: Objectives and Measures Table - Ecosystem Units

	Geographic Location	Current Issues	Future Risk/Impact*	Planning Unit Objective	Coastal Objectives	Measures																																
						1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
						Levee Alignment No. 1 (Alternate East Levee Alignment 6)	Re-evaluation of south shore of Lake Pontchartrain Levee Alignment and connection to Levee Alignment 1	Open-System Pontchartrain Basin Hurricane Protection Levee Alignment Alternative incl.	Suggested Modification of Lake Pontchartrain Basin Barrier Plan Levee Alignment	Construct New Floodgate at Bohemia (Mississippi River)	Raise Both Sides of Levee on Mississippi R. (Bohemia to just north of Caernarvon)	Raise 40 Arpent Levee to 17.5' (from Industrial Canal to Verret with tie-in at Verret)	Construct New MRGO Lock and Extend MRGO Eastbank Levee	Enhance Levees along the Intracoastal (north towards Lake Pontchatrain), the GIWW, the Industrial Canal, and the MRGO	Construct a Sill at Seabrook (Industrial Canal at Lake Pontchartrain)	Maintain the MRGO - Lake Borgne Landbridge including Shoreline Protection/Restoration Features	Restore the Bayou LaLoutre Ridge (Includes Construction of MRGO to GIWW Dimensions)	Restore the Chandeleur Barrier Islands	Construct the Jefferson Parish Fringe Marsh Buffer	Construct the Violet Reintroduction to Maintain Target Salinity in Louisiana and Mississippi	Maintain and Restore Biloxi Marsh Landbridge and Barrier Reefs - South	Maintain and Restore Biloxi Marsh Landbridge and Barrier Reefs - North	Maintain Critical Marsh Shorelines and Ridges of the East Orleans Landbridge	Modification of Caernarvon Diversion (Maintain Breton Landbridge)	Maintain and Enhance the Maurepas Landbridge with Maurepas Reintroduction	1,000 cfs Diversion at Convent/Blind River	5,000 cfs Diversion at Convent/Blind River	10,000 cfs Diversion at Convent/Blind River	1,000 cfs Diversion at Hope Canal	1,000 cfs Diversion at Reserve Relief Canal	5,000 cfs Diversion at Bonnet Carre Spillway (incl. Diversion into LaBranche Wetlands)	10,000 cfs Diversion at Bonnet Carre Spillway (incl. Diversion into LaBranche Wetlands)	6,000 cfs Diversion at White's Ditch	10,000 cfs Diversion at White's Ditch	15,000 cfs Diversion at American/California Bay
						Alt 1** , Alt 2**	Alt 1, Alt 2									Alt 1, Alt 2	Alt 1, Alt 2	Alt 1, Alt 2	Alt 1, Alt 2	Alt 2	Alt 1, Alt 2	Alt 2	Alt 2	Alt 1, Alt 2		Alt 1, Alt 2			Alt 1, Alt 2				Alt 1, Alt 2		
Ecosystem Units	**EU1-7 Fringing Marshes**	Function disruption due to subsidence, wave/wake energy, sediment disruption, and direct removal.	Moderate loss of brackish/saline habitats, decreased fisheries, and moderate reduction in storm attenuation.	Reduce wave/wake energy impacts to the Fringing Marshes.	B													+																		
				Increase introduction of sediment, freshwater, and nutrients into the Fringing Marshes.	C, G																			+											+
				Improve natural hydrology within the Fringing Marshes	D											+	+							+											+
				Sustain productive fish and wildlife habitats in the Fringing Marshes.	F											+	+							+											+
	EU1-8 Biloxi Marshes	Function disruption due to subsidence, wave/wake energy, sediment disruptions, and direct removal.	Moderate loss of brackish/saline habitats, decreased wildlife, decreased fisheries, and significant reduction in storm attenuation.	Reduce wave/wake energy impacts to the Biloxi Marshes.	B													+			+	+													
				Increase introduction of sediment, freshwater into Biloxi Marshes.	C, G												+			+	+	+													
				Sustain productive fish and wildlife habitats in the Biloxi Marshes.	F												+	+		+	+	+													
	EU1-9 Barrier Chain and Sound	Function disruption due to subsidence and wave/wake energy.	High loss of land mass and habitat and moderate reduction in storm attenuation.	Maintain storm attenuation characteristics of the Barrier Islands.	A, B													+																	
				Maintain the ecosystem functions of the Barrier Islands.	A, C, D, E, F													+																	
				Sustain productive fish and wildlife habitats in the Barrier Chain and Sound.	F													+																	
	EU1-10 Delta	Function disruption due to subsidence, wave/wake energy, sediment disruption, saltwater intrusion, and tidal exchange.	High loss of fresh and intermediate habitats, decreased avifauna, decreased fisheries, and moderate reduction in storm attenuation.	Restore Delta building processes.	C, D, G																														
				Sustain productive fish and wildlife habitats in the Delta.	F																														

(Continued on Page 11)

* Ecosystems Unit Future Risk, percent changed: L= Low Loss (1-15); M = Moderate Loss (16-49); H = High Loss (< 5); Increase (I); Not Applicable (NA); Steady (S); Decrease (D); Increase (I); Unknown (U)
** Alternative Plan (Measure used in Alternative Plans)

Coastwide Objectives:
A - Reduce storm damage vulnerability of coastal communities, resources, and infrastructure.
B - Minimize exposure of traditional flood protection measures to open Gulf conditions.
C - Increase sediment input from sources outside estuarine basins, and manage existing sediment resources within estuarine basines, to sustain and rejuvenate existing wetlands, rebuild marsh substrate and construct flood protections projects.
D - Maintain or establish natural landscape features and hydrologic processes that are critical to sustainable ecosystems structure and function, including dissipation of storm energy.
E - Establish or maintain dynamic salinity gradients that reflect natural cycles of freshwater availabilty and marine forcing (fluctuation related to normal daily and seasonal tide action or exchange).
F - Sustain productive and diverse wildlife habitats.
G - Maximize retention of river-borne sediments and nutrients within coastal wetlands.

Ecosystem Units Table Legend

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Table 2.8c Planning Unit 1: Objectives and Measures Table - Ecosystem Units

	Geographic Location	Current Issues	Future Risk/Impact*	Planning Unit Objective	Coastal Objectives	Measures																																		
						31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60							
						110,000 cfs Diversion at American/California Bay with Sediment Enrichment	250,000 cfs Diversion at American/California Bay with Sediment Enrichment	12,000 cfs Diversion at Bayou Lamoque	15,000 cfs Diversion at Fort St. Phillip	26,000 cfs Diversion at Fort St. Phillip with Sediment Enrichment	52,000 cfs Diversion at Fort St. Phillip with Sediment Enrichment	Sediment Delivery by Pipeline at American/California Bay	Sediment Delivery by Pipeline at Central Wetlands	Sediment Delivery by Pipeline at Fort St. Phillips	Sediment Delivery by Pipeline at Golden Triangle	Sediment Delivery by Pipeline at LaBranche	Sediment Delivery by Pipeline at Quarantine Bay	Increase Amite River Influence by Gapping Dredged Material Banks on Diversion Canals	Reinstitute Violet Siphon and Post Authorization Change for the Diversion of Water through Inner Harbor Navigation Canal for Enhanced Influence to the Central Wetlands	Opportunistic Use of the Bonnet Carre Spillway	Restore Main Pass Ridge with Dredge Material	Remove Old Grand Prairie Levee	Add New Bank Line Stabilization (Lake Borgne Corner at GIWW to Verret)	Add Breakwater (in Lake Borgne from Southwest Corner to Biloxi Wildlife Management Area)	Resolve/Close the MRGO to Deep Draft Navigation	Create Marsh in Interior Open Water Areas and Install Shore Protection Features on the North Shore of Lake Pontchartrain.	Construct 3 or 4 Small Mississippi River Spillways through the Protected Corridor between Carlisle and Bohemia.	Remove the Gates from the Existing Bayou Lamoque Diversion Structure.	Construct two 5,000 cfs Diversions into the Maurepas Swamps	Construct a Band of Marsh Across the Basin from Point-a-la-Hache Northeastward to MRGO Spoilbank at the Heads of the Major Bays and Lakes.	Goose Point / Point Platte Marsh Creation	LaBranche Wetlands Terracing, Planting, Shoreline Protection	Pass-a-Loutre Crevasse (Deauthorized)	Periodic Introduction of Sediment and Nutrients at Selected Diversion Sites Demonstration (ref in PU-1)	Mississippi River Sediment Trap (half in PU-1)							
						Alt 2**						Alt 1	Alt 1			Alt 1		Alt 1, Alt 2			Alt 1		Alt 1	Alt 2	Alt 1, Alt 2						Alt 1										
Ecosystem Units	**EU1-7 Fringing Marshes**	Function disruption due to subsidence, wave/wake energy, sediment disruption, and direct removal.	Moderate loss of brackish/saline habitats, decreased fisheries, and moderate reduction in storm attenuation.	Reduce wave/wake energy impacts to the Fringing Marshes.	B	+	+			+	+	+		+			+				+				+									+							
				Increase introduction of sediment, freshwater, and nutrients into the Fringing Marshes.	C, G	+	+	+	+	+	+	+		+			+					+						+		+				+						
				Improve natural hydrology within the Fringing Marshes	D	+	+	+	+	+	+										+	+			+			+		+				+						
				Sustain productive fish and wildlife habitats in the Fringing Marshes.	F	+	+	+	+	+	+	+		+			+					+			+			+		+				+						
	EU1-8 Biloxi Marshes	Function disruption due to subsidence, wave/wake energy, sediment disruptions, and direct removal.	Moderate loss of brackish/saline habitats, decreased wildlife, decreased fisheries, and significant reduction in storm attenuation.	Reduce wave/wake energy impacts to the Biloxi Marshes.	B																																		
				Increase introduction of sediment, freshwater into Biloxi Marshes.	C, G																																			
				Sustain productive fish and wildlife habitats in the Biloxi Marshes.	F																																			
	EU1-9 Barrier Chain and Sound	Function disruption due to subsidence and wave/wake energy.	High loss of land mass and habitat and moderate reduction in storm attenuation.	Maintain storm attenuation characteristics of the Barrier Islands.	A, B																																		
				Maintain the ecosystem functions of the Barrier Islands.	A, C, D, E, F																																			
				Sustain productive fish and wildlife habitats in the Barrier Chain and Sound.	F																+																			
	EU1-10 Delta	Function disruption due to subsidence, wave/wake energy, sediment disruption, saltwater intrusion, and tidal exchange.	High loss of fresh and intermediate habitats, decreased avifauna, decreased fisheries, and moderate reduction in storm attenuation.	Restore Delta building processes.	C, D, G																													+		+				
				Sustain productive fish and wildlife habitats in the Delta.	F						+										+														+		+				

(Continued on Page 12)

* Ecosystems Unit Future Risk, percent changed: L= Low Loss (1-15); M = Moderate Loss (16-49); H = High Loss (< 5); Increase (I); Not Applicable (NA); Steady (S); Decrease (D); Increase (I); Unknown (U)
** Alternative Plan (Measure used in Alternative Plans)

Coastwide Objectives:
A - Reduce storm damage vulnerability of coastal communities, resources, and infrastructure.
B - Minimize exposure of traditional flood protection measures to open Gulf conditions.
C - Increase sediment input from sources outside estuarine basins, and manage existing sediment resources within estuarine basines, to sustain and rejuvenate existing wetlands, rebuild marsh substrate and construct flood protections projects.
D - Maintain or establish natural landscape features and hydrologic processes that are critical to sustainable ecosystems structure and function, including dissipation of storm energy.
E - Establish or maintain dynamic salinity gradients that reflect natural cycles of freshwater availabilty and marine forcing (fluctuation related to normal daily and seasonal tide action or exchange).
F - Sustain productive and diverse wildlife habitats.
G - Maximize retention of river-borne sediments and nutrients within coastal wetlands.

Ecosystem Units Table Legend

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Table 2.8c Planning Unit 1: Objectives and Measures Table - Ecosystem Units

	Geographic Location	Current Issues	Future Risk/Impact*	Planning Unit Objective	Coastal Objectives	Measures																																		
						61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82															
						Lake Borgne Shoreline Protection at Bayou Dupre	Bayou Bienvenue Pump Station Diversion and Terracing (Deauthorized)	Eden Isles East Marsh Restoration (Deauthorized)	Red Mud Demonstration (Deauthorized)	Benneys Bay Sediment Diversion	Maintain Shoreline Integrity of Lake Pontchartrain	Resolve/Close MRGO to Deep Draft Navigation	Stabilize the Entire North Bank of the MRGO	Dedicated Delivery of Sediment for Marsh Building (Tchefuncte, Tangipahoa, and Pearl River Mouths. Eloi Bay and Biloxi Marshes)	Diversion from Jefferson Parish Drainage into La Branche Wetlands	Provide Diversion-Related Flood Protection where needed in the Upper Basin.	Small (<2,000 cfs) Diversion at Reserve Relief Canal with Outfall Management	Restore St. Tammany Marsh	Reconstruct Madisonville Bulkhead	Improve St. Tammany Parish Drainage	Lake Lery Marsh Restoration and Freshwater Diversion	Mississippi River Delta Management Study	Mississippi River Gulf Outlet Environmental Features and Salinity Control Study	Strategize and Implement Plan to Elevate and/or Relocate Assets Located Outside the Hurricane Protection Plans	Acquire management through maintenance of existing crevasses and construction of new crevassesMississippi River Gulf Outlet Environmental Features and Salinity Control Study.	Maximize beneficial use of dredge material where feasible.	Louisiana/Mississippi Hydrodynamic Study.														
										Alt 1**, Alt 2**								Alt 2				Alt 1, Alt 2	Alt 1, Alt 2	Alt 1, Alt 2	Alt 1, Alt 2	Alt 1, Alt 2	Alt 1, Alt 2																
Ecosystem Units	**EU1-7 Fringing Marshes**	Function disruption due to subsidence, wave/wake energy, sediment disruption, and direct removal.	Moderate loss of brackish/saline habitats, decreased fisheries, and moderate reduction in storm attenuation.	Reduce wave/wake energy impacts to the Fringing Marshes.	B					+		+	+										+																		
				Increase introduction of sediment, freshwater, and nutrients into the Fringing Marshes.	C, G								+										+																		
				Improve natural hydrology within the Fringing Marshes	D					+		+											+																		
				Sustain productive fish and wildlife habitats in the Fringing Marshes.	F					+		+	+										+																		
	EU1-8 Biloxi Marshes	Function disruption due to subsidence, wave/wake energy, sediment disruptions, and direct removal.	Moderate loss of brackish/saline habitats, decreased wildlife, decreased fisheries, and significant reduction in storm attenuation.	Reduce wave/wake energy impacts to the Biloxi Marshes.	B									+									+																		
				Increase introduction of sediment, freshwater into Biloxi Marshes.	C, G									+									+																		
				Sustain productive fish and wildlife habitats in the Biloxi Marshes.	F									+									+																		
	EU1-9 Barrier Chain and Sound	Function disruption due to subsidence and wave/wake energy.	High loss of land mass and habitat and moderate reduction in storm attenuation.	Maintain storm attenuation characteristics of the Barrier Islands.	A, B																																				
				Maintain the ecosystem functions of the Barrier Islands.	A, C, D, E, F																																				
				Sustain productive fish and wildlife habitats in the Barrier Chain and Sound.	F																																				
	EU1-10 Delta	Function disruption due to subsidence, wave/wake energy, sediment disruption, saltwater intrusion, and tidal exchange.	High loss of fresh and intermediate habitats, decreased avifauna, decreased fisheries, and moderate reduction in storm attenuation.	Restore Delta building processes.	C, D, G					+													+																		
				Sustain productive fish and wildlife habitats in the Delta.	F					+													+																		

* Ecosystems Unit Future Risk, percent changed: L= Low Loss (1-15); M = Moderate Loss (16-49); H = High Loss (< 5); Increase (I); Not Applicable (NA); Steady (S); Decrease (D); Increase (I); Unknown (U)
** Alternative Plan (Measure used in Alternative Plans)

Coastwide Objectives:
A - Reduce storm damage vulnerability of coastal communities, resources, and infrastructure.
B - Minimize exposure of traditional flood protection measures to open Gulf conditions.
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D - Maintain or establish natural landscape features and hydrologic processes that are critical to sustainable ecosystems structure and function, including dissipation of storm energy.
E - Establish or maintain dynamic salinity gradients that reflect natural cycles of freshwater availabilty and marine forcing (fluctuation related to normal daily and seasonal tide action or exchange).
F - Sustain productive and diverse wildlife habitats.
G - Maximize retention of river-borne sediments and nutrients within coastal wetlands.

Ecosystem Units Table Legend

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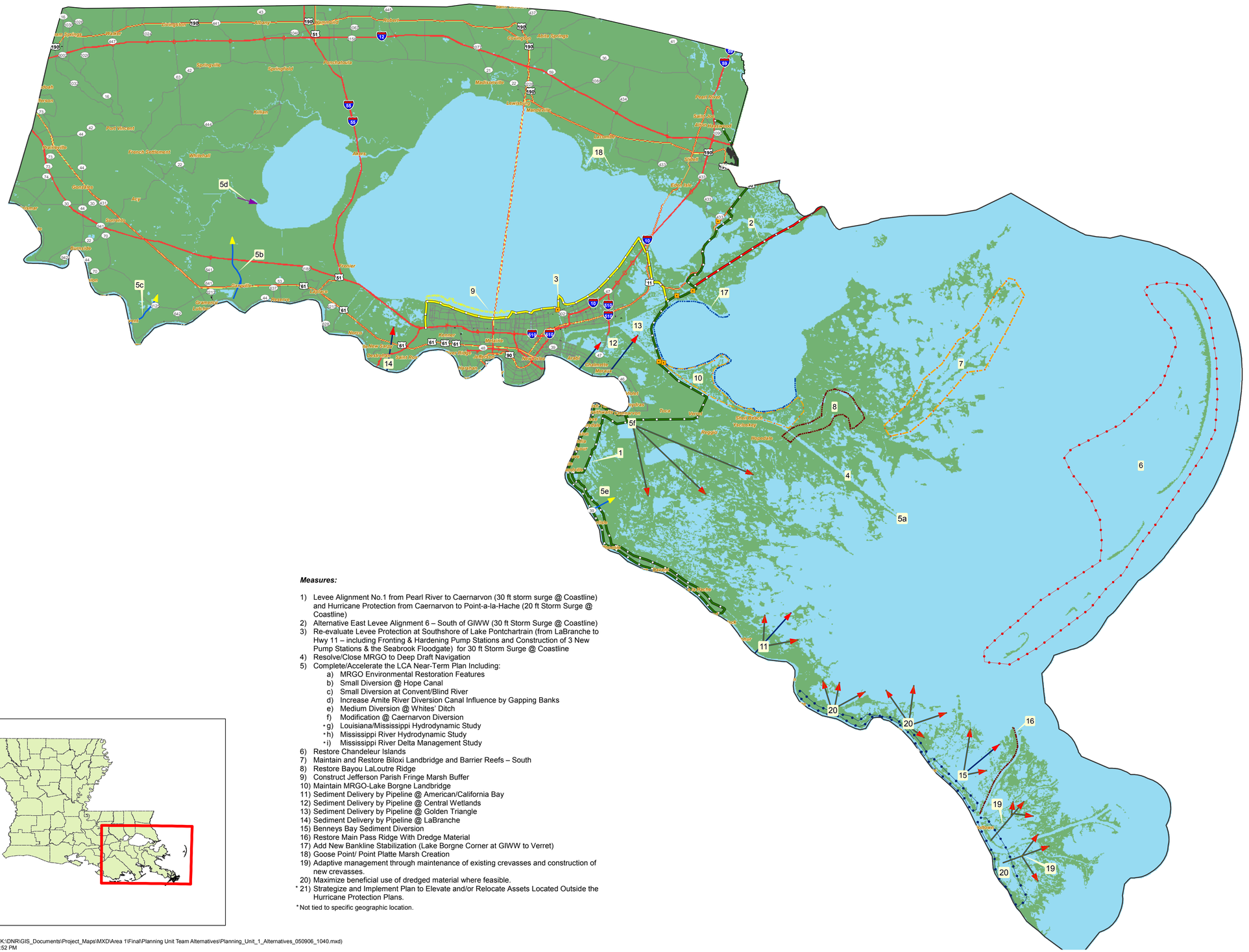

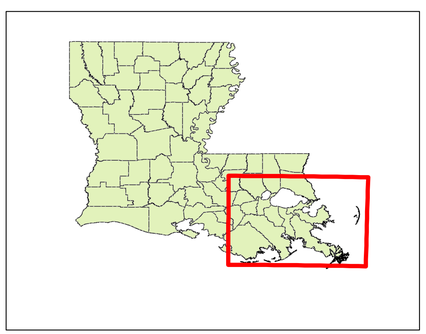

Measures:

1) Levee Alignment No.1 from Pearl River to Caernarvon (30 ft storm surge @ Coastline) and Hurricane Protection from Caernarvon to Point-a-la-Hache (20 ft Storm Surge @ Coastline)
2) Alternative East Levee Alignment 6 – South of GIWW (30 ft Storm Surge @ Coastline)
3) Re-evaluate Levee Protection at Southshore of Lake Pontchartrain (from LaBranche to Hwy 11 – including Fronting & Hardening Pump Stations and Construction of 3 New Pump Stations & the Seabrook Floodgate) for 30 ft Storm Surge @ Coastline
4) Resolve/Close MRGO to Deep Draft Navigation
5) Complete/Accelerate the LCA Near-Term Plan Including:
   a) MRGO Environmental Restoration Features
   b) Small Diversion @ Hope Canal
   c) Small Diversion at Convent/Blind River
   d) Increase Amite River Diversion Canal Influence by Gapping Banks
   e) Medium Diversion @ Whites' Ditch
   f) Modification @ Caernarvon Diversion
   * g) Louisiana/Mississippi Hydrodynamic Study
   * h) Mississippi River Hydrodynamic Study
   * i) Mississippi River Delta Management Study
6) Restore Chandeleur Islands
7) Maintain and Restore Biloxi Landbridge and Barrier Reefs – South
8) Restore Bayou LaLoutre Ridge
9) Construct Jefferson Parish Fringe Marsh Buffer
10) Maintain MRGO-Lake Borgne Landbridge
11) Sediment Delivery by Pipeline @ American/California Bay
12) Sediment Delivery by Pipeline @ Central Wetlands
13) Sediment Delivery by Pipeline @ Golden Triangle
14) Sediment Delivery by Pipeline @ LaBranche
15) Benneys Bay Sediment Diversion
16) Restore Main Pass Ridge With Dredge Material
17) Add New Bankline Stabilization (Lake Borgne Corner at GIWW to Verret)
18) Goose Point/ Point Platte Marsh Creation
19) Adaptive management through maintenance of existing crevasses and construction of new crevasses.
20) Maximize beneficial use of dredged material where feasible.
* 21) Strategize and Implement Plan to Elevate and/or Relocate Assets Located Outside the Hurricane Protection Plans.

* Not tied to specific geographic location.

0 4.5 9 13.5
Miles

1:348,480
1 inch equals 5.5 miles

Legend

- Flood Gate
- Levee Alignment No. 1
- Levee Alignment No. 2
- Levee Alignment No. 3
- Diversion
- Bank Gapping
- Barrier Island Restoration
- Land Bridge Restoration
- Bankline Stabilization
- Ridge Restoration
- Marsh Buffer Creation
- Beneficial Use of Dreged Material
- Sediment Diversion

Shaw® Halcrow BG

LOUISIANA COMPREHENSIVE COASTAL PROTECTION MASTER PLAN

FIGURE 2.4

PLANNING UNIT 1
ALTERNATIVE ONE

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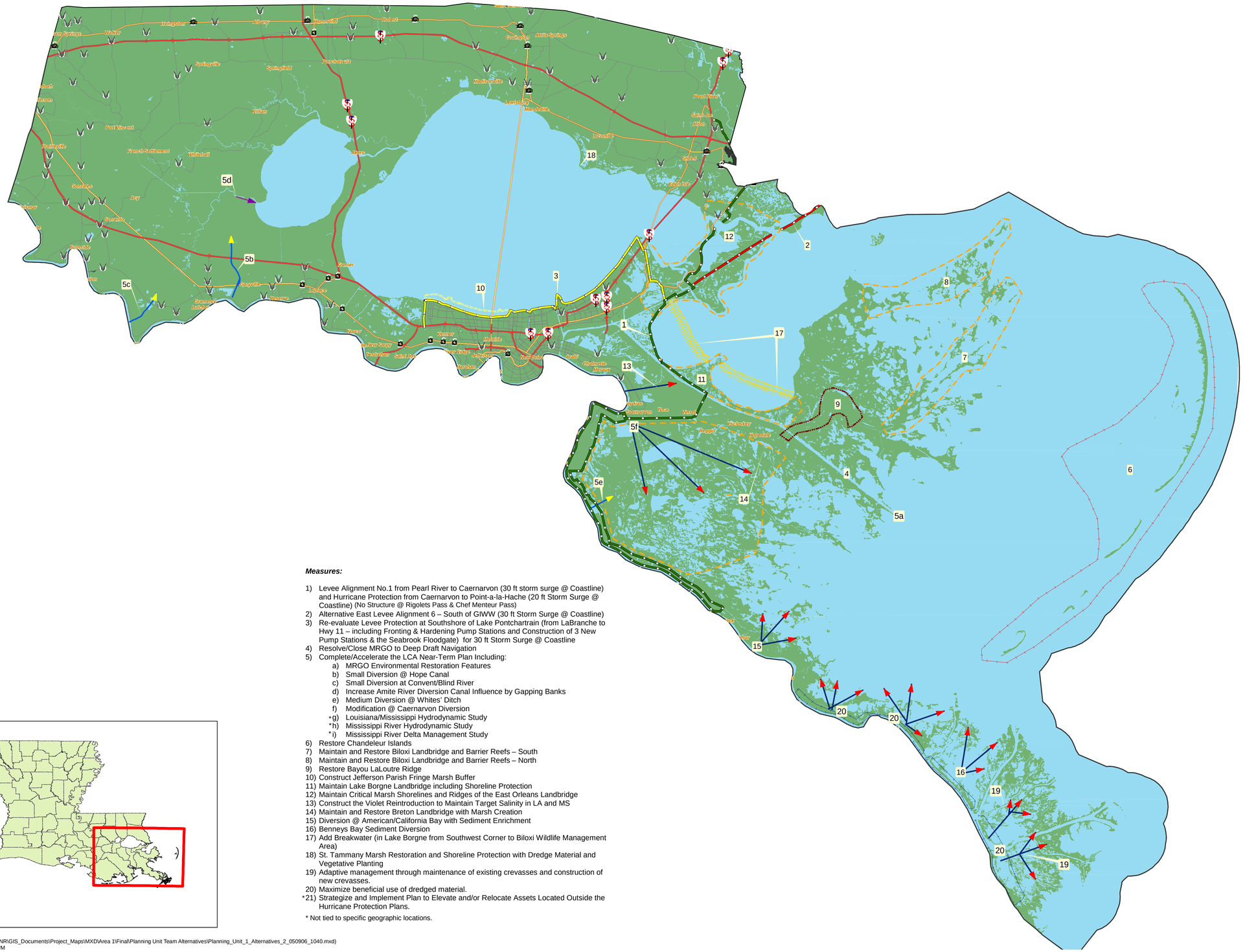

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1 inch equals 5.5 miles

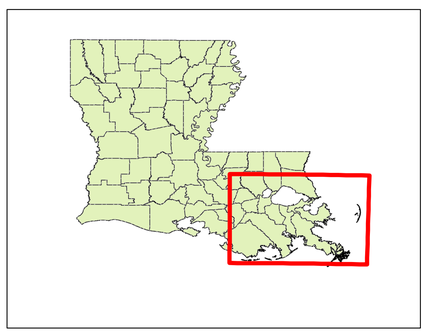
Legend

- Flood Gate
- Levee Alignment No. 1
- Levee Alignment No. 2
- Levee Alignment No. 3
- Diversion
- Bank Gapping
- Barrier Island Restoration
- Land Bridge Restoration
- Ridge Restoration
- Marsh Buffer Creation
- Sediment Diversion
- Beneficial Use of Dredged Material
- Breakwaters

Measures:

1) Levee Alignment No.1 from Pearl River to Caernarvon (30 ft storm surge @ Coastline) and Hurricane Protection from Caernarvon to Point-a-la-Hache (20 ft Storm Surge @ Coastline) (No Structure @ Rigolets Pass & Chef Menteur Pass)
2) Alternative East Levee Alignment 6 – South of GIWW (30 ft Storm Surge @ Coastline)
3) Re-evaluate Levee Protection at Southshore of Lake Pontchartrain (from LaBranche to Hwy 11 – including Fronting & Hardening Pump Stations and Construction of 3 New Pump Stations & the Seabrook Floodgate) for 30 ft Storm Surge @ Coastline
4) Resolve/Close MRGO to Deep Draft Navigation
5) Complete/Accelerate the LCA Near-Term Plan Including:
   a) MRGO Environmental Restoration Features
   b) Small Diversion @ Hope Canal
   c) Small Diversion at Convent/Blind River
   d) Increase Amite River Diversion Canal Influence by Gapping Banks
   e) Medium Diversion @ Whites' Ditch
   f) Modification @ Caernarvon Diversion
   *g) Louisiana/Mississippi Hydrodynamic Study
   *h) Mississippi River Hydrodynamic Study
   *i) Mississippi River Delta Management Study
6) Restore Chandeleur Islands
7) Maintain and Restore Biloxi Landbridge and Barrier Reefs – South
8) Maintain and Restore Biloxi Landbridge and Barrier Reefs – North
9) Restore Bayou LaLoutre Ridge
10) Construct Jefferson Parish Fringe Marsh Buffer
11) Maintain Lake Borgne Landbridge including Shoreline Protection
12) Maintain Critical Marsh Shorelines and Ridges of the East Orleans Landbridge
13) Construct the Violet Reintroduction to Maintain Target Salinity in LA and MS
14) Maintain and Restore Breton Landbridge with Marsh Creation
15) Diversion @ American/California Bay with Sediment Enrichment
16) Benneys Bay Sediment Diversion
17) Add Breakwater (in Lake Borgne from Southwest Corner to Biloxi Wildlife Management Area)
18) St. Tammany Marsh Restoration and Shoreline Protection with Dredge Material and Vegetative Planting
19) Adaptive management through maintenance of existing crevasses and construction of new crevasses.
20) Maximize beneficial use of dredged material.
*21) Strategize and Implement Plan to Elevate and/or Relocate Assets Located Outside the Hurricane Protection Plans.

* Not tied to specific geographic locations.



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LOUISIANA COMPREHENSIVE COASTAL PROTECTION MASTER PLAN

FIGURE 2.5

PLANNING UNIT 1
ALTERNATIVE TWO

3.0 Planning Unit 2: Mississippi River to Bayou Lafourche

3.1 Overview

Planning Unit 2 (PU 2) is a triangular shaped area bounded by the Mississippi River, Bayou Lafourche, and the Gulf of Mexico. This highly productive estuary is home to a vast human population, where the social and economic cultures have evolved around and are dependent upon the estuary's natural resources. However, man's habitation of this dynamic environment has lead to landscape changes that threaten the sustainability of both the natural and human environment.

Freshwater and sediment input to PU 2 was virtually eliminated by the erection of flood protection levees along the Mississippi River and the closure of Bayou Lafourche at Donaldsonville. The lack of fresh water, and the loss of the accompanying sediments, nutrients, and hydrologic influence, forms the most critical ecological problem of the Barataria Basin. The second critical problem is the erosion of the barrier island chain as individual islands are reshaped or breached, passes widen and deepen, allowing the Gulf of Mexico greater influence on interior wetlands.

The life and livelihood of the human population located in PU 2 requires protection from river flooding and gulf storm surge. The major Mississippi river ports, noted in Planning Unit 1 on the east of the river, have infrastructure on the west bank and thus effectively operate from both banks of the river. Thus, the solution to the critical problems facing this planning unit include flood protection structures and coastal landscape features that work together to ensure the long-term sustainability of the natural and human environment. This type of synergy can be accomplished by restoring critical landscape features at strategic locations selected for their ability to protect human infrastructure and restore ecological processes. Reintroduction of sediments, nutrients and freshwater from the Mississippi River and restoring the barrier island chain are paramount to achieving long-term sustainability.

Accordingly, analysis of current condition and future long-term sustainability requires that sediment now being lost off the continental shelf be redirected to nourish and establish marsh. To accomplish this goal would require compatibility with navigation's current and future needs. The overall goal should be to maximize the use of available sediment for habitat creation and ultimately surge protection.

Both Alternative Plan 1 and Alternative Plan 2 must include completion or acceleration of the measures within the Louisiana Coastal Authority (LCA) near-term plan as follows:

- Barataria Basin barrier Shoreline Restoration (Caminada Headland and Shell Island)
- Small Bayou Lafourche Reintroduction
- Medium Diversion with Dedicated Dredging at Myrtle Grove
- Re-authorization of Davis Pond – Optimize for Marsh Creation
- Louisiana/Mississippi Hydrodynamic Study
- Mississippi River Hydrodynamic Study
- Mississippi River Delta Management Study

3.2 Alternative Plan One

For PU 2, the maximum structural protection would be given by the USACE Levee Alignment 1, Mississippi River to LaRose reach. This alignment is the same as the Donaldsonville to the Gulf, Modified Gulf Intracoastal Waterway (GIWW) alignment. The proposed hurricane protection would be constructed on the gulf side of the waterway to keep tidal surges from entering the waterway and progressing into the protected side of the Barataria Basin. The hurricane barrier, which would protect against a 30-ft. storm surge at the coastline, would start near the Mississippi River south of Belle Chasse in Plaquemine parish and extend to, and include improvements to, the existing Larose to Golden Meadow levee in Lafourche Parish. To provide additional protection to other consolidated assets, the alignment would be modified to include the communities of Jean Lafitte and Barataria. Other structural protection proposed in this rationale include: improving existing levees in the City Price to Venice segment of the New Orleans to Venice Hurricane Protection Project to provide 1% annual probability storm event (1 in 100-year event) level of protection; and, providing the maximum technically feasible protection for assets on Grand Isle.

Metropolitan New Orleans includes a highly populated urban area on the west bank of the Mississippi River. This area includes parts of Plaquemine, Orleans and Jefferson Parishes. The West Bank and Vicinity Hurricane Protection project, which provides Standard Project Hurricane level of protection, is authorized to protect this area, and would serve as a second line of defense for the area of highest concentrated assets.

Therefore, the modified GIWW levee alignment in combination with the lower Plaquemine and Grand Isle protective measures would provide a maximum structural level of protection for populated areas in PU 2.

Coastal restoration measures chosen for this rationale were selected to provide the maximum level of protection to distributed assets and to enhance protection provided by structural protection features. Selected measures include: completing/accelerating the LCA study; restoring the Barataria shoreline and barrier islands from the Caminada Headlands to Sandy Point; adaptive management through maintenance of the West Bay crevasse; pipeline conveyance of sediment to create marsh at strategic locations, including along Louisiana Highway 1 and the back levees of Plaquemine and Lafourche Parishes; back filling and/or plugging non-essential oil and gas canals; development of a watershed management plan to optimize flood protection and habitat restoration; small diversions at strategic locations in the upper basin; maximizing beneficial use of dredge material where feasible; and, strategizing and implementing a plan to elevate and/or relocate assets located outside the hurricane protection plans.

Restoration of the barrier island chain is a major need in this planning unit and has to be addressed within any alternative chosen due to the critical need to protect distributed assets such as Port Fouchon, the Loop distribution system, navigation and evacuation routes, and other oil and gas infrastructure. Besides directly protecting the distributed assets mentioned above, the barrier islands serve as the first line of defense against storm surge for population centers and concentrated assets of the Barataria Basin. In addition, barrier islands provide essential habitat to critical fish and wildlife species. Without immediate restoration measures to sustain the barrier island chain, Barataria Bay would be absorbed by the Gulf of Mexico, causing irreparable damage to the Barataria Estuary.

Sediment delivery via pipeline was chosen in various locations as an immediate solution to enhance and restore critical wetlands that are sediment deprived, fragmented and/or deteriorated from saltwater intrusion and wave/wake impacts. Immediate sediment input is needed, particularly in the fringe marsh area along the back levees of Plaquemine and Lafourche Parishes and along the Barataria land bridge in Jefferson Parish. The small

diversion with sediment enrichment proposed at Myrtle Grove would provide freshwater, nutrients and sediment to nourish and sustain marsh. Adaptive management of the West Bay crevasses south of Venice would provide for additional marsh creation.

Barataria basin is experiencing the highest rate of land loss of any area of Louisiana. An influx of freshwater, nutrients and sediments is needed to sustain this highly productive ecosystem. Optimizing flow from Davis Pond, adding small diversion along the river in the upper basin at strategic locations and back filing and/or plugging oil and gas canals would allow progress towards achieving a sustainable estuary. Development of a storm water management plan would allow an integrated approach to water management that would prevent conflicts between flood protection and habitat restoration.

Besides hurricane protection and coastal restoration features, it would also be necessary to implement a strategic plan to elevate and/or relocate assets located outside the hurricane protection plans. This effort, in combination with the described features above, would provide a holistic approach to coastal protection as defined in Act 8.

3.3 Alternative Plan Two

PU 2 consists of the New Orleans Metropolitan area on the west bank and other assets located within the Barataria Basin. The highly populated urban area on the west bank includes parts of Plaquemines, Orleans and Jefferson Parishes. The West Bank and Vicinity Hurricane Protection project, which provides Standard Project Hurricane level of protection, is authorized to protect this area from Davis Pond on the west to Oakville below Belle Chasse on the east. Upgrading the existing hurricane protection project to a levee system averaging 30 feet in elevation would offer the maximum level of protection to the metropolitan area on the west bank.

The USACE Levee Alignment 3 is proposed to provide 1% annual probability storm event (1 in 100-year event) level of protection to other populated areas of PU 2. This alignment is the same as the Donaldsonville to the Gulf, Highway 90 Levee Alignment, which extends from Golden Meadow to the Davis Pond guide levee. The levee segment along Highway 90 would be constructed on the gulf side of the highway and would connect with the existing Golden Meadow to Larose hurricane protection project to the west.

Other structural protection proposed in this rationale include: improving existing levees in the City Price to Venice segment of the New Orleans to Venice Hurricane Protection Project to provide 1% annual probability storm event (1 in 100-year event) level of protection; and, improving the ring levees around Lafitte, Barataria and Crown Point to provide the maximum technically feasible protection.

The variable structural protection described above would provide the maximum level of protection to the highly developed urban area, while offering a feasible protection to areas comprising less concentrated assets.

Coastal restoration measures chosen for this rationale were selected to provide the maximum level of protection to distributed assets and to enhance protection provided by structural protection features. Selected measures include: completing/accelerating the LCA study; restoring the Barataria shoreline and barrier islands from the Caminada Headlands to Sandy Point; adaptive management through maintenance of the West Bay crevasse; pipeline conveyance of sediment to create marsh at strategic locations, including along Louisiana Highway 1 and the back levees of Plaquemine and Lafourche Parishes; back filling and/or plugging non-essential oil and gas canals; development of a watershed management plan to optimize flood protection and habitat restoration; small diversions at strategic locations in the upper basin; maximizing beneficial use of dredge material where feasible; small diversion in the vicinity of Port Sulphur; restoring ridges; constructing a wave break along the northern

shoreline of Barataria Bay; and, strategizing and implementing a plan to elevate and/or relocate assets located outside the hurricane protection plans. The synergism of the non-structural coastal restoration features chosen for this rationale provide a basis for a sustainable ecosystem while enhancing storm attenuation and providing the greatest possible natural protection for the region.

Restoration of the barrier island chain is a major need in this planning unit and has to be addressed within any alternative chosen due to the critical need to protect distributed assets such as Port Fouchon, the LOOP distribution system, navigation and evacuation routes, and other oil and gas infrastructure. Besides directly protecting the distributed assets mentioned above, the barrier islands serve as the first line of defense against storm surge for population centers and concentrated assets of the Barataria Basin. In addition, barrier islands provide essential habitat to critical fish and wildlife species. Without immediate restoration measures to sustain the barrier island chain, Barataria Bay would be absorbed by the Gulf of Mexico, causing irreparable damage to the Barataria Estuary.

Sediment delivery via pipeline was chosen in various locations as an immediate solution to enhance and restore critical wetlands that are sediment deprived, fragmented and/or deteriorated from saltwater intrusion and wave/wake impacts. Immediate sediment input is needed, particularly in the fringe marsh area along the back levees of Plaquemine and Lafourche Parishes and along the Barataria land bridge in Jefferson Parish. The small diversion with sediment enrichment proposed at Myrtle Grove would provide freshwater, nutrients and sediment to nourish and sustain marsh. To provide a framework for marsh created via sediment delivery, key ridges throughout the basin would be restored.

A wave break along the northern rim of the Barataria Bay would serve as a second line of defense to augment the wave height attenuation function of the barrier islands and would also help to retain sediment within the basin.

Relocating the Mississippi River sediment distributary system out of the deep draft navigation channel is needed to prevent loss of sediment off the continental shelf and to provide long-term sustainability and create new marsh in the lower basin. Diverting freshwater, nutrients and sediments from the river is also needed in the upper and middle basin. However, navigation and flood protection needs must be maintained. Therefore, completing the studies recommended in the LCA plan would provide the necessary data needed to develop technically feasible solutions.

Barataria basin is experiencing the highest rate of land loss of any area of Louisiana. An influx of freshwater, nutrients and sediments is needed to sustain this highly productive ecosystem. Optimizing flow from Davis Pond, adding small diversion along the river in the upper basin at strategic locations and back filing and/or plugging oil and gas canals would go along way toward achieving a sustainable estuary. Development of a storm water management plan would allow an integrated approach to water management that would prevent conflicts between flood protection and habitat restoration.

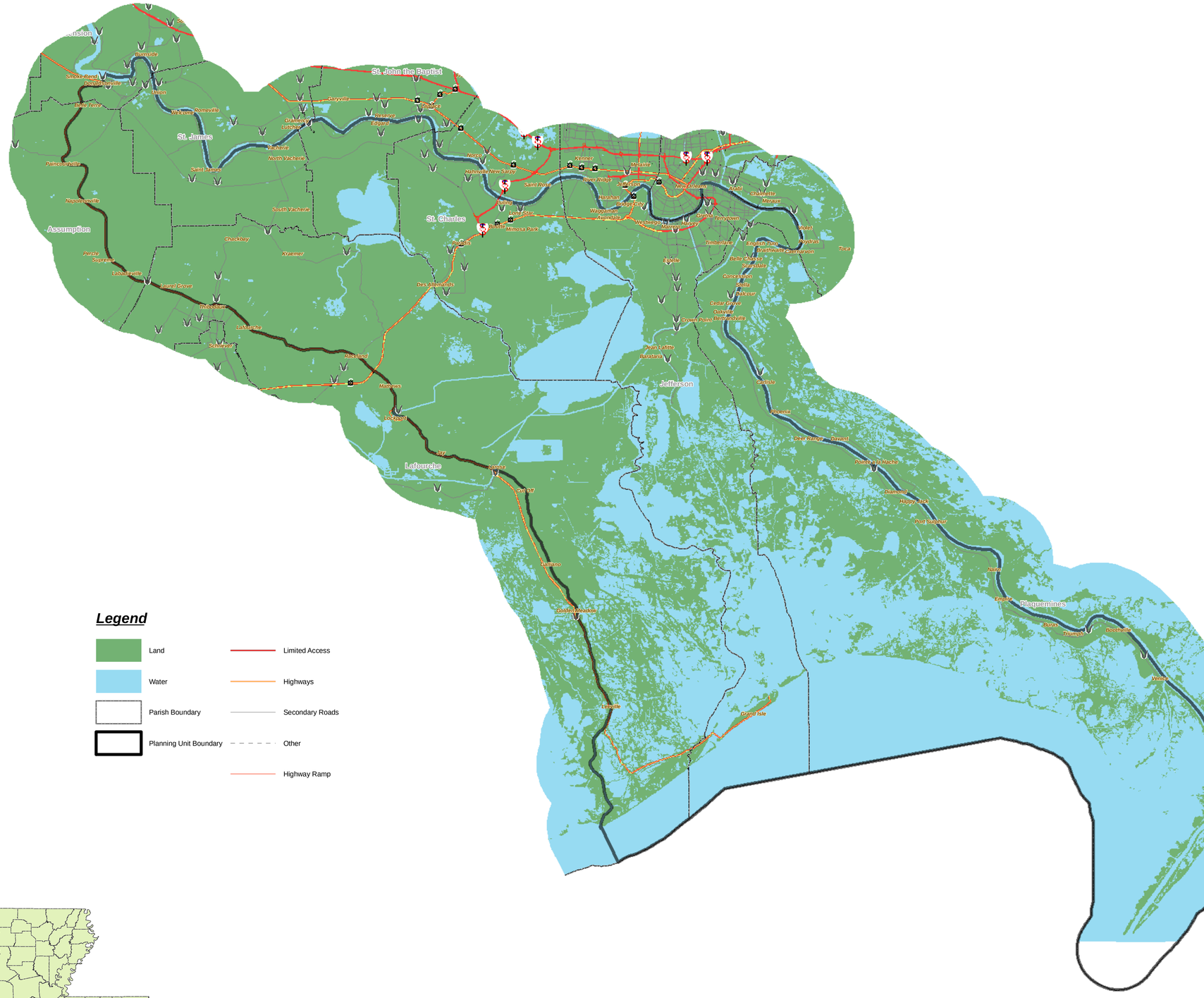
Besides hurricane protection and coastal restoration features, it would also be necessary to implement a strategic plan to elevate and/or relocate assets located outside the hurricane protection plans. This effort, in combination with the described features above, would provide a holistic approach to coastal protection as defined in Act 8.

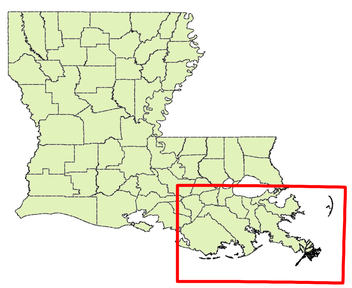
3.4 Supporting Documentation

Supporting documentation for Planning Unit 2 Alternative Plan formulation includes the following:

Figure 3.1 Boundary and Base Map

Figure 3.2	Concentrated and Distributed Assets Map
Table 3.1	Relative Damage from Storm Surge for Concentrated Assets
Table 3.2	Concentrated Assets Scoring
Table 3.3	Relative Damage from Storm Surge for Distributed Assets
Table 3.4	Distributed Assets Scoring
Table 3.5	Distributed Assets Identification
Table 3.6	Existing Conditions and Problem Identification Table
Table 3.7	Changes in Natural Resources, 1990-2050 Table
Figure 3.3	Ecosystem Units and Natural Resources Map
Table 3.8a	Objectives and Measures Table - Concentrated Assets
Table 3.8b	Objectives and Measures Table - Distributed Assets
Table 3.8c	Objectives and Measures Table – Ecosystem Units
Figure 3.4	Alternative One Map
Figure 3.5	Alternative Two Map





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LOUISIANA COMPREHENSIVE COASTAL PROTECTION MASTER PLAN

FIGURE 3.1

PLANNING UNIT 2
BOUNDARY AND BASE MAP

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Legend

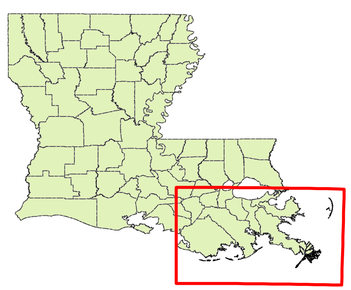
Concentrated Assets

- 1, Metro Area on the West Bank
- 2, Upper Plaquemines Parish
- 3, Lower Plaquemines Parish
- 4, Oil and Gas, Fishing and Tourism Communities
- 5, Industrial Communities Port Fouchon
- 6, South Lafourche
- 7, Central LaFourche
- 8, North LaFourche, Assumption, Ascension
- 9, River Parish Communities
- 10, Central Basin Communities

Distributed Assets

- DA 2-1, Birdsfoot Delta
- DA 2-2, Empire
- DA 2-3, Grand Cheniere
- DA 2-4, Bay
- DA 2-5, L'Ours
- DA 2-6, North Bay
- DA 2-7, Central Marsh
- DA 2-8, Salvador
- DA 2-9, Des Allemands

Parish Boundary



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LOUISIANA COMPREHENSIVE COASTAL PROTECTION MASTER PLAN

FIGURE 3.2

PLANNING UNIT 2
CONCENTRATED AND DISTRIBUTED ASSETS

PLANNING UNIT 2: West of the Mississippi River to Bayou Lafourche

Table 3.1 Relative Damages from Storm Surge to Concentrated Assets

Proportion of assets damaged or destroyed due to storm surge: EL = Extremely Low (0-5%) L = Low (5 - 15%) M = Medium (15 - 25%) H = High (25 - 50%) EH = Extremely High (>50%)	**Storm Surge at Coastline (Feet)**	**Metro Area on West Bank**	**Upper Plaquemines Parish**	**Lower Plaquemines Parish**	**Oil & Gas, Fishing, and Tourism Communities**	**Industrial Communities**	**South LaFourche**	**Central LaFourche**	**North LaFourche/ Assumption/ Ascension**	**River Parish Communities**	**Cental Basin Communities**
	5	EL	EL	EL	M	EL	EL	EL	EL	EL	EL
	10	EL	L	EL	M	L	EL	L	EL	EL	L
	15	M	H	H	EH	M	H	M	L	L	M
	20	EH	EH	EH	EH	EH	EH	EH	H	H	EH
	25	EH	EH	EH	EH	EH	EH	EH	EH	EH	EH
	30	EH	EH	EH	EH	EH	EH	EH	EH	EH	EH

Table 3.2 Concentrated Assets Scoring

Scoring Criteria	**Maximum Score for Resource**	**Metro Area on West Bank**	**Upper Plaquemines Parish**	**Lower Plaquemines Parish**	**Oil & Gas, Fishing, and Tourism Communities**	**Industrial Communities**	**South LaFourche**	**Central LaFourche**	**North LaFourche/ Assumption/ Ascension**	**River Parish Communities**	**Cental Basin Communities**
1. Residences	**25**	25	8	8	8	1	15	12	15	15	12
2. Industry	**20**	20	3	9	6	5	10	10	10	15	6
3. Infrastructure	**15**	15	5	5	5	3	8	4	10	10	3
4. Institutional and Publicly Owned Facilities	**15**	15	3	5	5	1	6	4	8	8	4
5. Strategic Resources	**25**	25	4	5	4	25	20	4	4	20	1
Total Score	**100**	**100**	**23**	**32**	**28**	**35**	**59**	**34**	**47**	**68**	**26**

Table 3.3 Relative Damages from Storm Surge to Distributed Assets[1]

Proportion of assets damaged or destroyed due to storm surge: EL = Extremely Low (0-5%) L = Low (5 - 15%) M = Medium (15 - 25%) H = High (25 - 50%) EH = Extremely High (>50%)	**Storm Surge at Coastline (Feet)**	**DA2-1** Birdsfoot Delta	**DA2-2** Empire	**DA2-3** Grand Cheniere	**DA2-4** Bay	**DA2-5** L'ours	**DA2-6** North Bay	**DA2-7** Central Marsh	**DA2-8** Salvador	**DA2-9** Des Allemands
	5	EL	L	EL	EL	EL	EL	EL	EL	EL
	10	EL	M	EL	L	EL	EL	EL	L	EL
	15	L	H	L	M	L	EL	L	M	L
	20	M	EH	M	H	M	M	M	H	H
	25	H	EH	H	EH	H	H	H	EH	EH
	30	H	EH	H	EH	H	H	H	EH	EH

[1] Assets outside of the defined concentrated areas (see Concentrated and Distributed Assets Map)

Table 3.4 Scoring of Distributed Assets

Scoring Criteria	**Maximum Score for Resources**	**DA2-1** Birdsfoot Delta	**DA2-2** Empire	**DA2-3** Grand Cheniere	**DA2-4** Bay	**DA2-5** L'ours	**DA2-6** North Bay	**DA2-7** Central Marsh	**DA2-8** Salvador	**DA2-9** Des Allemands
National Significance	**25**	25	10	5	25	25	20	25	25	15
State Significance	**25**	15	15	5	25	20	20	25	25	20
Local Significance	**25**	10	25	0	25	10	20	20	25	25
Critical to Recovery	**25**	10	5	0	25	15	5	15	20	25
Total Score	**100**	**60**	**55**	**10**	**100**	**70**	**65**	**85**	**95**	**85**

TABLE 3.5. DISTRIBUTED ASSETS FOR PLANNING UNIT 2

The land outside the defined communities was divided into areas of surge impact commonality. For Planning Unit 2 these are defined by the significant water bodies that impact these areas:

Birdsfoot Delta	= DA 2-1
Empire	= DA 2-2
Grand Cheniere	= DA 2-3
Bay	= DA 2-4
L'ours	= DA 2-5
North Bay	= DA 2-6
Central Marsh	= DA 2-7
Salvador	= DA 2-8
Des Allemand	= DA 2-9

Within these areas following assets are comprised:

	Assets	Oil & Gas	Pipelines	Highway, Bridges & Transportation	Evacuation Routes	Ports, Waterway & Infrastructure	Other Strategic Assets
DA 2-1	Oil & Gas Fields and Pipelines	X	X				
	Southwest Pass					X	
DA 2-2	Oil & Gas Fields and Pipelines	X	X				
	Port Venice					X	
DA 2-3	Oil & Gas Fields and Pipelines	X	X				
DA 2-4	Oil & Gas Fields and Pipelines	X	X				
	LOOP		X				
	Barataria Bay Waterway					X	
	LA 1			X	X		
	Waterline (Lafitte - Grand Isle)						X
DA 2-5	Oil & Gas Fields and Pipelines	X	X				
	LOOP		X				

	Assets	Oil & Gas	Pipelines	Highway, Bridges & Transportation	Evacuation Routes	Ports, Waterway & Infrastructure	Other Strategic Assets
DA 2-6	Oil & Gas Fields and Pipelines	X	X				
	Barataria Bay Waterway					X	
DA 2-7	Oil & Gas Fields and Pipelines	X	X				
	Barataria Bay Waterway					X	
	GIWW					X	
DA 2-8	Oil & Gas Fields and Pipelines	X	X				
	GIWW					X	
	Bayou des Allemands					X	
	Hwy 90 (Future I-49)			X	X		
DA 2-9	Oil & Gas Fields and Pipelines	X	X				
	Bayou des Allemands					X	
	Davis Pond Deversion Structure						X
	Hwy 90 (Future I-49)			X	X		
	LA 20			X			
	LA 307			X			
	LA 3127			X	X		

Table 3.6. Planning Unit 2 Existing Conditions/ Problem Identification

NOTE: Rankings are only relatable within an ecosystem unit; the purpose is not to prioritize between units, but rather to prioritize function disruptions within ecosystem units

	Ecosystem Unit					
Function Disruption (System Threat)	**EU 2-1 Upper Basin Swamps**	**EU 2-2 Middle Basin FW Marsh**	**EU 2-3 Middle Basin Intermediate Marsh**	**EU 2-4 Fringing Marsh**	**EU 2-5 Shoreline/ Barrier Islands**	**EU 2-6 Delta**
Subsidence	M	M	H	H	H	VH
Tidal Exchange	NI	L	M	H	H	L
Sediment Disruptions	VH	M	H	VH	H	NI
Salt Water Intrusion	NI	L	H	H	NI	NI
Altered Inundation	M	L	L	H	NI	NI
Wave/Wake Energy	L	M	M	VH	VH	H
Direct Removal	L	L	M	H	M	M

No Impact	NI
Low	L
Moderate	M
High	H
Very High	VH

Subsidence = true subsidence; benchmark elevations not referenced to tide gauges
Tidal Exchange = Daily tide energy; assumed to be more destructive to historically fresh/intermediate wetlands, more beneficial to brackish/saline wetlands
Sediment Disruptions = disconnection from riverine sources
Saltwater Intrusion = due to encroachment of Gulf on landscape edge or movement up canals & channels
Altered Inundation = altered frequency or duration of inundation, not related to RSLR; e.g., impoundments
Wave/Wake Energy = includes storm energy
Direct Removal = dredging sediments or covering by spoil banks & levees.

Table 3.7. Planning Unit 2 Changes in Natural Resources, 1990 - 2050 (From Coast 2050 Report; LCA Land Change Map)

Resource	Ecosystem Unit					
	EU 2-1 Upper Basin Swamps	EU 2-2 Middle Basin FW Marsh	EU 2-3 Middle Basin Intermediate Marsh	EU 2-4 Fringing Marsh	EU 2-5 Shoreline/ Barrier Islands	EU 2-6 Delta
Swamp	H	M	NA	NA	NA	NA
Fresh/Intermediate Marsh	M	L	L	L	NA	I
Brackish/Saline Marsh	NA	NA	L	M	H	NA
Beach/Dune/Back Barrier Marsh	NA	NA	NA	NA	H	NA
Sessile Estuarine (Oysters)	NI	NI	NI	S	D	S
Saltwater (Red Drum)	NI	D	S	D	D	S
Freshwater (Largemouth Bass)	S	S	S	D	NI	I
Estuarine (Spotted Seatrout)	NI	D	D	D	D	S
Estuarine (Shrimp)	NI	D	D	D	D	S
Woodland Edge (Deer)	S	S	S	D	NI	S
Woodland Avifauna	D	S	S	S	D	NI
Fresh Wetlands (Alligator)	I	I	I	D	D	S
Muskrat	S	S	S	D	D	S
Shore Birds	NI	S	S	D	D	S
Loss of Storm Attenuation* **	H	NI	NI	M	H	M

Wetland Key		% Change
No Impact	NI	0
Low Loss	L	1-15
Moderate Loss	M	16-49
High Loss	H	>50
Increase	I	
Not Applicable	NA	

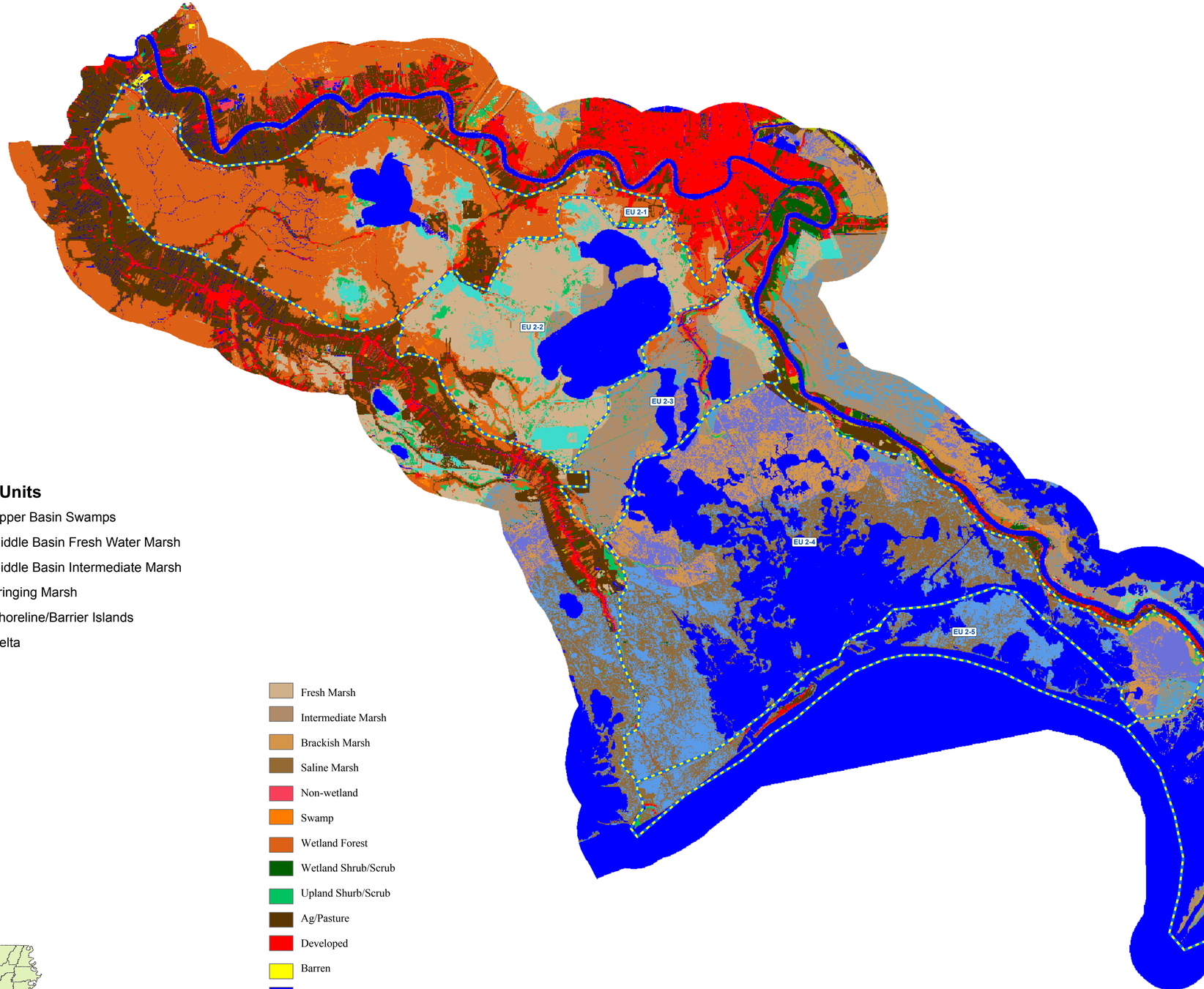
Fish & Wildlife Key	
No Impact/Not historically present	NI
Steady	S
Decrease	D
Increase	I
Unknown (No information)	U

NOTES:

* = Small acreage by percentage w\in ecosys unit

** = Lake Pontchartrain Atlas

*** = Using land change as the surrogate for changes in storm attenuation capacity



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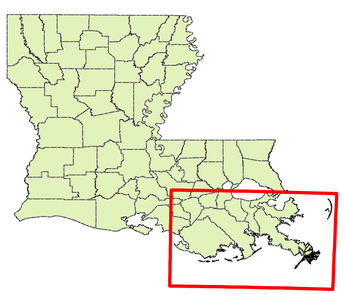
Legend

Eco System Units

- EU 2-1, Upper Basin Swamps
- EU 2-2, Middle Basin Fresh Water Marsh
- EU 2-3, Middle Basin Intermediate Marsh
- EU 2-4, Fringing Marsh
- EU 2-5, Shoreline/Barrier Islands
- EU 2-6, Delta

- Fresh Marsh
- Intermediate Marsh
- Brackish Marsh
- Saline Marsh
- Non-wetland
- Swamp
- Wetland Forest
- Wetland Shrub/Scrub
- Upland Shurb/Scrub
- Ag/Pasture
- Developed
- Barren
- Water



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LOUISIANA COMPREHENSIVE COASTAL PROTECTION MASTER PLAN

FIGURE 3.3

PLANNING UNIT 2
ECOSYSTEM UNITS AND NATURAL RESOURCES

Table 3.8a Planning Unit 2: Objectives and Measures Table - Concentrated Assets

	Geographic Location	Current Issues*	Future Risk/Impact	Planning Unit Objective	Coastal Objectives	Measures																										
						1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
						West Bank and Vicinity, New Orleans, Louisiana Hurricane Protection Project	USACE Barrier Plan: GIWW Alignment from below Belle Chasse and connect to existing Larose to Golden Meadow levee.	New Orleans to Venice (Plaquemines West Bank levee from St. Jude (City Price) to Venice - 34 miles)	Oakville to LaReussite, Louisiana (CAP Sec 25)	Grand Isle and Vicinity, Louisiana Project (Flood Control and Coastal Protection)	Larose to Golden Meadow, LA Hurricane Protection Project	Donaldsonville to the Gulf: Highway 90 Levee Alignment (includes Lafourche to Golden Meadow)	Donaldsonville to the Gulf: Modified GIWW Alignment (including Lafitte / Barataria)	Donaldsonville to the Gulf: Bayou Lafourche Levee Alignment	Donaldsonville to the Gulf: Pipeline Canal Levee Alignment	Lafitte / Barataria Levee Protection (Fisher School, Rosethorne, Goose Bayou and Pallet basins - CAP Sec 25)	Crown Point Levee Protection (Crown Point Basin - CAP Sec 25)	Southeast Louisiana Urban Flood Control Project - Jefferson Parish	Watershed Management Plan (Integrated hydrologic restoration, marsh management, flood control, etc.)	LCA: Small Bayou Lafourche reintroduction (≤ 5,000 CFS)	Small Diversion at Donaldsonville (1,000 CFS) / Manage Effluent - Bayou Lafourche (Lafourche)	Small Diversion at Donaldsonville w/ Sediment Enrichment (≤ 5,000 CFS)	Small Diversion at Pikes Peak (1,000 CFS)	Small Diversion at Pikes Peak w/ Sediment Enrichment	Small Diversion at Edgard (1,000 CFS)	Small Diversion at Edgard w/ Sediment Enrichment (≤ 5,000 CFS)	Small Diversion at Lac des Allemands (1,000 CFS)	Small Diversion at Lac des Allemands w/ Sediment Enrichment (≤ 5,000 CFS)	LCA: Reauthorization of Davis Pond - Optimize for Marsh Creation	Small Diversion at Oakville (≤ 5,000 CFS)	Small Diversion at Myrtle Grove (≤ 5,000 CFS)	LCA: Medium Diversion at Myrtle Grove w/ Sediment Enrichment (5,001 to 15, 000 CFS)	Medium Diversion at Myrtle Grove (5,001 to 15,000 CFS)	Small Diversion at Port Sulphur (≤ 5, 000 CFS)	Small Diversion at Empire (≤ 5, CFS)
						Alt. 2**	Alt. 1	Alt. 1 Alt. 2	Alt. 2	Alt. 1 Alt. 2	Alt. 1	Alt. 2	Alt. 1			Alt. 2	Alt. 2		Alt. 1 Alt. 2	Alt. 1 Alt. 2			Alt. 1 Alt. 2		Alt. 1 Alt. 2		Alt. 1 Alt. 2		Alt. 1 Alt. 2			Alt. 1 Alt. 2			
Concentrated Assets	Metro Area on West Bank	Extremely high flood risk to Concentrated Assets with storm surges over 2 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to Metro Area on West Bank Concentrated Assets.	A, B	+	+					+	+	+	+			+	+										+			+	+		
	Upper Plaquemines Parish	Extremely high level of flood risk to Concentrated Assets with storm surges over 2 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to Upper Plaquemines Parish Concentrated Assets.	A, B,C, D	+	+		+																				+	+	+	+	+	
	Lower Plaquemines Parish	Extremely high flood risk to Concentrated Assets with storm surges over 2 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to Lower Plaquemines Parish Concentrated Assets.	A, B,C, D			+																					+		+	+		+
	Oil & Gas, Fishing and Tourism Communities	Extremely high level of flood risk to Concentrated Assets with storm surges over 15 ft	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to the Oil & Gas, Fishing and Tourism Communities including Grand Isle, Lafitte, Golden Meadow's	A, B,C, D					+			+			+	+		+										+			+	+		
	Industrial Communities	Extremely high level of flood risk to Concentrated Assets with storm surges over 2 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to Industrial Communities around Port Fourchon Concentrated Assets.	A, D																													
	South Lafourche	Extremely high flood risk to Concentrated Assets with storm surges over 2 ft.	Significantly increased flood risk due to wetland loss exposing defense structures to open Gulf conditions.	Provide coastal protection to South Lafourche Concentrated Assets.	A, B,C, D		+				+	+	+	+	+				+															
	Central Lafourche	Extremely high flood risk to Concentrated Assets with storm surges over 2 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to Central Lafourche Concentrated Assets.	A, B,C, D		+				+	+	+	+	+				+															
	North Lafourche, Assumption, and Ascension	Extremely high flood risk to Concentrated Assets with storm surges over 25 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to North Lafourche, Assumption, and Ascension Concentrated Assets.	A, B,C, D		+					+	+	+	+				+	+	+	+	+	+	+	+	+	+						
	River Parish Communities	Extremely high flood risk to Concentrated Assets with storm surges over 25 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to River Parish Communities Concentrated Assets.	A, B,C, D		+					+	+	+	+				+			+	+	+	+	+	+	+				+		
	Central Basin Communities	Extremely high flood risk to Concentrated Assets with storm surges over 2 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to Central Basin Communities Concentrated Assets.	A, B,C, D		+					+	+	+	+				+			+	+	+	+	+	+	+				+		

(Continued on Sheet 2)

* Current issues, percent flooded: H = High (25-50%); EH= Extremely High (> 50%)
** Alternative Plan (Measure used in Alternative Plans)

Coastwide Objectives:
A - Reduce storm damage vulnerability of coastal communities, resources, and infrastructure.
B - Minimize exposure of traditional flood protection measures to open Gulf conditions.
C - Increase sediment input from sources outside estuarine basins, and manage existing sediment resources within estuarine basines, to sustain and rejuvenate existing wetlands, rebuild marsh substrate and construct flood protections projects.
D - Maintain or establish natural landscape features and hydrologic processes that are critical to sustainable ecosystems structure and function, including dissipation of storm energy.
E - Establish or maintain dynamic salinity gradients that reflect natural cycles of freshwater availabilty and marine forcing (fluctuation related to normal daily and seasonal tide action or exchange).
F - Sustain productive and diverse wildlife habitats.
G - Maximize retention of river-borne sediments and nutrients within coastal wetlands.

Concentrated Asset Table Legend

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Table 3.8a Planning Unit 2: Objectives and Measures Table - Concentrated Assets

	Geographic Location	Current Issues*	Future Risk/Impact	Planning Unit Objective	Coastal Objectives	Measures																														
						31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
						Medium Diversion at Empire (5,001 to 15, 000 CFS)	Small Diversion at Bastian Bay/Buras (≤ 5, 000 CFS)	Large Diversion Bastian Bay/Buras (> 15, 000 CFS)	Small Diversion at Fort Jackson (≤ 5,000 CFS)	Large Diversion at Fort Jackson (> 15, CFS)	Large Diversion at Fort Jackson w/ Sediment Enrichment (> 15, CFS)	Large Diversion at Boothville w/ Sediment Enrichment (> 15, CFS)	Sediment Delivery via Pipeline at Myrtle Grove	Sediment Delivery via Pipeline at Empire	Sediment Delivery via Pipeline at Bastin Bay / Buras	Sediment Delivery via Pipeline at Main Pass (Head of Passes)	Relocation of Deep Draft Navigation Channel	LCA: Barataria Basin Barrier Shoreline Restoration (Caminada Headland and Shell Island)	LCA: Mississippi River Delta Management Study	LCA: Mississippi River Hydrodynamic Study	LCA: Third Delta Study - Mississippi River Reintroduction near Bayou Lafourche	Barrier Shoreline Restoration Projects - restoring the Barataria barrier islands.	Marsh Creation at Wetland Creation and Restoration Feasibility Study Sites	Bayou Perot/Bayou Rigolettes Peninsula Restoration	LA Highway 1 Marsh Creation (BA-29 deauthorized) Initiate the LA-1 Marsh Creation Project (Lafourche)	East/West Grand Terre Islands Restoration (BA-3)	Delta Building Diversion at Myrtle Grove (BA-33)	Mississippi River Reintroduction Into Northwest Barataria Basin (BA-34)	Pass Chaland to Grand Bayou Pass Barrier Shoreline Restoration (BA-35)	Dedicated Dredging on the Barataria Basin Landbridge (BA-36)	Little Lake Shoreline Protection /Dedicated Dredging near Round Lake (BA-37)	Barataria Barrier Island Complex Project: Pelican Island and Pass La Mer to Chaland Pass Restoration (BA-38)	Mississippi River Sediment Delivery System - Bayou Dupont (BA-39)	Riverine Sand Mining/Scofield Island Restoration (BA-4) Restore Riverine Sand Mining / Scofield Island (Pelapremies)	South Shore of the Pen Shoreline Protection and Marsh Creation (BA-41)
																		Alt. 1** Alt. 2**	Alt. 1 Alt. 2	Alt. 1 Alt. 2	Alt. 1 Alt. 2	Alt. 1 Alt. 2			Alt. 1 Alt. 2										
Concentrated Assets	Metro Area on West Bank	Extremely high flood risk to Concentrated Assets with storm surges over 2 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to Metro Area on West Bank Concentrated Assets.	A, B	+		+		+	+	+	+	+	+	+	+	+	+	+		+	+	+			+		+			+	+	+	+	+
	Upper Plaquemines Parish	Extremely high level of flood risk to Concentrated Assets with storm surges over 2 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to Upper Plaquemines Parish Concentrated Assets.	A, B,C, D	+		+		+	+	+	+	+	+	+	+	+	+	+		+	+				+		+			+	+	+		
	Lower Plaquemines Parish	Extremely high flood risk to Concentrated Assets with storm surges over 2 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to Lower Plaquemines Parish Concentrated Assets.	A, B,C, D	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		+	+						+			+		+		
	Oil & Gas, Fishing and Tourism Communities	Extremely high level of flood risk to Concentrated Assets with storm surges over 15 ft	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to the Oil & Gas, Fishing and Tourism Communities including Grand Isle, Lafitte, Golden Meadow's	A, B,C, D								+	+	+	+	+	+	+	+		+	+	+	+	+				+	+			+	+	+	+
	Industrial Communities	Extremely high level of flood risk to Concentrated Assets with storm surges over 2 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to Industrial Communities around Port Fourchon Concentrated Assets.	A, D								+	+	+	+	+	+	+	+		+	+							+						
	South Lafourche	Extremely high flood risk to Concentrated Assets with storm surges over 2 ft.	Significantly increased flood risk due to wetland loss exposing defense structures to open Gulf conditions.	Provide coastal protection to South Lafourche Concentrated Assets.	A, B,C, D								+	+	+	+	+	+	+	+	+	+	+		+					+						
	Central Lafourche	Extremely high flood risk to Concentrated Assets with storm surges over 2 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to Central Lafourche Concentrated Assets.	A, B,C, D								+	+	+	+	+	+	+	+	+	+	+							+	+	+				
	North Lafourche, Assumption, and Ascension	Extremely high flood risk to Concentrated Assets with storm surges over 25 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to North Lafourche, Assumption, and Ascension Concentrated Assets.	A, B,C, D								+	+	+	+	+	+	+	+	+	+	+				+			+	+			+	+
	River Parish Communities	Extremely high flood risk to Concentrated Assets with storm surges over 25 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to River Parish Communities Concentrated Assets.	A, B,C, D						+	+	+	+	+	+	+	+	+	+	+	+	+	+			+			+	+			+	+
	Central Basin Communities	Extremely high flood risk to Concentrated Assets with storm surges over 2 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to Central Basin Communities Concentrated Assets.	A, B,C, D						+	+	+	+	+	+	+	+	+	+	+	+	+	+			+			+	+			+	+

(Continued on Sheet 3)

* Current issues, percent flooded: H = High (25-50%); EH= Extremely High (> 50%)
** Alternative Plan (Measure used in Alternative Plans)

Coastwide Objectives:
A - Reduce storm damage vulnerability of coastal communities, resources, and infrastructure.
B - Minimize exposure of traditional flood protection measures to open Gulf conditions.
C - Increase sediment input from sources outside estuarine basins, and manage existing sediment resources within estuarine basines, to sustain and rejuvenate existing wetlands, rebuild marsh substrate and construct flood protections projects.
D - Maintain or establish natural landscape features and hydrologic processes that are critical to sustainable ecosystems structure and function, including dissipation of storm energy.
E - Establish or maintain dynamic salinity gradients that reflect natural cycles of freshwater availabilty and marine forcing (fluctuation related to normal daily and seasonal tide action or exchange).
F - Sustain productive and diverse wildlife habitats.
G - Maximize retention of river-borne sediments and nutrients within coastal wetlands.

Concentrated Asset Table Legend

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Table 3.8a Planning Unit 2: Objectives and Measures Table - Concentrated Assets

	Geographic Location	Current Issues*	Future Risk/Impact	Planning Unit Objective	Coastal Objectives	Measures																													
						61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90
						Lake Hermitage Marsh Creation (BA-42)	Periodic Introduction of Sediment and Nutrients at Selected Diversion Sites Demonstration (MR-11)	Mississippi River Sediment Trap(MR-12)	Spanish Pass Diversion (MR-14) Restore Spanish Pass Freshwater Diversion (Plaquemines)	Venice Ponds Marsh Creation and Crevasses (MR-15)	Small Freshwater Diversion at Home Place, Happy Jack, Hero Canal	Davis Pond Outfall Management	Reactivate Bayou LaFourche as Distributary Channel of Mississippi	Freshwater and Sediment Diversions	Manage Municipal Effluent to Restore and Sustain Marsh (Jefferson)	Stabilize Lafitte / Barataria Shoreline (Jefferson) Shoreline Stabilization at Grand Isle Water Tank (PR-6) Shoreline Protection Measures (Jefferson) Goose Bayou to Cypress Bayou Shoreline Protection (NA-3)		Implement the Ships for Shores Project (Jefferson)	Restore Jefferson Barrier Islands (Jefferson) Elmer's Island & West Grand Terre Oak Ridge Restoration (BI-4)	Beneficially Use Dredged Material	Construct a Coastal Slurry Pipeline (Plaquemines, Jefferson, Lafourche)	Enhance LA Highway 23 for Flood Protection (Plaquemines)	Manage Effluent - Bayou Lafourche (Lafourche)	Restore the Lafourche Parish Coast (Lafourche)	Bayou Dupont Sediment Delivery Expansion	Bayou Rigolettes, Bayou Perot and Harvey Cut Channel Management (PR-1)	Dupre Cut/Bartaria Bay Waterway Channel Management (PR-2)	Land Bridge Shoreline Protection Ext. and Wetland Restore (PR-7)	Goose Bayou to Cypress Bayou Shoreline Protection (NA-3)	Lafitte Oil and Gas Field (East) Restoration (MG-2)	Delta Farms Oil and Gas Field Restoration (PR-5)	Grand Isle Oil and Gas Pipeline Corridor Shoreline Protection (BI-5)	Goose Bayou to Lafitte Levee (NA-8)	Elmer's Island Acquisition and Preservation (BI-3)	North Barataria Bay Shoreline Wave Breaks (BB-1)
																				Alt. 1** Alt. 2**	Alt. 1 Alt. 2										Alt. 1 Alt. 2	Alt. 1 Alt. 2				Alt. 2
Concentrated Assets	Metro Area on West Bank	Extremely high flood risk to Concentrated Assets with storm surges over 2 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to Metro Area on West Bank Concentrated Assets.	A, B	+	+		+	+		+	+					+		+	+			+	+	+	+	+		+					+
	Upper Plaquemines Parish	Extremely high level of flood risk to Concentrated Assets with storm surges over 2 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to Upper Plaquemines Parish Concentrated Assets.	A, B,C, D	+	+		+	+		+	+	+				+		+	+	+		+	+			+		+					+
	Lower Plaquemines Parish	Extremely high flood risk to Concentrated Assets with storm surges over 2 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to Lower Plaquemines Parish Concentrated Assets.	A, B,C, D		+		+	+	+	+	+	+				+		+	+	+		+					+	+					+
	Oil & Gas, Fishing and Tourism Communities	Extremely high level of flood risk to Concentrated Assets with storm surges over 15 ft	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to the Oil & Gas, Fishing and Tourism Communities including Grand Isle, Lafitte, Golden Meadow's	A, B,C, D	+	+		+	+		+	+		+	+	+	+	+	+	+			+	+	+	+	+				+	+	+	+
	Industrial Communities	Extremely high level of flood risk to Concentrated Assets with storm surges over 2 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to Industrial Communities around Port Fourchon Concentrated Assets.	A, D							+	+					+	+	+	+			+										+	
	South Lafourche	Extremely high flood risk to Concentrated Assets with storm surges over 2 ft.	Significantly increased flood risk due to wetland loss exposing defense structures to open Gulf conditions.	Provide coastal protection to South Lafourche Concentrated Assets.	A, B,C, D							+	+					+		+	+		+	+						+					+
	Central Lafourche	Extremely high flood risk to Concentrated Assets with storm surges over 2 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to Central Lafourche Concentrated Assets.	A, B,C, D							+	+					+		+	+		+	+						+					+
	North Lafourche, Assumption, and Ascension	Extremely high flood risk to Concentrated Assets with storm surges over 25 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to North Lafourche, Assumption, and Ascension Concentrated Assets.	A, B,C, D		+		+	+		+	+	+				+		+	+		+	+											+
	River Parish Communities	Extremely high flood risk to Concentrated Assets with storm surges over 25 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to River Parish Communities Concentrated Assets.	A, B,C, D		+		+	+		+	+					+		+	+			+											+
	Central Basin Communities	Extremely high flood risk to Concentrated Assets with storm surges over 2 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to Central Basin Communities Concentrated Assets.	A, B,C, D		+		+	+		+	+					+		+	+			+											+

(Continued on Sheet 4)

* Current issues, percent flooded: H = High (25-50%); EH= Extremely High (> 50%)
** Alternative Plan (Measure used in Alternative Plans)

Coastwide Objectives:
A - Reduce storm damage vulnerability of coastal communities, resources, and infrastructure.
B - Minimize exposure of traditional flood protection measures to open Gulf conditions.
C - Increase sediment input from sources outside estuarine basins, and manage existing sediment resources within estuarine basines, to sustain and rejuvenate existing wetlands, rebuild marsh substrate and construct flood protections projects.
D - Maintain or establish natural landscape features and hydrologic processes that are critical to sustainable ecosystems structure and function, including dissipation of storm energy.
E - Establish or maintain dynamic salinity gradients that reflect natural cycles of freshwater availabilty and marine forcing (fluctuation related to normal daily and seasonal tide action or exchange).
F - Sustain productive and diverse wildlife habitats.
G - Maximize retention of river-borne sediments and nutrients within coastal wetlands.

Concentrated Asset Table Legend

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Table 3.8a Planning Unit 2: Objectives and Measures Table - Concentrated Assets

	Geographic Location	Current Issues*	Future Risk/Impact	Planning Unit Objective	Coastal Objectives	Measures																																
						91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113												
						Naomi Siphon Sediment Enrichment (NA-1)	Rosethorne Wetlands Sewage Effluent Division (NA-6)	Bayou Segnette Wetlands Sewage Effluent Diversion (CS-3)	Grand Isle Plan, Part 1-NW GI Breakwater Enhancement (BI-6)	LaBranche Wetlands Drainage Diversion (JE-1)	Caminada Chenier Restoration (FN-1)	Elmer's Island & West Grand Terre Oak Ridge Restoration (BI-4)	Grand Pierre Island Restoration (PPL 3 XBA-1c) (BS-1)	Dupre Cut Project (BA-26 was shoreline only) Wetland Restoration (MG-3)	Grand Isle - Maintain Beaches and Dunes	Ridge Restoration	Caminada Bay Fringe Marsh Creation	Little Lake Fringe Marsh Creation	Lake Hermitage Basin Marsh Creation	Extra Small Diversion at Homeplace	West Point a la Hache Siphon (increase flow)	Lake Grand Ecaille to Bastian Bay Fringe Marsh Creation	Barataria Landbridge Shoreline Protection and Marsh Creation	Naomi Siphone (increase flow)	Appropriately Sized Diversions in the Upper Basin	Adaptive management through maintenance of West Bay crevasse.	Strategize and implement plan to elevate and/or relocate assests located outside the hurricane protection plans.	Lake Salvador Shoreline Protection											
																Alt. 2**									Alt. 1 Alt. 2	Alt. 1 Alt. 2	Alt. 2											
Concentrated Assets	Metro Area on West Bank	Extremely high flood risk to Concentrated Assets with storm surges over 2 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to Metro Area on West Bank Concentrated Assets.	A, B	+		+		+	+			+	+	+						+	+		+													
	Upper Plaquemines Parish	Extremely high level of flood risk to Concentrated Assets with storm surges over 2 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to Upper Plaquemines Parish Concentrated Assets.	A, B,C, D	+					+			+	+	+		+	+		+	+		+	+													
	Lower Plaquemines Parish	Extremely high flood risk to Concentrated Assets with storm surges over 2 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to Lower Plaquemines Parish Concentrated Assets.	A, B,C, D	+					+				+	+		+	+		+	+			+	+													
	Oil & Gas, Fishing and Tourism Communities	Extremely high level of flood risk to Concentrated Assets with storm surges over 15 ft	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to the Oil & Gas, Fishing and Tourism Communities including Grand Isle, Lafitte, Golden Meadow's	A, B,C, D	+	+		+		+	+	+	+	+	+	+	+	+	+	+	+	+		+		+												
	Industrial Communities	Extremely high level of flood risk to Concentrated Assets with storm surges over 2 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to Industrial Communities around Port Fourchon Concentrated Assets.	A, D						+	+	+		+	+	+								+													
	South Lafourche	Extremely high flood risk to Concentrated Assets with storm surges over 2 ft.	Significantly increased flood risk due to wetland loss exposing defense structures to open Gulf conditions.	Provide coastal protection to South Lafourche Concentrated Assets.	A, B,C, D						+				+	+	+						+		+													
	Central Lafourche	Extremely high flood risk to Concentrated Assets with storm surges over 2 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to Central Lafourche Concentrated Assets.	A, B,C, D						+				+	+							+		+			+										
	North Lafourche, Assumption, and Ascension	Extremely high flood risk to Concentrated Assets with storm surges over 25 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to North Lafourche, Assumption, and Ascension Concentrated Assets.	A, B,C, D						+				+	+							+		+													
	River Parish Communities	Extremely high flood risk to Concentrated Assets with storm surges over 25 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to River Parish Communities Concentrated Assets.	A, B,C, D						+				+	+							+		+													
	Central Basin Communities	Extremely high flood risk to Concentrated Assets with storm surges over 2 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to Central Basin Communities Concentrated Assets.	A, B,C, D						+				+	+							+		+			+										

* Current issues, percent flooded: H = High (25-50%); EH= Extremely High (> 50%)
** Alternative Plan (Measure used in Alternative Plans)

Coastwide Objectives:
A - Reduce storm damage vulnerability of coastal communities, resources, and infrastructure.
B - Minimize exposure of traditional flood protection measures to open Gulf conditions.
C - Increase sediment input from sources outside estuarine basins, and manage existing sediment resources within estuarine basines, to sustain and rejuvenate existing wetlands, rebuild marsh substrate and construct flood protections projects.
D - Maintain or establish natural landscape features and hydrologic processes that are critical to sustainable ecosystems structure and function, including dissipation of storm energy.
E - Establish or maintain dynamic salinity gradients that reflect natural cycles of freshwater availabilty and marine forcing (fluctuation related to normal daily and seasonal tide action or exchange).
F - Sustain productive and diverse wildlife habitats.
G - Maximize retention of river-borne sediments and nutrients within coastal wetlands.

Concentrated Asset Table Legend

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Table 3.8b Planning Unit 2: Objectives and Measures Table - Distributed Assets

	Geographic Location	Current Issues*	Future Risk/Impact	Planning Unit Objective	Coastal Objectives	Measures																												
						1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
						West Bank and Vicinity, New Orleans, Louisiana Hurricane Protection Project	USACE Barrier Plan: GIWW Alignment from below Belle Chasse and connect to existing Larose to Golden Meadow levee.	New Orleans to Venice (Plaquemines West Bank levee from St. Jude (City Price) to Venice - 34 miles)	Oakville to LaReussite, Louisiana (CAP Sec 25)	Grand Isle and Vicinity, Louisiana Project (Flood Control and Coastal Protection)	Larose to Golden Meadow, LA Hurricane Protection Project	Donaldsonville to the Gulf: Highway 90 Levee Alignment (includes Lafourche to Golden Meadow)	Donaldsonville to the Gulf: Modified GIWW Alignment (including Lafitte / Barataria)	Donaldsonville to the Gulf: Bayou Lafourche Levee Alignment	Donaldsonville to the Gulf: Pipeline Canal Levee Alignment	Lafitte / Barataria Levee Protection (Fisher School, Rosethorne, Goose Bayou and Pallet basins - CAP Sec 25)	Crown Point Levee Protection (Crown Point Basin - CAP Sec 25)	Southeast Louisiana Urban Flood Control Project - Jefferson Parish	Watershed Management Plan (Integrated hydrologic restoration, marsh management, flood control, etc.)	LCA: Small Bayou Lafourche reintroduction (≤ 5,000 CFS)	Small Diversion at Donaldsonville (1,000 CFS) / Manage Effluent - Bayou Lafourche (Lafourche)	Small Diversion at Donaldsonville w/ Sediment Enrichment (≤ 5,000 CFS)	Small Diversion at Pikes Peak (1,000 CFS)	Small Diversion at Pikes Peak w/ Sediment Enrichment	Small Diversion at Edgard (1,000 CFS)	Small Diversion at Edgard w/ Sediment Enrichment (≤ 5,000 CFS)	Small Diversion at Lac des Allemands (1,000 CFS)	Small Diversion at Lac des Allemands w/ Sediment Enrichment (≤ 5,000 CFS)	LCA: Reauthorization of Davis Pond - Optimize for Marsh Creation	Small Diversion at Oakville (≤ 5,000 CFS)	Small Diversion at Myrtle Grove (≤ 5,000 CFS)	LCA: Medium Diversion at Myrtle Grove w/ Sediment Enrichment (5,001 to 15, 000 CFS)	Medium Diversion at Myrtle Grove (5,001 to 15,000 CFS)	Small Diversion at Port Sulphur (≤ 5, 000 CFS)	Small Diversion at Empire (≤ 5, CFS)
						Alt. 2**	Alt. 1	Alt. 1 Alt. 2	Alt. 2	Alt. 1 Alt. 2	Alt. 1	Alt. 2	Alt. 1			Alt. 2	Alt. 2		Alt. 1 Alt. 2	Alt. 1 Alt. 2			Alt. 1 Alt. 2		Alt. 1 Alt. 2		Alt. 1 Alt. 2		Alt. 1 Alt. 2			Alt. 1 Alt. 2			
Distributed Assets	DA2-1 Birdsfoot Delta	High level of flood risk to Distributed Assets with storm surges over 25 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to the Southwest Pass.	A, C, D,G																													
				Provide coastal protection to oil and gas fields and pipelines.	A, C, D,G																														
	DA2-2 Empire	Extremely high level of flood risk to Distributed Assets with storm surges over 2 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to lower coast port facilities.	A, B, C, D,G																												+	
				Provide coastal protection to oil and gas fields and pipelines.	A, C, D,G																														+	
	DA2-3 Grand Cheniere	High level of flood risk to Distributed Assets with storm surges over 25 ft.	Loss of Distributed Assets due to permanent erosion/flooding.	Provide coastal protection to back levees.	A, B,																												+	
				Provide coastal protection to oil and gas fields and pipelines.	A, C, D,G																														+	
	DA2-4 Bay	Extremely high level of flood risk to Distributed Assets with storm surges over 25 ft.	Loss of Distributed Assets due to permanent erosion/flooding.	Provide coastal protection to oil and gas fields and pipelines.	A, C, D,G																														
				Provide coastal protection to the LOOP distribution system.	A, B, C, D, G																														
				Provide coastal protection to the Barataria Bay Waterway.	A, C, D,G																														
				Provide coastal protection to LA1.	A, C, D																														
				Provide coastal protection to the Waterline from Lafitte to Grand Isle.	A, C, D																														
	DA2-5 L'ours	High level of flood risk to Distributed Assets with storm surges over 25 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to the LOOP distribution system.	A, B, C, D, G																														
				Provide coastal protection to oil and gas fields and pipelines.	A, C, D,G																														
				Provide coastal protection to LA-1.	A, C, D																														
	DA2-6 North Bay	High level of flood risk to Distributed Assets with storm surges over 25 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to oil and gas fields and pipelines.	A, C, D,G																								+	+	+	+		
				Provide coastal protection to Barataria Bay Waterway.	A, C, D,G																								+	+	+	+		
	DA2-7 Central Marsh	High level of flood risk to Distributed Assets with storm surges over 25 ft.	Loss of Distributed Assets due to permanent erosion/flooding.	Provide coastal protection to oil and gas fields and pipelines	A, C, D,G								+																+		+	+	+		
				Provide coastal protection to Barataria Bay Waterway.	A, C, D,G								+																	+		+	+	+		
				Provide coastal protection to the GIWW.	A, C, D,G								+																	+						

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(Continued on Page 9)

* Current issues, percent flooded: H = High (25-50%); EH= Extremely High (> 50%)
** Alternative Plan (Measure used in Alternative Plans)

Coastwide Objectives:
A - Reduce storm damage vulnerability of coastal communities, resources, and infrastructure.
B - Minimize exposure of traditional flood protection measures to open Gulf conditions.
C - Increase sediment input from sources outside estuarine basins, and manage existing sediment resources within estuarine basines, to sustain and rejuvenate existing wetlands, rebuild marsh substrate and construct flood protections projects.
D - Maintain or establish natural landscape features and hydrologic processes that are critical to sustainable ecosystems structure and function, including dissipation of storm energy.
E - Establish or maintain dynamic salinity gradients that reflect natural cycles of freshwater availabilty and marine forcing (fluctuation related to normal daily and seasonal tide action or exchange).
F - Sustain productive and diverse wildlife habitats.
G - Maximize retention of river-borne sediments and nutrients within coastal wetlands.

Distributed Asset Table Legend

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Table 3.8b Planning Unit 2: Objectives and Measures Table - Distributed Assets

	Geographic Location	Current Issues*	Future Risk/Impact	Planning Unit Objective	Coastal Objectives	Measures																																
						31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60					
						Medium Diversion at Empire (5,001 to 15, 000 CFS)	Small Diversion at Bastian Bay/Buras (≤ 5, 000 CFS)	Large Diversion Bastian Bay/Buras (> 15, 000 CFS)	Small Diversion at Fort Jackson (≤ 5,000 CFS)	Large Diversion at Fort Jackson (> 15, CFS)	Large Diversion at Fort Jackson w/ Sediment Enrichment (> 15, CFS)	Large Diversion at Boothville w/ Sediment Enrichment (> 15, CFS)	Sediment Delivery via Pipeline at Myrtle Grove	Sediment Delivery via Pipeline at Empire	Sediment Delivery via Pipeline at Bastin Bay / Buras	Sediment Delivery via Pipeline at Main Pass (Head of Passes)	Relocation of Deep Draft Navigation Channel	LCA: Barataria Basin Barrier Shoreline Restoration (Caminada Headland and Shell Island)	LCA: Mississippi River Delta Management Study	LCA: Mississippi River Hydrodynamic Study	LCA: Third Delta Study - Mississippi River Reintroduction near Bayou Lafourche	Barrier Shoreline Restoration Projects - restoring the Barataria barrier islands.	Marsh Creation at Wetland Creation and Restoration Feasibility Study Sites	Bayou Perot/Bayou Rigolettes Peninsula Restoration	LA Highway 1 Marsh Creation (BA-29 deauthorized) Initiate the LA-1 Marsh Creation Project (Lafourche)	East/West Grand Terre Islands Restoration (BA-3)	Delta Building Diversion at Myrtle Grove (BA-33)	Mississippi River Reintroduction Into Northwest Barataria Basin (BA-34)	Pass Chaland to Grand Bayou Pass Barrier Shoreline Restoration (BA-35)	Dedicated Dredging on the Barataria Basin Landbridge (BA-36)	Little Lake Shoreline Protection /Dedicated Dredging near Round Lake (BA-37)	Barataria Barrier Island Complex Project: Pelican Island and Pass La Mer to Chaland Pass Restoration (BA-38)	Mississippi River Sediment Delivery System - Bayou Dupont (BA-39)	Riverine Sand Mining/Scofield Island Restoration (BA-4) Restore Riverine Sand Mining / Scofield Island (Pass/Pelican)	South Shore of the Pen Shoreline Protection and Marsh Creation (BA-41)					
							Alt. 1** Alt. 2**	Alt. 1 Alt. 2	Alt. 1 Alt. 2	Alt. 1 Alt. 2	Alt. 1 Alt. 2																														
Distributed Assets	DA2-1 Birdsfoot Delta	High level of flood risk to Distributed Assets with storm surges over 25 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to the Southwest Pass.	A, C, D,G											+	+	+				+	+																
				Provide coastal protection to oil and gas fields and pipelines.	A, C, D,G											+	+	+				+	+																
	DA2-2 Empire	Extremely high level of flood risk to Distributed Assets with storm surges over 2 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to lower coast port facilities.	A, B, C, D,G	+	+	+	+	+	+			+	+	+	+	+				+	+						+			+		+					
				Provide coastal protection to oil and gas fields and pipelines.	A, C, D,G	+	+	+	+	+	+			+	+	+	+	+				+	+						+			+		+					
	DA2-3 Grand Cheniere	High level of flood risk to Distributed Assets with storm surges over 25 ft.	Loss of Distributed Assets due to permanent erosion/flooding.	Provide coastal protection to back levees.	A, B,								+	+	+	+	+	+				+	+						+			+		+					
				Provide coastal protection to oil and gas fields and pipelines.	A, C, D,G								+	+	+	+	+	+				+	+						+			+		+					
	DA2-4 Bay	Extremely high level of flood risk to Distributed Assets with storm surges over 25 ft.	Loss of Distributed Assets due to permanent erosion/flooding.	Provide coastal protection to oil and gas fields and pipelines.	A, C, D,G								+	+	+	+	+	+			+	+	+			+			+					+					
				Provide coastal protection to the LOOP distribution system.	A, B, C, D, G								+					+			+	+	+						+										
				Provide coastal protection to the Barataria Bay Waterway.	A, C, D,G								+								+	+	+			+			+										
				Provide coastal protection to LA1.	A, C, D								+					+				+	+						+										
				Provide coastal protection to the Waterline from Lafitte to Grand Isle.	A, C, D								+									+	+			+			+										
	DA2-5 L'ours	High level of flood risk to Distributed Assets with storm surges over 25 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to the LOOP distribution system.	A, B, C, D, G													+			+	+	+		+				+										
				Provide coastal protection to oil and gas fields and pipelines.	A, C, D,G								+					+			+	+	+		+				+										
				Provide coastal protection to LA-1.	A, C, D													+				+	+		+				+										
	DA2-6 North Bay	High level of flood risk to Distributed Assets with storm surges over 25 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to oil and gas fields and pipelines.	A, C, D,G													+			+	+	+						+										
				Provide coastal protection to Barataria Bay Waterway.	A, C, D,G																+	+	+						+										
	DA2-7 Central Marsh	High level of flood risk to Distributed Assets with storm surges over 25 ft.	Loss of Distributed Assets due to permanent erosion/flooding.	Provide coastal protection to oil and gas fields and pipelines	A, C, D,G													+			+	+	+	+			+		+	+	+		+		+					
				Provide coastal protection to Barataria Bay Waterway.	A, C, D,G																+	+	+	+			+		+	+	+		+		+					
				Provide coastal protection to the GIWW.	A, C, D,G													+			+	+	+	+			+		+	+	+		+							

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(Continued on Page 10)

* Current issues, percent flooded: H = High (25-50%); EH= Extremely High (> 50%)
** Alternative Plan (Measure used in Alternative Plans)

Coastwide Objectives:
A - Reduce storm damage vulnerability of coastal communities, resources, and infrastructure.
B - Minimize exposure of traditional flood protection measures to open Gulf conditions.
C - Increase sediment input from sources outside estuarine basins, and manage existing sediment resources within estuarine basines, to sustain and rejuvenate existing wetlands, rebuild marsh substrate and construct flood protections projects.
D - Maintain or establish natural landscape features and hydrologic processes that are critical to sustainable ecosystems structure and function, including dissipation of storm energy.
E - Establish or maintain dynamic salinity gradients that reflect natural cycles of freshwater availabilty and marine forcing (fluctuation related to normal daily and seasonal tide action or exchange).
F - Sustain productive and diverse wildlife habitats.
G - Maximize retention of river-borne sediments and nutrients within coastal wetlands.

Distributed Asset Table Legend

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Table 3.8b Planning Unit 2: Objectives and Measures Table - Distributed Assets

	Geographic Location	Current Issues*	Future Risk/Impact	Planning Unit Objective	Coastal Objectives	Measures																															
						61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90
						Lake Hermitage Marsh Creation (BA-42)	Periodic Introduction of Sediment and Nutrients at Selected Diversion Sites Demonstration (MR-11)	Mississippi River Sediment Trap(MR-12)	Spanish Pass Diversion (MR-14) Restore Spanish Pass Freshwater Diversion (Plaquemines)	Venice Ponds Marsh Creation and Crevasses (MR-15)	Small Freshwater Diversion at Home Place, Happy Jack, Hero Canal	Davis Pond Outfall Management	Reactivate Bayou LaFourche as Distributary Channel of Mississippi	Freshwater and Sediment Diversions	Manage Municipal Effluent to Restore and Sustain Marsh (Jefferson)	Stabilize Lafitte / Barataria Shoreline (Jefferson) Shoreline Stabilization at Grand Isle Water Tank (PR-6) Implement Shoreline Protection Measures (Jefferson)	Goose Bayou to Cypress Bayou Shoreline Protection (NA-3)	Implement the Ships for Shores Project (Jefferson)	Restore Jefferson Barrier Islands (Jefferson) Elmer's Island & West Grand Terre Oak Ridge Restoration (BI-4)	Beneficially Use Dredged Material	Construct a Coastal Slurry Pipeline (Plaquemines, Jefferson, Lafourche)	Enhance LA Highway 23 for Flood Protection (Plaquemines)	Manage Effluent - Bayou Lafourche (Lafourche)	Restore the Lafourche Parish Coast (Lafourche)	Bayou Dupont Sediment Delivery Expansion	Bayou Rigolettes, Bayou Perot and Harvey Cut Channel Management (PR-1)	Dupre Cut/Barataria Bay Waterway Channel Management (PR-2)	Land Bridge Shoreline Protection Ext. and Wetland Restore (PR-7)	Goose Bayou to Cypress Bayou Shoreline Protection (NA-3)	Lafitte Oil and Gas Field (East) Restoration (MG-2)	Delta Farms Oil and Gas Field Restoration (PR-5)	Grand Isle Oil and Gas Pipeline Corridor Shoreline Protection (BI-5)	Goose Bayou to Lafitte Levee (NA-8)	Elmer's Island Acquisition and Preservation (BI-3)	North Barataria Bay Shoreline Wave Breaks (BB-1)
																				Alt. 1** Alt. 2**	Alt. 1 Alt. 2									Alt. 1 Alt. 2	Alt. 1 Alt. 2				Alt. 2
Distributed Assets	DA2-1 Birdsfoot Delta	High level of flood risk to Distributed Assets with storm surges over 25 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to the Southwest Pass.	A, C, D,G															+															
				Provide coastal protection to oil and gas fields and pipelines.	A, C, D,G															+															
	DA2-2 Empire	Extremely high level of flood risk to Distributed Assets with storm surges over 2 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to lower coast port facilities.	A, B, C, D,G					+										+	+														
				Provide coastal protection to oil and gas fields and pipelines.	A, C, D,G					+										+	+														
	DA2-3 Grand Cheniere	High level of flood risk to Distributed Assets with storm surges over 25 ft.	Loss of Distributed Assets due to permanent erosion/flooding.	Provide coastal protection to back levees.	A, B,	+	+		+	+	+			+						+	+														
				Provide coastal protection to oil and gas fields and pipelines.	A, C, D,G	+	+		+	+	+			+						+	+														
	DA2-4 Bay	Extremely high level of flood risk to Distributed Assets with storm surges over 25 ft.	Loss of Distributed Assets due to permanent erosion/flooding.	Provide coastal protection to oil and gas fields and pipelines.	A, C, D,G		+											+		+	+			+							+		+	+
				Provide coastal protection to the LOOP distribution system.	A, B, C, D, G																+			+										+	
				Provide coastal protection to the Barataria Bay Waterway.	A, C, D,G													+		+	+			+											+
				Provide coastal protection to LA1.	A, C, D																+			+										+	
				Provide coastal protection to the Waterline from Lafitte to Grand Isle.	A, C, D													+		+	+			+											+
	DA2-5 L'ours	High level of flood risk to Distributed Assets with storm surges over 25 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to the LOOP distribution system.	A, B, C, D, G								+						+		+			+										
				Provide coastal protection to oil and gas fields and pipelines.	A, C, D,G								+						+		+				+										
				Provide coastal protection to LA-1.	A, C, D								+						+		+				+										
	DA2-6 North Bay	High level of flood risk to Distributed Assets with storm surges over 25 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to oil and gas fields and pipelines.	A, C, D,G		+						+					+		+	+		+	+			+			+				+
				Provide coastal protection to Barataria Bay Waterway.	A, C, D,G		+						+					+		+	+		+	+			+			+				+
	DA2-7 Central Marsh	High level of flood risk to Distributed Assets with storm surges over 25 ft.	Loss of Distributed Assets due to permanent erosion/flooding.	Provide coastal protection to oil and gas fields and pipelines	A, C, D,G		+					+	+		+	+	+	+		+	+		+	+	+	+	+	+		+		+			
				Provide coastal protection to Barataria Bay Waterway.	A, C, D,G		+					+	+		+	+	+	+		+	+		+	+	+	+	+	+		+		+			
				Provide coastal protection to the GIWW.	A, C, D,G		+					+	+		+	+				+	+		+	+	+	+	+	+			+		+			

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* Current issues, percent flooded: H = High (25-50%); EH= Extremely High (> 50%)
** Alternative Plan (Measure used in Alternative Plans)

Coastwide Objectives:
A - Reduce storm damage vulnerability of coastal communities, resources, and infrastructure.
B - Minimize exposure of traditional flood protection measures to open Gulf conditions.
C - Increase sediment input from sources outside estuarine basins, and manage existing sediment resources within estuarine basines, to sustain and rejuvenate existing wetlands, rebuild marsh substrate and construct flood protections projects.
D - Maintain or establish natural landscape features and hydrologic processes that are critical to sustainable ecosystems structure and function, including dissipation of storm energy.
E - Establish or maintain dynamic salinity gradients that reflect natural cycles of freshwater availabilty and marine forcing (fluctuation related to normal daily and seasonal tide action or exchange).
F - Sustain productive and diverse wildlife habitats.
G - Maximize retention of river-borne sediments and nutrients within coastal wetlands.

Distributed Asset Table Legend

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Table 3.8b Planning Unit 2: Objectives and Measures Table - Distributed Assets

	Geographic Location	Current Issues*	Future Risk/Impact	Planning Unit Objective	Coastal Objectives	Measures																																
						91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113												
						Naomi Siphon Sediment Enrichment (NA-1)	Rosethorne Wetlands Sewage Effluent Division (NA-6)	Bayou Segnette Wetlands Sewage Effluent Diversion (CS-3)	Grand Isle Plan, Part 1-NW GI Breakwater Enhancement (BI-6)	LaBranche Wetlands Drainage Diversion (JE-1)	Caminada Chenier Restoration (FN-1)	Elmer's Island & West Grand Terre Oak Ridge Restoration (BI-4)	Grand Pierre Island Restoration (PPL 3 XBA-1c) (BS-1)	Dupre Cut Project (BA-26 was shoreline only) Wetland Restoration (MG-3)	Grand Isle - Maintain Beaches and Dunes	Ridge Restoration	Caminada Bay Fringe Marsh Creation	Little Lake Fringe Marsh Creation	Lake Hermitage Basin Marsh Creation	Extra Small Diversion at Homeplace	West Point a la Hache Siphon (increase flow)	Lake Grand Ecaille to Bastian Bay Fringe Marsh Creation	Barataria Landbridge Shoreline Protection and Marsh Creation	Naomi Siphone (increase flow)	Appropriately Sized Diversions in the Upper Basin	Adaptive management through maintenance of West Bay crevasse.	Strategize and implement plan to elevate and/or relocate assests located outside the hurricane protection plans.	Lake Salvador Shoreline Protection											
																Alt. 2**										Alt. 1 Alt. 2	Alt. 1 Alt. 2	Alt. 2											
Distributed Assets	DA2-1 Birdsfoot Delta	High level of flood risk to Distributed Assets with storm surges over 25 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to the Southwest Pass.	A, C, D,G																					+												
				Provide coastal protection to oil and gas fields and pipelines.	A, C, D,G																					+												
	DA2-2 Empire	Extremely high level of flood risk to Distributed Assets with storm surges over 2 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to lower coast port facilities.	A, B, C, D,G											+				+		+				+												
				Provide coastal protection to oil and gas fields and pipelines.	A, C, D,G											+				+		+				+												
	DA2-3 Grand Cheniere	High level of flood risk to Distributed Assets with storm surges over 25 ft.	Loss of Distributed Assets due to permanent erosion/flooding.	Provide coastal protection to back levees.	A, B,											+			+		+					+												
				Provide coastal protection to oil and gas fields and pipelines.	A, C, D,G											+			+		+					+												
	DA2-4 Bay	Extremely high level of flood risk to Distributed Assets with storm surges over 25 ft.	Loss of Distributed Assets due to permanent erosion/flooding.	Provide coastal protection to oil and gas fields and pipelines.	A, C, D,G						+		+		+		+																				
				Provide coastal protection to the LOOP distribution system.	A, B, C, D, G						+						+											+											
				Provide coastal protection to the Barataria Bay Waterway.	A, C, D,G				+		+		+				+																					
				Provide coastal protection to LA1.	A, C, D						+				+		+											+											
				Provide coastal protection to the Waterline from Lafitte to Grand Isle.	A, C, D				+		+		+		+																							
	DA2-5 L'ours	High level of flood risk to Distributed Assets with storm surges over 25 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to the LOOP distribution system.	A, B, C, D, G											+		+									+											
				Provide coastal protection to oil and gas fields and pipelines.	A, C, D,G											+		+																				
				Provide coastal protection to LA-1.	A, C, D											+											+											
	DA2-6 North Bay	High level of flood risk to Distributed Assets with storm surges over 25 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to oil and gas fields and pipelines.	A, C, D,G											+		+																				
				Provide coastal protection to Barataria Bay Waterway.	A, C, D,G											+																							
	DA2-7 Central Marsh	High level of flood risk to Distributed Assets with storm surges over 25 ft.	Loss of Distributed Assets due to permanent erosion/flooding.	Provide coastal protection to oil and gas fields and pipelines	A, C, D,G	+	+							+		+							+	+				+										
				Provide coastal protection to Barataria Bay Waterway.	A, C, D,G		+							+		+								+	+													
				Provide coastal protection to the GIWW.	A, C, D,G																			+														

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* Current issues, percent flooded: H = High (25-50%); EH= Extremely High (> 50%)
** Alternative Plan (Measure used in Alternative Plans)

Coastwide Objectives:
A - Reduce storm damage vulnerability of coastal communities, resources, and infrastructure.
B - Minimize exposure of traditional flood protection measures to open Gulf conditions.
C - Increase sediment input from sources outside estuarine basins, and manage existing sediment resources within estuarine basines, to sustain and rejuvenate existing wetlands, rebuild marsh substrate and construct flood protections projects.
D - Maintain or establish natural landscape features and hydrologic processes that are critical to sustainable ecosystems structure and function, including dissipation of storm energy.
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Distributed Asset Table Legend

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Table 3.8b Planning Unit 2: Objectives and Measures Table - Distributed Assets

	Geographic Location	Current Issues*	Future Risk/Impact	Planning Unit Objective	Coastal Objectives	Measures																															
						1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30				
						West Bank and Vicinity, New Orleans, Louisiana Hurricane Protection Project	USACE Barrier Plan: GIWW Alignment from below Belle Chasse and connect to existing Larose to Golden Meadow levee.	New Orleans to Venice (Plaquemines West Bank levee from St. Jude (City Price) to Venice - 34 miles)	Oakville to LaReussite, Louisiana (CAP Sec 25)	Grand Isle and Vicinity, Louisiana Project (Flood Control and Coastal Protection)	Larose to Golden Meadow, LA Hurricane Protection Project	Donaldsonville to the Gulf: Highway 90 Levee Alignment (includes Lafourche to Golden Meadow)	Donaldsonville to the Gulf: Modified GIWW Alignment (including Laffite / Barataria)	Donaldsonville to the Gulf: Bayou Lafourche Levee Alignment	Donaldsonville to the Gulf: Pipeline Canal Levee Alignment	Laffite / Barataria Levee Protection (Fisher School, Rosethorne, Goose Bayou and Pallet basins - CAP Sec 25)	Crown Point Levee Protection (Crown Point Basin - CAP Sec 25)	Southeast Louisiana Urban Flood Control Project - Jefferson Parish	Watershed Management Plan (Integrated hydrologic restoration, marsh mangement, flood control, etc.)	LCA: Small Bayou Lafourche reintroduction (≤ 5,000 CFS)	Small Diversion at Donaldsonville (1,000 CFS) / Manage Effluent - Bayou Lafourche (Lafourche)	Small Diversion at Donaldsonville w/ Sediment Enrichment (≤ 5,000 CFS)	Small Diversion at Pikes Peak (1,000 CFS)	Small Diversion at Pikes Peak w/ Sediment Enrichment	Small Diversion at Edgard (1,000 CFS)	Small Diversion at Edgard w/ Sediment Enrichment (≤ 5,000 CFS)	Small Diversion at Lac des Allemands (1,000 CFS)	Small Diversion at Lac des Allemands w/ Sediment Enrichment (≤ 5,000 CFS)	LCA: Reauthorization of Davis Pond - Optimize for Marsh Creation	Small Diversion at Oakville (≤ 5,000 CFS)	Small Diversion at Myrtle Grove (≤ 5,000 CFS)	LCA: Medium Diversion at Myrtle Grove w/ Sediment Enrichment (5,001 to 15, 000 CFS)	Medium Diversion at Myrtle Grove (5,001 to 15,000 CFS)	Small Diversion at Port Sulphur (≤ 5, 000 CFS)	Small Diversion at Empire (≤ 5, CFS)				
						Alt. 2**	Alt. 1	Alt. 1 Alt. 2	Alt. 2	Alt. 1 Alt. 2	Alt. 1	Alt. 2	Alt. 1			Alt. 2	Alt. 2		Alt. 1 Alt. 2	Alt. 1 Alt. 2			Alt. 1 Alt. 2		Alt. 1 Alt. 2		Alt. 1 Alt. 2		Alt. 1 Alt. 2			Alt. 1 Alt. 2						
Distributed Assets	DA2-8 Salvador	Extremely high level of flood risk to Distributed Assets with storm surges over 25 ft.	Loss of Distributed Assets due to permanent erosion/flooding.	Provide coastal protection to oil and gas fields and pipelines.	A, C, D,G		+						+															+								
				Provide coastal protection to the GIWW.	A, C, D,G		+						+																+								
				Provide coastal protection to Bayou des Allemands.	A, C, D,G		+						+																								
				Provide coastal protection to Hwy 90.	A, C, D, G		+						+																								
	DA2-9 Des Allemands	Extremely high level of flood risk to Distributed Assets with storm surges over 25 ft.	Loss of Distributed Assets due to permanent erosion/flooding.	Provide coastal protection to oil and gas fields and pipelines.	A, C, D,G		+					+	+						+	+	+	+	+	+	+	+	+									
				Provide coastal protection to Bayou des Allemands.	A, C, D,G		+					+	+						+	+	+	+	+	+	+	+	+									
				Provide coastal protection to Highways 22, 7, 37, 33, 3127 and 3199.	A, B, C, D, G		+					+	+	+					+	+	+	+	+	+	+	+	+									

(Continued on Page 10)

* Current issues, percent flooded: H = High (25-50%); EH= Extremely High (> 50%)
** Alternative Plan (Measure used in Alternative Plans)

Coastwide Objectives:
A - Reduce storm damage vulnerability of coastal communities, resources, and infrastructure.
B - Minimize exposure of traditional flood protection measures to open Gulf conditions.
C - Increase sediment input from sources outside estuarine basins, and manage existing sediment resources within estuarine basines, to sustain and rejuvenate existing wetlands, rebuild marsh substrate and construct flood protections projects.
D - Maintain or establish natural landscape features and hydrologic processes that are critical to sustainable ecosystems structure and function, including dissipation of storm energy.
E - Establish or maintain dynamic salinity gradients that reflect natural cycles of freshwater availabilty and marine forcing (fluctuation related to normal daily and seasonal tide action or exchange).
F - Sustain productive and diverse wildlife habitats.
G - Maximize retention of river-borne sediments and nutrients within coastal wetlands.

Distributed Asset Table Legend

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Table 3.8b Planning Unit 2: Objectives and Measures Table - Distributed Assets

	Geographic Location	Current Issues*	Future Risk/Impact	Planning Unit Objective	Coastal Objectives	Measures																																	
						31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60						
						Medium Diversion at Empire (5,001 to 15, 000 CFS)	Small Diversion at Bastian Bay/Buras (≤ 5, 000 CFS)	Large Diversion Bastian Bay/Buras (> 15, 000 CFS)	Small Diversion at Fort Jackson (≤ 5,000 CFS)	Large Diversion at Fort Jackson (> 15, CFS)	Large Diversion at Fort Jackson w/ Sediment Enrichment (> 15, CFS)	Large Diversion at Boothville w/ Sediment Enrichment (> 15, CFS)	Sediment Delivery via Pipeline at Myrtle Grove	Sediment Delivery via Pipeline at Empire	Sediment Delivery via Pipeline at Bastin Bay / Buras	Sediment Delivery via Pipeline at Main Pass (Head of Passes)	Relocation of Deep Draft Navigation Channel	LCA: Barataria Basin Barrier Shoreline Restoration (Caminada Headland and Shell Island)	LCA: Mississippi River Delta Management Study	LCA: Mississippi River Hydrodynamic Study	LCA: Third Delta Study - Mississippi River Reintroduction near Bayou Lafourche	Barrier Shoreline Restoration Projects - restoring the Barataria barrier islands.	Marsh Creation at Wetland Creation and Restoration Feasibility Study Sites	Bayou Perot/Bayou Rigolettes Peninsula Restoration	LA Highway 1 Marsh Creation (BA-29 deauthorized) Initiate the LA-1 Marsh Creation Project (Lafourche)	East/West Grand Terre Islands Restoration (BA-3)	Delta Building Diversion at Myrtle Grove (BA-33)	Mississippi River Reintroduction Into Northwest Barataria Basin (BA-34)	Pass Chaland to Grand Bayou Pass Barrier Shoreline Restoration (BA-35)	Dedicated Dredging on the Barataria Basin Landbridge (BA-36)	Little Lake Shoreline Protection /Dedicated Dredging near Round Lake (BA-37)	Barataria Barrier Island Complex Project: Pelican Island and Pass La Mer to Chaland Pass Restoration (BA-38)	Mississippi River Sediment Delivery System - Bayou Dupont (BA-39)	Riverine Sand Mining/Scofield Island Restoration (BA-4) Restore Riverine Sand Mining / Scofield Island (Pelican Island)	South Shore of the Pen Shoreline Protection and Marsh Creation (BA-41)						
							Alt. 1** Alt. 2**	Alt. 1 Alt. 2	Alt. 1 Alt. 2	Alt. 1 Alt. 2	Alt. 1 Alt. 2																														
Distributed Assets	DA2-8 Salvador	Extremely high level of flood risk to Distributed Assets with storm surges over 25 ft.	Loss of Distributed Assets due to permanent erosion/flooding.	Provide coastal protection to oil and gas fields and pipelines.	A, C, D,G																+	+	+	+					+	+										
				Provide coastal protection to the GIWW.	A, C, D,G																+	+	+	+					+	+										
				Provide coastal protection to Bayou des Allemands.	A, C, D,G																+	+	+	+					+	+										
				Provide coastal protection to Hwy 90.	A, C, D, G																+	+	+	+					+	+										
	DA2-9 Des Allemands	Extremely high level of flood risk to Distributed Assets with storm surges over 25 ft.	Loss of Distributed Assets due to permanent erosion/flooding.	Provide coastal protection to oil and gas fields and pipelines.	A, C, D,G																+	+	+	+					+	+										
				Provide coastal protection to Bayou des Allemands.	A, C, D,G																+	+	+	+					+	+										
				Provide coastal protection to Highways 22, 7, 37, 33, 3127 and 3199.	A, B, C, D, G																+	+	+	+					+	+										

(Continued on Page 11)

* Current issues, percent flooded: H = High (25-50%); EH= Extremely High (> 50%)
** Alternative Plan (Measure used in Alternative Plans)

Coastwide Objectives:
A - Reduce storm damage vulnerability of coastal communities, resources, and infrastructure.
B - Minimize exposure of traditional flood protection measures to open Gulf conditions.
C - Increase sediment input from sources outside estuarine basins, and manage existing sediment resources within estuarine basines, to sustain and rejuvenate existing wetlands, rebuild marsh substrate and construct flood protections projects.
D - Maintain or establish natural landscape features and hydrologic processes that are critical to sustainable ecosystems structure and function, including dissipation of storm energy.
E - Establish or maintain dynamic salinity gradients that reflect natural cycles of freshwater availabilty and marine forcing (fluctuation related to normal daily and seasonal tide action or exchange).
F - Sustain productive and diverse wildlife habitats.
G - Maximize retention of river-borne sediments and nutrients within coastal wetlands.

Distributed Asset Table Legend

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Table 3.8b Planning Unit 2: Objectives and Measures Table - Distributed Assets

	Geographic Location	Current Issues*	Future Risk/Impact	Planning Unit Objective	Coastal Objectives	Measures																																	
						61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90
						Lake Hermitage Marsh Creation (BA-42)	Periodic Introduction of Sediment and Nutrients at Selected Diversion Sites Demonstration (MR-11)	Mississippi River Sediment Trap(MR-12)	Spanish Pass Diversion (MR-14) Restore Spanish Pass Freshwater Diversion (Plaquemines)	Venice Ponds Marsh Creation and Crevasses (MR-15)	Small Freshwater Diversion at Home Place, Happy Jack, Hero Canal	Davis Pond Outfall Management	Reactivate Bayou LaFourche as Distributary Channel of Mississippi	Freshwater and Sediment Diversions	Manage Municipal Effluent to Restore and Sustain Marsh (Jefferson)	Stabilize Lafitte / Barataria Shoreline (Jefferson) Shoreline Stabilization at Grand Isle Water Tank (PR-5) Shoreline Protection Measures (Jefferson) Goose Bayou to Cypress Bayou Shoreline Protection (NA-3)	Implement the Ships for Shores Project (Jefferson)	Restore Jefferson Barrier Islands (Jefferson) Elmer's Island & West Grand Terre Oak Ridge Restoration (BI-4)	Beneficially Use Dredged Material	Construct a Coastal Slurry Pipeline (Plaquemines, Jefferson, Lafourche)	Enhance LA Highway 23 for Flood Protection (Plaquemines)	Manage Effluent - Bayou Lafourche (Lafourche)	Restore the Lafourche Parish Coast (Lafourche)	Bayou Dupont Sediment Delivery Expansion	Bayou Rigolettes, Bayou Perot and Harvey Cut Channel Management (PR-1)	Dupre Cut/Bartaria Bay Waterway Channel Management (PR-2)	Land Bridge Shoreline Protection Ext. and Wetland Restore (PR-7)	Goose Bayou to Cypress Bayou Shoreline Protection (NA-3)	Lafitte Oil and Gas Field (East) Restoration (MG-2)	Delta Farms Oil and Gas Field Restoration (PR-5)	Grand Isle Oil and Gas Pipeline Corridor Shoreline Protection (BI-5)	Goose Bayou to Lafitte Levee (NA-8)	Elmer's Island Acquisition and Preservation (BI-3)	North Barataria Bay Shoreline Wave Breaks (BB-1)
																				Alt. 1** Alt. 2**	Alt. 1 Alt. 2								Alt. 1 Alt. 2	Alt. 1 Alt. 2				Alt. 2
Distributed Assets	DA2-8 Salvador	Extremely high level of flood risk to Distributed Assets with storm surges over 25 ft.	Loss of Distributed Assets due to permanent erosion/flooding.	Provide coastal protection to oil and gas fields and pipelines.	A, C, D,G		+					+	+							+	+		+	+												
				Provide coastal protection to the GIWW.	A, C, D,G		+					+	+							+	+		+	+												
				Provide coastal protection to Bayou des Allemands.	A, C, D,G		+					+	+								+		+	+												
				Provide coastal protection to Hwy 90.	A, C, D, G		+					+	+								+		+	+												
	DA2-9 Des Allemands	Extremely high level of flood risk to Distributed Assets with storm surges over 25 ft.	Loss of Distributed Assets due to permanent erosion/flooding.	Provide coastal protection to oil and gas fields and pipelines.	A, C, D,G		+						+								+			+												
				Provide coastal protection to Bayou des Allemands.	A, C, D,G		+						+								+			+												
				Provide coastal protection to Highways 22, 7, 37, 33, 3127 and 3199.	A, B, C, D, G		+						+								+			+												

* Current issues, percent flooded: H = High (25-50%); EH= Extremely High (> 50%)
** Alternative Plan (Measure used in Alternative Plans)

Coastwide Objectives:
A - Reduce storm damage vulnerability of coastal communities, resources, and infrastructure.
B - Minimize exposure of traditional flood protection measures to open Gulf conditions.
C - Increase sediment input from sources outside estuarine basins, and manage existing sediment resources within estuarine basines, to sustain and rejuvenate existing wetlands, rebuild marsh substrate and construct flood protections projects.
D - Maintain or establish natural landscape features and hydrologic processes that are critical to sustainable ecosystems structure and function, including dissipation of storm energy.
E - Establish or maintain dynamic salinity gradients that reflect natural cycles of freshwater availabilty and marine forcing (fluctuation related to normal daily and seasonal tide action or exchange).
F - Sustain productive and diverse wildlife habitats.
G - Maximize retention of river-borne sediments and nutrients within coastal wetlands.

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Table 3.8b Planning Unit 2: Objectives and Measures Table - Distributed Assets

	Geographic Location	Current Issues*	Future Risk/Impact	Planning Unit Objective	Coastal Objectives	Measures																																
						91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113												
						Naomi Siphon Sediment Enrichment (NA-1)	Rosethorne Wetlands Sewage Effluent Division (NA-6)	Bayou Segnette Wetlands Sewage Effluent Diversion (CS-3)	Grand Isle Plan, Part 1-NW GI Breakwater Enhancement (BI-6)	LaBranche Wetlands Drainage Diversion (JE-1)	Caminada Chenier Restoration (FN-1)	Elmer's Island & West Grand Terre Oak Ridge Restoration (BI-4)	Grand Pierre Island Restoration (PPL 3 XBA-1c) (BS-1)	Dupre Cut Project (BA-26 was shoreline only) Wetland Restoration (MG-3)	Grand Isle - Maintain Beaches and Dunes	Ridge Restoration	Caminada Bay Fringe Marsh Creation	Little Lake Fringe Marsh Creation	Lake Hermitage Basin Marsh Creation	Extra Small Diversion at Homeplace	West Point a la Hache Siphon (increase flow)	Lake Grand Ecaille to Bastian Bay Fringe Marsh Creation	Barataria Landbridge Shoreline Protection and Marsh Creation	Naomi Siphone (increase flow)	Appropriately Sized Diversions in the Upper Basin	Adaptive management through maintenance of West Bay crevasse.	Strategize and implement plan to elevate and/or relocate assests located outside the hurricane protection plans.	Lake Salvador Shoreline Protection										
																Alt. 2**										Alt. 1 Alt. 2	Alt. 1 Alt. 2	Alt. 2										
Distributed Assets	DA2-8 Salvador	Extremely high level of flood risk to Distributed Assets with storm surges over 25 ft.	Loss of Distributed Assets due to permanent erosion/flooding.	Provide coastal protection to oil and gas fields and pipelines.	A, C, D,G			+																														
				Provide coastal protection to the GIWW.	A, C, D,G																																			
				Provide coastal protection to Bayou des Allemands.	A, C, D,G																																			
				Provide coastal protection to Hwy 90.	A, C, D, G																																			
	DA2-9 Des Allemands	Extremely high level of flood risk to Distributed Assets with storm surges over 25 ft.	Loss of Distributed Assets due to permanent erosion/flooding.	Provide coastal protection to oil and gas fields and pipelines.	A, C, D,G					+															+														
				Provide coastal protection to Bayou des Allemands.	A, C, D,G																				+															
				Provide coastal protection to Highways 22, 7, 37, 33, 3127 and 3199.	A, B, C, D, G																				+															

* Current issues, percent flooded: H = High (25-50%); EH= Extremely High (> 50%)
** Alternative Plan (Measure used in Alternative Plans)

Coastwide Objectives:
A - Reduce storm damage vulnerability of coastal communities, resources, and infrastructure.
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F - Sustain productive and diverse wildlife habitats.
G - Maximize retention of river-borne sediments and nutrients within coastal wetlands.

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Table 3.8c Planning Unit 2: Objectives and Measures Table - Ecosystem Units

	Geographic Location	Current Issues	Future Risk/Impact*	Planning Unit Objective	Coastal Objectives	Measures																														
						1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
						West Bank and Vicinity, New Orleans, Louisiana Hurricane Protection Project	USACE Barrier Plan: GIWW Alignment from below Belle Chasse and connect to existing Larose to Golden Meadow levee.	New Orleans to Venice (Plaquemines West Bank levee from St. Jude (City Price) to Venice - 34 miles)	Oakville to LaReussite, Louisiana (CAP Sec 25)	Grand Isle and Vicinity, Louisiana Project (Flood Control and Coastal Protection)	Larose to Golden Meadow, LA Hurricane Protection Project	Donaldsonville to the Gulf: Highway 90 Levee Alignment (includes Lafourche to Golden Meadow)	Donaldsonville to the Gulf: Modified GIWW Alignment (including Laffite / Barataria)	Donaldsonville to the Gulf: Bayou Lafourche Levee Alignment	Donaldsonville to the Gulf: Pipeline Canal Levee Alignment	Laffite / Barataria Levee Protection (Fisher School, Rosethorne, Goose Bayou and Pallet basins - CAP Sec 25)	Crown Point Levee Protection (Crown Point Basin - CAP Sec 25)	Southeast Louisiana Urban Flood Control Project - Jefferson Parish	Watershed Management Plan (Integrated hydrologic restoration, marsh management, flood control, etc.)	LCA: Small Bayou Lafourche reintroduction (≤ 5,000 CFS)	Small Diversion at Donaldsonville (1,000 CFS) / Manage Effluent - Bayou Lafourche (Lafourche)	Small Diversion at Donaldsonville w/ Sediment Enrichment (≤ 5,000 CFS)	Small Diversion at Pikes Peak (1,000 CFS)	Small Diversion at Pikes Peak w/ Sediment Enrichment	Small Diversion at Edgard (1,000 CFS)	Small Diversion at Edgard w/ Sediment Enrichment (≤ 5,000 CFS)	Small Diversion at Lac des Allemands (1,000 CFS)	Small Diversion at Lac des Allemands w/ Sediment Enrichment (≤ 5,000 CFS)	LCA: Reauthorization of Davis Pond - Optimize for Marsh Creation	Small Diversion at Oakville (≤ 5,000 CFS)	Small Diversion at Myrtle Grove (≤ 5,000 CFS)	LCA: Medium Diversion at Myrtle Grove w/ Sediment Enrichment (5,001 to 15, 000 CFS)	Medium Diversion at Myrtle Grove (5,001 to 15,000 CFS)	Small Diversion at Port Sulphur (≤ 5, 000 CFS)	Small Diversion at Empire (≤ 5, CFS)
						Alt. 2**	Alt. 1	Alt. 1 Alt. 2	Alt. 2	Alt. 1 Alt. 2	Alt. 1	Alt. 2	Alt. 1			Alt. 2	Alt. 2		Alt. 1 Alt. 2	Alt. 1 Alt. 2			Alt. 1 Alt. 2		Alt. 1 Alt. 2		Alt. 1 Alt. 2		Alt. 1 Alt. 2				Alt. 1 Alt. 2			
Ecosystem Units	EU2-1 Upper Basin Swamps	Function disruption due to subsidence, sediment disruption, and altered inundation.	High loss of swamp and freshmarsh habitat, high reduction in storm attenuation, and decrease in avifauna.	Sustain productive fish and wildlife habitats.	F		-												+	+	+	+	+	+	+	+	+	+	+						
				Increase introduction of sediment and freshwater into the Upper Basin Swamps.	C, D, E, G		-						-						+	+	+	+	+	+	+	+	+	+	+						
	EU2-2 Middle Basin Swamps	Function disruption due to subsidence, sediment disruption, and wave/wake energy.	Moderate loss of swamp and decrease in fisheries.	Reduce wave/wake energy impacts to the Middle Basin Swamps.	D		+						+																						
				Sustain productive fish and wildlife habitats.	F		-												+			+	+	+	+	+	+	+	+						
				Introduce sediment and freshwater into the Middle Basin Swamps.	C, D, E, G		-						-						+			+	+	+	+	+	+	+	+						
	EU2-3 Middle Basin Intermediate Marsh	Function disruption due to subsidence, sediment disruption, and salt water intrusion.	Decrease in fisheries.	Introduce sediments into the Middle Basin Intermediate Marsh.	C		-						-						+												+				
				Reduce saltwater intrusion impacts of the Middle Basin Intermediate Marsh.	D, E		-						-						+											+	+	+	+	+		
				Sustain productive fish and wildlife habitats in Middle Basin Intermediate Marsh.	F														+											+	+	+	+	+		
	EU2-4 Fringing Marsh	Function disruption due to subsidence, tidal exchange, sediment disruptions, salt water intrusion, altered inundation, wave/wake energy, and direct removal of sediments.	Moderate loss of brackish/saline marsh, decreased fisheries and wildlife, and moderate reduction in storm attenuation.	Introduce sediments to the Fringing Marshes.	C																									+	+	+	+		
				Reduce saltwater intrusion impacts within the Fringing Marsh.	D, E														+											+	+	+	+	+	+	+
				Reduce tidal exchange along the bay rim.	D																															
				Reduce wave/wake energy impacts to the Fringing Marshes.	D																															
				Retain sediments in the fringing marsh.	G																															
				Sustain productive fish and wildlife habitats.	F														+											+	+	+	+	+	+	+
	EU2-5 Shoreline/Barrier Islands	Function disruption due to subsidence, wave/wake energy, tidal exchange, and sediment disruptions.	High loss of brackish/saline marsh and beach/dune/back barrier marsh, decreased fisheries and wildlife, and high reduction in storm attenuation.	Introduce sediments to the Shoreline/Barrier Islands.	C																															
				Reduce tidal exchange along the bay rim.	D																															
				Sustain productive fish and wildlife habitats along the Shoreline/Barrier Islands.	F																															
				Reduce wave/wake energy impacts to the Shoreline/Barrier Islands.	D																															
	EU2-6 Delta	Function disruption due to subsidence, wave/wake energy, and direct removal of sediments.	Moderate reduction in storm attenuation.	Maximize sediment and freshwater into the Delta area.	C																															
				Prevent direct removal of sediment within the Delta.	G																															
				Reduce wave/wake energy impacts to the Delta.	D																															

* Ecosystems Unit Future Risk, percent changed: L= Low Loss (1-15); M = Moderate Loss (16-49); H = High Loss (< 5); Increase (I); Not Applicable (NA); Steady (S); Decrease (D); Increase (I); Unknown (U)
** Alternative Plan (Measure used in Alternative Plans)

Coastwide Objectives:
A - Reduce storm damage vulnerability of coastal communities, resources, and infrastructure.
B - Minimize exposure of traditional flood protection measures to open Gulf conditions.
C - Increase sediment input from sources outside estuarine basins, and manage existing sediment resources within estuarine basines, to sustain and rejuvenate existing wetlands, rebuild marsh substrate and construct flood protections projects.
D - Maintain or establish natural landscape features and hydrologic processes that are critical to sustainable ecosystems structure and function, including dissipation of storm energy.
E - Establish or maintain dynamic salinity gradients that reflect natural cycles of freshwater availabilty and marine forcing (fluctuation related to normal daily and seasonal tide action or exchange).
F - Sustain productive and diverse wildlife habitats.
G - Maximize retention of river-borne sediments and nutrients within coastal wetlands.

Ecosystem Units Table Legend

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Table 3.8c Planning Unit 2: Objectives and Measures Table - Ecosystem Units

	Geographic Location	Current Issues	Future Risk/Impact*	Planning Unit Objective	Coastal Objectives	Measures																														
						31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
						Medium Diversion at Empire (5,001 to 15, 000 CFS)	Small Diversion at Bastian Bay/Buras (≤ 5, 000 CFS)	Large Diversion Bastian Bay/Buras (> 15, 000 CFS)	Small Diversion at Fort Jackson (≤ 5,000 CFS)	Large Diversion at Fort Jackson (> 15, CFS)	Large Diversion at Fort Jackson w/ Sediment Enrichment (> 15, CFS)	Large Diversion at Boothville w/ Sediment Enrichment (> 15, CFS)	Sediment Delivery via Pipeline at Myrtle Grove	Sediment Delivery via Pipeline at Empire	Sediment Delivery via Pipeline at Bastin Bay / Buras	Sediment Delivery via Pipeline at Main Pass (Head of Passes)	Relocation of Deep Draft Navigation Channel	LCA: Barataria Basin Barrier Shoreline Restoration (Caminada Headland and Shell Island)	LCA: Mississippi River Delta Management Study	LCA: Mississippi River Hydrodynamic Study	LCA: Third Delta Study - Mississippi River Reintroduction near Bayou Lafourche	Barrier Shoreline Restoration Projects - restoring the Barataria barrier islands.	Marsh Creation at Wetland Creation and Restoration Feasibility Study Sites	Bayou Perot/Bayou Rigolettes Peninsula Restoration	LA Highway 1 Marsh Creation (BA-29 deauthorized) Initiate the LA-1 Marsh Creation Project (Lafourche)	East/West Grand Terre Islands Restoration (BA-3)	Delta Building Diversion at Myrtle Grove (BA-33)	Mississippi River Reintroduction Into Northwest Barataria Basin (BA-34)	Pass Chaland to Grand Bayou Pass Barrier Shoreline Restoration (BA-35)	Dedicated Dredging on the Barataria Basin Landbridge (BA-36)	Little Lake Shoreline Protection /Dedicated Dredging near Round Lake (BA-37)	Barataria Barrier Island Complex Project: Pelican Island and Pass La Mer to Chaland Pass Restoration (BA-38)	Mississippi River Sediment Delivery System - Bayou Dupont (BA-39)	Riverine Sand Mining/Scofield Island Restoration (BA-4) Restore Riverine Sand Mining / Scofield Island (Pelapelmine)	South Shore of the Pen Shoreline Protection and Marsh Creation (BA-41)
							Alt. 1** Alt. 2**	Alt. 1 Alt. 2	Alt. 1 Alt. 2	Alt. 1 Alt. 2														Alt. 1 Alt. 2											
Ecosystem Units	EU2-1 Upper Basin Swamps	Function disruption due to subsidence, sediment disruption, and altered inundation.	High loss of swamp and freshmarsh habitat, high reduction in storm attenuation, and decrease in avifauna.	Sustain productive fish and wildlife habitats.	F												+	+	+		-	+	+					+	+			+	+	+	
				Increase introduction of sediment and freshwater into the Upper Basin Swamps.	C, D, E, G														+				+						+							
	EU2-2 Middle Basin Swamps	Function disruption due to subsidence, sediment disruption, and wave/wake energy.	Moderate loss of swamp and decrease in fisheries.	Reduce wave/wake energy impacts to the Middle Basin Swamps.	D												+	+	+		+	+	+				+		+			+	+	+	+
				Sustain productive fish and wildlife habitats.	F												+	+	+		+	+	+				+	+	+			+	+	+	+
				Introduce sediment and freshwater into the Middle Basin Swamps.	C, D, E, G														+			+	+					+	+					+		
	EU2-3 Middle Basin Intermediate Marsh	Function disruption due to subsidence, sediment disruption, and salt water intrusion.	Decrease in fisheries.	Introduce sediments into the Middle Basin Intermediate Marsh.	C								+						+		+		+	+			+			+	+		+		
				Reduce saltwater intrusion impacts of the Middle Basin Intermediate Marsh.	D, E								+				+	+	+		+	+	+				+		+	+	+	+	+	+	
				Sustain productive fish and wildlife habitats in Middle Basin Intermediate Marsh.	F								+				+	+	+		+	+	+	+			+		+	+	+	+	+	+	
	EU2-4 Fringing Marsh	Function disruption due to subsidence, tidal exchange, sediment disruptions, salt water intrusion, altered inundation, wave/wake energy, and direct removal of sediments.	Moderate loss of brackish/saline marsh, decreased fisheries and wildlife, and moderate reduction in storm attenuation.	Introduce sediments to the Fringing Marshes.	C								+	+	+				+		+		+		+				+						
				Reduce saltwater intrusion impacts within the Fringing Marsh.	D, E	+	+	+	+	+	+	+	+	+	+		+	+	+		+	+	+						+			+		+	
				Reduce tidal exchange along the bay rim.	D								+				+	+	+		+	+	+		+				+			+		+	
				Reduce wave/wake energy impacts to the Fringing Marshes.	D												+	+	+		+	+	+		+				+			+		+	
				Retain sediments in the fringing marsh.	G			+		+	+	+	+	+	+		+		+		+	+	+		+				+			+			
				Sustain productive fish and wildlife habitats.	F	+	+	+	+	+	+	+	+	+	+		+	+	+		+	+	+		+				+			+		+	
	EU2-5 Shoreline/Barrier Islands	Function disruption due to subsidence, wave/wake energy, tidal exchange, and sediment disruptions.	High loss of brackish/saline marsh and beach/dune/back barrier marsh, decreased fisheries and wildlife, and high reduction in storm attenuation.	Introduce sediments to the Shoreline/Barrier Islands.	C												+	+	+			+	+			+			+			+		+	
				Reduce tidal exchange along the bay rim.	D												+	+	+			+	+			+			+			+		+	
				Sustain productive fish and wildlife habitats along the Shoreline/Barrier Islands.	F												+	+	+			+	+			+			+			+		+	
				Reduce wave/wake energy impacts to the Shoreline/Barrier Islands.	D												+	+	+			+	+			+			+			+		+	
	EU2-6 Delta	Function disruption due to subsidence, wave/wake energy, and direct removal of sediments.	Moderate reduction in storm attenuation.	Maximize sediment and freshwater into the Delta area.	C											+	+		+				+									+			
				Prevent direct removal of sediment within the Delta.	G											+	+		+				+									+			
				Reduce wave/wake energy impacts to the Delta.	D											+	+	+	+				+									+			

* Ecosystems Unit Future Risk, percent changed: L= Low Loss (1-15); M = Moderate Loss (16-49); H = High Loss (< 5); Increase (I); Not Applicable (NA); Steady (S); Decrease (D); Increase (I); Unknown (U)
** Alternative Plan (Measure used in Alternative Plans)

Coastwide Objectives:
A - Reduce storm damage vulnerability of coastal communities, resources, and infrastructure.
B - Minimize exposure of traditional flood protection measures to open Gulf conditions.
C - Increase sediment input from sources outside estuarine basins, and manage existing sediment resources within estuarine basines, to sustain and rejuvenate existing wetlands, rebuild marsh substrate and construct flood protections projects.
D - Maintain or establish natural landscape features and hydrologic processes that are critical to sustainable ecosystems structure and function, including dissipation of storm energy.
E - Establish or maintain dynamic salinity gradients that reflect natural cycles of freshwater availabilty and marine forcing (fluctuation related to normal daily and seasonal tide action or exchange).
F - Sustain productive and diverse wildlife habitats.
G - Maximize retention of river-borne sediments and nutrients within coastal wetlands.

Ecosystem Units Table Legend

Page 13	Page 14	Page 15	Page 16

Table 3.8c Planning Unit 2: Objectives and Measures Table - Ecosystem Units

	Geographic Location	Current Issues	Future Risk/Impact*	Planning Unit Objective	Coastal Objectives	Measures																														
						61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90
						Lake Hermitage Marsh Creation (BA-42)	Periodic Introduction of Sediment and Nutrients at Selected Diversion Sites Demonstration (MR-11)	Mississippi River Sediment Trap(MR-12)	Spanish Pass Diversion (MR-14) Restore Spanish Pass Freshwater Diversion (Plaquemines)	Venice Ponds Marsh Creation and Crevasses (MR-15)	Small Freshwater Diversion at Home Place, Happy Jack, Hero Canal	Davis Pond Outfall Management	Reactivate Bayou LaFourche as Distributary Channel of Mississippi	Freshwater and Sediment Diversions	Manage Municipal Effluent to Restore and Sustain Marsh (Jefferson)	Stabilize Lafitte / Barataria Shoreline (Jefferson) Shoreline Stabilization at Grand Isle Water Tank (PR-5)	Implement Shoreline Protection Measures (Jefferson) Goose Bayou to Cypress Bayou Shoreline Protection (NA-3)	Implement the Ships for Shores Project (Jefferson)	Restore Jefferson Barrier Islands (Jefferson) Elmer's Island & West Grand Terre Oak Ridge Restoration (BI-4)	Beneficially Use Dredged Material	Construct a Coastal Slurry Pipeline (Plaquemines, Jefferson, Lafourche)	Enhance LA Highway 23 for Flood Protection (Plaquemines)	Manage Effluent - Bayou Lafourche (Lafourche)	Restore the Lafourche Parish Coast (Lafourche)	Bayou Dupont Sediment Delivery Expansion	Bayou Rigolettes, Bayou Perot and Harvey Cut Channel Management (PR-1)	Dupre Cut/Bartaria Bay Waterway Channel Management (PR-2)	Land Bridge Shoreline Protection Ext. and Wetland Restore (PR-7)	Goose Bayou to Cypress Bayou Shoreline Protection (NA-3)	Lafitte Oil and Gas Field (East) Restoration (MG-2)	Delta Farms Oil and Gas Field Restoration (PR-5)	Grand Isle Oil and Gas Pipeline Corridor Shoreline Protection (BI-5)	Goose Bayou to Lafitte Levee (NA-8)	Elmer's Island Acquisition and Preservation (BI-3)	North Barataria Bay Shoreline Wave Breaks (BB-1)
																				Alt. 1** Alt. 2**	Alt. 1 Alt. 2										Alt. 1 Alt. 2	Alt. 1 Alt. 2				Alt. 2
Ecosystem Units	EU2-1 Upper Basin Swamps	Function disruption due to subsidence, sediment disruption, and altered inundation.	High loss of swamp and freshmarsh habitat, high reduction in storm attenuation, and decrease in avifauna.	Sustain productive fish and wildlife habitats.	F	+	+		+	+		+	+					+		+	+					+	+	+								
				Increase introduction of sediment and freshwater into the Upper Basin Swamps.	C, D, E, G		+	+					+								+															
	EU2-2 Middle Basin Swamps	Function disruption due to subsidence, sediment disruption, and wave/wake energy.	Moderate loss of swamp and decrease in fisheries.	Reduce wave/wake energy impacts to the Middle Basin Swamps.	D	+	+		+	+		+	+			+	+	+		+	+			+	+	+	+	+	+	+	+				
				Sustain productive fish and wildlife habitats.	F	+	+		+	+		+	+		+	+	+	+		+	+		+	+	+	+	+	+	+	+	+	+		-		
				Introduce sediment and freshwater into the Middle Basin Swamps.	C, D, E, G	+	+	+				+	+		+						+		+													
	EU2-3 Middle Basin Intermediate Marsh	Function disruption due to subsidence, sediment disruption, and salt water intrusion.	Decrease in fisheries.	Introduce sediments into the Middle Basin Intermediate Marsh.	C	+	+	+				+	+								+				+										
				Reduce saltwater intrusion impacts of the Middle Basin Intermediate Marsh.	D, E	+	+		+	+	+	+	+					+		+	+		+	+	+	+	+	+		+	+					
				Sustain productive fish and wildlife habitats in Middle Basin Intermediate Marsh.	F	+	+		+	+	+	+	+					+		+	+		+	+	+	+	+	+		+	+					
	EU2-4 Fringing Marsh	Function disruption due to subsidence, tidal exchange, sediment disruptions, salt water intrusion, altered inundation, wave/wake energy, and direct removal of sediments.	Moderate loss of brackish/saline marsh, decreased fisheries and wildlife, and moderate reduction in storm attenuation.	Introduce sediments to the Fringing Marshes.	C		+	+	+	+			+								+														
				Reduce saltwater intrusion impacts within the Fringing Marsh.	D, E		+		+	+		+	+					+			+			+			+			+						
				Reduce tidal exchange along the bay rim.	D		+		+	+								+		+	+			+			+			+						+
				Reduce wave/wake energy impacts to the Fringing Marshes.	D		+		+	+			+					+		+	+			+			+			+						+
				Retain sediments in the fringing marsh.	G		+	+	+	+											+			+			+			+						+
				Sustain productive fish and wildlife habitats.	F		+		+	+		+	+					+		+	+			+			+			+						+
	EU2-5 Shoreline/Barrier Islands	Function disruption due to subsidence, wave/wake energy, tidal exchange, and sediment disruptions.	High loss of brackish/saline marsh and beach/dune/back barrier marsh, decreased fisheries and wildlife, and high reduction in storm attenuation.	Introduce sediments to the Shoreline/Barrier Islands.	C			+												+														
				Reduce tidal exchange along the bay rim.	D													+		+	+			+									+		
				Sustain productive fish and wildlife habitats along the Shoreline/Barrier Islands.	F													+	+	+	+			+								-		+	
				Reduce wave/wake energy impacts to the Shoreline/Barrier Islands.	D													+	+	+	+			+								+		+	
	EU2-6 Delta	Function disruption due to subsidence, wave/wake energy, and direct removal of sediments.	Moderate reduction in storm attenuation.	Maximize sediment and freshwater into the Delta area.	C		+	+																										
				Prevent direct removal of sediment within the Delta.	G			+												+	+														
				Reduce wave/wake energy impacts to the Delta.	D		+													+															

* Ecosystems Unit Future Risk, percent changed: L= Low Loss (1-15); M = Moderate Loss (16-49); H = High Loss (< 5); Increase (I); Not Applicable (NA); Steady (S); Decrease (D); Increase (I); Unknown (U)
** Alternative Plan (Measure used in Alternative Plans)

Coastwide Objectives:
A - Reduce storm damage vulnerability of coastal communities, resources, and infrastructure.
B - Minimize exposure of traditional flood protection measures to open Gulf conditions.
C - Increase sediment input from sources outside estuarine basins, and manage existing sediment resources within estuarine basines, to sustain and rejuvenate existing wetlands, rebuild marsh substrate and construct flood protections projects.
D - Maintain or establish natural landscape features and hydrologic processes that are critical to sustainable ecosystems structure and function, including dissipation of storm energy.
E - Establish or maintain dynamic salinity gradients that reflect natural cycles of freshwater availabilty and marine forcing (fluctuation related to normal daily and seasonal tide action or exchange).
F - Sustain productive and diverse wildlife habitats.
G - Maximize retention of river-borne sediments and nutrients within coastal wetlands.

Ecosystem Units Table Legend

Page 13	Page 14	Page 15	Page 16

Table 3.8c Planning Unit 2: Objectives and Measures Table - Ecosystem Units

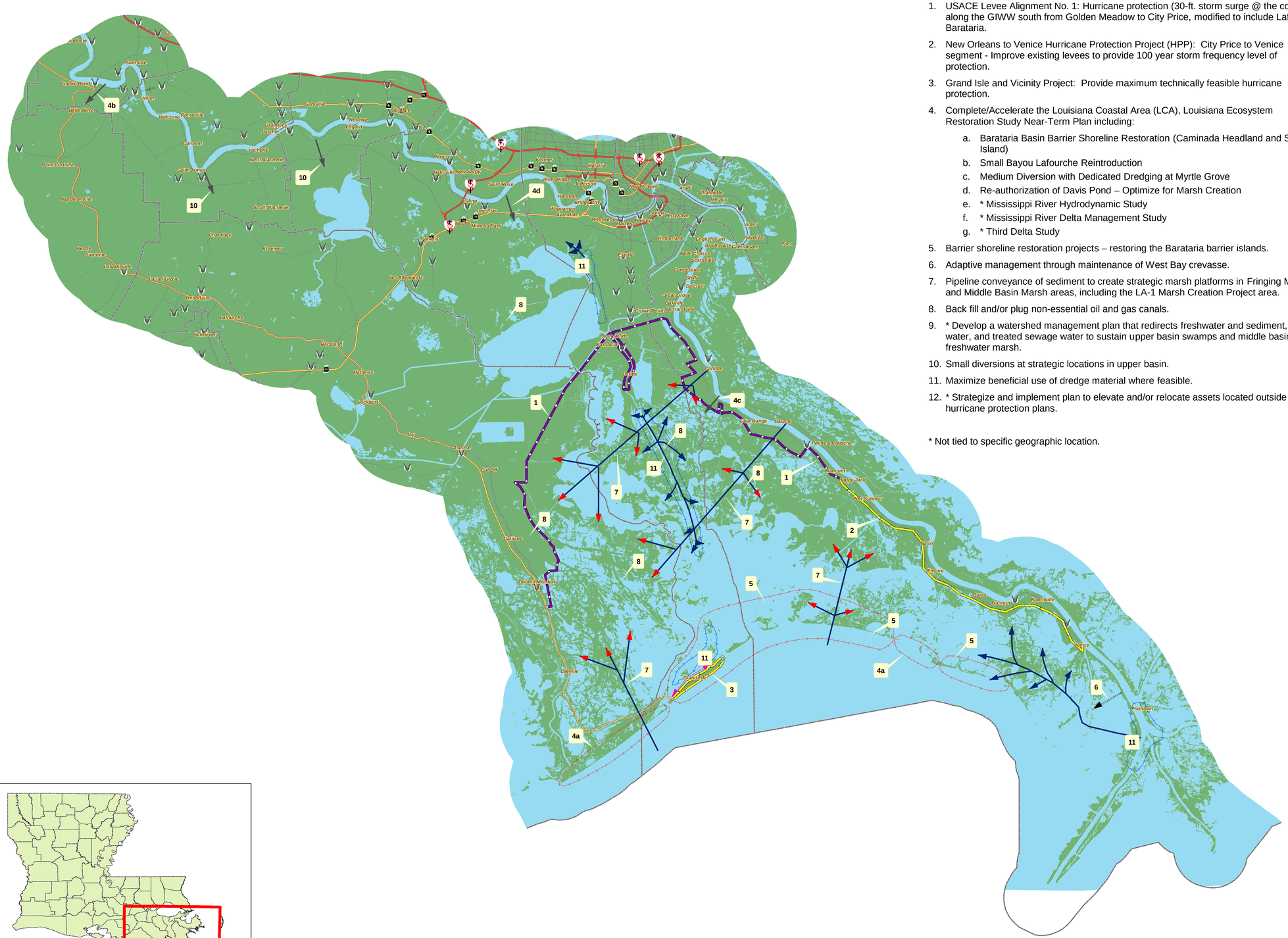
	Geographic Location	Current Issues	Future Risk/Impact*	Planning Unit Objective	Coastal Objectives	Measures																																
						91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113												
						Naomi Siphon Sediment Enrichment (NA-1)	Rosethorne Wetlands Sewage Effluent Division (NA-6)	Bayou Segnette Wetlands Sewage Effluent Diversion (CS-3)	Grand Isle Plan, Part 1-NW GI Breakwater Enhancement (BI-6)	LaBranche Wetlands Drainage Diversion (JE-1)	Caminada Chenier Restoration (FN-1)	Elmer's Island & West Grand Terre Oak Ridge Restoration (BI-4)	Grand Pierre Island Restoration (PPL 3 XBA-1c) (BS-1)	Dupre Cut Project (BA-26 was shoreline only) Wetland Restoration (MG-3)	Grand Isle - Maintain Beaches and Dunes	Ridge Restoration	Caminada Bay Fringe Marsh Creation	Little Lake Fringe Marsh Creation	Lake Hermitage Basin Marsh Creation	Extra Small Diversion at Homeplace	West Point a la Hache Siphon (increase flow)	Lake Grand Ecaille to Bastian Bay Fringe Marsh Creation	Barataria Landbridge Shoreline Protection and Marsh Creation	Naomi Siphone (increase flow)	Appropriately Sized Diversions in the Upper Basin	Adaptive management through maintenance of West Bay crevasse.	Strategize and implement plan to elevate and/or relocate assests located outside the hurricane protection plans.	Lake Salvador Shoreline Protection										
																Alt. 2**										Alt. 1 Alt. 2	Alt. 1 Alt. 2	Alt. 2										
Ecosystem Units	EU2-1 Upper Basin Swamps	Function disruption due to subsidence, sediment disruption, and altered inundation.	High loss of swamp and freshmarsh habitat, high reduction in storm attenuation, and decrease in avifauna.	Sustain productive fish and wildlife habitats.	F					+														+													
				Increase introduction of sediment and freshwater into the Upper Basin Swamps.	C, D, E, G																				+													
	EU2-2 Middle Basin Swamps	Function disruption due to subsidence, sediment disruption, and wave/wake energy.	Moderate loss of swamp and decrease in fisheries.	Reduce wave/wake energy impacts to the Middle Basin Swamps.	D																						+										
				Sustain productive fish and wildlife habitats.	F		+	+																	+			+										
				Introduce sediment and freshwater into the Middle Basin Swamps.	C, D, E, G		+	+																														
	EU2-3 Middle Basin Intermediate Marsh	Function disruption due to subsidence, sediment disruption, and salt water intrusion.	Decrease in fisheries.	Introduce sediments into the Middle Basin Intermediate Marsh.	C	+								+					+				+	+													
				Reduce saltwater intrusion impacts of the Middle Basin Intermediate Marsh.	D, E	+								+		+		+	+				+	+	+												
				Sustain productive fish and wildlife habitats in Middle Basin Intermediate Marsh.	F	+								+		+		+	+				+	+	+												
	EU2-4 Fringing Marsh	Function disruption due to subsidence, tidal exchange, sediment disruptions, salt water intrusion, altered inundation, wave/wake energy, and direct removal of sediments.	Moderate loss of brackish/saline marsh, decreased fisheries and wildlife, and moderate reduction in storm attenuation.	Introduce sediments to the Fringing Marshes.	C														+	+	+	+															
				Reduce saltwater intrusion impacts within the Fringing Marsh.	D, E											+	+		+	+	+	+															
				Reduce tidal exchange along the bay rim.	D											+	+		+			+															
				Reduce wave/wake energy impacts to the Fringing Marshes.	D											+	+		+			+															
				Retain sediments in the fringing marsh.	G											+			+			+															
				Sustain productive fish and wildlife habitats.	F											+	+		+	+	+	+															
	EU2-5 Shoreline/Barrier Islands	Function disruption due to subsidence, wave/wake energy, tidal exchange, and sediment disruptions.	High loss of brackish/saline marsh and beach/dune/back barrier marsh, decreased fisheries and wildlife, and high reduction in storm attenuation.	Introduce sediments to the Shoreline/Barrier Islands.	C																				+												
				Reduce tidal exchange along the bay rim.	D				+		+		+		+		+								+												
				Sustain productive fish and wildlife habitats along the Shoreline/Barrier Islands.	F				+		+	+	+		+		+								+												
				Reduce wave/wake energy impacts to the Shoreline/Barrier Islands.	D				+			+	+		+		+								+												
	EU2-6 Delta	Function disruption due to subsidence, wave/wake energy, and direct removal of sediments.	Moderate reduction in storm attenuation.	Maximize sediment and freshwater into the Delta area.	C																				+												
				Prevent direct removal of sediment within the Delta.	G																				+												
				Reduce wave/wake energy impacts to the Delta.	D																				+												

* Ecosystems Unit Future Risk, percent changed: L= Low Loss (1-15); M = Moderate Loss (16-49); H = High Loss (< 5); Increase (I); Not Applicable (NA); Steady (S); Decrease (D); Increase (I); Unknown (U)
** Alternative Plan (Measure used in Alternative Plans)

Coastwide Objectives:
A - Reduce storm damage vulnerability of coastal communities, resources, and infrastructure.
B - Minimize exposure of traditional flood protection measures to open Gulf conditions.
C - Increase sediment input from sources outside estuarine basins, and manage existing sediment resources within estuarine basines, to sustain and rejuvenate existing wetlands, rebuild marsh substrate and construct flood protections projects.
D - Maintain or establish natural landscape features and hydrologic processes that are critical to sustainable ecosystems structure and function, including dissipation of storm energy.
E - Establish or maintain dynamic salinity gradients that reflect natural cycles of freshwater availabilty and marine forcing (fluctuation related to normal daily and seasonal tide action or exchange).
F - Sustain productive and diverse wildlife habitats.
G - Maximize retention of river-borne sediments and nutrients within coastal wetlands.

Ecosystem Units Table Legend

Page 13	Page 14	Page 15	Page 16



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Measures:

1. USACE Levee Alignment No. 1: Hurricane protection (30-ft. storm surge @ the coastline) along the GIWW south from Golden Meadow to City Price, modified to include Lafitte and Barataria.
2. New Orleans to Venice Hurricane Protection Project (HPP): City Price to Venice segment - Improve existing levees to provide 100 year storm frequency level of protection.
3. Grand Isle and Vicinity Project: Provide maximum technically feasible hurricane protection.
4. Complete/Accelerate the Louisiana Coastal Area (LCA), Louisiana Ecosystem Restoration Study Near-Term Plan including:
   a. Barataria Basin Barrier Shoreline Restoration (Caminada Headland and Shell Island)
   b. Small Bayou Lafourche Reintroduction
   c. Medium Diversion with Dedicated Dredging at Myrtle Grove
   d. Re-authorization of Davis Pond – Optimize for Marsh Creation
   e. * Mississippi River Hydrodynamic Study
   f. * Mississippi River Delta Management Study
   g. * Third Delta Study
5. Barrier shoreline restoration projects – restoring the Barataria barrier islands.
6. Adaptive management through maintenance of West Bay crevasse.
7. Pipeline conveyance of sediment to create strategic marsh platforms in Fringing Marsh and Middle Basin Marsh areas, including the LA-1 Marsh Creation Project area.
8. Back fill and/or plug non-essential oil and gas canals.
9. * Develop a watershed management plan that redirects freshwater and sediment, storm water, and treated sewage water to sustain upper basin swamps and middle basin freshwater marsh.
10. Small diversions at strategic locations in upper basin.
11. Maximize beneficial use of dredge material where feasible.
12. * Strategize and implement plan to elevate and/or relocate assets located outside the hurricane protection plans.

* Not tied to specific geographic location.

0 2.5 5 10 15 Miles

1:316,800

1 inch equals 5 miles

Legend

- Adaptive Management through Crevasses
- Barrier Island Restoration
- Dredge Material Placement
- Freshwater Introduction
- Levee Alignment (100 yr. frequency)
- Levee Alignment (30' Storm Surge @ the Coastline)
- Sediment Delivery via Pipeline
- Shoreline Stabilization
- Beneficial Use of Dredge Material

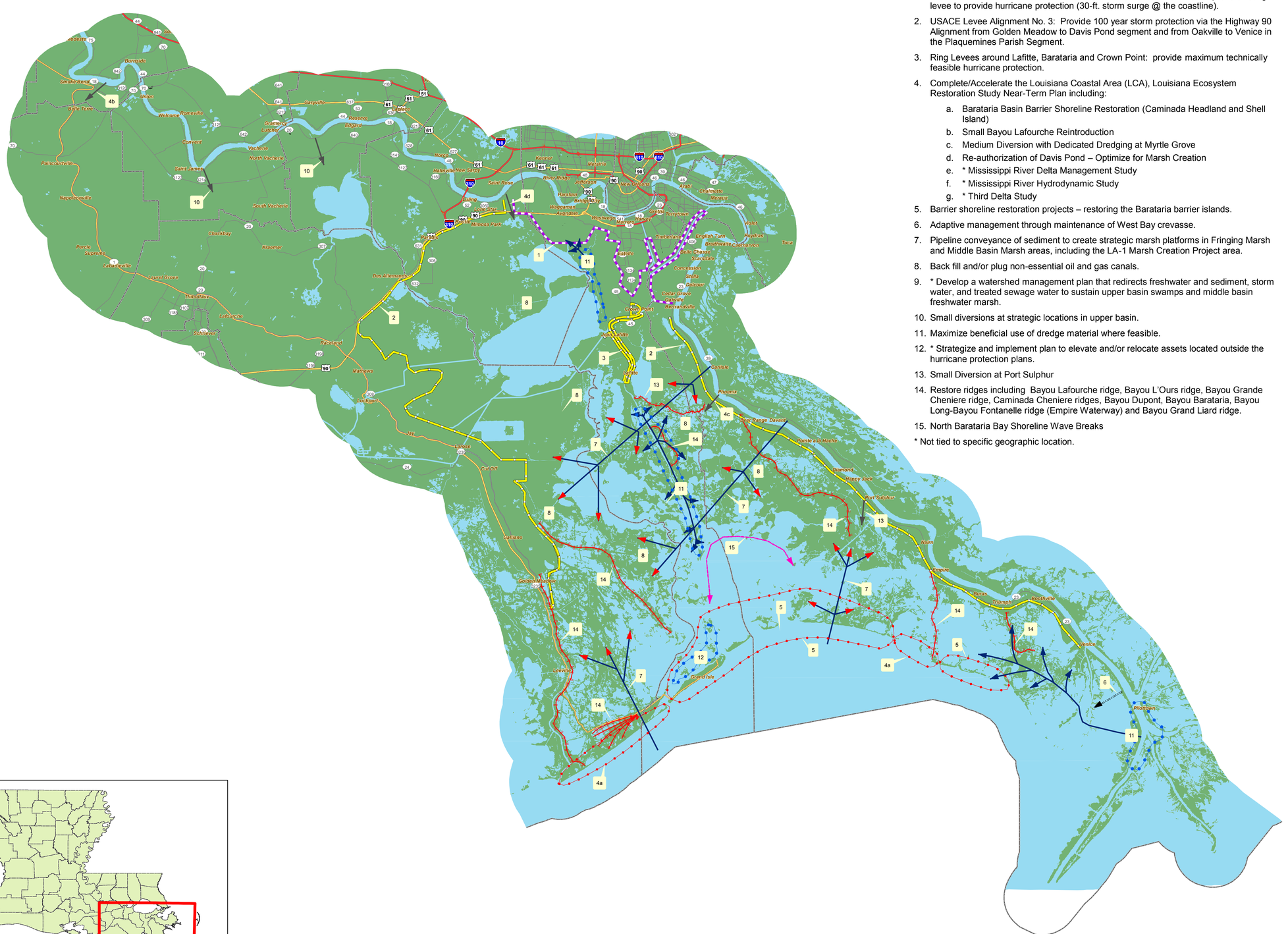
Source: LCA - 2004; COAST 2050 - 1996; USACE - 2006; LADOTD - 2006

PROJECTION: Louisiana South, State Plane NAD 83 Feet

LOUISIANA COMPREHENSIVE COASTAL PROTECTION MASTER PLAN

FIGURE 3.4

PLANNING UNIT 2
ALTERNATIVE ONE



Measures:

1. West Bank Hurricane Protection Levee from Davis Pond to Oakville: improve existing levee to provide hurricane protection (30-ft. storm surge @ the coastline).
2. USACE Levee Alignment No. 3: Provide 100 year storm protection via the Highway 90 Alignment from Golden Meadow to Davis Pond segment and from Oakville to Venice in the Plaquemines Parish Segment.
3. Ring Levees around Lafitte, Barataria and Crown Point: provide maximum technically feasible hurricane protection.
4. Complete/Accelerate the Louisiana Coastal Area (LCA), Louisiana Ecosystem Restoration Study Near-Term Plan including:
    a. Barataria Basin Barrier Shoreline Restoration (Caminada Headland and Shell Island)
    b. Small Bayou Lafourche Reintroduction
    c. Medium Diversion with Dedicated Dredging at Myrtle Grove
    d. Re-authorization of Davis Pond – Optimize for Marsh Creation
    e. * Mississippi River Delta Management Study
    f. * Mississippi River Hydrodynamic Study
    g. * Third Delta Study
5. Barrier shoreline restoration projects – restoring the Barataria barrier islands.
6. Adaptive management through maintenance of West Bay crevasse.
7. Pipeline conveyance of sediment to create strategic marsh platforms in Fringing Marsh and Middle Basin Marsh areas, including the LA-1 Marsh Creation Project area.
8. Back fill and/or plug non-essential oil and gas canals.
9. * Develop a watershed management plan that redirects freshwater and sediment, storm water, and treated sewage water to sustain upper basin swamps and middle basin freshwater marsh.
10. Small diversions at strategic locations in upper basin.
11. Maximize beneficial use of dredge material where feasible.
12. * Strategize and implement plan to elevate and/or relocate assets located outside the hurricane protection plans.
13. Small Diversion at Port Sulphur
14. Restore ridges including Bayou Lafourche ridge, Bayou L'Ours ridge, Bayou Grande Cheniere ridge, Caminada Cheniere ridges, Bayou Dupont, Bayou Barataria, Bayou Long-Bayou Fontanelle ridge (Empire Waterway) and Bayou Grand Liard ridge.
15. North Barataria Bay Shoreline Wave Breaks

* Not tied to specific geographic location.

0 2.5 5 10 15 Miles

1:316,800

1 inch equals 5 miles

Legend

- Adaptive Management through Crevasses
- Barrier Island Restoration
- Dredge Material Placement
- Freshwater Introduction
- Levee Alignment (100 yr frequency)
- Levee Alignment (30' Storm Surge @ the Coastline)
- Ridge Restoration
- Sediment Delivery via Pipeline
- Shoreline Protection
- Shoreline Restoration
- Beneficial Use of Dredge Material

SOURCE: LCA - 2004; COAST 2050 - 1996; USACE - 2006; LADOTD - 2006

PROJECTION: LOUISIANA SOUTH, STATE PLANE NAD 83 FEET

Shaw® Halcrow BG

LOUISIANA COMPREHENSIVE COASTAL PROTECTION MASTER PLAN

FIGURE 3.5

PLANNING UNIT 2
ALTERNATIVE TWO

Map Document: (K:\DNR\GIS_Documents\Project_Maps\MXD\Area 2\Final\FINAL_dnr_area_2_0004_ALTERNATIVE_TWO_051106.mxd)
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4.0 Planning Unit 3a: Bayou Lafourche to Bayou De West

4.1 Overview

Planning Unit 3a (PU 3a) consists of Terrebonne, St. Mary (east bank), Lafourche (west bank), Assumption (west bank), and St. Martin (east bank) Parishes, and is made up of the Verret, Fields, East Penchant, and Timbalier sub-basins. The concentrated assets, consisting of the communities and related assets in and around Houma, Thibodaux, and Morgan City, are increasingly facing threats from hurricane storm surges and flood events. The distributed assets, consisting of oil and gas infrastructure, marinas, and port facilities, and the concentrated assets are vulnerable to destructive storm surges without coastal protection features in place.

This planning unit has lost more than 200,000 acres of marsh since the 1930s. High natural subsidence combined with construction of navigation and oil and gas canals allowed large scale increases in tidal exchange and inundation, resulting in high rates of wetlands loss. In the lower areas of the Timbalier sub-basin, the barrier islands have severely eroded with many of the islands almost submerged.

Wetland losses in the East Penchant basin are substantial, but less than in the Timbalier sub-basin. Stressors that have impacted the East Penchant are salt water intrusion, and subsidence, which are aggravated by landscape modifications such as construction of the Houma Navigation Canal and the GIWW, and oil and gas activities. Combined, these activities have caused substantial hydrologic changes to the basin. Impediments to natural distribution and retention of sediments and freshwater have caused significant problems and severely reduce fresh water movement to the eastern Terrebonne wetlands.

Losses in the Verret sub-basin are minor in comparison to Penchant East, Fields and Timbalier sub-basins. Losses in the Fields sub-basin are primarily the result of land use changes and hydrologic isolation from sources of freshwater, nutrients, and sediments. Past rates of marsh loss have been fairly steady, but are small in comparison to Timbalier and East Penchant basins. Adverse impacts on remaining wetlands appear to be minor and relate to matters such as impoundment and shoreline erosion. Salt water intrusion impacts would increase as marshes to the south continue to convert to open water.

The future without further action in PU-3a is one of continued marsh loss. Without actions to correct the problems, another third of the basin's wetlands would be lost to open water by 2050. These wetland losses would result in the loss of critical breeding, nesting, nursing, foraging, and over wintering habitat for commercially and recreationally important fish and wildlife species. The loss of this important buffer to coastal communities (concentrated assets) and distributed assets would result in substantial increase in to damages caused by storms to these assets.

Solutions that integrate storm protection and coastal restoration to ensure long-term sustainability of this planning unit are needed. Implementation of coastal protection measures that reduce storm damages to the communities and associated assets, minimize exposure of structural flood protection measures, restore and sustain wetland ecosystems, and flood protection measures are needed not only to reverse the present loss rates, but to sustain and increase valuable natural assets, as well as to preserve the culture and the way of life of the residents of Louisiana.

Both Alternative Plan 1 and Alternative Plan 2 must include completion or acceleration of the measures within the Louisiana Coastal Authority (LCA) near-term plan as follows:

- Small Bayou Lafourche Reintroduction
- Multi-purpose operation of Houma Navigation Canal (HNC) Lock

- Terrebonne Basin Barrier shoreline restoration
- Maintain Land Bridge between Caillou Lake and Gulf of Mexico
- Convey Atchafalaya River Water to Northern Terrebonne Marshes
- Third Delta Study
- Upper Atchafalaya Basin Study

4.2 Alternative Plan One

Structural protection in Alternative Plan One is the Morganza to the Gulf Hurricane Protection levee alignment increased to provide protection for a 30-ft storm surge at the coastline. In addition, non-structural protection measures are proposed to provide the maximum level of protection to concentrated and distributed assets. Selected measures include completing/accelerating the LCA study, which includes: Small Bayou Lafourche reintroduction; multi-purpose operation of the Houma Navigation Canal (HNC); Terrebonne Basin shoreline restoration; maintaining the land bridge between Caillou Lake and the Gulf of Mexico and conveying Atchafalaya River water to Northern Terrebonne marshes. Additional measures include: marsh creation by sediment conveyance; plugging and/or backfilling oil and gas canals to restore hydrology and regulate salt water movement; providing bank line protection for the GIWW; maximizing beneficial use of dredge material where feasible; and introducing freshwater to nourish the newly created marsh platforms. Distributed assets are to be protected by elevating infrastructure and strategic relocation of assets. Freshwater conveyance from Atchafalaya River through existing waterways is an integral element of this alternative along with restoration and maintenance of bank lines of these waterways.

4.3 Alternative Plan Two

Structural protection in this alternative plan would be provided by the Morganza to the Gulf Hurricane Protection alignment that provides 20-ft storm surge at the coastline protection along with an internal levee alignment that provides protection at 30-ft storm surge at the coastline for concentrated assets.

Coastal restoration measures chosen for this alternative were selected to provide protection to distributed assets and to enhance protection provided by structural protection features. Barrier island restoration is a non-structural measure that would provide the first line of defense. Pipeline conveyance of sediments is essential to create marsh platforms along fringing marshes. This marsh would be sustained by conveyance of freshwater, sediment, and nutrients from Atchafalaya River through the existing waterways. The bank lines of the existing waterways require restoration for effective conveyance of water, sediment, and nutrients. These measures cannot be implemented unless the existing inundation and drainage concerns of Verret and Chacahoula Basins are addressed by implementing of the Chacahoula Basin Plan and/or other measures. The conveyance of the Atchafalaya River freshwater and sediment can be improved by utilizing the Houma Navigational Canal Lock System. The distributed assets are to be protected by providing well protected hurricane evacuation routes and other measures such as elevating infrastructures and strategic relocation of assets. Other coastal restoration measures proposed include: freshwater introduction via Blue Hammock Bayou; freshwater introduction to south Lake Decade; shoreline protection; stabilizing/maintaining the northern shoreline of Terrebonne/Timblier Bay; short-term freshwater redirections to nourish and sustain intermediate marshes that are being adversely affected by salt water; implementing the Penchant Basin Plan; protecting and maintaining ridges and maximizing the beneficial use of dredge material where feasible.

4.4 Supporting Documentation

Supporting documentation for Planning Unit 3a Alternative Plan formulation includes the following:

Figure 4.1	Boundary and Base Map
Figure 4.2	Concentrated and Distributed Assets Map
Table 4.1	Relative Damage from Storm Surge for Concentrated Assets
Table 4.2	Concentrated Assets Scoring
Table 4.3	Relative Damage from Storm Surge for Distributed Assets
Table 4.4	Distributed Assets Scoring
Table 4.5	Distributed Assets Identification
Table 4.6	Existing Conditions and Problem Identification Table
Table 4.7	Changes in Natural Resources, 1990-2050 Table
Figure 4.3	Ecosystem Units and Natural Resources Map
Table 4.8a	Objectives and Measures Table - Concentrated Assets
Table 4.8b	Objectives and Measures Table - Distributed Assets
Table 4.8c	Objectives and Measures Table – Ecosystem Units
Figure 4.4	Alternative One Map
Figure 4.5	Alternative Two Map

4 2 0 4 8 Miles

1:253,440

1 inch equals 4 miles

Legend

- Land
- Water
- Planning Unit Boundary
- Parish Boundary
- State Offshore Area
- Limited Access
- Highways
- Secondary Roads
- Other
- Highway Ramp

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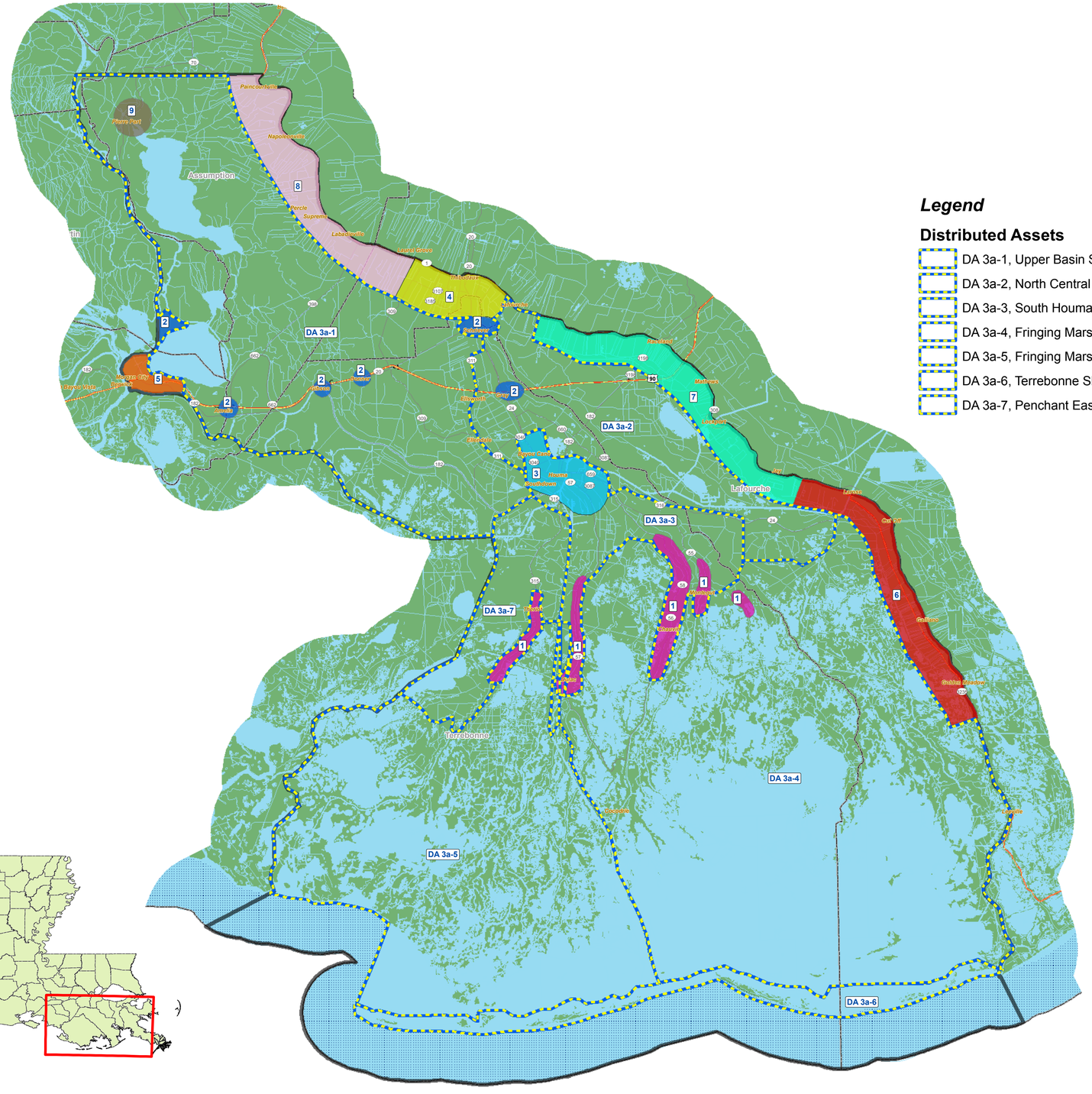
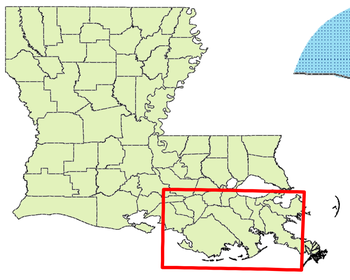
LOUISIANA COMPREHENSIVE COASTAL PROTECTION MASTER PLAN

FIGURE 4.1

PLANNING UNIT 3A
BOUNDARY AND BASE MAP





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1 inch equals 4 miles

Legend

Distributed Assets

- DA 3a-1, Upper Basin Swamp
- DA 3a-2, North Central Terrebonne Wetlands
- DA 3a-3, South Houma Swamps
- DA 3a-4, Fringing Marshes East
- DA 3a-5, Fringing Marshes West
- DA 3a-6, Terrebonne Shoreline
- DA 3a-7, Penchant East

Concentrated Assets

- 1, South of Houma
- 2, HWY 198 & HWY 20
- 3, Houma
- 4, Thibodaux
- 5, Morgan City
- 6, South Lafourche
- 7, Central Lafourche
- 8, North Lafourche, Assumption, & Ascension
- 9, Stephensville & Pierre Part

- Planning Unit Boundary
- Parish Boundary
- State Offshore Area

Shaw® Halcrow BG

LOUISIANA COMPREHENSIVE COASTAL PROTECTION MASTER PLAN

FIGURE 4.2

PLANNING UNIT 3A
CONCENTRATED AND DISTRIBUTED ASSETS

Map Document: (K:\DNR\GIS_Documents\Project_Maps\MXD\Area 3a\Final\dnr_area_3a_0002_Concentrated_AssetsFinal1.mxd)
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PLANNING UNIT 3a: Bayou Lafourche to Bayou de West / Bay Junop

Table 4.1 Relative Damages from Storm Surge to Concentrated Assets

Proportion of assets damaged or destroyed due to storm surge: EL = Extremely Low (0-5%) L = Low (5 - 15%) M = Medium (15 - 25%) H = High (25 - 50%) EH = Extremely High (>50%)	**Storm Surge at Coastline (Feet)**	**South of Houma**	**Hwy 182 & 20**	**Houma**	**Thibodeaux**	**Morgan City**	**South Lafource**	**Central Lafourche**	**North Lafource, Assumption & Acension**	**Stephensville & Pierre Port**
	5	EL	EL	EL	EL	EL	EL	EL	EL	EL
	10	H	L	L	EL	EL	EL	L	EL	M
	15	EH	L	M	L	L	H	M	EL	H
	20	EH	M	H	L	M	EH	H	L	EH
	25	EH	H	EH	H	H	EH	EH	L	EH
	30	EH	EH	EH	EH	EH	EH	EH	L	EH

Table 4.2 Concentrated Assets Scoring

Scoring Criteria	**Storm Surge at Coastline (Feet)**	**South of Houma**	**Hwy 182 & 20**	**Houma**	**Thibodeaux**	**Morgan City**	**South Lafource**	**Central Lafourche**	**North Lafource, Assumption & Acension**	**Stephensville & Pierre Port**
1. Residences	**25**	12	12	17	15	15	8	12	12	5
2. Industry	**20**	5	8	15	12	12	9	10	9	5
3. Infrastructure	**15**	5	7	10	8	10	9	8	5	2
4. Institutional and Publicly Owned Facilities	**20**	5	7	12	11	10	11	11	9	5
5. Strategic Resources	**20**	6	8	18	10	12	10	8	6	5
Total Score	**100**	**33**	**42**	**72**	**56**	**59**	**47**	**49**	**41**	**22**

Table 4.3 Relative Damages from Storm Surge to Distributed Assets[1]

Proportion of assets damaged or destroyed due to storm surge: EL = Extremely Low (0-5%) L = Low (5 - 15%) M = Medium (15 - 25%) H = High (25 - 50%) EH = Extremely High (>50%)	**Storm Surge at Coastline (Feet)**	**DA 3a-1** Upper Basin Swamp	**DA 3a-2** NC Terrebonne Wetlands	**DA 3a-3** South Houma Swamps	**DA 3a-4** Fringing Marshes East	**DA 3a-5** Fringing Marshes West	**DA 3a-6** Terrebonne Shoreline	**DA 3a-7** Penchant East
	5	EL	EL	EL	EL	EL	L	L
	10	L	L	M	M	M	H	M
	15	M	M	H	H	H	EH	H
	20	H	H	EH	EH	EH	EH	EH
	25	EH	EH	EH	EH	EH	EH	EH
	30	EH	EH	EH	EH	EH	EH	EH

[1] Assets outside of the defined concentrated areas (see Concentrated and Distributed Assets Map)

Table 4.4 Scoring of Distributed Assets

Scoring Criteria	**Maximum Score for Resources**	**DA 3a-1** Upper Basin Swamp	**DA 3a-2** NC Terrebonne Wetlands	**DA 3a-3** South Houma Swamps	**DA 3a-4** Fringing Marshes East	**DA 3a-5** Fringing Marshes West	**DA 3a-6** Terrebonne Shoreline	**DA 3a-7** Penchant East
National Significance	**25**	25	25	15	20	20	15	15
State Significance	**25**	25	25	20	20	20	15	15
Local Significance	**25**	25	25	25	20	20	15	20
Critical to Recovery	**25**	25	25	15	15	15	10	10
Total Score	**100**	**100**	**100**	**75**	**75**	**75**	**55**	**60**

NOTE: Morganza to the Gulf is not authorized and is not included.

TABLE 4.5. DISTRIBUTED ASSETS FOR PLANNING UN IT 3a

The land outside the defined communities was divided into areas of surge impact commonality. For Planning Unit 2 these are defined by the significant water bodies that impact these areas:

Upper Basin Swamp	= DA 3a-1
NC Terrebonne Wetlands	= DA 3a-2
South Houma Swamps	= DA 3a-3
Fringing Marshes East	= DA 3a-4
Fringing Marshes West	= DA 3a-5
Terrebonne Shoreline	= DA 3a-6
Penchant East	= DA 3a-7

Table

Within these areas following assets are comprised:

	Assets	Oil & Gas	Pipelines	Highway, Bridges & Transportation	Evacuation Routes	Ports, Waterway & Infrastructure	Other Strategic Assets
DA 3a-1	Oil & Gas Fields and Pipelines	X	X				
	Hwy 90 (future I-49)			X	X		
	Hwy 182			X			
	Hwy 398			X			
	Hwy 70			X			
	Port of Morgan City					X	
DA 3a-2	Oil & Gas Fields and Pipelines	X	X				
	Hwy 24			X			
	Hwy 90 (future I-49)			X	X		
	Future TP Evacuation Route				X		
	GIWW					X	
	Bayou Terrebonne					X	
DA 3a-3	Oil & Gas Fields and Pipelines	X	X				
	Hwy 55			X	X		
	Hwy 56			X	X		
	Hwy 57			X	X		
	Hwy 58			X	X		
	Hwy 315			X	X		
	Hwy 665			X	X		
	5 community Bayou's					X	
	Houma Navigation Canal					X	

	Assets	Oil & Gas	Pipelines	Highway, Bridges & Transportation	Evacuation Routes	Ports, Waterway & Infrastructure	Other Strategic Assets
DA 3a-4	Oil & Gas Fields and Pipelines	X	X				
	Cocodrie Docks					X	
	Lumcon						X
	Hwy 56			X	X		
	Houma Navigation Canal					X	
DA 3a-5	Oil & Gas Fields and Pipelines	X	X				
	Houma Navigation Canal					X	
DA 3a-6	Oil & Gas Fields and Pipelines	X	X				
	Houma Navigation Canal					X	
DA 3a-7	Oil & Gas Fields and Pipelines	X	X				
	Falgout Canal					X	
	Houma Navigation Canal					X	

Table 4.6. Planning Unit 3A Existing Conditions/ Problem Identification

NOTE: Rankings are only applicable within an ecosystem unit; the purpose is not to prioritize between units, but rather to prioritize function disruptions within ecosystem units.

Function Disruption (System Threat)	Ecosystem Unit						
	Upper Basin Swamp	NC Terrebonne Wetlands	South Houma Swamps	Fringing Marshes East	Fringing Marshes West	Terrebonne Shoreline/Barrier Islands	Penchant East
Subsidence	M	M	M	H	H	H	H
Tidal Exchange	NI	L	L	H	H	H	M
Sediment Disruptions	H	L	M	H	H	H	M
Salt Water Intrusion	NI	L	M	H	H	H	M
Altered Inundation	H	H	M	M	M	NI	M
Wave/Wake Energy	L	L	L	VH	VH	VH	L
Direct Removal	L	L	M	M	H	M	M

NC Terrebonne Wetlands = North Central Terrebonne Wetlands

No Impact	NI
Low	L
Moderate	M
High	H
Very High	VH

Subsidence = true subsidence; benchmark elevations not referenced to tide gauges

Tidal Exchange = daily tide energy; assumed to be more destructive to historically fresh/intermediate wetlands, more beneficial to brackish/saline wetlands

Sediment Disruptions = disconnection from riverine sources

Saltwater Intrusion = due to encroachment of Gulf on landscape edge or movement up canals & channels

Altered Inundation = altered frequency or duration of inundation, not related to RSLR; e.g., impoundments

Wave/Wake Energy = includes storm energy

Direct Removal = dredging sediments or covering by spoil banks & levees.

Table 4.7. Planning Unit 3A Changes in Natural Resources, 1990 - 2050 (From Coast 2050 Report; LCA Land Change Map)

Resource	Ecosystem Unit						
	EU 3a-1 Upper Basin Swamp	EU 3a-2 NC Terrebonne Wetlands	EU 3a-3 South Houma Swamps	EU 3a-4 Fringing Marshes East	EU 3a-5 Fringing Marshes West	EU 3a-6 Shoreline/ Barrier Islands	EU 3a -7 Penchant East
Swamp	M	NA	NI	NA	NA	NA	NI
Fresh/Intermediate Marsh	NA	M	L	NA	NA	NA	M
Brackish/Saline Marsh	NA	NA	NA	H	M	NA	NA
Beach/Dune/Back Barrier Marsh	NA	NA	NA	NA	NA	H	NA
Sessile Estuarine (Oysters)	NI	NI	S	S	S	D	I
Saltwater (Red Drum)	NI	NI	D	D	D	D	D
Freshwater (Largemouth Bass)	I	I	I	I	D	NI	I
Estuarine (Spotted Seatrout)	NI	NI	D	D	D	D	D
Estuarine (Shrimp)	NI	NI	D	D	D	D	D
Woodland Edge (Deer)	D	S	D	D	S	NI	S
Woodland Avifauna	S	NI	D	S	NI	D	S
Fresh Wetlands (Alligator)	I	S	S	D	D	D	I
Muskrat	S	S	S	D	D	NI	D
Shore Birds	NI	S	NI	D	D	D	D
Loss of Storm Attenuation* **	M	M	NI	M	M	M	M

Wetland Key		% Change
No Impact	NI	0
Low Loss	L	1-15
Moderate Loss	M	16-49
High Loss	H	>50
Increase	I	
Not Applicable	NA	

Fish & Wildlife Key	
No Impact/Not historically present	NI
Steady	S
Decrease	D
Increase	I
Unknown (No information)	U

NOTES:

* = Small acreage by percentage w\in ecosys unit

** = Lake Pontchartrain Atlas

*** = Using land change as the surrogate for changes in storm attenuation capacity

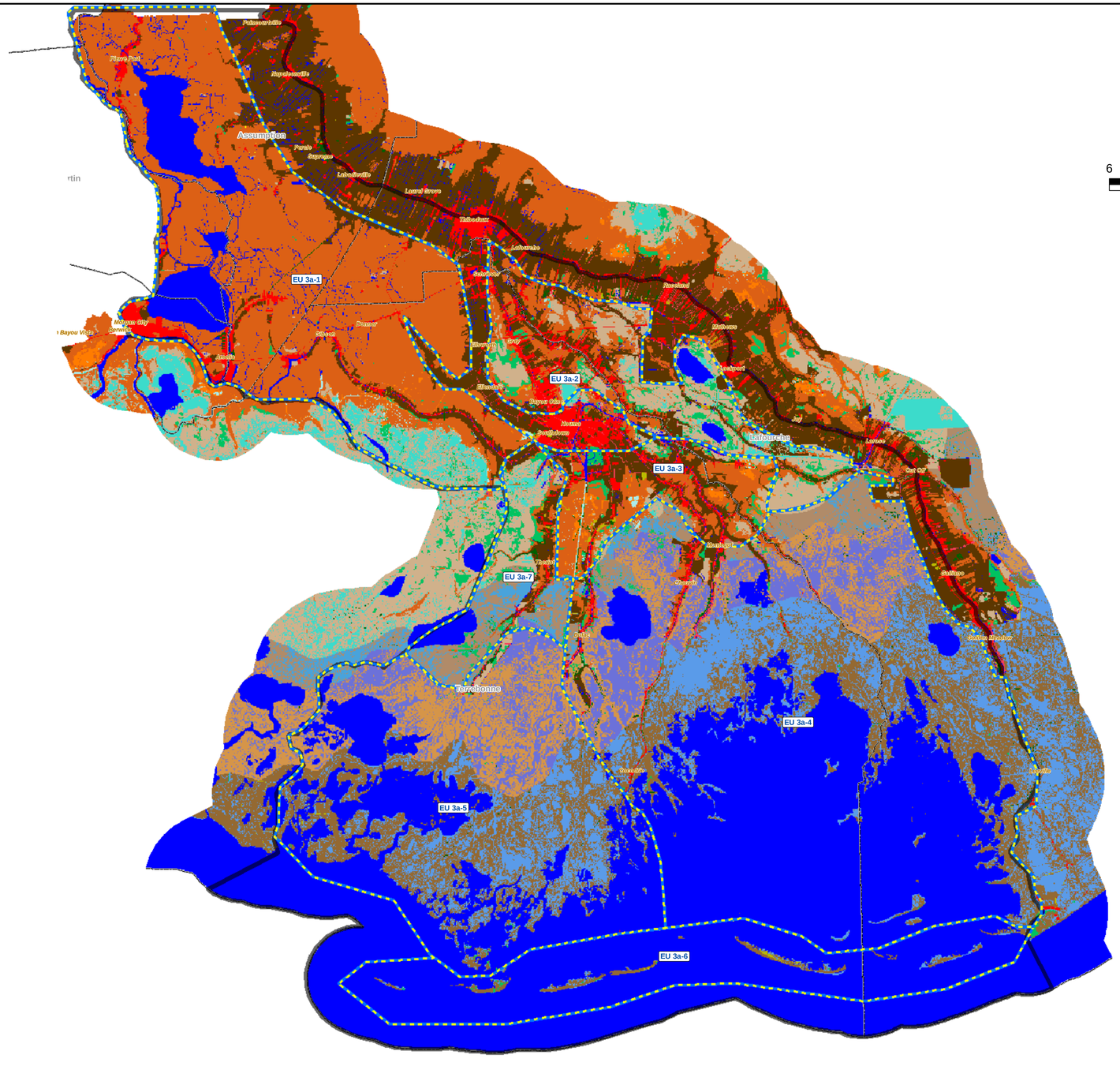
Legend

Ecological Units

EU_Desc, DESC_

- EU 3a-1, Upper Basin Swamp
- EU 3a-2, NC Terrebonne Wetlands
- EU 3a-3, South Houma Swamps
- EU 3a-4, Fringing Marshes East
- EU 3a-5, Fringing Marshes West
- EU 3a-6, Terrebonne Shoreline
- EU 3a-7, Penchant East

- Fresh Marsh
- Intermediate Marsh
- Brackish Marsh
- Saline Marsh
- Non-wetland
- Swamp
- Gap Wetland Forest
- Gap Wetland Shrub/Scrub
- Gap Upland Shrub/Scrub
- Gap Ag/Pasture
- Gap Developed
- Gap Barren
- Water
- Water-fresh zone
- Water-intermediate zone
- Water-brackish zone
- Water-saline zone
- Water-swamp zone



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LOUISIANA DEPARTMENT OF NATURAL RESOURCES

FIGURE 4.3

PLANNING UNIT 3A
NATURAL RESOURCES

Table 4.8a Planning Unit 3A: Objectives and Measures Table - Concentrated Assets

	Geographic Location	Current Issues*	Future Risk/Impact	Planning Unit Objective	Coastal Objectives	Measures																													
						1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	
						Initiate the LA-1 Marsh creation Project	Backfill Pipeline Canals	Bayou Lafourche 1000 cfs	Convey Atchafalaya River Water to Terrebonne Marshes	Freshwater Introduction South of Lake Decade (Avoca Island)	Freshwater Introduction via Blue Hammock Bayou	Maintain Land Bridge Between Bayous Du Large and Grand Bayou	Maintain Land Bridge Between Caillou Lake and Gulf of Mexico	Maintain Timbalier Land Bridge	Multi-Purpose Operation of the Houma Navigational Canal Lock System	Optimize flows and Atchafalya River Influence in Penchant Basin	Rehabilitate Northern Shorelines of Terrebonne/Timbalier Bays	Restore Terrebonne Barrier Islands	Alternative Operational Schemes of the Old River Control	Lower Water Levels in Upper Penchant	Enhance Atchafalaya Flow to Lower Penchant	Improve Hydrology and Drainage in the Verret Sub-basin	Stabilize Banks of Navigation Channels for Water Conveyance	Morganza to the Gulf of Mexico Hurricane Protection Study	StateParish Barrier Plan (Reaches, 1,2, and 3)	Reach 5 (LHR) and Reach 6 (HMCR) Storm Surge Protection	Madison Bay Marsh Creation and Terracing Project	West Bell Pass Barrier Headland Restoration Project	Falgout Canal Freshwater Enhancement Project	Timbalier Island East Restoration	Pipeline Conveyance of sediment to create marsh platform	Protection to distributed assets by elevated structures and protected hurricane routes	Internal levee alignment	Maximize beneficial use of dredge material where possible	
							ALT 1**	ALT 1,2	ALT 1, 2	ALT 2	ALT 2		ALT 1, 2		ALT 1, 2	ALT 2	ALT 2	ALT 1, 2		ALT 2	ALT 1	ALT 2	ALT 1	ALT 1, 2	ALT 1, 2	ALT 1, 2				ALT 1, 2	ALT 1, 2	ALT 1, 2	ALT 2	ALT 1, 2	
Concentrated Assets	**South of Houma**	Extremely high flood risk to Concentrated Assets with storm surges over 15 ft.	Loss of Concentrated Assets due to permanent erosion/flooding.	Provide coastal protection to South of Houma Concentrated Assets.	A, B, D							+	+										+			+			+	+			+	
				Protect LA- 56 from Cocodrie to LA- 57	A,B,D																		+	+	+				+					
	Hwy 182 & 20	High level of flood risk to Concentrated Assets with storm surges over 25 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to Hwy 182 & 20 Concentrated Assets.	A,B																	+		+	+		+			+	+				
	Houma	Extremely high flood risk to Concentrated Assets with storm surges over 25 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to Houma Concentrated Assets.	A,B																		+	+		+			+	+			+	
	Thibodeaux	High level of flood risk to Concentrated Assets with storm surges over 25 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to Thibodeaux Concentrated Assets.	A,B																		+	+			+			+				
	Morgan City	High level of flood risk to Concentrated Assets with storm surges over 25 ft.	Increased flood risk to assets due to sea level rise, subsidence and wetland loss.	Provide coastal protection to Morgan City Concentrated Assets.	A,B															+		+		+		+								
	South Lafourche	Extremely high flood risk to Concentrated Assets with storm surges over 20 ft.	Significantly increased flood risk due to wetland loss exposing defence structures to open Gulf conditions.	Provide coastal protection to South Lafourche Concentrated Assets.	A,B	+																	+		+	+				+				
				Protect LA-+ from Leeville to Golden Meadow to Leon Theriot Lock	A,B,D	+																	+		+	+				+				
	Central Lafourche	Extremely high flood risk to Concentrated Assets with storm surges over 25 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to Central Lafourche Concentrated Assets.	A,B	+																	+		+	+								
	North Lafourche, Assumption, and Acension	Low level of flood risk to Concentrated Assets.	Increased flood risk to assets due to sea level rise, and susbsidence, and wetland loss.	Provide coastal protection to North Lafourche, Assumption, and Acension Concentrated Assets.	A,B															+		+		+		+								
	Stephensville & Pierre Part	Low level of flood risk to Concentrated Assets.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to Stephensville & Pierre Part Concentrated Assets.	A,B															+		+		+		+								

* Current issues, percent flooded: H = High (25-50%); EH= Extremely High (> 50%)
** Alternative Plan (Measure used in Alternative Plans)

Coastwide Objectives:
A - Reduce storm damage vulnerability of coastal communities, resources, and infrastructure.
B - Minimize exposure of traditional flood protection measures to open Gulf conditions.
C - Increase sediment input from sources outside estuarine basins, and manage existing sediment resources within estuarine basines, to sustain and rejuvenate existing wetlands, rebuild marsh substrate and construct flood protections projects.
D - Maintain or establish natural landscape features and hydrologic processes that are critical to sustainable ecosystems structure and function, including dissipation of storm energy.
E - Establish or maintain dynamic salinity gradients that reflect natural cycles of freshwater availabilty and marine forcing (fluctuation related to normal daily and seasonal tide action or exchange).
F - Sustain productive and diverse wildlife habitats.
G - Maximize retention of river-borne sediments and nutrients within coastal wetlands.

Table 4.8b Planning Unit 3A: Objectives and Measures Table - Distributed Assets

	Geographic Location	Current Issues*	Future Risk/Impact	Planning Unit Objective	Coastal Objectives	Measures																													
						1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	
						Initiate the LA-1 Marsh creation Project	Backfill Pipeline Canals	Bayou Lafourche 1000 cfs	Convey Atchafalaya River Water to Terrebonne Marshes	Freshwater Introduction South of Lake Decade (Avoca Island)	Freshwater introduction via Blue Hammock Bayou	Maintain Land Bridge Between Bayous Du Large and Grand Bayou	Maintain Land Bridge Between Caillou Lake and Gulf of Mexico	Maintain Timbalier Land Bridge	Multi-Purpose Operation of the Houma Navigational Canal Lock System	Optimize flows and Atchafalya River Influence in Penchant Basin	Rehabilitate Northern Shorelines of Terrebonne/Timbalier Bays	Restore Terrebonne Barrier Islands	Alternative Operational Schemes of the Old River Control	Lower Water Levels in Upper Penchant	Enhance Atchafalaya Flow to Lower Penchant	Improve Hydrology and Drainage in the Verret Sub-basin	Stabilize Banks of Navigation Channels for Water Conveyance	Morganza to the Gulf of Mexico Hurricane Protection Study	State/Parish Barrier Plan (Reaches, 1,2, and 3)	Reach 5 (LHR) and Reach 6 (HMCR) Storm Surge Protection	Madison Bay Marsh Creation and Terracing Project	West Bell Pass Barrier Headland Restoration Project	Falgout Canal Freshwater Enhancement Project	Timbalier Island East Restoration	Pipeline Conveyance of sediment to create marsh platform	Protection to distributed assets by elevated structures and prodcted hurricane routes	Internal levee alignment	Maximize beneficial use of dredge material where possible	
							ALT 1**	ALT 1,2	ALT 1, 2	ALT 2	ALT 2		ALT 1, 2		ALT 1, 2	ALT 2	ALT 2	ALT 1, 2		ALT 2	ALT 1	ALT 2	ALT 1	ALT 1, 2	ALT 1, 2	ALT 1, 2				ALT 1, 2	ALT 1, 2	ALT 1, 2	ALT 2	ALT 1, 2	
Distributed Assets	DA3a-1 Upper Basin Swamp	Extremely high level of flood risk to Distributed Assets with storm surges over 25 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to Port of Morgan City.	A,B															+		+		+	+			+		+	+				
				Provide coastal protection to oil and gas fields and pipelines.	A,B															+		+		+	+			+		+	+				
				Provide coastal protection to Highways and Evacuation Routes.	A,B															+		+		+				+		+	+				
	DA3a-2 North Central Terrebonne Wetlands (NCTW)	Extremely high level of flood risk to Distributed Assets with storm surges over 25 ft.	Increased flood risk to assets due to sea level rise, subsidence and wetland loss.	Provide coastal protection to GIWW & Bayou Terrebonne.	A,B																			+						+	+			+	
				Provide coastal protection to oil and gas fields and pipelines.	A,B															+		+		+						+	+				
				Provide coastal protection to Highways and Evacuation Routes.	A,B															+		+		+						+	+			+	
	DA3a-3 South Houma Swamps	Extremely high level of damage to Distributed Assets with storm surges over 20 ft.	Loss of Distributed Assets due to permanent erosion/flooding.	Provide coastal protection to 5 community bayou's and Houma navigation channel.	A,B																	+		+							+			+	
				Reduce storm surge impacts of 5 community bayou's and Houma navigation channel.	A,B																			+			+				+			+	
				Provide coastal protection to oil and gas fields and pipelines.	A,B																	+		+			+				+			+	
				Provide coastal protection to Highways and Evacuation Routes.	A,B											+								+			+				+			+	
	DA3a-4 Fringing Marshes East	Extremely high level of damage to Distributed Assets with storm surges over 20 ft.	Loss of Distributed Assets due to permanent erosion/flooding.	Provide coastal protection to Houma navigation channel.	A,B												+							+			+				+			+	
				Reduce storm surge impacts of Houma navigation canal.	A,B												+							+			+				+			+	
				Provide coastal protection to oil and gas fields and pipelines.	A,B				-								+							+			+				+			+	
				Provide coastal protection to Highways, Evacuation Routes and LUMCON.	A,B												+							+							+				
	DA3a-5 Fringing Marshes West	Extremely high level of damage to Distributed Assets with storm surges over 20 ft.	Loss of Distributed Assets due to permanent erosion/flooding.	Provide coastal protection to Houma navigation channel.	A,B							+	+	+	+		+							+							+				
				Reduce storm surge impacts of the Houma Navigation Canal, Bush/Boudraux Canal, Cutoff Canal, Falgout Canal, Robinson Canal.	A,B							+	+	+			+							+							+				
				Provide coastal protection to oil and gas fields and pipelines.	A,B							+	+	+			+							+							+				
	DA3a-6 Terrebonne Shoreline/Barrier Islands	Extremely high level of damage to Distributed Assets with storm surges over 15 ft.	Loss of Distributed Assets due to permanent erosion/flooding.	Provide coastal protection to Houma navigation channel.	A,B							+	+	+	+		+							+											
				Reduce storm surge impacts of the Houma Navigation Canal, Bush/Boudraux Canal, Cutoff canal, Falgout Canal, Robinson Canal.	A,B							+	+	+			+	+						+							+				
				Provide coastal protection to oil and gas fields and pipelines.	A,B												+	+						+							+				
	DA3a-7 Penchant East	Extremely high level of damage to Distributed Assets with storm surges over 20 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to Houma Navigation Canal and Falgout Canal.	A,B													+						+							+				
				Reduce storm surge impacts of Houma Navigation Canal.	A,B													+						+											
				Provide coastal protection to oil and gas fields and pipelines.	A,B			+		-	-	+	+	+				+						+											

* Current issues, percent flooded: H = High (25-50%); EH= Extremely High (> 50%)
** Alternative Plan (Measure used in Alternative Plans)

Coastwide Objectives:
A - Reduce storm damage vulnerability of coastal communities, resources, and infrastructure.
B - Minimize exposure of traditional flood protection measures to open Gulf conditions.
C - Increase sediment input from sources outside estuarine basins, and manage existing sediment resources within estuarine basines, to sustain and rejuvenate existing wetlands, rebuild marsh substrate and construct flood protections projects.
D - Maintain or establish natural landscape features and hydrologic processes that are critical to sustainable ecosystems structure and function, including dissipation of storm energy.
E - Establish or maintain dynamic salinity gradients that reflect natural cycles of freshwater availabilty and marine forcing (fluctuation related to normal daily and seasonal tide action or exchange).
F - Sustain productive and diverse wildlife habitats.
G - Maximize retention of river-borne sediments and nutrients within coastal wetlands.

Table 4.8c Planning Unit 3A: Objectives and Measures Table - Distributed Assets

	Geographic Location	Current Issues	Future Risk/Impact*	Planning Unit Objective	Coastal Objectives	Measures																														
						1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29		
						Initiate the LA-1 Marsh creation Project	Backfill Pipeline Canals	Bayou Lafourche 1000 cfs	Convey Atchafalaya River Water to Terrebonne Marshes	Freshwater Introduction South of Lake Decade (Avoca Island)	Freshwater Introduction via Blue Hammock Bayou	Maintain Land Bridge Between Bayous Du Large and Grand Bayou	Maintain Land Bridge Between Caillou Lake and Gulf of Mexico	Maintain Timbalier Land Bridge	Multi-Purpose Operation of the Houma Navigational Canal Lock System	Optimize flows and Atchafalya River Influence in Penchant Basin	Rehabilitate Northern Shorelines of Terrebonne/Timbalier Bays	Restore Terrebonne Barrier Islands	Alternative Operational Schemes of the Old River Control	Lower Water Levels in Upper Penchant	Enhance Atchafalaya Flow to Lower Penchant	Improve Hydrology and Drainage in the Verret Sub-basin	Stabilize Banks of Navigation Channels for Water Conveyance	Morganza to the Gulf of Mexico Hurricane Protection Study	StateParish Barrier Plan (Reaches, 1,2, and 3)	Reach 5 (LHR) and Reach 6 (HMCR) Storm Surge Protection	Madison Bay Marsh Creation and Terracing Project	West Bell Pass Barrier Headland Restoration Project	Falgout Canal Freshwater Enhancement Project	Timbalier Island East Restoration	Pipeline Conveyance of sediment to create marsh platform	Protection to distributed assets by elevated structures and protcted hurricane routes	Internal levee alignment	Maximize beneficial use of dredge material where possible		
							ALT 1**	ALT 1,2	ALT 1, 2	ALT 2	ALT 2		ALT 1, 2		ALT 1, 2	ALT 2	ALT 2	ALT 1, 2		ALT 2	ALT 1	ALT 2	ALT 1	ALT 1, 2	ALT 1, 2	ALT 1, 2				ALT 1, 2	ALT 1, 2	ALT 1, 2	ALT 2	ALT 1, 2		
Ecosystem Units	**EU3a-1 Upper Basin Swamp**	Function disruption due subsidence, freshwater/sediment disruption, and altered inundation.	Moderate loss of swamp habitat and reduction in storm attenuation.	Improve hydrologic conditions to promote cypress regeneration in the Upper Basin Swamps (UBS) such as Verret, Chacahoula,	A,C,E,F,G											+			+	+	-	+						+		+						
				Sustain productive fish and wildlife habitats in the Upper Basin Swamps (UBS)	F																																
				Introduce sediments to the Upper Basin Swamp.	A,C,D,G											+			+												+					
	EU3a-2 North Central Terrebonne Wetlands (NCTW)	Function disruption due to subsidence, freshwater/sediment disruption, and altered inundation.	Moderate loss of fresh/intermediate marsh and reduction in storm attenuation.	Improve natural hydrology as it relates to ecosystem benefits and storm surge reduction within the North Central Terrebonne Wetlands	A,C,E,F,G											+			+		+	+		+			+		+	+	+			+		
				Sustain productive fish and wildlife habitats in the North Central Terrebonne Wetlands (NCTW)	F																														+		
				Increase introduction of sediments into NCTW.	A,C,D,G											+			+		+		+				+		+	+	+			+		
	EU3a-3 South Houma Swamps	Function disruption due to subsidence, freshwater/sediment disruption, and salt water intrusion.	Decreased fisheries and reduction in storm attenuation.	Introduce sediments into the South Houma Swamps (SHS).	A,C,D,G				+												+		+				+		+	+	+			+		
				Reduce saltwater intrusion impacts of the 5 community bayou's and Houma navigation channel.	E				+								+	+			+		+				+		+	+	+			+		
				Reduce impounded areas inside the SHS.	D,E																			+			+		+					+		
				Sustain productive fish and wildlife habitats in South Houma Swamps (SHS)	F				+																										+		
				Minimize direct removal within the SHS.	D,E																			+			+		+					+		
				Reclaim the north of the Lake Boudreaux System and South of Houma Swamps Area	A, B, D,F				+	+					+																+			+		
	EU3a-4 Fringing Marshes East	Function disruption due tosubsidence, wave/wake energy, tidal exchange, freshwater/sediment disruption, salt water intrusion, and direct removal.	High loss of brackish/saline marsh, decreased fisheries, fresh wetlands and shore birds, and high reduction in storm attenuation.	Introduce sediments to the Fringing Marshes East from the Mississippi River and Atchafalaya River.	C,D,E			+	+												+			+			+		+		+					
				Reduce saltwater intrusion impacts of the Houma Navigation Canal.	E				+					+			+	+	+				+	+				+		+		+				
				Sustain productive fish and wildlife habitats in Fringing Marshes East (FME)	F				+						+		+														+		+			
				Reduce deleterious tidal energy impacts within Fringing Marshes East (FME).	E		+	+	+			+	+	+			+	+			+		+				+		+		+					
				Reduce wave/wake energy impacts to the FME.	A,G							+	+	+			+	+										+		+		+					
				Protect and maintain the ridge.	D												+							+			+		+		+					

* Ecosystems Unit Future Risk, percent changed: L= Low Loss (1-15); M = Moderate Loss (16-49); H = High Loss (< 5); Increase (I); Not Applicable (NA); Steady (S); Decrease (D); Increase (I); Unknown (U)
** Alternative Plan (Measure used in Alternative Plans)

Coastwide Objectives:
A - Reduce storm damage vulnerability of coastal communities, resources, and infrastructure.
B - Minimize exposure of traditional flood protection measures to open Gulf conditions.
C - Increase sediment input from sources outside estuarine basins, and manage existing sediment resources within estuarine basines, to sustain and rejuvenate existing wetlands, rebuild marsh substrate and construct flood protections projects.
D - Maintain or establish natural landscape features and hydrologic processes that are critical to sustainable ecosystems structure and function, including dissipation of storm energy.
E - Establish or maintain dynamic salinity gradients that reflect natural cycles of freshwater availabilty and marine forcing (fluctuation related to normal daily and seasonal tide action or exchange).
F - Sustain productive and diverse wildlife habitats.
G - Maximize retention of river-borne sediments and nutrients within coastal wetlands.

Table 4.8c Planning Unit 3A: Objectives and Measures Table - Distributed Assets

	Geographic Location	Current Issues	Future Risk/Impact*	Planning Unit Objective	Coastal Objectives	Measures																															
						1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29					
						Initiate the LA-1 Marsh creation Project	Backfill Pipeline Canals	Bayou Lafourche 1000 cfs	Convey Atchafalaya River Water to Terrebonne Marshes	Freshwater Introduction South of Lake Decade (Avoca Island)	Freshwater Introduction via Blue Hammock Bayou	Maintain Land Bridge Between Bayous Du Large and Grand Bayou	Maintain Land Bridge Between Caillou Lake and Gulf of Mexico	Maintain Timbalier Land Bridge	Multi-Purpose Operation of the Houma Navigational Canal Lock System	Optimize flows and Atchafalya River Influence in Penchant Basin	Rehabilitate Northern Shorelines of Terrebonne/Timbalier Bays	Restore Terrebonne Barrier Islands	Alternative Operational Schemes of the Old River Control	Lower Water Levels in Upper Penchant	Enhance Atchafalaya Flow to Lower Penchant	Improve Hydrology and Drainage in the Verret Sub-basin	Stabilize Banks of Navigation Channels for Water Conveyance	Morganza to the Gulf of Mexico Hurricane Protection Study	StateParish Barrier Plan (Reaches, 1,2, and 3)	Reach 5 (LHR) and Reach 6 (HMCR) Storm Surge Protection	Madison Bay Marsh Creation and Terracing Project	West Bell Pass Barrier Headland Restoration Project	Falgout Canal Freshwater Enhancement Project	Timbalier Island East Restoration	Pipeline Conveyance of sediment to create marsh platform	Protection to distributed assets by elevated structures and protcted hurricane routes	Internal levee alignment	Maximize beneficial use of dredge material where possible				
							ALT 1**	ALT 1,2	ALT 1, 2	ALT 2	ALT 2		ALT 1, 2		ALT 1, 2	ALT 2	ALT 2	ALT 1, 2		ALT 2	ALT 1	ALT 2	ALT 1	ALT 1, 2	ALT 1, 2	ALT 1, 2				ALT 1, 2	ALT 1, 2	ALT 1, 2	ALT 2	ALT 1, 2					
Ecosystem Units	EU3a-5 Fringing Marshes West	Function disruption due to subsidence, wave/wake energy, tidal exchange, freshwater/sediment disruption, salt water intrusion, and direct removal.	Loss of brackish/saline marsh, decreased fisheries, fresh wetlands and shore birds, and reduction in storm attenuation.	Introduce sediments to the Fringing Marshes West from the Atchafalaya River.	C,D				+	+	+			+	+		+		+		+		+								+							
				Reduce saltwater intrusion impacts of the Houma Navigation channel.	E				+	+	+			+	+		+		+		+		+								+			+				
				Reduce deleterious tidal energy and salt water intrusion within Fringing Marshes West (FMW).	E			+	+	+	+	+	+	+	+		+	+	+		+		+								+			+				
				Sustain productive fish and wildlife habitats in Fringing Marshes West (FMW)	F				+	+	+						+														+							
				Reduce wave/wake energy impacts to the Fringing Marshes West.	A,G							+	+	+	+		+	+													+							
				Minimize direct removal within the FMW.	D																																		
	EU3a-6 Terrebonne Shoreline/Barrier Islands	Function disruption due to subsidence, wave/wake energy, tidal exchange, freshwater/sediment disruption, and direct removal.	High loss of barrier and back barrier marsh, decrease in oysters, fisheries, fresh wetlands and shore birds, and reduction in storm attenuation.	Enhance and maintain the storm attenuation characteristics of the Barrier Islands.	D							+	+					+												+							
				Reduce saltwater intrusion impacts of the Houma navigation channel.	E										+				+											+	+							
				Enhance and maintain the ecosystem functions and values of the Barrier Islands.	D,F							+	+	+	+			+												+							
				Sustain productive fish and wildlife habitats in Terrebonne Shoreline.	F				+	+	+	+	+	+	+		+	+												+		+						
				Eliminate removal of sediments on the Barrier Islands.	C													+																				
	EU3a-7 Penchant East	Function disruption due to subsidence, freshwater/sediment disruption, and salt water intrusion.	Loss of fresh/intermediate marsh, decrease in fisheries and shore birds, and reduction in storm attenuation.	Introduce sediment to the Penchant East area via Atchafalaya River and other sources.	C,D,G					+	+	+	+								+										+							
				Sustain productive fish and wildlife habitats in Penchant East	F				+	+	+						+			+	+																	
				Reduce salt water intrusion.	E					+	+	+	+					+			+										+							
				Reduce tidal exchange Penchant of East Marshes (PEM).	E					+	+	+	+								+										+							
				Enhance hydrologic conditions of the impounded areas within PEM.	D,F,G																+										+							

* Ecosystems Unit Future Risk, percent changed: L= Low Loss (1-15); M = Moderate Loss (16-49); H = High Loss (< 5); Increase (I); Not Applicable (NA); Steady (S); Decrease (D); Increase (I); Unknown (U)
** Alternative Plan (Measure used in Alternative Plans)

Coastwide Objectives:
A - Reduce storm damage vulnerability of coastal communities, resources, and infrastructure.
B - Minimize exposure of traditional flood protection measures to open Gulf conditions.
C - Increase sediment input from sources outside estuarine basins, and manage existing sediment resources within estuarine basines, to sustain and rejuvenate existing wetlands, rebuild marsh substrate and construct flood protections projects.
D - Maintain or establish natural landscape features and hydrologic processes that are critical to sustainable ecosystems structure and function, including dissipation of storm energy.
E - Establish or maintain dynamic salinity gradients that reflect natural cycles of freshwater availabilty and marine forcing (fluctuation related to normal daily and seasonal tide action or exchange).
F - Sustain productive and diverse wildlife habitats.
G - Maximize retention of river-borne sediments and nutrients within coastal wetlands.

Measures:

1. Morganza to the Gulf Hurricane Protection Levee alignment (30-ft storm surge @coastline)
2. Complete/Accelerate the Louisiana Coastal Area (LCA), Louisiana Ecosystem Restoration Study Near-Term Plan including:
   a) Small Bayou Lafourche reintroduction
   b) Multi-purpose operation of Houma Navigation Canal (HNC) Lock
   c) Terrebonne Basin Barrier shoreline restoration
   d) Maintain Land Bridge between Caillou Lake and Gulf of Mexico
   e) Convey Atchafalaya River Water to Northern Terrebonne marshes
   f) *Third Delta Study
   g) *Upper Atchafalaya Basin Study
3. Pipeline conveyance of sediment to create strategic marsh platforms
4. Plugging and/or backfilling oil and gas canals to restore hydrology and regulate salt water movement
5. Bankline protection to Houma Navigation Canal (HNC)
6. Bankline protection for GIWW
7. Protection to distributed assets south of Morganza to the Gulf Hurricane Protection alignment by elevated structures and protected hurricane evacuation routes
8. *Strategize and implement plan to elevate and/or relocate assets located outside the hurricane protection plans
9. Implement Chacahoula Basin Plan and other projects to alleviate inundation issues in the Verret Sub-basin
10. Maximize beneficial use of dredge material where feasible

*Not tied to specific geographic location

0 3.5 7 10.5 Miles

1:221,760

1 inch equals 3.5 miles

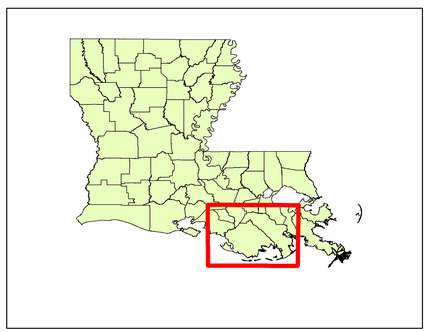
Legend

- Bankline Restoration
- Barrier Island
- Beneficial Use of Dredge Material
- Dredge Material Placement
- Freshwater Introduction
- Landbridge Restoration
- Levee Alignment
- Pipeline Conveyance of Sediment
- Protection of Distributed Assets
- River Water Re-Introduction
- Houma Navigation Canal

Sediment Delivery

Sediment Delivery

Sediment Delivery



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LOUISIANA COMPREHENSIVE COASTAL PROTECTION MASTER PLAN

FIGURE 4.4

PLANNING UNIT 3A ALTERNATIVE ONE

Measures:

1. Morganza to the Gulf Hurricane Protection Levee alignment (20-ft storm surge @coastline)
2. Internal hurricane levee alignment (30-ft storm surge @coastline)
3. Complete/Accelerate the Louisiana Coastal Area (LCA), Louisiana Ecosystem Restoration Study Near-Term Plan including:
   a) Small Bayou Lafourche reintroduction
   b) Multi-purpose operation of Houma Navigation Canal (HNC) Lock
   c) Terrebonne Basin Barrier shoreline restoration
   d) Maintain Land Bridge between Caillou Lake and Gulf of Mexico
   e) Convey Atchafalaya River Water to Northern Terrebonne marshes
   f) *Third Delta Study
   g) *Upper Atchafalaya Basin Study
4. Pipeline conveyance of sediment to create strategic marsh platforms
5. Implement Chacahoula Basin Plan and other projects to alleviate inundation issues in the Verret Sub-basin
6. Freshwater introduction via Blue Hammock Bayou
7. Freshwater introduction to south of Lake Decade and Shoreline Protection
8. Penchant Basin Plan
9. Protection to distributed assets south of Morganza to the Gulf Hurricane Protection alignment by elevated structures and protected hurricane evacuation routes
10. *Strategize and implement plan to elevate and/or relocate assets located outside the hurricane protection plans
11. Stabilize/maintain northern shoreline of Terrebonne/Timbalier Bay
12. Short-term freshwater redirections to nourish and sustain intermediate marshes that are being affected by salt water
13. Protect and maintain ridges
14. Maximize beneficial use of dredge material where feasible

*Not tied to specific geographic location

0 3.5 7 10.5 Miles

1:221,760

1 inch equals 3.5 miles

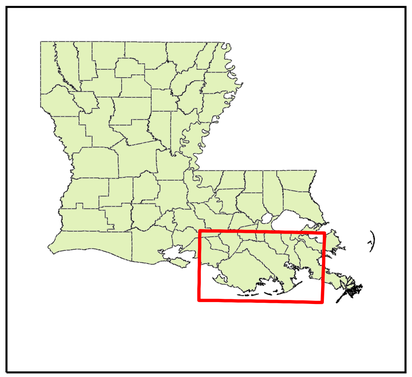
Legend

- Bankline Stabilization
- Barrier Island
- Beneficial Use of Dredge Material
- Dredge Material Placement
- Freshwater Introduction
- Internal Levee Alignment
- Landbridge Restoration
- Levee Alignment
- Penchant Basin Plan
- Pipeline Conveyance of Sediment
- Protect and Maintain Ridges
- Protection of Distributed Assets
- River Water Re-Introduction
- Shoreline Protection
- Short Term Freshwater Diversion
- Houma Navigation Canal

Sediment Delivery

Sediment Delivery

Sediment Delivery



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LOUISIANA COMPREHENSIVE COASTAL PROTECTION MASTER PLAN

FIGURE 4.5

PLANNING UNIT 3A
ALTERNATIVE TWO

5.0 Planning Unit 3b: Bayou De West to Freshwater Bayou

5.1 Overview

Planning Unit 3b (PU 3b) encompasses a majority of the West Penchant Sub-Basin in the Terrebonne Marshes, and the Atchafalaya and Teche-Vermilion Basins. The region extends from Bayou de West located west of Houma and south of Bay Junop, then westward to Freshwater Bayou. It extends north beyond the boundary of the coastal wetlands and includes Berwick, Patterson, Franklin, Jeanerette, New Iberia, Abbeville, Garden City, Sorrel, Louisa, Avery Island, Delcambre, Erath, Henry, Intracoastal City, and other communities. It covers all or part of Terrebonne, St. Mary, Iberia, and Vermilion Parishes.

There is a high to extremely high flood risk to concentrated assets from storm surges throughout the PU 3b, with future risk for increased flooding due to sea level rise, subsidence, and wetland loss. A similar picture exists for distributed assets such as oil and gas fields, facilities, and pipelines, as well as transportation infrastructure including hurricane evacuation routes.

Conditions of the ecosystem and natural resource vary throughout the planning unit. Unlike other areas of the coast, the Atchafalaya River and Wax Lake Outlet, deltas are prograding. However, other areas like the West Penchant Sub-Basin of Terrebonne Marshes and Vermilion and Cote Blanche Bays are subject to rapid erosion and subsidence rates. Subsidence is a factor throughout PU 3b, including the areas where delta building is occurring. Some areas such as Acadiana Bay and Wetlands are experiencing problems related to disconnection from riverine sediment sources. Other ecosystem units are experiencing varying levels of impact such as frequency and duration of inundation, wave, and/or wake energy which includes storm energy and sediment removal from dredging activities. Wetlands, fish and wildlife, and natural resources are experiencing varying levels of impacts ranging from no impact to high loss.

Restoring and sustaining the unique ecosystems of the West Penchant Sub-Basin, Atchafalaya River and Wax Lake Outlet, Teche-Vermilion Basin, and coastal shorelines, and historic barrier reefs are essential to providing for the livelihoods, culture, way of life, and infrastructure for the people of PU 3b. Solutions for the planning unit include providing coastal protection to communities as well as industry and infrastructure. Issues to address in this planning unit include utilizing sediment sources to combat area wide subsidence, reduce wave and wake energy impacts throughout PU 3b, reduce direct sediment removal, introduce sediments into areas of need and opportunity, encourage natural delta building, protect shorelines and rebuild barrier reefs, and maintain historic tidal exchange through Southwest Pass. The vision for the future for PU 3b depends upon the level of solutions and the measures within the alternatives adopted.

Both Alternative Plan 1 and Alternative Plan 2 must include completion or acceleration of the measures within the Louisiana Coastal Authority (LCA) near-term plan as follows:

- Stabilize the Gulf shoreline at Point Au Fer Island
- Convey Atchafalaya River water to northern Terrebonne marshes
- Acadiana Bays Estuarine Restoration Feasibility Study
- Upper Atchafalaya Basin Study

5.2 Alternative Plan One

The LCA short-term projects listed previously would be included in this alternative plan. The existing ring levee protection around Berwick and Patterson would be used to provide protection for a 30-ft surge elevation at the

coast. For Planning Unit 3b, the maximum structural protection would be given by a recommended levee alignment (East Alignment Levee 3) that proceeds westward from Wax Lake Outlet along the south side of the GIWW to Freshwater Bayou. The recommended levee would provide for protection against a storm surge of 30 feet at the coast.

Coastal restoration measures chosen for this rationale were selected to provide the maximum level of protection to distributed assets. Selected measures include: creating and/or maintaining marsh and wetlands in the Acadiana Bays, Marsh Island, Rainey Marsh, and other areas; rebuilding historic reefs; utilizing to extend possible beneficial uses of dredged material and dedicated dredging to restore shoreline; and utilizing detached breakwaters where practical. Specific features for this plan include two LCA near-term projects to stabilize the Gulf shoreline at Point Au Fer Island and an effort to convey Atchafalaya River water to northern Terrebonne marshes. Other features included establishing a buffer marsh at Weeks Bay; providing wide-spread shoreline restoration along many miles of shoreline in Vermillion Bay and West Cote Blanche Bays; and constructing bank stabilization along Freshwater Bayou (Belle Island to Freshwater Lock). Beneficial uses of dredged material (Atchafalaya Bay) and dedicated dredging wherever possible to rebuild or nourish marsh should also be a key feature. Another proposed measure is to create an artificial reef complex extending from Point Chevreuil south-westward toward Marsh Island to serve as a storm surge barrier to East and West Cote Blanche Bay and Vermilion Bay.

5.3 Alternative Plan Two

Several of the proposed features would be included in Alternative Plan Two. The LCA short-term projects listed previously would be included in this alternative. For this alternative plan the recommended protection includes a levee alignment from Wax Lake Outlet to the Vermillion River following the USACE West Levee Alignment 3. The level of surge protection for the ring levee around Berwick and Patterson would be the same as Alternative Plan One. The level of protection for the Wax Lake Outlet to Vermilion River alignment is also recommended to be for a 30-ft storm surge at the coastline. Because this levee alignment is further inland than that proposed in Alternative Plan One, the levee height should be lower and the foundation conditions should be better.

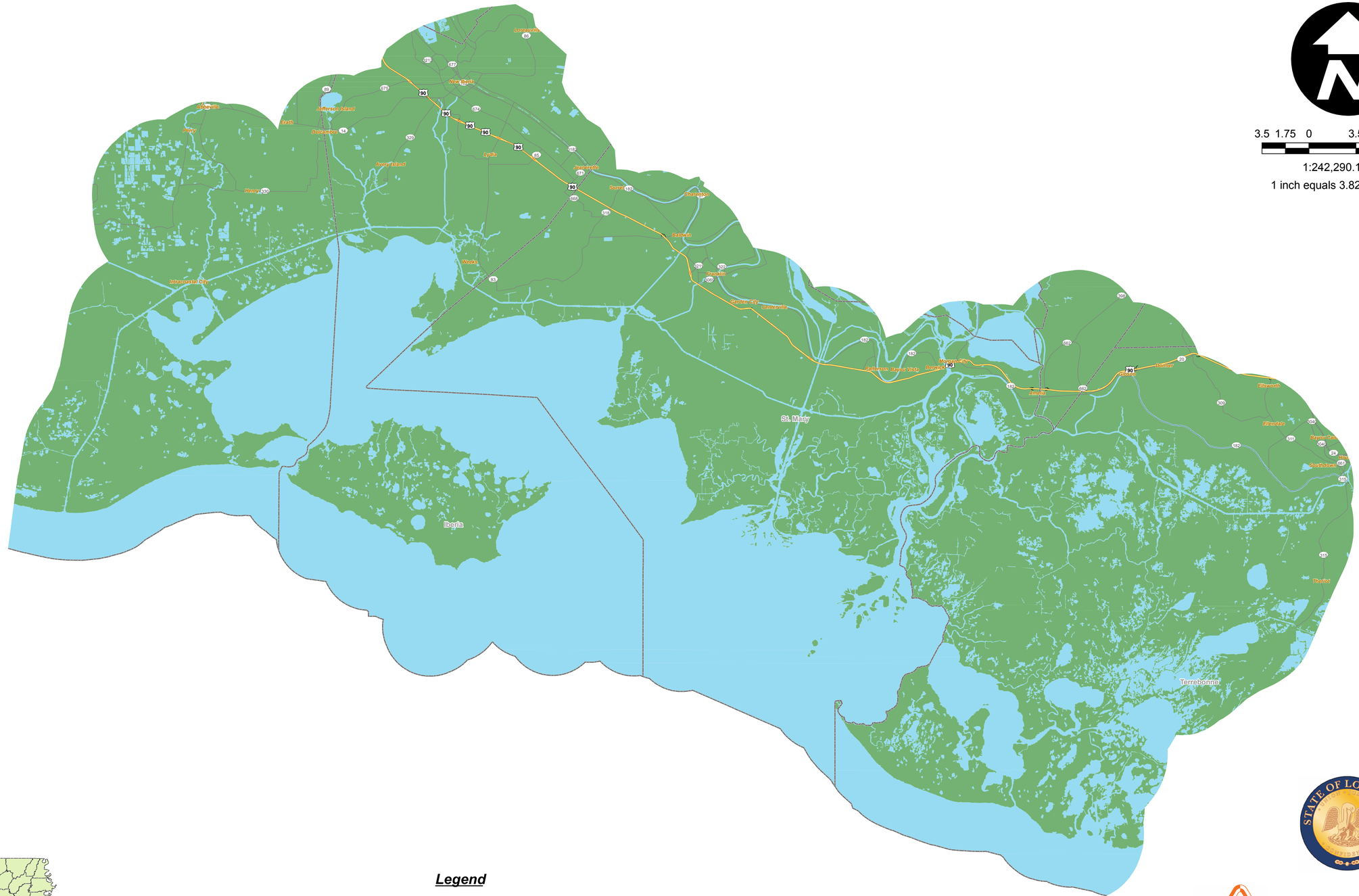
Specific features include protection levee alignment that is located inland from the coastline. The alignment follows the interface between the low marsh ground level and the edge of the higher natural levee formations along Bayou Teche. The 30-ft surge at the coast is the same as in Alternative Plan One but, due to inland location, the surge at the proposed levee height would be less than in Alternative Plan One.

The restoration features includes: a feature to increase sediment discharge through Wax Lake Outlet, that should be beneficial to slow shoreline losses as well as for marsh nourishment in many places; shoreline restoration in Vermillion Bay and West Cote Blanche Bays that is still considered to be a critical feature in both Alternative Plans. Another important feature in Alternative Two is stabilization of the bank lines along the GIWW throughout the planning unit. There is a desire to move fresh water and sediment in the GIWW from Wax Lake Outlet to the west, but there is significant leakage out the GIWW, seriously impacting the magnitude of water and sediment that arrives in the western region of PU 3b and PU 4. Southwest Pass between Marsh Island and Rainey Marsh has increased in width and thus conveys more salt water into Vermilion Bay. A feature to prevent further widening and some contraction is included.

5.4 Supporting Documentation

Supporting documentation for Planning Unit 3b Alternative Plan formulation includes the following:

Figure 5.1	Boundary and Base Map
Figure 5.2	Concentrated and Distributed Assets Map
Table 5.1	Relative Damage from Storm Surge for Concentrated Assets
Table 5.2	Concentrated Assets Scoring
Table 5.3	Relative Damage from Storm Surge for Distributed Assets
Table 5.4	Distributed Assets Scoring
Table 5.5	Distributed Assets Identification
Table 5.6	Existing Conditions and Problem Identification Table
Table 5.7	Changes in Natural Resources, 1990-2050 Table
Figure 5.3	Ecosystem Units and Natural Resources Map
Table 5.8a	Objectives and Measures Table - Concentrated Assets
Table 5.8b	Objectives and Measures Table - Distributed Assets
Table 5.8c	Objectives and Measures Table – Ecosystem Units
Figure 5.4	Alternative One Map
Figure 5.5	Alternative Two Map



3.5 1.75 0 3.5 7 Miles

1:242,290.165098

1 inch equals 3.824024 miles

Coordinate system: Louisiana South State Plane feet, NAD83, FIPS Zone 1702

Legend

- Land
- Water
- Parish Boundary
- Limited Access
- Highways
- Secondary Roads
- Other
- Highway Ramp

Shaw® Halcrow BG

LOUISIANA COMPREHENSIVE COASTAL PROTECTION MASTER PLAN

FIGURE 5.1

PLANNING UNIT 3b
BOUNDARY AND BASE MAP

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3.5 1.75 0 3.5 7
Miles

1:221,760

1 inch equals 3.5 miles

Legend

Concentrated Assets

- 1, Berwick/Patterson
- 2, Franklin
- 3, Jeanerette
- 4, Weeks Island
- 4, Avery Island
- 5, HWY 317
- 6, Delcambre
- 7, New Iberia

Distributed Assets

- DA 3b-1, Point Au Fer
- DA 3b-2, West Penchant
- DA 3b-3, Wax Lake Swamps
- DA 3b-4, Wax Lake Marshes
- DA 3b-5, Deltas
- DA 3b-6, Marsh Island
- DA 3b-7, Acadiana Bays
- DA 3b-8, Acadiana Wetlands
- DA 3b-9, Raynie Marsh

Parish Boundary

Coordinate system: Louisiana South State Plane feet, NAD83, FIPS Zone 1702

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LOUISIANA COMPREHENSIVE COASTAL PROTECTION MASTER PLAN

FIGURE 5.2

PLANNING UNIT 3b
CONCENTRATED ASSETS AND DISTRIBUTED ASSETS

PLANNING UNIT 3b: Bayou de West / Bay Junop to Freshwater Bayou

Table 5.1 Relative Damages from Storm Surge to Concentrated Assets

Proportion of assets damaged or destroyed due to storm surge: EL = Extremely Low (0-5%) L = Low (5 - 15%) M = Medium (15 - 25%) H = High (25 - 50%) EH = Extremely High (>50%)	**Storm Surge at Coastline (Feet)**	**Berwick Patterson**	**Franklin**	**Jeanerette**	**Avery / Weeks Island**	**Intercoastal City**	**Delcambre**	**Abbeville**	**New Iberia**
	5	EL	EL	EL	EL	EL	L	EL	EL
	10	EL	EL	L	EL	M	M	L	EL
	15	EL	M	M	M	H	H	M	L
	20	H	M	H	H	EH	EH	H	M
	25	EH	EH	EH	H	EH	EH	EH	H
	30	EH	EH	EH	EH	EH	EH	EH	EH

Table 5.2 Concentrated Assets Scoring

Scoring Criteria	**Storm Surge at Coastline (Feet)**	**Berwick Patterson**	**Franklin**	**Jeanerette**	**Avery / Weeks Island**	**Intercoastal City**	**Delcambre**	**Abbeville**	**New Iberia**
1. Residences	**25**	12	12	8	3	2	5	10	12
2. Industry	**20**	10	10	8	8	9	8	10	12
3. Infrastructure	**15**	10	8	6	8	5	5	8	10
4. Institutional & Publicly Owned Facilities	**20**	9	11	7	1	5	4	10	11
5. Strategic Resources	**20**	10	8	4	1	5	4	7	8
Total Score	**100**	**51**	**49**	**33**	**21**	**26**	**26**	**45**	**53**

Table 5.3 Relative Damages from Storm Surge to Distributed Assets[1]

Proportion of assets damaged or destroyed due to storm surge: EL = Extremely Low (0-5%) L = Low (5 - 15%) M = Medium (15 - 25%) H = High (25 - 50%) EH = Extremely High (>50%)	**Storm Surge at Coastline (Feet)**	**DA-1** Point Au Fer	**DA-2** West Penchant	**DA-3** Wax Lake Swamps	**DA-4** Wax Lake Marshes	**DA-5** Deltas	**DA-6** Marsh Island	**DA-7** Acadiana Bays	**DA-8** Acadiana Wetlands	**DA-9** Raynie Marsh
	5	EL	EL	EL	EL	EL	EL	EL	EL	L
	10	L	L	EL	EL	L	M	L	M	M
	15	M	M	L	M	M	H	H	H	H
	20	H	H	L	H	H	EH	EH	EH	EH
	25	EH	EH	H	EH	EH	EH	EH	EH	EH
	30	EH	EH	EH	EH	EH	EH	EH	EH	EH

[1] Assets outside of the defined concentrated areas (see Concentrated and Distributed Assets Map)

Table 5.4 Scoring of Distributed Assets

Scoring Criteria	**Maximum Score for Resources**	**DA-1** Point Au Fer	**DA-2** West Penchant	**DA-3** Wax Lake Swamps	**DA-4** Wax Lake Marshes	**DA-5** Deltas	**DA-6** Marsh Island	**DA-7** Acadiana Bays	**DA-8** Acadiana Wetlands	**DA-9** Raynie Marsh
National Significance	**25**	10	20	25	20	15	10	15	25	20
State Significance	**25**	15	15	20	15	15	15	15	20	15
Local Significance	**25**	25	15	20	15	20	25	20	20	15
Critical to Recovery	**25**	5	5	25	5	10	5	5	25	5
Total Score	**100**	**55**	**55**	**90**	**55**	**60**	**55**	**55**	**90**	**55**

TABLE 5.5 DISTRIBUTED ASSETS FOR PLANNING UN IT 3b

The land outside the defined communities was divided into areas of surge impact commonality. For Planning Unit 2 these are defined by the significant water bodies that impact these areas:

Point Au Fer	= DA 3b-1
West Penchant	= DA 3b-2
Wax Lake Swamp	= DA 3b-3
Wax Lake Marshes	= DA 3b-4
Deltas	= DA 3b-5
Marsh Island	= DA 3b-6
Acadiana Bays	= DA 3b-7
Acadiana Wetlands	= DA 3b-8
Raynie Marsh	= DA 3b-9

Within these areas following assets are comprised:

	Assets	Oil & Gas	Pipelines	Highway, Bridges & Transportation	Evacuation Routes	Ports, Waterway & Infrastructure	Other Strategic Assets
DA 3b-1	Oil & Gas Wells	X					
	Oil & Gas Pipelines		X				
DA 3b-2	Oil & Gas Wells	X					
	Oil & Gas Pipelines		X				
	GIWW					X	
	Bayou's Bouef, Black & Chene					X	
	Transco/Williams Facility						X
DA 3b-3	Oil & Gas Facilities	X					
	Oil & Gas Pipelines		X				
	Hwy 90 (future I-49)			X	X		
	Hwy 182			X			
	Atchafalaya Bridges (2)			X			
	Wax Lake Outlet					X	
DA 3b-4	Oil & Gas Facilities	X					
	Oil & Gas Pipelines		X				
	Wax Lake Outlet					X	
	Atchafalaya River					X	
DA 3b-5	Oil & Gas Facilities	X					
	Oil & Gas Pipelines		X				
	Atchafalaya River					X	
	Wax Lake Outlet					X	

	Assets	Oil & Gas	Pipelines	Highway, Bridges & Transportation	Evacuation Routes	Ports, Waterway & Infrastructure	Other Strategic Assets
DA 3b-6	Oil & Gas Facilities	X					
	Oil & Gas Pipelines		X				
	Hunting and Fishing Sites						X
	Southwest Pass					X	
DA 3b-7	Oil & Gas Facilities	X					
	Oil & Gas Pipelines		X				
	Acadiana Navigation Canal					X	
	Vermillion River Cut-off					X	
DA 3b-8	Oil & Gas Facilities	X					
	Oil & Gas Pipelines		X				
	Port of West St. Mary					X	
	Port of Iberia					X	
	Port of Delcambre					X	
	Freshwater Bayou					X	
	U.S. Highway 90				X		
DA 3b-9	Oil & Gas Facilities	X					
	Oil & Gas Pipelines		X				
	Freshwater Bayou					X	
	Freshwater Bayou Lock					X	
	Southwest Pass					X	

Table 5.6. Planning Unit 3B Existing Conditions/ Problem Identification

NOTE: Rankings are only relatable within an ecosystem unit; the purpose is not to prioritize between units, but rather to prioritize function disruptions within ecosystem units

	Ecosystem Unit								
Function Disruption (System Threat)	**EU 3b-1 Point Au Fer**	**EU 3b-2 West Penchant**	**EU 3b-3 Wax Lake Swamps**	**EU 3b-4 Wax Lake Marshes**	**EU 3b-5 Deltas**	**EU 3b-6 Marsh Island**	**EU 3b-7 Acadiana Bays**	**EU 3b-8 Acadiana Wetlands**	**EU 3b-9 Raynie Marsh**
Subsidence	M	M	M	M	M	M	M	M	M
Tidal Exchange	L	NI	NI	NI	NI	L	L	NI	L
Sediment Disruptions	NI	H	NI	NI	NI	NI	M	L	L
Salt Water Intrusion	NI	NI	NI	NI	NI	NI	NI	NI	NI
Altered Inundation	NI	H	L*	L	L	NI	NA	L	M
Wave/Wake Energy	M	H	L	L	L	M	H	H	M
Direct Removal	M	H	M	L	NI	M	NA	M	L

No Impact	NI
Low	L
Moderate	M
High	H
Very High	VH

Subsidence = true subsidence; benchmark elevations not referenced to tide gauges
Tidal Exchange = Daily tide energy; assumed to be more destructive to historically fresh/intermediate wetlands, more beneficial to brackish/saline wetlands; assumed that if fresh to fresh then not exposed to tidal scour.
Sediment Disruptions = disconnection from riverine sources
Saltwater Intrusion = due to encroachment of Gulf on landscape edge or movement up canals & channels
Altered Inundation = altered frequency or duration of inundation, not related to RSLR; e.g., impoundments
Wave/Wake Energy = includes storm energy
Direct Removal = dredging sediments or covering by spoil banks & levees.

* Avoca Island in this sub unit

Table 5.7. Planning Unit 3B Changes in Natural Resources, 1990 - 2050 (From Coast 2050 Report; LCA Land Change Map)

	Ecosystem Unit								
Resource	EU 3b-1 Point Au Fer	EU 3b-2 West Penchant	EU 3b-3 Wax Lake Swamps	EU 3b-4 Wax Lake Marshes	EU 3b-5 Deltas	EU 3b-6 Marsh Island	EU 3b-7 Acadiana Bays	EU 3b-8 Acadiana Wetlands	EU 3b-9 Raynie Marsh
Swamp	NA	NA	NA	NA	NA	NA	NA	NI	NA
Fresh/Intermediate Marsh	NA	M	M	M	I	NA	NA	M	I
Brackish/Saline Marsh	M	NA	NA	NA	NA	L	L	L	L
Beach/Dune/Back Barrier Marsh	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sessile Estuarine (Oysters)	S	NI	NI	NI	U	NI	NI	D	NI
Saltwater (Red Drum)	S	S	NI	NI	U	S	S	S	S
Freshwater (Largemouth Bass)	I	I	I	I	U	NI	NI	I	I
Estuarine (Spotted Seatrout)	D	D	NI	NI	U	D	D	D	NI
Estuarine (Shrimp)	S	S	NI	NI	U	S	S	S	S
Woodland Edge (Deer)	S	S	S	S	NI	NI	NI	S	S
Woodland Avifauna	NI	S	NI	NI	NI	NI	NI	D	NI
Fresh Wetlands (Alligator)	D	I	I	I	I	I	NI	I	I
Muskrat	S	S	S	S	S	S	NI	S	S
Shore Birds	D	NI	S	S	S	D	NI	S	D
Loss of Storm Attenuation* **	M	M	M	L	NI	L	L	L	L

Wetland Key		% Change
No Impact	NI	0
Low Loss	L	1-15
Moderate Loss	M	16-49
High Loss	H	>50
Increase	I	
Not Applicable	NA	

Fish & Wildlife Key	
No Impact/Not historically present	NI
Steady	S
Decrease	D
Increase	I
Unknown (No information)	U

NOTES:

* = Small acreage by percentage w\in ecosys unit

** = Lake Pontchartrain Atlas

*** = Using land change as the surrogate for changes in storm attenuation capacity

EU 3b-8
EU 3b-7
EU 3b-9
EU 3b-6
EU 3b-3
EU 3b-4
EU 3b-2
EU 3b-5
EU 3b-1

3.5 1.75 0 3.5 7 Miles

1:221,760
1 inch equals 3.5 miles

Legend

Ecological Units

- EU 3b-1, Point Au Fer
- EU 3b-2, West Penchant
- EU 3b-3, Wax Lake Swamps
- EU 3b-4, Wax Lake Marshes
- EU 3b-5, Deltas
- EU 3b-6, Marsh Island
- EU 3b-7, Acadiana Bays
- EU 3b-8, Acadiana Wetlands
- EU 3b-9, Raynie Marsh

- Fresh Marsh
- Intermediate Marsh
- Brackish Marsh
- Saline Marsh
- Non-wetland
- Swamp
- Wetland Forest
- Wetland Shrub/Scrub
- Upland Shurb/Scrub
- Ag/Pasture
- Developed
- Barren
- Water

Map Document: (K:\DNR\GIS_Documents\Project_Maps\MXD\Area 3b\Final\dnr_area_3b_0002_natural_resources.mxd)
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LOUISIANA COMPREHENSIVE COASTAL PROTECTION MASTER PLAN

FIGURE 5.3

PLANNING UNIT 3b
ECOSYSTEM UNITS/NATURAL RESOURCES

Table 5.8a Planning Unit 3b: Objectives an Measures Table - Concentrated Assets

	Geographic Location	Current Issues	Future Risk/Impact	Planning Unit Objective	Measures																														
					1	2a	2b	2c	2d	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26			
					Hurricane Protection Levee	Stabilize Gulf Shoreline of Point Au Fer Island	Convey Atchafalaya River water to Northern/Terrebone Marshes	Acadiana bays estuarine restoration feasibility sutdy	Upper Achafalaya Basin Study	Create Marsh at Weeks Bay	Create Marshes at Marsh Island	Restore Vermillion Bay and East & West Cote Bays shorelins	Increase Sediment Transport Down Wax Lake Outlet	Maintain Northern Shore of East Cote Branche Bay at Point Marone	Rebuild Historic Reefs at Point Au Fer	Stabilize banks of Southwest Pass off Marsh Island and Rainey Marsh	Acadiana Bay Estuarine Restoration for Old Shell Ridge	Maintain Vermillion East and West Cote Blanche Bays as Brackish	Optimize GIWW Flow to Marshes and Eliminate GIWW Direct Flows into Vermillion Bay	Resolve Cote Blanche Bays Salinity and Turbidity Issues	Create an Artificial Reef Complex from Point Chevreuil Southward	Storm Surge Protection - Levee Alignment South of GIWW	Storm Surge Protection - Levee Alignment North of GIWW	Point Chevreuil Shoreline Protection Project	Vermillion Bay Shoreline Beach Restoration/Vegetative Plant & Maintance	Beneficial Uses of Dredged Material/Dedicated Dredging/Avoca Lake	Beneficial Uses of Dredged Material/Dedicated Dredging/shorelines	Maximize sediment use from Atchafalaya River	Stabilize shoreline - Freshwater Bayou to Southwest Pass	Stabilize shorelines-Point Au Fer to Pelican Island	Stabilize shorelines-Lighthouse Point to South Point/Marsh Island	Stabilize shorelines-Freshwater Bayou and GIWW	Freshwater Bayou Bank Stabilization			
					Alt. 1** Alt. 2**	Alt. 1 Alt. 2	Alt. 1 Alt. 2	Alt. 1 Alt. 2	Alt. 1 Alt. 2	Alt. 1 Alt. 2	Alt. 1 Alt. 2	Alt. 2	Alt. 1	Alt. 1 Alt. 2	Alt. 1 Alt. 2	Alt. 2	Alt. 1	Alt. 1	Alt. 1 Alt. 2	Alt. 1 Alt. 2	Alt. 1	Alt. 1	Alt. 2	Alt. 1	Alt. 1 Alt. 2	Alt. 1	Alt. 1 Alt. 2	Alt. 2	Alt. 2	Alt. 1 Alt. 2	Alt. 2	Alt. 2	Alt. 1 Alt. 2			
Concentrated Assets	**Berwick & Patterson**	Extremely high flood risk to Concentrated Assets with storm surges over 25 ft.	Increased flood risk to assets due to sea level rise and wetland loss.	Provide coastal protection to Berwick & Patterson Concentrated Assets.	+	+			+						+															+					
	Franklin	Extremely high flood risk to Concentrated Assets with storm surges over 25 ft.	Increased flood risk to assets due to sea level rise and wetland loss.	Provide coastal protection to Franklin Concentrated Assets.	+				+			+											+	+	+	+		+				+				
	Jeanerette	Extremely high flood risk to Concentrated Assets with storm surges over 25 ft.	Increased flood risk to assets due to sea level rise and wetland loss.	Provide coastal protection to Jeanerette Concentrated Assets.	+				+			+											+	+	+	+		+					+			
	Avery/Weeks Island	High level of flood risk to Concentrated Assets with storm surges over 30 ft.	Significantly increased flood risk due to wetland loss exposing defence structures to open gulf conditions.	Provide coastal protection to Avery/Weeks Island Concentrated Assets.	+			+		+		+											+	+	+	+		+					+	+		
	Intracoastal City	Extremely high flood risk to Concentrated Assets with storm surges over 20 ft.	Significantly increased flood risk due to wetland loss exposing defence structures to open gulf conditions.	Provide coastal protection to Intercoastal City Concentrated Assets.	+			+		+	+	+											+	+		+		+			+		+	+		
	Delcambre	Extremely high flood risk to Concentrated Assets with storm surges over 20 ft.	Increased flood risk to assets due to sea level rise and wetland loss.	Provide coastal protection to Delcambre Concentrated Assets.	+			+		+	+	+											+	+		+		+					+	+		
	Abbeville	Extremely high flood risk to Concentrated Assets with storm surges over 25 ft.	Increased flood risk to assets due to sea level rise and wetland loss.	Provide coastal protection to Abbeville Concentrated Assets.	+			+		+	+	+											+	+		+		+					+	+		
	New Iberia	Extremely high flood risk to Concentrated Assets with storm surges over 30 ft.	Increased flood risk to assets due to sea level rise and wetland loss.	Provide coastal protection to New Iberia Concentrated Assets.	+			+			+	+											+	+		+		+					+	+		

* Current issues, percent flooded: H = High (25-50%); EH= Extremely High (> 50%)
** Alternative Plan (Measure used in Alternative Plans)

Coastwide Objectives:
A - Reduce storm damage vulnerability of coastal communities, resources, and infrastructure.
B - Minimize exposure of traditional flood protection measures to open Gulf conditions.
C - Increase sediment input from sources outside estuarine basins, and manage existing sediment resources within estuarine basines, to sustain and rejuvenate existing wetlands, rebuild marsh substrate and construct flood protections projects.
D - Maintain or establish natural landscape features and hydrologic processes that are critical to sustainable ecosystems structure and function, including dissipation of storm energy.
E - Establish or maintain dynamic salinity gradients that reflect natural cycles of freshwater availabilty and marine forcing (fluctuation related to normal daily and seasonal tide action or exchange).
F - Sustain productive and diverse wildlife habitats.
G - Maximize retention of river-borne sediments and nutrients within coastal wetlands.

Table 5.8b Planning Unit 3b: Objectives and Measures Table - Distributed Assets

	Geographic Location	Current Issues	Future Risk/Impact	Planning Unit Objective	Measures																														
					1	2a	2b	2c	2d	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26			
					Hurricane Protection Levee	Stabilize Gulf Shoreline of Point Au Fer Island	Convey Atchafalaya River water to NorthernTerrebone Marshes	Acadiana bays estuarine restoration feasibility sutdy	Upper Achafalaya Basin Study	Create Marsh at Weeks Bay	Create Marshes at Marsh Island	Restore Vermilion Bay and East & West Cote Bays shorelins	Increase Sediment Transport Down Wax Lake Outlet	Maintain Northern Shore of East Cote Branche Bay at Point Marone	Rebuild Historic Reefs at Point Au Fer	Stabilize banks of Southwest Pass off Marsh Island and Rainey Marsh	Acadiana Bay Estuarine Restoration for Old Shell Ridge	Maintain Vermillion East and West Cote Blanche Bays as Brackish	Optimize GIWW Flow to Marshes and Elliminate GIWW Direct Flows into	Resolve Cote Blanche Bays Salinity and Turbidity Issues	Create an Artificial Reef Complex from Point Chevreuil Southward	Storm Surge Protection - Levee Alignment South of GIWW	Storm Surge Protection - Levee Alignment North of GIWW	Point Chevreuil Shoreline Protection Project	Vermillion Bay Shoreline Beach Restoration/Vegetative Plant & Maintance	Beneficial Uses of Dredged Material/Dedicated Dredging/Avoca Lake	Beneficial Uses of Dredged Material/Dedicated Dredging/Shorelines	Maximize sediment use from Atchafalaya River	Stabilize shoreline - Freshwater Bayou to Southwest Pass	Stabilize shorelines-Point Au Fer to Pelican Island	Stabilize shorelines-Lighthouse Point to South Point/Marsh Island	Stabilize shorelines-Freshwater Bayou and GIWW	Freshwater Bayou Bank Stabilization		
					Alt. 1** Alt. 2**	Alt. 1 Alt. 2	Alt. 1 Alt. 2	Alt. 1 Alt. 2	Alt. 1 Alt. 2	Alt. 1 Alt. 2	Alt. 1 Alt. 2	Alt. 2	Alt. 1	Alt. 1 Alt. 2	Alt. 1 Alt. 2	Alt. 2	Alt. 1	Alt. 1	Alt. 1 Alt. 2	Alt. 1 Alt. 2	Alt. 1	Alt. 1	Alt. 2	Alt. 1	Alt. 1 Alt. 2	Alt. 1	Alt. 1 Alt. 2	Alt. 2	Alt. 2	Alt. 1 Alt. 2	Alt. 2	Alt. 2	Alt. 1 Alt. 2		
Distributed Assets	DA3b-1 Point Au Fer	Extremely high level of damage to Distributed Assets with storm surges over 25 ft.	Increased risk to assets due to sea level rise and wetland loss.	Provide coastal protection to oil and gas fields and pipelines.		+									+											+			+						
	DA3b-2 West Penchant	Extremely high level of flood risk to Distributed Assets with storm surges over 25 ft.	Increased flood risk to assets due to sea level rise and wetland loss.	Provide coastal protection to GIWW, Bayou's Buoef, Black & Chene.	+	+									+							+	+				+			+						
				Provide coastal protection to oil and gas fields and pipelines.	+	+									+				+			+	+				+			+						
	DA3b-3 Wax Lake Swamps	Extremely high level of flood risk to Distributed Assets with storm surges over 30 ft.	Increased flood risk to assets due to sea level rise and wetland loss.	Provide coastal protection to oil and gas fields and pipelines.	+	+							+		+							+					+			+						
				Provide coastal protection to Wax Lake Swamp.		+							+		+										+		+			+						
				Provide coastal protection to Highways, bridges, and Evacuation Routes.	+	+				+		+										+	+		+		+			+						
	DA3b-4 WaX Lake Marshes	Extremely high level of damage to Distributed Assets with storm surges over 25 ft.	Increased flood risk to assets due to sea level rise and wetland loss.	Provide coastal protection to oil and gas fields and pipelines.	+	+						+			+							+	+		+		+			+						
				Provide coastal protection to Wax Lake Outlet and Atchafalaya River.	+	+							+		+							+	+				+	+		+						
	DA3b-5 Deltas	Extremely high level of damage to Distributed Assets with storm surges over 25 ft.	Loss of Distributed Assets due to permanent erosion/flooding.	Provide coastal protection to oil and gas fields and pipelines.	+					+		+							+		+	+	+		+		+				+					
				Provide coastal protection to Wax Lake Outlet and Atchafalaya River.	+	+							+		+							+	+				+	+		+						
	DA3b-6 Marsh Island	Extremely high level of damage to Distributed Assets with storm surges over 20 ft.	Loss of Distributed Assets due to permanent erosion/flooding.	Provide coastal protection to oil and gas facilities and pipelines.				+			+	+	+			+	+				+				+			+	+		+					
				Maintain Southwest Pass.				+			+					+									+		+	+	+		+					
	DA3b-7 Acadiana Bays	Extremely high level of damage to Distributed Assets with storm surges over 20 ft.	Loss of Distributed Assets due to permanent erosion/flooding.	Provide coastal protection to oil and gas facilities and pipelines.				+		+	+	+	+			+	+								+		+	+			+	+				
				Maintain the Acadiana Navigation Canal and Vermillion River Cutoff.	+			+				+				+	+					+	+		+		+		+		+	+				
	DA3b-8 Acadiana Wetlands	Extremely high level of damage to Distributed Assets with storm surges over 20 ft.	Loss of Distributed Assets due to permanent erosion/flooding.	Provide coastal protection to oil and gas facilities and pipelines.				+		+	+	+	+			+	+								+		+	+			+	+				
				Provide coastal protection to evacuation route.	+			+		+		+	+						+						+		+				+	+				
				Provide coastal protection to Freshwater Bayou and Ports of West St. Mary, Iberia, and Delcambre.	+			+		+	+	+	+			+						+	+		+		+		+		+	+	+			
	DA3b-9 Rainey Marsh	Extremely high level of damage to Distributed Assets with storm surges over 20 ft.	Loss of Distributed Assets due to permanent erosion/flooding.	Provide coastal protection to oil and gas facilities and pipelines.				+		+	+	+	+			+									+		+		+		+	+	+			
				Maintatin Freshwater Bayou, Freshwater Bayou Lock and Southwest Pass.				+		+	+	+				+									+		+		+		+	+	+			

* Current issues, percent flooded: H = High (25-50%); EH= Extremely High (> 50%)
** Alternative Plan (Measure used in Alternative Plans)

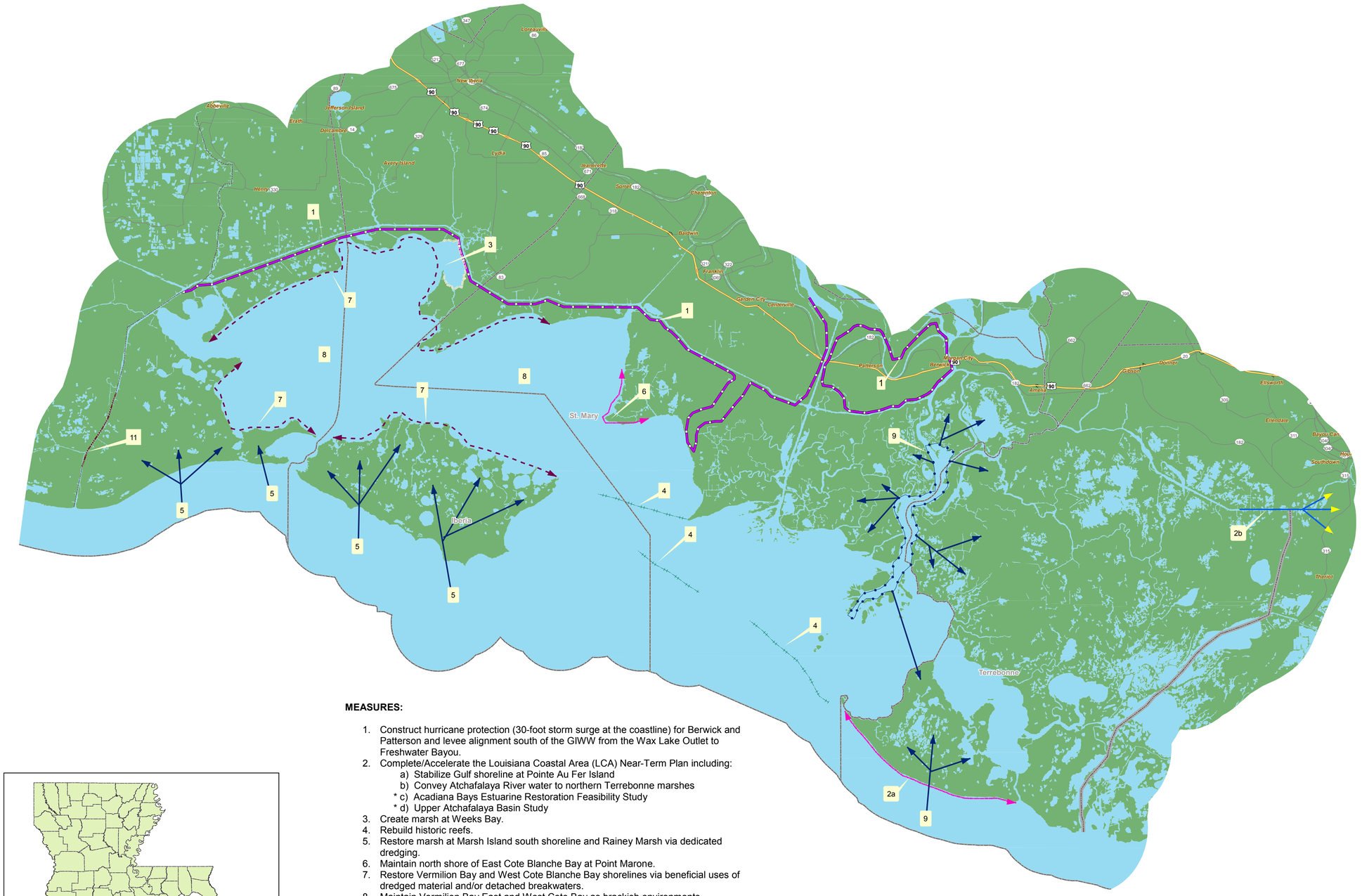
Coastwide Objectives:
A - Reduce storm damage vulnerability of coastal communities, resources, and infrastructure.
B - Minimize exposure of traditional flood protection measures to open Gulf conditions.
C - Increase sediment input from sources outside estuarine basins, and manage existing sediment resources within estuarine basines, to sustain and rejuvenate existing wetlands, rebuild marsh substrate and construct flood protections projects.
D - Maintain or establish natural landscape features and hydrologic processes that are critical to sustainable ecosystems structure and function, including dissipation of storm energy.
E - Establish or maintain dynamic salinity gradients that reflect natural cycles of freshwater availabilty and marine forcing (fluctuation related to normal daily and seasonal tide action or exchange).
F - Sustain productive and diverse wildlife habitats.
G - Maximize retention of river-borne sediments and nutrients within coastal wetlands.

Table 5.8c Planning Unit 3b: Objectives and Measures Table - Ecosystem Units

	Geographic Location	Current Issues	Future Risk/Impact*	Planning Unit Objective	Measures																														
					1	2a	2b	2c	2d	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26			
					Hurricane Protection	Stabilize Gulf Shoreline of Point Au Fer Island	Convey Atchafalaya River water to NorthernTerrebonne Marshes	Acadiana bays estuarine restoration feasibility sutdy	Upper Achafalaya Basin Study	Create Marsh at Weeks Bay	Create Marshes at Marsh Island	Restore Vermillion Bay and East & West Cote Bays shorelins	Increase Sediment Transport Down Wax Lake Outlet	Maintain Northern Shore of East Cote Branche Bay at Point Marone	Rebuild Historic Reefs at Point Au Fer	Stabilize banks of Southwest Pass off Marsh Island and Rainey Marsh	Acadiana Bay Estuarine Restoration for Old Shell Ridge	Maintain Vermillion East and West Cote Blanche Bays as Brackish	Optimize GIWW Flow to Marshes and Eliminate GIWW Direct Flows into	Resolve Cote Blanche Bays Salinity and Turbidity Issues	Create an Artificial Reef Complex from Point Chevreuil Southward	Storm Surge Protection - Levee Alignment South of GIWW	Storm Surge Protection - Levee Alignment North of GIWW	Point Chevreuil Shoreline Protection Project	Vermillion Bay Shoreline Beach Restoration/Vegetative Plant & Maintance	Beneficial Uses of Dredged Material/Dedicated Dredging/Avoca Lake	Beneficial Uses of Dredged Material/Dedicated Dredging/shorelines	Maximize sediment use from Atchafalaya River	Stabilize shoreline - Freshwater Bayou to Southwest Pass	Stabilize shorelines-Point Au Fer to Pelican Island	Stabilize shorelines-Lighthouse Point to South Point/Marsh Island	Stabilize shorelines-Freshwater Bayou and GIWW	Freshwater Bayou Bank Stabilization		
					Alt. 1** Alt. 2**	Alt. 1 Alt. 2	Alt. 1 Alt. 2	Alt. 1 Alt. 2	Alt. 1 Alt. 2	Alt. 1 Alt. 2	Alt. 1 Alt. 2	Alt. 2	Alt. 1	Alt. 1 Alt. 2	Alt. 1 Alt. 2	Alt. 2	Alt. 1	Alt. 1	Alt. 1 Alt. 2	Alt. 1 Alt. 2	Alt. 1	Alt. 1	Alt. 2	Alt. 1	Alt. 1 Alt. 2	Alt. 1	Alt. 1 Alt. 2	Alt. 2	Alt. 2	Alt. 1 Alt. 2	Alt. 2	Alt. 2	Alt. 1 Alt. 2		
Ecosystem Units	**EU3b-1 Point Au Fer**	Function disruption due to subsidence, wave/wake energy and direct removal.	Moderate loss of brackish/saline marsh, decreased fisheries and wildlife, and reduction in storm attenuation.	Introduce Atchafalaya River sediments into the Point Au Fer Island area (PAF).		+	+								+				+								+	+		+					
				Reduce wave/wake energy impacts to the PAF.		+	+								+												+	+		+					
				Reduce direct removal of sediment from the PAF.		+	+								+												+	+		+					
				Sustain productive fish and wildlife habitats.		+									+												+	+		+					
	EU3b-2 West Penchant	Function disruption due to subsidence, freshwater/sediment disruption, wave/wake energy, altered inundation, and direct removal.	Moderate loss of fresh/intermediate marsh, decreased fisheries, and reduction in storm attenuation.	Increase introduction of Atchafalaya River sediments into the West Penchant area (WP).			+		+																	+		+							
				Reduce wave/wake energy impacts to the WP.		+			+						+																+					
				Restore hydrology within WP.			+												+				+												
	EU3b-3 Wax Lake Swamps	Function disruption due to direct removal and subsidence.	Moderate loss of fresh/intermediate marsh and reduction in storm attenuation.	Reduce direct removal of sediment from the Wax Lake Swamps.			+		+				+						+				+				+	+							
	EU3b-4 Wax Lake Marshes	Function disruption due to subsidence.	Moderate loss of fresh/intermediate marsh.	Encourage natural delta building processes.			+		+				+															+						
	EU3b-5 Delta	Function disruption due to subsidence.	Ongoing delta building.	Encourage natural delta building processes.			+		+				+															+						
	EU3b-6 Marsh Island	Function disruption due to subsidence, wave/wake energy and direct removal.	Decrease in fisheries and shore birds.	Sustain productive fish and wildlife habitats in Marsh Island.							+	+				+			+		+				+		+		+		+	+		
				Reduce wave/wake energy impacts to Marsh Island.							+	+				+									+		+		+		+	+		
				Introduce Atchafalaya River sediments into the Marsh Island area.							+	+	+																+						
				Reduce direct removal on Marsh Island.				+			+	+	+			+									+		+	+	+		+	+		
	EU3b-7 Acadiana Bays	Function disruption due to subsidence, wave/wake energy and freshwater/sediment disruption.	Loss of saline/brackish marsh, decrease in fisheries and reduced storm attenuation.	Sustain productive fish and wildlife habitats in Acadiana Bays.				+	+	+	+	+				+									+		+		+		+	+		
				Maintain landbridge between Acadiana Bays and the GIWW.				+		+		+	+	+					+			+		+	+		+		+		+	+		
				Reduce/eliminate impounded areas within the PEM.				+				+	+						+						+		+		+		+	+		
				Plug outlets from GIWW into Acadiana Bays.				+		+	+	+										+			+		+							
	EU3b-8 Acadiana Wetlands	Function disruption due to subsidence, wave/wake energy and direct removal.	Moderate loss of marsh, decrease in fisheries, avifuana and habitats, and reduction in storm attenuation.	Maintain landbridge between Acadiana Bays and the GIWW.				+		+		+	+	+					+			+		+	+		+		+		+	+		
				Introduce freshwater and sediments from the Atchafalaya River into the Acadiana Wetlands (AW).				+	+				+															+						
				Reduce wave/wake energy impacts to AW.				+		+		+	+								+				+		+				+	+	+		
				Reduce direct removal of sediment from AW.				+		+	+	+	+												+						+	+	+		
	EU3b-9 Rainey Marsh	Function disruption due to subsidence, altered inundation, and wave/wake energy.	Conversion of brackish/saline to freshwater/intermediate marsh, decrease in shore birds.	Introduce sediments into the Rainey Marsh.				+		+	+	+	+			+									+		+	+	+		+			
				Reduce wave/wake energy impacts to Rainey Marsh.				+				+				+									+		+		+		+		+		

* Ecosystems Unit Future Risk, percent changed: L= Low Loss (1-15); M = Moderate Loss (16-49); H = High Loss (< 5); Increase (I); Not Applicable (NA); Steady (S); Decrease (D); Increase (I); Unknown (U)
** Alternative Plan (Measure used in Alternative Plans)

Coastwide Objectives:
A - Reduce storm damage vulnerability of coastal communities, resources, and infrastructure.
B - Minimize exposure of traditional flood protection measures to open Gulf conditions.
C - Increase sediment input from sources outside estuarine basins, and manage existing sediment resources within estuarine basines, to sustain and rejuvenate existing wetlands, rebuild marsh substrate and construct flood protections projects.
D - Maintain or establish natural landscape features and hydrologic processes that are critical to sustainable ecosystems structure and function, including dissipation of storm energy.
E - Establish or maintain dynamic salinity gradients that reflect natural cycles of freshwater availabilty and marine forcing (fluctuation related to normal daily and seasonal tide action or exchange).
F - Sustain productive and diverse wildlife habitats.
G - Maximize retention of river-borne sediments and nutrients within coastal wetlands.



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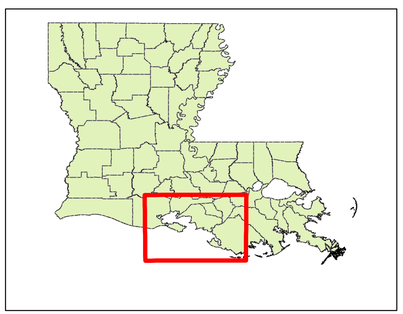
1 inch equals 4 miles

Legend

- Levee Alignment
- Marsh Buffer
- Reef Restoration
- Beneficial Use of Dreged Material
- Dredged Material Placement
- Bank Stabilization
- Freshwater Diversion
- Shoreline Protection
- Shoreline Restoration
- PU_3b_Buffer



MEASURES:

1. Construct hurricane protection (30-foot storm surge at the coastline) for Berwick and Patterson and levee alignment south of the GIWW from the Wax Lake Outlet to Freshwater Bayou.
2. Complete/Accelerate the Louisiana Coastal Area (LCA) Near-Term Plan including:
   a) Stabilize Gulf shoreline at Pointe Au Fer Island
   b) Convey Atchafalaya River water to northern Terrebonne marshes
   * c) Acadiana Bays Estuarine Restoration Feasibility Study
   * d) Upper Atchafalaya Basin Study
3. Create marsh at Weeks Bay.
4. Rebuild historic reefs.
5. Restore marsh at Marsh Island south shoreline and Rainey Marsh via dedicated dredging.
6. Maintain north shore of East Cote Blanche Bay at Point Marone.
7. Restore Vermilion Bay and West Cote Blanche Bay shorelines via beneficial uses of dredged material and/or detached breakwaters.
8. Maintain Vermilion Bay East and West Cote Bay as brackish environments.
9. Beneficial uses of dredged material and dedicated dredging wherever possible to rebuild marsh, shorelines and barrier islands.
10. Strategize and implement plan to elevate and/or relocate assets located outside the hurricane protection plans.
11. Freshwater Bayou Bank Stabilization – Belle Isle to Lock.

* Not tied to geographic location.

LOUISIANA COMPREHENSIVE COASTAL PROTECTION MASTER PLAN

FIGURE 5.4

PLANNING UNIT 3b
ALTERNATIVE ONE

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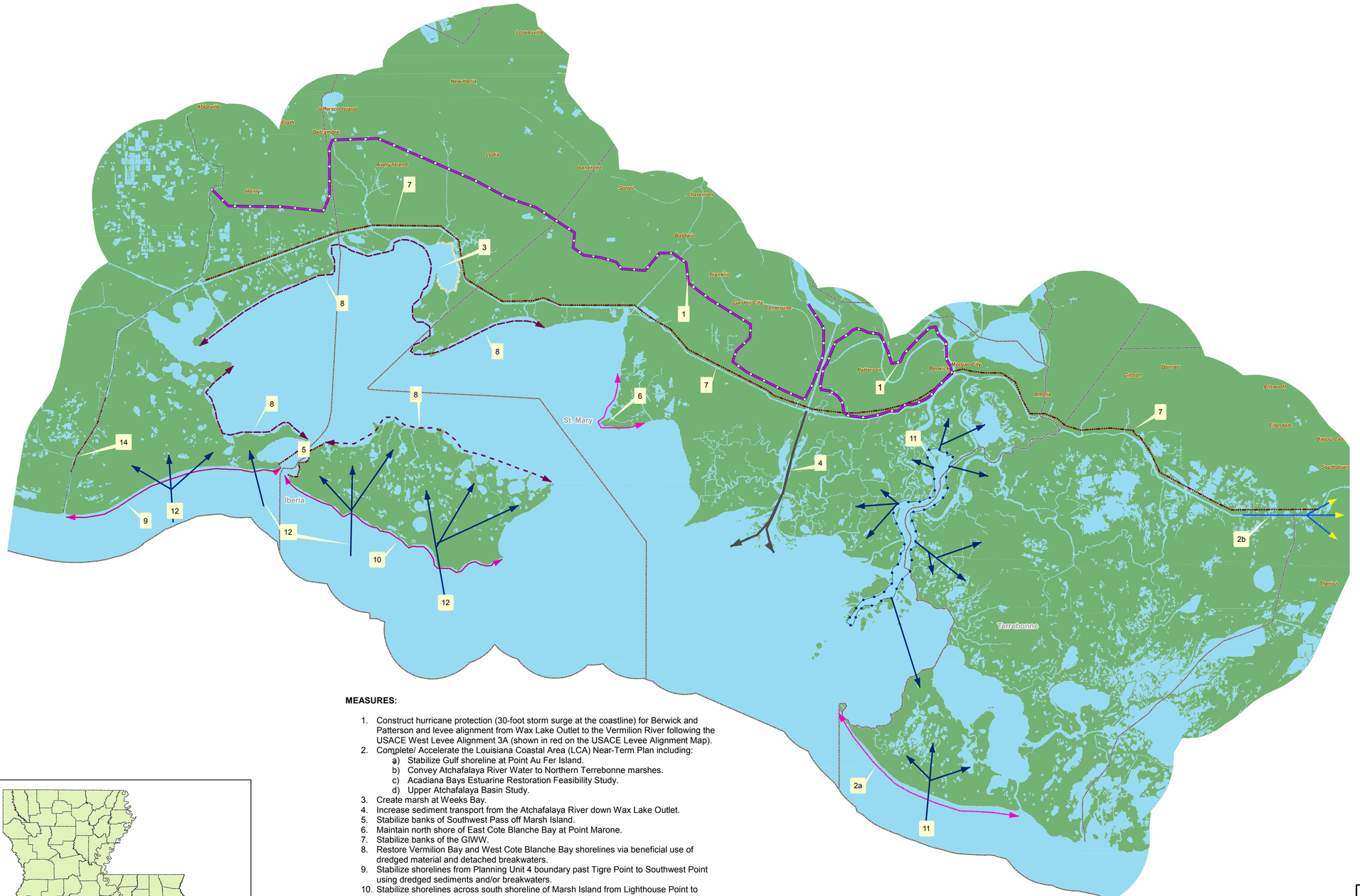

0 2 4 8 12 Miles

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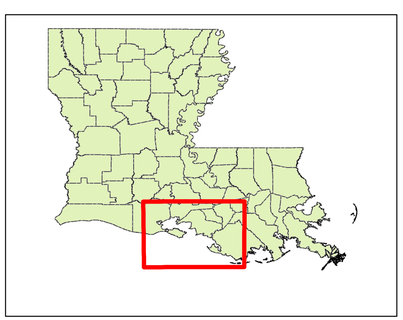
1 inch equals 4 miles

Legend

- Levee Alignment
- Marsh Buffer
- Reef Restoration
- Beneficial Use of Dreged Material
- Dredged Material Placement
- Bank Stabilization
- Freshwater Diversion
- Shoreline Protection
- Shoreline Restoration
- PU_3b_Buffer



MEASURES:

1. Construct hurricane protection (30-foot storm surge at the coastline) for Berwick and Patterson and levee alignment from Wax Lake Outlet to the Vermilion River following the USACE West Levee Alignment 3A (shown in red on the USACE Levee Alignment Map).
2. Complete/ Accelerate the Louisiana Coastal Area (LCA) Near-Term Plan including:
   a) Stabilize Gulf shoreline at Point Au Fer Island.
   b) Convey Atchafalaya River Water to Northern Terrebonne marshes.
   c) Acadiana Bays Estuarine Restoration Feasibility Study.
   d) Upper Atchafalaya Basin Study.
3. Create marsh at Weeks Bay.
4. Increase sediment transport from the Atchafalaya River down Wax Lake Outlet.
5. Stabilize banks of Southwest Pass off Marsh Island.
6. Maintain north shore of East Cote Blanche Bay at Point Marone.
7. Stabilize banks of the GIWW.
8. Restore Vermilion Bay and West Cote Blanche Bay shorelines via beneficial use of dredged material and detached breakwaters.
9. Stabilize shorelines from Planning Unit 4 boundary past Tigre Point to Southwest Point using dredged sediments and/or breakwaters.
10. Stabilize shorelines across south shoreline of Marsh Island from Lighthouse Point to South Point (east of Mound Point) using dredged sediments and/or breakwaters.
11. Beneficial use of dredged material and dedicated dredging wherever possible to rebuild marsh shorelines, historic reefs and barrier islands.
12. Restore marsh at Marsh Island south shoreline and Rainey marsh via dedicated dredging and beneficial use of dredged material.
13. * Strategize and implement plan to elevate and/or relocate assets located outside of the hurricane protection plans.
14. Freshwater Bayou Bank Stabilization – Belle Isle to Freshwater Lock.

* Not tied to a specific geographic location.

Shaw® Halcrow BG

LOUISIANA COMPREHENSIVE COASTAL PROTECTION MASTER PLAN

FIGURE 5.5

PLANNING UNIT 3b ALTERNATIVE TWO

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6.0 Planning Unit 4: Freshwater Bayou to Sabine River

6.1 Overview

Planning Unit 4 (PU 4) extends from the western bank of the Freshwater Bayou Canal westward to the Louisiana/Texas border in Sabine Lake, and from the Gulf of Mexico in the south to the northern boundary established areas that are subject to storm or tidal surge. The Unit includes all or parts of Vermilion, Cameron, Acadia, Jefferson Davis, and Calcasieu parishes. The Chenier Plain extends from Freshwater Bayou westward to Sabine Pass, and is influenced by three interconnected rivers and marine processes. There are two major hydrologic basins in the Cheniers: the Mermentau Basin and the Calcasieu/Sabine Basin.

The Sabine/Neches Waterway, Calcasieu River Navigation Channel, the Gulf Intracoastal Waterway (GIWW), Mermentau Ship Channel, and Freshwater Bayou Canal are the navigation channels of the Chenier Plain, and all of them influence hydrology throughout the planning unit. Saltwater intrusion and wave and wind energy are the main forces driving salinity into freshwater marshes and causing deterioration of fresh marsh, which is not necessarily replaced by salt marsh but has remained as shallow open water.

Many of the wetlands in PU 4 are hydrologically isolated because of dredged canals and berms, roads and highways, the GIWW, and flood protection levees. During floods and large storm events, these areas can be slow to drain and create temporary ponds that can result in additional loss of wetlands due to drowning. Significant oil and gas facilities, chemical plants and other coast-related industries are located in the Lake Charles area, Lafayette, Hackberry, Vinton, and smaller communities. Agricultural land and cattle land are the primary land uses in much of PU 4. According to sources that are familiar with the region, this land was severely impacted by Hurricane Rita. Farmers are not able to plant crops on their land because of residual salt in the soil. The native vegetation, fish and wildlife in State Wildlife Management Areas and the National Wildlife Refuges have also been severely impacted by residual salt, causing death or degradation to almost all vegetation and freshwater ponds. In addition, coastal erosion is rampant along the entire shoreline of PU 4, and this is proliferating salt water intrusion. The detached off-shore breakwaters, protecting Highway 82 between Constance and Holly Beach, performed well through Hurricane Rita.

The planning, procedures and logic that was used to develop the rationale in this planning unit follows that described for the overall coast of Louisiana. It is discussed elsewhere in this report. The list of possible restoration projects was compiled from the following sources: USACE study for the Louisiana Coastal Authority (LCA), the Coastal 2050: Toward a Sustainable Coastal Louisiana report (2050), the Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA), the Louisiana Coastal Protection Restoration study (LACPR), the Emergency Support Function 14 (ESF-14) report. These documents provided the understanding and information that was used to evaluate the current risk to the natural communities (fish, wildlife, aquatic habitat, terrestrial habitat, wetlands, beaches, and shorelines). No new studies were performed.

6.2 Alternative Plan One

Alternative Plan One provides levee protection to the maximum number of human communities. The protection and restoration objectives that are adopted for the Louisiana Comprehensive Costal Protection Master Plan would be applied to the design of the levee to insure that it protects the natural resources as well. The existing coastal features are included in the design height of the levee, and they must be preserved to maintain the design parameters for the levee. This alternative was not constrained by the benefit to costs ratio. The long-term O&M costs were not included in the selection of features.

The result is the levee proposed by the USACE along the south side of the GIWW. The proposed levee height is adequate for a 30-ft high hurricane surge at the Coastline. The distance from this levee alignment to the open waters of the Gulf of Mexico varies from ten to twenty miles. Enhancing and maintaining a healthy terrestrial habitat in this area is one of the criteria applied to the design of the levee height. Promoting the beneficial use of sediment and obtaining sediment from sources outside of this planning unit are important for preserving marsh. Zoning and other measures are proposed for communities and assets south of the GIWW. Maintaining Louisiana Highways 27 and 82, and the other highways between the coast and I-10, for evacuation routes is an important measure in this plan.

The strategy in this alternative satisfies the expectation for a freshwater system in the Mermentau Basin. The measures include fresh water inflow from the Atchafalaya Basin, fresh water from the Sabine River, and fresh water from the Red River. The connection to the Red River source is via the Mermentau channel. The GIWW is used to distribute this fresh water to strategic locations across this planning unit. A new lock, constructed at the location of the existing Calcasieu Lock, would handle navigation requirements and regulate fresh water discharges simultaneously.

Landform and vegetation are important features for reducing surge heights. The Coast 2050 study concluded that future land loss in the Lakes Sub-basin could be reduced by 57 percent by managing the water levels. Fresh water control structures are proposed along Louisiana Highway 82; a water control structure is proposed at Little Pecan Island; and a water control structure is proposed at Rollover Bayou.

It is important to preserve the existing landforms between the levee and the Gulf of Mexico. The beach, coastline, cheniers, and land bridge between Grand Lake and White Lake are important landscape features both for storm surge reduction and ecosystem function. Shoreline stabilization is proposed along the coast, and shoreline protection is proposed in Grand and White Lakes. Bank protection is proposed along the GIWW. The beneficial use of sediment and obtaining sediment from sources outside of this planning unit are important for preserving the marsh.

The strategy for the Calcasieu/Sabine Sub-basins deals with salinity issues. This alternative regards navigation as a given asset. It focuses on managing the salinity gradient by increasing the fresh water supply from sources outside of the planning unit and by controlling the connection between the Calcasieu Ship Channel and the Gulf of Mexico. Salinity control structures are proposed around the lake, and a control structure is proposed across the Calcasieu near the existing ferry.

Ecosystem restoration projects that maximize acres of wetlands and provide other coastal features are proposed regardless of the sustaining nature of these features in the long term. That is, the use of long distance pipeline is proposed for delivering sediment rather than the construction of river diversions that provide a long-term solution.

6.3 Alternative Plan Two

Alternative Plan Two proposes a variable level of hurricane protection based on the risk to concentrated assets and the risk to distributed asset. The rationale would compute the risk using the probability of a given surge height at the coastline and would evaluate the consequences using a rational developed for concentrated assets, distributed assets, and ecosystem assets.

This strategy provides ring levees for Lake Charles, Lafayette, Abbeville, Gueydan, Kaplan and Vinton. Protection for other communities would be provided by zoning, by building codes, by elevating assets above

surge heights and by relocation. As in Alternative Plan One, maintaining Louisiana Highways 27 and 82, and the other highways between the coast and I-10, for evacuation routes is an important measure in this plan.

Grand and White Lakes would be managed as fresh water lakes. The strategy includes fresh water inflow from the Atchafalaya Basin via the GIWW. It utilizes the GIWW to distribute this fresh water to strategic locations across this planning unit. A new lock, constructed at the location of the existing Calcasieu Lock, would handle navigation requirements and regulate fresh water discharges simultaneously. It provides structures for passing flow at Louisiana Highway 82. The need to re-establish a normal hydrological exchange and to maximizing the use of alternatives that do not disrupt the overland flow of water are emphasized. Rather than seeking fresh water from the Red River basin, this strategy manages flows in the Mermentau basin to mimic historical flows by implementing the use of best management practices.

This strategy seeks to preserve natural landforms such as the beach, the coastline, cheniers, and the land bridge between Grand Lake and White Lake. These are important landscape features both for storm surge reduction and ecosystem function. Shoreline stabilization is proposed along the coast, and shoreline protection is proposed in Grand and White Lakes. Bank protection is proposed along the GIWW.

The strategy for the Calcasieu/Sabine Sub-basins regards subsidence and sea level rise as primary concerns in long-term sustainability of the historical with salinity gradient. This alternative regards navigation as a given asset. The key difference between this alternative plan and Alternative Plan One is acknowledging that the pre-navigation salinity gradient is not sustainability in the long term in this sub basin. The strategy focuses on allowing the sub basin to transition to brackish/saline over time while managing the salinity gradient to the extent possible by utilizing the fresh water supply that is available from sources outside of the planning unit. The Sabine River and the Atchafalaya River are proposed as possible sources for increasing the fresh water supply to these sub basins. This strategy recognizes that new management practices would not include newly proposed salinity control structures beyond those currently ready to accept construction funding.

Promoting the beneficial use of sediment and obtaining sediment from sources outside of this planning unit are important for preserving marsh. These measures are proposed even though the historical salinity gradient is not sustainable.

6.4 Supporting Documentation

Supporting documentation for PU 4 Alternative Plan formulation includes the following:

Figure 6.1	Boundary and Base Map
Figure 6.2	Concentrated and Distributed Assets Map
Table 6.1	Relative Damage from Storm Surge for Concentrated Assets
Table 6.2	Concentrated Assets Scoring
Table 6.3	Relative Damage from Storm Surge for Distributed Assets
Table 6.4	Distributed Assets Scoring
Table 6.5	Distributed Assets Identification
Table 6.6	Existing Conditions and Problem Identification Table
Table 6.7	Changes in Natural Resources, 1990-2050 Table
Figure 6.3	Ecosystem Units and Natural Resources Map
Table 6.8a	Objectives and Measures Table - Concentrated Assets

Table 6.8b Objectives and Measures Table - Distributed Assets
Table 6.8c Objectives and Measures Table – Ecosystem Units
Figure 6.4 Alternative One Map
Figure 6.5 Alternative Two Map

Legend

- Land
- Water
- Parish Boundary
- Limited Access
- Highways
- Secondary Roads
- Other
- Highway Ramp

4 2 0 4 8 Miles

1:253,440
1 inch equals 4 miles

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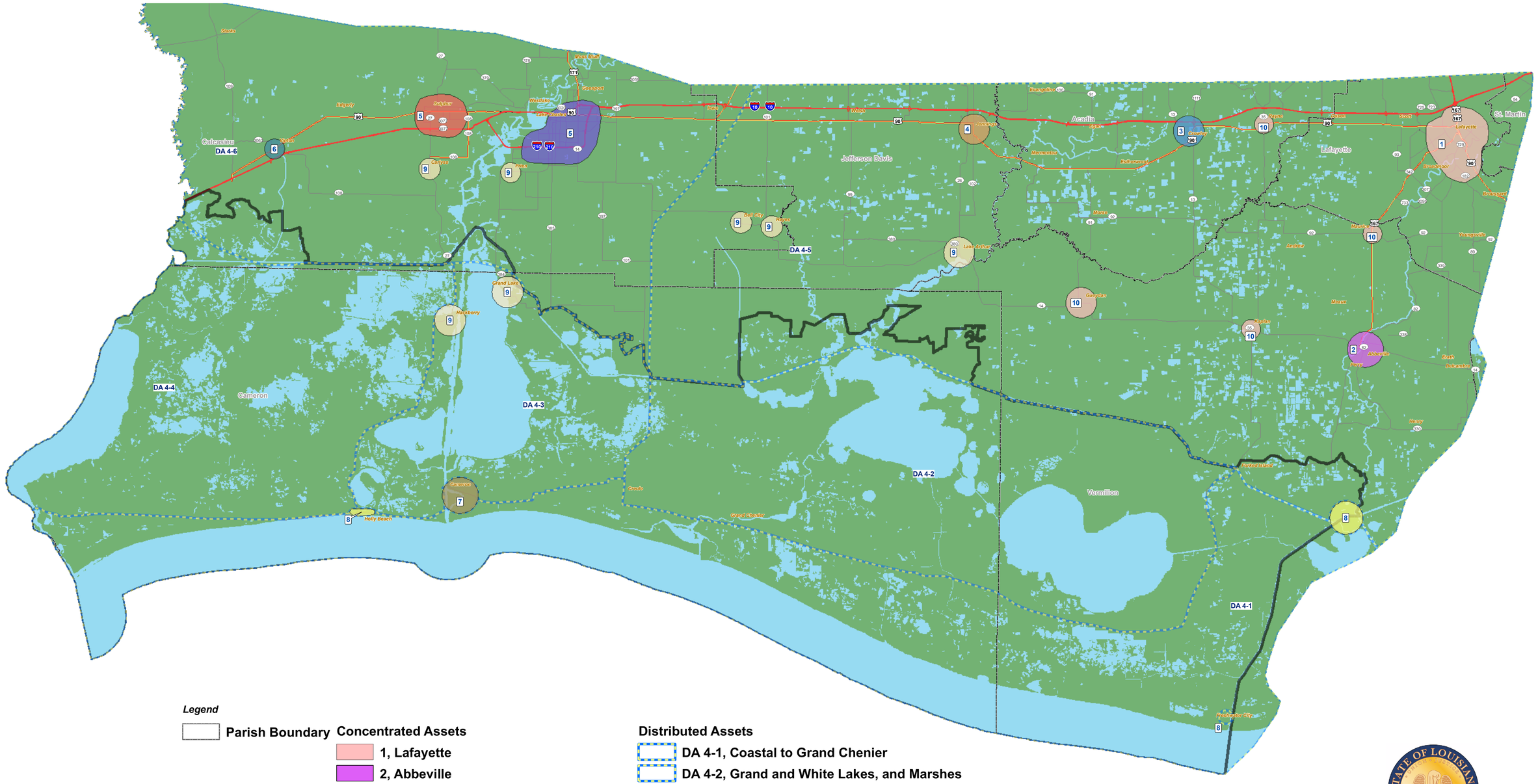
LOUISIANA COMPREHENSIVE COASTAL PROTECTION MASTER PLAN

FIGURE 6.1

PLANNING UNIT 4
BOUNDARY AND BASE MAP



Legend

Parish Boundary

Concentrated Assets

- 1, Lafayette
- 2, Abbeville
- 3, Crowley
- 4, Jennings
- 5, Lake Charles
- 5, Sulphur
- 6, Vinton
- 7, Cameron
- 8, Coastal Communiteis
- 9, Western Central CZM Communities
- 10, Agricultural & Crawfish Communities

Distributed Assets

- DA 4-1, Coastal to Grand Chenier
- DA 4-2, Grand and White Lakes, and Marshes
- DA 4-3, Calcasieu to Gulf Corridor
- DA 4-4, Sabine Marshes
- DA 4-5, Acadian Parishes
- DA 4-6, Vicinity of Lake Charles

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1 inch equals 3.91 miles

LOUISIANA COMPREHENSIVE COASTAL PROTECTION MASTER PLAN

FIGURE 6.2

PLANNING UNIT 4
CONCENTRATED ASSETS AND DISTRIBUTED ASSETS

PLANNING UNIT 4: Freshwater Bayou to Sabine River

Table 6.1 Relative Damages from Storm Surge to Concentrated Assets

Proportion of assets damaged or destroyed due to storm surge: EL = Extremely Low (0-5%) L = Low (5 - 15%) M = Medium (15 - 25%) H = High (25 - 50%) EH = Extremely High (>50%)	**Storm Surge at Coastline (Feet)**	**Lafayette**	**Abbeville**	**Crowley**	**Jennings**	**Lake Charles**	**Vinton**	**Cameron**	**Coastal Communities**	**West Central CZM Towns**	**Agriculture & CrawfishTowns**
	5	EL	EL	EL	EL	EL	EL	EL	EL	EL	EL
	10	EL	EL	EL	EL	L	EL	EL	EL	EL	EL
	15	EL	H	EL	EL	H	EL	EL	EL	EL	EL
	20	EL	H	EL	EH	EH	EL	H	H	H	EH
	25	EH	EH	EL	EH	EH	EH	EH	EH	EH	EH
	30	EH	EH	EH	EH	EH	EH	EH	EH	EH	EH

Table 6.2 Concentrated Assets Scoring

Scoring Criteria	**Maximum Score for Resource**	**Lafayette**	**Abbeville**	**Crowley**	**Jennings**	**Lake Charles**	**Vinton**	**Cameron**	**Coastal Communities**	**West Central CZM Towns**	**Agriculture & CrawfishTowns**
1. Residences	25	20	12	5	8	20	5	5	5	12	5
2. Industry	20	5	5	5	5	20	5	15	5	5	15
3. Infrastructure	15	15	10	5	5	15	5	5	5	5	5
4. Institutional and Publicly Owned Facilities	15	15	10	5	5	15	5	10	5	10	5
5. Strategic Resources	25	10	5	5	5	25	5	17	5	10	5
Total Score	**100**	**65**	**42**	**25**	**28**	**95**	**25**	**52**	**25**	**42**	**35**

Table 6.3 Relative Damages from Storm Surge to Distributed Assets[1]

Proportion of assets damaged or destroyed due to storm surge: EL = Extremely Low (0-5%) L = Low (5 - 15%) M = Medium (15 - 25%) H = High (25 - 50%) EH = Extremely High (>50%)	**Storm Surge at Coastline (Feet)**	**DA-1** Coastal to Grand Chenier	**DA-2** Grand and White Lakes and Marshes	**DA-3** Calcasieu to Gulf Corridor	**DA-4** Sabine Marshes	**DA-5** Arcadian Parishes	**DA-6** Vicinity of Lake Charles
	5	EL	EL	EL	EL	EL	EL
	10	EH	EH	EH	EH	EH	EH
	15	EH	EH	EH	EH	EH	EH
	20	EH	EH	EH	EH	EH	EH
	25	EH	EH	EH	EH	EH	EH
	30	EH	EH	EH	EH	EH	EH

[1] Assets outside of the defined concentrated areas (see Concentrated and Distributed Assets Map)

Table 6.4 Scoring of Distributed Assets

Scoring Criteria	**Maximum Score for Resources**	**DA-1** Coastal to Grand Chenier	**DA-2** Grand and White Lakes and Marshes	**DA-3** Calcasieu to Gulf Corridor	**DA-4** Sabine Marshes	**DA-5** Arcadian Parishes	**DA-6** Vicinity of Lake Charles
National Significance	**25**	10	10	15	5	10	25
State Significance	**25**	10	10	15	5	10	25
Local Significance	**25**	25	25	25	25	25	25
Critical to Recovery	**25**	10	10	10	10	25	25
Total Score	**100**	**55**	**55**	**65**	**45**	**70**	**100**

TABLE 6.5. DISTRIBUTED ASSETS IDENTIFICATION FOR PLANNING UN IT 4

The land outside the defined communities was divided into areas of surge impact commonality. For Planning Unit 4 these are defined by the significant water bodies that impact these areas:

Coast to Grand Chenier	= DA 4-1
Grand & White Lakes & Marshes	= DA 4-2
Calcasieu to Gulf Corridor	= DA 4-3
Sabine Marshes	= DA 4-4
Acadian Parishes	= DA 4-5
Vicinity of Lake Charles	= DA 4-6

Within these areas following assets are comprised:

	Assets	Oil & Gas	Pipelines	Highway, Bridges & Transportation	Evacuation Routes	Ports, Waterway & Infrastructure	Other Strategic Assets
DA 4-1	Oil & Gas Fields and Pipelines		X				
	Hwy 82			X	X		
DA 4-2	Oil & Gas Fields and Pipelines	X	X				
	GIWW					X	
	Vermilion Lock					X	
	Hwy 82, Schooner & GIWW Bridges			X	X		
	Southern Pacific RR			X			
DA 4-3	Calcasieu Ship Channel					X	
	Oil & Gas Fields and Pipelines	X	X				
	GIWW					X	
	Hwy 27, GIWW Bridge			X	X		
DA 4-4	Oil & Gas Fields and Pipelines	X					
	GIWW					X	

TABLE 6.5. DISTRIBUTED ASSETS IDENTIFICATION FOR PLANNING UN IT 4

The land outside the defined communities was divided into areas of surge impact commonality. For Planning Unit 4 these are defined by the significant water bodies that impact these areas:

Coast to Grand Chenier	= DA 4-1
Grand & White Lakes & Marshes	= DA 4-2
Calcasieu to Gulf Corridor	= DA 4-3
Sabine Marshes	= DA 4-4
Acadian Parishes	= DA 4-5
Vicinity of Lake Charles	= DA 4-6

Within these areas following assets are comprised:

DA 4-5	Hwy 82			X	X		
	Hwy 165			X	X		
	I-10			X	X		
	Hwy 14			X	X		
DA 4-6	Oil & Gas Fields and Pipelines	X	X				
	Hwy 27			X	X		
	I-10			X	X		
	Hwy 14			X	X		
	Calcasieu Ship Channel					X	

Table 6.6. Planning Unit 4 Existing Conditions/ Problem Identification

NOTE: Rankings are only relatable within an ecosystem unit; the purpose is not to prioritize between units, but rather to prioritize function disruptions within ecosystem units

	Ecosystem Unit			
	EU 4-1	**EU 4-2**	**EU 4-3**	**EU 4-4**
Function Disruption (System Threat)	**Grand/White Lake**	**Eastern Chenier**	**Western Chenier**	**Calcasieu/Sabine Lakes**
Subsidence	L	L	L	L
Tidal Exchange	NI	H	L	L
Sediment Disruptions	L	M	M	L
Salt Water Intrusion	NI	NI	NI	H
Altered Inundation	H	H	H	H
Wave/Wake Energy	H	H	H	H
Direct Removal	H	M	M	H

No Impact	NI
Low	L
Moderate	M
High	H
Very High	VH

Subsidence = true subsidence; benchmark elevations not referenced to tide gauges
Tidal Exchange = Daily tide energy; assumed to be more destructive to historically fresh/intermediate wetlands, more beneficial to brackish/saline wetlands
Sediment Disruptions = disconnection from riverine sources
Saltwater Intrusion = due to encroachment of Gulf on landscape edge or movement up canals & channels
Altered Inundation = altered frequency or duration of inundation, not related to RSLR; e.g., impoundments
Wave/Wake Energy = includes storm energy
Direct Removal = dredging sediments or covering by spoil banks & levees.

Table 6.7. Planning Unit 4 Changes in Natural Resources, 1990 - 2050 (From Coast 2050 Report; LCA Land Change Map)

Resource	Ecosystem Unit			
	EU 4-1 Grand/White Lake	EU 4-2 Eastern Chenier	EU 4-3 Western Chenier	EU 4-4 Calcasieu/Sabine Lakes
Swamp	NA	NA	NA	NA
Fresh/Intermediate Marsh	L	L	L	L
Brackish/Saline Marsh	NA	M	M	M
Beach/Dune/Back Barrier Marsh	NA	H	M	NA
Sessile Estuarine (Oysters)	NI	I	S	S
Saltwater (Red Drum)	D	D	S	D
Freshwater (Largemouth Bass)	S	I	I	S
Estuarine (Spotted Seatrout)	D	D	S	D
Estuarine (Shrimp)	D	D	S	D
Woodland Edge (Deer)	S	D	D	S
Woodland Avifauna	D	D	D	D
Fresh Wetlands (Alligator)	S	S	S	S
Muskrat	I	S	S	S
Shore Birds	D	D	D	D
Loss of Storm Attenuation* **	L	M	M	M

Wetland Key		% Change
No Impact	NI	0
Low Loss	L	1-15
Moderate Loss	M	16-49
High Loss	H	>50
Increase	I	
Not Applicable	NA	

Fish & Wildlife Key	
No Impact/Not historically present	NI
Steady	S
Decrease	D
Increase	I
Unknown (No information)	U

NOTES:

* = Small acreage by percentage w\in ecosys unit

** = Lake Pontchartrain Atlas

*** = Using land change as the surrogate for changes in storm attenuation capacity

EU 4-4

EU 4-3

EU 4-1

EU 4-2

Fresh Marsh
Intermediate Marsh
Brackish Marsh
Saline Marsh
Non-wetland
Swamp
Wetland Forest
Wetland Shrub/Scrub
Upland Shurb/Scrub
Ag/Pasture
Developed
Barren
Water

Legend

Ecological Units

EU 4-1, Grand/White Lake
EU 4-2, Eastern Chenier
EU 4-3, Western Chenier
EU 4-4, Calcasieu/Sabine Lakes

4 2 0 4 8
Miles

1:253,440
1 inch equals 4 miles

Map Document: (K:\DNR\GIS_Documents\Project_Maps\MXD\Area 4\Final\dnr_area_4_0002_Natural_Resourcesl.mxd)
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LOUISIANA COMPREHENSIVE COASTAL PROTECTION MASTER PLAN

FIGURE 6.3

PLANNING UNIT 4
ECOSYSTEM UNITS/NATURAL RESOURCES

Table 6.8a Planning Unit 4: Objectives and Measures Table - Concentrated Assets

	Geographic Location	Current Issues*	Future Risk/Impact	Planning Unit Objective	Coastal Objectives	Measures																												
						1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
						Proposed Hurricane Protection Levee for 30-ft storm surge @ coastline	Complete/Accelerate the Cheniere Plain Freshwater and Sediment Management and Allocation Reassessment Study which was included in the LCA Near-Term Plan	Maximize freshwater inflow from Sabine River	Salinity Control structures along the east shoreline of Sabine Lake nr Blue Buck Point, Sabine Is and Sabine Pass	Beneficial uses of dredged material Program: utilize sediment from Sabine Ship Channel and dedicated dredging for marsh enhancement and construction of terraces	Salinity control structure at Sabine Pass nr Hwy 82 Causeway.	Stabilize Gulf shoreline and beach west of Calcasieu River to Sabine River using dredged sediment or breakwaters	Stabilize Gulf shoreline and beach east of Calcasieu River to Freshwater Bayou using dredged sediment or breakwaters	Salinity control structure in Calcasieu Ship Channel nr ferry.	Beneficial uses of dredged material Program: utilize sediment and dedicated dredging for marsh enhancement and construction of terraces in Calcasieu Lake	Salinity control structures at points on east side of Calcasieu Lake to aid in salinity control.	Maximize freshwater inflow to tributaries of the Mermentau from outside sources.	Maximize freshwater inflow to Mermentau from outside sources.	Stabilize Grand Lake shoreline and land bridge.	Freshwater introduction/Retention structure or sill on Little Pecan Bayou	Freshwater introduction/Retention structure or sill on Rollover Bayou	Stabilize White Lake shoreline and land bridge.	Stabilize banks from Schooner Bayou to GIWW along Freshwater Bayou and along GIWW nr White Lake	Salinity Control on Black Lake Bayou nr Hackberry.	Build new chamber for navigation at Calcasieu Lock on GIWW and use old lock to evacuate excess water.	Stabilize banks of Freshwater Bayou	Stabilize eastern shore of Lake Calcasieu	Develop a plan to elevate and/or relocate assets located outside the hurricane protection Levee	Maintain Hwy 82 for hurricane evacuation and marsh protection	Provide water control structures at strategic locations along Hwys 82 and 27.	Manage watershed to reduce rapid inflows into Mermentau Sub-basin	Restore Marsh by Filling Abandoned Canals.	Utilize freshwater inflow from Atchafalaya River.	Improve hydrology of the old Mermentau River Channel between Mud Lake and GOM.	Stabilize Banks of GIWW	Toll road on top of levee south of GIWW.
						Alt 1**	Alt 1, 2	Alt 1, 2	Alt 1, 2	Alt 1, 2	Alt 1	Alt 1, 2	Alt 1, 2	Alt 1	Alt 1, 2	Alt 1	Alt 1	Alt 1	Alt 1, 2	Alt 1	Alt 1	Alt 1, 2	Alt 1, 2	Alt 1	Alt 1, 2	Alt 1, 2	Alt 1, 2	Alt 1, 2	Alt 1, 2	Alt 1, 2	Alt 2	Alt 1	Alt 1, 2	Alt 1	Alt 1, 2	Alt 1
Concentrated Assets	**Lafayette**	Extremely high level of flood risk to Concentrated Assets with storm surges over 25 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to Lafayette concentrated assets	A, D, E	+							+												+										
	Abbeville	High level of flood risk to Concentrated Assets with storm surges over 15 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to Abbeville concentrated assets	A, D	+							+												+										
	Crowley	Extremely high level of flood risk to Concentrated Assets with storm surges over 30 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to Crowley concentrated assets	A, D	+																														
	Jennings	Extremely high level of flood risk to Concentrated Assets with storm surges over 20 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to Jennings concentrated assets	A, D	+																														
	Lake Charles	High level of flood risk to Concentrated Assets with storm surges over 15 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to Lake Charles concentrated assets	A, D, E	+						+		+	+												+									
	Vinton	Extremely high level of flood risk to Concentrated Assets with storm surges over 25 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to Vinton concentrated assets	A, D	+						+			+																					
	Cameron	Extremely high level of flood risk to Concentrated Assets with storm surges over 5 ft.	Loss of concentrated assets will be catastrophic and risk will increase due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to Cameron concentrated assets	A, D	+							+														+	+								
	Coastal Communities	Extremely high level of flood risk to Concentrated Assets with storm surges over 5 ft.	Loss of concentrated assets will be catastrophic and risk will increase due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to Intercoastal City, Freshwater City and Holly Beach concentrated assets	A, D	+						+	+														+	+								
	Western Central Coastal Zone Management Communities	Extremely high level of flood risk to Concentrated Assets with storm surges over 10 ft.	Loss of concentrated assets will be catastrophic and risk will increase due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to Hackberry, Grand Lake, Carlyss, Prien, Bell City, Hayes, and Lake Arthur concentrated assets	A, D	+						+	+	+	+				+			+															
	Agricultural & Crawfish Towns	Extremely high level of flood risk to Concentrated Assets with storm surges over 10 ft.	Loss of concentrated assets will be catastrophic and risk will increase due to sea level rise, subsidence, and wetland loss.	Provide coastal protection to Gueydon, Kaplan, Maurice and Rayne concentrated assets	A, D	+							+						+			+															

* Current issues, percent flooded: H = High (25-50%); EH= Extremely High (> 50%)
** Alternative Plan (Measure used in Alternative Plans)

Coastwide Objectives:
A - Reduce storm damage vulnerability of coastal communities, resources, and infrastructure.
B - Minimize exposure of traditional flood protection measures to open Gulf conditions.
C - Increase sediment input from sources outside estuarine basins, and manage existing sediment resources within estuarine basines, to sustain and rejuvenate existing wetlands, rebuild marsh substrate and construct flood protections projects.
D - Maintain or establish natural landscape features and hydrologic processes that are critical to sustainable ecosystems structure and function, including dissipation of storm energy.
E - Establish or maintain dynamic salinity gradients that reflect natural cycles of freshwater availabilty and marine forcing (fluctuation related to normal daily and seasonal tide action or exchange).
F - Sustain productive and diverse wildlife habitats.
G - Maximize retention of river-borne sediments and nutrients within coastal wetlands.

Table 6.8b Planning Unit 4: Objectives and Measures Table - Distributed Assets

	Geographic Location	Current Issues*	Future Risk/Impact	Planning Unit Objective	Coastal Objectives	Measures																												
						1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
						Proposed Hurricane Protection Levee for 30-ft storm surge @ coastline	Complete/Accelerate the Chenier Plain Freshwater and Sediment Management and Allocation Reassessment Study which was included in the LCA Near-Term Plan	Maximize freshwater inflow from Sabine River	Salinity Control structures along the east shoreline of Sabine Lake nr Blue Buck Point, Sabine Is and Blue Buck Point	Beneficial Uses of Dredged Material Program: Utilize sediment from Sabine Ship Channel and dedicated dredging for marsh enhancement and construction of terraces	Salinity control structure at Sabine Pass nr Hwy 82 Causeway.	Stabilize Gulf shoreline and beach west of Calcasieu River to Sabine River using dredged sediment or breakwaters	Stabilize Gulf shoreline and beach east of Calcasieu River to Freshwater Bayou using dredged sediment or breakwaters	Salinity control structure in Calcasieu Ship Channel nr ferry.	Beneficial Uses of Dredged Material Program: Utilize sediment and dedicated dredging for marsh enhancement and construction of terraces in Calcasieu Lake	Salinity control structures at points on east side of Calcasieu Lake to aid in salinity control.	Maximize freshwater inflow to tributaries of the Mermentau from outside sources.	Maximize freshwater inflow to Mermentau from outside sources.	Stabilize Grand Lake shoreline and land bridge.	Freshwater Introduction/Retention structure or sill on Little Pecan Bayou	Freshwater Introduction/Retention structure or sill on Rollover Bayou	Stabilize White Lake shoreline and land bridge.	Stabilize banks from Schooner Bayou to GIWW along Freshwater Bayou and along GIWW nr White Lake	Salinity Control on Black Lake Bayou nr Hackberry.	Build new chamber for navigation at Calcasieu Lock on GIWW and use old lock to evacuate excess water.	Stabilize banks of Freshwater Bayou	Stabilize eastern shore of Lake Calcasieu	Develop a plan to elevate and/or relocate assets located outside the hurricane protection Levee	Maintain Hwy 82 for hurricane evacuation and marsh protection	Provide water control structures at strategic locations along Hwys 82 and 27.	Manage watershed to reduce rapid inflows into Mermentau Sub-basin	Restore Marsh by Filling Abandoned Canals.	Utilize freshwater inflow from Atchafalaya River.	Improve hydrology of the old Mermentau River Channel between Mud Lake and GOM.	Stabilize Banks of GIWW	Toll road on top of levee south of GIWW.
						Alt 1	Alt 1, 2	Alt 1, 2	Alt 1, 2	Alt 1, 2	Alt 1	Alt 1, 2	Alt 1, 2	Alt 1	Alt 1, 2	Alt 1	Alt 1	Alt 1	Alt 1, 2	Alt 1	Alt 1	Alt 1, 2	Alt 1, 2	Alt 1	Alt 1, 2	Alt 1, 2	Alt 1, 2	Alt 1, 2	Alt 1, 2	Alt 1, 2	Alt 2	Alt 1	Alt 1, 2	Alt 1	Alt 1, 2	Alt 1
Distributed Assets	**DA4-1. Coast to chenier ridge at Highway 82**	High level of flood risk to Distributed Assets with storm surges over 5 ft.	Increased flood risk to assets due to sea level rise, subsidence, and wetland loss.	Maintain and protect evacuation routes between the coast and I-10.	A, D							+	+														+			+	+			+
				Protect lakes, ponds and gulf shore lines and maintain beaches	A, D, F		+					+	+												+										
				Provide coastal protection to oil and gas fields and pipelines.	A		+					+	+												+						+	+			
	DA4-2. Grand/White Lakes and marshes	Extremely high level of flood risk to Distributed Assets with storm surges over 5 ft	Increased flood risk to distributed assets due to sea level rise, subsidence, loss of the cheniers and wetland loss.	Provide coastal protection to oil and gas fields and pipelines.	A		+						+						+			+	+			+									
				Provide coastal protection to GIWW.	A	+							+						+				+			+								+	
				Provide coastal protection to Vermilion Lock.	A								+																			+	+		+	
				Provide outlets for freshwater flow under Louisiana Highway 82	D, F	+	+						+						+			+											+		
				Reduce wave/wake impacts on the shorelines of White and Grand Lakes to protect the integrity of the land bridge between them	A, D, F	+	+												+			+														
				Maintain and protect evacuation routes between the coast and I-10.	A								+																+			+	+			+
	DA4-3. Calcasieu to Gulf Corridor	Extremely high level of flood risk to Distributed Assets with storm surges over 5 ft	Increased flood risk to assets due to sea level rise, subsidence, loss of the cheniers and wetland loss.	Provide coastal protection to GIWW.	A								+																					+	
				Provide coastal protection to Strategic Oil Reserves, oil and gas facilities and pipelines	A		+					+	+		+												+								
				Provide coastal protection to Calcasieu Ship Channel.	A	+									+																					
				Protect lakes, ponds and gulf shore lines and maintain beaches	A, D, F		+						+														+	+	+							
				Provide coastal protection to Oil and Gas Production facilities	A	+				+		+	+	+	+													+								
				Maintain and protect evacuation routes between the coast and I-10.	A							+	+		+														+							+
	DA4-4. Sabine Marshes and Lake	Extremely high level of flood risk to Distributed Assets with storm surges over 5 ft	Increased flood risk to assets due to sea level rise, subsidence, loss of the cheniers and wetland loss.	Provide coastal protection to GIWW.	A					+		+																	+			+	+		+	
				Provide coastal protection to oil and gas fields and pipelines.	A		+			+		+			+																					
				Protect lakes, ponds and gulf shore lines and maintain beaches	A, D, F		+					+																								
				Promote the use of sediment from source outside of this Planning Unit, such as trapping sediment moving off-shore to increase wetland	A, C		+			+					+																	+	+			
	DA4-5. Acadian Parishes	Extremely high level of flood risk to Distributed Assets with storm surges over 10 ft.	Increased flood risk to assets due to sea level rise, subsidence, loss of the cheniers and wetland loss.	Provide coastal protection to SP Railroad.	A																														
				Provide coastal protection for the oil and gas facilities, strategic petroleum reserves, including Henry Hub, ports and waterborne	A		+																													
				Maintain and protect evacuation routes between the coast and I-10.	A							+		+																						+
	DA4-6. Vicinity of Lake Charles	Extremely high level of flood risk to Distributed Assets with storm surges over 10 ft.	Increased flood risk to assets due to sea level rise, subsidence, loss of the cheniers and wetland loss.	Provide coastal protection for the oil and gas facilities, strategic petroleum reserves, ports and waterborne commerce facilities	A		+					+		+																					
				Protect lakes, ponds and gulf shore lines and maintain beaches	A, D, F		+					+																								
				Provide coastal protection to Calcasieu Ship Channel.	A					+					+															+						
				Maintain and protect evacuation routes between the coast and I-10.	A							+		+																						+

* Current issues, percent flooded: H = High (25-50%); EH= Extremely High (> 50%)
** Alternative Plan (Measure used in Alternative Plans)

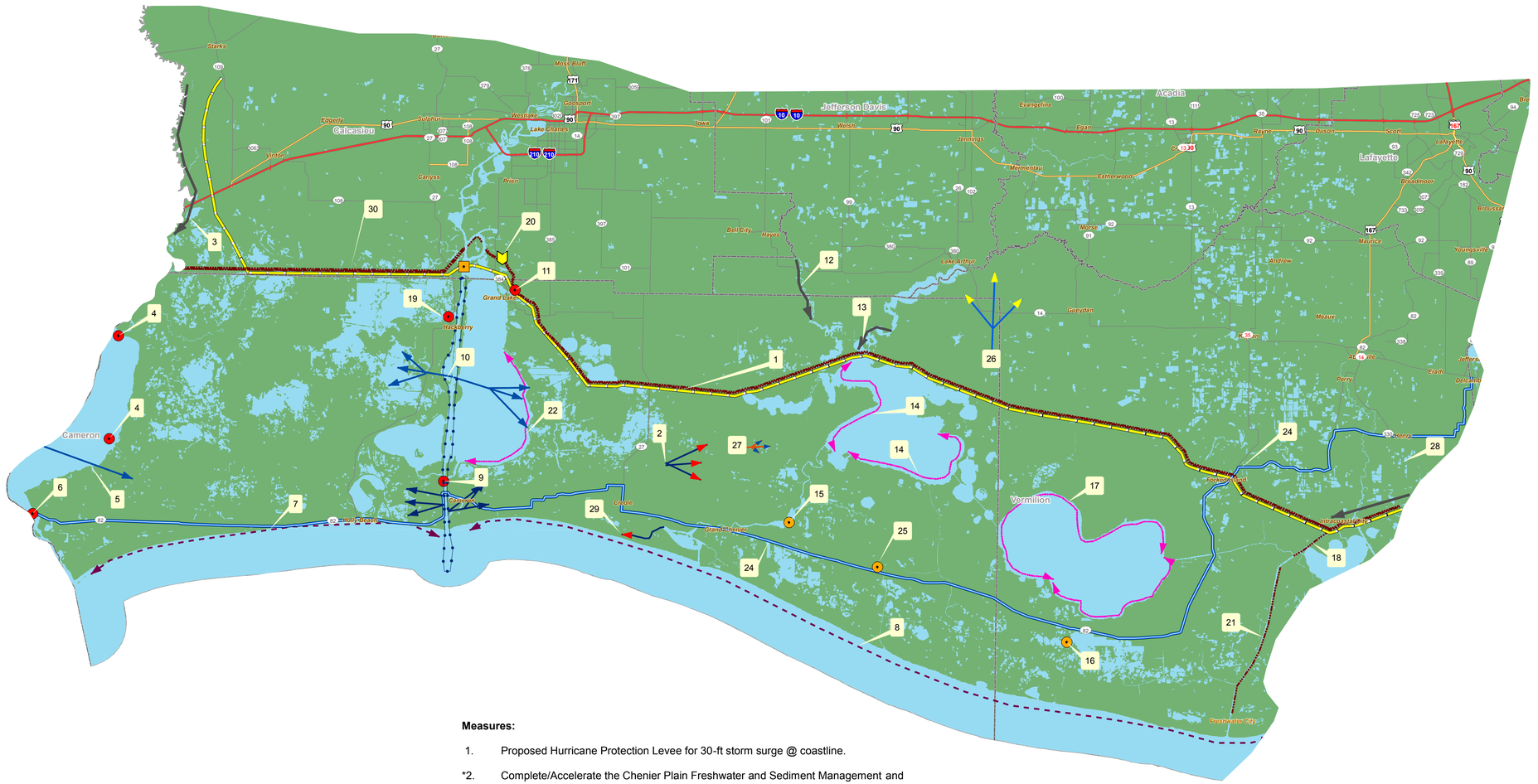
Coastwide Objectives:
A - Reduce storm damage vulnerability of coastal communities, resources, and infrastructure.
B - Minimize exposure of traditional flood protection measures to open Gulf conditions.
C - Increase sediment input from sources outside estuarine basins, and manage existing sediment resources within estuarine basines, to sustain and rejuvenate existing wetlands, rebuild marsh substrate and construct flood protections projects.
D - Maintain or establish natural landscape features and hydrologic processes that are critical to sustainable ecosystems structure and function, including dissipation of storm energy.
E - Establish or maintain dynamic salinity gradients that reflect natural cycles of freshwater availabilty and marine forcing (fluctuation related to normal daily and seasonal tide action or exchange).
F - Sustain productive and diverse wildlife habitats.
G - Maximize retention of river-borne sediments and nutrients within coastal wetlands.

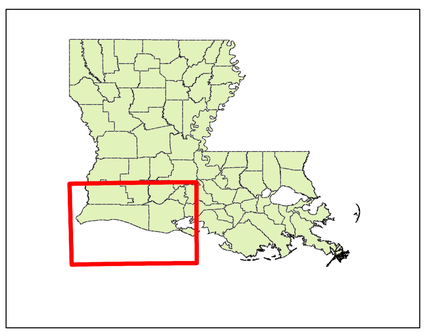
Table 6.8c Planning Unit 4: Objectives and Measures Table - Ecosystem Units

	Geographic Location	Current Issues	Future Risk/Impact*	Planning Unit Objective	Coastal Objectives	Measures																															
						1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
						Proposed Hurricane Protection Levee for 30-ft storm surge @ coastline	Complete/Accelerate the Chenier Plain Freshwater and Sediment Management and Allocation Reassessment Study which was included in the LCA Near-Term Plan	Maximize freshwater inflow from Sabine River	Salinity Control structures along the east shoreline of Sabine Lake nr Blue Buck Point, Sabine Is and Blue Buck Point	Beneficial Uses of Dredged Material Program: Utilize sediment from Sabine Ship Channel and dedicated dredging for marsh enhancement and construction of terraces	Salinity control structure at Sabine Pass nr Hwy 82 Causeway.	Stabilize Gulf shoreline and beach west of Calcasieu River to Sabine River using dredged sediment or breakwaters	Stabilize Gulf shoreline and beach east of Calcasieu River to Freshwater Bayou using dredged sediment or breakwaters	Salinity control structure in Calcasieu Ship Channel nr ferry.	Beneficial Uses of Dredged Material Program: Utilize sediment and dedicated dredging for marsh enhancement and construction of terraces in Calcasieu Lake	Salinity control structures at points on east side of Calcasieu Lake to aid in salinity control.	Maximize freshwater inflow to tributaries of the Mermentau from outside sources.	Maximize freshwater inflow to Mermentau from outside sources.	Stabilize Grand Lake shoreline and land bridge.	Freshwater introduction/Retention structure or sill on Little Pecan Bayou	Freshwater introduction/Retention structure or sill on Rollover Bayou	Stabilize White Lake shoreline and land bridge.	Stabilize banks from Schooner Bayou to GIWW along Freshwater Bayou and along GIWW nr White Lake	Salinity Control on Black Lake Bayou nr Hackberry.	Build new chamber for navigation at Calcasieu Lock on GIWW and use old lock to evacuate excess water.	Stabilize banks of Freshwater Bayou	Stabilize eastern shore of Lake Calcasieu	Develop a plan to elevate and/or relocate assets located outside the hurricane protection Levee	Maintain Hwy 82 for hurricane evacuation and marsh protection	Provide water control structures at strategic locations along Hwys 82 and 27.	Manage watershed to reduce rapid inflows into Mermentau Sub-basin	Restore Marsh by Filling Abandoned Canals.	Utilize freshwater inflow from Atchafalaya River.	Improve hydrology of the old Mermentau River Channel between Mud Lake and GOM.	Stabilize Banks of GIWW	Toll road on top of levee south of GIWW.
						Alt 1	Alt 1, 2	Alt 1, 2	Alt 1, 2	Alt 1, 2	Alt 1	Alt 1, 2	Alt 1, 2	Alt 1	Alt 1, 2	Alt 1	Alt 1	Alt 1	Alt 1, 2	Alt 1	Alt 1	Alt 1, 2	Alt 1, 2	Alt 1	Alt 1, 2	Alt 1, 2	Alt 1, 2	Alt 1, 2	Alt 1, 2	Alt 1, 2	Alt 2	Alt 1	Alt 1, 2	Alt 1	Alt 1, 2	Alt 1
Ecosystem Units	**EU4-1. Grand/White Lakes**	Function disruption due to subsidence, altered inundation, wave/wake energy, direct removal of sediments for spoil banks or levees.	Low loss of fresh/interdediate marsh, surge attenuation and decrease in fisheres and Avifauna.	Provide outlets for fresh water flow under Louisiana Highway 82.	D, F		+																							+	+			+		
				Promote a diversity of unique, regional habitats such as cheniers, prairies, and forested areas.	D, F		+												+			+												+		
				Restore natural hydrology to the Chenier Plain.	D, F		+										-	-						+						+	+	+	-	+		
	EU4-2. Eastern Chenier	Function disruption due to subsidence, tidal exchange, altered inundation, sediment disruption, and wave/wake energy.	Low loss of Fresh/Interdediate Marsh; Moderate Loss of Brackish/Saline Marsh & surge attenuation; High Loss of Beach/Dune/Bak Barrier Marsh; Decrease in fisheres, wildlife and Avifauna	Promote a diversity of unique, regional habitats such as cheniers, prairies, and forested areas.	D, F		+												+			+												+		
				Restore/preserve the existing and unique chenier ridges to contribute to surge and wave dissipation.	A, D, F	+							+										+						+					+		
				Restore natural hydrology to the Chenier Plain.	D, F		+										-	-						+						+	+	+	-			
				Promote the use of sediment from sources outside of this Planning Unit, such as trapping sediment moving off-shore to increase wetland acres and	A, C	+	+						+																				+			
				Protect the lakes, ponds, and Gulf shorelines from wave/wake impacts, and maintain existing beaches	A, D, F	+							+						+			+	+			+	+				+					
	EU4-3. Western Chenier	Function disruption due to subsidence, altered inundation, and wave/wake energy.	Moderate Loss of Brackish/Saline Marsh, Beach/Dune/Bak Barrier Marsh & Surge attenuation; Decrease in fisheres, wildlife and Avifauna.	Restore natural hydrology to the Chenier Plain	D, F		+	+																	+					+	+	+	-	+		
				Promote a diversity of unique, regional habitats such as cheniers, prairies, and forested areas.	D, F																								+					+	
				Protect the lakes, ponds, and Gulf shorelines from wave/wake impacts, and maintain existing beaches	A, D, F							+	+									+				+									
				Promote the use of sediment from sources outside of this Planning Unit, such as trapping sediment moving off-shore to increase wetland acres and	A, C	+	+					+	+																				+			
				Control the salinity gradient in Planning Unit 4 to promote diversity of ecosystem habitat.	E, F			+	+		+			+		+	+	+		+	+			+	+							+	+	+		
				Restore/preserve the existing and unique chenier ridges to contribute to surge and wave dissipation.	A, D, F	+	+					+	+																+					+		
				Balance the fresh water needs for agriculture, municipal, industrial, and natural ecosystem needs and uses.	E, F		+	+									+	+															+			
	EU4-4. Calcasieu/Sabine Lakes	Function disruption due to subsidence, altered inundation, salt water intrusion, wave/wake energy, direct removal of sediments for spoil banks or levees	Moderate loss of brackish/saline marsh, beach/dune/back barrier marsh, storm attenuation and decrease in fisheres and Avifauna.	Restore more natural hydrology to the Chenier Plain.	D, F		+	+																	+					+	+	+		+		
				Provide additional freshwater from sources outside the basin.	E		+										+	+															+			
				Promote the beneficial uses of dredged material from the Calcasieu Ship Channel, the Mermentau River and the Sabine River to create marsh.	C					+					+																					
				Balance the fresh water needs for agriculture, municipal, industrial, and natural ecosystem needs and uses.	D, E, F		+	+									+	+							+					+	+		+			
				Control the salinity gradient in Planning Unit 4 to promote diversity of ecosystem habitat.	E, F		+	+	+		+			+		+	+	+		+	+			+	+							+	+	+		

* Ecosystems Unit Future Risk, percent changed: L= Low Loss (1-15); M = Moderate Loss (16-49); H = High Loss (< 5); Increase (I); Not Applicable (NA); Steady (S); Decrease (D); Increase (I); Unknown (U)
** Alternative Plan (Measure used in Alternative Plans)

Coastwide Objectives:
A - Reduce storm damage vulnerability of coastal communities, resources, and infrastructure.
B - Minimize exposure of traditional flood protection measures to open Gulf conditions.
C - Increase sediment input from sources outside estuarine basins, and manage existing sediment resources within estuarine basines, to sustain and rejuvenate existing wetlands, rebuild marsh substrate and construct flood protections projects.
D - Maintain or establish natural landscape features and hydrologic processes that are critical to sustainable ecosystems structure and function, including dissipation of storm energy.
E - Establish or maintain dynamic salinity gradients that reflect natural cycles of freshwater availabilty and marine forcing (fluctuation related to normal daily and seasonal tide action or exchange).
F - Sustain productive and diverse wildlife habitats.
G - Maximize retention of river-borne sediments and nutrients within coastal wetlands.





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Measures:

1. Proposed Hurricane Protection Levee for 30-ft storm surge @ coastline.
*2. Complete/Accelerate the Chenier Plain Freshwater and Sediment Management and Allocation Reassessment Study which was included in the LCA Near-Term Plan.
3. Maximize freshwater inflow from Sabine River.
4. Salinity Control structures along the east shoreline of Sabine Lake near Blue Buck Point, Sabine Island and Black Bayou.
5. Beneficial Uses of dredged material Program: utilize sediment from Sabine Ship Channel and dedicated dredging for marsh enhancement and construction of terraces.
6. Salinity control structure at Sabine Pass near Hwy 82 Causeway.
7. Stabilize Gulf shoreline and beach west of Calcasieu River to Sabine River using dredged sediment or breakwaters.
8. Stabilize Gulf shoreline and beach east of Calcasieu River to Freshwater Bayou using dredged sediment or breakwaters.
9. Salinity control structure in Calcasieu Ship Channel near ferry.
10. Beneficial Uses of dredged material Program: utilize sediment and dedicated dredging for marsh enhancement and construction of terraces in vicinity of Calcasieu Lake.
11. Salinity control structures at points on east side of Calcasieu Lake to aid in salinity control.
12. Maximize freshwater inflow to tributaries of the Mermentau from outside sources.
13. Maximize freshwater inflow to Mermentau from outside sources.
14. Stabilize Grand Lake shoreline and land bridge.
15. Freshwater Introduction/Retention structure or sill on Little Pecan Bayou.
16. Freshwater Introduction/Retention structure or sill on Rollover Bayou.
17. Stabilize White Lake shoreline.
18. Stabilize banks from Schooner Bayou to GIWW along Freshwater Bayou and along GIWW near White Lake.
19. Salinity Control on Black Lake Bayou near Hackberry.
20. Build new chamber for navigation at Calcasieu Lock on GIWW and use old lock to evacuate excess water.
21. Stabilize banks of Freshwater Bayou.
22. Stabilize eastern shore of Lake Calcasieu.
*23. Develop a plan to elevate and/or relocate assets located outside the hurricane protection Levee.
24. Maintain Hwy 82 for hurricane evacuation and marsh protection.
25. Provide water control structures at strategic locations along Hwys 82 and 27.
26. Manage watershed to reduce rapid inflows into Mermentau Sub-basin.
27. Restore Marsh by Filling Abandoned Canals.
28. Utilize freshwater inflow from Atchafalaya River.
29. Improve hydrology of the old Mermentau River Channel between Mud Lake and GOM.
30. Stabilize Banks of GIWW.

* Not tied to specific geographic location.

0 4.5 9 13.5 Miles

1:316,800
1 inch equals 5 miles

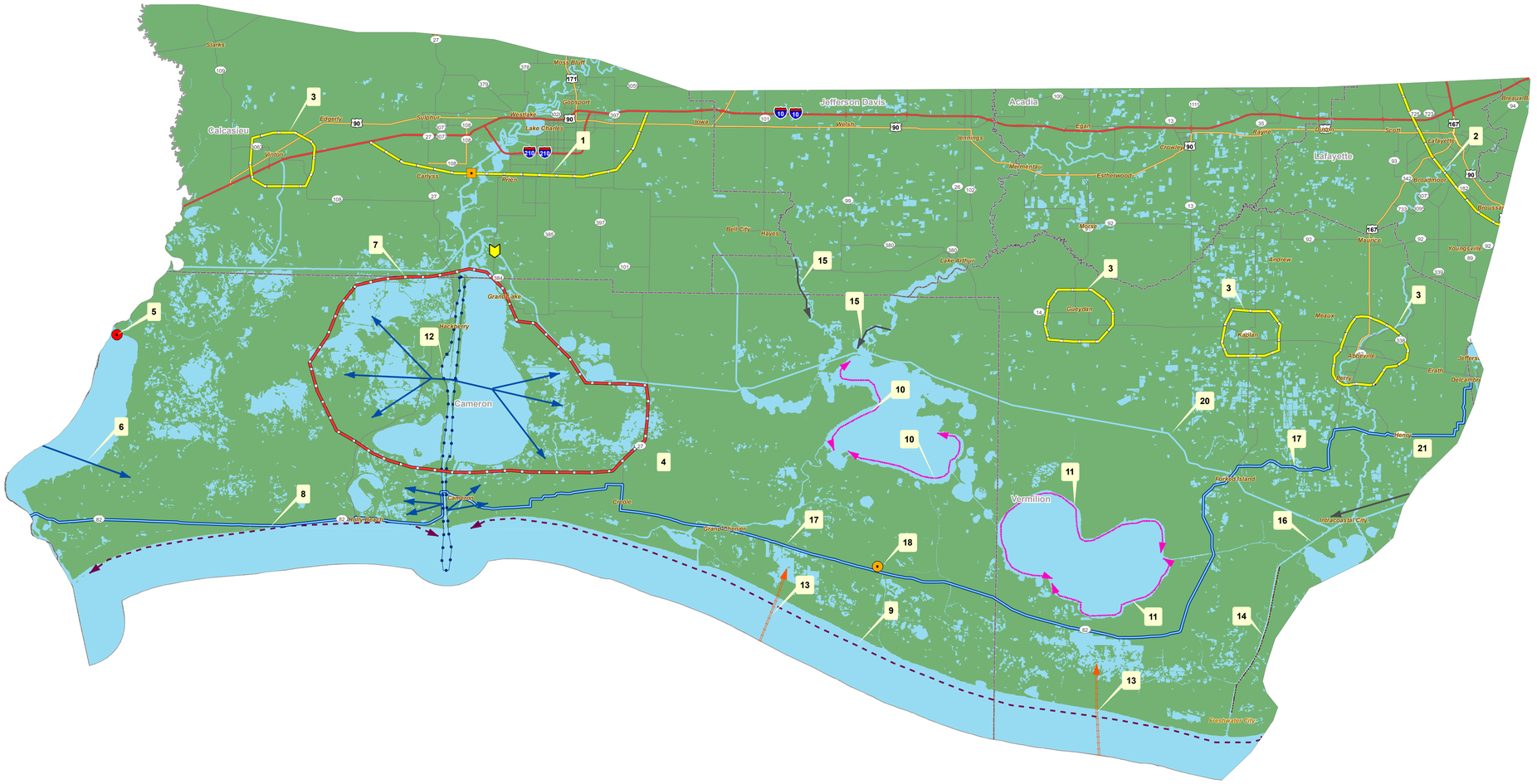
Legend

- Navigation Lock
- Flood Gate
- Freshwater Control Structure
- Salinity Control Structure
- Levee Alignment
- Evacuation Route
- Dredge Material Placement
- Freshwater Introduction
- Bankline Stabilization
- Shoreline Protection
- Shoreline Stabilization
- Beneficial Use of Dredged Material
- Beneficial Use of Dredged Material

LOUISIANA COMPREHENSIVE COASTAL PROTECTION MASTER PLAN

FIGURE 6.4

PLANNING UNIT 4
ALTERNATIVE ONE



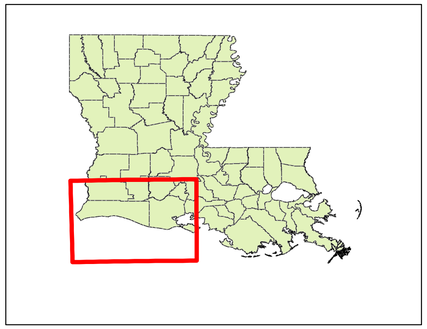
0 2.5 5 10 15 Miles

1:316,800

1 inch equals 5 miles

Legend

- Navigation Lock
- Floodgate
- Freshwater Control Structure
- Salinity Control Structure
- Levee Alignment
- Evacuation Route
- Dedicated Dredging
- Bank Stabilization
- Freshwater Introduction
- Shoreline Protection (Lake)
- Shoreline Stabilization (Gulf)
- Beneficial Use of Dredged Material
- Dredge Material Placement
- Freshwater and Sediment Managment
- Salinity Management



MEASURES:

1. Storm surge protection for Lake Charles Metropolitan Area using ring levee.
2. Storm surge protection for Lafayette using ring levee.
3. Storm surge protection around Abbeville, Gueydan, Kaplan, and Vinton.
* 4. Complete/Accelerate the Chenier Plain Freshwater and Sediment Management and Allocation Reassessment Study which was included in the LCA Near-Term Plan.
5. Salinity Control at Black Bayou.
6. Beneficial Uses of dredged material program: utilize sediment from Sabine Ship Channel and dedicated dredging for marsh enhancement and construction of terraces.
7. Allow Calcasieu Lake and surrounding area to become and remain brackish to saline.*
8. Stabilize Gulf shoreline and beach west of Calcasieu River to Louisiana Point using dredged sediment and/or breakwaters.
9. Stabilize Gulf shoreline and beach east of Calcasieu River to Freshwater Bayou using dredged sediments and/or breakwaters.
10. Stabilize Grand Lake shoreline and land bridge.
11. Stabilize White Lake shoreline and land bridge.
12. Beneficial uses of dredged material program: utilize sediment and dedicated dredging for marsh enhancement and construction of terraces in vicinity of Calcasieu Lake.
13. Dedicated dredging from the Gulf of Mexico for marsh creation and enhancement.
14. Bank stabilization along Freshwater Bayou.
15. Manage watershed to reduce rapid inflows into Mermentau Sub-basin.
16. Bank stabilization from Schooner Bayou to GIWW along Freshwater Bayou and the GIWW.
17. Maintain Hwy 82 for hurricane evacuation and marsh protection.
18. Provide water control structures at strategic locations along Hwys 82 and 27.
*19. Develop a plan elevate and/or relocate assets located outside the hurricane protection Levee.
20. Stabilize Banks of GIWW
21. Utilize fresh water inflow from Atchafalaya River.
22. Build a new chamber for navigation at Calcasieu Lock and use the old lock to evacuate excess water.

* Not tied to specific geographic location.

LOUISIANA COMPREHENSIVE COASTAL PROTECTION MASTER PLAN

FIGURE 6.5

PLANNING UNIT 4
ALTERNATIVE TWO

Map Document: (K:\DNR\GIS_Documents\Project_Maps\MXD\Area 4\Final\FINAL_dnr_area_4_ALTERNATIVE TWO_DELIVERABLE1_051106_0200.mxd)
6/8/2006 -- 1:24:30 PM

7.0 Interdisciplinary Technical Team Workshop, May 2006

The ITT group was convened to represent a broad cross-section of stakeholder interests in coastal Louisiana. The first meeting of this group was held on May 1, 2006. At that meeting, attendees were asked to review the information collected to that date by the IPT and then to assist in the population of two alternative plans for appraisal, based upon the plan formulation rationale.

At the workshop, attendees were broken out into groups representing the five planning units used in plan development. In the morning of the workshop each group was asked to review the data help by the IPT while the afternoon was used to review the plan formulation rationale and consider the measures to populate alternative plans.

The following sections present the notes from those discussions, including the comment made, and the response provided. These notes are representative of the discussions at the meeting, and the actions taken based upon those comments, at that time. No attempt has been made to modify the notes based upon the subsequent analyses, undertaken for the Master Plan. The notes are broken down by planning unit.

7.1 Planning Unit 1

7.1.1 Morning Notes & Comments with Actions Taken

Notes taken during the Planning Unit 1 Morning Breakout Session documented the comments made by the workshop participants during the discussion**.** The actions taken (or to be taken) for each comment received are listed after the comment in italics.

1. The Bayou la Loutre Ridge is not within the Upper Breton Marshes and needs to be moved to the adequate ecosystem unit. *The Bayou Laloutre Ridge is shown as part of the Fringing Marsh Ecosystem Unit.*

2. Instead of using just “increase sediment introduction” use the terminology “increase sediment, freshwater and nutrients introduction” where applicable. *The suggested terminology has been incorporated into the planning unit objectives where appropriate.*

3. There was consensus that levee protection and coastal protection features will need to be maintained over time in order to fulfill their goal. *This recommendation has been incorporated into language within the revised document where appropriate*.

4. For some ITT members the objectives were too broad for hurricane protection and too detailed for coastal restoration. *The coastwide objectives cover coastal protection in a more defined manner; the planning unit objectives, as stated, were intended to inherently include the coastwide objectives.*

5. The fact that Coastal Protection includes *Hurricane Protection* and *Coastal Restoration* was not understood by some ITT members and needs more emphasis. *This recommendation has been incorporated into language within the revised document where appropriate.*

6. Describe how different projects can be measured in terms of fulfilling applicable objectives (i.e. restore natural hydrology). *At the meeting, it was explained that projects selected for either alternative would at a later date be defined in terms of how they are measured, based on historic conditions and/or modeling; i.e. restoration of natural hydrology could be measured in terms of historical salinity versus current salinity data.*

7. Define "estuarine gradient" for measuring purposes and refer to it as "dynamic salinity gradient" if possible. *This recommendation will be incorporated into language within future documents where appropriate.*

8. The USACE barrier plan that will be implemented along the shoreline of Lake Pontchartrain still needs to be protective of existing marshes and bottomland hardwoods are still of high importance to protect assets from the waves created within the Lake in case of a major hurricane (bath tub effect). *This recommendation will be incorporated into language within future documents where appropriate.*

9. It would be beneficial to identify how much surge protection will be provided by any restoration measure or by different ecosystem features (bottomland hardwood, marsh, barrier islands, etc.) to define their contribution to protection. *This suggestion will be discussed in future documents, and will be based on modeling efforts.*

10. Identify which restoration efforts support the quality of life/livelihood of residents. *This suggestion will be discussed in future documents, and will be based on data compilation and modeling efforts.*

11. Appropriate sediment sources have to be identified. *This suggestion will be discussed in future documents.*

7.1.2 Afternoon Notes & Comments With Actions Taken

Notes taken during the Planning Unit 1 Afternoon Breakout Session documented the comments made by the workshop participants during the discussion**.** The actions taken, or to be taken, for each comment received are listed after the comment in underlined italics.

1. Neither Rationale 1 nor 2 reached total consensus. *Comment noted.*

2. The new defined Rationale 3 is very similar to Rationale 2. *The Rationales have been revised in the latest document (May 12, 2006).*

3. The term "30ft @ coastline" needs to be replaced by actual modeling results on maximum storm surges and "coastline" has to be defined for this planning unit. *This recommendation will be discussed in future documentation, and will be based on data compilation and modeling efforts.*

4. Rationale 1 should not say "regardless of primary wetland impacts". Regardless is not an option. *This recommendation has been incorporated into language within the revised document (May 12, 2006).*

5. There was a concern that there can not be an alternative that implements a hurricane protection system while destroying a significant amount of ecosystem features and at the same time ask Congress to fund restoration of ecosystem features. Protection and restoration measures should attain a balanced sustainability. *Comment noted. It is recognized that all coastal protection, both for hurricane protection and coastal restoration, has impacts as well as benefits and that multiple uses of the coast should strive for sustainability.*

6. Suggested terminology: "Minimize overall length of levees while optimizing protection and restoration". *This recommendation will be incorporated into language within future documents where appropriate.*

7. The part "…and not constrained by local (asset) benefit/costs. Long-term O&M costs are not a consideration." was not agreed upon and should be taken out. *This recommendation was incorporated into the revised document (May 12, 2006).*

8. Rationale 2 was not agreed upon but negative comments were not collected either. *The Rationales have been revised in the latest document (May 12, 2006).*

9. Rationale 3: *For all of the following items listed, the Rationales 1 and 2 have been revised in the latest document (May 12, 2006) where appropriate.*

    - Maximize protection of structural and non-structural measures by balancing/weighing trade-offs of long-term sustainability of human, economic, social and natural resources.
    - The level of protection provided for all communities will be based on consensus modeling. Where the maximum protection is not feasible, an adequate degree of protection will be provided.
    - Avoid where possible and otherwise minimize environmental impacts and support sustainability of natural systems.
    - Short- and long-term perspectives will be incorporated.

10. Strategize and implement plan to elevate and/or relocate assets located outside the Hurricane Protection Plans is an important measure that was agreed upon by all ITT members. *This recommendation was incorporated into the revised document and included with the revised Alternative Plans 1 and 2 (May 12, 2006).*

11. The ITT group reached consensus on closing the MRGO and to relocate the industries affected by this or to fund the IHNC lock. *This recommendation was incorporated into the revised document and included with the revised Alternative Plans 1 and 2 (May 12, 2006).*

12. The ITT group reached consensus on the importance of restoring the barrier islands and the Bayou la Loutre Ridge. *This recommendation was incorporated into the revised document and included with the revised Alternative Plans 1 and 2 (May 12, 2006).*

13. The ITT group reached consensus on the need of re-evaluating the levee protection on the south shore of Lake Pontchartrain. *This recommendation was incorporated into the revised document and included with the revised Alternative Plans 1 and 2 (May 12, 2006).*

14. Shoreline protection and marsh creation at the MRGO-Lake Borgne Landbridge was agreed upon as an important measure. *This recommendation was incorporated into the revised document and included with the revised Alternative Plans 1 and 2 (May 12, 2006).*

15. The group reached consensus on maximizing the use of existing diversions utilizing the Mississippi River. *This recommendation was incorporated into the revised document and included with the revised Alternative Plans 1 and 2 (May 12, 2006).*

16. To minimize/stop storm surge into Lake Pontchartrain was acknowledged as very important. *This recommendation was incorporated into the revised document and included with the revised Alternative Plans 1 and 2 (May 12, 2006).*

17. The Maurepas Landbridge was acknowledged as the most critical restoration area within the Upper Basin. *This recommendation was incorporated into the revised document, and included with the revised Alternative Plans 1 and 2 (May 12, 2006).*

18. Both Alternatives (USACE Barrier Plan and USFWS Open System) need to be analyzed within the future modeling effort. More ITT members prefer the USACE Barrier Plan. *This recommendation will be evaluated in future documents.*

19. To tie the Southshore of Lake Pontchartrain levee into the USACE Alignment 1 at the Golden Triangle and to continue the Alignment to Caernarvon was requested to be of high priority by DOTD. *This recommendation*

was incorporated into the revised document, and included with the revised Alternative Plans 1 and 2 (May 12, 2006).

20. Utilize sediment and freshwater resources of the lower Mississippi River to rebuild land, wetlands, and to sustain the local ecosystem compatible with navigation was acknowledged and agreed on as an important goal. *This recommendation was incorporated into the revised document, and included with the revised Alternative Plans 1 and 2 (May 12, 2006).*

21. To raise the 40 Arpent Levee was recommended by an ITT member.
22. Leverage all federal funding sources (e.g. DOT, FHWA, USACE, Navigation, USFWS)

7.2 Planning Unit 2

7.2.1 Morning Notes & Comments with Actions Taken

Notes taken during the Planning Unit 2 Morning Breakout Session documented the comments made by the workshop participants during the discussion**.** The actions taken or to be taken for each comment received are listed after the comment in italics.

1. The term "coastal protection" as defined in Act 8 was felt to be somewhat ambiguous and ITT members expressed a desire to clearly indicate that coastal protection included wetland restoration. *Coastal protection is clearly defined in Act 8, Section 214.2. Definitions (4) as meaning plans, projects, policies, and programs intended to provide hurricane protection or coastal conservation and restoration. The meaning of coastal protection is iterated in the Purposes and Principles section of the Plan Formulation Report.*

2. Many of the comments centered on the planning unit objectives. In general, the ITT members felt that some PU comments were too specific while others were not specific enough. Some members suggested that only the coastwide objectives be used. *After the IPT-ITT Plan Refinement Workshop, the PFT met and discussed comments received regarding objectives for all five planning units. It was determined that the PU Summary Comments were often misleading because they were not considered in context with the other data provided in the objectives tables. Therefore, the summary comments were eliminated from the report, thus resolving many of the issues raised. Comments regarding specific PU objectives were reviewed and modified where appropriate. Specific modifications include:*

    - *Des Allemands was added to the list of distributed assets areas and "Provide protection to Highways 22, 70, 307, 303, 3127 and 3199" was included as an objective.*
    - *"Provide coastal protection to LA-1" was added as an objective in the L'ours distributed assets area.*

3. ITT members were concerned that the objectives to increase introduction of freshwater and sediments could be construed as an endorsement of large Mississippi River diversions, which are inconsistent with the Barataria Terrebonne National Estuary Program (BTNEP) Comprehensive Conservation and Management Plan (CCMP) and historic hydrologic regimes. Conversely, diversions with sufficient flow to deliver sediments are needed in some areas. The consensus was that the operational issues associated with the Davis Pond Diversion need to be addressed; appropriate sized diversion should be place at strategic locations along the river; and measures to deliver freshwater, nutrients and sediments should be explored. *Both alternative coastal protection scenarios for PU 2 included the following measures: Small diversions at strategic locations in the upper basin; Develop a watershed management plan that redirects freshwater and sediment, storm water, and treated sewage water to sustain upper basin swamps and middle basin freshwater marsh;*

and, Complete/Accelerate the Louisiana Coastal Area (LCA), Louisiana Ecosystem Restoration Study Near-Term Plan including Re-authorization of Davis Pond – optimize for marsh creation, medium diversion with dedicated dredging at Myrtle Grove, and Mississippi River Hydrodynamic, Mississippi River Delta Management and Third Delta studies.

4. The group recommended that all future diversion projects should be designed to deliver freshwater when needed to nourish wetland habitat and also to remove storm water when flooding threatened communities. *Consideration of this technique will be addressed through the Develop a watershed management plan that redirects freshwater and sediment, storm water, and treated sewage water to sustain upper basin swamps and middle basin freshwater marsh measure.*

5. The group was concerned with how objectives would be measured and how the objectives would be used to select and prioritize measures. *Measures were ranked as either have positive, negative or no impact toward achieving objectives.*

6. There were many comments regarding the objective to increase delta building processes. As part of this discussion, the measure to divert the sediment load out of the main river channel into Barataria Bay was discussed. Although the group agreed there were many benefits to diverting the river and establishing a non-stop locking system for navigation, there were concerns about impacts to fisheries and saltwater habitat. *The measure to complete/accelerate the LCA Near-Term plan will address these concerns through the Mississippi River Hydrodynamic and Mississippi River Delta Management studies.*

7.2.2 Afternoon Notes & Comments with Actions Taken

Notes taken during the Planning Unit 2 Afternoon Breakout Session documented the comments made by the workshop participants during the discussion**.** The actions taken or to be taken for each comment received are listed after the comment in italics.

1. Considerable discussion took place regarding Rationale 1 and Rationale 1. The ITT group felt that the first rational is unrealistic and the second rational brings out more of the true factors. They also felt that Rationale 2 needs to include time to construct, political factors and socioeconomic considerations. The group recommended that these factors be incorporated into Rationale 2 or that a third rationale be developed. The third rationale proposed would read as follows:
   Rationale 3: Maintain existing natural features and use them effectively to minimize the footprint of new structure and maximize existing structures to ensure sustainable communities that acknowledge and accept the risk associated with living on the coast.

   Measures selected for coastal protection Alternative 2 were selected to minimize the footprint of new structures and maximize existing structures to ensure sustainable communities. All rationales include the measure to strategize and implement a plan to elevate and/or relocate assets located outside the hurricane protection plans.

2. Some members of the ITT felt that levee protection for Grand Isle was futile and that a back levee would destroy wetland without adding storm protection value. The consensus was that coastal protection for Grand Isle should be achieved by maintaining the 12 foot dune on the Gulf side, landscape features on the back side such as marsh creation and restoration of back islands through the beneficial use of dredge material and non-structural measures such as elevating homes and ensuring early evacuation. *Comment noted.*

3. The group developed the following list of measures that they want to see included in alternative plans:

   - Barrier Island Restoration
   - Ridge Restoration
   - Marsh creation
   - Pipeline sediment delivery
   - Levees in strategic locations (appropriate sized levees dependent on soil composition) where technically feasible; and other flood control structures, such as sheet pile and concrete walls where earthen levees are not technically feasible.
   - Appropriately sized Freshwater diversions
   - Storm water management plans
   - Continue beneficial use of dredged materials
   - Protect evacuation routes

   These measures were selected for inclusion in Alternative 1, Alternative 2, or both.
4. The ITT members felt that all levees should include a marsh buffer on the unprotected side to ensure long-term sustainability. If no marsh exists, marsh creation should be part of the levee design/footprint. *Marsh creation and restoration measures included in Alternative 1 and Alternative 2 were selected for their ability to enhance coastal protection by adding marsh buffers along back levee alignments.*

7.3 Planning Unit 3A

7.3.1 Morning Notes & Comments with Actions Taken

Notes taken during the Planning Unit 3a Morning Breakout Session documented the comments made by the workshop participants during the discussion**.** The actions taken or to be taken for each comment are listed after the comment in italics.

1. Formulate general consensus on what belongs in the Planning Unit 3A as compared to Planning Unit 3B and what has been omitted?

   1a. How were areas divided? *Originally the Team set the boundary line as the center line of the Atchafalaya River at the direction of CPRA. It was then moved to Oyster Bayou by the CPRA. Further at the PFT workshop, the boundary was further moved to the east. Bay Junop was decided to be the boundary so as to include areas that are significantly influenced by the Atchafalaya River.*

   1b. What were ecosystem units? *See response to 1a above.*

   1c. Why not planning unit objectives for each section of each unit? *See response to 1a above.*

   1d. Why not follow the Chacahoula boundary line for the unit? *Constraints such as sediment delivery. Levees constitute disconnect.*

   1e. Were Coastal Engineers consulted? *See response to 1a above.*

2. Rework the objectives for the unit to be more proactive (e.g., enhance this landscape features of a specified location to reduce a specified impact). *Comment noted.*

3. Rewrite the objective to include "Need to maintain the ridge" (Also stated that this objective would block movement of water in some places). *A separate planning unit objective has been added to the objectives and measures table to accommodate this request.*

4 Rewrite the objective to include "Maintain and protect the natural ridges." *A separate planning unit objective has been added to the objectives and measures table to accommodate this request.*

5 Edit and rewrite to include "Verret and other locations". Define Upper Basin Swamp (UBS) more specifically. UBS should include Verret and Chacahoula (It is also stated that this objective would promote regeneration and acquisition of conservation easement). The objective will be revised to: "*Improve hydrologic conditions to promote cypress regeneration in the Upper Basin Swamps (UBS) such as Verret, Chacahoula, and other locations."*

6 Rewrite PU Objective 6 to include "Protection from vessel draft surges" and improve natural hydrology as it relates to ecosystem benefits and storm surges reduction". *Improve natural hydrology as it relates to ecosystem benefits and storm surge reduction within the North Central Terrebonne Wetlands (NCTW) including the effects of GIWW such as protection from vessel draft surges.*

7 Rewrite PU Objective 7 to include 'sediment into the NCTW where needed". The comment will be incorporated appropriately.

8 Increase introduction of sediment into NCTW where needed. The comment will be incorporated appropriately.

9 Rewrite PU Objective 12 to add Robinson Canal and Bayou Dulac. The objective will be revised to include the comment as "*Reduce storm surge impacts of the Houma navigation Canal, Bush/Boudreaux Canal, Cutoff Canal, Falgout Canal, Robinson Canal, and Bayou Dulac."*

10. Rewrite PU Objective 13 to add Robinson Canal and Bayou Dulac and include, "Reclamation of the north of Lake Boudreaux System and South of Houma Swamps Area. *Reduce storm surge impacts of the Houma navigation Canal, Bush/Boudreaux Canal, Cutoff Canal, Falgout Canal, Robinson Canal, and Bayou Dulac and reclaim the north of Lake Boudreaux System and South of Houma Swamps Area.*

11. For PU Objective 15 Omit "along the bay rim". The objective will be revised to "*Reduce deleterious tidal energy and salt water intrusion within Fringing Marshes West (FMW)."*

12. Comment on:" For PU Objective 18 omit "along the bay rim" and replace with "salt water intrusion". The objective will be revised to: "*Reduce deleterious tidal energy and salt water intrusion within Fringing Marshes West (FMW)."*

13. Rewrite PU Objective 20 to add "enhance and maintain". The objective will be revised to "*Enhance and maintain the storm attenuation characteristics of the Barrier Islands."*

14. Rewrite PU Objective 21 to add "Enhance and maintain". The objective will be revised to: *"Enhance and maintain the ecosystem functions and values of the Barrier Islands."*

15. Rewrite PU Objective 22 to add "of sediments" and delete "direct". The objective will be revised to: *"Eliminate removal of sediments on the Barrier Islands."*

16. Rewrite PU Objective 23 to add "or other sources… Atchafalaya River and other sources". The objective will be revised to: *"Introduce sediment to the Penchant East area via Atchafalaya River and other sources."*

17. For PU Objective 24 delete "at Minors Canal". The objective will be revised to: *"Reduce tidal exchange Penchant East Marshes (PEM)."*

18. Rewrite PU Objective 25 to add "Enhance Hydrologic Conditions" and delete "reduce/eliminate impounded areas". The objective will be revised to: *"Enhance hydrologic conditions of the impounded areas within the PEM."*

7.3.2 Afternoon Notes & Comments with Actions Taken

In the afternoon breakout session for Planning Unit 3a the discussion regarding the planning unit objectives was continued. The breakout session time expired prior to the group being able to discuss the planning unit rationales. For clarity, all discussions regarding the project objectives have been listed together in the morning session section even though some of these were covered in the afternoon session. As no discussion occurred on the planning unit rationales, there are no further notes to be included in this afternoon session for Planning Unit 3a.

7.4 Planning Unit 3B

7.4.1 Morning Notes & Comments with Actions Taken

Notes taken during the Planning Unit 3b Morning Breakout Session documented the comments made by the workshop participants during the discussion**.** The actions taken or to be taken for each comment received are listed after the comment in italics.

1. Rewrite to add "Baldwin and Erath" into communities list. *Communities of Baldwin and Erath have been added to objective 1.*

2. Rewrite or add "and off-shore sediments" following "Atchafalaya River". *Objective 2 was rewritten to include "and off-shore borrow sediments" following "Atchafalaya River".*

3. Objective 3 is okay as written. *No action required.*

4. Delete Objective 4. Also remove "wake" from all written information as boat wakes are not the problem. The problem is wind-driven waves. *Objective 4 has been deleted. All of the objectives were reviewed and the word "wake" removed where appropriate.*

5. Rewrite after talking to landowners in the area, because their concerns must be considered. *Public meetings are planned to be scheduled. Public input and comment is very important to this process and opportunities for review of the process and meaningful comment will be provided.*

6. Ditto as above – landowners must be consulted before objectives can be finalized. *The action is the same as Action 5.*

7. Okay as written. *No action required.*

8. Rewrite to include "Passive and Active" with regard to introduction of sediments. Objective was modified as requested.
9. Okay as written. *No action required.*

10. Again need input from landowners. Rewrite to add "Wake (note misspelling?) influence GIWW/Acadiana Wetlands" and add "to reduce degradation". Sediment goals could have unintended consequences. *Added Objective 12: "Plug outlets from the GIWW into Acadiana Bay to reduce degradation in the Acadiana Wetlands" and Objective 14: "Reduce wave/wake energy impacts into the Acadiana Wetlands." (Along GIWW.)*

11. Rewrite to include "Freshwater Bayou", and add "Where and as needed to prevent degradation. *Objective 15 was rewritten as requested.*

12 Rewrote to delete "wake". Word "wake" removed.

13. Rewrite to add "and reduce" following "maintain" and what do we mean by "historic"? *Added "and reduce" following maintain and removed the word historic".*

14. Delete objective. *Objective 14 "Reduce direct removal of sediments from Wax Lake Swamps (WLS)" deleted.*

15. The workshop participants requested that the following be added to the list of objectives for Planning Unit 3b:

- Improve hydrology to Marsh Island, Acadiana area, and Rainey Marsh.
- Increase sedimentation to Wax Lake Island Marsh.
- Maximize the Atchafalaya Bay building process gulfward.
- Improve fresh water and sediment transport westward through the GIWW.
- Maintain or reduce tidal exchange openings to the Acadiana Bays.
- Sustain productive and diverse fish and wildlife habitat.

16. In the Master Plan adopt the nomenclature used in 2050/LCA, and to name all small communities in an "undistributed assets" category but to make sure they are "ALL" named to show Congress the large face of the issue. *This comment is noted. The list of identified communities will be expanded to include the communities listed for each parish by the National Association of Counties. This listing is based on the US Postal Service mail delivery.*

17. Request to add the state-wide objective "F" (sustain productive and diverse fish and wildlife habitats throughout the Coastal Zone). *The requested objective "F" was included.*

18. Request to add beneficial uses of dredged material and dedicated dredging specifically to the unit objective. Beneficial uses of dredged material and dedicated dredging specifically to the unit objective was added to the objectives list.

19. A question was asked as to why LDNR wants to protect Wax Lake Outlet and that it needed to specify reason, i.e., railroad tracks or other reasons. *The question stems from the Distributed Assets Table. The geographical location is DA3b-3 Wax Lake Swamps. According to the table, the current issue is an extremely high level of flood risk to distributed assets with storm surges over 30 feet. The future risk impact is increased flood risk to assets due to sea level risk subsidence and wetland loss. PU Objectives show:*
    - Provide coastal protection to oil and gas fields, pipelines and facilities. (structural)
    - Provide coastal protection to Wax Lake Outlet. (general)
    - Provide coastal protection to highways, bridges, and evacuation routes. (storm evacuation)

    There is coastal protection to the structure complex, which is designed to divert a specific percent of the total Atchafalaya River flow to the Gulf. The integrity of the structural complex could be compromised should sea level rise, subsidence, and wetland loss result in open gulf water at the structural complex. The structural complex would be subject to greater storm attack. Thus the Wax Lake Outlet Swamps are valuable as an element of protection to the structure complex. Integrity of the structural complex is also vital to evacuation routes.

20. Add Chene, Boeuf, Black Bayou, and Lower Atchafalaya River to Wax Lake Outlet Swamps. *It is believed that Chene, Boeuf, Black Bayou and Lower Atchafalaya River influence does not have a significant influence on Wax Lake Outlet swamps. A case could be made for the Lower Atchafalaya River but the case would be very weak for Chene, Boeuf, and Black Bayou.*

21. Add “sustain productive fish and wildlife habitats to all ecosystem units.” *“Sustain productive fish and wildlife habitats to all ecosystem units” will be added to the remaining ecosystem units. The objective is in 3 units but not shown in 6 of the units.*

22. Add “and continue beneficial uses of dredged material” to Wax Lake Outlet Marshes and to deltas. *Objective 26 “create marsh in eroding areas where possible using dredged material” applies to this request.*

23. Add “restoring hydrology” to Marsh Island, Acadiana Wetlands, and Rainey Marsh. *This is covered in Objective 13. “Improve hydrology to Marsh Island, Acadiana area, and Rainey Refuge Marshes.*

24. Add “increase sediment” to Wax Lake Outlet Marsh. *This is covered in Objective 4, “Increase sedimentation to the Wax Lake Island Marsh”.*

7.4.2 Afternoon Notes & Comments with Actions Taken

Notes taken during the Planning Unit 3b Afternoon Breakout Session documented the comments made by the workshop participants during the discussion**.** The actions taken or to be taken for each comment received are listed after the comment in italic.

1. In Rational One, questions were raised as to why a 30-foot storm surge protection was needed in Measure 1. *It was explained that actual surge levels for different category hurricanes were not available so different surge levels used. A 30-foot surge was a high level at the coast. This explanation was acceptable to the participants.*

2. It was discovered quickly that most measures were incorrectly placed on the map. It was explained that apparently an incorrect version of the map was provided for the workshop. Regrets were expressed that the locations on the map were depicted incorrectly but that the listed measures that were being considered (listed on the map) were correct. It was further explained that the goal was to discuss the measures and all agreed and the discussion proceeded.

Some suggested changes in the measures being considered in Rationale One were:

- To be sure we included in all discussion of beneficial uses of dredged material the wording for dedicated dredging to indicate that it was not a maintenance-dredging source, but from borrow pits off shore in the Gulf, or from some other dredging source such as regulatory mitigation for pipelines or canals.
- Group wanted to put Measures 10 and 13 on the objectives list rather than being on the measures list.

3. A measure to include Avoca Lake restoration in the Terrebonne Parish was requested to be added. *It was indicated that the area was located in Planning Unit 3a.*

4. Several questions were raised as to why we included the ESF items as measures, since those were not peer reviewed like LCA and Coast 2050 measures were and had been put out by FEMA with no expertise in Coastal Louisiana. It was recommended that they be eliminated from the measures lists in all planning units. *Twelve measures had been added to the Planning Unit 3b measures list but nine have been taken out. Three were left in. One is to create marsh at Weeks Bay. This area is eroding into the GIWW. Marsh creation and maintenance needs to happen, therefore Planning Unit 3b retained this measure. Create marsh at Marsh Island was another project that has merit and is included in the measures but more has been added to that measure. Restore the Vermilion Bay Shoreline was a third ESF project. That project also has merit and is needed badly, therefore it remains in the measures and has been added to in its scope.*

5. The group wanted to add the shoreline stabilization measures 5, 9, 10, and 11 from Rationale Two (and have them in both Rationales). *Outer shorelines such as Rainey Marsh, Marsh Island and Point Au Fer and historic reef remnants would be considered outer defences against storm surges. Placing both categories in each Rationale was considered extreme from a cost viewpoint. Rationale one is considered the higher cost rationale (reef restoration and a levee alignment with less than favourable foundation conditions). Rationale Two on the other hand is considered the more conservative rationale considering better levee foundation conditions and protecting and preserving existing shorelines. It is recommended that including measures the subject measures into both rationales is not desirable. There will be opportunities in the future to add or subtract measures but for this report it is recommended to not put these measures in both rationales.*

6. The group wanted to add measures 3 and 5 from Rationale One to Rationale Two. *This request was considered reasonable and performed.*

7. Several in the group suggested that instead of new levees, that the old USACE levee alignments be used as the footprint of any levee improvements planned in order to lessen impacts to the communities involved. *The request is noted and will be retained for future reference.*

8. In Rationale Two add "and Rainey Marshes" on Measure 5; add "and Freshwater Bayou" on Measure 7; add "marsh plantings and dedicated dredging" on Measures 8 and 10. *"Marsh plantings" inadvertently left out, can be added.*

9. Add Avoca Lake to Measure 12. *Avoca Lake is in Planning Unit 3a.*

10. Find a way to include dredged material from private sources, i.e. oil and gas companies, etc. *Noted for future opportunities.*

11. Planning Unit 3b will require new maps and new information being sent to the group.

12. Question arose as where was the rationale for the scoring criteria and where were the scores so that they could look at them (the tables and procedures summary in the workbook used to reach the measures maps was apparently not presented well enough or not understood by participants, several of whom said they could not read the small print in the workbook tables.

NOTE: All references to Measures by number in the above should be ignored and the most recent correct maps and measures be furnished the participants in the Planning Unit 3b part of the Workshop. Measures have been changed, modified, removed and new ones added several times since the workshop. Some measures have remained but numbers have changed since the workshop.

7.5 Planning Unit 4

7.5.1 Morning Notes & Comments with Actions Taken

Notes taken during the Planning Unit 4 Morning Breakout Session documented the comments made by the workshop participants during the discussion**.** The actions taken or to be taken for each comment received are listed after the comment in italic.

1. There was the general concern about how to prevent measures from conflicting with objectives. This was directed at the GIWW levee. *This is a valid concern. There are multiple uses of our coast and coastal protection must be a responsible integration of hurricane protection and coastal restoration.*

2. Concerns over omissions were expressed because regulatory procedures are not mentioned in the objectives. Regulatory agencies deal with problems on a daily basis that impact on these Planning Unit 4 Objectives. *This concern seems to be a policy issue rather than a planning objective. It is proposed that this issue be dealt with at the policy level.*

3. The following new objectives were recommended:
   - "Promote the beneficial uses of dredged material from the Calcasieu Ship Channel, Mermentau River and Sabine River to create marsh."

- "Sustain productive and diverse fish and wildlife habitats."

They were included in this planning unit.

4. The storm surge heights shown under Current Issues in the Objectives Table were questioned. Exactly what do 30-ft and 25-ft storm surges mean? When will risk assessment be completed and protection levels be available? USACE questioned the surge heights being used. *Tony Thomas pointed out that the 30-ft storm surge level (at the coast) was arbitrarily tied to a Category 5 level of protection until better information is available. It will be refined when the USACE modeling effort provides better information.*

5. The level of protection at Hackberry should take into consideration that three new LPN facilities are being in Cameron Parish. They are the Sabine Pass LNG at Sabine Pass, the Creole Trail LNG west of Calcasieu Ship Channel in Cameron, and Cameron LNG at Hackberry. In addition, the National Strategic Reserve is located at Hackberry. *This information will be used in the next phase of plan development when the level of protection is addressed.*

6. Highway rights-of-way were eroded during Hurricane Rita, but the embankments helped reduce the storm surge. Manmade berms also reduced storm surges. Woody vegetation growing on berms trapped huge amounts of debris and deflected waves. *Comment noted.*

7. Potential conflicts in objectives were discussed. The implementation of measures under Objective 1 hinges on the details. The concern was how to prevent these measures from conflicting with the other objectives? *This is a valid concern and can only be addressed if the state's objectives are used by those designing the levees or other protective measures. Those coordinating the work should deal with this issue.*

8. The comment to remove the word "wake" from "wave/wake" in objectives 4 and 6 was made. Wakes are not significant and waves are due to wind. Only on GIWW and ship channels do wakes matter. *Do not concur. Although wakes may not be significant in some locations, the presence of that energy in the objectives does not compromise their intent.*

9. Marshes that are becoming open water bodies need to be restored. Both Chenier ridges and marshes play similar roles in protection in that they dissipate the surge height. There is no objective that allows marshes to be restored or preserved. Either include marshes in objective 5 or develop a stand-alone objective. *The words "AND the MARSHES" will be added to objective 5 following "cheniers" making it read: Restore/preserve the existing Chenier ridges and the marshes.*

10. A considerable discussion ensued over Objective 7 and from it came the realization that "Restore more natural hydrology—"is more of a concept then a measure. To the USFWS, the concept means correcting the disruptions of flow that exist at Highway 82. To others, the concept included the removal of jetties because the perception was the jetties deflect the long-shore currents away from the Louisiana coast. This concept needs clarification. *Two changes to the wording of the objective were made: 1) add the parameters that are significant in defining what "natural hydrology" means and 2) describe what, when and where one should measure to compare existing conditions to what the "natural values" should be. This issue was resolved in the measure "Complete/Accelerate the Chenier Plain Freshwater and Sediment Management and Allocation Reassessment Study which was included in the LCA Near-Term Plan".*

11. A DOTD comment was made concerning the impact of oil and gas canals on natural hydrology. Should we recommend closing some of the canals and restricting navigation to facilities through "highways"*? This is a measure that can be included because of Objective 7.*

12. The Mermentau Cutoff forced the old channel of the Mermentau River to silt up, and this is impeding drainage. It is no longer functioning as an estuary and needs to be dredged. *This is to be moved into the list of measures and addressed under Objective 7.*

13. Objective 9 refers to Highway 82. It should be expanded to include Hwy 27, also. These highways should also be included as evacuation routes. When rewording Objective 9 to include Highway 27, remove the word "fresh". *Objective should also include Hwy 27. This would accommodate measures that deal with both fresh and salt water. The new objective will read, "Provide water control structures at strategic locations along Highways 82 and 27. These highways are already included as evacuation routes in Objectives 2 and 3."*

14. Change Objective 11 to include all sub-basins by replacing "Sabine Sub-Basin" with Planning Unit 4. *This would allow a broader application of measures and still not require that any historic gradient be maintained. The new objective will read, "Control the salinity gradient in the Planning Unit 4 to promote diversity of ecosystem habitat."*

15. The western parts of the Calcasieu Basin and the Sabine Ship Channels cause bad circulation patterns. These patterns contribute to an increase in salt water intrusion into these areas. Find a way to minimize these impacts from artificial channels. These are "plumbing issues." *This is an issue that can be addressed as a measure under Objective 11.*

16. In Objective 12, a clarification needs to be made in spite of the Texas/Louisiana conflict over the Sabine River. The words "at strategic locations" were suggested. *They were added as follows," Provide additional fresh water from sources outside the planning unit at strategic locations."*

    Regarding objective 12, some areas may not want to add additional water, i.e., fresh water levels already too high in Grand Lake and White Lake due to outlet problems. Half of PU 4 is Mermentau, and the objective needs modifying to add the words "at strategic locations."

17. Sand nourishment projects for protection on coast should be a strategy. It is somewhat covered in Objective 14, but not well enough. *The words "sand pumping from off-shore" will be added to the "such as" list in objective 14 as follows: Promote the use of sediment from sources outside of this planning unit, such as trapping sediment that is moving long-shore and pumping sand from off-shore, to increase the area of wetlands and beaches.*

18. Add the coast-wide Objective "F" to Planning Unit 4: "Sustain productive and diverse fish and wildlife habitats." *That objective is not visible in PU4, and it is deeply buried in PU4 objectives dealing with hydrology, salinity gradient or freshwater distribution. It will be added.*

19. Regulatory issues are not addressed in objectives. Oil and gas companies are issued permits to access wells by hydraulic dredging. Regulatory agencies do not presently have the authority to "permit" oil and gas companies to include beneficial uses of sediment when they construct canals. Regulatory agencies are also permitting activities that contradict environmental enhancement and/or coastal protection. It would be well to possibly modify an existing objective or add a new one that deals with regulations for the beneficial uses of dredged material. If it were a requirement, companies could get credit for beneficial use as mitigation or environmental restoration. *Regulatory issues do need to be addressed. However, these are policy issues that should utilize the objectives selected for the Master Plan and not the objectives themselves.*

20. USFWS suggested that a specific objective be added to state, "Promote the beneficial uses of dredged material from the Calcasieu Ship Channel, Mermentau and Sabine Rivers to create marsh." This use was only implied in our objectives 13 and 14. *Objective 15 was added with the recommended text.*

21. A new objective was proposed to "Restore the width of the present Mermentau, Calcasieu and Sabine channels to their original, authorized widths." The purpose is two fold. First, it would restore bank lines to their original location. Second, it would reduce the rate at which salt water could move inland by reducing the discharge capacity of these channels. *This idea was included as a measure under Objectives 4 and 11.*

22. A suggestion was made to add "using Atchafalaya River sediments" as a measure or an objective in Unit 4. The idea was to compete with Planning Units 3a and 3b for that resource. *This would require the introduction of water, also, and several comments were made regarding the excessive volume of freshwater. Intuition suggests that it is not technically feasible to consider Atchafalaya River Sediment as a significant source of sediment for use in Planning Unit 4. The idea needs technical evaluation.*

23. The Old River Control Structure management should be added as an objective in Unit 4, and should be incorporated in the objectives to use sediments and water from outside the planning unit. Modify Objective 14 to include active management of Atchafalaya and Red Rivers sediment (all available sources). *See response to Comment 22.*

7.5.2 Afternoon Notes & Comments with Actions Taken

Notes taken during the Planning Unit 4 Afternoon Breakout Session documented the comments made by the workshop participants during the discussion**.** The actions taken or to be taken for each comment received are listed after the comment in italics.

1. USFWS comments are that Rationale Two is better for coastal resources, and they prefer that Rationale. They also preferred ring levees for surge protection rather than the GIWW alignment. The GIWW alignment in Rationale One will act as a wall, but if it could be moved further north, it could be workable. Incorporate concepts from their Planning Aid Report in response to the USACE October 2005 LCPR report. Add the constriction of outfall channels to Rationale Two. *Remember that this is a 100-yr horizon Master Plan, which has to consider sea level rise and continued subsidence, and measures should be sustainable under changing conditions.*

2. The freshwater-salinity issue was discussed at length. First determine the locations needing fresh water across all uses. This will identify what measures will be most useful. Hydrology drives salinity. There are problems with too much salinity in the west and too much fresh water in the east. Grand and White Lakes' levels are too high because they cannot drain adequately. Water should drain north to south. Highway 82 needs more culvert capacity to help restore natural hydrology. Land loss and marsh loss are the biggest problems. Levee alignment is critical, and if high levees are needed, the footprint will destroy both marshes and fisheries. Protecting shorelines and land bridges is a no-brainer. Everything else is more difficult, including managing water issues. Everyone was cautioned not to make this more difficult than it has to be. *These were general statements of concern from the group. No response required.*

3. Hackberry and Cameron should have some sort of surge protection. How did one community get picked over another? With Hackberry and Cameron and other small communities outside all protection due to their elevations and exposed locations, only a ring levee is a possible solution, and Hackberry and Cameron are situated where they cannot be protected by a ring levee. Their infrastructures will all have to be re-built/constructed to stand hurricane force winds and water, or in the case of Cameron, they are already considering relocation further inland. *This discussion reached no conclusion. It did not change the possible difficulty of protecting these communities with levees. The rationale provides hurricane protection by re-zoning, building codes and evacuation routes. Since no technical reason to change this rationale was provided by this comment, no changes were made.*

4. Overall, beach nourishment should be considered as well as detached near-shore breakwaters, where sediment dredged from off-shore is pumped onto the beaches, and/or behind detached breakwaters built far enough out to serve a protection for new beaches behind them. *Shoreline restoration is an included measure.*

5. An issue was raised about the Cameron-Creole levee. One said it should either be completed or mined for sediment. Another opposed by USFWS any modification. *In general, the group had no problem with the lack of linear levees as long as they had the proposed ring levees and other types of protection were included in the measures.*

6. In discussing the Rationale One measures, the following general comments were made (no response was required to these comments and all will be taken under consideration in further project development):

6a. No linear levee should be built below the 10-ft contour MSL.

6b. Okay as written

6c. Salinity on East Shore of Sabine Lake---hydrologic modeling indicates weir structures with a boat bay are not reducing salinity in interior marshes and are also fish impediments. USFWS suggests dropping measure.

6d. Re-word to include a weir at the Sabine Causeway, and to return Sabine/Calcasieu/Mermentau to authorized dimensions and maintain at this dimension, i.e., a new measure for all new channels. The existing weir in Sabine causes unnatural high velocities.

6e. Measures 3, 5, 10, 11, 13, 15, 19, 20, 21, and 22 depend on salinity/fresh water inflow decisions. On Measure 5, there is no provision to restore the cheniers. It should include stopping mining as well.

6f. Measure 8 is not just for salinity but for protection of banks. Construction to armor navigation channels helps during hurricanes. Fresh/saline measures need to be looked at individually for effectiveness.

6g. Suggest deleting Measures 12 and 13 from Rationale One, or at least re-considering how they are worded. *Wording regarding freshwater was changed to include "strategic" locations.*

6h. Measure 14 has been partially completed under CWPPRA, and might be better if it was carried out at Mallard Point.

6i. Measure 22 is out of Coast 2050 strategy, and is a new look at Calcasieu or GIWW, old lock for salinity management, really move fresh water out of lakes and release high water pressure.

6j. Measures 19, 20, and 21 create could blockages across water to fisheries, and will be problematic unless designed properly. Needs to be examined individually.

6k. Measure 24 is not needed because CWPPRA has a maintenance plan for this area.

7. The fact that Rationale Two is without a linear levee but has strategically placed ring levees brought considerable discussion. Roads on levees were discussed as to their importance, and Hwy 82 serves as both a levee and a highway. Their shoulders need reinforcement because they eroded during Rita. The group asked that the Master Plan not base all decisions on what is required for New Orleans. We should consider the importance of Lake Charles area and Lafayette and their infrastructure. *It was pointed out that Lake Charles Metro scored as highly as New Orleans did for hurricane surge protection. It was followed closely by Lafayette. This scoring was based on concentrated assets. Hackberry also scored highly, but we saw no reasonable way to levee Hackberry.*

8. Overall, DOTD commented that without protection, restoration and preservations would be meaningless. USFWS said that protection is given by restoring and maintaining the wetlands. DOTD wants to have a tiered system to reduce surge, and wants to talk more about breakwaters rather than levees. Multiple lines of near-shore to dissipate wave energy that would function like a "barrier island" would be effective, and the only structure that completely survived Rita on the Unit 4 coast was the detached riprap breakwaters at Holly Beach, still functioning to trap sediment from the water column and littoral drift. Protection off the beach would offer some measure of protection to those communities that cannot support a levee, i.e. Hackberry, Cameron, Creole, Holly Beach, and others. *Such protective use of these coastal resources seems logical.*

9. The private sector can contribute significantly if they are allowed to do so. Oil and gas companies can build and maintain spoil banks and canal berms that provide habitat and reduce storm surge heights. This should also be encourages and included in the concept of beneficial uses of dredged material. *This seems like a policy issue.*

10. Fresh water could be brought from the GIWW, or managed using the GIWW. Cheniers are being mined, and this needs to be stopped under policy issues (also a private landowner issue). The current practice of mining sand from cheniers is undermining coastal protection. Swapping cheniers for marshes is irresponsible. Strategically, areas west of Highway 27 and south of Highway 82 need fresh water input. *Comments noted.*

Integrated Ecosystem Restoration and Hurricane Protection: Louisiana's Comprehensive Master Plan for a Sustainable Coast

Appendix I: Measures Appraised: Alternative Plans 1 and 2 (May 2006)

Coastal Protection and Restoration Authority of Louisiana

April 2007

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1.0 Introduction

This appendix presents the full suite of protection and restoration measures appraised in two full alternative plans as part of the development of the November 2006 Preliminary Draft Master Plan. Appendix H presents the process through which these alternative plans were defined.

The appendix contains two sets of listings of measures. Tables C.1 to C.5 present all the potential measures identified during the Plan Formulation Process, divided into the five Planning Units (PU1, PU2, PU3a, PU3b & PU4). The subsequent sections then present a brief description of the measures taken forward for appraisal in the two alternative plans.

1.1 Summary of Alternative Plan Formulation Process

The current and likely future levels of risk to the human environment and the existing disruptions to processes for the natural environment were used to project the natural landscape in order to identify long-term issues for coastal Louisiana. These risks to human and natural assets were used as the basis for defining specific planning unit objectives. These objectives address the specific future risks and impacts identified (see Appendix B).

A full list of known proposed measures was compiled, using existing knowledge and published reports, to provide a list of potential options for future management of the coast to achieve the planning unit objectives. The sources of these measures include, but are not limited to CWPPRA, LCA, BTNEP, LDNR, FEMA ESF 14, Conservation Plans, Feasibility Studies, USACE, and USFWS. Tables C.1 to C.5 consist of all proposed measures considered in the Plan Formulation process for the five planning units.

The proposed measures were then reviewed with regard to their potential for achieving the planning unit objectives. Those measures considered potentially viable for achieving an objective were given a positive score against that objective (see Appendix H, Measures vs. Objectives tables).

Two plan formulation rationales were then developed to provide the basis for defining complete alternative plans for appraisal. These rationales were set up to represent potential alternative approaches to managing the protection and restoration issues facing coastal Louisiana in the long-term, and capture the trade-offs necessary in defining the long-term plan.

In the first rationale, the strategy for selection of measures is summarized as follows:

> *"Provides for maximum structural protection, without constraints by local asset benefit/costs. Landscape features will be created and sustained using mechanical means. Long-term O&M costs are not a constraint at this stage of plan formulation."*

In the second rationale, the strategy for selection of measures is summarized as follows:

> *"Provides for variable levels of structural protection with non-structural alternatives for protection (e.g. coastal restoration, evacuation planning, raising or relocating assets). Measures will reflect benefit/cost constraints and include self-sustaining environmental options. Long-term O&M costs will be minimized."*

Based on the plan formulation rationales, selected measures were classified under two alternatives, simply titled "Alternative One" and "Alternative Two". Table C.6 through C.10 lists all measures under Alternatives One and Two, which were selected from Tables C.1 to C.5. In addition to measures that were selected from the original list of measures presented in Tables C.1 to C.5, measures have also been nominated by stakeholders during the ongoing process of stakeholder engagement (see Appendix B). These lists of measures, found in Tables C.11 to C.15, were also considered as the November 2006 Preliminary Draft Master Plan was being developed.

Through the appraisal of these two alternative plans (see Appendices E, F and G) and application of the decision making process (see Appendix B) the November 2006 Preliminary Draft Master Plan was defined. This is presented in the Main Report, and in more detail in Appendix B.

The following sections summarize the measures appraised as part of Alternative One or Two for each Planning Unit in the development of the Master Plan.

2.0 Planning Unit 1- East of the Mississippi River

Eighty-one measures were considered for planning unit one. Thirty-three measures were selected to represent the two alternatives, and are described briefly by alternative below. The analysis and model runs on these alternative measures resulted in twenty-four measures to represent preferred plan.

2.1 Alternative 1

1-1. Levee Alignment No. 1 from Pearl River to Caernarvon (30-ft Storm Surge at Coastline) and Hurricane Protection from Caernarvon to Pointe a la Hache (20-ft Storm Surge at Coastline)

The USACE LaCPR Levee Alignment No. 1 includes a barrier levee from Caernarvon to the Pearl River at Interstate 59. It also includes a ring levees on the east bank of the Mississippi River from Caernarvon to Belair and Phoenix to Bohemia.

The Levee Alignment No.1 would provide increased surge protection, 40-ft levee, to communities, industries, and other assets located in New Orleans metropolitan area, St. Bernard, and to areas along the shoreline of Lake Pontchartrain; and also provide increased protection to major highways and evacuation routes. In addition, levee Alignment No. 1 would provide increased surge protection, 24 ft from Caernarvon to Belair and 21.5 ft from Phoenix to Pointe a la Hache.

1-2. West Shore Lake Pontchartrain Study Levee Alignment

The proposed levee alignment provides hurricane protection along Lake Pontchartrain and extends the Lake Pontchartrain and Vicinity Project to include St. Charles, St. John the Baptist and St. James Parishes. This measure encloses a population of approximately 40,000 people and includes the communities of LaPlace, Reserve, and Garyville.

The design concept includes the construction of the levee utilizing the adjacent borrow construction method and will provide for detention pond storage outside of developed areas. It would also provide a continuous conveyance channel to pump stations and provide a wet type pumping system. The design accommodates future Southeast Louisiana (SELA) Projects and parish drainage improvements and reduces operation and maintenance costs to existing parish drainage infrastructure.

The ongoing Feasibility Study (USACE & Pontchartrain Levee District) currently projects an initial first lift levee elevation of 17.0 ft and final lift levee elevations at 14.0 ft for the Montz Area, 14.5 ft for the I-10/I-55 area, and 10.5 ft for the Reserve area. The crown of the levee is designed with a width of 8 ft and with a slope of 1:4.

1-3. Reevaluate Levee Protection at South Shore of Lake Pontchartrain (30-ft Storm Surge at Coastline) and Hurricane Protection from Caernarvon to Pointe-a-la-Hache (20 ft Storm Surge at Coastline)

The levee alignment location is along the south shore of Lake Pontchartrain from Kenner to Highway 11. In case the Levee Alignment No. 1 is not implemented as a first line of defense, this protection system needs to be reevaluated. The concept of second-line levees and internal protection systems are vital to restoration of confidence in the flood protection system and to the concept of lowering risk in highly developed urban areas.

1-4. Resolve/Close Mississippi River Gulf Outlet (MRGO) to Deep Draft Navigation

The MRGO begins at the confluence of the Gulf Intracoastal Waterway (GIWW) and the Inner Harbor Navigation Canal (IHNC) and extends southeastward approximately 35 miles, emptying into the Breton/Chandeleur Sound area.

This measure will resolve/close the MRGO to deep draft navigation. Alternative 1 will include a 110-ft by -14-ft by 30-ft floodgate at Bayou Dupre. A restriction to GIWW dimensions (approximately 110 ft) at the Bayou LaLoutre Ridge would supplement this measure.

1-5. Complete/Accelerate the Louisiana Coastal Area (LCA), Louisiana Ecosystem Restoration Study Near-Term Plan including:

1-5a. Mississippi River Gulf Outlet (MRGO) Environmental Restoration Features

The MRGO begins at the confluence of the Gulf Intracoastal Waterway (GIWW) and the Inner Harbor Navigation Canal (IHNC) and extends eastward approximately 35 miles, emptying into the Breton/Chandeleur Sound area. The environmental restoration features involve construction of shoreline protection measures, such as rock breakwaters along the north bank of the MRGO, and along important segments of the southern shoreline of Lake Borgne. New bankline stabilization along Lake Borgne is proposed in measure 1-17. Stabilization along the MRGO will start approximately 0.5mile south of Bayou LaLoutre and extends to the corner of the GIWW and Michoud Canal (approx. 25.6 miles). Because in some places some rock stabilization is already in place, 23 miles were assumed to be in need of new rock stabilization.

1-5b. Small Diversion at Hope Canal

The Hope Canal is located in the Upper Basin (south of Lake Maurepas) on the north bank of the Mississippi River between Gramercy and Garyville. A small diversion (1,000 cfs to 5,000 cfs) from the Mississippi River and through a new structure at Hope Canal would increase freshwater and sediment introduction to the Maurepas swamps. The project would result in increased organic deposition and improved biological productivity.

1-5c. Small Diversion at Convent/Blind River

The Convent/Blind River is located in the upper basin (20 miles south of Lake Maurepas) on the north bank of the Mississippi River between Gramercy and Burnside. A small (1,000 cfs to 5,000 cfs) diversion from the Mississippi River and through a new structure at Convent/Blind would increase freshwater and sediment introduction to the Maurepas swamp. The measure would result in increased organic deposition and improved biological productivity. This measure is intended to work in conjunction with the Hope Canal diversion to facilitate organic and mineral deposition in the swamp.

1-5d. Increase Amite River Diversion Canal Influence by Gapping Banks

The Amite River is located southwest of Lake Maurepas and east of I-10. The proposed measure involves the construction of eight (8) 40-ft-wide gaps in the existing dredged material banks of the Amite River Diversion Canal, each diverting an average of 250 cfs. The objective of this measure is to allow floodwaters to introduce additional fresh water, nutrients, and sediment into the western Maurepas swamp. The exchange of flow would occur during flood events on the river and from runoff of localized rainfall events, and would in turn providing nutrients and sediment to facilitate organic sediment deposition in the swamp, some fluctuation of water levels, improve biological productivity, and prevent further swamp deterioration.

1-5e. Medium Diversion at White Ditch

The White Ditch is located on the east bank of the Mississippi River north of Carlisle. The measure involves implementing a medium sized diversion (5,000 cfs to 15,000 cfs) from the Mississippi River through a new control structure at White Ditch. This feature is located in the vicinity of a historic

crevasse. Follow-up feasibility-level analysis will determine the ultimate size of the diversion. The area requires additional fresh water and sediment to facilitate organic sediment deposition, improve biological productivity, and prevent further deterioration of the marshes.

1-5f. Modification at Caernarvon Diversion

The diversion structure is located on the east bank of the Mississippi River about 15 miles downstream from New Orleans, near the city of Caernarvon, near the Breton Sound marshes close to the St. Bernard-Plaquemines Parish line. Modified operation of this structure would allow an increase in the freshwater introduction rate, probably 5,000 cfs on average, to accommodate the wetland building function of the system. This measure would identify operation changes that would increase restoration outputs. The additional input of fresh water would facilitate organic sediment deposition, improve biological productivity, and prevent further deterioration of the marshes. This structure is located in the vicinity of a historic crevasse.

1-5g. Louisiana/Mississippi Hydrodynamic Study

The proposed study area would encompass the estuaries and near shore water associated with Lake Borgne Basin, Chandeleur and Breton Sound, Mississippi Sound and Mobile Bay. The study effort would include data collection, data synthesis, extension of existing modeling, and possibly development of new models. The comprehensive study would assist in determining the need, location, size, and seasonal variations for planned diversions and future restoration projects. After a comprehensive model is developed, calibrated, and verified for existing conditions, it would be used to simulate a new base condition for the coastal area, simulating the collective impacts of near-term features and any other existing or planned projects that affect the river system. The model would also be used to evaluate the impacts of potential large-scale restoration features and to evaluate adaptive management and adjustments to restoration features.

This measure was labeled as “not being tied to a specific geographic location” and was, therefore, not shown on the Alternative maps.

1-5h. Mississippi River Hydrodynamic Study

The proposed study area would encompass the existing Mississippi and Atchafalaya River systems necessary to properly assess the operation and parameters of the system with respect to water and sediment transport, flood control, and navigation. The study effort would include data collection, data synthesis, extension of existing modeling, and possibly new models. The comprehensive study would assist in determining the need, location, size, and seasonal variations for planned diversions and future restoration projects. After a comprehensive model is developed, calibrated, and verified for existing conditions, it would be used to simulate a new base condition for the coastal area, simulating the collective impacts of near-term features and any other existing or planned projects that affect the river system. The model would also be used to evaluate the impacts of potential large-scale restoration features and to evaluate adaptive management and adjustments to restoration features.

This measure was labeled as being “not tied to a specific geographic location” and was, therefore, not shown on the Alternative maps.

1-5i. Mississippi River Delta Management Study

The Mississippi River Delta Study includes the delta region below Pointe a la Hache. The study would analyze two types of projects including large diversions (approximately50,000 cfs) from the Mississippi

River, and alternative navigation channel alignments. The large scale river diversions could potentially maximize the river's sediment and freshwater resources available for ecosystem maintenance. Diversion sites, capacities, and outfall management measures would also be assessed to help optimize diversion plans. Such massive diversions, however, may cause adverse impacts to the existing navigation channel; so alternative scenarios must be investigated to accommodate navigation needs. Alternate navigation scenarios include new channels to the east or west of the current river while providing navigation either in the new channel or by maintaining the existing channel as a slack-water channel by the construction and operation of a lock system. In addition, the study would evaluate potential impacts of natural and man-made factors on the environment and economy.

This measure was labeled as "not being tied to a specific geographic location" and was, therefore, not shown on the Alternative maps.

1-6. Restore the Chandeleur Islands

The Chandeleur Islands are a barrier island chain located in easternmost St. Bernard and Plaquemines Parishes, approximately 70 miles east of New Orleans, Louisiana. This barrier island chain separates the Chandeleur and Breton Sounds from the Gulf of Mexico. The curve of the Chandeleur Islands connects the Mississippi gulf coast to the delta of the Mississippi River. Like all barrier islands, the Chandeleur Islands form a protective boundary between the Gulf of Mexico and the estuaries and the coastal communities. The islands are impacted by the strongest waves and act to reduce the wave energy, sheltering the mainland during storm events.

This measure will enhance flood protection and restore island habitat. Dredged material from offshore borrow areas is needed to rebuild the islands to an elevation of 6 ft above MSL. Restoration of the barrier islands will reduce wave height and wave energy that enter Chandeleur Sound (fair weather and storm generated), and reduce storm surge elevations east of the barrier islands that impact the Biloxi Marsh. Habitat restoration includes re-vegetation, which will be implemented simultaneously with beach nourishment activity in the barrier island dune and lagoon habitats. This measure will support the preservation and enhancement of saline marshes, bird rookery, recreational and commercial fishing, and maintain benefits of the National Wildlife Refuge.

1-7. Maintain and Restore the Biloxi Land Bridge and Barrier Reefs- South

The Biloxi Land Bridge South is a brackish marsh/oyster reef system that is situated in a southwest-to-northeast alignment, extending from easternmost St. Bernard Parish and north to Pelican Point. Drum Bay and the Chandeleur Sound are east of the Biloxi Land Bridge South, and Bay Boudreau is located along the west side.

This measure includes the marsh restoration of a 33,000 acres Biloxi Marsh area, which includes the placement of 5ft of dredged material and the creation of a 21 mile long and 400 ft wide ridge. Vegetative planting in the marsh area is part of this measure and black mangrove and matrimony vines will be placed on the crown of the ridge. Smooth hard grass will be planted on the water sides of the ridge and the containment berm. Offshore borrow material will be used in this effort.

1-8. Restore Bayou LaLoutre Ridge

The Bayou LaLoutre Ridge is a natural ridge that extends from the east bank of the Mississippi River Gulf Outlet (MRGO) south of Old Shell Beach eastward along the south boundary of the Biloxi Wildlife Management Area.

To restore the Bayou LaLoutre Ridge, a constriction (rock) of the MRGO to GIWW dimensions is required at the ridge, along with a rebuilding and reforesting of the natural ridge using dredged material, and the plantings of hardwoods is needed. Restoration of the Bayou LaLoutre Ridge will in the long-term assist in sustaining the

Biloxi Land Bridge South, and in reducing wave/wake, and storm surge impacts to the entire area encompassing the ridge and land bridge. Habitat restoration will provide refuge for indigenous ridge species.

1-9. Construct Jefferson Parish Fringe Marsh Buffer

The Jefferson Fringe Marsh area is located on the south shore of Lake Pontchartrain (north Jefferson Parish shoreline) between the Causeway Bridge and west to the New Orleans Airport. This measure includes an approximately 9-mile-long foreshore dike (rock) and marsh restoration between the dike and the shore, to reduce shoreline and berm erosion lakeward of the Hurricane Protection Levee. The dike is on average 300 ft away from the shoreline. Restoration of intermediate and fringe marshes must be integral to shoreline protection to provide sustainable shoreline. Marsh restoration provides critical marsh nursery, recreational fishing, birding, and other outdoor activities.

1-10. Maintain MRGO – Lake Borgne Land Bridge

The Lake Borgne Land Bridge is the area along the Lake Borgne shoreline between Doulluts Canal and Jahnckes Ditch and along the north bank of the Mississippi River Gulf Outlet (MRGO) between Doulluts Canal and Lena Lagoon in St. Bernard Parish, Louisiana. To maintain the land bridge, the marsh between Lake Borgne and the MRGO must be protected and maintained to prevent further shoreline erosion. This measure includes marsh restoration of the deteriorated land bridge between Lake Borgne and the MRGO, which includes approximately 14,000 acres. Bankline stabilization along the north bank of the MRGO is incorporated in measure 1-5a and bankline stabilization along the Lake Borgne shoreline is incorporated in measure 1-17, therefore, no additional shoreline protection is included in this measure.

1-11. Sediment Delivery by Pipeline at American/California Bay

The American/California Bay is located off the east bank of the Mississippi River, east of Sulphur, Louisiana. The objective of this measure is to restore wetlands in the American/California Bay by pipeline conveyance (1,000 cfs). The moderately deep (6 to 10 ft) open water in the bay system requires a large volume of sediment in order to bring back lost land and marsh and a containment dike to keep the sediments in place. Sediment to the bay will be provided via pipeline through programmatic sediment mining from the Mississippi River

1-12. Sediment Delivery by Pipeline at Central Wetlands

The Central Wetlands are located between the east bank of the Mississippi River, the south bank of the Gulf Intracoastal Waterway (GIWW), and west of the Mississippi River Gulf Outlet (MRGO). This measure includes restoration of wetlands in the Central Wetlands by pipeline conveyance (1,000 cfs). The objective of this measure is to counteract marsh breakup by providing sediment and nutrients to renourish the area by pipeline conveyance. Sediments will be mined from the Mississippi River into the Central Wetlands, adjacent to the MRGO and Violet Canal, via pipeline. Sediment would be placed in shallow open water zones of the marshes.

1-13. Sediment Delivery by Pipeline at Golden Triangle

The Golden Triangle area is located between the west lobe of Lake Borgne, the north bank of the Mississippi River Gulf Outlet (MRGO), and the south bank of the Gulf Intracoastal Waterway (GIWW). This measure includes restoration of wetlands in the Golden Triangle by pipeline conveyance (1,000 cfs). The objective of this measure is to counteract marsh breakup and restore wetlands by providing sediment and nutrients to renourish the area. Sediments will be mined from the Mississippi River into the Golden Triangle, and placed at the confluence of the MRGO and GIWW, via pipeline. Sediment would be placed in shallow open water zones of the eroding marshes. Increasing the area and improving the function of these marshes would facilitate biological productivity of the marshes and will reduce wetland loss.

1-14. Sediment Delivery by Pipeline at La Branche

The La Branche area is located along the southwest shoreline of Lake Pontchartrain between the Bonnet Carre Spillway and the west boundary of Jefferson Parish. This measure includes restoration of wetlands in the La Branche wetlands by pipeline conveyance (1,000 cfs). The objective of this measure is to counteract marsh breakup and restore wetlands by providing sediment and nutrients to renourish the area. Sediments will be mined from the Mississippi River into the La Branche Wetlands and placed in shallow open water zones of the marshes, via pipeline.

1-15. Benneys Bay Sediment Diversion

The Benneys Bay diversion site is located on the east bank of the Mississippi River, in Plaquemines Parish, Louisiana, 7.5 miles above Head of Passes. This measure will divert Mississippi River water and sediments into Benneys Bay. The objective is to restore vegetated wetlands in an area that is currently shallow open water. The project will divert sediments in an effort to restore, nourish, and maintain approximately 5,828 acres of fresh to intermediate marsh in the Benneys Bay . The project consists of a conveyance channel for the large scale diversion of water and sediments from the river. The conveyance channel would be constructed in two phases: (1) construction of an initial channel with an average discharge of 20,000 cfs; (2) after a period of intensive monitoring, enlargement of the channel to a 50,000-cfs discharge. Material from the construction of the channel would be used to restore wetlands in the diversion outfall area

The diversion would induce shoaling in the main navigation channel of the Mississippi River. Dredging of the channel is accomplished under the U.S. Army Corps of Engineers' ongoing Operations and Maintenance Program for the river. The Pilottown anchorage area is not maintained under the Operations and Maintenance Program. The additional dredging of the induced shoaling in the navigation channel and anchorage area would be an added feature and cost of the project. The dredged material removed from these areas would be used to restore wetlands where possible.

1-16. Restore Main Pass Ridge with Dredge Material

Main Pass Ridge extends approximately 10 miles northeast from the east bank of the Lower Mississippi River (near Pilottown). This measure will restore the Main Pass Ridge (400 feet wide and 5 feet high) with dredged material from the Mississippi River or from other beneficial uses of dredged material and be armored with rock for bankline protection and vegetated for resilience. Restoration of the ridge in conjunction with sediment diversions to the north (Benneys Bay Sediment Diversion) would serve to strengthen the ridge and marsh system in the area

1-17. Add New Bankline Stabilization (Shoreline of Lake Borgne from Alligator Point to Lake Shore Bayou)

The Lake Borgne bankline stabilization is located along the south shoreline of Lake Borgne from Alligator Point (Orleans Landbridge), along the Golden Triangle and the MRGO to Lake Shore Bayou. This measure includes shoreline protection by structural means (riprap) along the south shoreline of Lake Borgne from Alligator Point to Lake Shore Bayou.

1-18. Goose Point / Pointe Platte Marsh Creation

The measure is located on the north shore of Lake Pontchartrain between Fontainebleau State Park and Louisiana Highway 11 and within the Big Branch Marsh National Wildlife Refuge in St. Tammany Parish, Louisiana. The measure area at Goose Point also includes a portion of the St. Tammany Wildlife Management Area.

This measure includes marsh restoration of approximately 330 acres. The goal of this measure is to restore marsh habitat in the open water behind the shoreline. This marsh will maintain the lake-rim function along this section of the north shore of Lake Pontchartrain by preventing the formation of breaches into the interior marsh. Sediment will be dredged from Lake Pontchartrain, contained in cells within the interior ponds, and planted with vegetation. Marsh will be restored to widen the shoreline so that the ponds will not be breached during the course of normal shoreline retreat.

1-19. Adaptive Management through Maintenance of Existing Crevasses and Construction of New Crevasses

This measure applies to the Lower Mississippi River and Delta area. This measure includes the implementation of four crevasses in the first year. Each crevasse is assumed to have a flow of 2,500 cfs and allows for delta building processes. In the second year, four different crevasses will be opened and the four crevasses from the previous year are assumed to silt in during this period. This procedure will continue throughout the next 100 years

1-20. Maximize Beneficial Use of Dredged Material

The areas within Planning Unit 1 where beneficial uses of dredged material could be placed from river and other sediment sources include Biloxi Marsh area, Breton Sound area, and all marsh areas that have eroded away in the vicinity of the MRGO on the east side of the Mississippi River, as well as the Chandeleurs, a national wildlife refuge. Other areas adjacent to navigable waterways and drainage canals subject to maintenance dredging could also provide opportunities to maximize beneficial use of dredged material.

Increasing and maximizing the beneficial uses of dredged material will provide stronger foundations for marsh-building processes, and allow marsh recovery to take place. Approximately 100 acre/ft of marsh can be restored with 1 MCY of dredged material, thus, the potential is great for considerable marsh restoration to occur in PU 1 and throughout coastal Louisiana using river sediments, dedicated dredging outside navigation channels, and off-shore borrow.

This measure was labeled as “not being tied to a specific geographic location” and was, therefore, not shown on the Alternative maps.

1-21. Strategize and Implement Plan to Elevate and/or Relocate Assets Located Outside the Hurricane Protection Plans

This measure applies to all areas of the Planning Unit that are identified as being at risk from storm surge inundation at the 1% annual probability storm event (1 in 100-year event) that are not protected by a current and/or proposed hurricane levee or levees.

It is necessary to prepare, and implement, a comprehensive plan to provide for non-structural protection of properties outside the levee system. The plan will define whether it is more appropriate to raise properties or, where future risks are likely to be so great as to make long-term occupancy unrealistic, relocate occupants. Surveys of areas not protected by levees to identify and prioritize requirements for non-structural protection and a review of potential funding sources will be included.

This measure was labeled as “not being tied to a specific geographic location” and was, therefore, not shown on the Alternative maps.

1-22. Maintain and Restore the Breton Land Bridge with Marsh Creation

The Breton Land Bridge is located between the east bank of the Mississippi River and the south bank of the Mississippi River Gulf Outlet (MRGO), from Burbridge to Pointe a la Hache on the Mississippi River, and from

Yscloskey to south of Hopedale on the MRGO. This measure includes marsh restoration to maintain the Breton Land Bridge and marshes. Dedicated dredging and marsh restoration are components of this measure. Approximately 156,000 acres will be restored, excluding 60-percent of total acreage to account for open bays, channels, passes, uplands, and infrastructure. A Mississippi River diversion at Caernarvon would supply the needed fresh water and sediments to the Breton Land Bridge area.

2.2 Alternative 2

1-1. Levee Alignment No. 2 from Pearl River to Caernarvon (30-ft Storm Surge at Coastline) and Hurricane Protection from Caernarvon to Pointe a la Hache (20-ft Storm Surge at Coastline)

The USACE LaCPR Levee Alignment No. 2 includes a barrier levee from Caernarvon to the Pearl River at Interstate 59. It also includes a ring levees on the east bank of the Mississippi River from Caernarvon to Belair and Phoenix to Bohemia.

The Levee Alignment No.1 would provide increased surge protection, 40-ft levee, to communities, industries, and other assets located in New Orleans metropolitan area, St. Bernard, and to areas along the shoreline of Lake Pontchartrain; and also provide increased protection to major highways and evacuation routes. In addition, levee Alignment No. 1 would provide increased surge protection, 24 ft from Caernarvon to Belair and 21.5 ft from Phoenix to Pointe a la Hache.

1-2. West Shore Lake Pontchartrain Study Levee Alignment

The proposed levee alignment provides hurricane protection along Lake Pontchartrain and extends the Lake Pontchartrain and Vicinity Project to include St. Charles, St. John the Baptist and St. James Parishes. This measure encloses a population of approximately 40,000 people and includes the communities of LaPlace, Reserve, and Garyville.

The design concept includes the construction of the levee utilizing the opposite borrow construction method and will provide for detention pond storage outside of developed areas. It would also provide a continuous conveyance channel to pump stations and provide a wet type pumping system. The design accommodates future Southeast Louisiana (SELA) Projects and parish drainage improvements and reduces operation and maintenance costs to existing parish drainage infrastructure.

The ongoing Feasibility Study (USACE & Pontchartrain Levee District) currently projects an initial first lift levee elevation of 17.0 ft and final lift levee elevations at 14.0 ft for the Montz Area, 14.5 ft for the I-10/I-55 area, and 10.5 ft for the Reserve area. The crown of the levee is designed in this Feasibility Study with a width of 8 ft and with a slope of 1:4.

1-3. Reevaluate Levee Protection at South Shore of Lake Pontchartrain (30-ft Storm Surge at Coastline) and Hurricane Protection from Caernarvon to Pointe-a-la-Hache (20 ft Storm Surge at Coastline)

The levee alignment location is along the south shore of Lake Pontchartrain from Kenner to Highway 11. In case the Levee Alignment No. 1 is not implemented as a first line of defense, this protection system needs to be reevaluated. The concept of second-line levees and internal protection systems are vital to restoration of confidence in the flood protection system and to the concept of lowering risk in highly developed urban areas.

1-4. Resolve/Close Mississippi River Gulf Outlet (MRGO) to Deep Draft Navigation

The MRGO begins at the confluence of the Gulf Intracoastal Waterway (GIWW) and the Inner Harbor Navigation Canal (IHNC) and extends southeastward approximately 35 miles, emptying into the Breton/Chandeleur Sound area. This measure will resolve/close the MRGO to deep draft navigation. Alternative 1 will include a 110-ft by -14-ft by 30-ft floodgate at Bayou Dupre. A restriction to GIWW dimensions (approximately 110 ft) at the Bayou LaLoutre Ridge would supplement this measure.

1-5. Complete/Accelerate the Louisiana Coastal Area (LCA), Louisiana Ecosystem Restoration Study Near-Term Plan including:

1-5a. Mississippi River Gulf Outlet (MRGO) Environmental Restoration Features

The MRGO begins at the confluence of the Gulf Intracoastal Waterway (GIWW) and the Inner Harbor Navigation Canal (IHNC) and extends eastward approximately 35 miles, emptying into the Breton/Chandeleur Sound area.

The environmental restoration features involve construction of shoreline protection measures, such as rock breakwaters along the north bank of the MRGO, and along important segments of the southern shoreline of Lake Borgne. New bankline stabilization along Lake Borgne is proposed in measure 1-17 and therefore excluded from this measure. Stabilization along the MRGO will start approximately 0.5 mile south of Bayou LaLoutre and extends to the corner of the GIWW and Michoud Canal (approx. 25.6 miles). Because in some places some rock stabilization is already in place 23 miles where assumed to be in need of new rock stabilization.

1-5b. Small Diversion at Hope Canal

The Hope Canal is located in the Upper Basin (south of Lake Maurepas) on the north bank of the Mississippi River between Gramercy and Garyville. A small diversion (1,000 cfs to 5,000 cfs) from the Mississippi River and through a new structure at Hope Canal would increase freshwater and sediment introduction to the Maurepas swamps. The measure would result in increased organic and mineral deposition and improved biological productivity.

1-5c. Small Diversion at Convent/Blind River

The Convent/Blind River is located in the Upper Basin (20 miles south of Lake Maurepas) on the north bank of the Mississippi River between Gramercy and Burnside. A small (1,000 cfs to 5,000 cfs) diversion from the Mississippi River and through a new structure at Convent/Blind would increase freshwater and sediment introduction to the Maurepas swamp. The measure would result in increased organic deposition and improved biological productivity. This measure is intended to work in conjunction with the Hope Canal diversion to facilitate organic deposition in the swamp.

1-5d. Increase Amite River Diversion Canal Influence by Gapping Bank

The Amite River is located southwest of Lake Maurepas and east of I-10. The proposed measure involves the construction of eight (8) 40-ft-wide gaps in the existing dredged material banks of the Amite River Diversion Canal, each diverting an average of 250 cfs. The objective of this measure is to allow floodwaters to introduce additional fresh water, nutrients, and sediment into the western Maurepas swamp. The exchange of flow would occur during flood events on the river and from runoff of localized rainfall events, and would in turn providing nutrients and sediment to facilitate organic sediment

deposition in the swamp, some fluctuation of water levels, improve biological productivity, and prevent further swamp deterioration.

1-5e. Medium Diversion at White Ditch

The White Ditch is located on the east bank of the Mississippi River north of Carlisle. The project involves implementing a medium sized diversion (5,000 cfs to 15,000 cfs) from the Mississippi River through a new control structure at White Ditch. This feature is located in the vicinity of a historic crevasse. Follow-up feasibility-level analysis will determine the ultimate size of the diversion. The area requires additional fresh water and sediment to facilitate organic sediment deposition, improve biological productivity, and prevent further deterioration of the marshes.

1-5f. Modification at Caernarvon Diversion

The diversion structure is located on the east bank of the Mississippi River about 15 miles downstream from New Orleans, near the city of Caernarvon, near the Breton Sound marshes close to the St. Bernard-Plaquemines Parish line. Modified operation of this structure would allow an increase in the freshwater introduction rate, probably 5,000 cfs on average, to accommodate the wetland building function of the system. This measure would identify operation changes that would increase restoration outputs. The additional input of fresh water would facilitate organic sediment deposition, improve biological productivity, and prevent further deterioration of the marshes. This structure is located in the vicinity of a historic crevasse.

1-5g. Louisiana/Mississippi Hydrodynamic Study

The proposed study area would encompass the estuaries and nearshore water associated with Lake Borgne Basin, Chandeleur and Breton Sound, Mississippi Sound and Mobile Bay. The study effort would include data collection, data synthesis, extension of existing modeling, and possibly development of new models. The comprehensive study would assist in determining the need, location, size, and seasonal variations for planned diversions and future restoration measures/projects. After a comprehensive model is developed, calibrated, and verified for existing conditions, it would be used to simulate a new base condition for the coastal area, simulating the collective impacts of near-term features and any other existing or planned projects that affect the river system. The model would also be used to evaluate the impacts of potential large-scale restoration features and to evaluate adaptive management and adjustments to restoration features.

This measure was labeled as “not being tied to a specific geographic location” and was, therefore, not shown on the Alternative maps.

1-5h. Mississippi River Hydrodynamic Study

The proposed study area would encompass the existing Mississippi and Atchafalaya River systems necessary to properly assess the operation and parameters of the system with respect to water and sediment transport, flood control, and navigation. The study effort would include data collection, data synthesis, extension of existing modeling, and possibly new models. The comprehensive study would assist in determining the need, location, size, and seasonal variations for planned diversions and future restoration projects/measures. After a comprehensive model is developed, calibrated, and verified for existing conditions, it would be used to simulate a new base condition for the coastal area, simulating the collective impacts of near-term features and any other existing or planned projects that affect the river system. The model would also be used to evaluate the impacts of potential large-scale restoration features and to evaluate adaptive management and adjustments to restoration features.

This measure was labeled as "not being tied to a specific geographic location" and was, therefore, not shown on the Alternative maps.

1-5i. Mississippi River Delta Management Study

The Mississippi River Delta Study includes the delta region below Pointe a la Hache. The study would analyze two types of measures including large diversions (greater than 50,000 cfs) from the Mississippi River, and alternative navigation channel alignments. The large scale river diversions could potentially maximize the river's sediment and freshwater resources available for ecosystem maintenance. Diversion sites, capacities, and outfall management measures would also be assessed to help optimize diversion plans. Such massive diversions, however, may cause adverse impacts to the existing navigation channel; so alternative scenarios must be investigated to accommodate navigation needs. Alternate navigation scenarios include new channels to the east or west of the current river while providing navigation either in the new channel or by maintaining the existing channel as a slack-water channel by the construction and operation of a lock system. In addition, the study would evaluate potential impacts of natural and man-made factors on the environment and economy.

This measure was labeled as "not being tied to a specific geographic location" and was, therefore, not shown on the Alternative maps.

1-6. Restore the Chandeleur Islands

The Chandeleur Islands are a barrier island chain located in easternmost St. Bernard and Plaquemines Parishes, approximately 70 miles east of New Orleans, Louisiana. This barrier island chain separates the Chandeleur and Breton Sounds from the Gulf of Mexico. The curve of the Chandeleur Islands, approximately 45 miles in length, connects the Mississippi gulf coast to the delta of the Mississippi River. Like all barrier islands, the Chandeleur Islands form a thin protective wall between the open sea and the mainland. The islands absorb the strongest waves, sheltering the mainland during large storms.

This measure will enhance flood protection and restore island habitat. Dredged material from offshore borrow areas is needed to rebuild the islands to an elevation of 6 ft above MSL. Restoration of the barrier islands will reduce wave height and wave energy that enter Chandeleur Sound (fair weather and storm generated), and reduce storm surge elevations east of the barrier islands that impact the Biloxi Marsh. Habitat restoration includes re-vegetation, which will be implemented simultaneously with beach nourishment activity in the barrier island dune and lagoon habitats. This measure will support the preservation and enhancement of saline marshes, bird rookery, recreational and commercial fishing, and maintain benefits of the National Wildlife Refuge.

1-7. Maintain and Restore the Biloxi Land Bridge and Barrier Reefs- South

The Biloxi Land Bridge South is a brackish marsh/oyster reef system that is situated in a southwest-to-northeast alignment, extending from easternmost St. Bernard Parish and north to Pelican Point. The Drum Bay and the Chandeleur Sound are east of the Biloxi Land Bridge South, and Bay Boudreau is located along the west side.

To maintain and restore the Biloxi Land Bridge and Barrier Reefs marsh areas have to be restored. This measure includes the marsh restoration of a 33,000 acres Biloxi Marsh area, which includes the placement of 5ft of dredged material and the creation of a 21 mile long and 400 ft wide ridge. Vegetative planting in the marsh area is part of this measure and black mangrove and matrimony vines will be placed on the crown of the ridge. Smooth hard grass will be planted on the water sides of the ridge and the containment berm. Offshore borrow material will be used in this effort.

1-8. Maintain and Restore the Biloxi Land Bridge and Barrier Reefs- North

The Biloxi Land Bridge North is a brackish marsh/oyster reef system that is situated in a southwest-to-northeast alignment, extending from the northeast area of the Biloxi Wildlife Management Area and northeast to Isle Aux Pass. Bay Boudreau is located along the southeast of the Biloxi Land Bridge North, and Lake Borgne is located to the west.

To maintain and restore the Biloxi Land Bridge and Barrier Reefs marsh areas have to be restored. This measure includes the marsh restoration of a 25,000 acres Biloxi Marsh area, which includes the placement of 5ft of dredged material and the creation of an 11 mile long and 400 ft wide ridge. Vegetative planting in the marsh area is part of this measure and black mangrove and matrimony vines will be placed on the crown of the ridge. Smooth hard grass will be planted on the water sides of the ridge and the containment berm. Offshore borrow material will be used in this effort.

1-9. Restore Bayou LaLoutre Ridge

The Bayou LaLoutre Ridge is a natural ridge that extends from the east bank of the Mississippi River Gulf Outlet (MRGO) south of Old Shell Beach eastward along the south boundary of the Biloxi Wildlife Management Area. To restore the Bayou LaLoutre Ridge, a constriction (rock) of the MRGO to GIWW dimensions is required at the ridge, along with a rebuilding and reforesting of the natural ridge using dredged material, and the plantings of hardwoods is needed. Restoration of the Bayou LaLoutre Ridge will in the long-term assist in sustaining the Biloxi Land Bridge South, and in reducing wave/wake, and storm surge impacts to the entire area encompassing the ridge and land bridge. Habitat restoration will provide refuge for indigenous ridge species.

1-10. Construct Jefferson Parish Fringe Marsh Buffer

The Jefferson Fringe Marsh area is located on the south shore of Lake Pontchartrain (north Jefferson Parish shoreline) between the Causeway Bridge and west to the New Orleans Airport. This measure includes an approximately 9-mile-long foreshore dike (rock) and marsh restoration between the dike and the shore, to reduce shoreline and berm erosion lakeward of the Hurricane Protection Levee. The dike is on average 300 ft away form the shoreline. Restoration of intermediate and fringe marshes must be integral to shoreline protection to provide sustainable shoreline. Marsh restoration provides critical marsh nursery, recreational fishing, birding, and other outdoor activities

1-11. Maintain Lake Borgne Land Bridge Including Shoreline Protection

The Lake Borgne Land Bridge is the area along the Lake Borgne shoreline between Doulluts Canal and Jahnckes Ditch and along the north bank of the Mississippi River Gulf Outlet (MRGO) between Doulluts Canal and Lena Lagoon in St. Bernard Parish, Louisiana. To maintain the land bridge, the marsh between Lake Borgne and the MRGO must be protected and maintained to prevent further shoreline erosion. This measure includes marsh restoration of the deteriorated land bridge between Lake Borgne and the MRGO, which includes approximately 14,000 acres. Bankline stabilization along the Lake Borgne shoreline of the land bridge is included in this measure. Bankline stabilization along the MRGO is included in measure 1-5a and not included in this measure.

1-12. Maintain Critical Marsh Shorelines and Ridges of the East Orleans Land Bridge

The East Orleans Land Bridge consists of the land bridge and marsh area located between the western shoreline of Lake Borgne and the eastern shoreline of Lake Pontchartrain. The area encompasses the eastern portion of the Bayou Sauvage National Wildlife Sanctuary, the Chef Menteur Pass, the Rigolets Pass, and Lake St. Catherine. The Gulf Intracoastal Waterway (GIWW) runs through the middle of this area.

This measure restores and maintains the East Orleans Land Bridge. Rock armoring along Lake Pontchartrain and Lake Borgne bankline is included. Dedicated dredging and marsh restoration are components of this measure; approximately 43,000 acres will be restored, excluding 40 % of total acreage to account for open bays, channels, passes, uplands and transportation infrastructure. Maintaining the land bridge, marshes, and natural ridges is essential to providing flood protection, as well as sustainable habitat.

1-13. Construct the Violet Reintroduction to Maintain Target Salinity in Louisiana and Mississippi

The diversion site is located on the east bank of the Mississippi River, between the Mississippi River and the Mississippi River Gulf Outlet (MRGO). The measure will divert Mississippi River water and sediments into the swamp and marsh areas of Lake Borgne southeast of the East Orleans Land Bridge. The objective is to maintain target salinities, reduce additional saltwater intrusion, allow the marshes to develop into more mature, denser wetland forest, enhance oyster growth, and increase secondary productivity such as shrimp, blue crab, and oysters to benefit recreational and commercial fishing.

1-14. Diversion at American/California Bay with Sediment Enrichment

The American/California Bay is located off the east bank of the Mississippi River, east of Sulphur, Louisiana. The objective of this measure is to provide a non-structural, uncontrolled diversion from the Mississippi River at American/California Bays. The diversion feature will consist of an armored crevasse (200,000 cfs) through the existing un-leveed riverbank into the fringe marsh and open water of the bay system. The introduction of additional sediment from dedicated dredging will facilitate organic and mineral deposition, improve biological productivity, and prevent further deterioration of existing marshes, thereby providing increased attenuation of wave/wake energy and storm surge elevation.

1-15. Benneys Bay Sediment Diversion

The Benneys Bay diversion site is located on the east bank of the Mississippi River, in Plaquemines Parish, Louisiana, 7.5 miles from Above Head of Passes. This measure will divert Mississippi River water and sediments into Benneys Bay as well as utilize sediment enrichment. The objective is to restore vegetated wetlands in an area that is currently shallow open water. The measure will divert sediments in an effort to restore, nourish, and maintain approximately 5,828 acres of fresh to intermediate marsh in the Benneys Bay area over the 20-year project life. The measure consists of a conveyance channel for the large scale diversion of water and sediments from the river. The conveyance channel would be constructed in two phases: (1) construction of an initial channel with an average discharge of 20,000 cubic feet per second (cfs); (2) after a period of intensive monitoring, enlargement of the channel to a 50,000-cfs discharge. Material from the construction of the channel would be used to restore wetlands in the diversion outfall area.

The diversion would induce shoaling in the main navigation channel of the Mississippi River. Dredging of the channel is accomplished under the U.S. Army Corps of Engineers' ongoing Operations and Maintenance Program for the river. The Pilottown anchorage area is not maintained under the Operations and Maintenance Program. The additional dredging of the induced shoaling in the navigation channel and anchorage area would be an added feature and cost of the project. The dredged material removed from these areas would be used to restore wetlands where possible.

1-16. Add Breakwater (in Lake Borgne from Southwest Corner to Biloxi Wildlife Management Area)

The breakwater in Lake Borgne Bankline would extend from the southwest corner of the lake to the Biloxi Wildlife Management Area. Increased lake shoreline protection will be accomplished by adding a breakwater

structure (20 feet above MSL). This project proposes to construct a series of breakwater groins constructed within Lake Borgne to dissipate the forces induced by breaking waves. Each breakwater will be diagonally spaced and will be approximately 1,000 feet long, 20 ft wide at the crown, 39 ft high (total – incl. settlement), 50 ft apart, and will overlap 25 feet on each end. The measure will limit tidal forces and wind-driven wave actions originating from the Gulf of Mexico and Lake Borgne, assist in the retardation of saltwater migration, and improve retention of fresh water within the adjacent marshes north of the structures and will be built to an elevation of 20 feet above MSL

1-17. St. Tammany Marsh Restoration and Shoreline Protection with Dredge Material and Vegetative Planting

The St. Tammany shoreline and marsh area extends along the north shoreline of Lake Pontchartrain from Madisonville to the Louisiana border. Dredged material will be placed strategically along the St. Tammany shoreline (approximately 330 acres) to improve protection to inland areas from wave propagation. This measure will be combined with planned vegetative planting, so that the marsh areas would continue to naturally expand and also aid in beach nourishment.

1-18. Adaptive Management through Maintenance of Existing Crevasses and Construction of New Crevasses

This measure applies to the Lower Mississippi River and Delta area. This measure includes the implementation of four crevasses in the first year. Each crevasse is assumed to have a flow of 2,500 cfs and allows for delta building processes. In the second year, three different crevasses will be opened and the four crevasses from the previous year are assumed to silt in during this period. This procedure will continue throughout the next 100 years.

1-19. Maximize Beneficial Use of Dredged Material

The areas within Planning Unit 1 where beneficial uses of dredged material could be placed from river and other sediment sources include Biloxi Marsh area, Breton Sound area, and all marsh areas that have eroded away in the vicinity of the MRGO on the east side of the Mississippi River, as well as the Chandeleurs, a national wildlife refuge. Other areas adjacent to navigable waterways and drainage canals subject to maintenance dredging could also provide opportunities to maximize beneficial use of dredged material.

Increasing and maximizing the beneficial uses of dredged material will provide stronger foundations for marsh-building processes to occur, and allow marsh recovery to take place. Approximately 100 acre/ft of marsh can be restored with 1 MCY of dredged material, thus, the potential is great for considerable marsh restoration to occur in PU 1 and throughout coastal Louisiana using river sediments, dedicated dredging outside navigation channels, and off-shore borrow.

This measure was labeled as “not being tied to a specific geographic location” and was, therefore, not shown on the Alternative maps.

1-20. Strategize and Implement Plan to Elevate and/or Relocate Assets Located Outside the Hurricane Protection Plans

This measure, Non-structural Protection to Assets Located Outside of the Hurricane Protection Levee System., applies to all areas of the Planning Unit that are identified as being at risk from storm surge inundation by the 1% annual probability storm event (1 in 100-year event) that are not protected by a hurricane levee or levees.

It is necessary to prepare, and implement, a comprehensive plan to provide for non-structural protection of properties outside the levee system. The plan will define whether it is more appropriate to raise properties or,

where future risks are likely to be so great as to make long-term occupancy unrealistic, relocate occupants. Surveys of areas not protected by levees to identify and prioritize requirements for non-structural protection and a review of potential funding sources will be included.

This measure was labeled as “not being tied to a specific geographic location” and was, therefore, not shown on the Alternative maps.

3.0 Planning Unit 2 – Mississippi River to Bayou Lafourche

There were ninety-eight proposed measures considered for alternatives one and two, including stakeholders' measures. Thirty-two of these measures were selected to represent the two alternatives, and are described briefly by alternative below. The analysis and model runs on these alternative measures resulted in sixteen measures to represent the preferred plan.

3.1 Alternative 1

2-1. USACE Levee Alignment No. 1: Hurricane Protection (30-ft Storm Surge at the Coastline) Along the GIWW South from Golden Meadow to City Price, Modified to Include Lafitte and Barataria

- The U. S. Army Corps of Engineers (USACE) Louisiana Coastal Protection and Restoration (LaCPR)-Preliminary Technical Report Levee Alignment No. 1 starts near the Mississippi River south of Belle Chasse, three miles north of City Price/Diamond in Plaquemines Parish and extends along the southern bank of the Gulf Intracoastal Waterway (GIWW) and connects to the existing Larose to Golden Meadow levee in Lafourche Parish. The alignment would include a southern loop around the developed areas of Lafitte and Barataria. Existing levees would be upgraded, and where no levees exist, new levees would be constructed to provide protection against a storm surge of 30 feet hitting the coastline of Louisiana (0.2% annual probability storm event—1 in 500-year event).

This Levee Alignment will provide increased surge protection to concentrated (cities, towns, communities, or important industrial infrastructure) and distributed (e.g., highways) assets located within the Planning Unit 2 study area. Currently, the Modified GIWW alignment is the preferred alignment for the Donaldsonville to the Gulf Feasibility Study sponsors, Lafourche Levee District, and many state and local representatives.

2-2. New Orleans to Venice Hurricane Protection Project (HPP): City Price to Venice Segment – Improve Existing Levees to Provide 100-year Storm Frequency Level of Protection

This levee alignment is along the west bank of the Mississippi River beginning at City Price in Plaquemines Parish and extending down river to the Venice, Louisiana.

The Mississippi River Levee (MRL) protects the west bank of Plaquemines Parish from river flooding and also serves to protect the region from hurricane-induced tidal surges in conjunction with the NOV Hurricane Protection System. The west bank NOV extends from St. Jude/Diamond to Venice, a distance of 34 miles.

2-3. Grand Isle and Vicinity Project: Provide Maximum Technically Feasible Hurricane Protection

The proposed measure is located on the Gulf Coast of southern Jefferson Parish, Louisiana. It is about 50 miles south of New Orleans and 45 miles northwest of the mouth of the Mississippi River. Grand Isle is the only inhabited barrier island in Louisiana. The island is bounded by Caminada Bay to the north, Caminada Pass to the west, the Gulf of Mexico to the south, and Barataria Pass to the east. Louisiana Highway 1 connects Cheniere Caminada to western Grand Isle through a bridge that passes over the Caminada Pass tidal inlet. The highway extends to the eastern end of the island near Grand Isle State Park. Grand Isle extends about 7.5 miles in a northeast-to-southwest direction. The island width is about 0.75 mile at the center.

The measure consists of raising the height of the levee on the gulf side from 12 to 14 feet; constructing a levee along the bayside to an elevation of 14 feet; elevating Highway 1 approximately 1.5 feet to an elevation or 5 feet

from Port Fourchon to its terminus at the eastern end of Grand Isle; and, construction of segmented breakwaters along the bayside of Grand Isle. In additional to these structural measures proposed on the island , restoration of adjacent barrier islands that provide protection to Grand Isle is also recommended.

2-4. Complete/Accelerate the Louisiana Coastal Area (LCA), Louisiana Ecosystem Restoration Study Near-Term Plan including:

2-4a. Barataria Basin Barrier Shoreline Restoration Caminada Headland and Shell Island

Caminada Headland is an area between Belle Pass and Caminada Pass, and Shell Island is a barrier island in the Plaquemines barrier island system. These barrier shoreline segments are critical components of the Barataria Shoreline.

This restoration feature involves mining offshore sediment sources to reestablish sustainable barrier islands. The feature is based on designs developed in the LCA Barataria Barrier Island Restoration Study (an early coastal interim report) and assumes a 3,000-foot-wide island footprint. The Caminada Headland and Shell Island are critical components of the Barataria shoreline. Objectives for the Caminada Headland are to: 1) Preserve a critical barrier headland without disrupting the natural hydrologic regime, 2) Preserve the integrity of the barrier headland by closing existing breeches, 3) Sustain and improve shoreline, dune and interior marsh habitat quality for essential fish and wildlife species, and 4) Reduce wave energy transmission by providing a natural storm protective buffer for interior marsh and Chenier ridge habitats north of the Caminada Headland.

2-4b. Small Bayou Lafourche Reintroduction

The Bayou Lafourche reintroduction is located in the Upper Basin near Donalsonville on the west bank of the Mississippi River. Channel improvements to Bayou Lafourche to allow the exiting pump to operate at maximum capacity are proposed. In 1955, a pump/siphon system with a capacity to reintroduce approximately 340 cfs was installed on the levee at Donaldsonville. Because of channel constraints, this existing pump/siphon currently provides approximately 200 cfs of river water into the bayou.

2-4c. Medium Diversion with Dedicated Dredging at Myrtle Grove

Myrtle Grove is located on the west bank of the Mississippi River between Ironton and Deer Range and directly across from Phoenix. The proposed restoration feature considers a diversion ranging from 2,500 to 15,000 cfs coupled with dedicated dredging for the restoration of up to 19,700 acres of wetlands. The diversion will allow the reintroduction of freshwater, sediment and nutrients into the critically affected area of the Barataria Basin in a manner similar to the rise and fall of the river's hydrologic cycle. The rate of reintroduction would be optimized according to the overall planning objectives of the LCA restoration effort to maintain hydrogeomorphic diversity and connectivity, as well as habitat diversity. The dedicated dredging component of the Myrtle Grove measure would allow immediate recovery of former wetland areas already converted to open water. The combination is also expected to maximize the amount of acreage created per yard of sediment placed by capitalizing on incremental accretion of diverted sediment.

2-4d. Re-authorization of Davis Pond – Optimize for Marsh Creation

Davis Pond Freshwater Diversion is located on the west bank of the Mississippi River, between Luling and Ama, in the vicinity of a historic crevasse. Necessary changes in the operation of Davis Pond project to increase wetland creation and restoration outputs will be assessed. Modified operation of this structure could potentially result in an increase in the freshwater introduction rate, perhaps 5,000 cfs on average, to accommodate the wetland building function of the system. This measure would identify operation changes that would increase restoration outputs.

The introduction of additional freshwater would facilitate organic and sediment deposition, improve biological productivity, and prevent further deterioration of the marshes.

2-4e. Mississippi River Hydrodynamic Study

The proposed study area would encompass the existing Mississippi and Atchafalaya River systems necessary to properly assess the operation and parameters of the system with respect to water and sediment transport, flood control, and navigation. The western side of the Mississippi River system is located in Planning Unit 2. The study effort would include data collection, data synthesis, extension of existing modeling, and possibly development of new models. The comprehensive study would assist in determining the need, location, size, and seasonal variations for planned diversions and future restoration projects. After a comprehensive model is developed, calibrated, and verified for existing conditions, it would be used to simulate a new base condition for the coastal area, simulating the collective impacts of near-term features and any other existing planned projects that affect the river system. The model would also be used to evaluate the impacts of potential large-scale restoration features, and to evaluate adaptive management and adjustments to restoration features.

This measure was labeled as “not being tied to a specific geographic location” and was, therefore, not shown on the Alternative maps.

2-4f. Mississippi River Delta Management Study

The Barataria and Mississippi River Delta basins would be the locations benefited in Planning Unit 2. The restoration strategy is to investigate methods of harnessing the river to restore wetlands in southeast Louisiana by greatly increasing the deposition of Mississippi River sediments on the shallow continental shelf, while ensuring navigation interests are protected. The study would analyze two types of projects including large diversions (greater than 50,000 cfs) from the Mississippi River, and alternative navigation channel alignments. The large-scale river diversions could potentially maximize the river’s sediment and freshwater resources available for ecosystem maintenance. Diversion sites, capacities, and outfall management measures would also be assessed to help optimize diversion plans. Such massive diversions, however, may cause adverse impacts to the existing navigation channel; so alternative scenarios must be investigated to accommodate navigation needs. Alternate navigation scenarios include new channels to the east or west of the current river while providing navigation either in the new channel or by maintaining the existing channel as a slack-water channel by the construction and operation of a lock system. In addition, the study would evaluate potential impacts of natural and man-made factors on the environment and economy.

This measure was labeled as “not being tied to a specific geographic location” and was, therefore, not shown on the Alternative maps.

2-4g. Third Delta Study

The Third Delta Study conveyance channel, as proposed, would follow the eastern slope of the natural Bayou Lafourche levee system, and split into two channels near Raceland. The eastern channel, located in Planning Unit 2, would terminate in Little Lake in Barataria Basin.

The purpose of the Third Delta Study is to examine large-scale alternatives for the restoration of the lower areas of Terrebonne, Lafourche, and Jefferson Parishes in the region of the Barataria-Terrebonne National Estuary. This restoration concept involves constructing a conveyance channel parallel to Bayou Lafourche that would carry Mississippi River water and sediment to the western Barataria and eastern Terrebonne Basins in order to create two new deltas in this estuarine complex. The proposed two new deltas would be formed by sediment carried through a constructed conveyance channel. To reduce channel construction cost and increase availability of

sediment in the created delta, a pilot channel would be constructed, and natural riverine processes would erode the conveyance channel to its final design width and discharge.

2-5. Barrier Shoreline Restoration Projects- Restoring the Barataria Barrier Islands

The Barataria Barrier Islands form a barrier island chain which separates Barataria Bay from the Gulf of Mexico and stretches from the Mississippi River in the east to Bayou Lafourche in the west. This restoration feature involves mining offshore sediment sources to reestablish sustainable barrier islands. Enhanced flood protection and habitat restoration are the performance goals for the Barataria Barrier Islands. Beach nourishment with sand, shell, and/or beneficial use of dredged sediments are needed along the islands coasts to stabilize and build up the islands' coasts to reduce wave height and wave energy that enter Barataria Bay (fair weather and storm generated). Habitat restoration, to include re-vegetation can be implemented simultaneously with beach nourishment activity in that barrier island dune and lagoon habitats will be improved to protect and enhance the saline marshes, bird rookery, recreational and commercial fishing, and to maintain benefits of barrier island ecosystem.

2-6. Adaptive Management through Maintenance of West Bay Crevasse

The existing West Bay Crevasse is located on the west bank of the Mississippi River, in Plaquemines Parish, Louisiana, 4.7 miles above Head of Passes. The diversion outfall area is a large, shallow, open-ended inter-distributary basin, situated between the main river channel on the east, Grand Pass on the west, and Zinzin Bay on the south. The measure area is composed of 12 percent freshwater marsh and tidal flats and 88 percent open water, totaling 12,294 acres. Sediment diversion is to promote the formation of emergent marsh through construction of a crevasse and the placement of dredged material. The location of the receiving basin, along with the shallow depth and open-end configuration, maximizes the potential for emergent marsh creation. Adaptive management and maintenance of the existing crevasse will keep the main navigation channel of the Mississippi River and the adjacent Pilottown anchorage area open to navigation, and direct dredged material, riverine sediments, and fresh water into critical marsh areas where sediments and nutrients will better be retained for marsh-building processes to occur.

2-7. Pipeline Conveyance of Sediment to Create Strategic Marsh Platforms in Fringing Marsh and Middle Basin Marsh Areas, Including the LA-1 Marsh Creation Project Area

The areas targeted for strategic marsh platform restoration are across the Fringing Marsh and Middle Basin Marsh areas of the Barataria Basin and include marsh restoration adjacent to back levees in Plaquemines Parish, at strategic locations on the Barataria Land Bridge in Jefferson Parish, and along Bayou L'Ours and LA-1 near Golden Meadow in Lafourche Parish. The objective of this measure is to develop a Tri-Parish restoration project that utilizes proven sediment transfer methods for restoration activities. The measure would initiate marsh/wetland development in close proximity to levees and evacuation routes to provide added hurricane protection; regenerate marsh at strategic locations along the Barataria Land Bridge, focusing on areas where synergy can be created between existing and planned diversions and shoreline stabilization projects; and provide sediments, nutrients, and fresh water to counteract marsh breakup and nourish marsh within the Barataria Basin. Sediments would be mined from the Mississippi River and delivered to sites across the basin via slurry pipelines with pumps and outlet units for slurry distribution.

2-8. Backfill and/or Plug Non-essential Oil and Gas Canals

The primary measure area is sited in Jefferson Parish approximately 2 miles south of The Pen, within the portion of the Lafitte Oil and Gas Field which is east of the Dupre Cut area of the Barataria Bay Waterway and would also include other areas within the Barataria Basin. This measure would close several breaches in the area of the Lafitte Oil and Gas Field, and in other locations within the basin, by plugging abandoned location canals, as

allowed by ongoing production operations. The first step would be to identify canals that may be eliminated, while maintaining operational access through alternate routes. The canals marked for elimination would then be permanently plugged and/or backfilled thereby mitigating the adverse effects of unchecked tidal exchanges. Backfilling is a method of managing dredged material banks after the abandonment of a dredging site by returning dredged material from the banks to the canal, or using it to construct plugs, and allowing marsh vegetation to reestablish on the degraded dredged material banks and within the filled canal. The proposed canal plugs would also act as retention features for future sediment deposits. In conjunction with future dedicated dredging projects to introduce sediments dredged from the Mississippi River into adjacent deteriorated marsh areas, this project will assist in protecting Plaquemines Parish back levees, and will enhance storm surge protection to New Orleans and oil and gas industry production infrastructure within the direct vicinity.

This measure was labeled as "not being tied to a specific geographic location" and was, therefore, not shown on the Alternative maps.

2-9. Develop a Watershed Management Plan that Redirects Freshwater and Sediment, Storm Water, and Treated Sewage Water to Sustain Upper Basin Swamps and Middle Basin and Middle Basin Freshwater Marsh

The Upper Basin and Middle Basin Freshwater Marsh ecosystem units within the Barataria Basin would be the locations benefited in Planning Unit 2. Development of a flexible framework for managing water resource quality and quantity within watersheds in the basin is proposed.

2-10. Small Diversions at Strategic Locations in Upper Basin

The Upper Basin in located in the area south of Donaldsonville and north of Highway 90, between the Mississippi River and Bayou Lafourche.

The proposed restoration feature considers freshwater, nutrient, and sediment reintroduction by diverting some Mississippi River flows into the Upper Basin swamps. A small diversion is defined as diversion ranging in size from 1,000 to 5,000 cfs. Sediment enhancement using dedicated dredged material would be included as appropriate. The rate of reintroduction would be optimized according to the overall planning objectives of the Louisiana Coastal Area (LCA) restoration effort to maintain hydrogeomorphic diversity and connectivity, as well as habitat diversity. Negative impacts on flood control and drainage would also be avoided. The feasibility of utilizing a design that would allow for introduction of river water and removal of storm water would be investigated

2-11. Maximize Beneficial Use of Dredged Material Where Feasible

The areas within Planning Unit 2 where beneficial uses of dredged material could be maximized include barrier islands in the vicinity of Bayou Rigaud and the Barataria Bay Waterway, marsh and open water areas adjacent to the Barataria Bay Waterway and Bayou Segnette Waterway, and marsh and open water areas near the Head of Passes and Southwest Pass. Other areas adjacent to navigable waterways and drainage canals subject to maintenance dredging could also provide opportunities to maximize beneficial uses of dredged material.

Increasing and maximizing beneficial uses of dredged material will provide stronger foundations for marsh-building processes to occur, and allow marsh recovery to take place. Approximately 100 acre/ft of marsh can be restored with 1 MCY of dredged material, thus, the potential is great for considerable marsh restoration to occur in PU 2 and throughout coastal Louisiana using river sediments, dedicated dredging outside navigation channels, and off-shore borrow.

This measure was labeled as “not being tied to a specific geographic location” and was, therefore, not shown on the Alternative maps.

2-12. Strategize and Implement Plan to Elevate and/or Relocate Assets Located Outside the Hurricane Protection Plans

This measure, Non-structural Protection to Assets Located Outside of the Hurricane Protection Levee System., applies to all areas of the Planning Unit that are identified as being at risk from storm surge inundation by the 1% annual probability storm event (1 in 100-year event) that are not protected by a hurricane levee or levees.

It is necessary to prepare, and implement, a comprehensive plan to provide for non-structural protection of properties outside the levee system. The plan will define whether it is more appropriate to raise properties or, where future risks are likely to be so great as to make long-term occupancy unrealistic, relocate occupants. Surveys of areas not protected by levees to identify and prioritize requirements for non-structural protection and a review of potential funding sources will be included.

This measure was labeled as “not being tied to a specific geographic location” and was, therefore, not shown on the Alternative maps.

3.2 Alternative 2

2-1. West Bank and Vicinity Hurricane Protection Levee (WBVHPL) from Davis Pond to Oakville: Improve Existing Levee to Provide for Hurricane Protection (30-ft Storm Surge at the Coastline)

The West Bank and Vicinity Hurricane Protection Levee is located on the west bank of the Mississippi River in the vicinity of New Orleans and in Jefferson, Orleans, and Plaquemines Parishes. East of the Harvey Canal, the levee alignment begins at Oakville below Belle Chasse in Plaquemines Parish and extends to the Harvey Canal Floodgate. West of Harvey Canal, the levee alignment extends from the Harvey Canal down to the V-Levee near the Jean Lafitte National Historical Park and back up to the town of Westwego. At Westwego, the alignment follows the Lake Cataouatche levee alignment west to the east guide levee of Davis Pond.

This measure is to increase the level of protection afforded the West Bank New Orleans metropolitan area by raising the elevation of the WBVHPL to protect against a 500-year frequency storm, and, if needed, will include increasing the height of the Mississippi River Levee from Oakville to Davis Pond

2-2. USACE Levee Alignment No. 3: Provide 100 Year Storm Protection via the Highway 90 Alignment from Golden Meadow to Davis Pond Segment and from Oakville to Venice in the Plaquemines Parish Segment

The USACE LaCPR Levee Alignment No. 3 Highway 90 Alignment would cross the basin parallel to and south of U.S. Highway 90 and connect to the Larose to Golden Meadow hurricane protection levee at the west guide levee of Davis Pond and, to the east, connect to the Oakville to Venice hurricane protection levee.

The proposed levee alignment will provide surge protection (100-year frequency storm) from Davis Pond to Golden Meadow and from Oakville to Venice. The levee alignment would tie into the West Bank and Vicinity Hurricane Protection Levee at its eastern and western most reaches, and consists of three segments:

- Donaldsonville to the Gulf Highway 90 Alignment
- Larose to Golden Meadow

- Oakville to Venice

2-3. Ring Levees around Lafitte, Barataria, and Crown Point: Provide Maximum Technically Feasible Hurricane Protection

Jean Lafitte, Barataria, and Crown Point are located south of New Orleans in Jefferson Parish, Louisiana. Jean Lafitte is on the eastern bank of Bayou Barataria, and Barataria is on the western bank of Bayou Barataria. Crown Point is located east of the Lafitte-Larose Highway, bordered on the north and south by Bayou des Familles and Bayou Barataria, respectively. This measure is to provide hurricane protection to the 1% probability level through improvements to existing levees and, where no levees exist, construct new levees. All levees would be designed and constructed to federal standards.

2-4. Complete/Accelerate the Louisiana Coastal Area (LCA), Louisiana Ecosystem Restoration Study Near-Term Plan including:

2-4a. Barataria Basin Barrier Shoreline Restoration Caminada Headland and Shell Island

Caminada Headland is an area between Belle Pass and Caminada Pass, and Shell Island is a barrier island in the Plaquemines barrier island system. These barrier shoreline segments are critical components of the Barataria Shoreline. This restoration feature involves mining offshore sediment sources to reestablish sustainable barrier islands. The feature is based on designs developed in the LCA Barataria Barrier Island Restoration Study (an early coastal interim report) and assumes a 3,000-foot-wide island footprint. The Caminada Headland and Shell Island are critical components of the Barataria shoreline. Objectives for the Caminada Headland are to: 1) Preserve a critical barrier headland without disrupting the natural hydrologic regime, 2) Preserve the integrity of the barrier headland by closing existing breeches, 3) Sustain and improve shoreline, dune and interior marsh habitat quality for essential fish and wildlife species, and 4) Reduce wave energy transmission by providing a natural storm protective buffer for interior marsh and chenier ridge habitats north of the Caminada Headland.

2-4b. Small Bayou Lafourche Reintroduction

The Bayou Lafourche reintroduction is located in the Upper Basin near Donalsonville on the west bank of the Mississippi River. Upgrading the existing pump/siphon facility to operate at the full 340 cfs capacity and constructing a 660 cfs new pump/siphon facility to bring the total diversion capacity to 1000 cfs. This project will be implemented in accordance with the Louisiana Department of Natural Resources, Mississippi River Water Reintroduction into Bayou Lafourche, Final Phase 2 Design Report, March 2006.

2-4c. Medium Diversion with Dedicated Dredging at Myrtle Grove

Myrtle Grove is located on the west bank of the Mississippi River between Ironton and Deer Range and directly across from Phoenix. The proposed restoration feature considers a diversion ranging from 2,500 to 15,000 cfs coupled with dedicated dredging for the restoration of up to 19,700 acres of wetlands. The diversion will allow the reintroduction of freshwater, sediment and nutrients into the critically affected area of the Barataria Basin in a manner similar to the rise and fall of the river's hydrologic cycle. The rate of reintroduction would be optimized according to the overall planning objectives of the LCA restoration effort to maintain hydrogeomorphic diversity and connectivity, as well as habitat diversity. The dedicated dredging component of the Myrtle Grove measure would allow immediate recovery of former wetland areas already converted to open water. The combination is also expected to maximize the amount of acreage created per yard of sediment placed by capitalizing on incremental accretion of diverted sediment.

2-4d. Re-authorization of Davis Pond – Optimize for Marsh Creation

Davis Pond Freshwater Diversion is located on the west bank of the Mississippi River, between Luling and Ama, in the vicinity of a historic crevasse. Necessary changes in the operation of Davis Pond project to increase wetland

creation and restoration outputs will be assessed. Modified operation of this structure could potentially result in an increase in the freshwater introduction rate, perhaps 5,000 cfs on average, to accommodate the wetland building function of the system. This measure would identify operation changes that would increase restoration outputs. The introduction of additional freshwater would facilitate organic and sediment deposition, improve biological productivity, and prevent further deterioration of the marshes.

2-4e. Mississippi River Hydrodynamic Study

The proposed study area would encompass the existing Mississippi and Atchafalaya River systems necessary to properly assess the operation and parameters of the system with respect to water and sediment transport, flood control, and navigation. The western side of the Mississippi River system is located in Planning Unit 2. The study effort would include data collection, data synthesis, extension of existing modeling, and possibly development of new models. The comprehensive study would assist in determining the need, location, size, and seasonal variations for planned diversions and future restoration projects/measures. After a comprehensive model is developed, calibrated, and verified for existing conditions, it would be used to simulate a new base condition for the coastal area, simulating the collective impacts of near-term features and any other existing planned projects that affect the river system. The model would also be used to evaluate the impacts of potential large-scale restoration features, and to evaluate adaptive management and adjustments to restoration features.

This measure was labeled as “not being tied to a specific geographic location” and was, therefore, not shown on the Alternative maps.

2-4f. Mississippi River Delta Management Study

The Barataria and Mississippi River Delta basins would be the locations benefited in Planning Unit 2. The restoration strategy is to investigate methods of harnessing the river to restore wetlands in southeast Louisiana by greatly increasing the deposition of Mississippi River sediments on the shallow continental shelf, while ensuring navigation interests are protected. The study would analyze two types of projects including large diversions (greater than 50,000 cfs) from the Mississippi River, and alternative navigation channel alignments. The large-scale river diversions could potentially maximize the river’s sediment and freshwater resources available for ecosystem maintenance. Diversion sites, capacities, and outfall management measures would also be assessed to help optimize diversion plans. Such massive diversions, however, may cause adverse impacts to the existing navigation channel; so alternative scenarios must be investigated to accommodate navigation needs. Alternate navigation scenarios include new channels to the east or west of the current river while providing navigation either in the new channel or by maintaining the existing channel as a slack-water channel by the construction and operation of a lock system. In addition, the study would evaluate potential impacts of natural and man-made factors on the environment and economy.

This measure was labeled as “not being tied to a specific geographic location” and was, therefore, not shown on the Alternative maps.

2-4g. Third Delta Study

The Third Delta Study conveyance channel, as proposed, would follow the eastern slope of the natural Bayou Lafourche levee system, and split into two channels near Raceland. The eastern channel, located in Planning Unit 2, would terminate in Little Lake in Barataria Basin.

The purpose of the Third Delta Study is to examine large-scale alternatives for the restoration of the lower areas of Terrebonne, Lafourche, and Jefferson Parishes in the region of the Barataria-Terrebonne National Estuary. This restoration concept involves constructing a conveyance channel parallel to Bayou Lafourche that would carry

Mississippi River water and sediment to the western Barataria and eastern Terrebonne Basins in order to create two new deltas in this estuarine complex. The proposed two new deltas would be formed by sediment carried through a constructed conveyance channel. To reduce channel construction cost and increase availability of sediment in the created delta, a pilot channel would be constructed, and natural riverine processes would erode the conveyance channel to its final design width and discharge.

2-5. Barrier Shoreline Restoration Projects- Restoring the Barataria Barrier Islands

The Barataria Barrier Islands form a barrier island chain which separates Barataria Bay from the Gulf of Mexico and stretches from the Mississippi River in the east to Bayou Lafourche in the west.

This restoration feature involves mining offshore sediment sources to reestablish sustainable barrier islands. Enhanced flood protection and habitat restoration are the performance goals for the Barataria Barrier Islands. Beach nourishment with sand, shell, and/or beneficial use of dredged sediments are needed along the islands coasts to stabilize and build up the islands' coasts to reduce wave height and wave energy that enter Barataria Bay (fair weather and storm generated). Habitat restoration, to include revegetation can be implemented simultaneously with beach nourishment activity in that barrier island dune and lagoon habitats will be improved to protect and enhance the saline marshes, bird rookery, recreational and commercial fishing, and to maintain benefits of barrier island ecosystem.

2-6. Adaptive Management through Maintenance of West Bay Crevasse

The existing West Bay Crevasse is located on the west bank of the Mississippi River, in Plaquemines Parish, Louisiana, 4.7 miles above Head of Passes. The diversion outfall area is a large, shallow, open-ended inter-distributary basin, situated between the main river channel on the east, Grand Pass on the west, and Zinzin Bay on the south. The measure area is composed of 12 percent freshwater marsh and tidal flats and 88 percent open water, totaling 12,294 acres. Sediment diversion is to promote the formation of emergent marsh through construction of a crevasse and the placement of dredged material. The location of the receiving basin, along with the shallow depth and open-end configuration, maximizes the potential for emergent marsh creation. Adaptive management and maintenance of the existing crevasse will keep the main navigation channel of the Mississippi River and the adjacent Pilottown anchorage area open to navigation, and direct dredged material, riverine sediments, and fresh water into critical marsh areas where sediments and nutrients will better be retained for marsh-building processes to occur.

2-7. Pipeline Conveyance of Sediment to Create Strategic Marsh Platforms in Fringing Marsh and Middle Basin Marsh Areas, Including the LA-1 Marsh Creation Project Area

The areas targeted for strategic marsh platform restoration are across the Fringing Marsh and Middle Basin Marsh areas of the Barataria Basin and include marsh restoration adjacent to back levees in Plaquemines Parish, at strategic locations on the Barataria Land Bridge in Jefferson Parish, and along Bayou L'Ours and LA-1 near Golden Meadow in Lafourche Parish.

The objective of this measure is to develop a Tri-Parish restoration project that utilizes proven sediment transfer methods for restoration activities. The measure would initiate marsh/wetland development in close proximity to levees and evacuation routes to provide added hurricane protection; regenerate marsh at strategic locations along the Barataria Land Bridge, focusing on areas where synergy can be created between existing and planned diversions and shoreline stabilization projects; and provide sediments, nutrients, and fresh water to counteract marsh breakup and nourish marsh within the Barataria Basin. Sediments would be mined from the Mississippi River and delivered to sites across the basin via slurry pipelines with pumps and outlet units for slurry distribution.

2-8. Backfill and/or Plug Non-essential Oil and Gas Canals

The primary measure area is sited in Jefferson Parish approximately 2 miles south of The Pen, within the portion of the Lafitte Oil and Gas Field which is east of the Dupre Cut area of the Barataria Bay Waterway and would also include other areas within the Barataria Basin. The objective of this measure is to develop a Tri-Parish restoration project that utilizes proven sediment transfer methods for restoration activities. The project would initiate marsh/wetland development in close proximity to levees and evacuation routes to provide added hurricane protection; regenerate marsh at strategic locations along the Barataria Land Bridge, focusing on areas where synergy can be created between existing and planned diversions and shoreline stabilization projects; and provide sediments, nutrients, and fresh water to counteract marsh breakup and nourish marsh within the Barataria Basin. Sediments would be mined from the Mississippi River and delivered to sites across the basin via slurry pipelines with pumps and outlet units for slurry distribution.

This measure was labeled as "not being tied to a specific geographic location" and was, therefore, not shown on the Alternative maps.

2-9. Develop a Watershed Management Plan that Redirects Freshwater and Sediment, Storm Water, and Treated Sewage Water to Sustain Upper Basin Swamps and Middle Basin and Middle Basin Freshwater Marsh

The Upper Basin and Middle Basin Freshwater Marsh ecosystem units within the Barataria Basin would be the locations benefited in Planning Unit 2. This measure would close several breaches in the area of the Lafitte Oil and Gas Field, and in other locations within the basin, by plugging abandoned location canals, as allowed by ongoing production operations. The first step would be to identify canals that may be eliminated, while maintaining operational access through alternate routes. The canals marked for elimination would then be permanently plugged and/or backfilled thereby mitigating the adverse effects of unchecked tidal exchanges. Backfilling is a method of managing dredged material banks after the abandonment of a dredging site by returning dredged material from the banks to the canal, or using it to construct plugs, and allowing marsh vegetation to reestablish on the degraded dredged material banks and within the filled canal. The proposed canal plugs would also act as retention features for future sediment deposits. In conjunction with future dedicated dredging projects to introduce sediments dredged from the Mississippi River into adjacent deteriorated marsh areas, this project will assist in protecting Plaquemines Parish back levees, and will enhance storm surge protection to New Orleans and oil and gas industry production infrastructure within the direct vicinity.

This measure was labeled as "not being tied to a specific geographic location" and was, therefore, not shown on the Alternative maps.

2-10. Small Diversions at Strategic Locations in Upper Basin

The Upper Basin in located in the area south of Donaldsonville and north of Highway 90, between the Mississippi River and Bayou Lafourche. The proposed restoration feature considers freshwater, nutrient, and sediment reintroduction by diverting some Mississippi River flows into the Upper Basin swamps. A small diversion is defined as diversion ranging in size from 1,000 to 5,000 cfs. Sediment enhancement using dedicated dredged material would be included as appropriate. The rate of reintroduction would be optimized according to the overall planning objectives of the Louisiana Coastal Area (LCA) restoration effort to maintain hydrogeomorphic diversity and connectivity, as well as habitat diversity. Negative impacts on flood control and drainage would also be avoided. The feasibility of utilizing a design that would allow for introduction of river water and removal of storm water would be investigated.

2-11. Maximize Beneficial Use of Dredged Material Where Feasible

The areas within Planning Unit 2 where beneficial uses of dredged material could be maximized include barrier islands in the vicinity of Bayou Rigaud and the Barataria Bay Waterway, marsh and open water areas adjacent to the Barataria Bay Waterway and Bayou Segnette Waterway, and marsh and open water areas near the Head of Passes and Southwest Pass. Other areas adjacent to navigable waterways and drainage canals subject to maintenance dredging could also provide opportunities to maximize beneficial uses of dredged material.

Increasing and maximizing beneficial uses of dredged material will provide stronger foundations for marsh-building processes to occur, and allow marsh recovery to take place. Approximately 100 acre/ft of marsh can be restored with 1 MCY of dredged material, thus, the potential is great for considerable marsh restoration to occur in PU 2 and throughout coastal Louisiana using river sediments, dedicated dredging outside navigation channels, and off-shore borrow.

This measure was labeled as “not being tied to a specific geographic location” and was, therefore, not shown on the Alternative maps.

2-12. Strategize and Implement Plan to Elevate and/or Relocate Assets Located Outside the Hurricane Protection Plans

This measure, Non-structural Protection to Assets Located Outside of the Hurricane Protection Levee System., applies to all areas of the Planning Unit that are identified as being at risk from storm surge inundation by the 1% annual probability storm event (1 in 100-year event) that are not protected by a hurricane levee or levees.

It is necessary to prepare, and implement, a comprehensive plan to provide for non-structural protection of properties outside the levee system. The plan will define whether it is more appropriate to raise properties or, where future risks are likely to be so great as to make long-term occupancy unrealistic, relocate occupants. Surveys of areas not protected by levees to identify and prioritize requirements for non-structural protection and a review of potential funding sources will be included.

This measure was labeled as “not being tied to a specific geographic location” and was, therefore, not shown on the Alternative maps.

2-13. Small Diversion at Port Sulphur

Port Sulphur is located on the west bank of the Mississippi River in Plaquemines Parish, Louisiana. This measure provides for a 5,000 cfs diversion at 50 percent duration river stage diverted in the Freeport Sulphur Canal. Annual diversion corresponds to annual river stage hydrograph for the controlled structure.

2-14. Ridge Restoration in the Barataria Basin

Ridges in the Barataria Basin include: Bayou Lafourche ridge, Bayou L’Ours ridge, Bayou Grande Cheniere ridge, Caminada Cheniere ridges, Bayou Dupont ridge, Bayou Barataria ridge, Bayou Long-Bayou Fontanelle ridge (Empire Waterway) and Bayou Grand Liard ridge. The restoration of ridges within the Barataria Basin complement hurricane protection features by providing outer lines of defense. Restoration would include increasing ridge elevation and width with dredged material, and would also included woody vegetation and native wetland plants.

2-15. North Barataria Bay Shoreline Wave Breaks

The measure extends across the northern rim of Barataria Bay, from the northwest shore of Wilkerson Bayou, westward, across the northern lobes of the Bay and around St. Mary’s Point, and then southwestward to the Barataria Bay Waterway. This project proposes to construct a series of breakwater groins, totaling approximately

64,020 linear feet, constructed approximately 500 feet off the shoreline, so as to dissipate the forces induced by breaking waves. Each breakwater will be approximately 350 feet long, and adjacent groins will be spaced at 400-ft intervals, so as to provide 50-ft gaps between the breakwater segments to allow for adequate levels of hydrologic exchange within the inland bays and channels. The measure will limit tidal forces and wind-driven wave actions originating from the Gulf of Mexico and inland bays, assist in the retardation of saltwater migration, and improve retention of fresh water within the adjacent marshes north of the structures.

4.0 Planning Unit 3a - Bayou Lafourche to Bayou De West

Forty-six measures were considered in the initial stages. Small measures and measures that were in the process of planning and design were rejected and twenty-nine measures were considered for alternatives selection. Twenty-two measures were selected for alternatives one and two, and are described briefly by alternative below. The analysis and model runs on these alternative measures resulted in twelve measures represented in the preferred plan.

4.1 Alternative 1

3a-1 Morganza to the Gulf Hurricane Protection Levee Alignment and LAR Barrier Plan Alignment (30-ft storm surge at coastline)

The Flood Control, Mississippi River & Tributaries, Morganza, LA, to the Gulf of Mexico Hurricane Protection (Morganza to the Gulf) study area is located in coastal Louisiana, approximately 60 miles southwest of New Orleans, and includes portions of Terrebonne and Lafourche Parishes. The area is bounded on the west by Bayou Boeuf Lock, on the east by Bayou Lafourche, and on the south by the Gulf of Mexico and includes concentrated assets within Houma, Thibodeaux, and Morgan City.

The measure consists of approximately 134 miles of new earthen levee (inclusive of raising existing levee heights), five floodgate structures, nine 56-foot sector gates, two pump stations, and a lock complex consisting of a lock in the Houma Navigation Canal (HNC) measuring 110 ft by 800 ft, and an adjoining floodgate measuring 200 ft. in width, all designed for 500-year storm surge protection. The structural features would be integrated into the levee alignment to provide flood protection, drainage, environmental benefits, and navigational passage.

3a-2. Complete/Accelerate the Louisiana Coastal Area (LCA), Louisiana Ecosystem Restoration Study Near-Term Plan including:

3a-2a Small Bayou Lafourche Reintroduction Including Small Company Canal Diversion

The Bayou Lafourche reintroduction is located in the Upper Basin near Lockport, on the GIWW. Channel improvements to Bayou Lafourche to allow the exiting pump to operate at maximum capacity are proposed. In 1995, a pump/siphon system with a capacity to reintroduce approximately 340 cfs was installed on the levee at Donaldsonville. Because of channel constraints, this existing pump/siphon currently provides approximately 200 cfs of river water into the bayou.

3a-2b Multi-Purpose Operation of Houma Navigation Canal (HNC) Lock

The location is 1.75 miles south of the intersection of Bayou Sale and the HNC. This restoration feature involves the multi-purpose operation of the proposed HNC Lock for environmental benefits; implementation of this measure is dependent upon construction of the HNC as proposed in the Morganza to the Gulf Levee Alignment. The objective of this feature is to make more efficient use of Atchafalaya River waters and sediment flow, as well as maintain salinity regimes favorable for area wetlands. The proposed structure would be operated to restrict saltwater intrusion and distribute fresh water and sediment during times of high Atchafalaya River flow. The current measure is designed to limit saltwater intrusion, but with a minor modification would provide additional benefits to the wetlands by increasing retention time of Atchafalaya River water in the Terrebonne Basin wetlands. An increased retention time would provide additional sediment and nutrients to nourish the wetlands and would benefit the forested wetlands, and fresh, intermediate, and brackish marshes adjacent to the lock and canal; the Lake Boudreaux wetlands to the north; the Lake Mechant wetlands to the west; and the Grand Bayou wetlands to the east.

3a-2c Terrebonne Basin Barrier Shoreline Restoration

The measure includes the Isles Dernieres and East Timbalier Island reaches of the Terrebonne barrier-shoreline chain. This measure proposes to restore the barrier islands by using materials dredged from offshore areas and building up the barrier islands, so as to dissipate the forces induced by breaking waves. Construction of the barrier island segments will allow for adequate levels of hydrologic exchange within the inland bays and channels. The measure will limit tidal forces and wind-driven wave actions originating from the Gulf of Mexico and inland bays, assist in the retardation of saltwater migration, and improve retention of fresh water within the adjacent marshes north of the structures.

3a-2d Maintain Land Bridge between Caillou Lake and Gulf of Mexico

The measure area is between Caillou Lake and the Gulf of Mexico, bordered on the west by East Bay Junop, and on the east by Lake Pelto. This restoration feature would maintain the land bridge between the Gulf and Caillou Lake by placing shore protection in Grand Bayou du Large to minimize saltwater intrusion. This feature would involve rock armoring or marsh restoration to plug/fill broken marsh areas on the west bank of lower Grand Bayou du Large, to prevent a new channel from breaching the bayou bank and allowing a new connection with Caillou Lake. Some gulf shore armoring would be needed to protect these features from erosion on the gulf shoreline. Gulf shoreline armoring might be required where shoreline retreat and loss of shoreline oyster reefs has allowed increased water exchange between the gulf and the interior water bodies between Bay Junop and Caillou Lake. Some newly opened channels would be closed to restore historic cross sections of exchange points. By reducing marine influences in these interior areas, this feature would allow increased freshwater influence from Four League Bay to benefit area marshes.

3a-2e Convey Atchafalaya River Water to Northern Terrebonne Marshes

The measure area is located east of the Avoca Island Levee and includes the wetlands located north and south of the GIWW and east and west of the HNC below Gibson, Houma, Lockport, and Larose. This restoration feature would increase existing Atchafalaya River influence to central (Lake Boudreaux) and eastern (Grand Bayou) Terrebonne marshes via the GIWW by introducing flow into the Grand Bayou Basin by enlarging the connecting channel (Bayou L'Eau Bleu) to capture as much of the surplus flow (maximum 2,000 to 4,000 cfs) that would otherwise leave/ circumvent the Terrebonne Basin. Several alternatives would be evaluated through hydrologic models; however, in all cases, control structures would be installed to restrict channel cross section to prevent increased saltwater intrusion during the late summer and fall when riverine influence is typically low. Some alternatives may include auxiliary freshwater distribution structures. This feature also includes increasing freshwater supply through repairing banks along the GIWW, enlarging constrictions in the GIWW, and diverting additional Atchafalaya River fresh water through the Avoca Island Levee and into Bayou Chene/GIWW system.

3a-2f Third Delta Study

The Third Delta Study area includes the Barataria-Terrebonne National Estuary, and Lower areas of Terrebonne, Lafourche, and Jefferson Parishes. The Barataria-Terrebonne estuarine complex is bounded by the Mississippi and Atchafalaya Rivers. Bayou Lafourche separates this complex into two basins, Barataria Basin to the east, and Terrebonne Basin to the west. Restoration of the lower areas of Barataria-Terrebonne National Estuary, and especially the eastern Terrebonne marshes on the western side of Bayou Lafourche, has been confounded by the long distances sediment must travel from the Mississippi River. The Third Delta concept involves creating a new delta between the Atchafalaya River and Mississippi River Birdfoot Deltas. The proposed two new deltas would be formed by sediment carried through a constructed conveyance channel. To reduce channel construction cost and increase availability of sediment

in the created delta, a pilot channel would be constructed, and natural riverine processes would erode the conveyance channel to its final design width and discharge. The conveyance channel, as proposed, would follow the eastern slope of the natural Bayou Lafourche levee system, and split into two channels near Raceland. The eastern channel would terminate in Little Lake in the Barataria Basin, and the western channel would cross Bayou Lafourche and carry sediment to the Terrebonne Basin, ending near the Pointe au Chene Wildlife Management Area, north of Lake Felicity and Lake Raccourci.

3a-2g Upper Atchafalaya Basin Study

The measure is in the Upper Atchafalaya Basin. The study purpose is to conduct a system-wide comprehensive analysis of the problems and opportunities related to flood control, navigation, and ecosystem sustainability for the lower Red River, Old River, Mississippi River, and Atchafalaya River Basins. This study relates primarily to the Mississippi River and Tributaries (MR&T) Project and, as such, would be funded under that project. The study is discussed in this report because it would link closely with the Mississippi River Hydrodynamic Study (via the modeling to be developed) and because several proposed Louisiana Coastal Area (LCA) features would either impact the operation of the Old River Control Structure (ORCS) and/or effect changes to the Atchafalaya Basin, the Mississippi River, and the coastal zone. As such, any potential LCA alternatives would have to assess the potential impacts to the existing river systems.

This measure was labeled as “not being tied to a specific geographic location” and was, therefore, not shown on the Alternative maps.

3a-3 Pipeline Conveyance of Sediment to Create Strategic Marsh Platforms

The Terrebonne Wetlands are located between the west bank of Bayou Lafourche, the south bank of the Gulf Intracoastal Waterway (GIWW), and east of Bayou Hammock. The objective of this measure is to counteract marsh breakup by providing sediment and nutrients to renourish the area using a pipeline conveyance system. Sediments would be mined from the Mississippi River, the Atchafalaya River, and from the Gulf of Mexico into the eastern, central, and western Terrebonne Basin. Sediment would be placed in shallow open water and in areas to nourish degraded marshes..

3a-4. Plugging and/or Backfilling Pipeline Canals to Restore Hydrology and Regulate Salt Water Movement

Five main areas were identified (from west to east) as part of this measure: (1) south of Lake Decade between Lake Mechant and Bayou du Large, (2) east of Bayou du Large and west of Houma Navigation Canal (HNC), (3) north of Lake Boudreaux, (4) north of Lake Barre and south of Lake Tambour, and (5) west of Catfish Lake. This measure would close several breaches in areas within the basin, by plugging abandoned location canals, as allowed by ongoing production operations. The first step would be to identify canals that may be eliminated, while maintaining operational access through alternate routes. The canals marked for elimination would then be permanently plugged and/or backfilled thereby mitigating the adverse effects of unchecked tidal exchanges. Backfilling is a method of managing dredged material banks after the abandonment of a dredging site by returning dredged material from the banks to the canal, or using it to construct plugs, and allowing marsh vegetation to reestablish on the degraded dredged material banks and within the filled canal. The proposed canal plugs would also act as retention features for future sediment deposits. In conjunction with future dedicated dredging projects to introduce sediments dredged from the Mississippi River, nearby lakes, and the Atchafalaya River into adjacent deteriorated marsh areas, this project will assist in protecting the back levees, and will enhance storm surge protection to Montegut, Chauvin, south Houma and oil and gas industry production infrastructure within the direct

vicinity. This measure assumes that 25 plugs would be constructed at four geographic locations within the Terrebonne Basin, for a total of 100 plugs.

This measure was labeled as "not being tied to a specific geographic location" and was, therefore, not shown on the Alternative maps.

3a-5. Bankline Protection for the Houma Navigation Canal

The measure area is the Houma Navigation Canal from its confluence with the Gulf Intracoastal Waterway (GIWW) south into the Gulf of Mexico. This measure includes rock armoring along the east and west bank of the HNC from the confluence of the HNC and the GIWW south to Terrebonne Bay (total of 56 miles).

3a-6. Bankline Protection for the GIWW

The measure is located in the Terrebonne Basin along the Gulf Intracoastal Waterway (GIWW) reach from Morgan City to Larose. This measure will restore critical lengths of deteriorated channel banks (approximately 108 miles) and stabilize selected critical lengths of deteriorated channel banks with hard shoreline stabilization materials.

3a-7. Protection to Distributed Assets South of Morganza to the Gulf Hurricane Protection Alignment by Elevated Structures and Protected Hurricane Evacuation Routes

There are four areas associated with protection of assets outside the levee protected areas (Morganza to the Gulf of Mexico Alignment) including (1) south of Lake Boudreaux, (2) south of Montegut and west of Bayou Pointe au Chene, (3) south of Montegut and east of Bayou Pointe au Chene, and (4) south of the levee alignment near Golden Meadow and southeast of Catfish Lake.

The purpose of this measure is to provide a reasonable amount of protection to distributed assets outside the levee alignment, by creating surrounding marsh areas, particularly for roads that allow for evacuation from at risk areas south of these assets. The strategy is to identify highways and other distributed assets that would be gulfward of the hurricane protection and develop plans to either elevate or relocate those assets. With the alignment described, there are a number of assets gulfward of the line of protection. A complete survey will be needed over the entire reach. Maintain highways in good travel condition at all times. Prior to annual hurricane seasons, recommend a thorough inspection of the emergency/evacuation highways to ensure good travel conditions exist along all reaches of the road. Identify areas of potential bottlenecks and investigate ways of elimination or, at a minimum, improvement.

3a-8. Strategize and Implement Plan to Elevate and/or Relocate Assets Located Outside Hurricane Protection Plans

This measure, Non-Structural Protection to Assets Located Outside of the Hurricane Protection Levee System, applies to all areas of the Planning Unit 3a that are identified as being at risk from storm surge inundation by the 1% annual probability storm event (1 in 100 year event) that are not protected by a hurricane levee or levees.

It is necessary to prepare, and implement, a comprehensive plan to provide for non-structural protection of properties outside the levee system. The plan will define whether it is more appropriate to raise properties or, where future risks are likely to be so great as to make long-term occupancy unrealistic, relocate occupants. Surveys of areas not protected by levees to identify and prioritize requirements for non-structural protection and a review of potential funding sources will be included.

This measure was labeled as "not being tied to a specific geographic location" and was, therefore, not shown on the Alternative maps.

3a-9. Implement Chacahoula Basin Plan and Other Projects to Alleviate Inundation Issues in the Verret Sub-Basin

The Chacahoula Basin Watershed is enclosed by man-made boundaries. The basin comprises approximately 107,179 acres and is bounded to the north by Louisiana Highway 1, US Highway 90 to the south, Louisiana Highway 662 and Louisiana Highway 398 to the west, and to the east by Louisiana Highway 311 and Louisiana Highway 20. The purpose of this measure is to optimize and actively manage the water levels to decrease flooding and to encourage "good seed years" for the cypress and tupelo. To be able to effectively manage water levels in the basin, pump station installation at three locations is recommended: (1) at the Eliot Jones Canal (4500 cfs), (2) at the Hanson Canal (600 cfs), and (3) at the Minors Canal (400 cfs).

3a-10. Maximize Beneficial Use of Dredged Material Where Feasible

The areas within Planning Unit 3a where beneficial uses of dredged material could be maximized include barrier islands, marsh and open water areas adjacent to the Bayou Lafourche, Lake Tambour, the HNC, Bayou du Large. Other areas adjacent to navigable waterways and drainage canals subject to maintenance dredging could also provide opportunities to maximize beneficial uses of dredged material.

Increasing and maximizing beneficial uses of dredged material will provide stronger foundations for marsh-building processes to occur, and allow marsh recovery to take place. Approximately 100 acre/ft of marsh can be restored with 1 MCY of dredged material, thus, the potential is great for considerable marsh restoration to occur in PU 3a and throughout coastal Louisiana using river sediments, dedicated dredging outside navigation channels, and off-shore borrow. The existing federal programs for navigation maintenance do not provide adequate funding for the U.S. Army Corps of Engineers (USACE) to take full advantage of the available sediment resources.

This measure was labeled as "not being tied to a specific geographic location" and was, therefore, not shown on the Alternative maps.

4.2 Alternative 2

3a-1 Morganza to the Gulf Hurricane Protection and LAR Barrier Plan Alignment (20-ft storm surge at coastline)

The Flood Control, MR&T, Morganza, LA, to the Gulf of Mexico Hurricane Protection measure area is located in coastal Louisiana, approximately 60 miles southwest of New Orleans, and includes portions of Terrebonne and Lafourche Parishes. The area is bounded on the west by Bayou Boeuf Lock, on the east by Bayou Lafourche, and on the south by the Gulf of Mexico and includes concentrated assets within Houma, Thibodeaux, and Morgan City.

The measure consists of approximately 113.5 miles of new earthen levee (inclusive of raising existing levee heights), five 125-ft floodgates, and nine 56-foot sector gates all designed for 100-year storm surge protection. The structural features would be integrated into the levee alignment to provide flood protection, drainage, environmental benefits, and navigational passage.

3a-2. Internal Hurricane Levee Alignment (30-ft Storm Surge at Coastline)

This levee alignment begins in Gibson, follows the Terrebonne Levee and Conservation District Barrier Plan to Minors Canal crosses the HNC just south of the Terrebonne Port and then proceeds to the Gulf Intracoastal Waterway (GIWW) below Bourg to Larose.

The measure consists of approximately 52 miles of new earthen levee, four floodgate structures, and two pump stations. The purpose of the project is to reduce hurricane and flood damages in an environmentally sustainable

manner in the Houma/Thibodeaux area. The measure would protect over 200,000 people and 2,000 square miles of fresh and saline marshes, farmlands, heavy and light industry, residential, and other developed areas.

3a-3. Complete/Accelerate the Louisiana Coastal Area (LCA), Louisiana Ecosystem Restoration Study Near-Term Plan including:

3a-3a. Small Bayou Lafourche Reintroduction Including Small Company Canal Diversion

The Bayou Lafourche reintroduction measure is located in the Upper Basin near Lockport, on the GIWW. Upgrade the existing pump/siphon facility to operate at the full 340 cfs capacity and constructing a 660 cfs new pump/siphon facility to bring the total diversion capacity to 1000 cfs. This project will be implemented in accordance with the Louisiana Department of Natural Resources, Mississippi River Water Reintroduction into Bayou Lafourche, Final Phase 2 Design Report, March 2006.

3a-3b. Multi-Purpose Operation of Houma Navigation Canal (HNC) Lock

The measure area is 1.75 miles south of the intersection of Bayou Sale and the HNC. This restoration feature involves the multi-purpose operation of the proposed HNC Lock for environmental benefits. The objective of this feature is to make more efficient use of Atchafalaya River waters and sediment flow, as well as maintain salinity regimes favorable for area wetlands. The proposed structure would be operated to restrict saltwater intrusion and distribute fresh water and sediment during times of high Atchafalaya River flow. The current measure is designed to limit saltwater intrusion, but with a minor modification would provide additional benefits to the wetlands by increasing retention time of Atchafalaya River water in the Terrebonne Basin wetlands. An increased retention time would provide additional sediment and nutrients to nourish the wetlands and would benefit the forested wetlands, and fresh, intermediate, and brackish marshes adjacent to the lock and canal; the Lake Boudreaux wetlands to the north; the Lake Mechant wetlands to the west; and the Grand Bayou wetlands to the east.

3a-3c. Terrebonne Basin Barrier Shoreline Restoration

The measure area includes the Isles Dernieres and East Timbalier Island reaches of the Terrebonne barrier-shoreline chain. This measure proposes to restore the barrier islands by using materials dredged from offshore areas and building up the barrier islands, so as to dissipate the forces induced by breaking waves. Construction of the barrier island segments will allow for adequate levels of hydrologic exchange within the inland bays and channels. The measure will limit tidal forces and wind-driven wave actions originating from the Gulf of Mexico and inland bays, assist in the retardation of saltwater migration, and improve retention of fresh water within the adjacent marshes north of the structures.

3a-3d. Maintain Land Bridge between Caillou Lake and Gulf of Mexico

The measure area is between Caillou Lake and the Gulf of Mexico, bordered on the west by East Bay Junop, and on the east by Lake Pelto. This restoration feature would maintain the land bridge between the Gulf and Caillou Lake by placing shore protection in Grand Bayou du Large to minimize saltwater intrusion. This feature would involve rock armoring or marsh restoration to plug/fill broken marsh areas on the west bank of lower Grand Bayou du Large, to prevent a new channel from breaching the bayou bank and allowing a new connection with Caillou Lake. Some gulf shore armoring would be needed to protect these features from erosion on the gulf shoreline. Gulf shoreline armoring might be required where shoreline retreat and loss of shoreline oyster reefs has allowed increased water exchange between the gulf and the interior water bodies between Bay Junop and Caillou Lake. Some newly opened channels would be closed to restore historic cross sections of exchange points. By reducing marine influences in these

interior areas, this feature would allow increased freshwater influence from Four League Bay to benefit area marshes.

3a-3e. Convey Atchafalaya River Water to Northern Terrebonne Marshes

The measure area is located east of the Avoca Island Levee and includes the wetlands located north and south of the GIWW and east and west of the HNC below Gibson, Houma, Lockport, and Larose. This restoration feature would increase existing Atchafalaya River influence to central (Lake Boudreaux) and eastern (Grand Bayou) Terrebonne marshes via the GIWW by introducing flow into the Grand Bayou Basin by enlarging the connecting channel (Bayou L'Eau Bleu) to capture as much of the surplus flow (maximum 2,000 to 4,000 cfs) that would otherwise leave/ circumvent the Terrebonne Basin. Several alternatives would be evaluated through hydrologic models; however, in all cases, control structures would be installed to restrict channel cross section to prevent increased saltwater intrusion during the late summer and fall when riverine influence is typically low. Some alternatives may include auxiliary freshwater distribution structures. This feature also includes increasing freshwater supply through repairing banks along the GIWW, enlarging constrictions in the GIWW, and diverting additional Atchafalaya River fresh water through the Avoca Island Levee and into Bayou Chene/GIWW system.

3a-3f. Third Delta Study

The Third Delta Study area includes the Barataria-Terrebonne National Estuary, and Lower areas of Terrebonne, Lafourche, and Jefferson Parishes. The Barataria-Terrebonne estuarine complex is bounded by the Mississippi and Atchafalaya Rivers. Bayou Lafourche separates this complex into two basins, Barataria Basin to the east, and Terrebonne Basin to the west. Restoration of the lower areas of Barataria-Terrebonne National Estuary, and especially the eastern Terrebonne marshes on the western side of Bayou Lafourche, has been confounded by the long distances sediment must travel from the Mississippi River. The Third Delta concept involves creating a new delta between the Atchafalaya River and Mississippi River Birdfoot Deltas. The proposed two new deltas would be formed by sediment carried through a constructed conveyance channel. To reduce channel construction cost and increase availability of sediment in the created delta, a pilot channel would be constructed, and natural riverine processes would erode the conveyance channel to its final design width and discharge. The conveyance channel, as proposed, would follow the eastern slope of the natural Bayou Lafourche levee system, and split into two channels near Raceland. The eastern channel would terminate in Little Lake in the Barataria Basin, and the western channel would cross Bayou Lafourche and carry sediment to the Terrebonne Basin, ending near the Pointe au Chein Wildlife Management Area, north of Lake Felicity and Lake Raccourci.

3a-3g. Upper Atchafalaya Basin Study

The proposed measure is in Upper Atchafalaya Basin. The measure is in the Upper Atchafalaya Basin. The study purpose is to conduct a system-wide comprehensive analysis of the problems and opportunities related to flood control, navigation, and ecosystem sustainability for the lower Red River, Old River, Mississippi River, and Atchafalaya River Basins. This study relates primarily to the Mississippi River and Tributaries (MR&T) Project and, as such, would be funded under that project. The study is discussed in this report because it would link closely with the Mississippi River Hydrodynamic Study (via the modeling to be developed) and because several proposed Louisiana Coastal Area (LCA) features would either impact the operation of the Old River Control Structure (ORCS) and/or effect changes to the Atchafalaya Basin, the Mississippi River, and the coastal zone. As such, any potential LCA alternatives would have to assess the potential impacts to the existing river systems.

This measure was labeled as "not being tied to a specific geographic location" and was, therefore, not shown on the Alternative maps.

3a-4. Pipeline Conveyance of Sediment to Create Strategic Marsh Platforms

The Terrebonne Wetlands are located between the west bank of Bayou Lafourche, the south bank of the Gulf Intracoastal Waterway (GIWW), and east of Bayou Hammock. The objective of this measure is to counteract marsh breakup by providing sediment and nutrients to renourish the area using a pipeline conveyance system. Sediments would be mined from the Mississippi River, the Atchafalaya River, and from the Gulf of Mexico into the eastern and central Terrebonne Basin. Sediment would be placed in shallow open water and in areas to nourish degraded marshes.

3a-5. Implement Chacahoula Basin Plan and Other Projects to Alleviate Inundation Issues in the Verret Sub-Basin

The Chacahoula Basin Watershed is enclosed by man-made boundaries. The basin comprises approximately 107,179 acres and is bounded to the north by Louisiana Highway 1, US Highway 90 to the south, Louisiana Highway 662 and Louisiana Highway 398 to the west, and to the east by Louisiana Highway 311 and Louisiana Highway 20. The purpose of this measure is to optimize and actively manage the water levels to decrease flooding and to encourage "good seed years" for the cypress and tupelo. To be able to effectively manage water levels in the basin, pump station installation at three locations is recommended: (1) at the Eliot Jones Canal (4500 cubic feet per second [cfs]), (2) at the Hanson Canal 600 cfs), and (3) at the Minors Canal (400 cfs). Pump stations (2) and (3) are included in this plan, however, pump station (1) (1) is part of the LAR Barrier Plan. Costs were estimated for 2 pump stations; the 3rd is included with cost for the levee alignment and associated structure costs.

3a-6. Freshwater Introduction via Blue Hammock Bayou

The measure area is located between Four League Bay and Bayou du Large, encompassing Lake Mechant and the marshes north to Bayou Decade. The purposes of the proposed measure are1) Conduct hydrologic modeling to determine appropriate channel sizes to accomplish the goals of the project; 2) Construct a weir in Grand Pass; 3) Construct a weir in Buckskin Bayou; 4) construct armored plugs; 5) Dredge Blue Hammock Bayou to increase the cross section; and 6) Create 229 acres of marsh with the material dredged from Blue Hammock Bayou.

3a-7. Freshwater Introduction to South of Lake De Cade and Shoreline Protection

The measure is located in Terrebonne Parish, approximately 15 miles southwest of Houma, Louisiana. Proposed components include installing three control structures along the south rim of the lake and enlarging Lapeyrouse Canal to allow the controlled diversion of Atchafalaya River water, nutrients, and sediments south into project area marshes. Outfall management structures are planned in the marsh interior to provide better distribution of river water. In addition, approximately 1.6 miles of foreshore rock dike is planned to protect the critical areas of the south lake shoreline from breaching. Measure implementation is expected to increase knowledge about floating marshes and help identify management techniques for potential large-scale applications.

3a-8. Penchant Basin Plan

The measure is bounded on the north by the Gulf Intracoastal Waterway (GIWW), the east by a north/south line from Lake De Cade to the GIWW, the south by Lake Mechant and Lost Lake, and to the west by a north/south line from Lost Lake to Avoca Island in Terrebonne Parish, Louisiana.

The measure will combine the long-term realignment of Penchant Basin hydrology with restoration and protection measures aimed at maintaining the physical integrity of the area during the transition toward greater riverine influence. Proposed measure components may include: a rock weir with a barge bay in the northern end of Big Carencro Bayou at its intersection with Bayou Penchant; a steel sheet-pile weir with variable crest sections

and flap gates in the Bayou Mauvais Bois at its intersection with the Superior Canal; rock bank stabilization; dredging and marsh creation at the mouth of Bayou Penchant; a rock weir with a barge bay at the southern shoreline of Raccourci Bay; maintenance of existing weirs along Bayou De Cade; shell plugs with rock riprap cover along Bayou De Cade; three steel sheet-pile variable crest weirs along Bayou De Cade; two steel sheet-pile variable crest weirs with boat bays along Bayou De Cade; a rock liner in Little Deuce Bayou at its intersection with Bayou De Cade; a rock weir with barge bay in Bayou la Loutre at its intersection with the Superior Canal; a steel sheet-pile weir with boat bay and variable crest sections in Brady Canal at its intersection with Bayou Penchant; an earthen bank stabilization along Bayou De Cade; and bank maintenance. The measure is expected to divert water and potentially reduce water levels in the northwestern portion of the project area and divert that fresh water southeastward to where it is needed. This is expected to increase marsh, fisheries, and wildlife production.

This measure was labeled as “not being tied to a specific geographic location” and was, therefore, not shown on the Alternative maps.

3a-9. Protection to Distributed Assets South of Morganza to the Gulf Hurricane Protection Alignment by Elevated Structures and Protected Hurricane Evacuation Routes

There are four areas associated with protection of assets outside the levee protected areas (Morganza to the Gulf of Mexico Alignment) including (1) south of Lake Boudreaux, (2) south of Montegut and west of Bayou Pointe au Chene, (3) south of Montegut and east of Bayou Pointe au Chene, and (4) south of the levee alignment near Golden Meadow and southeast of Catfish Lake. The purpose of this measure is to provide a reasonable amount of protection to distributed assets outside the levee alignment, particularly roads that allow for evacuation from at risk areas south of these assets. The strategy is to identify highways and other distributed assets that would be gulfward of the hurricane protection and develop plans to either elevate or relocate those assets. With the alignment described, there are a number of assets gulfward of the line of protection. A complete survey will be needed over the entire reach. Maintain highways in good travel condition at all times. Prior to annual hurricane seasons, recommend a thorough inspection of the emergency/evacuation highways to ensure good travel conditions exist along all reaches of the road. Identify areas of potential bottlenecks and investigate ways of elimination or, at a minimum, improvement.

3a-10. Strategize and Implement Plan to Elevate and/or Relocate Assets Located Outside Hurricane Protection Plans

This measure, non-structural protection to assets located outside of the hurricane protection levee system, applies to all areas of the Planning Unit 3a that are identified as being at risk from storm surge inundation by the 1% annual probability storm event (1 in 100 year event) that are not protected by a hurricane levee or levees. It is necessary to prepare, and implement, a comprehensive plan to provide for non-structural protection of properties outside the levee system. The plan will define whether it is more appropriate to raise properties or, where future risks are likely to be so great as to make long-term occupancy unrealistic, relocate occupants. Surveys of areas not protected by levees to identify and prioritize requirements for non-structural protection and a review of potential funding sources will be included.

This measure was labeled as “not being tied to a specific geographic location” and was, therefore, not shown on the Alternative maps.

3a-11. Stabilize/Maintain Northern Shorelines of Terrebonne/Timbalier Bays

The measure includes the north shoreline of Terrebonne/Timbalier Bays. This feature provides for the stabilization and maintenance (rehabilitation) of the northern shorelines of Terrebonne/Timbalier Bays with a

segmented breakwater from the Seabreeze area to the Little Lake area. This feature would rebuild and maintain the historic shoreline integrity around Terrebonne and Timbalier Bays by constructing segmented barriers along the west side of Terrebonne Bay, across the historic shoreline alignment along the northern sides of both bays, and along the eastern side of Timbalier Bay

3a-12. Short-Term Freshwater Redirections to Nourish and Sustain Intermediate Marshes that are being Affected by Salt Water

There are seven locations where diversions are proposed as part of this measure.. Three diversions are near the Gulf Intracoastal Waterway (GIWW) north of the internal levee alignment (near Boudreaux Canal, Bayou La Cache, and Bayou Pointe-au-Chiene). Two diversions are located near the HNC, one is south of Southdowns (near to the confluence of the HNC and the GIWW), the other is west of the HNC, south of the GIWW, and on Grand Bayou. Two diversions are located near the mouth of Bayou du Large. This measure includes several diversions that will manage increased freshwater introduction into depleted marsh areas during high water stages of the GIWW, HNC, and the interconnecting canals utilizing pump stations. The pump stations will be operated at 100 cfs during high water stages. Pump station installation includes pump station intake structures, intake lines, pump pit structures, mechanical and electrical installation, discharge piping and discharge structures. They will be allowed to divert fresh water, sediment, and nutrients to the marsh areas specified above.

3a-13. Protect and Maintain Ridges

The measure includes multiple ridges in the Terrebonne Basin. The restoration of ridges within the Terrebonne Basin complement hurricane protection features by providing outer lines of defense. Restoration would include increasing ridge elevation and width with dredged material, and planting of woody vegetation and native wetland plants.

3a-14. Maximize Beneficial Use of Dredged Material Where Feasible

The areas within Planning Unit 3a where beneficial uses of dredged material could be maximized include barrier islands, marsh and open water areas adjacent to the Bayou Lafourche, Lake Tambour, the HNC, Bayou du Large. Other areas adjacent to navigable waterways and drainage canals subject to maintenance dredging could also provide opportunities to maximize beneficial uses of dredged material. Increasing and maximizing beneficial uses of dredged material will provide stronger foundations for marsh-building processes to occur, and allow marsh recovery to take place. Approximately 100 acre/ft of marsh can be restored with 1 MCY of dredged material, thus, the potential is great for considerable marsh restoration to occur in PU 3a and throughout coastal Louisiana using river sediments, dedicated dredging outside navigation channels, and off-shore borrow.

The existing federal programs for navigation maintenance do not provide adequate funding for the U.S. Army Corps of Engineers (USACE) to take full advantage of the available sediment resources.

This measure was labeled as “not being tied to a specific geographic location” and was, therefore, not shown on the Alternative maps.

3a-15. Bankline Protection for the Houma Navigation Canal

The measure area is the Houma Navigation Canal from its confluence with the Gulf Intracoastal Waterway (GIWW) south into the Gulf of Mexico. This measure includes rock armoring along the east and west bank of the HNC from the confluence of the HNC and the GIWW south to Terrebonne Bay (total of 56 miles). This measure is expected to prevent saltwater intrusion from the Gulf of Mexico into the adjacent marshes along the HNC, and prevent wave energy impacts to adjacent marsh and wetland areas that occur with waterborne traffic along the HNC.

3a-16. Bankline Protection for the GIWW

The measure is located in the Terrebonne Basin along the Gulf Intracoastal Waterway (GIWW) reach from Morgan City to Larose. This measure will restore critical lengths of deteriorated channel banks (approximately 108 mile) and stabilize selected critical lengths of deteriorated channel banks with hard shoreline stabilization materials.

5.0 Planning Unit 3b – Bayou De West to Freshwater Bayou

Twenty-six measures, including additional measures suggested by stakeholders, were considered for Planning Unit 3b. Seventeen measures were selected to represent alternative one and two, and are described briefly by alternative below. The analysis and model runs on these alternative measures resulted in eighteen measures to represent the preferred plan.

5.1 Alternative 1

3b-1. Construct Hurricane Protection (30-ft Storm Surge at the Coastline) for Berwick and Patterson and Levee Alignment South of the GIWW from the Wax Lake Outlet to Freshwater Bayou

Location of this measure is from the west side of Wax Lake Outlet Structure to the intersection of the Gulf Intracoastal Waterway (GIWW) and Freshwater Bayou. The measure will reduce or eliminate storm surge damage to cities, towns, and small communities as well as industry and infrastructure. The alignment is along the south bank of the GIWW. The construction of levee along this alignment would close some openings that accelerate erosion between the GIWW and the bays, and eliminates freshwater flow into the bays. The length of levee is 107.5 miles (from attribute file). Stone protection is provided on the protected side of levee toe.

3b-2. Complete/Accelerate the Louisiana Coastal Area (LCA), Louisiana Ecosystem Restoration Study Near-Term Plan including:

3b-2a. Stabilize Gulf Shoreline at Point Au Fer Island

The measure is located at Point au Fer Island in the southeastern area of St. Mary Parish, south and slightly east of the mouth of the Atchafalaya River. The gulf shoreline is part of the Louisiana Barrier Shoreline System. Implementation of a measure to minimize losses of shoreline to protect the integrity of the barrier is proposed. It is part of the LCA Near-Term Critical Restoration Features Recommended for Study and future congressional authorization. Detached near-shore stone breakwater, 250-feet in length, 5-feet in height, and 5-feet in top width with 50-foot gaps between segments are proposed. They should be placed in water two-feet deep approximately 100 feet from shoreline. This feature would stabilize the gulf shoreline of Point au Fer Island, prevent direct connections forming between the gulf and interior water bodies as the barrier island eroded, and prevent bay-side water circulation patterns from being influenced directly by the gulf. This measure seeks to limit erosion on the edge of an extensive wetland area remote from population and thus provides limited direct hurricane protection benefits.

3b-2b. Convey Atchafalaya River Water to Northern Terrebonne Marshes

The measure area includes modifications to the Atchafalaya River flow into the Terrebonne Estuary system via the Gulf Intracoastal Waterway (GIWW). The primary location of need is central (Lake Boudreaux) and eastern (Grand Bayou) Terrebonne marshes.

The measure would affect existing wetlands, enhance storm-buffering capacity, and provide fresh water and nutrients to reduce saltwater intrusion and enhance marsh growth. Several features will produce enhanced areas for both the Larose to Houma reach and Houma to Morgan City reach through feature components such as a small diversion in the Avoca Island levee, repairing eroding banks of the GIWW, and enlarging constrictions in the GIWW below Gibson and in Houma and Grand Bayou conveyance channel construction/enlargement. Several alternatives would be evaluated through hydrologic models. However, in all cases, gated control structures would be installed to restrict channel cross section to prevent increased saltwater intrusion during the late summer and fall when riverine influence is typically

low. Some alternatives may include auxiliary freshwater distribution structures. The water and sediment source for this measure is the Atchafalaya River discharge. The area for utilization is Planning Unit 3a.

3b-2c. Acadiana Bays Estuarine Restoration Feasibility Study

The Acadiana Bays area of Louisiana is located in the central part of coastal Louisiana including Four League, Atchafalaya, East Cole Blanche, Weeks, and Vermilion Bays. The goal of the study is to evaluate the potential for reestablishing historic water quality conditions and viable estuarine fisheries in the Acadiana Bays system while maintaining a growing delta system in Atchafalaya Bay.

This measure was labeled as "not being tied to a specific geographic location" and was, therefore, not shown on the Alternative maps.

3b-2d Upper Atchafalaya Basin Study

The location of the Upper Atchafalaya Basin study includes the leveed reach in the vicinity of Simmesport, LA and on the Old River Control Structure Complex, as well as the interior and lower floodway.

The proposed measure is in Upper Atchafalaya Basin. The measure is in the Upper Atchafalaya Basin. The study purpose is to conduct a system-wide comprehensive analysis of the problems and opportunities related to flood control, navigation, and ecosystem sustainability for the lower Red River, Old River, Mississippi River, and Atchafalaya River Basins. This study relates primarily to the Mississippi River and Tributaries (MR&T) Project and, as such, would be funded under that project. The study is discussed in this report because it would link closely with the Mississippi River Hydrodynamic Study (via the modeling to be developed) and because several proposed Louisiana Coastal Area (LCA) features would either impact the operation of the Old River Control Structure (ORCS) and/or effect changes to the Atchafalaya Basin, the Mississippi River, and the coastal zone. As such, any potential LCA alternatives would have to assess the potential impacts to the existing river systems.

This measure was labeled as "not being tied to a specific geographic location" and was, therefore, not shown on the Alternative maps.

3b-3. Create Marsh at Weeks Bay

This measure is located in Iberia Parish, Louisiana, in the northeastern area of Vermilion and Weeks Bays. Measures are to reduce erosion rates along the northern shoreline of Vermilion/Weeks Bay and provide protection to Weeks Island and adjacent interior wetlands by restoring the isthmus that existed between Weeks Bay and the Gulf Intracoastal Waterway (GIWW). The components under this measure will include constructing retention levees for placement of dedicated dredged material from off-shore borrow sources to restore the isthmus to 1.0-foot above MSL (mean sea level), repairing critical areas along the northern shoreline of the GIWW, and protecting the shoreline of Vermilion Bay/Weeks Bay. Shoreline protection will be vegetative.

3b-4. Restore Marsh at Marsh Island South Shoreline and Rainey Marsh via Dedicated Dredging

The measure location is Marsh Island in Iberia Parish, Louisiana, in the Marsh Island State Wildlife Refuge, also known as Russell Sage Refuge. The goal of the measure is to restore brackish marsh habitat in the open water areas of the interior marsh primarily caused by hurricane damage. The project will restore acres of interior emergent marsh with hydraulically dredged material from East Cote Blanche Bay. The restored areas will be planted with plugs of smooth cordgrass on approximately 3-foot centers.

3b-5. Maintain Northern Shore of East Cote Blanche Bay and Point Marone

The measure is located at Point Marone, approximately 10 miles southwest of Franklin, Louisiana, in St. Mary Parish. It is a point land feature along the north shore of West and East Blanche Bays that separate the two bays. A barrier along 4,140 feet of shoreline between Jackson Bayou and the British American Canal to protect the shoreline was constructed. For this measure, the barrier was a PVC sheet-pile wall and the construction of low-level weirs across seven major water exchange avenues.

3b-6. Restore Vermilion Bay and East and West Cote Blanche Bays Shoreline via Beneficial Use of Dredged Material and/or Detached Breakwaters

This location includes all shorelines in Vermilion Bay, West Cote Blanche Bay, and East Cote Blanche Bay. Within this broad area many miles of shoreline have been stabilized through smaller individual projects, and there are some projects such as Weeks Bay that are in initial stages of a local project. One area is east of Weeks Bay to near the area called Jaws. Another area is Red Fish Point east to the west point of Southwest Pass. A third area is the shoreline along the northern edge of Marsh Island from Southwest Pass to the western point of the Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA) Restoration site TV-14. Generally, restoration or stabilization work is accomplished with near-shore or toe stone and/or vegetative plantings or a combination of both. The three reaches' estimates are: (1) Cypremont Point - at 77,000 feet; (2) Red Fish Point - at 77,000 feet; and (3) northern shore of Marsh Island - at 65,000 feet.

3b-7. Maintain Vermilion Bay and East and West Cote Blanche Bays as Brackish Environments

The measure includes Vermilion, East, and West Cote Blanche Bays are part of the Acadiana Bays and located west of Wax Lake Delta. No specific measures have been identified, other than the general strategy of restoring shorelines via beneficial uses of dredged material and/or detached breakwaters. This measure's goals are to achieve the objective while planning other measures in the region that could affect bay salinities.

3b-8. Strategize and Implement Plan to Elevate and/or Relocate Assets Outside Hurricane Protection Plan

The measure begins on the west side of Wax Lake Outlet and covers the width of the Planning Unit north of the bays over to the Vermilion River. The hurricane protection levee is located along an alignment south of the Gulf Intracoastal Waterway (GIWW) from the Wax Lake Outlet to Freshwater Bayou with the exception that the levee would follow Bayou Sale along an existing levee alignment to a point near the bay and then back to the alignment south of the GIWW. The strategy is to identify assets that would be gulfward of the hurricane protection and develop plans to either elevate or relocate those assets. With the alignment described, there are few assets gulfward of the protection. At the south end of Bayou Sale there is one small community, Burns which will need to be evaluated. A complete survey will be needed over the entire reach.

This measure was labeled as "not being tied to a specific geographic location" and was, therefore, not shown on the Alternative maps.

3b-9. Freshwater Bayou Bank Stabilization – Belle Isle to Lock

This measure is located in Vermilion Parish, Louisiana, along the eastern bank of the Freshwater Bayou Canal between Freshwater Bayou Lock and Belle Isle Bayou. The objective of the measure is to halt bank erosion through the construction of a stone dike in high-energy areas along the eastern bank of Freshwater Bayou Canal between Belle Isle Bayou and Freshwater Lock. The dike would stabilize the bank and reduce the amount of water exchange between the canal and interior marshes, thus protecting the marshes from erosion. A 40,000-foot-long near-bank rock dike is to be constructed. The dike will be continuous except for openings left at the mouths of several oil well canals where the dike will be tied into the bank on both sides of each canal.

5.2 Alternative 2

3b-1. Construct Hurricane Protection (30 ft Storm Surge at the Coastline) for Berwick and Patterson and Levee Alignment from Wax Lake Outlet to the Vermillion River Following the U.S. Army Corp of Engineers (USACE) West Levee Alignment 3A

This measure involves using an earthen levee for hurricane protection for Berwick and Patterson using existing levee alignment Morgan City to Wax Lake outlet west to Vermillion River following old existing levee alignments and the U.S. Army Corp of Engineers (USACE) west levee alignment 3. Strategy is to identify assets that would be gulfward of the hurricane protection and develop plans to either elevate or relocate those assets. With the alignment described, there are a number of assets gulfward of the line of protection.

3b-2. Complete/Accelerate the Louisiana Coastal Area (LCA), Louisiana Ecosystem Restoration Study Near-Term Plan including:

3b-2a. Stabilize Gulf Shoreline at Point Au Fer Island

The measure is located at Point au Fer Island in the southeastern area of St. Mary Parish, south and slightly east of the mouth of the Atchafalaya River. The gulf shoreline is part of the Louisiana Barrier Shoreline System. The plan is to minimize losses of shoreline, protect existing marshes, and to protect the integrity of the barrier is proposed. It is part of the LCA Near-Term Critical Restoration Features Recommended for study and future congressional authorization. Using segmented stone breakwater is recommended. Stone segments 250-feet in length, 5-feet in height and 5-feet in top width with 50-foot gaps between segments should be placed in water two-feet deep approximately 100 feet from shoreline. This feature would stabilize the gulf shoreline of Point au Fer Island, prevent direct connections forming between the gulf and interior water bodies as the barrier island eroded, and prevent bayside water circulation patterns from being influenced directly by the gulf. This measure seeks to limit erosion on the edge of an extensive wetland area remote from population and thus provides limited direct hurricane protection benefits.

3b-2b. Convey Atchafalaya River Water to Northern Terrebonne Marshes

This measure area includes modifications to maximize the Atchafalaya River freshwater and sediment flow. The location of need is the Terrebonne Estuary system via the Gulf Intracoastal Waterway (GIWW). The central (Lake Boudreaux) and eastern (Grand Bayou) Terrebonne marshes are the most critical areas to be nourished and restored. Convey Atchafalaya River Water to Northern Terrebonne Marshes. The measure would affect existing wetlands, enhance storm-buffering capacity, and provide fresh water and nutrients to reduce saltwater intrusion and enhance marsh growth. This feature would produce enhanced areas for both the Larose to Houma reach and Houma to Morgan City reach through feature components such as a small diversion in the Avoca Island levee, repairing eroding banks of the GIWW, and enlarging constrictions in the GIWW below Gibson and in Houma and Grand Bayou conveyance channel construction/enlargement. Several alternatives would be evaluated through hydrologic models; however, in all cases, gated control structures would be installed to restrict channel cross-section to prevent increased saltwater intrusion during the late summer and fall when riverine influence is typically low. Some alternatives may include auxiliary freshwater distribution structures. The source for this measure is the Atchafalaya River discharge. The area for utilization is Planning Unit 3a.

3b-2c. Acadiana Bays Estuarine Restoration Feasibility Study

The Acadiana Bays area of Louisiana is located in the central part of coastal Louisiana including Four League, Atchafalaya, East Cole Blanche, Weeks, and Vermilion Bays. The goal of the study is to

evaluate the potential for reestablishing historic water quality conditions and viable estuarine fisheries in the Acadiana Bays system while maintaining a growing delta system in Atchafalaya Bay.

This measure was labeled as "not being tied to a specific geographic location" and was, therefore, not shown on the Alternative maps.

3b-2d. Upper Atchafalaya Basin Study

The location of the Upper Atchafalaya Basin study includes the leveed reach in the vicinity of Simmesport, LA and on the Old River Control Structure Complex, as well as the interior and lower floodway. The study has not been implemented. Detailed studies of this proposal would include determination of impacts to the interior of the Atchafalaya Basin, the degree to which flow, and sediment distributions would be required.

This measure was labeled as "not being tied to a specific geographic location" and was, therefore, not shown on the Alternative maps.

3b-3. Increase Sediment Transport from the Atchafalaya River Down Wax Lake Outlet

Wax Lake Outlet is located in St. Mary Parish at the eastern side of East Cote Blanche Bay. The structure discharges a portion of the flow carried by the Atchafalaya River into East Cote Blanche Bay. A delta formed and is growing as a result of the sediment carried by Wax Lake Outlet from the Atchafalaya. There is a need to have even greater amounts of sediments entering the Bay from the Atchafalaya River via Wax Lake Outlet. The measure is to relocate the alignment of the Wax Lake Outlet inflow channel to a more direct route to the Atchafalaya River channel with a deeper inflow channel, capturing additional sediment to be deposited in the delta of Wax Lake. One consideration is a channel 16.5-miles long going through Cypress Island. The south side of the inflow channel will have rock bank protection to guard against excessive bank erosion as the discharge makes greater than90 degree to enter the new channel. The protected section would be 1,000-feet in length, cover 40 feet of the channel bottom, and extend 10 feet beyond the top bank. This measure would provide a more sediment rich alignment

3b-4. Stabilize Banks of Southwest Pass off Marsh Island

The measure includes Southwest Pass, which is located in Vermilion Parish, Louisiana on the west side of Marsh Island. It is a pass or open channel between the Gulf of Mexico and Vermilion Bay. The need is to stabilize Southwest Pass with rock to minimize further increase in erosion due to the high energy levels. This would entail the construction of in-water stone dikes to restore the bank along the west side of Southwest Pass and armoring of the east bank of the Pass. The strategy is to maintain existing Pass dimensions. The features would be a total of 9.0 miles of stone dike along the top bank of either side of the present channel (4.5 miles plus 4.5 miles). Dikes would be 6-feet high, 3-feet in water and 3-feet above water. A 500-foot section on the west bank would be 33-feet in the water and 3-feet above water. The dikes would follow along the top bank.

3b-5. Stabilize Banks of GIWW

For this planning unit, the GIWW begins on the west side of the Atchafalaya River at the south side of the Patterson/Berwick ring levee and proceeds west to Wax Lake Outlet and from the west side of Wax Lake Outlet, it proceeds west to an intersection with the Vermilion River/Freshwater Bayou. This represents a distance of 62 miles or 327,360 feet. The strategy is to stabilize the banks of the GIWW using stone dikes along the banks in high energy areas. The toe of the stone dike would be against the underwater bank and reach a height one or two feet above ground or marsh level. There would be an area of water behind the dike, which would result in land building by catching any materials being eroded from the marsh or wetland as a result of boat wakes.

3b-6. Restore Vermilion Bay and East and West Cote Blanche Bays Shoreline via Beneficial Use of Dredged Material and/or Detached Breakwaters

The site is the gulf shoreline between the east bank of Freshwater Bayou (the western limit of Planning Unit 3b) and the west bank of Southwest Pass. It is in Vermilion Parish, Louisiana. The purpose of the measure is to stabilize shore lines from Freshwater Bayou boundary past Tigre Point to Southwest Point using near-shore segmented stone breakwaters. The segments are to be placed on filter cloth in water 2 to 4-feet deep if the foundation is soft. Segments will be constructed 250-feet long with 50-foot gaps between each segment. Individual segments should have 1 on 5-foot side slope and 5 to 10-foot crest width. Breakwater is to be constructed parallel to the shoreline at a distance of 150 to 200-feet offshore depending on depth of the water. Planning involves assuming a 1-foot settlement and constructing to 3.5 feet above mean high tide (MHT). The strategy is to trap and retain sediment from gulf waters in this part of the gulf shoreline. A demonstration project located east of Cheniere Au Tigre along the shoreline in southern Vermilion Parish, completed in 2001, has experienced a large amount of sediment accretion behind the structures. The length of the demonstration structure is 1,800 feet. It is located about mid-length and will need to be taken into consideration. The full length of the reach for this project is 89,760 feet.

3b-7. Stabilize Shorelines Across South Shoreline of Marsh Island from Lighthouse Point to South Point (East of Mound Point) using Dredged Sediments and/or Breakwaters

The site is the gulf shoreline between the east bank of Freshwater Bayou (west end of Marsh Island) and South Point (eastern tip of Marsh Island). Dredged sediment from off shore would be source material for this measure. Assume 107,545-feet of area for deposits located at the edge of the marsh area, and place material just into the marsh at 6- to 12-inches deep in thin layers. The placed volume is estimated at 597,474 cubic yards

3b-8. Beneficial Use of Dredged Material and Dedicated Dredging Wherever Possible to Rebuild Marsh Shorelines, Historic Reefs, and Barrier Islands

The measure area is damaged historic reefs. U.S. Geological Survey (USGS) quadrangles indicate an historic reef alignment beginning at the western tip of the gulf shoreline of Point au Fer Island and extending westward toward the eastern tip of Marsh Island. Another historic reef is located between Point Chevreuil, in East Cote Blanche Bay, and east side of Marsh Island along the line of an historic oyster shell reef that has been mined. One segment, Point au Fer Island to Eugene Island, a distance of 22,700 feet, could be a reef build with shell, limestone aggregate reef, or a barrier built with dedicated dredged material from the Atchafalaya Bay area. Another segment, estimated at 107,700 feet, extends from Eugene Island to South Point on the east end of Marsh Island. If shell is available and economical, shell that would be the preferred material to rebuild the reef. If not economical or available and limestone aggregate is also not available, it is suggested to consider segmented breakwaters or dedicated dredged material. The length of the project from Point Chevreuil to Marsh Island is 71,300 feet. The top of the rebuilt reef should be at or near low tide so that the top of the reef would just be exposed or slightly under water. In some areas the depth of water could be zero at low tide, while in other locations along the alignment water depth could be 5 or 6 feet. The design for segmented breakwaters is 250-foot segments, 50-foot gaps, with 1 on 5-foot slopes and 5 to 10-feet wide at the top.

3b-9. Strategize and Implement Plan to Evaluate and/or Relocate Assets Located Outside of the Hurricane Protection Plans

The location for consideration begins on the west side of Wax Lake Outlet and covers the width of the Planning Unit 3a north of the bays over to the Vermilion River. Hurricane protection begins on the west side of Wax Lake Outlet and follows old levee alignments and the U.S. Army Corp of Engineers West Levee Alignment 3 shown in red on the levee alignment map. The strategy is to identify assets that would be gulfward of the hurricane

protection and develop plans to either elevate or relocate those assets. With the alignment described, there are a number of assets gulfward of the line of protection. A complete survey will be needed over the entire reach.

This measure was labeled as "not being tied to a specific geographic location" and was, therefore, not shown on the Alternative maps.

3b-10. Freshwater Bayou Bank Stabilization – Belle Isle Bayou to Freshwater Lock

This measure is located in Vermilion Parish, Louisiana, along the eastern bank of the Freshwater Bayou Canal between Freshwater Bayou Lock and Belle Isle Bayou. The objective of the project is to halt bank erosion in high-energy areas through the construction of a stone dike along the eastern bank of Freshwater Bayou Canal between Belle Isle Bayou and Freshwater Lock. The dike would stabilize the bank and reduce the amount of water exchange between the canal and interior marshes, thus protecting the marshes from erosion.

A 40,000-foot-long near-bank rock dike is to be constructed. The dike will be continuous except for openings left at the mouths of several oil-well canals where the dike will be tied into the bank on both sides of each canal.

6.0 Planning Unit 4 – Freshwater Bayou to Sabine River

Fifty-two measures, including additional measures suggested by stakeholders, were considered for alternatives one and two. Thirty- six measures were selected to represent alternative one and two, and are described briefly by alternative below. The analysis and model runs on these alternative measures resulted in eighteen measures to represent the preferred plan.

6.1 Alternative 1

4-1. Proposed Hurricane Protection Levee for 30-foot Storm Surge at Coastline

This levee begins at the levee in Planning Unit 3b and runs along the south bank of the Gulf Intracoastal Waterway (GIWW) to the Calcasieu/Sabine divide. At that point it turns north and crosses I-10 about 8 miles to the north of the GIWW. It continues to the north for about more 7 miles and into high ground.

The Levee Alignment No.1 will provide surge protection to communities, industries, and other assets located north of the GIWW. This alignment runs generally parallel to the coast and from10 to 20 miles inland. It will provide protection to major highways and evacuation routes. The project will include gated structures across the Vermilion River, the Mermentau River, and the Calcasieu River. It will provide a structure at the GIWW where the levee turns north toward high ground. These structural features will be integrated into the levee design and will provide flood protection, drainage, navigational passage, and environmental benefits including salinity control, freshwater management, and reduction of wetland flooding. This alignment can be designed to meet the objectives in this planning unit and to minimize the impact of the levee on the existing ecosystem units. The length of levee is 111.0 miles. This approach is within the objectives of the Louisiana Comprehensive Coastal Protection Master Plan (2006).

4-2. Complete/Accelerate the Chenier Plain Freshwater and Sediment Management and Allocation Reassessment Study which was included in the LCA Near-term

The location of this measure is the Chenier Plain, western Louisiana. These studies and their resultant projects/measures, if authorized and constructed, could significantly restore environmental conditions that existed prior to large-scale, alteration of the natural system.

This measure was labeled as “not being tied to a specific geographic location” and was, therefore, not shown on the Alternative maps.

4-3. Maximize Freshwater Inflow from Sabine River

This measure is proposed in the lower Sabine River. Freshwater sources and quantities in western Louisiana are limited the majority of time. The supplies from the Sabine River under current conditions are not adequate most of the time to minimize salt water intrusion. Loss of a portion of this source could result from an export measure and this would increase an already stressful condition to marsh and wetland east of Sabine lake. A thorough study of potential mitigation opportunities is needed to address this potential loss of freshwater source.

4-4. Salinity Control Structures along East Shoreline of Sabine Lake near Blue Buck Point, Sabine Island and Black Bayou

The measure is located along the east shoreline of Sabine Lake near Blue Buck Point, Sabine Island, and Black Bayou. This measure is composed of several salinity control structures along the eastern shore of Sabine Lake. Salinity control at Black Bayou (CS-27; the number represents CWPPRA projects) is described as a structure with a boat bay at the mouth of Black Bayou (either gated structure or a rock weir) located at the intersection of Black Bayou and the northeastern shoreline of Sabine Lake. The other salinity control structures along the lake

shoreline are: Black Bayou Culverts Hydrologoic Restoration (CS-29); and East Sabine Lake Hydrologic Restoration Project (CS-32)

4-5. Beneficial Use of Dredged Material Program: Utilize Sediment from Sabine Ship Channel and Dedicated Dredging for Marsh Enhancement and Construction of Terraces

The measure location is the land east of the Sabine River and west of Lake Calcasieu. Maximizing the beneficial uses of dredged material will provide stronger foundations for marsh-building processes to occur. This measure compliments and is patterned after the Sabine National Wildlife Project (CS-28, Cycles 1-5), which consist of constructing five marsh creation sites using material dredged out of the Calcasieu River Ship Channel.

4-6. Salinity Control Structure at Sabine Pass near Highway 82 Causeway

The measure area is the Sabine River near the Gulf of Mexico. Salinity control could be established by installing a gate, lock, or other saltwater barrier in Sabine Pass. The primary goal of this strategy is to reduce peak salinities. It would be operated on a limited basis during peak seasons. During non-peak salinities, navigation would be unaffected. This strategy is expected to preserve a substantial amount of marsh by 2050 by reducing salinities. Salinity and tidal amplitude control at Sabine Pass sufficient to restore and protect wetlands while maintaining control on the east shoreline of Sabine Lake and Sabine Pass are included as Regional Ecosystem Strategies for Coast 2050 for Region Planning Unit 4.

4-7. Stabilize Gulf Shoreline and Beach West of Calcasieu River to Sabine River using Dredged Sediment or Breakwaters

This measure extends from the Sabine River to the Calcasieu Ship Channel. This measure complements Alternative 1, Measure 4-24 Alternative 2, Measure 4-7: Maintain Highway 82 for Hurricane Evacuation and Marsh Protection. A portion of the coastline to the west of the Calcasieu River is already protected using detached breakwater dikes. The highway was preserved during Hurricane Rita. Because of the proximity of Louisiana Highway 82 to the coastline, the continued use of these riprap dikes is recommended for shore protection. These structures facilitate the deposition of sediment on the beach area. However, off-shore borrow sources of dredged material could also be used to accelerate the growth of beach area. Length of measure is 160,500 feet. Subaqueous rock reef placed 150 feet from shore in 2 to 5 feet of water, individual segments 250 feet long with 50-foot gaps between segments. Crest width is 5 feet constructed to a level 2 feet above MSL.

4-8. Stabilize Gulf Shoreline and Beach East of Calcasieu River to Freshwater Bayou using Dredged Sediment or Breakwater

This measure extends from the Calcasieu Ship Channel east to Freshwater Bayou. This Measure complements Alternative 1, Measure 4-24 and Alternative 2, Measure 4-17: Maintain Highway 82 for Hurricane Evacuation and Marsh Protection. A small portion of the coastline to the west of the Calcasieu River is already protected using detached breakwaters. The protection should also be applied to the east of the Calcasieu Ship Channel. Because of the proximity of evacuation route Louisiana Highway 82 to the coast, the continued use of near-shore blocked breakwater dikes is recommended for shore line protection. These structures facilitate the deposition of sediment on the beach area. The length between Calcasieu River and Freshwater Bayou is 338,976 feet. There is however a length of beach that is already protected. This reach is 51,000-feet long. The reach is located from Mermentau Ship Channel to near Rollover Bayou east of Rockefeller Refuge. The project is ME-18. The remaining protection, 278,976 feet, will be segmented breakwater protection. The segments of rock will be 250-feet long with 50-foot gaps. The individual segments will be placed in water 2- to 5-feet deep. Crest width will be 5 feet.

4-9. Salinity Control Structure in Calcasieu Ship Channel near Ferry

The measure is located in Calcasieu Ship Channel near the Gulf of Mexico. Salinity control could be established by installing a gate, lock, or other saltwater barrier in near the gulf. The primary goal of this strategy is to reduce peak salinities. The salinity control structure would be operated on a limited basis during peak seasons. During non-peak salinities, navigation would be unaffected. This strategy is expected to prevent salt water intrusion into the area around Calcasieu Lake and, thereby, preserve a substantial amount of marsh by reducing salinities.

4-10. Beneficial Use of Dredged Material Program: Utilize Sediment and Dedicated Dredging for Marsh Enhancement and Construction of Terraces in Vicinity of Calcasieu Lake

This measure includes the marsh and wetlands around Calcasieu Ship Channel. The Calcasieu Ship Channel is maintained at 40-feet deep by 400-feet wide and extends from the Gulf of Mexico to Lake Charles, Louisiana. Maximizing the beneficial use of dredged material will restore lost marsh acres and provide stronger foundations for marsh-building processes to occur. This measure was approved by CWPPRA Task Force as a part of Priority Project List 8. The measure consists of constructing five marsh-restoration sites within the Sabine National Wildlife Refuge using material dredged from the Calcasieu River Ship Channel (CS-28, Cycles 1 to 5).

4-11. Salinity Control Structures at Points on East Side of Calcasieu

This measure is located at Eastern Calcasieu Lake, southwest Louisiana on the Calcasieu River. The strategy is to establish newly constructed structures and modify existing structures to reduce salinity influences into the interior Chenier plain marshes. The installation or modification of water control structures will facilitate the flow of floodwater out of the basin while preventing salt water from entering the basin from the Calcasieu Ship Channel. Two projects; Highway 384 Hydrologic Restoration Project (CS-21); Cameron-Creole Watershed Management Project (CS-04a) consists of five large control structures and a 19-mile levee, have benefited the area.

4-12. Maximize Freshwater Inflow to Tributaries of Mermentau River from Outside Sources

The measure location is Mermentau river drainage basin at or above interstate 10 and adjoining drainage basins. The area in the southwest portion of this Planning Unit 4 annually experiences high salinity concentrations in the surface water and in the ground water aquifers. They are the result of salt-water intrusion from the Gulf coast through channels that are maintained for navigation in the Mermentau Rivers. The runoff patterns from the Mermentau are not prolonged in duration and can be infrequent. Freshwater from inside and outside sources are needed to supplement existing periodic deficits from the desired measure.

4-13. Maximize Freshwater Inflow to Mermentau River from Outside Sources

The location of this measure is the Mermentau River at or north of interstate 10. The magnitude of the problem calls for a study to research potential sources of freshwater both inside and outside the Mermentau drainage basin. A study is recommended.

4-14. Stabilize Grand Lake Shoreline and Land Bridge

The measure is located on Grand Lake, which is east of Calcasieu Lake. The strategy is to protect or minimize future shoreline erosion by constructing stone breakwater along the full shoreline, particularly in the areas where the lake shoreline is breaching or near breaching into the Gulf Intracoastal Waterway (GIWW). Stone breakwater will rise two feet above sea level. Fish dips every 1,000 feet, 46-feet wide at the top, will extend to the lake bottom and be lined with concrete aprons. A 6-feet deep flotation canal with a 1:4 side slope will be at least 35 feet from the centerline of the dike, and material from the flotation canal will be cast inside the breakwater. The total length of the proposed rock dike is roughly 45 miles around the banks of the lake, or 238,000 feet. This complements the Grand Lake Shoreline Protection Project (ME-21), and the Grand -White Lakes Land Bridge Protection Project (ME-19).

4-15. Fresh water Introduction/Retention Structure or Sill on Little Pecan Bayou

Little Pecan Bayou is located south of Grand Lake and north of Highway 82 near and east of the Mermentau River. This strategy complements Little Pecan Bayou Hydrologic Restoration (ME-17). Strategy is to evacuate excess water from the Grand and White Lakes subbasin and provide the fresh water to the Chenier subbasin. The outfall of the culvert or culverts will be adequately protected against scouring during discharge events.

4-16. Freshwater Introduction/Retention Structure or Sill on Rollover Bayou

Rollover Bayou is south of Highway 82, located in east Rockefeller State Wildlife Refuge. The strategy is to evacuate the excess water from the Lakes Subbasin and provide it to the Chenier Subbasin. The proposed project components include installation of approximately four freshwater introduction water control structures, plug removal, one structure modification, and canal enlargement north of Louisiana Highway 82 to allow water flow under the highway from the Lakes subbasin south into the Chenier subbasin.

4-17. Stabilize White Lake Shoreline

White Lake is located east of Grand Lake between Grand Lake and Freshwater Bayou in western Louisiana. The strategy is to protect the shoreline of White Lake with a near-shore stone breakwater to minimize and/or eliminate future shoreline erosion. The plan is to copy the design used in Grand Lake. A 45-foot flotation channel, 6-feet deep, cast material to bankline and stone breakwater will be constructed between the flotation channel and the bankline. Fish-dips will be built every 1,000 feet. The fish-dips, 46-feet wide at the top, will extend to the lake bottom and be lined with concrete aprons. The total amount of shoreline around the lake is 211,700 feet. There are two projects (ME-19) and (ME-21) that complement the project under consideration. These projects are in place.

4-18. Stabilize Banks from Schooner Bayou to GIWW along Freshwater Bayou and Along GIWW near White Lake

This measure is located from Schooner Bayou to GIWW along Freshwater Bayou and the Gulf Intracoastal Waterway (GIWW). The measure is on the west bankline. Strategy is to protect the bankline of Freshwater Bayou with a near-shore stone breakwater to minimize and/or eliminate future bankline erosion. The total amount of shoreline around the lake is 17,500 feet. Design is to place a stone dike located near the bankline but in the water. The landward toe of the dike should be near the waters edge but in the water. The height of the dike should be 2- to 3-feet above the level of the marsh. Assuming the water depth to be no more than 2 feet, then the vertical height of the dike should be no more than 5 feet.

4-19. Salinity Control on Black Lake Bayou near Hackberry

Location of this measure is Black Lake Bayou north of Hackberry near the Calcasieu Ship Channel. Strategy is construction of a salinity control structure in Long Point Bayou with a gated structure or rock weir located in Long point Bayou north of Sabine National Wildlife Refuge (NWR) near Highway 27, west of the Calcasieu Ship Channel. The existing dimensions are 40-feet wide by 5-feet deep. The structure's approximate dimensions are 10- to 15-feet wide by 4-feet deep boat bay.

4-20. Build New Chamber for Navigation at Calcasieu Lock on GIWW and Use Old Lock to Evacuate Excess Water

This measure includes the existing Calcasieu Lock on the Gulf Intracoastal Waterway (GIWW) south of Lake Charles, Louisiana. Strategy is construction of a new chamber for navigation and use the old lock chamber for freshwater introduction to the upper Calcasieu Estuary from the Mermentau Basin. Measure also provides for freshwater introduction via the Black Bayou culverts at the intersection of Black Bayou and Highway 384. New lock size is 1,200-feet in length, 75-feet wide, sill elevation at –13 feet.

4-21. Stabilize Banks of Freshwater Bayou

The measure is located on the west bank of Freshwater Bayou south of the intersection of Freshwater Bayou and the Gulf Intracoastal Waterway (GIWW) beginning at Schooner Bayou and going south to the Freshwater Lock. The strategy is construction of stone (rock) dike along the toe of the existing bankline. Two reaches in CWPPRA cover the reach from Six Mile Canal south to the Freshwater Lock. By placing riprap in front of the existing shoreline, further wetland loss will be decreased dramatically. It is anticipated that open water areas behind the rock structures will accumulate sediments and eventually become vegetated.

4-22. Stabilize Eastern Shore of Lake Calcasieu

The measure is located on the eastern shore of Lake Calcasieu, which is located south of Lake Charles, Louisiana. There is an existing 16-mile-long earthen levee along the eastern side of Calcasieu Lake (84,480 feet). Marsh restoration from land building could result with additional protection feature in front of the stone dike because erosion is continuing behind the dike.

4-23. Develop a Plan to Elevate and/or Relocate Assets Located Outside of the Hurricane Protection Levee

The measure includes all areas of Planning Unit 4 that are not protected by hurricane levee or levees and that can be impacted by hurricane surges. Strategy is to conduct surveys in areas not protected by proposed protection works to identify assets to elevate and determine how much and if relocation is practical.

This measure was labeled as “not being tied to a specific geographic location” and was, therefore, not shown on the Alternative maps.

4-24. Maintain Hwy 82 for Hurricane Evacuation and Marsh Protection

The measure is located along Highway 82, which traverses the lower coast area across all of Planning Unit 4. Maintain Highway 82 in good travel condition at all times. Prior to annual hurricane seasons, recommend a thorough inspection of the highway to ensure good travel conditions exist along all reaches of the road. Identify areas of potential bottlenecks and investigate ways of elimination or, at minimum, improvement. The shoulder and embankment slopes on the north side of the road bed should be protected against erosion from overtopping of the roadway. Prevention of numerous gullies and/or significant blowouts of the roadbed would benefit recovery efforts in the area.

4-25. Provide Water Control Structures at Strategic Locations along Highways 82 and 27

The measure is identified in three locations: (1) Highway 82 area between Rollover Bayou and Superior Canal to the eastern portion of Rockefeller Refuge; (2) Chenier subbasin west of Rockefeller Refuge at the Thibodeaux Bridge; and (3) Chenier subbasin, Hog Bayou Watershed. The strategy is to pass the excess freshwater through or under Highway 82 to the Chenier subbasin. Two CWPPRA projects, M-16, and M-17, cover the area described by (1), (2) and (3) designated in the ‘Location” paragraph above. Restoration strategy for ME-17 states that measures along the perimeter of Little Pecan Bayou would reduce marsh salinity levels and allow fresh water to be conveyed to the area south of Louisiana Highway 82. Planning and modeling are underway for ME-17. M-16 includes installation of four freshwater introduction water control structures; plug removal; canal enlargement north of Louisiana Highway 82 to allow water flow under the highway from the Lakes subbasin south into the Chenier subbasin.

4-26. Manage Watershed to Reduce Rapid Inflows into Mermentau Subbasin

Location of this measure is the Mermentau River and watershed, east of and to the north of Lake Charles, Louisiana. The strategy is to manage watershed runoff to minimize the rapid accumulation of runoff in the lower

reaches of the drainage basin. Design is to obtain and construct a dry storage area of 10-square-miles upstream of Mermentau, Louisiana. The 10-square-miles will be surrounded by levees or embankments, at a height of 5 feet. A two-mile long section is provided in the embankment that parallels the river. The crest of this section is two-feet above ground level. Construct a gated section at the downstream corner of the dry impoundment to evacuate stored water after a runoff event. Another element would be to widen the existing channel downstream of Catfish Bayou control structure. Recommend increasing existing channel width 50-feet downstream to Upper Mud Lake, a distance of 16 miles. This would provide a greater channel cross-section area downstream of the structure thus increasing the opportunity for greater hydraulic efficiency with a slight increase in water elevation across structure.

4-27. Restore Marsh by Filling Abandoned Canals

Measure location is throughout the coastal marsh region in Planning Unit 4. The strategy is to identify all unused, abandoned, or minimally used canals and develop a program to fill the canals and re-establish marsh. Inquiries identified 25 miles of canals that fall into the abandoned category. The strategy used is to place plugs at one mile intervals in the channels identified.

4-28. Utilize Freshwater Inflow from the Atchafalaya River

Measure location is the GIWW (Gulf Intracoastal Waterway) beginning at the west bank of Wax Lake Outlet Structure in Planning Unit 3b. The strategy is to use this source (freshwater inflow from the Atchafalaya River) as it could be available for longer durations and not have the rapid influx that the Mermentau can produce. Caution needs to be stated. The GIWW annually experiences erosion of its banks creating many holes or leaks. Currently, minimal amounts of the Atchafalaya River flowing through GIWW reach Freshwater Bayou. There is a measure in Planning Unit 4 and a similar measure in Planning Unit 3b that calls for stabilizing the banks of the GIWW. These measures would help to close some of the leaks or at least slow the leaks down. Also, Alternative 1 in both in both Planning Units has a levee measure along the south bank of the GIWW. These measures would also aid in minimizing losses of fresh water from the GIWW. In summary, measures already described will benefit the need in the subject measure. Constructing gates the Charenton Canal, repairing banklines at Weeks Bay, and installing gates at Freshwater Bayou would go even further to conveying more fresh water to the Grand Lake region in Planning Unit 4.

4-29. Improve Hydrology of the Old Mermentau River Channel between Mud Lake and Gulf of Mexico

Location of the measure is near where the Mermentau River enters the Gulf of Mexico, which is east of the Calcasieu Ship Channel. At the present time the flow of the Mermentau River is divided at the point where the Mermentau meets Mud Lake. It appears that at one time the river channel may have been separated from Mud Lake by a shoal area, but now there is a channel coming from the Mermentau through Mud Lake into the gulf. Part of the river flow is going through this channel. Since this provides two entrances from the gulf and by having a split flow Mermentau River velocities would be reduced, the strategy is that restoring to the original single channel, the opportunities for saltwater intrusion would be reduced. The measure would be to close the channel going through Mud Lake and in the process construct an embankment along the line of the existing shoal area, closing all openings between the Mermentau River and Mud Lake.

4-30. Stabilize Banks of GIWW

The location of this measure is from the west bank of Freshwater Bayou to the west Louisiana state boundary line. A distance of 101 miles. The strategy is to construct rock dikes parallel to the bankline with the landward toe of the stone dike located at the underwater toe of the bankline. Dikes would be on both sides of the waterway. The cross-section of the dike is 5-feet-high, 3-foot-wide crest, with side slopes of 1:3.

6.2 Alternative 2

4-1. Storm Surge Protection for Lake Charles Metropolitan Using Ring Levee

Location of this measure is the Lake Charles metropolitan area and surrounding communities. The strategy is to provide protection from hurricane surge via construction of a levee around the Lake Charles area and surrounding communities. The proposed alignment of this levee would start on the south side of Interstate 10 east of the Calcasieu River. From this point the levee would proceed southwestward in a gentle arc until it is south of I-10 and Highway 90 where I-10 and Highway 90 intersect on the east side of the Calcasieu River. The levee would continue west on a straight line until it crossed the Calcasieu River. Shortly after crossing the river the alignment would start a slow arc upward toward I-10 intersecting with I-10 west of the Calcasieu. The length of the levee section would be 25 miles or 132,000 feet. The disastrous 2005 hurricane season demonstrated that flood protection is urgently needed.

4-2. Storm Surge Protection for Lafayette

Measure location is Lafayette, Louisiana, the metropolitan area, and surrounding communities. The strategy is to provide protection from hurricane surge via construction of a levee around the Lafayette metropolitan area. The disastrous 2005 hurricane season demonstrated that protection is urgently needed.

4-3. Storm Surge Protection for Gueydan, Kaplan, and Vinton

Locations for this measure are Gueydan, Kaplan, and Vinton, Louisiana**.** The strategy is to provide protection from hurricane surge via construction of ring levees around each town/community listed. The disastrous hurricane season of 2005 demonstrated that flood protection is urgently needed.

4-4. Complete/Accelerate the Chenier Plain Freshwater and Sediment Management and Allocation Reassessment Study which was included in the LCA Near-Term Plan

The location of this measure is the Chenier Plain, western Louisiana. These studies and their resultant projects, if authorized and constructed, could significantly restore environmental conditions that existed prior to large-scale, alteration of the natural system.

This measure was labeled as “not being tied to a specific geographic location” and was, therefore, not shown on the Alternative maps.

4-5. Maximize Freshwater Inflow from Sabine River

This measure is the lower Sabine River. Returning the freshwater supply to the historical volume using flows from the Sabine River would aid in expelling the sea water that is now intruding because of the reduction in freshwater inflow from the Sabine River. If additional fresh water could be brought in (redistributed or diverted) from outside sources these waters could give more flexibility for controlling the salinity gradient. The GIWW could act as a manifold to deliver this water to strategic points along the Calcasieu/Sabine Basin. However, the conditions of the channel are not conducive to effectively acting as a manifold to deliver water. A measure is to build a 1,000-cfs pumping station on Moss Lake, Calcasieu River. The plan includes construction of a channel (50-ft by 10-ft) from Moss Lake southwest to intersect with the GIWW at Goose Lake. It will stabilize banks of GIWW and control outflow to marshes by closing the south bank openings to the Sabine River. Two closures are needed, one on Bayou Choupique and one on the south bank where the GIWW intersects Black Bayou. Pumping should be primarily during runoff periods on the Calcasieu River. Maintenance dredging of the GIWW segment to restore design dimensions (125-ft by 12-ft) is also recommended.

4-6. Beneficial Use of Dredged Material Program: Utilize Sediment from Sabine Ship Channel and Dedicated Dredging for Marsh Enhancement and Construction of Terraces

The measure location is the land east of the Sabine River and west of Lake Calcasieu. Maximizing the beneficial uses of dredged material will provide stronger foundations for marsh-building processes to occur. This measure compliments and is patterned after the Sabine National Wildlife Project (CS-28, Cycles 1-5), which consist of constructing five marsh-creation sites using material dredged from the Calcasieu River Ship Channel.

4-7. Allow Calcasieu Lake and Surrounding Area to Become and Remain Brackish to Saline

Location of this measure is Calcasieu Lake, which is directly south of Lake Charles, Louisiana. The proposed plan is to cease salinity control efforts and allow the subbasin to return to conditions that existed prior to efforts to regulate salinity in the lake. The Louisiana Coastal Protection and Restoration 2006 Report notes in Planning Unit 4 a significant change in the long-term approach to sustainability is identified by allowing Calcasieu Lake and surrounding areas to become and remain brackish to saline.

4-8. Stabilize Gulf Shoreline and Beach West of Calcasieu River to Sabine River using Dredged Sediment or Breakwaters

This measure extends from the Sabine River to the Calcasieu River. A portion of the coastline to the west of the Calcasieu River is already protected using near-shore detached breakwaters. The rest of the highway was exposed during Hurricane Rita. Because of the proximity of Louisiana Highway 82 to the coastline, the continued use of these riprap dikes is recommended for shore protection and land-building. These structures facilitate the deposition of sediment on the beach area. However, dredged material could also be used to accelerate the growth of beach area. The length of measure is 160,500 feet. Subaqueous rock reef will be placed 150 feet from shore in 2 to 5 feet of water, individual segments 250-feet long with 50-foot gaps between segments. Crest width is 5 feet constructed to a level 2-feet above MSL.

4-9. Stabilize Gulf Shoreline and Beach East of Calcasieu River to Freshwater Bayou using Dredged Sediment or Breakwater

This measure extends from the Calcasieu River to Freshwater Bayou. A portion of the coastline to the west of the Calcasieu River is already protected using detached breakwaters. The protection should also be applied to the east of the Calcasieu Ship Channel. Because of the proximity of evacuation route Louisiana Highway 82 to the coast, the continued use of riprap dikes is recommended for shore line protection. These structures facilitate the deposition of sediment on the beach area. The length between Calcasieu River and Freshwater Bayou is 338,976 feet. There is, however, a length of beach that is already protected. This reach is 51,000-feet long. The reach is located from Mermentau Ship Channel to near Rollover Bayou, east of Rockefeller Refuge. The project is CWPPRA ME-18. The remaining protection, 278,976 feet, will be segmented breakwater protection. The segments of rock will be 250-feet long with 50-foot gaps. The individual segments will be placed in water 2- to 5-feet deep. Crest width will be 5 feet.

4-10. Stabilize Grand Lake and Land Bridge

Measure location is the Grand Lake located east of Calcasieu Lake. The strategy is to protect or minimize future shoreline erosion by constructing stone breakwater along the full shoreline, particularly in the areas where the lake shoreline is breaching or near breaching into the Gulf Intracoastal Waterway (GIWW). Stone breakwater will rise 2 feet above sea level. Fish-dips every 1000 feet, 46-feet wide at the top, will extend to the lake bottom and be lined with concrete aprons. A 6-feet deep flotation canal with a 1:4 side slope will be at least 35 feet from the centerline of the dike, and material from the flotation canal will be cast inside the breakwater. The total length of the proposed rock dike is roughly 45 miles around the banks of the lake, or 238,000 feet. This complements the

Grand Lake Shoreline Protection Project (ME-21), and the Grand -White Lakes Land Bridge Protection Project (ME-19).

4-11. Stabilize White Lake Shoreline and Landbridge

This measure is located at White Lake, which is east of Grand Lake between Grand Lake and Freshwater Bayou in western Louisiana. The strategy is to protect the shoreline of White Lake with a stone breakwater to minimize and/or eliminate future shoreline erosion. The measure is to create a stone breakwater. The plan is to copy the design used in Grand Lake. A 45-foot flotation channel, 6-feet deep, cast material to bankline. Construct stone breakwater between flotation channel and the bankline. Fish-dips will be built every 1,000 feet. The fish-dips, 46 feet wide at the top, will extend to the lake bottom and be lined with concrete aprons. The total amount of shoreline around the lake is 211,700 feet. There are two projects (ME-19) and (ME-21) that complement the measure under consideration. These projects are in place.

4-12. Beneficial Use of Dredged Material Program: Utilize Sediment and Dedicated Dredging for Marsh Enhancement and Construction of Terraces in Calcasieu Lake

This measure addresses the marsh and wetlands around Calcasieu Ship Channel. The Calcasieu Ship Channel is maintained at 40-feet deep by 400-feet wide and extends from the Gulf of Mexico to Lake Charles, Louisiana. Maximizing the beneficial uses of dredged material will provide stronger foundations for marsh-building processes to occur. This project was approved by Task Force as a part of priority Project List 8. The measure consists of constructing five marsh restoration sites within the Sabine National Wildlife Refuge using material dredged out of the Calcasieu River Ship Channel (CS-28, Cycles 1 to 5).

4-13. Dedicated Dredging from the Gulf of Mexico for Marsh Creation and Enhancement

This measure is located in the Sabine Wildlife Refuge vicinity in shallow water south of Highway 82 at approximately the southern boundary of the Wildlife Refuge. The location is in Sabine Wildlife Refuge in shallow water north of and parallel to Highway 82. The plan is to restore 5,000 acres or more on Sabine NWR and adjacent properties by utilizing dedicated dredging from the Gulf of Mexico for marsh creation and enhancement. Average water depth is 1.5 to 2 feet.

4-14. Bank Stabilization along Freshwater Bayou

This measure is located on the west bank of Freshwater Bayou, south of the intersection of Freshwater Bayou and the Gulf Intracoastal Waterway (GIWW), beginning at Schooner Bayou and going south to the Freshwater Lock. The strategy is to construct stone (rock) dike along the toe of the existing bankline. Two reaches in CWPPRA cover the reach from Six Mile Canal south to the Freshwater Lock.

4-15. Manage Watershed to Reduce Rapid Inflows into Mermentau Subbasin

Location of this measure is the Mermentau River and watershed, east of and to the north of Lake Charles, Louisiana. The strategy is to manage watershed runoff to minimize the rapid accumulation of runoff in the lower reaches of the drainage basin. Design is to obtain and construct a dry storage area of 10 square miles upstream of Mermentau, Louisiana. The 10-square-miles will be surrounded by levees or embankments, at a height of 5 feet. A two-mile-long section is provided in the embankment that parallels the river. The crest of this section is 2-feet above ground level. A gated section will be constructed at the downstream-corner of the dry impoundment to evacuate stored water after a runoff event. Another element would be to widen the existing channel downstream of Catfish Bayou control structure. Increasing the existing channel 50-feet wider downstream to Upper Mud Lake, a distance of 16 miles is recommended. This would provide a greater channel cross-section area downstream of

the structure, thus increasing the opportunity for greater hydraulic efficiency with a slight increase in water elevation across structure.

4-16. Bank Stabilization from Schooner Bayou to GIWW along Freshwater Bayou

This measure is located from Schooner Bayou to the Gulf Intracoastal Waterway (GIWW) along Freshwater Bayou. The strategy is to protect the bankline of Freshwater Bayou with a stone dike to minimize and/or eliminate future bankline erosion. The amount of bankline along the reach is 17,500 feet. A potential design is to place a near-band or toe stone dike near the water's edge in the water. The height of the dike should be 2- to 3-feet above the level of the marsh. Assuming the water depth to be no more than 2 feet, then the vertical height of the dike should be 5 feet.

4-17. Maintain Hwy 82 for Hurricane Evacuation and Marsh Protection

The measure is located along Highway 82, which traverses the lower coast area across all of Planning Unit 4. Maintain Highway 82 in good travel condition at all times. Prior to annual hurricane seasons, recommend a thorough inspection of the highway to ensure good travel conditions exist along all reaches of the road. Identify areas of potential bottlenecks and investigate ways of elimination or, at minimum, improvement. The shoulder and embankment slopes on the north side of the road bed should be protected against erosion from overtopping of the roadway. Prevention of numerous gullies and/or significant blowouts of the roadbed would benefit recovery efforts in the area.

4-18. Provide Water Control Structures at Strategic Locations along Highways 82 and 27

This measure is identified in three locations: (1) Highway 82 area between Rollover Bayou and Superior Canal to the eastern portion of Rockefeller Refuge; (2) Chenier subbasin west of Rockefeller Refuge at the Thibodeaux Bridge; and (3) Chenier subbasin, Hog Bayou Watershed. The strategy is to pass the excess fresh water through or under Highway 82 to the Chenier subbasin. Two CWPPRA projects, M-16, and M-17, cover the area described by (1), (2) and (3) designated in the 'Location" paragraph above. Restoration strategy for ME-17 states that measures along the perimeter of Little Pecan Bayou would reduce marsh salinity levels and allow fresh water to be conveyed to the area south of Louisiana Highway 82. Planning and modeling are underway for ME-17. M-16 includes installation of four freshwater introduction water-control structures; plug removal; canal enlargement north of Louisiana Highway 82 to allow water flow under the highway from the Lakes subbasin south into the Chenier subbasin.

4-19. Develop a Plan to Elevate and/or Relocate Assets Located Outside of the Hurricane Protection Levee

The measure includes all areas of Planning Unit 4 that are not protected by hurricane levee or levees and that can be impacted by hurricane surges. The strategy is to conduct surveys in areas not protected by proposed protection works to identify assets to elevate and determine what assets should be relocated if practical.

This measure was labeled as "not being tied to a specific geographic location" and was, therefore, not shown on the Alternative maps.

4-20. Stabilize Banks of GIWW

The GIWW (Gulf Intracoastal Waterway) goes across the entire gulf coast from the west Louisiana state line to Florida. The location of this measure is from the west bank of Freshwater Bayou to the west Louisiana state boundary line, a distance of 101 miles. The strategy is to construct rock dikes parallel to the bankline with the landward toe of the stone dike located at the underwater toe of the bankline. Dikes would be on both sides of the waterway. The cross-section of the dike is 5-feet high, 3-foot wide crest, with side slopes of 1:3.

4-21. Utilize Freshwater Inflow from the Atchafalaya River

Measure location is the Gulf Intracoastal Waterway (GIWW) beginning at the west bank of Wax Lake Outlet Structure in Planning Unit 3b. The strategy is to use this source (freshwater inflow from the Atchafalaya River) as it could be available for longer durations and not have the rapid influx that the Mermentau can produce. Caution needs to be stated. The GIWW annually experiences erosion of its banks creating many holes or leaks. Currently, minimal amounts of the Atchafalaya River flowing through GIWW reach Freshwater Bayou. There is a measure in Planning Unit 4 and a similar measure in Planning Unit 3b that calls for stabilizing the banks of the GIWW. These measures would help to close some of the leaks or at least slow down the leaks. Also, Alternative 1 in both in both Planning Units has a levee measure along the south bank of the GIWW. These measures would also aid in minimizing losses of fresh water from the GIWW. In summary, measures already described will benefit the need in this measure. Constructing gates at the Charenton Canal, repairing banklines at Weeks Bay, and installing gates at Freshwater Bayou would go even further to conveying more fresh water to the Grand Lake region in Planning Unit 4

4-22. Build New Chamber for Navigation at Calcasieu Lock on GIWW and Use Old Lock to Evacuate Excess Water

This measure includes the existing Calcasieu Lock on the Gulf Intracoastal Waterway (GIWW) south of Lake Charles, Louisiana. The strategy is construction of a new chamber for navigation and to use the old lock chamber for freshwater introduction to the upper Calcasieu Estuary from the Mermentau Basin. The measure also provides for freshwater introduction via the Black Bayou culverts at the intersection of Black Bayou and Highway 384. The new lock size is 1,200-feet in length, 75-feet wide, and sill elevation at –13 feet.

7.0 TABLES

Table C.1 Planning Unit 1 - List of Proposed Measures

No	Measure	Source
1	Levee Alignment No. 1 (Storm Surge Protection to 30 feet)	USACE/LACPR
2	East Levee Alignment 6 (South of GIWW - Storm Surge Protection to 30 feet)	USACE/LACPR
3	Open-System Pontchartrain Basin Hurricane Protection Levee Alignment Alternative	USFWS
4	Suggested Modification of Lake Pontchartrain Basin Barrier Plan Levee Alignment	USFWS
5	Construct New Floodgate at Bohemia (Mississippi River)	St Bernard Plan
6	Raise Both Sides of Levee on Mississippi R. (East Bank, East of Jefferson P.)	St Bernard Plan
7	Connect 40 Arpent Levee System through Verret	St Bernard Plan
8	Raise 40 Arpent Levee to 17.5' (from Industrial Canal to Verret)	St Bernard Plan
9	Construct New MRGO Lock and Extend MRGO Eastbank Levee	St Bernard Plan
10	Construct 4 New Floodgates	St Bernard Plan
11	Construct a Sill at Seabrook (Industrial Canal at Lake Pontchartrain)	2050
12	Maintain Lake Borgne Landbridge/Shoreline Protection	PCLDP/CWPPRA/ ESF-14/USFWS
13	Restore the Bayou LaLoutre Ridge (Includes Constriction of MRGO to GIWW Dimensions)	PCLDP/ESF-14/ St. Bernard Plan/USFWS
14	Restore the Chandeleur Barrier Islands	PCLDP/CWPPRA/ESF-14/USFWS
15	Construct the Jefferson Parish Fringe Marsh Buffer	PCLDP
16	Construct the Violet Reintroduction to Maintain Target Salinity in LA and MS	PCLDP/ESF-14
17	Maintain and Restore Biloxi Marsh Landbridge and Barrier Reefs - South	PCLDP/ESF-14/USFWS
18	Maintain and Restore Biloxi Marsh Landbridge and Barrier Reefs - North	PCLDP/ESF-14/USFWS
19	Maintain Critical Marsh Shorelines and Ridges of the East Orleans Landbridge	PCLDP
20	Maintain and Restore Breton Landbridge with Caernarvon and Marsh Creation	PCLDP/CWPPRA/ LCA
21	Maintain and Enhance the Maurepas Landbridge with Maurepas Reintroduction	PCLDP
22	1,000 cfs Diversion at Convent/Blind River	LCA
23	5,000 cfs Diversion at Convent/Blind River	LCA/USFWS
24	10,000 cfs Diversion at Convent/Blind River	LCA
25	1,000 cfs Diversion at Hope Canal	LCA
26	1,000 cfs Diversion at Reserve Relief Canal	LCA
27	5,000 cfs Diversion at Bonnet Carre Spillway	LCA
28	10,000 cfs Diversion at Bonnet Carre Spillway	LCA
29	6,000 cfs Diversion at White's Ditch	LCA
30	10,000 cfs Diversion at White's Ditch	LCA
31	15,000 cfs Diversion at American/California Bay	LCA
32	110,000 cfs Diversion at American/California Bay with Sediment Enrichment	LCA
33	250,000 cfs Diversion at American/California Bay with Sediment Enrichment	LCA
34	12,000 cfs Diversion at Bayou Lamoque	LCA/ESF-14
35	15,000 cfs Diversion at Fort St. Phillip	LCA
36	26,000 cfs Diversion at Fort St. Phillip with Sediment Enrichment	LCA
37	52,000 cfs Diversion at Fort St. Phillip with Sediment Enrichment	LCA
38	Sediment Delivery by Pipeline at American/California Bay	LCA

No	Measure	Source
39	Sediment Delivery by Pipeline at Central Wetlands	LCA
40	Sediment Delivery by Pipeline at Fort St. Phillips	LCA
41	Sediment Delivery by Pipeline at Golden Triangle	LCA
42	Sediment Delivery by Pipeline at LaBranche	LCA
43	Sediment Delivery by Pipeline at Quarantine Bay	LCA
44	Increase Amite River Influence by Gapping Dredged Material Banks on Diversion Canals	LCA
45	Marsh Nourishment on the New Orleans East Landbridge	LCA
46	Mississippi River Gulf Outlet Environmental Features and Salinity Control Study	LCA
47	Rehabilitate Violet Siphon and Post Authorization Change for the Diversion of Water through Inner Harbor Navigation Canal for Enhanced Influence to the Central Wetlands	LCA/USFWS
48	Opportunistic Use of the Bonnet Carre Spillway	LCA/CWPPRA
49	Restore Breton Island/Chandeleur Island Chain with Dredge Material from Proposed Freshwater Channel (With Tie-in Point to Gulfport Channel)	St Bernard Plan
50	Restore Baptiste Colette Ridge with Dredge Material	St Bernard Plan
51	Remove Old Grand Prairie Levee	St Bernard Plan
52	Add New Bank Line Stabilization (Lake Borgne Corner at GIWW to Verret)	St Bernard Plan/USFWS
53	Add Breakwater (in Lake Borgne from Southwest Corner to Biloxi Wildlife Management Area)	St Bernard Plan/ ESF-14
54	Close and Restore the MRGO to Protect and Sustain Natural Protection Features	USFWS
55	Create Marsh in Interior Open Water Areas and Install Shore Protection Features on the North Shore of Lake Pontchartrain.	USFWS
56	Construct 3 or 4 Small Mississippi River Spillways through the Protected Corridor between Carlisle and Bohemia.	USFWS
57	Remove the Gates from the Existing Bayou Lamoque Diversion Structure.	USFWS
58	Construct two 5,000 cfs Diversions into the Maurepas Swamps	USFWS
59	Construct a Band of Marsh Across the Basin from Point-a-la-Hache Northeastward to MRGO Spoilbank at the Heads of the Major Bays and Lakes	USFWS
60	Goose Point (Protects NO Landbridge)	CWPPRA
61	LaBranch Wetlands Terracing, Planting, Shoreline Protection	CWPPRA
62	Bayou Chevee Shoreline Protection	CWPPRA
63	Delta Building Diversion North of Fort St. Phillip	CWPPRA
64	Hopedale Hydrologic Restoration	CWPPRA
65	MRGO Disposal Area Marsh Protection	CWPPRA
66	Diversion into LaBranche Wetlands	2050/CWPPRA
67	Maintain Shoreline Integrity of Lake Pontchartrain	2050/CWPPRA/ ESF-14
68	Resolve/Close MRGO to Deep Draft Navigation	2050
69	Restore St. Tammany Marsh	ESF-14
70	Design Storm Surge Barrier Across Lake Borgne	ESF-14
71	Lake Leary Marsh Restoration and Freshwater Diversion	ESF-14
72	Mississippi River Delta Management Study	LCA
73	Develop Cypress Islands Project Study	ESF-14
74	Extend the marsh restoration area along the north of Biloxi marsh (1-8 of Alt 2) westward to Malheureux Point.	Proposed

No	Measure	Source
75	Provide barrier reef/shoreline protection between the east side of the Biloxi marsh and the Chandeleur Sound.	Proposed
76	Conduct sediment mining in Southwest Pass for marsh restoration purposes.	Proposed
77	Increase freshwater diversion capacity at Violet, Bayou Lamoque, Whites Ditch, and other sites, and decrease the proposed capacity at Caernarvon and American Bay.	Proposed
78	Utilize a full protection/restoration concept as the preferred alternative.	Proposed
79	Model levee alignment 5. In the “funnel” area near Michoud, agencies want a different levee alignment which will enclose less existing marsh while providing protection to east New Orleans.	Proposed
80	The Biloxi Marsh Stabilization and restoration Plan	Proposed
81	Note: The National Estuary Program (EPA) has Lake Pontchartrain Basin Listed in its Priority Program, and May Overlap with Some of the Recommendations Above	USEPA

CWPPRA - Coastal Wetlands Planning, Protection and Restoration Act
EPA - Environmental Protection Agency
ESF-14 - Emergency Support Function 14
GIWW - Gulf Intracoastal Water Way
LACPR - Louisiana Coastal Protection Restoration
LCA - Louisiana Coastal Authority (USACE)
MRGO - Mississippi River Gulf Outlet
MS - Mississippi
NO - New Orleans
PCLDP - Pontchartrain Coast Line of Defense Plan
USACE - United States Army Corps of Engineers
2050 - Coast 2050 (USACE)
USEPA- United States Environmental Protection Agency

Table C.2 Planning Unit 2 - List of Proposed Measures

No	Measure	Source
1	5,000 cfs Diversion at Bastian Bay/Buras	LCA
2	130,000 cfs Diversion Bastian Bay/Buras	LCA
3	120,000 cfs Diversion. near Bayou Lafourche	LCA
4	60,000 cfs Diversion at Boothville w/ Sediment Enrichment	LCA
5	1,000 cfs Diversion at Donaldsonville	LCA
6	5,000 cfs Diversion at Donaldsonville w/ Sediment Enrichment	LCA
7	1,000 cfs Diversion at Edgard	LCA
8	5,000 cfs Diversion at Edgard w/ Sediment Enrichment	LCA
9	5,000 cfs Diversion at Empire	LCA
10	90,000 cfs Diversion at Empire	LCA
11	5,000 cfs Diversion at Fort Jackson	LCA
12	60,000 cfs Diversion at Fort Jackson	LCA
13	60,000 cfs Diversion at Fort Jackson w/ Sediment Enrichment	LCA
14	90,000 cfs Diversion at Fort Jackson w/ Sediment Enrichment	LCA
15	150,000 cfs Diversion at Fort Jackson w/ Sediment Enrichment	LCA
16	1,000 cfs Diversion at Lac des Allemands	LCA
17	5,000 cfs Diversion at Lac des Allemands w/ Sediment Enrichment	LCA
18	5,000 cfs Diversion at Myrtle Grove	LCA
19	15,000 cfs Diversion at Myrtle Grove	LCA
20	38,000 cfs Diversion at Myrtle Grove w/ Sediment Enrichment	LCA
21	75,000 cfs Diversion at Myrtle Grove w/ Sediment Enrichment	LCA
22	150,000 cfs Diversion at Myrtle Grove w/ Sediment Enrichment	LCA
23	5,000 cfs Diversion at Oakville	LCA
24	1,000 cfs Diversion at Pikes Peak	LCA
25	5,000 cfs Diversion at Pikes Peak w/ Sediment Enrichment	LCA
26	5,000 cfs Diversion at Port Sulphur	LCA
27	Barrier Island Restoration at Barataria Shoreline	LCA
28	Marsh Creation at Wetland Creation and Restoration Feasibility Study Sites	LCA
29	Mississippi Delta Management Study	LCA
30	Reauthorization of Davis Pond	LCA
31	Relocation of Deep Draft Navigation Channel	LCA
32	Sediment Delivery via Pipeline at Bastin Bay / Buras	LCA
33	Sediment Delivery via Pipeline at Empire	LCA
34	Sediment Delivery via Pipeline at Main Pass (Head of Passes)	LCA
35	Sediment Delivery via Pipeline at Myrtle Grove	LCA
36	Third Delta Study	LCA
37	Barataria Bay Waterway Wetland Restoration	CWPPRA
38	Mississippi River Reintroduction to Bayou Lafourche	CWPPRA
39	Grand Isle and Vicinity	USACE
40	Oakville to Lareussite Study	USACE
41	Pailet Basin Study	USACE
42	SE Louisiana Jefferson Parish Flood Control	USACE
43	West Bank and Vicinity Hurricane Protection	USACE
44	Freshwater and Sediment Diversions	BTNEP
45	Dedicated Dredging on Barataria Landbridge	DNR/USFWS
46	Little Lake Shoreline Protection/Dedicated Dredging @ Round Lake	DNR/USFWS
47	Barataria Basin Is. Complex (Pelican Is. & Pass La Mer to Chalance)	DNR/USFWS

No	Measure	Source
48	Riverine Sand Mining/Scofield Island Restoration	DNR/USFWS
49	S. Shore of Pen Shoreline Protection and Marsh Creation	DNR/USFWS
50	Bayou Lafourche Siphon	DNR/CWPPRA
51	Myrtle Grove Siphon	DNR/CWPPRA
52	Vegetative Planting of Dredged Material Disposal @ Grand Terre Island	DNR/CWPPRA
53	Stabilize Lafitte and Barataria Shoreline	ESF-14
54	Dredge Barataria Basin Landbridge	ESF-14
55	Implement Shoreline Protection Measures	ESF-14
56	Implement the Ships for Shores Project	ESF-14
57	Restore Jefferson Barrier Islands	ESF-14
58	Restore Rigoletes/Barataria Waterway Wetland	ESF-14
59	Bayou Dupont Sediment Delivery Expansion	JPCP
60	PR-1 B. Rigoletes, Perot and Harvey Cut Channel Management	JPCP
61	PR-2 Dupre Cut/Barataria Bay Waterway Channel Management	JPCP
62	PR-7 Land Bridge Shoreline Protection Ext. and Wetland Restore.	JPCP
63	NA-3 Goose Bayou to Cypress Bayou Shoreline Protection	JPCP
64	MG-1 Myrtle Grove Natural Ridge Restoration	JPCP
65	MG-2 Lafitte Oil and Gas Field (East) Restoration	JPCP
66	PR-5 Shoreline Stabilization at Grand Isle Water Tank	JPCP
67	PR-6 Delta Farms Oil and Gas Field Restoration	JPCP
68	BI-5 Grand Isle Oil and Gas Pipeline Corridor Shoreline Protection	JPCP
69	PR-11 Bayou Perot/Bayou Rigoletes Peninsula Restoration	JPCP
70	NA-8 Goose Bayou to Lafitte Levee	JPCP
71	BI-3 Elmer's Island Acquisition and Preservation	JPCP
72	CS-4 Wetland Harbor Activities Recreational Facility	JPCP
73	BB-1 North Barataria Bay Shoreline Wave Breaks	JPCP
74	NA-1 Naomi Siphon Sediment Enrichment	JPCP
75	NA-6 Rosethorn Wetlands Sewage Effluent Division	JPCP
76	CS-3 Bayou Segnette Wetlands Sewage Effluent Diversion	JPCP
77	BI-6 Grand Isle Plan, Part 1-NW GI Breakwater Enhancement	JPCP
78	FN-1 Caminada Chenier Restoration	JPCP
79	BI 4 Elmer's Island & West Grand Terre Oak Ridge Restoration	JPCP
80	BS-1 Grand Pierre Island Restoration (PPL 3 XBA-1c)	JPCP
81	MG-3 Dupre Cut Project (BA-26) Wetland Restoration	JPCP
82	D to G: GIWW Alignment	USACE
83	D to G: Hwy 90 Alignment	USACE
84	D to G: Ring Levee Alignment - Larose to Donaldsonville	USACE
85	D to G: Ring Levee Alignment - Donaldsonville to Avondale	USACE
86	D to G: Pipeline Canal Alignment	USACE
87	D to G: GIWW Modified Alignment	USACE
88	New Orleans to Venice Hurricane Protection Project	USACE
89	Mississippi River Hydrodynamic Study	LCA
90	West Bay Crevasse Adaptive Management	CWPPRA
91	Backfill or Plug Non-essential Oil and Gas Canals	Proposed
92	Watershed Management Plan for Upper Barataria Basin	Proposed
93	Strategize and Implement Plan to elevate and/or relocate assets located outside the hurricane protection plans.	Proposed

No	Measure	Source
ADDITIONAL MEASURES PROPOSED BY STAKEHOLDERS		
95	Increase freshwater diversion capacity at Myrtle Grove, West Pointe a la Hache, Port Sulphur, Buras and Jackson, for a total capacity of 163,000 cfs. This combines with a strategy of switching the majority of freshwater flows from the East bank of the River to the West Bank on a periodic basis.	
96	Provide for a band of marsh restoration in the north bay-shore protection alternative rather than shoreline protection only. Consider possible armoring the south side of this new marsh fringe to protect from wave action.	
97	Add more marsh restoration areas as described in the alternatives for the Third Delta report.	
98	Model levee alignment 3, but without the Category 5 levees in lower Plaquemines below River Mile 70, and include ring levees for Lafitte, Crown Point, and Barataria. They are adamantly opposed to the GIWW alignment because of the great impacts on existing marshes.	
99	Town of Jean Lafitte Hurricane Protection Plan	

BTNEP - Barataria Terrebonne National Estuary Program
CWPPRA - Coastal Wetlands Planning, Protection and Restoration Act
DNR - Department of Natural Resources
D to G - Donaldsonville to the Gulf Hurricane Protection Project
ESF-14 - Emergency Support Function 14
GIWW - Gulf Intracoastal Water Way
JPCP - Jefferson Parish Conservation Plan
LCA - Louisiana Coastal Authority (USACE)
USACE - United States Army Corps of Engineers
USFWS - United States Fish & Wildlife Service

Table C.3 Planning Unit 3a - List of Proposed Measures

No	Measure	Source
1	Initiate the LA-1 Marsh Creation Project	ESF-14
2	Backfill Pipeline Canals	LCA
3	Bayou Lafourche 1000 cfs	LCA
4	Convey Atchafalaya River Water to Terrebonne Marshes	LCA
5	Freshwater Introduction South of Lake Decade (Avoca Island)	LCA
6	Freshwater Introduction via Blue Hammock Bayou	LCA
7	Maintain Land Bridge Between Bayous Du Large and Grand Bayou	LCA
8	Maintain Land Bridge Between Caillou Lake and Gulf of Mexico	LCA
9	Maintain Timbalier Land Bridge	LCA
10	Multi-Purpose Operation of the Houma Navigational Canal Lock System	LCA
11	Optimize flows and Atchafalaya River Influence in Penchant Basin	LCA
12	Rehabilitate Northern Shorelines of Terrebonne/Timbalier Bays	LCA
13	Restore Terrebonne Barrier Islands	LCA
14	Alternative Operational Schemes of the Old River Control	LCA
15	Lower Water Levels in Upper Penchant	LCA
16	Enhance Atchafalaya Flow to Lower Penchant	LCA
17	Improve Hydrology and Drainage in the Verret Sub-basin	LCA
18	Stabilize Banks of Navigation Channels for Water Conveyance (HNC, GIWW, etc.)	LCA
19	Protect and Maintain Ridges	LCA
20	Third Delta Study	LCA
21	Upper Atchafalaya Basin Study	LCA
22	Maximize Beneficial Use of Dredge Material	LCA
23	Morganza to the Gulf of Mexico Hurricane Protection Study	USACE
24	State/Parish Barrier Plan (Reaches, 1,2, and 3)	Parish Plan
25	Reach 5 (LHR) and Reach 6 (HMCR) Storm Surge Protection	USACE
26	Internal Levee Alignment	Proposed
27	Madison Bay Marsh Creation and Terracing Project	CWPPRA
28	West Bell Pass Barrier Headland Restoration Project	CWPPRA
29	Falgout Canal Freshwater Enhancement Project	CWPPRA
30	Timbalier Island East Restoration	CWPPRA
31	Chacahoula Basin Plan	Proposed
32	Strategy Plan to Evaluate or Relocate Assets Outside of Protected Areas	Proposed
35	Include Ridge Restoration	USFWS
36	Include Houma Freshwater Bypass Channel	USFWS
37	Include Landbridge from Grand Caillou to Dularge Road Ending	USFWS

ADDITIONAL MEASURES

38	Include Marsh Restoration Along Twin Pipelines for Landbridge Establishment	Proposed
39	Include More Marsh Restoration as Described in Third Delta Report	Proposed
40	Include ridge restoration as shown in the prior Environmental Alternative presentation made by the US Fish and Wildlife Service.	USFWS
41	Include a Houma Freshwater Bypass Channel, per the US Fish and Wildlife Service plan.	USFWS

No	Measure	Source
42	Include Conveying Atchafalaya River Water at GIWW/Grand Bayou and Widen Intersection of Two Waterways	Proposed
43	Include a "Convey Atchafalaya water" feature at the GIWW at Grand Bayou, and widen the intersection of the two waterways.	Proposed
44	Model Levee Alignment 5 as Category 5 (Morganza Levee Assumed in Place)	Proposed
45	Use Morganza Levee Alignment from EIS - (not as shown with lobe extending down Bayou du Large below Falgout Canal)	Proposed
46	Include St. Mary Parish Storm Surge Protection Study	Proposed
CWPPRA - Coastal Wetlands Planning, Protection and Restoration Act		
ESF-14 - Emergency Support Function 14		
LCA - Louisiana Coastal Authority (USACE)		
USACE - United States Army Corps of Engineers		
USFWS - United States Fish and Wildlife Service		
2050 - Coast 2050 (USACE)		

Table C.4 Planning Unit 3b - List of Proposed Measures

No	Measure	Source
1	Create Marsh at Weeks Bay	ESF-14
2	Create Marshes at Marsh Island	ESF-14
3	Restore the Vermillion Bay Shoreline	ESF-14
4	Restore Marsh by Filling Abandoned Canals	ESF-14
5	Construct Terraces for Marsh Restoration	ESF-14
6	Stabilize Freshwater Bayou Bank	ESF-14
7	Increase Sediment Transport Down Wax Lake Outlet	LCA
8	Maintain Northern Shore of East Cote Blanche Bay at Pt. Marone	LCA
9	Rebuild Historic Reefs - Rebuild Historic Barrier Between Point Au Fer and Eugene Island	LCA
10	Rebuild Historic Reefs - Segmented Reef Along Historic Point Au Fer Barrier Reef from Eugene Island Extending towards Marsh Island to the West	LCA
11	Acadiana Bay Estuarine Restoration for Old Shell Ridge	LCA
12	Stabilize Gulf Shoreline of Point Au Fer Island	LCA
13	Maintain Vermilion East and West Cote Blanche Bays as Brackish	LCA
14	Reduce Sedimentation in Bays	LCA
15	Optimize GIWW Flow to Marshes and Eliminate GIWW Direct Flows into Bays	LCA
16	Resolve Cote Blanche Bays Salinity and Turbidity Issues	LCA
17	Create an Artificial Reef Complex Including One Extending from Point Chevreuil Southward	LCA
18	Storm Surge Protection- Levee Alignment South of GIWW to Provide Coastal Protection	USACE
19	Storm Surge Protection- Levee Alignment North of GIWW to Provide Coastal Protection	USACE
20	Point Chevreuil Shoreline Protection Project	CWPPRA
21	Deer Island Pass Re-Alignment Project	CWPPRA
22	Vermilion Bay Shoreline Beach Restoration/Vegetative Planting and Maintenance	CWPPRA
23	South Marsh Island Marsh Creation Project	CWPPRA

CWPPRA - Coastal Wetlands Planning, Protection and Restoration Act
ESF-14 - Emergency Support Function 14
GIWW - Gulf Intracoastal Water Way
LCA - Louisiana Coastal Authority (USACE)
USACE - United States Army Corps of Engineers
2050 - Coast 2050 (USACE)

Table C.5 Planning Unit 4- List of Proposed Measures

No	Measure	Source
1	West Levee Alignment 3A (Red)	USACE/LACPR
2	West Levee Alignment 3 (Green)	USACE/LACPR
3	East Levee Alignment 3 (Yellow)	USACE/LACPR
4	Gulf Shoreline Stabilization	LCA
5	Dedicated Dredging for Marsh Restoration	LCA
6	Salinity control at Oyster Bayou	LCA
7	Salinity Control at Long Point Bayou	LCA
8	Salinity Control at Black Lake Bayou	LCA
9	Salinity Control at Alkali Ditch	LCA
10	New Lock at Gulf Intracoastal Waterway East of Alkali Ditch	LCA
11	Modify Cameron-Creole Watershed Control Structures	LCA
12	East Sabine Lake Hydrologic Restoration	LCA
13	Salinity Control at Black Bayou	LCA
14	Salinity Control at Highway 82 Causeway	LCA
15	Freshwater Introduction and Retention at Pecan Island	LCA
16	Freshwater Introduction and Retention at Rollover Bayou	LCA
17	Freshwater Introduction and Retention at Highway 82	LCA
18	Freshwater Introduction and Retention at Little Pecan Bayou	LCA
19	Freshwater Introduction and Retention at South Grand Chenier	LCA
20	Chenier Plain Freshwater and Sediment Management and Allocation Reassessment Study	LCA
21	East Sabine Lake Hydrologic Restoration	CWPPRA
22	Maintain Sabine River Inflow	2050
23	Salinity Control Along the East Shoreline of Sabine Lake	2050
24	Marsh Creation by Sediment Delivery near Calcasieu Lake	2050
25	Salinity Control at the Sabine Causeway and Pass	2050
26	Salinity Control on the GIWW	2050
27	Stabilize Gulf Shoreline in Western Cheniers	2050
28	New Lock for Navigation/Old Lock for Drainage at Calcasieu Lock	2050
29	Operate Locks to Evacuate Excess Water on GIWW	2050
30	Manage Watershed to Reduce Rapid Inflows into Mermentau Lakes Sub-basin	2050
31	Prevent Coalescence of Grand Lake and GIWW	2050
32	Salinity Control at Calcasieu Ship Channel	2050
33	Stabilize Gulf Shoreline in Eastern Cheniers	2050
34	Constrict Calcasieu Ship Channel to Restore River Connection to Gulf	2050
35	Freshwater Introduction and Retention from the Mermentau Basin	2050
36	Move Water South Across Highway 82	2050
37	Maintain Atchafalaya Mud Stream	2050
38	Marsh Creation by Sediment Delivery near Pecan Island	2050
39	Operate Locks to Evacuate Excess Water Between Pecan Island and Abbeville	2050
40	Maintain Atchafalaya Flow	2050
41	Stabilize Grand and White Lakes Shorelines	2050
42	Prevent Coalescence of Grand Lake and White Lake	2050
43	Restore Marsh by Filling Abandoned Canals	ESF-14
44	Construct Terraces for Marsh Restoration	ESF-14
45	Develop Chenier Plain Freshwater Management and Allocation	ESF-14

No	Measure	Source
46	Develop Post-Storm Emergency Action Plan	ESF-14
47	Restore Natural Drainage from Freshwater Basins	ESF-14
48	Stabilize Freshwater Bayou Bank	ESF-14
49	Monitor Elevation in Cameron Parish	ESF-14
50	Establish Stormwater Action Plans	ESF-14
51	Restore Coast Reduce Erosion	ESF-14
52	Restore/Protect Cheniers for Hurricane Protection	ESF-14

CWPPRA - Coastal Wetlands Planning, Protection and Restoration Act
ESF-14 - Emergency Support Function 14
GIWW - Gulf Intracoastal Water Way
LACPR - Louisiana Coastal Protection Restoration
LCA - Louisiana Coastal Authority (USACE)
USACE - United States Army Corps of Engineers
2050 - Coast 2050 (USACE)

Table C.6 Alternative One and Two Measures- Planning Unit 1

Measure	Description
Alternative Plan: 1	
1-1	Levee Alignment No. 1 from Pearl River to Caernarvon (30 ft storm surge at Coastline) and Hurricane Protection from Caernarvon to Point-a-la-Hache (20 ft Storm Surge at Coastline)
1-2	West Shore Lake Pontchartrain Study Levee Alignment
1-3	Re-evaluate Levee Protection at Southshore of Lake Pontchartrain (from LaBranche to Hwy. 11 - including Fronting & Hardening Pump Stations and Construction of 3 New Pump Stations & the Seabrook Floodgate) 30 ft Storm Surge at Coastline
1-4	Resolve/Close MRGO to Deep Draft Navigation
1-5	Complete/Accelerate the Louisiana Coastal Area (LCA), Louisiana Ecosystem Restoration Study Near-Term Plan Including:
1-5a	MRGO Environmental Restoration Features
1-5b	Small Diversion at Hope Canal
1-5c	Small Diversion at Convent/Blind River
1-5d	Increase Amite River Diversion Canal Influence by Gapping Banks
1-5e	Medium Diversion at White Ditch
1-5f	Modification at Caernarvon Diversion
1-5g	* Louisiana/Mississippi Hydrodynamic Study
1-5h	* Mississippi River Hydrodynamic Study
1-5i	* Mississippi River Delta Management Study
1-6	Restore the Chandeleur Islands
1-7	Maintain and Restore Biloxi Landbridge and Barrier Reefs - South
1-8	Restore Bayou LaLoutre Ridge
1-9	Construct Jefferson Parish Fringe Marsh Buffer
1-10	Maintain Lake Borgne Landbridge
1-11	Sediment Delivery by Pipeline at American/California Bay
1-12	Sediment Delivery by Pipeline at Central Wetlands
1-13	Sediment Delivery by Pipeline at Golden Triangle
1-14	Sediment Delivery by Pipeline at LaBranche
1-15	Benneys Bay Sediment Diversion
1-16	Restore Main Pass Ridge with Dredge Material
1-17	Add New Bankline Stabilization (Shoreline of Lake Borgne from Alligator Point to Lake Shore Bayou)
1-18	Goose Point/Pointe Platte Marsh Creation
1-19	Adaptive Management Through Maintenance of Existing Crevasses and Construction of New Crevasses.
1-20	* Maximize Beneficial Use of Dredged Material where Feasible.
1-21	* Strategize and Implement Plan to Elevate and/or Relocate Assets Located Outside the Hurricane Protection Plans
1-22	Maintain and Restore Breton Landbridge with Marsh Creation

* Not tied to specific geographic locations

Measure	Description
Alternative Plan: 2	

Measure	Description
1-1	Levee Alignment No. 1 from Pearl River to Caernarvon (30 ft storm surge at Coastline) and Hurricane Protection from Caernarvon to Point-a-la-Hache (20 ft Storm Surge at Coastline) (No structure at Rigolets Pass & Chef Menteur Pass).
1-2	West Shore Lake Pontchartrain Study Levee Alignment
1-3	Re-evaluate Levee Protection at Southshore of Lake Pontchartrain (from LaBranche to Hwy. 11 - including Fronting & Hardening Pump Stations and Construction of 3 New Pump Stations & the Seabrook Floodgate) 30 ft Storm Surge at Coastline
1-4	Resolve/Close MRGO to Deep Draft Navigation
1-5	Complete/Accelerate the Louisiana Coastal Area (LCA), Louisiana Ecosystem Restoration Study Near-Term Plan Including:
1-5a	MRGO Environmental Restoration Features
1-5b	Small Diversion at Hope Canal
1-5c	Small Diversion at Convent/Blind River
1-5d	Increase Amite River Diversion Canal Influence by Gapping Banks
1-5e	Medium Diversion at White Ditch
1-5f	Modification at Caernarvon Diversion
1-5g	* Louisiana/Mississippi Hydrodynamic Study
1-5h	* Mississippi River Hydrodynamic Study
1-5i	* Mississippi River Delta Management Study
1-6	Restore Chandeleur Islands
1-7	Maintain and Restore Biloxi Landbridge and Barrier Reefs - South
1-8	Maintain and Restore Biloxi Landbridge and Barrier Reefs - North
1-9	Restore Bayou LaLoutre Ridge
1-10	Construct Jefferson Parish Fringe Marsh Buffer
1-11	Maintain Lake Borgne Landbridge Including Landbridge Shoreline Protection
1-12	Maintain Critical Marsh Shorelines and Ridges of the East Orleans Landbridge
1-13	Construct the Violet Reintroduction to Maintain Target Salinity in LA and MS
1-14	Diversion at American/California Bay with Sediment Enrichment
1-15	Benneys Bay Sediment Diversion
1-16	Add Breakwater (in Lake Borgne from Southwest Corner to Biloxi Wildlife Management Area)
1-17	St. Tammany Marsh Restoration and Shoreline Protection with Dredge Material and Vegetative Planting.
1-18	Adaptive Management Through Maintenance of Existing Crevasses and Construction of New Crevasses.
1-19	* Maximize Beneficial Use of Dredged Material
1-20	* Strategize and Implement Plan to Elevate and/or Relocate Assets Located Outside the Hurricane Protection Plans.

* Not tied to specific geographic locations

Table C.7 Alternative One and Two Measures- Planning Unit 2

Measure	Description
Alternative Plan: 1	
2-1	USACE Levee Alignment No. 1: Hurricane Protection (30 ft storm surge at the coastline) Along the GIWW South from Golden Meadow to City Price, Modified to include Lafitte and Barataria
2-2	New Orleans to Venice Hurricane Protection Project (HPP): City Price to Venice Segment- Improve Existing Levees to Provide 100-yr Storm Frequency Level of Protection
2-3	Grand Isle and Vicinity Project: Provide Maximum Technically Feasible Hurricane Protection
2-4	Complete/Accelerate the Louisiana Coastal Area (LCA); Louisiana Ecosystem Restoration Study Near-Term Plan Including:
2-4a	Barataria Basin Barrier Shoreline Restoration Caminada Headland and Shell Island
2-4b	Small Bayou Lafourche Reintroduction
2-4c	Medium Diversion with Dedicated Dredging at Myrtle Grove
2-4d	Re-authorization of Davis Pond - Optimize for Marsh Creation
2-4e	* Mississippi River Hydrodynamic Study
2-4f	* Mississippi River Delta Management Study
2-4g	* Third Delta Study
2-5	Barrier Shoreline Restoration Projects - Restoring the Barataria Barrier Islands
2-6	Adaptive Management Through Maintenance of West Bay Crevasse.
2-7	Pipeline Conveyance of Sediment to Create Strategic Marsh Platforms in Fringing Marsh and Middle Basin Marsh Areas, Including the LA-1 Marsh Creation Project Area.
2-8	* Back Fill and/or Plug Non-Essential Oil and Gas Canals
2-9	* Develop a Watershed Management Plan that Redirects Freshwater and Sediment, Storm Water, and Treated Sewage Water to Sustain Upper Basin Swamps Middle Basin Freshwater Marsh.
2-10	Small Diversions at Strategic Locations in Upper Basin.
2-11	* Maximize Beneficial Use of Dredge Material Where Feasible.
2-12	* Strategize and Implement Plan to Elevate and/or Relocate Assets Located Outside the Hurricane Protection Plans.

* Not tied to specific geographic locations

Measure	Description
Alternative Plan: 2	
2-1	West Bank Hurricane Protection Levee from Davis Pond to Oakville: Improve Existing Levee to Provide Hurricane Protection (30-ft storm surge at the coastline)
2-2	USACE Levee Alignment No. 3: Provide Hurricane Protection via Highway 90 Alignment from Golden Meadow to Davis Pond Segment and from Oakville to Venice in the Plaquemines parish Segment
2-3	Ring Levees around Lafitte, Barataria, and Crown Point, Provide Maximum Technically Feasible Hurricane Protection
2-4	Complete/Accelerate the Louisiana Coastal Area (LCA); Louisiana Ecosystem Restoration Study Near-Term Plan Including:
2-4a	Barataria Basin Barrier Shoreline Restoration Caminada Headland and Shell Island
2-4b	Small Bayou Lafourche Reintroduction
2-4c	Medium Diversion with Dedicated Dredging at Myrtle Grove
2-4d	Re-authorization of Davis Pond - Optimize for Marsh Creation
2-4e	* Mississippi River Hydrodynamic Study
2-4f	* Mississippi River Delta Management Study

Measure	Description
2-4g	* Third Delta Study
2-5	Barrier Shoreline Restoration Projects - Restoring the Barataria Barrier Islands
2-6	Adaptive Management Through Maintenance of West Bay Crevasse.
2-7	Pipeline Conveyance of Sediment to Create Strategic Marsh Platforms in Fringing Marsh and Middle Basin Marsh Areas, Including the LA-1 Marsh Creation Project Area.
2-8	* Back Fill and/or Plug Non-Essential Oil and Gas Canals
2-9	* Develop a Watershed Management Plan that Redirects Freshwater and Sediment, Storm water, and Treated Sewage Water to Sustain Upper Basin Swamps Middle Basin Freshwater Marsh.
2-10	Small Diversions at Strategic Locations in Upper Basin.
2-11	* Maximize Beneficial Use of Dredge Material Where Feasible.
2-12	* Strategize and Implement Plan to Elevate and/or Relocate Assets Located Outside the Hurricane Protection Plans.
2-13	Small Diversion at Port Sulphur
2-14	Ridge Restoration in the Barataria Basin
2-15	North Barataria Bay Shoreline Wave Breaks

* Not tied to specific geographic locations

Table C.8 Alternative One and Two Measures- Planning Unit 3a

Measure	Description
Alternative Plan: 1	
3a-1	Morganza to the Gulf Hurricane Protection Levee Alignment (30-ft storm surge at coastline)
3a-2	Complete/Accelerate the Louisiana Coastal Area (LCA); Louisiana Ecosystem Restoration Study Near-Term Plan Including:
3a-2a	Small Bayou Lafourche Reintroduction
3a-2b	Multi-purpose operation of the Houma Navigation Canal (HNC) Lock
3a-2c	Terrebonne Basin Barrier Shoreline Restoration
3a-2d	Maintain Land Bridge between Caillou Lake and Gulf of Mexico
3a-2e	Convey Atchafalaya River Water to Northern Terrebonne Marshes
3a-2f	* Third Delta Study
3a-2g	* Upper Atchafalaya Basin Study
3a-3	Pipeline Conveyance of Sediment to Create Strategic Marsh Platforms
3a-4	*Plugging and/or Backfilling Oil and Gas Canals to Restore Hydrology and Regulate Salt Water Movement.
3a-5	Bankline Protection for the Houma Navigation Canal (HNC)
3a-6	Bankline Protection for the GIWW
3a-7	Protection to Distributed Assets South of Morganza to the Gulf Hurricane Protection Alignment by Elevated Structures and Protected Hurricane Evacuation Routes.
3a-8	* Strategize and Implement Plan to Elevate and/or Relocate Assets Located Outside the Hurricane Protection Plans.
3a-9	Implement Chacahoula Basin Plan and other projects to alleviate inundation issues in the Verret Sub-Basin
3a-10	* Maximize beneficial use of dredge material where feasible.

* Not tied to specific geographic locations

Measure	Description
Alternative Plan: 2	
3a-1	Morganza to the Gulf Hurricane Protection and LAR Barrier Plan Alignment (20-ft storm surge at coastline)
3a-2	Internal hurricane levee alignment (30-ft storm surge at coastline)
3a-3	Complete/Accelerate the Louisiana Coastal Area (LCA); Louisiana Ecosystem Restoration Study Near-Term Plan Including:
3a-3a	Small Bayou Lafourche Reintroduction (cost is based on the LCA estimates, adjusted for inflation to 2006 price level and has been divided between PU 2 and PU 3a)
3a-3b	Multi-purpose operation of the Houma Navigation Canal (HNC) Lock
3a-3c	Terrebonne Basin Barrier shoreline restoration
3a-3d	Maintain Land Bridge between Caillou Lake and Gulf of Mexico
3a-3e	Convey Atchafalaya River Water to Northern Terrebonne marshes
3a-3f	* Third Delta Study
3a-3g	* Upper Atchafalaya Basin Study
3a-4	Pipeline Conveyance of Sediment to Create Strategic Marsh Platforms
3a-5	Implement Chacahoula Basin Plan and other projects to alleviate inundation issues in the Verret Sub-Basin
3a-6	Freshwater Introduction via Blue Hammock Bayou

Measure	Description
3a-7	Freshwater introduction to south of Lake Decade and Shoreline Protection
3a-8	* Penchant Basin Plan
3a-9	Protection to Distributed Assets South Morganza to the Gulf Hurricane Protection Alignment by Elevated Structures and Protected Hurricane Evacuation Routes.
3a-10	* Strategize and Implement Plan to Elevate and/or Relocate Assets Located Outside the Hurricane Protection Plans.
3a-11	Stabilize/Maintain Northern Shoreline of Terrebonne/Timbalier Bay
3a-12	Short-term Freshwater Redirections to Nourish and Sustain Intermediate Marshes that are being Affected by Salt Water
3a-13	Protect and Maintain Ridges
3a-14	* Maximize Beneficial Use of Dredge Material Where Feasible.
3a-15	Bankline Protection for the Houma Navigation Canal (HNC)
3a-16	Bankline Protection for the GIWW

* Not tied to specific geographic locations

Table C.9 Alternative One and Two Measures- Planning Unit 3b

Measure	Description
Alternative Plan: 1	
3b-1	Construct Hurricane Protection (30-ft Storm Surge at the Coastline) for Berwick and Patterson and Levee Alignment South of the GIWW from the Wax Lake Outlet to Freshwater Bayou.
3b-2	Complete/Accelerate the Louisiana Coastal Area (LCA) Near-Term Plan including:
3b-2a	Stabilize Gulf Shoreline at Pointe Au Fer Island
3b-2b	Convey Atchafalaya River water to Northern Terrebonne Marshes
3b-2c	* Acadiana Bays Estuarine Restoration Feasibility Study
3b-2d	* Upper Atchafalaya Basin Study
3b-3	Create Marsh at Weeks Bay
3b-4	Restore Marsh at Marsh Island South Shoreline and Rainey Marsh via Dedicated Dredging
3b-5	Maintain North Shore of East Cote Blanche Bay and Point Marone
3b-6	Restore Vermilion Bay and West Cote Blanche Bay Shorelines via Beneficial Uses of Dredged Material and/or Detached Breakwaters
3b-7	Maintain Vermillion Bay, East and West Cote Bay as Brackish Environments
3b-8	* Strategize and Implement Plan to Elevate and/or Relocate Assets Located Outside the Hurricane Protection Plans.
3b-9	Freshwater Bayou Bank Stabilization - Belle Isle to Lock

* Not tied to specific geographic locations

Measure	Description
Alternative Plan: 2	
3b-1	Construct Hurricane Protection (30-ft Storm Surge at the Coastline) for Berwick and Patterson and Levee Alignment from Wax Lake Outlet to the Vermillion River Following the USACE West Levee Alignment 3A
3b-2	Complete/Accelerate the Louisiana Coastal Area (LCA) Near-Term Plan Including:
3b-2a	Stabilize Gulf Shoreline at Pointe Au Fer Island
3b-2b	Convey Atchafalaya River Water to Northern Terrebonne Marshes
3b-2c	* Acadiana Bays Estuarine Restoration Feasibility Study
3b-2d	* Upper Atchafalaya Basin Study
3b-3	Increase Sediment Transport From the Atchafalaya River Down Wax Lake Outlet
3b-4	Stabilize Banks of Southwest Pass Off Marsh Island
3b-5	Stabilize Banks of GIWW
3b-6	Restore Vermilion Bay and East Cote Blanche Bays Shorelines via Beneficial Use of Dredge Material and/or Detached Breakwaters
3b-7	Stabilize Shorelines Across South Shoreline of Marsh Island From Lighthouse Point to South Point (East of Mound Point) Using Dredged Sediments and/or Breakwaters
3b-8	Elevate and/or Relocate Assets Outside Hurricane Protection Plan
3b-9	Stabilize And Implement Plan to Evaluate and/or Relocate Assets Located Outside of the Hurricane Protection Plan.
3b-10	Freshwater Bayou Bank Stabilization - Belle Isle to Freshwater Lock

* Not tied to specific geographic locations

Table C.10 Alternative One and Two Measures - Planning Unit 4

Measure	Description
Alternative Plan: 1	
4-1	Proposed Hurricane Protection Levee for 30-ft Storm Surge at Coastline
4-2	*Complete/ Accelerate the Chenier Plain Freshwater and Sediment Management and Allocation Reassessment Study
4-3	Maximize Freshwater Inflow From Sabine River
4-4	Salinity Control Structures Along the East Shoreline of Sabine Lake Near Blue Buck Point, Sabine Island and Black Bayou
4-5	Beneficial Uses of Dredged Material Program: Utilize Sediment From Sabine Ship Channel and Dedicated Dredging for Marsh Enhancement and Construction of Terraces.
4-6	Salinity Control Structure at Sabine Pass Near Hwy 82 Causeway
4-7	Stabilize Gulf Shoreline and Beach West of Calcasieu River to Sabine River Using Dredged Sediment or Breakwaters
4-8	Stabilize Gulf Shoreline and Beach East of Calcasieu River to Freshwater Bayou Using Dredged Sediment or Breakwaters
4-9	Salinity Control Structure in Calcasieu Ship Channel Near Ferry.
4-10	Beneficial Use of Dredged Material Program: Utilize Sediment And Dedicated Dredging for Marsh Enhancement and Construction of Terraces in Calcasieu Lake.
4-11	Salinity Control Structures at Points on East Side of Calcasieu Lake
4-12	Maximize Freshwater Inflow to Tributaries of the Mermentau River From Outside Sources.
4-13	Maximize freshwater inflow to Mermentau River From Outside Sources
4-14	Stabilize Grand Lake Shoreline and Landbridge
4-15	Freshwater Introduction/Retention Structure or Sill on Little Pecan Bayou
4-16	Freshwater Introduction/Retention Structure or Sill on Rollover Bayou
4-17	Stabilize White Lake Shoreline And Landbridge
4-18	Stabilize Banks from Schooner Bayou to GIWW along Freshwater Bayou and GIWW near White Lake
4-19	Salinity Control Structure on Black Lake Bayou Near Hackberry
4-20	Build New Chamber for Navigation at Calcasieu Lock on GIWW And Use Old Lock to Evacuate Excess Water
4-21	Stabilize Banks of Freshwater Bayou
4-22	Stabilize Eastern Shore of Lake Calcasieu
4-23	Develop a Plan to Elevate and/or Relocate Assets Located Outside the Hurricane Protection Levee
4-24	Maintain Hwy 82 for Hurricane Evacuation And Marsh Protection
4-25	Provide Water Control Structures at Strategic Locations along Hwys 82 and 27
4-26	Manage Watershed to Reduce Rapid Inflows into Mermentau Sub-Basin
4-27	Restore Marsh by Filling Abandoned Canals
4-28	Utilize Freshwater Inflow from Atchafalaya River.
4-29	Improve Hydrology of the Old Mermentau River Channel Between Mud Lake and Gulf of Mexico.
4-30	Stabilize Banks of GIWW

* Not tied to specific geographic locations

Measure	Description
Alternative Plan: 2	
4-1	Storm Surge Protection for Lake Charles Metropolitan Area Using Ring Levee
4-2	Storm Surge Protection for Lafayette
4-3	Storm Surge Protection Around Gueydan, Kaplan, and Vinton
4-4	Complete/ Accelerate the Chenier Plain Freshwater and Sediment Management and Allocation Reassessment Study
4-5	Maximize Freshwater Inflow From Sabine River.
4-6	Beneficial Uses of Dredged Material Program: Utilize Sediment From Sabine Ship Channel and Dedicated Dredging for Marsh Enhancement And Construction of Terraces.
4-7	Allow Calcasieu Lake and Surrounding Area to Become and Remain Brackish to Saline
4-8	Stabilize Gulf Shoreline and Beach West of the Calcasieu River to Sabine River Using Dredged Sediment or Breakwaters
4-9	Stabilize Gulf Shoreline and Beach East of the Calcasieu River to Freshwater Bayou Using Dredged Sediment or Breakwaters
4-10	Stabilize Grand Lake Shoreline and Landbridge
4-11	Stabilize White Lake Shoreline and Landbridge
4-12	Beneficial Use of Dredged Material Program: Utilize Sediment and Dedicated Dredging for Marsh Enhancement and Construction of Terraces in Calcasieu Lake.
4-13	Dedicated Dredging From the Gulf of Mexico for Marsh Creation and Enhancement
4-14	Bank Stabilization Along Freshwater Bayou
4-15	Manage Watershed to Reduce Rapid Inflows into Mermantau Subbasin
4-16	Bank Stabilization From Schooner Bayou to GIWW Along Freshwater Bayou
4-17	Maintain Hwy 82 for Hurricane Evacuation and Marsh Protection
4-18	Provide Water Control Structures at Strategic Locations Along Hwys 82 and 27
4-19	Develop a Plan to Elevate and/or Relocate Assets Located Outside the Hurricane Protection Levee
4-20	Stabilize Banks of GIWW
4-21	Utilize Freshwater Inflow From Atchafalaya River.
4-22	Build New Chamber for Navigation at Calcasieu Lock on GIWW and Use Old Lock to Evacuate Excess Water

* Not tied to specific geographic locations

Table C.11 - Planning Unit 1- Additional Projects Proposed by Stakeholders

Measure	Description
1	Construct New MRGO Lock near Verret and Extend Proposed MRGO East bank Levee
2	Raise 40 Arpent Levee to 17.5 feet from Industrial Canal to Verret
3	Connect 40 Arpent Levees System Through Verret
4	Extend the Marsh Restoration Area Along the North of Biloxi Marsh (1-8 of Alt 2) Westward to Malheureux Point
5	Provide Barrier Reef/Shoreline Protection Between the East Side of Biloxi Marsh and Chandeleur Sound
6	Conduct Sediment Mining in South West Pass for Marsh Restoration Purposes
7	Increase Freshwater Diversion Capacity at Violet, Bayou Lamoque, White Ditch, and Other Sites, and Decrease the Capacity at Caernarvon and American Bay that were Proposed in Alternatives 1 and 2
8	Utilize a Full Protection/Restoration Concept as the Preferred Alternative
9	Model Levee Alignment 5. In the "Funnel" area near Michoud, agencies want a different levee alignment, which will enclose less existing marsh while providing protection to east New Orleans.
10	Implement "Biloxi Marsh Stabilization and Restoration Plan"
11	8,000 cfs Diversion at Hope Canal
12	20,000 cfs Diversion at Caernarvon
13	30,000 cfs Diversion at White Ditch
14	30,000 cfs at Bayou Lamoque

Table C.12 - Planning Unit 2 - Additional Measures Proposed by Stakeholders

Measure	Description
1	Increase Freshwater Diversion Capacity at Myrtle Grove, West Pointe a la Hache, Port Sulphur, Buras and Jackson, for a Total Capacity of 163,000 cfs. This combines with a strategy of switching the majority of freshwater flows from the East Bank of the River
2	Provide for a Band of Marsh Restoration in the North Bay-Shore Protection Alternative rather than Shoreline Protection only. Consider possible armoring the south side of this new marsh fringe to protect from wave action
3	Model Levee Alignment 3, but without Category 5 Levees in Lower Plaquemines below River Mile 70, and include ring levees for Lafitte, Crown Point, and Barataria. They are adamantly opposed to the GIWW alignment because of the great impacts on existing marshes
4	Town of Jean Lafitte Hurricane protection Plan

Table C.13 - Planning Unit 3a - Additional Measures Proposed by Stakeholders

Measure	Description
1	Include more marsh restoration along the twin pipelines to establish a landbridge further south
2	Include more marsh restoration as described in the alternatives for the Third Delta report
3	Include ridge restoration as shown in the prior Environmental Alternative presentation made by the USFWS
4	Include a Houma Freshwater Bypass Channel, per USFWS
5	Include USFWS recommended marsh landbridge from Grand Caillou to approximately the end of the road on Dularge
6	Include a "Convey Atchafalaya Water" feature at the GIWW at Grand Bayou, and widen the intersection of the two waterways
7	Model the levee alignment 5 as category 5, with Morganza Levee assumed in place
8	In levee alignment 1-4, the illustrated Morganza Levee is shown following a part of the Minor's Canal. That Levee, along with a lobe extending down Bayou Dularge below Falgoust Canal, is not part of the authorized Morganza system. Use Morganza Levee alignment plan from EIS
9	St. Mary Parish Storm Surge Protection Study

Table C.14 - Planning Unit 3b - Additional Measures Proposed by Stakeholders

Measure	Description
1	Model a levee alignment that includes only ring levees west of Wax Lake Outlet
2	Conduct Sediment Mining Offshore of Pointe au Fer Island
3	Include a Bayou Shaffer By Pass for enhanced fish and wildlife introduction into the Terrebonne marshes per USFWS plan. This also includes gapping or degrading the existing Avoca Island Levee to increase Atchafalaya sediment and freshwater influence in Western Terrebonne Marshes
4	Bayou Tigre Flood Protection and freshwater Development
5	Lock or Floodgate at Intercoastal Canal

Table C.15 - Planning Unit 4 - Additional Measures Proposed by Stakeholders

Measure	Description
1	Remove the measure providing for control structures on the east side of Sabine Lake
2	Include additional marsh restoration and terrace construction in the area of Black Bayou and east Sabine Lake
3	Fix saltwater/storm water breaches at Mermentau Basin banks
4	Lock or floodgate at Intercoastal Canal
5	Hebert Canal Watershed Resource Plan, Vermilion Parish
6	Raise spoil banks of East West oil field in South Vermilion Parish
7	Raise Hwy 82, 4.0 ft from the Western Parish line eastward 44 miles

Integrated Ecosystem Restoration and Hurricane Protection: Louisiana's Comprehensive Master Plan for a Sustainable Coast

Appendix J: Glossary of Terms

Coastal Protection and Restoration Authority of Louisiana

April 2007

Glossary

acceptability Adequate to satisfy a need, requirement, or standard. One of the U.S. Army Corps of Engineers requirements for a project.

Act 8 Louisiana State legislation passed in the first extraordinary session of 2005 to provide for the development and implementation of a comprehensive coastal protection plan (see "coastal protection") to integrate hurricane protection and coastal restoration to achieve a long-term solution; also created the CPRA (see "Coastal Protection and Restoration Authority"), and provided for other mechanisms to promote the successful implementation of hurricane protection and ecosystem restoration measures in coastal Louisiana.

adaptive management An interdisciplinary approach acknowledging that uncertainty exists in the anticipated outcomes of manipulating large complicated systems, that understanding the complexity of systems requires the knowledge or expertise of many disciplines, and that we must continually monitor the results of our actions in order to adapt as necessary. It is also a vehicle to allow the existing body of best practices to be used, while reaching out to all stakeholders to understand the best technically sound and socially acceptable way to proceed An iterative approach that includes monitoring and refinements in decision making tools using information provided by scientists, engineers and others , resulting in recommendations that are incorporated into management actions; results are tracked to assess the effectiveness of the management to assess the need for further research, and changes to recommendations and management actions, and so on.

air quality determination The Louisiana Department of Environmental Quality ensures that projects do not adversely affect air quality through this determination as a requirement of the Clean Air Act.

alternative plan A set of one of more management measures within a subprovince functioning together to address one or more objectives.

amplitude The maximum absolute value of a periodically varying quantity.

anaerobic A situation in which molecular oxygen is absent from the environment.

annual plan The state coastal restoration and protection plan submitted annually to the legislature as provided in Act 8.

anoxia Absence of oxygen.

anthropogenic Caused by human activity.

aquaculture The science and business of farming marine or freshwater food fish or shellfish, such as oysters, crawfish, shrimp and trout, under controlled conditions.

astronomical tides Daily tides controlled by the moon, as opposed to wind-generated tides.

authority The Coastal Protection and Restoration Authority (CPRA). (Act 8)

beach nourishment The practice of hydraulically pumping clean, sandy sediment onto an eroded beach for the purpose of restoration.

beneficial uses of dredged material All productive and positive uses of material dredged from stream or navigation channels to maintain the desired depth for navigation purposes.

benefits Valuation of positive performance measures.

benthic Living on or in sea, lake, or stream bottoms.

biomass The total mass of living matter (plant and animal) within a given unit of environmental area.

borrow pit Term used to describe the physical site remaining after soil material has been removed for construction purposes; in uplands and wetlands, these sites may become bodies of water and in marine environments, the water depth becomes deeper in the seabed or lakebed.

bottomland hardwood forest Low-lying forested wetlands found along streams and rivers.

brackish marsh Intertidal plant community typically found in the area of the estuary where salinity ranges between 4-15 ppt.

bulk density An indicator of size and arrangement of various soil or sediment particles, and the ratio of the weight of the soil and water per unit volume of ground (e.g. pounds per cubic feet) .

Chenier Plain Western part of coastal Louisiana where there is indirect influence from Mississippi and Atchafalaya rivers.

clay That fraction of soil, sediment, or dredged material whose equivalent grain size diameter is 0.002 mm or less, generally referred to as fine-grained.

Clean Water Act Section 404 (b) (1) There are several sections of this Act that pertain to regulating discharges into wetlands. The discharge of dredged or fill material into waters of the United States is subject to permitting specified under Title IV (Permits and Licenses) of this Act and specifically under Section 404 (Discharges of Dredge or Fill Material) of the Act.

Coastal area The Louisiana Coastal Zone and contiguous areas subject to storm or tidal surge. (Act 8)

coastal protection Plans, projects, policies, and programs intended to provide hurricane protection, coastal conservation or restoration. (ACT 8)

Coastal Protection and Restoration Authority (CPRA) The Louisiana governing body with the authority to articulate a clear statement of priorities, and to focus development and implementation of efforts of local, state, and federal agencies to achieve comprehensive coastal protection (see “coastal protection”).

Coastal Zone Consistency Determination The U.S. Environmental Protection Agency reviews plans for activities in the coastal zone to ensure they are consistent with Federally approved State Coastal Management Programs under Section 307(c)(3)(B) of the Coastal Zone Management Act.

coast-wide plan Combination of coastal restoration and coastal protection measures assembled to address an objective or set of objectives across the Louisiana Coast.

compaction of holocene deposits Deltaic mud that settles under its own weight.

completeness The ability of a plan to address all of the objectives. One of the USACE four requirements for a project.

comprehensive plan See Coast-wide Plan.

connectivity Property of ecosystems that allows for exchange of resources and organisms throughout the broader ecosystem.

consequences Damages or losses resulting from some failure event. Each failure of a system has some consequence(s). A failure could cause economic damage, environmental damage, injury or loss of human life, or other possible events. Consequences need to be quantified in terms of failure-consequence severities using relative or absolute measures for various consequence types to facilitate risk analysis.

conservation and restoration The conservation, protection, enhancement, and restoration of coastal wetlands resources including but not limited to coastal vegetated wetlands and barrier shorelines or reefs through the construction and management of coastal wetlands enhancement projects, including privately funded marsh management projects or plans, and those activities requiring a coastal use permit which significantly affect such projects or which significantly diminish the benefits of such projects or plans insofar as they are intended to conserve or enhance coastal wetlands consistent with the legislative intent as expressed in R.S. 49:213.1 (ACT 8)

consolidation Term used to describe the effect caused by dewatering and desiccation of dredged soils, usually resulting in a reduction of volume and thickness of the material, or dewatering of soils caused by a load (typically soil fill) applied above the layer in question.

continental shelf The edge of the continent under gulf waters; the shallow Gulf of Mexico fringing the coast.

control structure A gate, lock, or weir that controls the flow of water.

crevasse A breach or gap in the levee or embankment of a river (natural or manmade), through which floodwaters flow.

cumulative impacts The combined effect of all direct and indirect impacts to a resource over time.

datum A point, line, or surface used as a reference, as in surveying, mapping, or geology.

deciduous forest A forest composed mostly of trees that lose their leaves in the winter.

decomposition Breakdown or decay of organic materials.

dedicated dredging Productive and beneficial uses of all dredged material from in-channel, in-lake, and in-bay sediment mining, off-shore borrow, and other non-navigation sources.

degradation phase The phase of the deltaic cycle when sediments are no longer delivered to a delta, and delta experiences erosion, dieback, or breakup of marshes.

deltaic cycle Sequence of events that typically occurs throughout time for the Mississippi River such that the Mississippi River's flow is captured by a distributary (a branch) channel that offers a shorter route to the Gulf of Mexico. After abandonment of an older delta lobe, which would cut off the primary supply of fresh water and sediment, an area undergoes compaction, subsidence, and erosion. The old delta lobe begins to retreat as the gulf advances, forming lakes, bays, sounds, and barrier islands. Concurrently, a new delta lobe would begin its advance gulfward.

deltaic deposits Mud and sand deposited at the mouth of a river.

deltaic plain The land formed and reworked as the Mississippi River switched channels in the eastern part of the Louisiana coastal area.

demersal Dwelling at or near the bottom of a body of water (e.g., a *demersal fish)*.

detritus The remains of plant material that has been destroyed or broken up.

dewatering The process of dredged sediments compacting while losing water after being deposited.

discharge The volume of fluid flowing past a point per unit of time, commonly expressed in cubic feet per second, millions of gallons per day, or gallons per minute.

dissolved oxygen Oxygen dissolved in water, available for respiration by aquatic organisms. One of the most important indicators of the suitability of a water body to support life.

direct impacts Those effects that result from the initial construction of a measure (e.g., marsh destroyed during the dredging of a canal). Contrast with "Indirect Effects."

diurnal Relating to or occurring in a 24-hour period; daily.

diversion An alteration of the natural course or flow of water. In coastal restoration this usually consists of such actions as channeling water through a canal, pipe, or conduit to introduce water and water-borne resources into a receiving area.

dynamic Characterized by continuous change and activity.

ecological Refers to the relationship between living things and their environment.

ecological community An assemblage of species of a particular time and place.

economic Of or relating to the production, development, and management of material wealth, as of a country, household, or business enterprise.

ecosystem An organic community of plants and animals viewed within its physical environment (habitat); the ecosystem results from the interaction between soil, climate, vegetation and animal life. A functional system which includes the organisms of a natural community together with their environment.

ecosystem restoration activities that seek to return a organic community of plants and animals and their habitat to a previously existing or improved natural condition or function.

effectiveness Having an intended or expected effect. One of the USACE four requirements for a project.

efficiency The quality of exhibiting a high ratio of output to input. One of the USACE's four requirements for a project.

egress A path or opening for going out; an exit.

conductivity The ability of a medium to conduct electricity. Salt water has a higher conductivity level than fresh water, and this property allows salinity to be easily measured using a hand-held instrument.

embankment A linear mound of earth or stone existing or built to hold back water or to support a roadway.

encroachment Entering gradually into an area not previously occupied, such as a plant species distribution changing in response to environmental factors such as salinity.

endangered species Animals and plants that are threatened with extinction.

enhance To augment or increase/heighten the existing state of an area.

entrenchment Being firmly embedded.

Environmental Impact Statement (EIS) A document that describes the positive and negative environmental effects of a proposed action and the possible alternatives to that action. The EIS is used by the federal government and addresses social issues as well as environmental ones.

estuary A semi-enclosed body of water with freshwater input and a connection to the sea; water body where fresh water and salt water mix.

estuarine Related to an estuary.

evaporation The process by which any substance is converted from a liquid state into, and carried off in, vapor; as, the evaporation of water.

exotic species Animal and plant species not native to the area; usually undesirable (e.g., hyacinth, nutria, tallow tree, giant salvinia).

faulting A fracture in the continuity of a soil or rock formation caused by a shifting or dislodging of the earth's crust, in which adjacent surfaces are displaced relative to one another and parallel to the plane of fracture.

feasibility report A description of a proposed action, previously outlined in a general fashion in a Reconnaissance Report that will satisfy the Federal interest and address the problems and needs identified for an area. It must include an assessment of impacts to the environment (either in an Environmental Assessment, or the more robust Environmental Impact Statement), an analysis of alternative methods of completion, and the selection of a Recommended Plan through the use of a cost-effectiveness analysis.

final array The final grouping of the most effective coast-wide plans from which a final recommendation can be made.

foreshore dikes An embankment of rock built to minimize flooding or erosion that is constructed in the area of a shore that lies between the average high tide mark and the average low tide mark.

forested wetland In Louisiana, a wetland that is dominated by trees and shrubs, including swamps, bottomland hardwoods, wet cheniers and ridges.

fresh marsh Intertidal herbaceous plant community typically found in that area of the estuary with salinity ranging from 0-3 ppt.

furbearer An animal whose skin is covered with fur, especially fur that is commercially valuable, such as muskrat, nutria, and mink.

geomorphic Related to the geological surface configuration.

geosynclinal down-warping The downward bend or subsidence of the earth's crust, which allows for the gradual accumulation of sediment.

goals Statements on what to accomplish and/or what is needed to address a problem without specific detail.

gradient A slope; a series of progressively increasing or decreasing differences in a system or organism.

habitat The place where an organism lives; part of physical environment in which a plant or animal lives.

habitat fragmentation The breakup or fragmentation of a large area of habitat into isolated patches that are not linked through corridors.

habitat loss The disappearance of places where target groups of organisms live. In coastal restoration, usually refers to the conversion of marsh or swamp to open water.

hazard is a threat, which may result from either an external cause (e.g. hurricane, , flood, earthquake or human actions) or an internal vulnerability, with the potential to initiate a failure mode. It is a source of potential harm or a situation with a potential to cause loss.

Hazardous, Toxic, and Radioactive Wastes (HTRW) Projects features must be examined to ensure that their implementation will not result in excessive exposure of people/animals to pollutants possibly located in the study area.

headland A point of land projecting into the sea or other expanse of water, still connected with the mainland.

herbaceous A plant with no persistent woody stem above ground.

Hollow Core Levee. A new levee design concept that is formed from concrete and steel, primarily in triangular shapes, hollow in the middle, and well-anchored either alone as a levee or on top on an existing levee that must be raised.

hydric soils Soils that are saturated, flooded, or ponded long enough during the growing season such that anaerobic conditions develop.

hydrodynamic The continuous change or movement of water.

hydrology The pattern of water movement on the earth's surface, in the soil and underlying rocks, and in the atmosphere.

hydroperiod The seasonal variability of inflow, outflow, and storage of water in a wetland.

hypoxia The condition of low dissolved oxygen concentrations.

incremental and intermittent dredging The management of a pipeline conveyence system used to make thin-lift or deposits of soils, either continuously during construction or intermittently pulse dredging at certain times of the year, to allow settling to occur and to allow effluent water to move from the site.

indemnification Insurance against or compensation for loss or damage.

indirect impacts Those effects that are not a direct result of project construction, but occur as secondary impacts due to changes in the environment brought about by the construction. Contrast with “Direct Impacts.”

infrastructure The basic facilities, services, and installations needed for the functioning of a community or society, such as transportation and communications systems, water and power lines, and public institutions including schools, post offices, and prisons.

ingress An entrance or the act of entering.

inorganic Not derived from living organisms; mainly composed of mineral matter; matter other than plant or animal.

interdistributary deposits Sand and mud deposited between the river channels or between bayous.

intermediate mars Intertidal herbaceous plant community typically found in that area of the estuary with salinity ranging from 2-5 ppt.

intertidal Alternately flooded and exposed by tides.

invertebrates Animals without backbones, including shrimp, crabs, oysters, and worms.

keystone strategy A strategy that other strategies rely upon for successful implementation.

land-water ratio The relative proportion (ratio) of area of wetlands and uplands to area of water.

landscape ecology, patterns, structure A heterogeneous land area composed of interacting ecosystems that are repeated in similar form throughout and their study; the arrangement of parts, elements, or details of the landscape that suggests a design of natural or human origin; the distribution of energy, materials, and species in relation to sizes, shapes, numbers, kinds, and configuration of landscape elements or ecosystems.

larvae The stage in some animal’s life cycles between egg and adult (most invertebrates).

leaky levee. The concept of providing for the exchange of tidal waters, hydrologic freshwater gravity flow, and other water movement by appropriate design, construction, implementation, and management of storm surge protection system elements. This includes large gated openings in levees that will be closed in times

of potential storm surges, permeable layers of coarse-grained materials under levees that allow percolation of ground and sheetflow water, and other innovative ways to maintain a healthy sustainable coastal hydrology.

leeward Sheltered from the wind; away from the wind.

levee A linear mound of earth or stone built to to minimize, but not eliminate, the risk of a river pr a surge from a storm from flooding an area; a long, broad, low natural ridge built by a stream on its flood plain along one or both banks of its channel in time of flood.

limiting ecological factor Any physical, chemical, or biological factor which is the critical boundary on growth and/or survival of an organism, i.e., smooth cordgrass is limited in its growth by the boundaries of the sub-tidal and upland zones.

loamy Soil composed of a mixture of sand, clay, silt, and organic matter.

Locally Preferred Plan (LPP) Alternative plan preferred by local sponsor.

maintain To keep in existing state.

measure A programmatic ecosystem restoration or hurricane protection feature that can be assembled with other measures to produce desired outcomes.

methodology A set of practices, procedures, and rules.

mineral substrate Soil composed predominately of mineral rather than organic materials; less than 20 percent organic material.

mitigation The replacement or substitution of a habitat as compensation for habitat that has been degraded or destroyed, in Louisiana generally referring to wetlands, and generally referring to priorities placed on in-kind, on-site replacements.

mudflats Flat, unvegetated wetlands subject to periodic flooding and minor wave action.

National Ecosystem Restoration (NER) USACE standard for cost-effectiveness based on ecosystem, not economic, benefits.

near-shore currents Movement of water parallel to the shoreline usually generated by waves breaking on the shore at an angle other than perpendicular.

National Environmental Policy Act (NEPA) A federal act that ensures that Federal agencies consider the environmental impacts of their actions and decisions. NEPA requires all Federal agencies to consider the values of environmental preservation for all significant actions and prescribes procedural measures to ensure that those values are fully respected.

net gain The amount of cumulative land gain minus the land loss, when gain area is greater than loss area.

net loss The amount of cumulative land gain less land loss, when gain is less than loss.

no action alternative The alternative in the plan which describes the ecosystem of the coastal area if no restoration or protection measures were constructed.

nursery A place for larval or juvenile animals to live, eat, and grow.

objectives Statements describing desired targets of proposed actions.

organic Composed of or derived from living things.

oscillations Fluctuations back and forth, or up and down.

oxidation of organic matter The decomposition (rotting, breaking down) of plant material through exposure to oxygen.

oxygen-depleted Situation of low oxygen concentrations where living organisms are stressed.

petrochemical Any compound derived from petroleum or natural gas.

pipeline conveyence The use of a hydraulically managed pipeline to pump and place dredged material for purposes of wetland nourishment or construction.

placement site Any area, confined or unconfined, that is used for the beneficial or dedicated disposal of dredged material for purposes of restoration or protection features.

point-bar deposit The shallow depositional area on the inside bank of a river bend.

post-larval Stage in an animal's lifecycle after metamorphosis from the larval stage, but not yet full grown.

potable water Water that is fit to drink.

ppm parts per million

ppt parts per thousand

primary consolidation/secondary compression Two processes acting on a compressible soil that has been loaded that causes the sediment to increase in density, and decrease in volume.

prime farmland Land that has the best combination of physical and chemical characteristics for producing food, feed, fiber, forage, oilseed, and other agricultural crops with minimum inputs of fuel, fertilizer, pesticides, and labor, and without intolerable soil erosion. One of the categories of concern in the EIS.

principles Framing statements that can be used to evaluate alternatives while considering issues that affect them. Used along with targets and assessments of ecosystem needs to provide guidance in formulation of alternative plans.

probability Measure of the likelihood, chance, odds, or degree of belief that a particular outcome will occur. A conditional probability is the probability of event occurrence based on the assumption that another event (or multiple events) has occurred.

productivity Growth rates of plants and animals; a net increase in productivity is an indicator of sustainabilty.

Progradation The phase during the deltaic cycle where land is being actively built gulfward through deposition of river sediments near the mouth.

Programmatic Environmental Impact Statement (PEIS) Any Environmental Impact Statement that supports a broad authorization for action, contingent on more specific detailing of impacts from specific measures.

Planning Unit A major division of the coastal zone of Louisiana.

pulsing Allowing a diversion to flow periodically at a high rate for a short time, rather than continuously.

quantitative Able to assign a specific number; measurement of the value is possible.

rebuild To some extent build back a structure/landform that had once existed.

reconnaissance report A document prepared as part of a major authorization that examines a problem or need and determines if sufficient methods and Federal interest exists to address the problem/need . If so, then a "Feasibility Report" is prepared, which details the solution and its impacts further.

reduce To diminish the rate or speed of a process.

rehabilitate To focus on historical or pre-existing ecosystems as models or references while emphasizing the reparation of ecosystem processes, productivity and service.

relative sea level rise The sum of the sinking of the land (subsidence) and eustatic sea level change; the change in average water level with respect to the surface.

reliability The ability of a system or a component to fulfill its design functions under designated operating and/or environmental conditions for a specified time period. This ability is commonly measured using probabilities. Reliability is, therefore, the probability that the failure event, however defined, does not occur.

restore Return a to a close approximation of a previous condition or function prior to disturbance; may be accomplished by modifying conditions responsible for the loss or change; re-establish the function and structure of an ecosystem to a desirable state.

risk The potential of losses for a system resulting from an uncertain exposure to a hazard or as a result of an uncertain event. Risk should be based on identified risk events or event scenarios. Risk is a multi-dimensional quantity that includes event-occurrence probability, event-occurrence consequences, consequence significance, and the exposed population; however, it is commonly measured as a pair of the probability of occurrence of an event, and the outcomes or consequences associated with the event's occurrence. Another common representation of risk is in the form of a curve depicting specified losses and the probability of exceeding those losses.

risk analysis The technical and scientific process to breakdown risk into its underlying components. Risk analysis provides the processes for identifying hazards, event-probability assessment, and consequence assessment. The risk analysis process answers three basic questions: (1) what can go wrong? (2) what is the likelihood that it will go wrong? (3) what are the consequences if it does go wrong? Risk analysis can include provisions to make changes to a system to control risks.

sand That fraction of soil, sediment, or dredged material whose grain size diameter is between 2.00 to 0.05 mm, generally referred to as coarse-grained.

salt marsh Intertidal herbaceous plant community typically found in that area of the estuary with salinity ranging from 12-32 ppt.

salinity The concentration of dissolved salts in a body of water, commonly expressed as parts per thousand.

scoping Soliciting and receiving public input to determine issues, resources, impacts, and alternatives to be addressed in the draft EIS.

sea-level Long-term average position of the sea surface.

Sediment budget **A**n accounting of the volume of sediments needed to nourish/restore an area, accounting for the transport into and out of the area due to natural processes.

sediment plume Caused by sediment rich rainwater runoff entering the ocean. The runoff creates a visible pattern of brown water that is rich in nutrients and suspended sediments that forms a kind of cloud in the water spreading out from the coastline. Commonly forms at river and stream mouths, near sloughs, and along coasts where a large amount of rain runoff flows directly into the ocean.

seedbank Residual seeds, tubers, or propagules in or on the soil or wetland surface.

sheet flow Flow of water, sediment, and nutrients across a flooded wetland surface, as opposed to through channels or through near-surface marsh/swamp deposits or subsurface soils.

shoaling The shallowing of an open-water area through deposition of sediments.

silt That fraction of soil, sediment, or dredged material whose equivalent grain size diameter is between 0.05 to 0.002 mm, generally referred to as fine-grained.

social Relating to human society and its modes of organization.

socioeconomic Involving both social and economic factors.

spoil banks Dredged material removed from canals and piled in a linear mound along the edge of canals.

stabilize To fix the level or fluctuation of; to make stable relative to the changes occurring under natural conditions, but not fixed such that no change is implied over time.

State Historic Preservation Office (SHPO) The part of the Louisiana Department of Culture, Recreation, and Tourism that deals with Indian sites and other archaeological remains.

storm overwash The process by which material is transposed landward during a storm event by waves and storm surge.

storm surge An abnormal and sudden rise of the sea along a shore as a result of the winds of a storm.

strategy Ecosystem restoration concept from the Coast 2050 Plan.

stream gaging data Records of water levels in streams and rivers.

submergence Going under water.

subsidence The gradual downward settling or sinking of the Earth's surface with little or no horizontal motion.

sustain To support and provide with nourishment to keep in existence; maintain.

swamp In Louisiana, a periodically inundated forested wetland with fluctuating water levels generally dominated by baldcypress and gums.

Tarbert flow Stream gage data recorded at Tarbert's Landing on the Mississippi River.

target A desired ecosystem state that meets and objective or set of objectives.

terrestrial habitat The land area or environment where an organism lives; as distinct from water or air habitats.

toxicity The measure of how poisonous something is.

transpiration The process by which water passes through living plants into the atmosphere.

turbidity The level of suspended sediments in water; opposite of clarity or clearness.

unique farmland Land other than Prime Farmland (see "Prime Farmland") that is used for the production of specific high-value food and fiber crops, such as citrus, tree nuts, olives, cranberries, fruits, and vegetables.

upland A general term for non-wetland elevated land above low areas along streams or between hills.

water budget An accounting of the inflow to, outflow from, and storage in a hydrologic unit.

Water Resources Development Act (WRDA) A bill passed by Congress that provides authorization and/or appropriation for projects related to the conservation and development of water and related resources.

weir A dam or low-level dike placed across, or at the base of, a canal or river to raise, divert, regulate or measure the flow of water or movement of a salt water plume upstream.

wetland Periodically inundated communities characterized by vegetation which survives in wet soils, ranging from coastal intertidal marshes to freshwater swamps and bottomland hardwoods.

wetland complex The aggregation of wetlands and associated ecological features (corridors, landbridges, buffers, ridges, cheniers, etc.) within the landscape.

wind fetch A term used to describe the open area and distance across a body of water in which wind can exert energy on waves to cause them to be higher and more forceful upon impact with shorelines.

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Appendix K: Bibliography

Coastal Protection and Restoration Authority of Louisiana

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