West Grand Terre Beach Nourishment and Stabilization

RESTORE Proposal
Coastal Protection & Restoration Authority

I. Summary Sheet

Appendix A: Council Member Applicant and Proposal Information Summary Sheet

Council Member: State of Louisiana	Point of Contact: Jerome Zeringue Phone: (225) 342-7669 Email: Jerome.Zeringue@LA.GOV

Project Identification

Project Title: West Grand Terre Beach Nourishment and Stabilization

State(s): Louisiana | County/City/Region: Jefferson Parish, Southeastern Louisiana

Specific Location: *Projects must be located within the Gulf Coast Region as defined in RESTORE Act. (attach map or photos, if applicable)*
Please see attached.

Project Description

RESTORE Goals: *Identify all RESTORE Act goals this project supports. Place a **P** for Primary Goal, and **S** for secondary goals.*

P Restore and Conserve Habitat
S Restore Water Quality
S Restore and Revitalize the Gulf Economy
S Replenish and Protect Living Coastal and Marine Resources
S Enhance Community Resilience

RESTORE Objectives: *Identify all RESTORE Act objectives this project supports. Place a **P** for Primary Objective, and **S** for secondary objectives.*

P Restore, Enhance, and Protect Habitats
S Restore, Improve, and Protect Water Resources
S Protect and Restore Living Coastal and Marine Resources
S Restore and Enhance Natural Processes and Shorelines
S Promote Community Resilience
S Promote Natural Resource Stewardship and Environmental Education
S Improve Science-Based Decision-Making Processes

RESTORE Priorities: *Identify all RESTORE Act priorities that this project supports.*

_X_ Priority 1: Projects that are projected to make the greatest contribution
_X_ Priority 2: Large-scale projects and programs that are projected to substantially contribute to restoring
_X_ Priority 3: Projects contained in existing Gulf Coast State comprehensive plans for the restoration ….
_X_ Priority 4: Projects that restore long-term resiliency of the natural resources, ecosystems, fisheries …

RESTORE Commitments: *Identify all RESTORE Comprehensive Plan commitments that this project supports.*

_X_ Commitment to Science-based Decision Making
_X_ Commitment to Regional Ecosystem-based Approach to Restoration
_X_ Commitment to Engagement, Inclusion, and Transparency
_X_ Commitment to Leverage Resources and Partnerships
_X_ Commitment to Delivering Results and Measuring Impacts

RESTORE Proposal Type and Phases: *Please identify which type and phase best suits this proposal.*

_X_ Project _X_ Planning ___ Technical Assistance ___ Implementation ___ Program

Project Cost and Duration

Project Cost Estimate:		**Project Timing Estimate**:
Total:	**$7,259,216**	Date Anticipated to Start: 09/2015 Time to Completion: 16 **months** / years Anticipated Project Lifespan: 20 years

II. Executive Summary

The objectives of the proposed West Grand Terre Beach Nourishment and Stabilization project are to restore and enhance dune and back barrier marsh habitat to provide storm surge and wave attenuation, thereby addressing the issues of gulf shoreline erosion, diminished storm surge protection, and subsidence of back barrier marshes. This project is estimated to build 12,700 feet of beach and dune with an area of 235 acres. In addition, up to 66 acres of back barrier marsh will be restored and a rock revetment will be constructed to protect the restored marsh. The project will increase the width of the island and maintain shoreline integrity through the introduction of sediment in order to increase island longevity.

Louisiana's barrier islands have decreased in land mass by more than 50% over the last 100 years (Penland et al. 2003), with the Barataria/ Plaquemines region being one of the most rapidly disappearing areas in Louisiana (Penland et al. 2005). Louisiana's Barataria/Plaquemines barrier island system extends approximately 25 miles along the shoreline from West Grand Terre to Sandy Point (Penland et al. 2005). The barrier islands are experiencing island narrowing and land loss due to the complex interaction of sea level rise, compaction, wave and storm damage, oil and gas activities, and insufficient sediment supply due to the channelization of the Mississippi River (Dean 1997, McBride et al. 1989, McBride and Byrnes 1997, Morton et al. 2005, Penland et al. 1988, Penland and Suter 1988, Rosati and Stone 2009, van Heerden and DeRouen 1997, Williams et al. 1992). In addition to several hurricanes impacting the island chain, the barrier islands were also heavily impacted by the April 2010 BP Deepwater Horizon Oil Spill.

The West Grand Terre Beach Nourishment and Stabilization project will be constructed by hydraulically dredging and pumping sediment from offshore deposits near the Quatre Bayou borrow site approximately nine miles to the designated fill sites. The project consists of three fill components: the Gulf of Mexico Beach/Dune, the Barataria Pass Beach/Dune, and the Marsh. The slurry fill will be constructed to elevations ranging from +9.0 ft. NAVD88 at the Gulf of Mexico Beach/Dune to +2.4 ft. NAVD88 at the Barataria Pass Beach/Dune and the Marsh. The borrow areas near Quatre Bayou mostly consists of sands, silts, and other sandy and clayey fill material that is suitable for beach/dune and marsh creation. Earthen containment dikes will be constructed to facilitate the construction of the Marsh, and a rock dike structure is also proposed to provide additional protection to West Grand Terre Island and Fort Livingston. The timeline for this project is 16 months for engineering and design, followed by 12 months of construction.

Measures of success for the West Grand Terre Beach Nourishment and Stabilization project include the restoration of beach, dune, and back-barrier marsh habitat for storm surge and wave attenuation. At the project-scale, performance measures will track the progress towards meeting management goals and objectives. When monitored over time, performance measures can help

reduce uncertainty surrounding predictive models and inform whether intended results are being achieved or if additional actions are needed to fulfill program expectations. Defining the health of a system is inherently complex however, and requires a systematic approach to develop a manageable list of metrics that can be quantified and monitored over time (The Water Institute of the Gulf, 2013).

CPRA is currently working with the Water Institute of the Gulf to more fully develop a System-Wide Assessment and Monitoring Program (SWAMP) that will bring their existing monitoring and assessment programs under one comprehensive umbrella in an effort to avoid duplication and improve efficiency. SWAMP is envisioned to be a scalable program that will allow for data assessments to be completed at the project-, basin-, and program-scales. Individual projects will generate monitoring plans which will nest within the larger SWAMP framework and will allow for periodic assessment of project performance against performance expectations.

The largest single environmental uncertainty in planning and implementing restoration projects in south Louisiana is accounting for the potentially high, and highly variable, rates of relative sea level rise (RSLR). However, CPRA has a variety of resources and partnerships with which it is able to apply and leverage for the benefit of this project. Through the Coastal Master Plan, CPRA is able to apply the integrated suite of Predictive Models and Planning Tool, a science-based decision support system developed for the Master Plan, to work towards achieving the RESTORE objectives of habitat protection and restoration. CPRA also has a spatially-variable map of predicted subsidence rates that was developed for the 2012 Coastal Master Plan following the convening of an expert workgroup to address the uncertainty that exists for both future changes in the Gulf's water level and subsidence components of RSLR. In addition to these tools, West Grand Terre was initially included as part of the original Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA) BA-30 East/West Grand Terre Restoration project, enabling CPRA to leverage much of the work already completed in this area to further provide protection to Louisiana's coast and Grand Isle, the state's only inhabited barrier island.

Barrier island systems are the most seaward bodies of land in the coastal zone and thus the most exposed to the destructive storm surge associated with tropical storm systems. While engineers can design barrier island projects to the nominal wave energy environment, it is difficult to design these features to withstand increasingly severe storm surges associated with the random (in time and space) strong hurricanes, especially while still ensuring that they maintain critical day-to-day ecological support functions. Louisiana has in place both a Barrier Island Maintenance Program and a Barrier Island Comprehensive Monitoring Program to track the physical resilience of the barrier islands and shorelines of the State and then implement corrective actions.

III. Proposal Narrative

1. Introduction and Background

Enacted in July 2012, the Resources and Ecosystems Sustainability, Tourist Opportunities, and Revived Economies of the Gulf Coast States Act (RESTORE Act) established the Gulf Coast Ecosystem Restoration Council (Council), and tasked the Council with developing a comprehensive plan for restoration of the Gulf Coast's ecosystem and economy. Overarching goals of this plan are to: restore and conserve habitat; restore water quality; replenish and protect living coastal and marine resources; enhance community resilience; and restore and revitalize the Gulf economy (Gulf Coast Ecosystem Restoration Council 2013). These comprehensive goals require large-scale projects that have a commensurate level of ecosystem benefits and far-reaching effects, particularly when combined with complementary projects as part of a coordinated program. The State of Louisiana, in response to an ongoing coastal land loss crisis, has identified a large number of projects in its Comprehensive Master Plan for a Sustainable Coast (Master Plan) (2012) that align with the Council's aforementioned goals for comprehensive restoration. These projects have been rigorously studied, analyzed, and publicly vetted; and will significantly contribute to the restoration and protection of the Gulf Coast region and the more inclusive Gulf of Mexico Large Marine Ecosystem. Restoring the Gulf from the 2010 Deepwater Horizon oil spill is an especially significant issue for Louisiana which has suffered and continues to suffer the greatest impacts from that disaster.

CPRA Coastal Master Plan

The Coastal Protection and Restoration Authority (CPRA) developed a robust decision-making process to ensure that formulation of the 2012 Coastal Master Plan (Master Plan) relied on the best science and technical information available, while still incorporating an extensive public outreach campaign. The process was guided by clearly-articulated objectives developed for the 2007 Master Plan and by planning principles developed to aid in meeting those objectives. The objectives were clearly defined to reflect key issues affecting communities in and around Louisiana's coast:

1. Reduce economic losses from storm surge flooding,
2. Promote a sustainable coastal ecosystem by harnessing the natural processes of the system,
3. Provide habitats suitable to support an array of commercial and recreational activities coast wide,
4. Sustain the unique cultural heritage of coastal Louisiana, and
5. Promote a viable working coast to support regionally and nationally important businesses and industries.

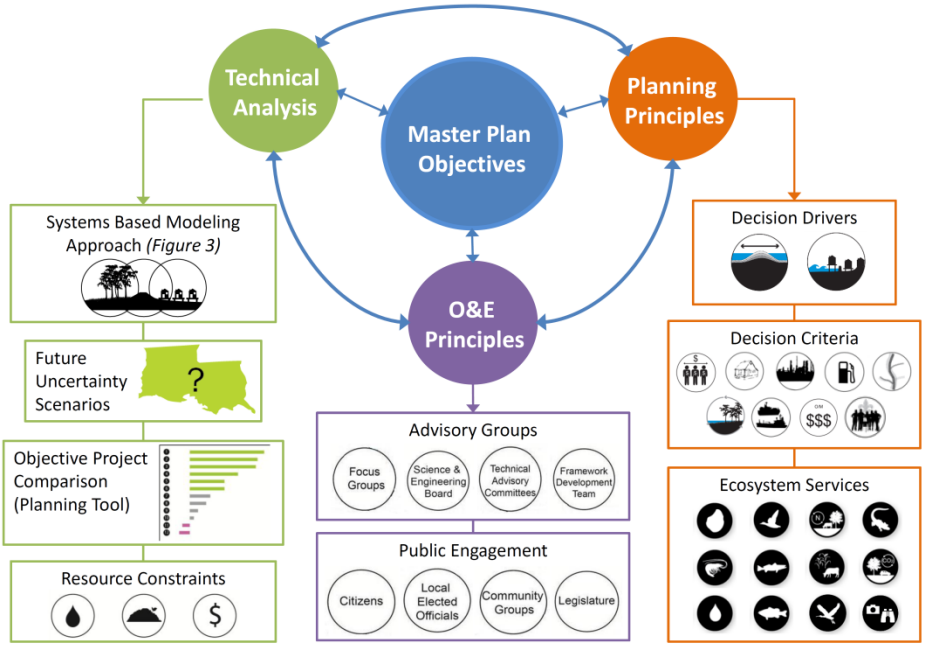


Figure 1. The decision-making process is a complex interaction of input and feedbacks between a technical analysis, outreach and engagement (O&E) and planning principles. The overall goal of the Master Plan is defined by the objectives. The systems-based modeling approach, future uncertainty scenarios, planning tool and resource constraints all contribute to the technical data needed for the decision-making process. The planning principles and formulation involve decision drivers, decision criteria and ecosystem services metrics, as described in the methods section, which help determine the plan's ability to meet the objectives. The O&E strategy was designed to ensure public input and acceptance throughout the decision-making process and multiple groups were involved in defining and reviewing the technical analysis and plan formulation (Peyronnin et al. 2013).

Evaluating Projects

The purpose for the 2012 Coastal Master Plan was to identify coastal protection and restoration projects that would improve the lives of coastal residents by creating a more resilient south Louisiana. Achieving this goal required new tools that helped us better understand our coast and how projects could provide benefits. The coast is a complex system. We needed to better understand how it is changing today and the kinds of changes we can expect in the future. We also had hundreds of project ideas and different views about how to move forward, and needed a way to sort through our many options and find those that would work best for us.

To meet these needs, CPRA used a systems approach to coastal planning and a science-based decision making process that resulted in a plan that was both funding- and resource- constrained. These tools helped us understand the practical implications of different project options and how gains in one area might create losses in another. Based on the preferences we wanted to explore, our tools helped identify strategies for investing in coastal protection and restoration projects. This analysis improved our understanding of how projects were affected by: our budget and the river water and sediment that we have to work with. We also used the tools to consider possible future coastal conditions that could affect the way our projects operate, along with other factors such as construction time.

The Predictive Models

The 2012 Coastal Master Plan analyzed both protection and restoration measures, which influenced the models we selected and how they work. To estimate risk reduction outcomes, we used models that evaluated storm surge and the risk of expected annual damages. To estimate restoration outcomes, the models looked at how land changes throughout the coast—where land is building and where it is disappearing. These models examined how water moves through the coastal system as well as how salt and fresh water affect vegetation and habitats for key species and ecosystem services.

The integrated suite of Predictive Models developed for the Master Plan assessed how Louisiana's coastal landscape may change and how much damage communities may face from storm flooding over the next 50 years if we take no further action and for comparison then assessed how the coastal ecosystem and our level of risk could change if certain risk reduction and restoration projects are constructed. The models incorporated what we know about the way the coast works, and they made it easier to identify projects that best achieve our objectives.

Ecosystem services are benefits that the environment provides to people. In Louisiana, these range from providing the right habitats for oysters and shrimp to nature-based tourism. We could not detail the economic aspect of ecosystem services in our analysis. Instead, we focused on proxy characteristics of the coast, such as provision of habitat (i.e. habitat suitability indices) and other factors that can support ecosystem services.

The Predictive Models used in the Master Plan were organized into seven linked groups (Figure 2), involving the work of over 60 scientists and engineers. Each group worked on a different aspect of how the coastal system changes over time. Our effort was based on existing models where they were appropriate. New models were developed for vegetation, nitrogen uptake, barrier shorelines, flood risk, and to reflect potential for nature based tourism, fresh water availability, and support for agriculture/ aquaculture.

The models were designed to work together, following the precedent set by earlier State planning efforts, such as the Coastal Louisiana Ecosystem Assessment and Restoration (CLEAR) work conducted for the Louisiana Coastal Area Study (Nuttle et al., 2004; USACE, 2004). We also found new ways to link the expanded set of models to more fully capture how the coast works as a system. The level of modeling in the 2012 Coastal Master Plan was a significant technical achievement in the systems approach, the linked nature of the models, and in the breadth of subjects evaluated.

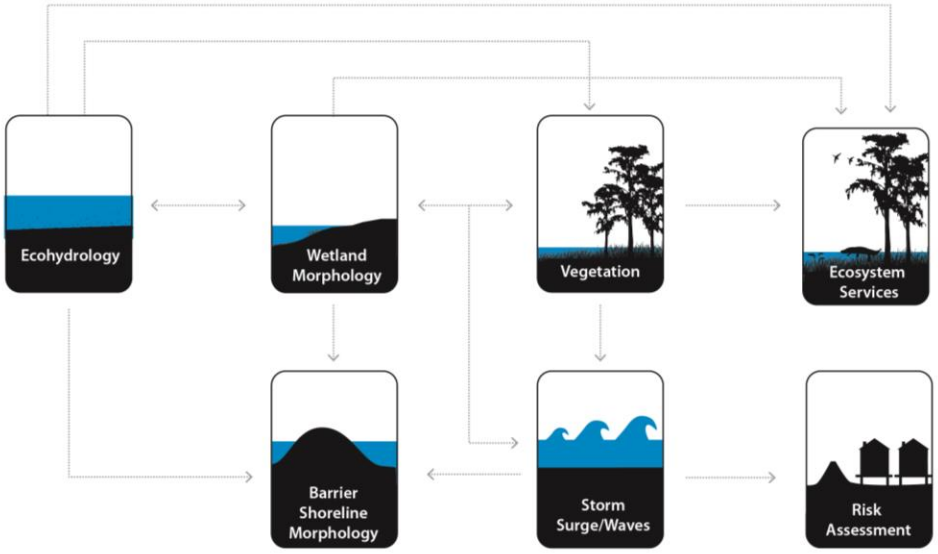


Figure 2. 2012 Master Plan predictive model groups (Meselhe et al. 2013, Couvillion et al. 2013, Visser et al. 2013, Nyman et al. 2013, Cobell et al. 2013, Johnson et al. 2013).

Future Environmental Scenarios

Many factors that will have a profound effect on the future of Louisiana's coast cannot be easily predicted or are outside of our control. These include factors such as subsidence and the levels of nutrients in the river, as well as the effects of climate change, such as sea level rise, changes in rainfall patterns, and storm frequency and intensity. Climate change was central to our analysis, given coastal Louisiana's vulnerability to increased flooding and the sensitivity of its habitats.

To account for these factors when developing the Master Plan, we worked with experts to develop two different sets of assumptions or scenarios. These scenarios reflect different ways future coastal conditions could affect our ability to achieve protection and build land:

- **Moderate scenario - assumed limited changes in the factors on the facing page over the next 50 years.**
- **Less optimistic scenario - assumed more dramatic changes in these factors over the next 50 years.**

CPRA found that restoration projects selected under the less optimistic scenario tended to be in the upper end of the estuaries and closer to existing land rather than near the Gulf of Mexico. As a result, the final Master Plan is largely comprised of projects selected under the less optimistic scenario.

The Planning Tool

The Planning Tool, in concert with the modeling effort, offered a way to examine these projects. The model results, represented by terabytes of data, are the building blocks of the 2012 Coastal Master Plan. We needed a user friendly way to sort and view these results so that we could

identify groups of projects to examine in greater detail. The Planning Tool is a decision support system that helps the state choose smart investments for the coast. The tool integrates information from the models with other information such as funding constraints, compares how different coastal restoration and risk reduction projects could be grouped, and allows us to systematically consider many variables (e.g., project costs, funding, landscape conditions, and stakeholder preferences). These science-based tools help us understand the practical implications of different project options. Based on the outcomes, our tools suggested a strategy for investing in coastal flood risk reduction and restoration projects. As part of this strategy, the tools considered the constraints, such as the limited money, water, and sediment that we have to work with. The tools also considered possible future conditions that will affect the way our projects operate, along with other important factors such as construction time and how combinations of projects will work together. These results were translated so that citizens and state leaders could understand the projects' real world effects.

We used predictive models and the Planning Tool to help us select 109 high-performing projects that could deliver measurable benefits to our communities and coastal ecosystem over the coming decades. The Planning Tool was designed to translate the models' scientific output and show the practical implications of different options. Decision making for the plan followed directly from this analysis.

West Grand Terre Beach Nourishment and Stabilization Project

Louisiana's Barataria/Plaquemines barrier island system extends approximately 25 miles along the shoreline of southeast Louisiana from West Grand Terre to Sandy Point (Figure 3; Penland et al. 2005). The barrier islands are experiencing island narrowing and land loss due to the complex interaction of sea level rise, compaction, wave and storm damage, oil and gas activities, and insufficient sediment supply due to the channelization of the Mississippi River (Dean 1997, McBride et al. 1989, McBride and Byrnes 1997, Morton et al. 2005, Penland et al. 1988, Penland and Suter 1988, Rosati and Stone 2009, van Heerden and DeRouen 1997, Williams et al. 1992). Several hurricanes have impacted the island chain: Andrew (1992), Opal (1995), Danny (1997), Earl (1998), Georges (1998), Isidore (2002), Lili (2002), Ivan (2004), Katrina (2005), Rita (2005), Gustav (2008), and Ike (2008). The barrier islands were also heavily impacted by the April 2010 BP Deepwater Horizon Oil Spill. Louisiana's barrier islands have decreased in land mass by more than 50% over the last 100 years (Penland et al. 2003). The Barataria/ Plaquemines region is one of the most rapidly disappearing areas in Louisiana; the average erosion rate increased from a long-term rate of -23.1 feet per year between 1884 and 2002 to a short-term rate of -42.3 feet per year between 1988 and 2002 (Penland et al. 2005), and in some locations shoreline erosion exceeds 65 feet per year (Penland and Boyd 1981). Barataria/Plaquemines barrier islands have been so severely eroded in the past century that they were approaching a point of complete breakdown, and many of the barrier islands had been reduced to fragmented relics before they were restored (Campbell et al. 2005a).

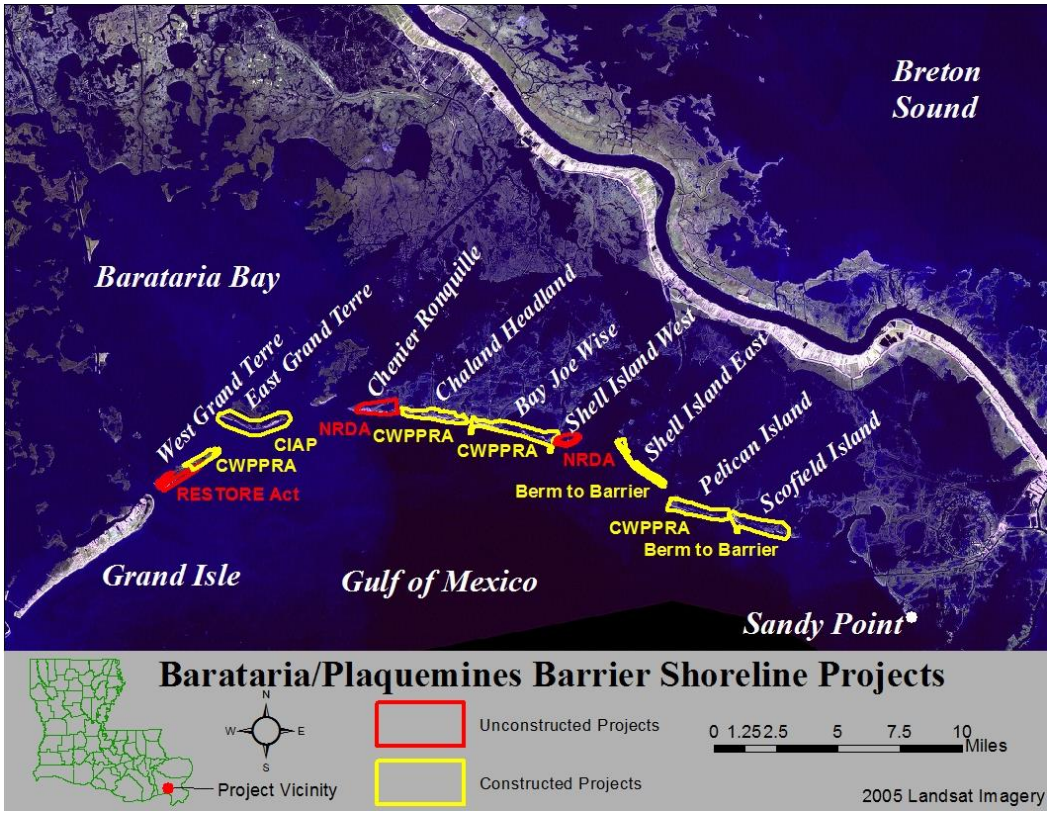


Figure 3. Location of West Grand Terre Beach Nourishment and Stabilization project and other barrier island restoration projects in the vicinity of the Barataria/Plaquemines barrier shoreline.

Several projects play an integral role in the overall effort to restore, enhance, and protect the Barataria/Plaquemines barrier shoreline (Figure 3). Much of the success of the planning, design, and construction of these projects has been due to leveraging partnerships with multiple federal, state, and parish agencies. A CWPPRA project, Vegetative Plantings of a Dredged Material Disposal Site on Grand Terre Island (BA-28) was completed on West Grand Terre in 2001. A Coastal Impact Assistance Program (CIAP) project, EB – East Grand Terre Island Restoration [BA-30 (EB)], was completed in 2011. The project was designed under the CWPPRA program in partnership with National Marine Fisheries Service (NMFS), and construction was funded through CIAP, Plaquemines Parish CIAP, and state surplus. Other nearby projects include two CWPPRA projects that were developed out of the comprehensive Barataria Shoreline Complex project, designed and constructed in partnership with NMFS: (1) Pass Chaland to Grand Bayou Pass Barrier Shoreline Restoration (BA-35; also known as Bay Joe Wise) and (2) Barataria Barrier Island Complex Project: Pelican Island and Pass La Mer to Chaland Pass Restoration (BA-38). Construction of the Bay Joe Wise (BA-35) project was completed in 2009. The BA-38 project is composed of two sections: the Chaland Headland segment, which was completed in 2007; and the Pelican Island segment, which was completed in 2013. Scofield Island (BA-40) was designed under the CWPPRA program in partnership with NMFS and was completed using Berm to Barrier Funds in 2013. Chenier Ronquille Barrier Island Restoration (BA-76) was a

CWPPRA project that was designed in partnership with NMFS and will be constructed through Natural Resource Damage Assessment (NRDA) Early Restoration Funds. Additional projects located in the Barataria/Plaquemines barrier shoreline are the Shell Island East (BA-110) and Shell Island West (BA-111) projects, which are components of the Louisiana Coastal Area (LCA) Barataria Basin Barrier Shoreline (BBBS) Restoration project, designed in partnership with the U.S. Army Corps of Engineers. Shell Island East was constructed in 2013 with Berm to Barrier funds. Shell Island West will be constructed using NRDA Early Restoration Funds.

The West Grand Terre Beach Nourishment and Stabilization project (Figure 3) is located in Jefferson Parish immediately northeast of Grand Isle at the mouth of Barataria Bay extending about 4.3 miles from Barataria Pass to Pass Abel (Martinez et al. 2009). Grand Terre, made famous as the base of smuggling activities for the storied 19th century pirate Jean Lafitte, was once a single barrier island (Maygarden et al. 1995). However, tropical storms, subsidence, and the absence of a replenishing sand source caused the development of Pass Abel and the separation of Grand Terre Island into the two currently existing islands, West Grand Terre and East Grand Terre (Penland and Suter 1988). According to results of the Barrier Island Comprehensive Monitoring (BICM) Program, the average shoreline loss rate for West Grand Terre has increased from an historic rate (1855-2005) of approximately -14.5 feet/year, to a short-term rate (1996-2005) of approximately -22.6 feet/year and a near-term rate (2004-2005) of -23.1 feet/year (Martinez et al. 2009).

The purpose of the original East/West Grand Terre Restoration (BA-30) CWPPRA project, which was later constructed through CIAP funds, was to restore marsh habitat and close shoreline breaches on East Grand Terre Island and to increase the overall elevation and seaward extent of East and West Grand Terre Island's shorelines, thus protecting existing infrastructure on West Grand Terre. However, the scope of this project was reduced to only include East Grand Terre. Restoration efforts for West Grand Terre were eliminated after cost projections indicated that the cost to construct either of two beach alternatives for West Grand Terre in combination with alternatives for East Grand Terre exceeded the total construction budget. East Grand Terre was suggested to be the more critical of the two islands due to the excessive amount of overwash and numerous breaches along the island shoreline, so it was constructed first. The East Grand Terre project restored 2.8 miles of barrier shoreline, consisting of 165 acres of beach and 450 acres of marsh, by dredging 3.3 million cubic yards of offshore material.

2. Implementation Methodology

The objectives of the proposed West Grand Terre Beach Nourishment and Stabilization project are to restore and enhance dune and back-barrier marsh habitat. The project will build an estimated 12,700 feet of beach and dune with an area of 235 acres, 66 acres of back-barrier marsh, and a rock revetment to protect the restored marsh. The project will increase the width of the island and maintain shoreline integrity through the introduction of sediment in order to increase island longevity.

The West Grand Terre Beach Nourishment and Stabilization project will be constructed by hydraulically dredging and pumping sediment from offshore deposits near the Quatre Bayou borrow site approximately nine miles to the designated fill sites. The project consists of three fill components: the Gulf of Mexico Beach/Dune, the Barataria Pass Beach/Dune, and the Marsh. The slurry fill will be constructed to elevations ranging from +9.0 ft. NAVD88 at the Gulf of Mexico Beach/Dune to +2.4 ft. NAVD88 at the Barataria Pass Beach/Dune and the Marsh. The borrow areas near Quatre Bayou mostly consists of sands, silts, and other sandy and clayey fill material that is suitable for beach/dune and marsh creation. Earthen containment dikes will be constructed to facilitate the construction of the Marsh, and a rock dike structure is also proposed to provide additional protection to West Grand Terre Island and Fort Livingston. A 30" cutterhead suction dredge will likely be utilized to construct this project and up to two booster pumps may be required.

3. Monitoring & Adaptive Management

CPRA and collaborators collect a variety of data, both programmatic and project-specific, in support of coastal protection and restoration projects and activities. These data can support various aspects of the project from strategic planning, construction, operations, maintenance and adaptive management. These data typically include but are not limited to: hydrographic (e.g., water level, water quality, salinity), bathymetric and topographic (e.g., above and below water surface land elevations including erosion, land loss/gain, accretion), geotechnical (e.g., soil analysis and mechanics), geophysical (e.g., seismic, sidescan sonar), biological (e.g., fish and wildlife, vegetation), and photographic (aerial and satellite imagery). Specifically, CPRA has several ongoing coast-wide and programmatic data collection systems for program evaluation and facilitation. The Coastwide Reference Monitoring System-Wetlands (CRMS) contains 390 sites that enable ecological assessments at the project, basin, and ecosystem level based on the collection of hydrographic data, forested swamp and herbaceous marsh vegetation data, accretion, surface elevation, and soil properties data. The Barrier Island Comprehensive Monitoring Program (BICM) began in 2006 to provide long-term data on the barrier islands of Louisiana that could be used to plan, design, evaluate, and maintain current and future barrier island restoration projects. The BICM program uses both historical and newly acquired data to assess and monitor changes in the aerial and subaqueous extent of islands, habitat types, geotechnical properties, environmental processes, and vegetation composition. BICM datasets included aerial still and video photography for shoreline positions, habitat mapping, and land loss; light detection and ranging (Lidar) surveys for topographic elevations; single-beam and swath bathymetry; and sediment grab samples. To manage sediment resources for coastal restoration projects the Louisiana Sand/Sediment Resource Database (LASARD) has been developed to identify and maintain geological, geotechnical, and geophysical data for marsh creation and barrier island projects. CPRA is currently working with the Water Institute of the Gulf to more fully develop a System-Wide Assessment and Monitoring Program (SWAMP) that will bring these monitoring and assessment programs under one comprehensive umbrella in an effort to avoid duplication and improve efficiency.

Managing complex environments in which the natural and socio-economic systems are highly integrated is inherently difficult. In addition, deltaic environments are uniquely challenged due to the interdependence and delicate balance of water, land and economic systems and future uncertainties regarding the magnitude and rate of climate change impacts. Adaptive management in deltaic environments is a relatively recent science and encourages the integrated and flexible approach to land and water management that considers risk and uncertainty. It promotes solutions that are sustainable even if conditions change by providing a mechanism for robust decision making. Connecting short-term investments with long-term challenges and the selection of action paths that allow for maximum flexibility of future decisions are two of the key concepts of "Adaptive Delta Management" (Delta Alliance 2014). Historically, as human developments evolved in deltas, decisions were made that cannot be easily changed (such as the location of New Orleans). This results in some "path dependency", meaning that future options are limited or constrained by past decisions. However, learning from past decisions and understanding the range of possible future scenarios will allow us to avoid these constraints in the future by using "adaptation pathways" to make decisions that allow for maximum future flexibility (Delta Alliance 2014; Haasnoot 2013). As new techniques and projects for restoration and risk reduction are being developed, there exists an opportunity for learning how the system will respond to the coastal protection and restoration program implementation and using that learning to improve future program management decisions. Adaptive management provides a structured process for making decisions over time through active learning and enables adjustments in program implementation as new information becomes available. Adaptive management embraces a scientific approach that involves identifying explicit goals and objectives, developing and implementing management actions, assessing the system's response to the action(s), and then using that knowledge to make management decisions. It is designed to be iterative, allowing for the incorporation of new knowledge through every step of the process (The Water Institute of the Gulf 2013).

Due to the complexity of CPRA's program, the uncertainty in future environmental conditions, and the "future without action" prognosis, CPRA's adaptive management strategy is complex. Project and program assessment, communication, and feedback loops are critical to CPRA's adaptive management strategy and affect every step in project and program implementation. Therefore, supporting efforts, such as focused applied research, science advisory boards and modeling tool development, are critical. CPRA's Adaptive Management Strategy streamlines the implementation of the Master Plan and maximizes its long-term benefits by institutionalizing the learning process, providing a process for resolving uncertainties and integrating new knowledge into the construction and operations of projects, and providing adaptation pathways to allow maximum flexibility for future management decisions.

4. Measures of Success

Measures of success for the West Grand Terre Beach Nourishment and Stabilization project include the restoration of beach, dune, and back-barrier marsh habitat for storm surge and wave attenuation. At the project-scale, performance measures will track the progress towards meeting

management goals and objectives. When monitored over time, performance measures can help reduce uncertainty surrounding predictive models and inform whether intended results are being achieved or if additional actions are needed to fulfill program expectations. In addition, performance measures can also be used to inform the public of the system's response to management actions. Defining the health of a system is inherently complex however, and requires a systematic approach to develop a manageable list of metrics that can be quantified and monitored over time (The Water Institute of the Gulf, 2013).

CPRA is currently working with the Water Institute of the Gulf to more fully develop a System-Wide Assessment and Monitoring Program (SWAMP) that will bring existing monitoring and assessment programs under one comprehensive umbrella in an effort to avoid duplication and improve efficiency. SWAMP is envisioned to be a scalable program that will allow for data assessments to be completed at the project-, basin-, and program-scales. Individual projects will generate monitoring plans which will nest within the larger SWAMP framework and will allow for periodic assessment of project performance against performance expectations.

CPRA has recently worked with the Water Institute to develop recommendations for performance measures, and is currently developing using those recommendations to design a robust SWAMP monitoring plan to provide data necessary to perform programmatic performance assessments. Concurrent with this effort, existing monitoring programs, such as CRMS and BICM are being incorporated into the SWAMP design framework, and projects that require monitoring strategies are being informed and nested within this overall framework. That is not to say that some projects will not require additional monitoring to supplement SWAMP; however SWAMP will provide the backbone to facilitate comprehensive programmatic performance assessment.

5. Risks & Uncertainties

The largest single environmental uncertainty in planning and implementing restoration projects in south Louisiana is accounting for the potentially high, and highly variable, rates of relative sea level rise (RSLR). Similar to marsh creation projects, maximum ecological benefits on barrier island restoration projects result when dredged sediments and the underlying native soils compact to where the island surfaces (dunes, shore face, back marsh, etc.) achieve target elevations after a few years. Underestimating RSLR can result in island surfaces that sink below target elevations earlier than intended. In contrast, overestimating RSLR can result both in the overspending of limited funds during construction and in excessive sediments being placed so that island surfaces do not compact to target elevations, reducing the ecological utility of the created habitat.

Uncertainty exists for both future changes in the water level of the Gulf of Mexico (regional) and subsidence components of RSLR. CPRA believes that it has made prudent assumptions of future regional sea levels, independent of subsidence, consistent with the scientific literature. CPRA also has a spatially-variable map of predicted subsidence rates that was developed for the 2012

Coastal Master Plan following the convening of an expert workgroup. Geographically-specific subsidence values derived from that map have since been shown to be consistent with calculated subsidence inferred from tide gauge observations. An additional component of predicted and realized settlement of placed sediments is the geotechnical stability of the underlying native soils, which can vary substantially across the coast.

While not unique to barrier islands, the unpredictable effects of tropical storm and hurricane passage on island structure are well documented. These systems are the most seaward bodies of land in the coastal zone and thus the most exposed to the destructive storm surge associated with tropical systems. While engineers can design barrier island projects to the nominal wave energy environment, it is difficult to design these features to withstand increasingly severe storm surges associated with the random (in time and space) strong hurricanes, especially while still ensuring that they maintain critical day-to-day ecological support functions. At a certain point breaching or rollover in response to a strong, destructive hurricane is inevitable. The State has in place both a Barrier Island Maintenance Program and a Barrier Island Comprehensive Monitoring Program to track the physical resilience of the barrier islands and shorelines of the State and then implement corrective actions.

6. Outreach & Education

CPRA established a strategic outreach and engagement framework for the Coastal Master Plan that helped to guide communications and interactions with diverse audiences throughout the planning process. These audiences include key citizen groups and organizations, non-governmental organizations, local and State officials, business groups and the general public. CPRA's outreach and engagement framework provides a variety of ways for stakeholders and citizens to learn about and participate in the master planning process, including small group gatherings, web offerings, direct communication with local and State government, and through monthly public meetings.

A successful restoration project is built on local knowledge, input from a diverse range of coastal stakeholders, and extensive dialogue with the public. We continue to reach out to the public in new ways to better share information on increasing flood risk and CPRA restoration and protection projects. Having a strong outreach and engagement component in the Louisiana's coastal program provides long-term benefits and will positively impact the future of coastal restoration and protection planning. CPRA is committed to engaging stakeholders and citizens in the effort to ensure their voices are heard and their input is incorporated.

People from all walks of life have rallied around the 2012 Coastal Master Plan, recognizing that we must embrace bold solutions if we are to tackle the crisis that has gripped our coast for so long. A poll conducted by the National Audubon Society showed that Louisiana voters feel strongly that our state's coastal areas and wetlands are crucial to save. Specifically, 86% of Louisiana voters supported adoption of the 2012 Coastal Master Plan and 98% of coastal voters felt that Louisiana's coastal areas and wetlands are "very important" to the state's future.

The solutions presented in the Coastal Master Plan and through these projects will preserve our nation's energy and economic security, restore the health of the gulf region, and support a bright and safe future for all coastal residents. Louisiana is committed to maximizing its investment in oil spill recovery activities by implementing restoration projects that are consistent with the Coastal Master Plan and have been through a transparent and robust public engagement process.

Below are additional details on current outreach and engagement opportunities CPRA provides.

CPRA Board Monthly Public Meetings
The CPRA Board holds monthly meetings to provide the public with updates related to projects, programs, and policies. A public comment period is included at the close of each monthly meeting allowing the opportunity for citizens to ask questions or provide comments for the record.

CPRA staff regularly attend these meetings and are available before and after to discuss agency initiatives with members of the public. Meeting details, including itemized agendas, are posted to CPRA's online calendar which is located at www.coastal.la.gov.

National Environmental Policy Act / Permitting Project-Specific Opportunities
Throughout project development there are a number of project-specific opportunities for public engagement and comment incorporated into the National Environmental Policy Act (NEPA) and permitting processes.

Community Meetings
As the project progresses, the state will be available to meet with local groups and leaders to provide information. CPRA also has staff available to meet with citizens in smaller groups, so that we can answer questions and share updates. To request a meeting on the status of this project or to be added to our mailing list, please send an email to: Coastal@LA.gov.

7. Leveraging of Partnerships

CPRA has a variety of resources and partnerships with which it is able to leverage for the benefit of this project. Through the Coastal Master Plan, CPRA is able to apply the integrated suite of Predictive Models and Planning Tool, a science-based decision support system developed for the master plan to work towards the RESTORE objectives of habitat protection and restoration. SWAMP will bring the previously described CRMS, BICM, and LASARD monitoring and assessment programs together into one framework in an effort to avoid duplication, improve efficiency, and provide the data needed to perform programmatic performance assessments.

As the Barataria/Plaquemines region is one of the most rapidly disappearing areas in Louisiana, several projects have already been constructed in the area around the proposed West Grand Terre Beach Nourishment and Stabilization project. Much of the success of the planning, design, and

construction of these projects has been due to leveraging partnerships with multiple federal, state, and parish agencies. The following is a list of projects and partnerships that the West Grand Terre project will leverage and build from.

- Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA) project: Vegetative Plantings of a Dredged Material Disposal Site on Grand Terre Island (BA-28), completed on West Grand Terre in 2001.
- Coastal Impact Assistance Program (CIAP) project, EB – East Grand Terre Island Restoration [BA-30 (EB)], completed in 2011.
    - This project was designed under the CWPPRA program in partnership with National Marine Fisheries Service (NMFS), and construction was funded through CIAP, Plaquemines Parish CIAP, and state surplus.
- CWPPRA projects developed out of the comprehensive Barataria Shoreline Complex project, designed and constructed in partnership with NMFS:
    - Pass Chaland to Grand Bayou Pass Barrier Shoreline Restoration (BA-35; also known as Bay Joe Wise), completed in 2009.
    - Barataria Barrier Island Complex Project: Pelican Island and Pass La Mer to Chaland Pass Restoration (BA-38).
        - The BA-38 project is composed of two sections: the Chaland Headland segment, which was completed in 2007; and the Pelican Island segment, which was completed in 2013.
- CWPPRA program designed in partnership with NMFS: Scofield Island (BA-40), completed using Berm to Barrier Funds in 2013.
- CWPPRA project designed in partnership with NMFS: Chenier Ronquille Barrier Island Restoration (BA-76), to be constructed through Natural Resource Damage Assessment (NRDA) Early Restoration Funds.
- Louisiana Coastal Area (LCA) Barataria Basin Barrier Shoreline (BBBS) Restoration project, designed in partnership with the U.S. Army Corps of Engineers:
    - Shell Island East (BA-110), constructed in 2013 with Berm to Barrier funds.
    - Shell Island West (BA-111), to be constructed using NRDA Early Restoration Funds.

As West Grand Terre was initially included as part of the original CWPPRA BA-30 East/West Grand Terre Restoration project, CPRA is able to leverage much of the work already completed in this area and further capitalize on previous efforts by utilizing the tools developed through the Master Plan to treat this project as part of a system.

8. Proposal Project Benefits

The West Grand Terre Beach Nourishment and Stabilization project will result in significant improvements to conserving and replenishing existing and created marsh and beach/dune habitat. The project will build an estimated 12,700 feet of beach and dune with an area of 235 acres, 66 acres of back-barrier marsh, and a rock revetment will be constructed to protect the restored

marsh. This project will restore and enhance interior wetlands which will benefit Gulf estuarine dependent marine species. This project will also protect, restore, and maintain ecologically important breeding and nesting habitat for Gulf species such as colonial nesting waterbirds, including the Louisiana state bird, the brown pelican (*Pelecanus occidentalis*), and migratory shorebirds, including the endangered piping plover (*Charadrius melodus*, Haig and Oring 1985). In addition, the project will also promote community resilience and reduce risk to infrastructure by providing storm surge and wave attenuation. Without action, it is predicted that West Grand Terre will disappear by 2044 (Martinez et al. 2009); however, the West Grand Terre Beach Nourishment and Stabilization project would result in significant improvements conserving and replenishing existing and created marsh and beach/dune habitat.

Barrier island restoration is critical, as barrier islands are the first line of defense against storm surge. The West Grand Terre Beach Nourishment and Stabilization project will promote community resilience and reduce risk to infrastructure by providing storm surge and wave attenuation. The project will increase the width of the island and maintain shoreline integrity through the introduction of sediment in order to increase island longevity.

Grand Terre has a natural sandy beach and is an excellent location for saltwater surf fishing and bird and wildlife watching, activities that are critically important to the region's economy. An analysis performed by Southwick and Associates (2008) found that hunting, fishing, boating, and wildlife viewing and photography had a total economic effect of $6.75 billion (including direct, indirect, and induced economic impacts) and supported a total of 76,700 jobs. Grand Terre is visible just a short distance across Barataria Pass from Grand Isle State Park and is accessible by boat. Grand Terre is known as being the headquarters for the storied 19th century pirate Jean Lafitte and his privateers. The main tourist attraction is Fort Livingston, which was constructed in 1841, and is listed on the National Register of Historic Places. Visitors to Grand Terre can also find the brick remains of a pre-Civil War plantation's sugar mill (Maygarden et al. 1995).

The Barataria/Plaquemines region is one of the most rapidly disappearing areas in Louisiana. The barrier islands that have not yet been restored have been so severely eroded that they are approaching a point of complete breakdown and have been reduced to fragmented relics. The state's Master Plan identified restoration of the Barataria Basin's barrier shoreline as an urgent action that would help to stabilize critical landforms, improve the structure and integrity of the landscape, restore the hydraulic regime in an area with a high projected future land loss, restore and maintain ecologically important habitat for migratory birds and threatened and endangered species, and provide hurricane protection to coastal Louisiana (CPRA 2007). There are still projects that need to be constructed, including the West Grand Terre Beach Nourishment and Stabilization project, to complete the restoration of the Barataria/ Plaquemines barrier island system, which will support the sustainability and resilience of Louisiana's coast.

Land loss and flooding risks are changing the way people live, work, and do business throughout Louisiana's coast. The projects in the 2012 Coastal Master Plan are intended to prevent the environmental and economic collapse that will occur if land loss continues and these projects also provide an opportunity to create jobs through a new restoration economy.

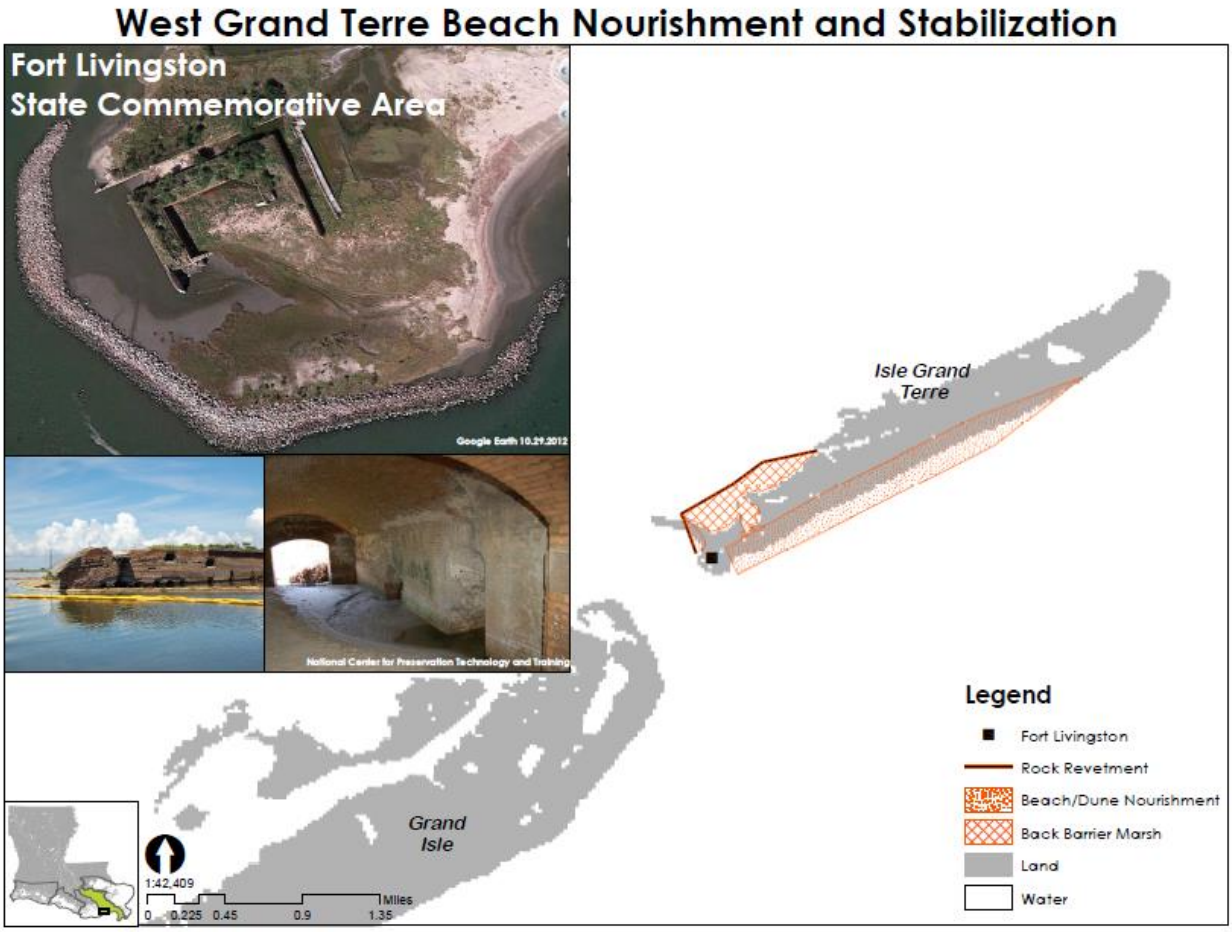
Several recent studies have examined how coastal restoration measures will help Louisiana's working coast. A common theme in these studies is how readily coastal restoration and protection efforts create jobs. A recent LSU/Louisiana Workforce Commission study (Louisiana Workforce Commission 2011) found that the $618 million spent by the state in 2010 on coastal restoration created 4,880 direct jobs and an additional 4,020 indirect and induced jobs, for a total impact of 8,900 Louisiana jobs. The spinoff benefits of these jobs were considerable; the study estimated that the state's initial investment in 2010 created more than $1.1 billion in sales. Louisiana's annual investment in coastal restoration alone is expected to be between $400 million to $1 billion, which would translate into 5,500 and 10,300 total jobs, $270-$520 million in wages, and between $720 million and $1.35 billion in total sales per year.

Duke University's Center on Globalization, Governance & Competitiveness (2011) found that Louisiana is already a national leader in the creation of coastal restoration jobs, with the highest concentration of related business headquarters in the Gulf. According to this study, restoration jobs spur investments and jobs in a range of sectors including shipbuilding, equipment repair, and manufacturing. The Duke study emphasized that to expand this job creation engine, Louisiana would need to maintain a steady investment in restoration efforts so that relevant firms will have an incentive to scale up their investments. A third study by Restore America's Estuaries (Restore America's Estuaries 2011), which looked at restoration efforts nationwide, found that restoring our coasts can create more than 30 jobs for each million dollars invested. This is more than twice as many jobs per dollars invested as is gained by the oil and gas and road construction industries combined. Further, the study found that investing in restoration provides long lasting benefits to local economies, such as higher property values, better water quality, sustainable fisheries, and increases in tourism dollars.

Since 2007, the State has made unprecedented investments in our coast, and the Coastal Master Plan builds on this momentum. The projects outlined here strike a balance between providing immediate relief to hard hit areas and laying the groundwork for the large scale projects that are needed if we are to protect communities and sustain our landscape into the future.

The project will promote community resilience and reduce risk to infrastructure by providing storm surge and wave attenuation and will protect and restore nesting and migratory bird habitat, including wintering habitat of the endangered piping plover (Charadrius melodus, Haig and Oring 1985). Restoration of West Grand Terre will also protect Fort Livingston, which was constructed in 1841 and is listed on the National Register of Historic Places. West Grand Terre is also recognized as a State Commemorative Area (Maygarden et al. 1995) and will protect Grand Isle, the only inhabited barrier island in Louisiana.

IV. Location Information



West Grand Terre Beach Nourishment and Stabilization

RESTORE Proposal
Coastal Protection & Restoration Authority

V. Budget Narrative

West Grand Terre Beach Nourishment and Stabilization	
Phase I	
Engineering & Design / Permitting	$6,752,759
Phase I Adaptive Management	$506,457
TOTAL PHASE I COST ESTIMATE	**$7,259,216**
Phase II	
Estimated Construction Cost	$53,713,003
Phase II Adaptive Management	$4,028,475
TOTAL PHASE II COST ESTIMATE	**$57,741,478**
TOTAL ESTIMATED PROJECT COST	**$65,000,694**

*The cost estimate for the project may be affected by change in project features, adjustment of quantities, or change in industry prices prior to bid openings.

The total estimated cost for the West Grand Terre Beach Nourishment and Stabilization project is $65,000,694. Of this total project cost, CPRA is requesting $7,259,216 in RESTORE funds to see this project through Phase I of engineering and design and permitting. Due to the extensive work already performed for the 2012 Coastal Master Plan, CPRA has completed the necessary high level planning exercises for this project. The requested $6,752,759 for the engineering and design and permitting line item includes all of the expected permitting, land rights, engineering and design, and state supervision and administration project needs. In addition to these dollars, CPRA is requesting $506,457 for Adaptive Management purposes in order to effectively manage resources and monitor complex environmental conditions to ensure the project's success and reduce foreseeable risks and uncertainties to the utmost, most feasible extent. Therefore, to build upon CPRA's experience and existing capacity, CPRA is requesting a total of $7,259,216 in RESTORE funds for the West Grand Terre Beach Nourishment and Stabilization project.

VI. Environmental Compliance Checklist (Appendix B)

Gulf Coast Ecosystem Restoration Council
Environmental Compliance Checklist

Please check all federal and state environmental compliance and permit requirements as appropriate to the proposed project/program

Environmental Compliance Type	**Yes**	**No**	**Applied For**	**N/A**
Federal				
National Marine Sanctuaries Act (NMSA)				X
Coastal Zone Management Act (CZMA)		X		
Fish and Wildlife Coordination Act		X		
Farmland Protection Policy Act (FPPA)				X
NEPA – Categorical Exclusion				X
NEPA – Environmental Assessment		X		
NEPA – Environmental Impact Statement				X
Clean Water Act – 404 – Individual Permit (USACE)		X		
Clean Water Act – 404 – General Permit(USACE)				X
Clean Water Act – 404 – Letters of Permission(USACE)				X
Clean Water Act – 401 – WQ certification		X		
Clean Water Act – 402 – NPDES				X
Rivers and Harbors Act – Section 10 (USACE)		X		
Endangered Species Act – Section 7 – Informal and Formal Consultation (NMFS, USFWS)		X		
Endangered Species Act – Section 7 - Biological Assessment (BOEM,USACE)		X		
Endangered Species Act – Section 7 – Biological Opinion (NMFS, USFWS)		X		
Endangered Species Act – Section 7 – Permit for Take (NMFS, USFWS)				X
Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat (EFH) – Consultation (NMFS)		X		
Marine Mammal Protection Act – Incidental Take Permit (106) (NMFS, USFWS)				X
Migratory Bird Treaty Act (USFWS)		X		
Bald and Golden Eagle Protection Act – Consultation and Planning (USFWS)		X		
Marine Protection, Research and Sanctuaries Act – Section 103 permit (NMFS)				X
BOEM Outer Continental Shelf Lands Act – Section 8 OCS Lands Sand permit				X
NHPA Section 106 – Consultation and Planning ACHP, SHPO(s), and/or THPO(s)		X		
NHPA Section 106 – Memorandum of Agreement/Programmatic Agreement				X
Tribal Consultation (Government to Government)		X		
Coastal Barriers Resource Act – CBRS (Consultation)				X
State				
As Applicable per State		X		

Coastal Zone Management Act
A Coastal Use Permit is required for implementation of the West Grand Terre Project. The Coastal Protection and Restoration Authority (CPRA) will submit a Joint Coastal Use Permit application to the Louisiana Department of Natural Resources Office of Coastal Management (LDNR OCM) for implementation of the West Grand Terre Project.

Clean Water Act – 404 – Individual Permit (USACE)
CPRA has not yet submitted the permit application specifically for the West Grand Terre project.

Rivers and Harbors Act – Section 10 (USACE)
CPRA has not yet submitted the permit application specifically for the West Grand Terre Project.

NEPA – Environmental Assessment
USACE NOD Regulatory Branch will complete an Environmental Assessment specifically for the West Grand Terre Project during the public interest review of the Clean Water Act Section 404/Rivers and Harbors Act Section 10 permit application.

Endangered Species Act – Section 7 – Informal and Formal Consultation (NMFS, USFWS)
Consultation with NMFS and USFWS specifically for the West Grand Terre Project will be initiated through the joint LDNR OCM - USACE public notice on the permit application.

Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat (EFH) – Consultation (NMFS)
Consultation with NMFS for the West Grand Terre Project in regard to EFH will be initiated through the joint LDNR OCM – USACE public notice on the permit application.

Migratory Bird Treaty Act (USFWS)
Consultation with USFWS for the West Grand Terre Project in regard to migratory birds will be initiated through the joint LDNR OCM – USACE public notice on the permit application.

NHPA Section 106 – Consultation and Planning ACHP, SHPO(s), and/or THPO(s)
Five previously recorded archaeological sites are located on West Grand Terre Island. Only one site, Fort Livingston, is listed on the National Register of Historic Places (NRHP). The other four (4) archaeological sites have been determined ineligible for the NRHP by USACE NOD in consultation with the State Historic Preservation Office (SHPO).

CPRA has not yet initiated consultation with SHPO for the West Grand Terre Project. If Fort Livingston is within the Area of Potential Effect for the West Grand Terre Project, effects to this historic property will be assessed and any adverse effects will be resolved through consultation with SHPO and the Advisory Council on Historic Preservation (ACHP).

State

- A Fill Material License will be obtained from the Louisiana Department of Wildlife and Fisheries prior to the commencement of construction if borrow material is obtained from a near shore location in the Gulf of Mexico.

VII. Data / Information Sharing Plan

Introduction

CPRA has for over a decade made its coastal protection and restoration data and information widely available on the internet using a web-enabled, GIS-integrated system called SONRIS. Recently, ever growing responsibilities, an increase in data generation, and the need to deliver this information in a more timely and efficient manner have inspired an effort by the CPRA to significantly improve its data management and delivery capabilities. The first step was the development of a Data Management Plan in 2013 through a partnership with The Water Institute of the Gulf (The Water Institute of the Gulf, 2013). CPRA then partnered with the U.S. Geological Survey's National Wetlands Research Center (USGS) to produce the CPRA Coastal Information Management System (CIMS) in an effort to redesign and improve its data management and delivery capabilities. CIMS combines a network of webpages hosted by CPRA (www.coastal.la.gov), a GIS database, and a relational tabular database into one GIS-integrated system capable of robust visualizations and data delivery. Any data generated through this RESTORE project will be made available to the public as part of CPRA's ongoing efforts to share data and improve transparency; CPRA is committed to sharing information to help the public make science-based decisions.

Data Generation

CPRA and collaborators collect a variety of data, both programmatic and project-specific, in support of coastal protection and restoration projects and activities. These data typically include but are not limited to: hydrographic (e.g., water level, water quality, salinity), bathymetric and topographic (e.g., above and below water surface land elevations including erosion, land loss/gain, accretion), geotechnical (e.g., soil analysis and mechanics), geophysical (e.g., seismic, sidescan sonar), biological (e.g., fish and wildlife, vegetation), and photographic (aerial and satellite imagery). Specifically, CPRA has several ongoing coast-wide and programmatic data collection systems for program evaluation and facilitation. The Coast-wide Reference Monitoring System-Wetlands (CRMS) contains 390 sites and several thousand ecological monitoring stations that enable ecological assessments at the project, basin, and ecosystem level. These stations collect hourly hydrographic data, forested swamp and herbaceous marsh vegetation data, accretion, surface elevation, and soil properties data. The Barrier Island Comprehensive Monitoring Program (BICM) began in 2006 to provide long-term data on the barrier islands of Louisiana that could be used to plan, design, evaluate, and maintain current and future barrier island restoration projects. The BICM program uses both historical and newly acquired data to assess and monitor changes in the aerial and subaqueous extent of islands, habitat types, geotechnical properties, environmental processes, and vegetation composition. BICM datasets included aerial still and video photography for shoreline positions, habitat

mapping, and land loss; light detection and ranging (Lidar) surveys for topographic elevations; single-beam and swath bathymetry; and sediment grab samples. To manage sediment resources for coastal restoration projects the Louisiana Sand/Sediment Resource Database (LASARD) has been developed to identify and maintain geological, geotechnical, and geophysical data for marsh creation and barrier island projects. CPRA is currently working with the Water Institute of the Gulf to more fully develop a System-wide Assessment and Monitoring Program (SWAMP) that will bring these monitoring and assessment programs under one comprehensive umbrella in an effort to avoid duplication and improve efficiency.

Data Standards and Metadata

CPRA has an established Data Management Team (DMT) and is the primary contributor to the data system with additional data streams from federal and state agencies, universities and private contractors. CPRA has developed and documented policies, standard operating procedures, data conventions, and quality assurance/quality control procedures (QA/QC) for data collection of all data generated in support of the coastal protection and restoration program (Folse et al., 2012; BEM Systems, Inc. and Coastal Planning and Engineering, Inc., 2012; Coastal Protection and Restoration Authority of Louisiana, 2013). In conjunction with the development of the CIMS system, CPRA and USGS are developing and maintaining metadata for all CPRA data using Federal Geographic Data Committee (FGDC) standards.

Data Stewardship and Preservation

Data stewardship is provided by the CPRA DMT and associated consultants. Data integrity is checked with very detailed and complex QA/QC software routines prior to input into the database and additional automated routines when input into the database. Intensive use of data by CPRA staff and contractors who collect and input data into the database provide feedback on data quality and software routines to the CPRA DMT. Data preservation of the database is largely done through regular tape backup and/or cloud storage. All data and documents are kept in perpetuity.

Data Access and Security for Adaptive Management

The ability to learn from previous actions and to adaptively manage existing efforts is a critical step to improve the success of the State's coastal protection and restoration program. An important step in that process is sound data management that makes past data and information on project and program effectiveness available to project planners, engineers, and scientists. Also of critical importance is making coastal protection and restoration program information readily available to interested parties outside of the CPRA. Academic researchers can use the data generated by the program to improve the science informing the decision-making process. The general public can use the information to understand how current and future program actions will affect their daily activities, which helps promote program transparency. To that end, CPRA provides a web-based portal for all geospatial and tabular data and documents associated with coastal protection and restoration projects and for coast-wide programmatic data such as CRMS and BICM. In addition to background information on the State's coastal protection and restoration program, a wide variety of up-to-date information is available such as program documents, remote imagery, project information and boundaries, project infrastructure (including

levees, floodwalls, and pump stations), monitoring station locations, elevation benchmarks, ecological data, geophysical data, and information on the State's coastal community resiliency program. Users are able to perform a wide range of custom data retrievals for refining and summarizing information. Private-facing aspects of CIMS include remote data upload and QA/QC by CPRA staff and contractors. Security is provided through Secure Socket Layers of username/password access and software assignment of roles that allows differential access to database functions.

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IX. Other

Letters of support.

November 14, 2014

Coastal Protection and Restoration Authority
c/o Mr. Jerome Zeringue, Chairman
Office of the Governor, Coastal Activities
Capitol Annex Building, Suite 138
Baton Rouge, Louisiana 70802

Re: Comments on the State of Louisiana Projects for the RESTORE Act Funded Priorities List; West Grand Terre Beach Nourishment & Stabilization Project

Dear Coastal Protection and Restoration Authority members,

The undersigned groups appreciate this opportunity to share our collective supporting comments on the West Grand Terre Beach Nourishment and Stabilization Project, submitted by the State of Louisiana for RESTORE Council consideration for the first Funded Priorities List of the RESTORE Pot 2 Council-selected projects.

We represent a coalition of conservation interests that have worked for decades to restore a healthy Gulf of Mexico ecosystem – starting with prompt restoration of the Mississippi River Delta – reconnecting the Mississippi River to its delta to protect communities, environment, and economies. Our groups continue to recommend urgent action on projects that will reduce land loss and restore wetlands in the Mississippi River Delta through comprehensive restoration actions that have the potential to provide multiple benefits and services over the long term to the entire Gulf of Mexico.

West Grand Terre Barrier Island is part of the barrier island chain separating the productive and economically important Barataria Bay estuary from the Gulf of Mexico. These islands provide habitat for migratory birds, wildlife, and fish. They also serve as the first line of defense in protecting nearby coastal communities from devastating storm surge as well as protecting the interior coastal habitats of Barataria Bay, which includes bottomland hardwood forests, cypress swamps, marshes ranging from fresh to saltwater, from high energy waves and saltwater intrusion. However, increasing tidal forces caused by ever-growing interior bays, canals, navigation channels, subsidence, wave action and sea level rise have all attributed to the erosion and retreat of these barrier islands. This erosion has led to loss of the island and back marsh habitats and threatened the entire interior Barataria Bay estuarine ecosystem.

The West Grand Terre Beach Nourishment and Marsh Stabilization Project provides the Council with an opportunity to fund one project within a larger effort to restore the Barataria Basin Barrier Shoreline. Other reaches of the shoreline have been or will be funded through state surplus funds, the Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA), Coastal Impact Assistance Program (CIAP) and the National Fish and Wildlife Foundation (NFWF). Together these individual projects will re-establish

barrier shorelines critical for protecting nearby communities, will restore important migratory and shore bird habitat and will improve the ecosystem function of the barrier island system, preventing the wholesale loss of the lower Barataria Bay estuary.

Our groups support the development of the West Grand Terre Beach Nourishment and Marsh Stabilization Project. We commend the selection of this important segment of the Barataria Bay Barrier Shoreline by the Coastal Protection and Restoration Authority. We look forward to the construction of this project within the next few years as funding becomes available.

Sincerely,

Kim Reyher
Executive Director
Coalition to Restore Coastal Louisiana

Doug Meffert
Executive Director/Vice President
Audubon Louisiana

Steve Cochran
Director, Mississippi River Delta Program
Environmental Defense Fund

Karen Gautreaux
Director of Governmental Relations
The Nature Conservancy of Louisiana

John Lopez, PhD
Coastal Director
Lake Pontchartrain Basin Foundation

Rebecca Triche
Executive Director
Louisiana Wildlife Federation

David Muth
Director
Mississippi River Delta Restoration Program
National Wildlife Federation

Simone Maloz
Executive Director
Restore or Retreat

cc: Kyle Graham, Director, CPRA Implementation Office

ELIGIBILITY REVIEW

Bucket 2 – Council Selected Restoration Component

PROPOSAL TITLE

West Grand Terre Beach Nourishment and Stabilization

PROPOSAL NUMBER

LA-1

LOCATION

Jefferson Parish, Louisiana

SPONSOR(S)

Louisiana

TYPE OF FUNDING REQUESTED (Planning, Technical Assistance, Implementation)

Planning

REVIEWED BY:

Bethany Carl Kraft/ Ben Scaggs

DATE:

November 18, 2014

1. Does the project aim to restore and/or protect natural resources, ecosystems, fisheries, marine and wildlife habitat, beaches, coastal wetlands and economy of the Gulf Coast Region?

◉ YES ○ NO

Notes:

This proposal aims to accomplish West Grand Beach Nourishment and Stabilization.

2. Is the proposal a project?

◉ YES ○ NO

If yes, is the proposed activity a discrete project or group of projects where the full scope of the restoration or protection activity has been defined?

◉ YES ○ NO

Notes:

3. Is the proposal a program?

◯ YES ◉ NO

If yes, does the proposed activity establish a program where the program manager will solicit, evaluate, select, and carry out discrete projects that best meet the program's restoration objectives and evaluation criteria?

◯ YES ◯ NO

Notes:

4. Is the project within the Gulf Coast Region of the respective Gulf States?

◉ YES ◯ NO

If no, do project benefits accrue in the Gulf Coast Region?

◯ YES ◯ NO

Notes:

Eligibility Determination

ELIGIBLE

Additional Information

Proposal Submission Requirements

1. Is the project submission overall layout complete? ***Check if included and formatted correctly.***

A. Summary sheet	☑	F. Environmental compliance checklist	☑
B. Executive summary	☑	G. Data/Information sharing plan	☑
C. Proposal narrative	☑	H. Reference list	☑
D. Location information	☑	I. Other	☑
E. High level budget narrative	☑		

If any items are NOT included - please list and provide details

2. Are all proposal components presented within the specified page limits (if applicable)?

◉ YES ○ NO

Notes: