



# **19<sup>th</sup> PRIORITY PROJECT LIST REPORT**

**PREPARED BY:**

**LOUISIANA COASTAL WETLANDS CONSERVATION AND RESTORATION**

**TASK FORCE**

**October 2010**



# **Coastal Wetlands Planning, Protection, and Restoration Act**

## **19<sup>th</sup> Priority Project List Report**

### **Executive Summary and Status of the CWPPRA Program**

In 1990, Congress established the Coastal Wetlands Planning, Protection, and Restoration Act (CWPPRA, PL 101-646, Title III) to provide for the long-term conservation of Louisiana's coastal wetlands (see Appendix A). Section 303(a) of the CWPPRA directed the Secretary of the Army to convene the Louisiana Coastal Wetlands Conservation and Restoration Task Force to initiate a process to identify and prepare a list of coastal wetlands restoration projects in Louisiana to provide for the long-term conservation of such wetlands and dependent fish and wildlife populations in order of priority, based upon the cost-effectiveness of such projects in creating, restoring, protecting, or enhancing coastal wetlands taking into account the quality of such coastal wetlands with due allowance for small-scale projects necessary to demonstrate the use of new techniques or materials for coastal wetlands restoration.

Section 303(a) also requires that the list of priority projects be updated and transmitted to Congress annually. According to Section 303 (a), the Task Force initiated an annual Priority Project List (PPL) process in 1991. This report transmits the 19<sup>th</sup> PPL (PPL 19) and fulfills the requirements of CWPPRA Section 303(a).

Under the development of PPL 19, parish officials, state and federal agencies met at four regional coastal meetings to nominate 20 projects and 6 demonstration projects in February 2009. Ten candidate projects and three candidate demonstration projects were selected from the list of nominees. These PPL 19 candidate projects were evaluated to determine the long-term net wetlands benefits based on a 20-year project life. Benefits were measured in both net acres and net Average Annual Habitat Units (AAHUs). The candidate projects were also evaluated to determine conceptual project designs and cost estimates. Economic analyses were conducted to determine the total fully funded cost estimate for feasibility planning, construction, and twenty years of operations and maintenance. Cost-effectiveness was calculated for each project using the fully funded cost estimate and net wetland benefits over the twenty year project life.

At the end of the PPL 19 development process the Task Force authorized the following four new coastal restoration projects:

- Lost Lake Marsh Creation and Hydrologic Restoration
- Freshwater Bayou Marsh Creation
- LaBranche East Marsh Creation
- Cheniere Ronquille Barrier Island Restoration

These PPL 19 projects will be implemented in two phases. Phase I will include data collection, engineering and design, environmental impact assessment and regulatory compliance, pre-construction monitoring, and real estate planning. The total Phase I cost for the four new PPL 19 coastal restoration projects is estimated to be \$10,736,747. Phase II would include real estate acquisition, construction, operation and maintenance, and post-construction monitoring. The total Phase II cost for these four projects is estimated to be

\$113,882,450. The total net wetland benefit that would be derived by implementing the four PPL 19 projects is estimated to be 1,977 acres or 918 AAHUs over a 20-year period. The Task Force will consider approving Phase II funding for individual PPL 19 projects after Phase I requirements have been met for each.

Since the last PPL Report to Congress, the Task Force de-authorized the following two projects because they did not represent the best strategy for addressing the immediate and/or long term coastal restoration needs as compared to other priority projects, and/or the project scope was beyond the funding capability of the CWPPRA Program:

- Castille Pass Channel Sediment Delivery Project (AT-04), PPL 9
- Mississippi River Sediment Trap (MR-12), PPL 12

With the addition of the four new PPL 19 projects and the removal of the two de-authorized projects, there are a total of 148 active Louisiana coastal restoration projects in the CWPPRA Program. The current estimated cost for the 148 projects combined is \$2.2B. The current funded cost estimate for approved phases for all projects is \$1.1B. At the time of the production of this PPL 19 report, \$856,874,828 has been obligated and \$568,060,973 has been expended on the 148 active CWPPRA coastal restoration projects in Louisiana since inception of the Program in 1991. Since the last PPL report, the Program has expended \$111,340,489. Of the 148 active projects, 85 projects have completed construction, 12 projects are under construction, and 51 projects are in various stages of planning and design. The Task Force has determined that these active projects represent the best strategy for addressing the immediate and/or long-term needs of Louisiana's coastal wetlands within the available and projected future funding limits of the CWPPRA Program. Given the significant need for coastal wetlands restoration in Louisiana, the Task Force often generates more projects than the CWPPRA Program has funding in hand to build. As such, Phase II funding of projects will be based on CWPPRA Program funding availability at the time of funding request. In 2004 Congress reauthorized CWPPRA through 2019, although the program is expected to reach its capacity to authorize new PPL projects within the next few years. Even though CWPPRA has received more than \$80 million each year over the last several years, there continues to be a backlog of construction-ready projects. To offset this back-log, the Task Force continues to de-authorize projects that are beyond the funding capability of the CWPPRA Program or do not represent the best strategy for addressing the immediate and long-term needs of Louisiana's coastal wetlands under CWPPRA.

# Coastal Wetlands Planning, Protection, and Restoration Act

## 19<sup>th</sup> Priority Project List Report

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# **Coastal Wetlands Planning, Protection, and Restoration Act**

## **19<sup>th</sup> Priority Project List Report**

### **Main Report – Volume 1**

#### **I. INTRODUCTION**

Approximately 90 percent of the total coastal marsh loss within the lower 48 states occurs in the State of Louisiana. These losses are due to a combination of human and natural factors, including subsidence, shoreline erosion, freshwater and sediment deprivation, saltwater intrusion, oil and gas production and canals, navigation channels, and herbivory. Louisiana's coastal zone contains 45 percent of all intertidal coastal marshes in the lower forty-eight states; however, it is suffering 80 percent of the entire Nation's annual coastal wetland loss. Since the 1930s, coastal Louisiana has lost over 1,875 square miles, an area more than 25 times larger than Washington D.C. As recently as the year 2000, the annual loss rate was quantified as 24 square miles per year. From 2000 to 2050, 513 square miles are projected to be lost. In addition, the U.S. Geological Survey (USGS) estimated the Hurricanes Katrina and Rita (2005) alone accounted for converting 217 square miles (138,880 acres) of coastal marsh to open water along the Louisiana coast. Concern over this loss exists because of the living resources and national economies dependent on Louisiana's coastal wetlands. These wetlands provide habitat for fisheries, waterfowl, neotropical birds, and furbearers; amenities for recreation and tourism; a buffer for coastal flooding; and a natural landscape for a culture unique to the world. Consequently, benefits go well beyond the local and state levels by providing positive economic impacts to the entire nation.

The coastal wetland loss problem in Louisiana is extensive and complex. Agencies of diverse purposes and missions involved with addressing the problem have proposed many alternative solutions. These proposals have had a wide spectrum of approaches for diminishing, neutralizing, or reversing these losses. An observation of these efforts by federal, state and local governments and the public has led to the conclusion that a comprehensive approach is needed to address this significant environmental problem. In response to this, the Coastal Wetlands Planning, Protection, and Restoration Act (Public Law 101-646) – also known as the Breaux Act – was signed into law by President George H.W. Bush on November 29, 1990. This report documents the implementation of Section 303(a) of the cited legislation.

#### **STUDY AUTHORITY**

Section 303(a) of the Coastal Wetlands Planning, Protection, and Restoration Act (CWPPRA, or the Breaux Act), displayed in Appendix A, directs the Secretary of the Army to convene the Louisiana Coastal Wetlands Conservation and Restoration Task Force to:

. . . initiate a process to identify and prepare a list of coastal wetlands restoration projects in Louisiana to provide for the long-term conservation of such wetlands and dependent fish and wildlife populations in order of priority, based upon the cost-effectiveness of such projects in creating, restoring, protecting, or enhancing coastal wetlands, taking into account the quality of such coastal

wetlands, with due allowance for small-scale projects necessary to demonstrate the use of new techniques or materials for coastal wetlands restoration.

## STUDY PURPOSE

The purpose of this study effort was to prepare the 19<sup>th</sup> Priority Project List (PPL) and transmit the list to Congress, as specified in Section 303(a)(3) of the CWPPRA. Section 303(b) of the Act calls for preparation of a comprehensive restoration plan for coastal Louisiana. In November 1993, the Louisiana Coastal Wetlands Restoration Plan was submitted. In December 1998, *Coast 2050: Toward a Sustainable Coastal Louisiana* was signed by all federal and state Task Force members. This plan consisted of several regional ecosystem strategies, which if all implemented could maintain a self-sustaining ecosystem along the Louisiana coast. A broad coalition of federal, state, and local entities, landowners, environmentalists, and wetland scientists developed the plan. In addition, all 20 coastal parishes approved the Coast 2050 plan.

## PROJECT AREA

The entire coastal area, which comprises all or part of 20 Louisiana parishes, is considered to be the CWPPRA project area. To facilitate the study process, the coastal zone was divided into four regions with nine hydrologic basins (Plate 1). Plate 2 contains a listing of project names for each PPL, referenced by number and grouped by sponsoring agency. A map of the Louisiana coastal zone is presented in Plates 3-7, indicating project locations by number of Priority Project Lists 1 through 19. All Plates can be found at the end of this report.

## STUDY PROCESS

The Interagency Planning Groups. Section 303(a)(1) of the CWPPRA directs the Secretary of the Army to convene the Louisiana Coastal Wetlands Conservation and Restoration Task Force (the Task Force), to consist of the following members:

- The Secretary of the Army (Chairman)
- The Administrator, Environmental Protection Agency
- The Governor, State of Louisiana
- The Secretary of the Interior
- The Secretary of Agriculture
- The Secretary of Commerce

The State of Louisiana is a full voting member of the Task Force, with the exception of budget matters, as stipulated in President George H.W. Bush's November 29, 1990, signing statement (Appendix A). In addition, the State of Louisiana may not serve as a "lead" Task Force agency for design and construction of wetlands projects of the PPL.

In practice, the Task Force members named by the law have delegated their responsibilities to other members of their organizations. For instance, the Secretary of the Army authorized the Commander of the U.S. Army Corps of Engineers (USACE) New Orleans District to act in his place as chairman of the Task Force. The other federal agencies on the CWPPRA Task Force include: U.S. Fish and Wildlife Service (USFWS) of



the U.S. Department of Interior, the Natural Resources Conservation Service (NRCS) of the U.S. Department of Commerce, and the U.S. Environmental Protection Agency (USEPA). The Governor's Office of the State of Louisiana represents the state as a Task Force member.

The Task Force established the Technical Committee and the Planning and Evaluation (P&E) Subcommittee, to assist it in putting the CWPPRA into action. Each of these bodies contains the same representation as the Task Force – one member from each of the five federal agencies and one from the state. The P&E Subcommittee is responsible for the actual planning of projects, as well as the other details involved in the CWPPRA process (such as development of schedules, budgets, etc.). This subcommittee makes recommendations to the Technical Committee and lays the groundwork for decisions that will ultimately be made by the Task Force. The Technical Committee reviews all materials prepared by the subcommittee, makes appropriate revisions, and provides recommendations to the Task Force. The Technical Committee operates at an intermediate level between the planning details considered by the subcommittee and the policy matters dealt with by the Task Force, and often formalizes procedures and formulates policy for the Task Force.

The P&E Subcommittee established several working groups to evaluate projects for priority project lists. The Environmental Work Group was charged with estimating the benefits (in terms of wetlands created, protected, enhanced, or restored) associated with various projects. The Engineering Work Group reviewed project and design cost estimates for consistency. The Economic Work Group performed the economic analysis, which permitted comparison of projects on the basis of their cost effectiveness. The Monitoring Work Group established a standard procedure for monitoring of CWPPRA projects, developed a monitoring cost estimating procedure based on project type, and a review of all monitoring plans.

Involvement of the Academic Community. While the agencies sitting on the Task Force possess considerable expertise regarding Louisiana's coastal wetlands problems, the Task Force recognized the need to incorporate another invaluable resource: the state's academic community. The Task Force therefore retained the services of the Louisiana Universities Marine Consortium (LUMCON) to provide scientific advisors to aid the Environmental Work Group in performing Wetland Value Assessments (WVAs). This Academic Advisory Group (AAG) also assisted in carrying out feasibility studies authorized by the Task Force. These include:

- The Louisiana Barrier Shoreline study – March 1995 - March 1999 (managed by the Louisiana Department of Natural Resources [LDNR]\*)
- The Mississippi River Sediment, Nutrient, and Freshwater Redistribution study – March 1995 – July 2000 (managed by the USACE)

Public Involvement. The CWPPRA public involvement program provides an opportunity for all interested parties to express their concerns and opinions and to submit their ideas concerning the problems facing Louisiana's wetlands. The Task Force and the Technical Committee held six public meetings annually to obtain input from the public. In addition, the Task Force distributes a quarterly newsletter ("Watermarks") with information on the CWPPRA program and on individual projects.

\*Because of the devastation of hurricanes Katrina and Rita, in December 2005, the Louisiana Legislature restructured the State's Wetland Conservation and Restoration Authority to form the Coastal Protection and Restoration Authority (CPRA). Agencies in the CPRA membership include Louisiana Department of Natural Resources (LDNR).

## II. PLAN FORMULATION PROCESS FOR THE 19<sup>th</sup> PRIORITY PROJECT LIST

### IDENTIFICATION & SELECTION OF CANDIDATE & DEMONSTRATION PROJECTS

Regional Planning Team (RPT) meetings were held during the period of January 27 through January 29, 2009 to provide a forum for the public and their local government representatives to identify potential projects for implementation under the priority list process. The RPT met to examine basin maps, discuss areas of need and Coast 2050 strategies, and to propose projects and demonstration projects. A separate coast-wide voting meeting was held on February 18, 2009 for the 19<sup>th</sup> PPL to choose no more than two projects per hydrologic basin, as per the accepted process. In reality one project was selected from the Mississippi River and Atchafalaya Basins and three projects were selected from Breton Sound, Barataria, Terrebonne, and Calcasieu/Sabine Basins because of the high loss rates in those basins. In addition, six demonstration projects were selected as nominees. A total of twenty projects and six demonstration projects were nominated. A schedule of meetings is shown in Table 1.

**Table 1: RPT Meetings to Propose/Nominate Projects**

Region 1: New Orleans, LA	January 29, 2009
Region 2: New Orleans, LA	January 29, 2009
Region 3: Morgan City, LA	January 28, 2009
Region 4: Rockefeller Refuge, LA	January 27, 2009
Coast-wide Voting Meeting, Baton Rouge, LA	February 18, 2009

The Engineering and Environmental Work Groups and the AAG met March 23 and March 24, 2009 to review and reach consensus on preliminary project features, benefits, and fully-funded cost estimates for the twenty nominated projects. The Engineering and Environmental Work Groups also identified any potential issues associated with each nominee. The P&E Subcommittee prepared a matrix of nominated projects' cost estimates and benefits and furnished it to the Technical Committee and Coastal Protection Restoration Authority (CPRA) on April 3, 2009. The matrix is included as Table 2.

**Table 2a: 19<sup>th</sup> Project Priority List - Candidate Nominee Project Matrix by Basin**

Rg	Basin	Type	Project	Preliminary Fully-Funded Cost Range	Preliminary Benefits (Net Acres Range)	Potential Issues				
						Oysters	Land Rights	Pipelines /Utilities	O&M	Other Issues
1	PO	MC/TR	Fritchie Marsh-Northshore Marsh Creation and Terracing Project	\$20M - \$25M	300-350			X		X
1	PO	MC	Seven Lagoons/ GIWW Marsh Creation, Shoreline Protection and Terracing	\$25M - \$30M	200-250					X
1	PO	MC	LaBranche East Marsh Creation Habitat Enhancement	\$30M - \$35M	500-550					
2	MR	FD/MC	Pass a Loutre Restoration Project	\$30M - \$35M	1,100-1,150			X		X
2	BS	FD	Monsecour Siphon	\$10M - \$15M	1,150-1,200	X		X	X	
2	BS	MC/O&M	Dedicated Sediment Delivery and Water Conveyance for Marsh Creation West of Big Mar	\$20M - \$25M	950-1,000			X	X	
2	BS	MC	Breton Marsh Restoration	\$25M - \$30M	350-400			X		
2	BA	MC	Bayou Dupont to Bayou Barataria Marsh Creation	\$25M - \$30M	250-300			X	X	
2	BA	HR/TR	Bayou L'Ours Ridge Restoration and Terracing	\$5M - \$10M	100-150					
2	BA	BI	Chenier Ronquille Barrier Shoreline Restoration and Marsh Creation	\$40M - \$50M	200-250	X		X		
3	TE	MC/HR	Lost Lake Marsh Creation and Hydrologic Restoration	\$25M - \$30M	600-650			X	X	
3	TE	MC	Terrebonne Bay Shoreline Restoration and Marsh Creation	\$25M - \$30M	250-300	X		X		
3	TE	MC	Madison/Terrebonne Bays Marsh Creation	\$15M - \$20M	150-200	X		X		
3	AT	TR	Bateman Island Sediment Retention and Marsh Restoration	\$0M - \$5M	50-100			X		
3	TV	SP/FD	Cote Blanche Freshwater/Sediment Introduction and Shoreline Protection Project	\$15M - \$20M	550-600			X	X	
3	TV	MC	Cheniere Au Tigre Headland Restoration	\$5M - \$10M	0-50	X		X		
4	ME	MC	Freshwater Bayou Marsh Creation	\$30M - \$35M	250-300			X		
4	ME	SP	Rockefeller Gulf of Mexico Shoreline Stabilization, Joseph's Harbor East	\$35M - \$40M	100-150			X	X	
4	CS	MC	Cameron-Creole Watershed Grand Bayou Marsh Creation Project	\$15M - \$20M	500-550	X				
4	CS	MC/HR	Kelso Bayou Marsh Creation and Hydrologic Restoration	\$15M - \$20M	100-150			X	X	

Basin codes are: PO=Pontchartrain; MR=Mississippi River Delta; BS=Breton Sound; BA=Barataria; TE=Terrebonne; AT=Atchafalaya; TV=Teche/Vermilion; ME=Mermentau; CS=Calcasieu/Sabine.

Type codes: FD=Freshwater Diversion; HR=Hydrologic Restoration; MC=Marsh Creation; O&M= Operation and Maintenance; SP=Shoreline Protection; TR=Terracing; BI=Barrier Island; VP=Vegetative Plantings.

**Table 2b: 19<sup>th</sup> Project Priority List Demonstration Nominee Project Matrix**

Demonstration Project Name	Meets Demonstration Project Criteria?	Lead Agency	Total Fully-Funded Cost	Technique Demonstrated
Rapidly Deployable Pre-cast Sediment Retention Barrier	Yes	NMFS	\$1,093,750	Evaluate the effectiveness of pre-cast concrete barriers as retention structures for dredged material as a potential alternative to earthen containment dikes.
EcoSystems Wave Attenuator for Shoreline Protection Demo	Yes	NMFS	\$1,500,000	Evaluate the effectiveness of the EcoSystems Wave Attenuator as an alternative method of shoreline protection in areas where site conditions limit or preclude traditional methods.
Bayou Backer Demo	Yes	NMFS	\$520,000	Evaluate the effectiveness of a bio-grass product in reducing shoreline erosion.
Floating Island Environmental Solutions BioHaven©	Yes	USACE	\$1,835,000	Evaluate the effectiveness of floating marsh islands to reduce wave fetch, trap sediment, and establish floating marsh. In addition, evaluate their effectiveness as an alternative to earthen terraces in areas of poor soils.
ViperWall Demo	Yes	NRCS	\$1,500,000	Evaluate the effectiveness of the ViperWall system to serve as a wave break and sediment collection system.

At the January 21, 2009 Task Force meeting, the Task Force decided to allow ten candidate projects to be considered under PPL19. The CWPPRA Technical Committee met publicly on April 15, 2009 to consider the preliminary costs, wetland benefits, and potential issues of the twenty nominees. Ten candidate projects were selected for detailed assessment by the Environmental, Engineering, and Economic Work Groups, and the AAG (Table 4).

Phase 0 analysis of the ten candidate projects took place April 2009 through September 2009. Interagency field visits were conducted during May and June 2009 at each project site/area with members of the Engineering and Environmental Work Groups and the AAG. The Environmental and Engineering Work Groups and AAG met to refine the projects and develop boundaries on June 30, 2009, based on site visits. Detailed project information packages were developed by the Environmental, Engineering, and Economics Work Groups. These packages included fact sheets addressing "compatibility with Coast 2050," Project Information Sheets containing the benefits analyses, Preliminary Engineering and Design Reports containing the preliminary design and cost estimates, and Economic Analyses containing fully-funded twenty-year project costs. On August 12 through August 14, 2009, the Engineering Work Group met to review and approve the Phase I and II cost estimates developed by the agencies for the ten PPL19 candidates and three PPL19 demonstration candidates. In September 2009, the Environmental Work Group finalized WVAs for each project. The Engineering Work Group reviewed and finalized the final project cost estimates for each project on September 17, 2009. The Economics Work Group reviewed the final project cost estimates and developed annualized costs in the month of October 2009.

The Environmental and Engineering Work Groups and AAG also met on September 16, 2009 to evaluate and rank the three demonstration projects. Demonstration projects were evaluated using defined parameters. Within each of these parameters a project was graded as low, medium or high and assigned point scores of 1, 2, or 3, respectively. The summary of the evaluation from the Environmental and Engineering Work Groups and AAG is shown in Table 3.

The parameters used to evaluate the demonstration projects were:

(P<sub>1</sub>) Innovativeness - The demonstration project should contain technology that has not been fully developed for routine application in coastal Louisiana or in certain regions of the coastal zone. The technology demonstrated should be unique and not duplicative in nature to traditional methods or other previously tested techniques for which the results are known. Techniques which are similar to traditional methods or other previously tested techniques should receive lower scores than those which are truly unique and innovative.

(P<sub>2</sub>) Applicability or Transferability - Demonstration projects should contain technology which can be transferred to other areas of the coastal zone. However, this does not imply that the technology must be applicable to all areas of the coastal zone. Techniques, which can only be applied in certain wetland types or in certain coastal regions, are acceptable but may receive lower scores than techniques with broad applicability.

(P<sub>3</sub>) Potential Cost Effectiveness - The potential cost-effectiveness of the demonstration project's method of achieving project objectives should be compared to the cost-effectiveness of traditional methods. In other words, techniques which provide substantial cost savings over traditional methods should receive higher scores than those with less substantial cost savings. Those techniques which would be more costly than traditional methods, to provide the same level of benefits, should receive the lowest scores. Information supporting any claims of potential cost savings should be provided.

(P<sub>4</sub>) Potential Environmental Benefits - Does the demonstration project have the potential to provide environmental benefits equal to traditional methods? Somewhat less than traditional methods? Above and beyond traditional methods? Techniques with the potential to provide benefits above and beyond those provided by traditional techniques should receive the highest scores.

(P<sub>5</sub>) Recognized Need for the Information to be Acquired - Within the restoration community, is there a recognized need for information on the technique being investigated? Demonstration projects which provide information on techniques for which there is a great need should receive the highest scores.

(P<sub>6</sub>) Potential for Technological Advancement - Would the demonstration project significantly advance the traditional technology currently being used to achieve project objectives? Those techniques which have a high potential for completely replacing an existing technique at a lower cost and without reducing wetland benefits should receive the highest scores.

**Table 3: Review of 19<sup>th</sup> Priority Project List Candidate Demonstration Projects**

Demonstration Project Name	Parameter (Pn)							Total Score
	Total Fully-Funded Cost	P <sub>1</sub>	P <sub>2</sub>	P <sub>3</sub>	P <sub>4</sub>	P <sub>5</sub>	P <sub>6</sub>	
ViperWall	\$1,427,154	3	3	2	3	3	2	16
EcoSystems Wave Attenuator	\$2,214,945	3	3	2	2	3	2	15
Bayou Backer	\$910,893	3	2	3	1	2	1	12

Demonstration Project Parameters: (P<sub>1</sub>) Innovativeness; (P<sub>2</sub>) Applicability or Transferability; (P<sub>3</sub>) Potential Cost Effectiveness; (P<sub>4</sub>) Potential Environmental Benefits; (P<sub>5</sub>) Recognized Need for the Information to be Acquired; (P<sub>6</sub>) Potential for Technological Advancement. Parameter Grading as to effect: 1= low; 2 = medium; 3 = high

The Environmental and Engineering Work Groups prepared a candidate project information package for the CWPPRA Technical Committee, consisting of updated Project Information Sheets and matrix. The matrix included average annual habitat units (AAHUs), acres created, restored, and/or protected, and costs. The matrix is included as Table 4.

**Table 4: 19<sup>th</sup> Priority Project List Candidate Project Evaluation Matrix**

Project Name	AAHUs	WVA Net Acres	Total Fully-Funded Cost	Average Annual Cost (AAC)	Cost Effectiveness (AAC/AAHU)	Cost Effectiveness (Cost/Net Acre)
Fritchie Marsh Terracing and Marsh Creation	178	449	\$24,273,654	\$1,820,587	\$10,228	\$54,062
LaBranche East Marsh Creation	339	715	\$32,323,291	\$2,436,410	\$7,187	\$45,207
Monsecour Siphon	882	990	\$10,607,905	\$756,765	\$858	\$10,715
Dedicated Sediment Delivery and Water Conveyance for Marsh	408	853	\$20,443,392	\$1,491,237	\$3,655	\$23,966
Breton Marsh Restoration	140	275	\$14,599,655	\$1,106,407	\$7,903	\$53,090
Bayou Dupont to Bayou Barataria Marsh Creation	173	292	\$37,631,550	\$2,885,713	\$16,680	\$128,875
Cheniere Ronquille Barrier Island Restoration	190	234	\$43,828,285	\$3,305,651	\$17,398	\$187,300
Lost Lake Marsh Creation and Hydrologic Restoration	281	749	\$22,943,866	\$1,683,509	\$5,991	\$30,633
Freshwater Bayou Marsh Creation	108	279	\$25,523,755	\$1,949,749	\$18,053	\$91,483
Cameron-Creole Watershed Grand Bayou Marsh Creation	210	550	\$23,380,486	\$1,770,844	\$8,433	\$42,510

Two public meetings were held in Abbeville, LA, and New Orleans, LA, respectively, November 17 and 18, 2009, to present projects to the public for comment.

The CWPPRA Technical Committee met on December 2, 2009 to select projects for recommendation to the CWPPRA Task Force for Phase I funding. Each agency cast a total of six weighted votes, used to rank the ten candidate projects. Projects were ranked by

number of agency votes first and total weighted score second. The top four projects were selected for recommendation to the CWPPRA Task Force for Phase I funding approval. The Technical Committee did not rank or recommend any demonstration projects for the CWPPRA Task Force to approve funding. The results of the CWPPRA Technical Committee vote are outlined in Table 5. On January 20, 2010, the CWPPRA Task Force reviewed the Technical Committee recommendations and moved to adopt the recommendation without change.

**Table 5: 19<sup>th</sup> Priority Project List Candidate Selection Process – Agency Voting Record**

*Project No.	Nominee Project Name	Coast 2050 Region	USACE	STATE	EPA	FWS	NRCS	NMFS	No. of Votes	Sum of Point Score
TE-72	Lost Lake Marsh Creation and Hydrologic Restoration	R3	2	3	2	6	6	1	6	20
ME-31	Freshwater Bayou Marsh Creation	R4	3	5	4		2	6	5	20
PO-75	LaBranche East Marsh Creation	R1	4	2	3	2		5	5	16
BA-76	Cheniere Ronquille Barrier Island Restoration	R2		6	5	1	4		4	16
+	Cameron-Creole Watershed Grand Bayou Marsh Creation	R4	6	1		5	1		4	13
+	Fritchie Marsh Terracing and Marsh Creation	R1	1			4	5	2	4	12
+	Monsecour Siphon	R2			6			4	2	10
+	Breton Marsh Restoration	R2	5			3			2	8
+	Bayou Dupont to Bayou Barataria Marsh Creation	R2		4				3	2	7
+	Dedicated Sediment Delivery and Water Conveyance for Marsh Creation Near Big Mar	R2			1		3		2	4

\*Each selected project received a two-letter code to identify its basin; these codes are: PO-Ponchartrain; BS-Breton Sound, MR- Mississippi River Delta; BA-Barataria; TE-Terrebonne; AT-Atchafalaya; TV-Teche/Vermilion; ME-Mermentau; CS-Calcasieu/Sabine.

+ These projects were not selected for funding.

## EVALUATION OF CANDIDATE PROJECTS

**Benefit Analysis (WVA).** The WVA is a quantitative, habitat-based assessment methodology developed for use in analyzing benefits of project proposals submitted for funding under the Breaux Act. The WVA quantifies changes in fish and wildlife habitat quality and quantity that are projected to emerge or develop as a result of a proposed wetland enhancement project. The results of the WVA, measured in AAHUs, can be combined with economic data to provide a measure of the effectiveness of a proposed project in terms of annualized cost per AAHU protected and/or gained.

The Environmental Work Group developed a WVA for each project. The WVA has been developed strictly for use in ranking proposed CWPPRA projects; it is not intended to provide a detailed, comprehensive methodology for establishing baseline conditions within a project area. It is a modification of the Habitat Evaluation Procedures (HEP) developed by the USFWS (USFWS, 1980). HEP is widely used by the USFWS and other federal and state agencies in



evaluating the impacts of development projects on fish and wildlife resources. A notable difference exists between the two methodologies. The HEP generally uses a species-oriented approach, whereas the WVA uses a community approach.

The following coastal Louisiana wetland types can be evaluated using WVA models: fresh marsh (including intermediate marsh), brackish marsh, saline marsh, cypress-tupelo swamp, barrier headland, barrier island, coastal chenier ridge, and bottomland hardwoods. Future reference in this document to "wetland" or "wetland type" refers to one or more of these four communities.

These models operate under the assumption that optimal conditions for fish and wildlife habitat within a given coastal wetland type can be characterized, and that existing or predicted conditions can be compared to that optimum to provide an index of habitat quality. Habitat quality is estimated or expressed through the use of a mathematical model developed specifically for each wetland type. Each model consists of the following components:

1. A list of variables that are considered important in characterizing fish and wildlife habitat:
  - a.  $V_1$ --percent of wetland covered by emergent vegetation,
  - b.  $V_2$ --percent open water dominated by submerged aquatic vegetation,
  - c.  $V_3$ --marsh edge and interspersions,
  - d.  $V_4$ --percent open water less than or equal to 1.5 feet deep,
  - e.  $V_5$ --salinity, and
  - f.  $V_6$ --aquatic organism access.
2. A Suitability Index graph for each variable, which defines the assumed relationship between habitat quality (Suitability Index) and different variable values; and
3. A mathematical formula that combines the Suitability Index for each variable into a single value for wetland habitat quality; that single value is referred to as the Habitat Suitability Index, or HSI.

The WVA models have been developed for determining the suitability of Louisiana coastal wetlands for providing resting, foraging, breeding, and nursery habitat to a diverse assemblage of fish and wildlife species. Models have been designed to function at a community level and therefore attempt to define an optimum combination of habitat conditions for all fish and wildlife species utilizing a given marsh type over a year or longer.

The output of each model (the HSI) is assumed to have a linear relationship with the suitability of a coastal wetland system in providing fish and wildlife habitat. A comprehensive discussion of the WVA methodology is presented in Appendix B.

Designs and Cost Analysis. During the plan formulation process, each of the Task Force agencies assumed responsibility for developing designs and estimates of costs and benefits for a number of candidate projects. The cost estimates for the projects were to be itemized as follows:

1. Construction Cost
2. Contingencies Cost (25%)
3. Engineering and Design

4. Environmental Compliance
5. Supervision and Administration (Federal and Non-Federal)
6. Supervision and Inspection (Construction Contract)
7. Real Estate
8. Operations and Maintenance
9. Monitoring

In addition, each lead agency provided a detailed itemized construction cost estimate for each project.

An Engineering Work Group was established by the P&E Subcommittee, with each federal agency and the State of Louisiana represented. The Engineering Work Group reviewed each estimate for accuracy and consistency.

When reviewing the construction cost estimates, the Engineering Work Group verified that each project feature had an associated cost and that the quantity and unit prices for those items were reasonable. In addition, the Engineering Work Group reviewed the design of the projects to determine whether the method of construction was appropriate and the design was feasible.

A 25% contingency was applied to construction, operations and maintenance costs on all projects because detailed project specific information such as soil borings, surveys, and hydrologic data were not collected. Construction unit costs, engineering and design, environmental compliance, real estate acquisition, supervision and administration, and supervision and inspection costs were reviewed for reasonableness.

Economic Analysis. The Breaux Act directed the Task Force to develop a prioritized list of wetland projects "based on the cost-effectiveness of such projects in creating, restoring, protecting, or enhancing coastal wetlands, taking into account the quality of such coastal wetlands." The Task Force satisfied this requirement through the integration of a traditional time-value analysis of life-cycle project costs and other economic impacts, and an evaluation of wetlands benefits using the WVA. The product of these two analyses was an Average Annual Cost per AAHU for each project. These values are used as the primary ranking criterion. The method permits incremental analysis of varying scales of investment and also accommodates the varying salinity types and habitat quality characteristics of projected wetland outputs.

The major inputs to the cost effectiveness analysis are the products of the lead Task Force agencies and the Engineering and Environmental Work Groups. The various plans were refined into estimates of annual implementation costs and respective AAHUs.

Financial costs chiefly consist of the resources needed to plan, design, construct, operate, monitor, and maintain the project. These are the costs, when adjusted for inflation, which the Task Force uses in budgeting decisions.

The stream of costs for each project was brought to present value and annualized at the current discount rate, based on a 20-year project life. Beneficial environmental outputs were annualized at a zero discount rate and expressed as AAHUs. These data were then used to rank each plan based on cost per AAHU produced. Annual costs were also calculated on a per-acre basis. Costs were adjusted to account for projected levels of inflation and used to monitor overall budgeting and any future cost escalations in accordance with rules established by the Task Force.

Following the review by the Engineering Work Group, costs were expressed as first costs, fully-funded costs, present worth costs, and average annual costs. The Cost per Habitat Unit criterion was derived by dividing the average annual cost for each wetland project by the AAHU for each wetland project. The average annual cost figures are based on price levels for the current year, the most current published discount rate, and a project life of 20 years. The fully-funded cost estimates include operation and maintenance and other compensated financial costs. Fully-funded cost estimates are developed for each project to determine how many projects could be supported through the Authorized program lifetime.



### **III. DESCRIPTION OF CANDIDATE PROJECTS**

This section provides a concise narrative of each candidate project. The project details provided include the Coast 2050 strategy, project location, problem, goals, proposed solution, benefits, costs, sponsoring agency and contact persons, and a map identifying the project area and features if applicable.

**Project Name: Bayou Dupont to Bayou Barataria Marsh Creation Project**

**Coast 2050 Strategy:**

Regional Strategy 26 – Dedicated dredging to create marsh on the land bridge.

**Project Location:** Region 2, Barataria Basin, Jefferson Parish, extending southward from the PPL17 Bayou Dupont Project (BA-48) to the Bayou Barataria ridge.

**Problem:** The marshes located between Bayou Dupont and Bayou Barataria are very deteriorated. The deteriorated marsh, along with numerous canals, allows a level of tidal exchange that is considerably greater than historic conditions.

**Goals:** The proposed project will re-establish a landmass between Bayou Dupont and Bayou Barataria, aid in storm surge reduction, provide bottomland hardwood habitat, and partially restore the area's hydrology.

**Proposed Solution:** Approximately 311 acres of marsh creation, 200 acres of marsh nourishment, and 19 acres of bottomland hardwood ridge restoration would be performed using dredged material. Target marsh creation and nourishment height is 1.4 NAVD88. Marsh creation containment dikes will be breached as needed to re-establish tidal exchange at about Year 3 post construction.

The ridge perimeter containment dike will be constructed to height of 8.0 NAVD88, have a crest width of 5 feet, an outside slope of 6:1, and inside side slope of 4:1. Inside the containment dike, the ridge restoration target elevation is 6.0 NAVD88. Above 3.0 NAVD88, the ridge will be planted to bottomland hardwood tree species. The outside containment dike toe (below 3.0 NAVD88) will be planted with marsh species.

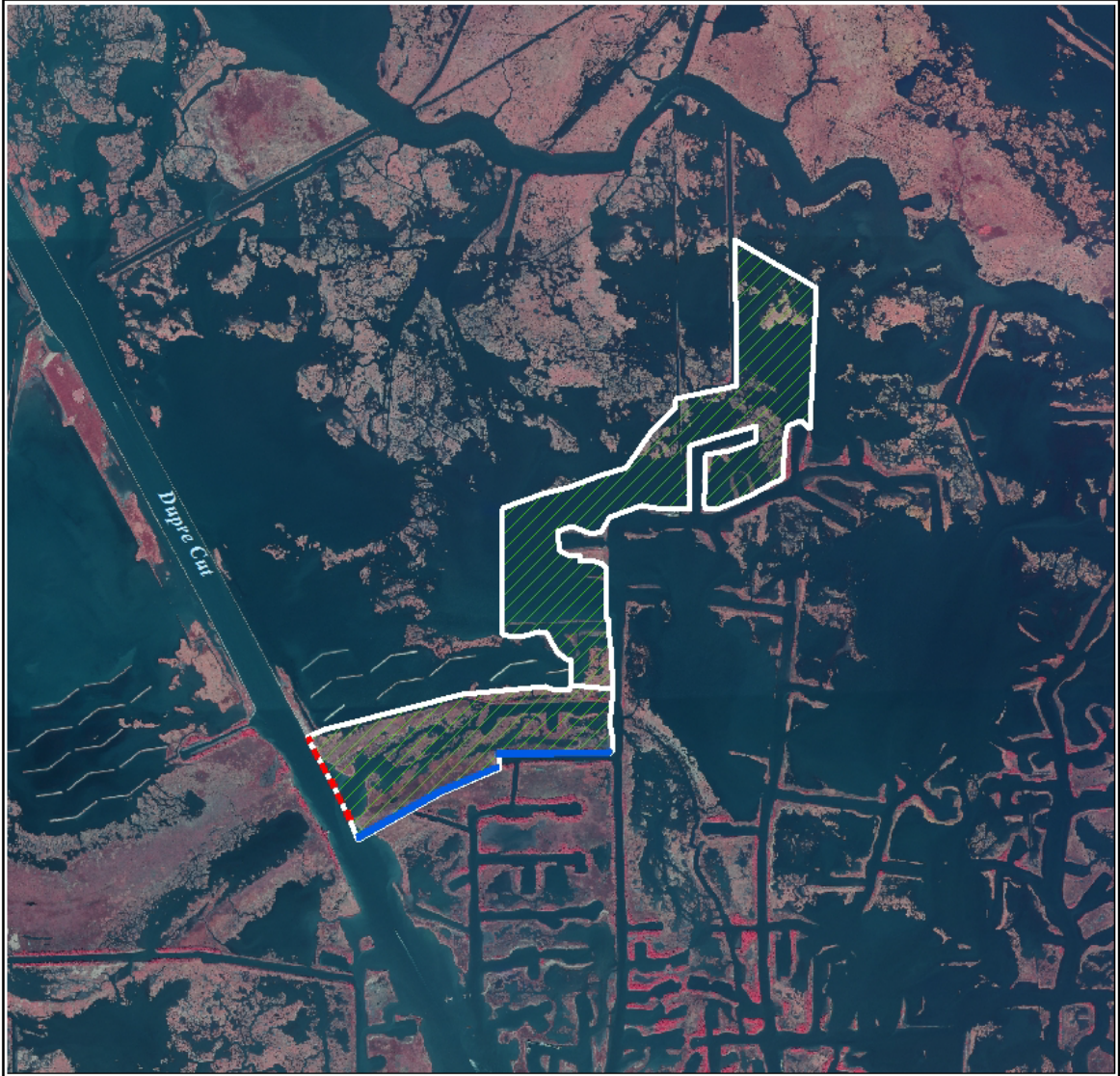
Along the east bank of the Barataria Bay Waterway, approximately 1,740 feet of rock dike bankline protection will be constructed. The rock dike will be constructed to a height of 4.0 NAVD88, with a crest width of 4 feet and side slopes of 2:1.

**Project Benefits:** The project will result in 513 acres of created/nourished marsh and 17 acres of bottomland hardwood ridge restoration, resulting in 292 net acres over the project life.

**Project Costs:** The total fully-funded cost for the project is \$37,631,550.





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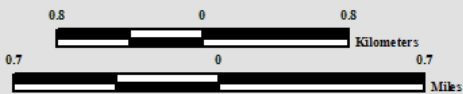


**Bayou Dupont to Bayou  
Barataria Marsh Creation  
(PPL19 Candidate)**



-  Shoreline Protection \*
-  Ridge Restoration \*
-  Marsh Creation \*
-  Project Boundary

\* denotes proposed features



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U.S. Geological Survey  
National Wetlands Research Center  
Coastal Restoration Field Station  
Baton Rouge, LA

Map ID: USGS-NWRC 2010-11-0013  
Map Date: November 05, 2009

Image Source:  
2008 Digital Orthophoto Quarter Quadrangles

**Project Name: Breton Marsh Restoration Project**

**Coast 2050 Strategy:**

Coastwide Strategy – Dedicated dredging to create, restore, or protect wetlands

**Project Location:** The project area is located in Region 2, Breton Basin, Plaquemines Parish, southeast of Delacroix, LA.

**Problem:** A major cause of loss in the Region 2, Caernarvon Mapping Unit has been storm related. Prior to Hurricane Katrina the greatest land loss (6,560 acres) occurred from 1956-1974 and coincided with Hurricane Betsy and extensive canal building. It is estimated that 40.9 square miles of marsh were converted to open water in the Breton Sound Basin as a result of Hurricane Katrina in 2005. Land loss rates for this area are currently estimated at  $-2.5\%$ /year based on USGS data from 1985 to 2006.

**Goals:** The goal of this project is to restore marsh that was damaged by Hurricane Katrina in 2005. Reestablishing this marsh will help to restore the western shoreline of Bayou Gentilly and moderate the effects of the brackish waters from the Black Bay system moving north into the more intermediate marshes. Initial project construction includes the creation of 337 acres and nourishment of 99 acres of brackish marsh.

**Proposed Solution:** Approximately 337 acres of marsh will be restored and 99 acres of marsh will be nourished through hydraulic dredging. It is estimated that 1.6 million cubic yards of material would be dredged hydraulically from Lake Lery and pumped via pipeline to create marsh. Dredged material would be pumped into containment dikes to achieve an average height of 1.4 feet NAVD88. Tidal creeks will be constructed prior to placement of dredged material and retention levees would be gapped for estuarine fisheries access and to achieve a functional marsh.

**Project Benefits:** The project would benefit 436 acres of brackish marsh and open water. Approximately 275 acres of brackish marsh would be created/protected over the 20-year project life.

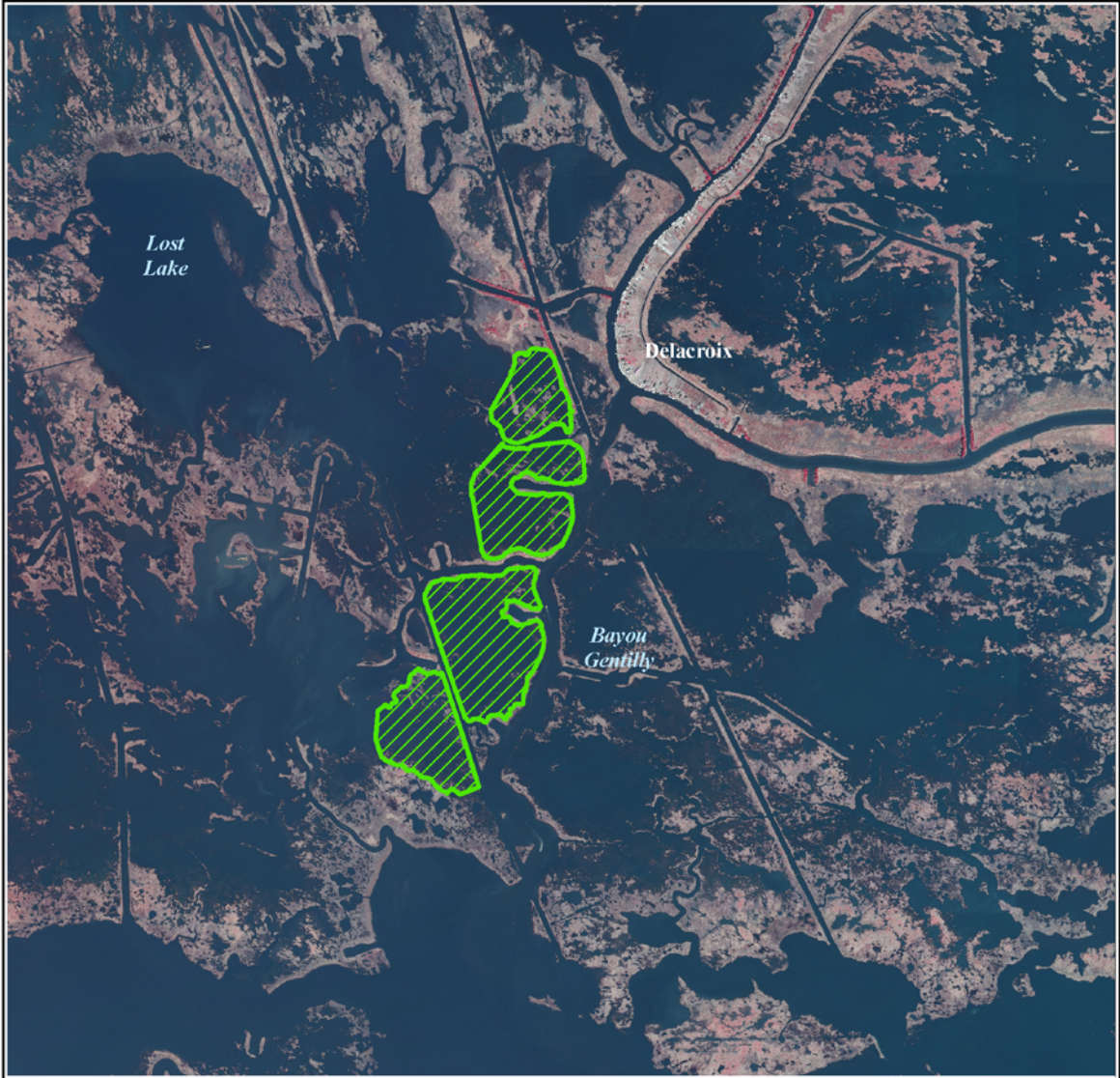
**Preliminary Construction Costs:** The total fully-funded cost for the project is \$14,599,655.

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### Breton Marsh Restoration Project (PPL19 Candidate)



 **Marsh Creation \***  
\* denotes proposed features



Map ID: USGS-NWRC 2010-04-0001  
Map Date: October 09, 2009

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U.S. Department of the Interior  
U.S. Geological Survey  
National Wetlands Research Center  
Coastal Restoration Field Station  
Baton Rouge, La  
Image Source:  
2008 Digital Orthophoto Quarter Quadrangles

**Project Name: Cameron-Creole Watershed Grand Bayou Marsh Creation Project**

**Coast 2050 Strategy:**

Coastwide Strategy – Dedicated dredging to create, restore, or protect wetlands

**Project Location:** Region 4, Calcasieu-Sabine Basin, Cameron Parish, 6 miles northeast from Cameron, LA, on the Cameron Prairie NWR and Miami Corporation north of Grand Bayou.

**Problem:** Approximately 14,390 acres (32%) of the Cameron-Creole Watershed Project (CCWP) marshes were lost from 1932 to 1990 at an average loss rate of 248 acres/year (0.55%/year) due to subsidence and saltwater intrusion from the Calcasieu Ship Channel. The CCWP was implemented by the NRCS in 1989 to reduce saltwater intrusion and stimulate restoration through revegetation. Hurricanes Rita and Ike in 2005 and 2008 breached the watershed levee scouring the marsh and allowing higher Calcasieu Lake salinities to enter the watershed causing more land loss. The Calcasieu-Sabine Basin lost 28 mi<sup>2</sup> (17,920 acres) (4.4%) as a result of Hurricane Rita (Barras et al. 2006). Land loss is estimated to be -0.87%/year based on USGS data from 1985 to 2006.

**Goals:** Project goals include restoring and nourishing marsh with dedicated dredged material from Calcasieu Lake to benefit fish and wildlife resources within the Cameron Prairie National Wildlife Refuge and adjacent brackish marshes. Specific Phase 0 goals include creating 604 acres brackish marsh and nourishing 13 acres of brackish marsh.

**Proposed Solution:** Place approximately 3 million cubic yards of material dredged from a Calcasieu Lake borrow site located approximately 2,000 feet west of Grand Bayou, away from existing oyster reefs, into two marsh creation areas north of Grand Bayou to restore 604 acres and nourish 13 acres of brackish marsh. The hurricane-scoured marsh, within the project area, is very shallow (averaging 1.2 feet deep) making it ideal for marsh restoration with sediment because more marsh per volume of dredged material could be restored. Tidal creeks will be constructed prior to placement of dredge material and retention levees would be gapped for estuarine fisheries access and to achieve a functional marsh.

**Preliminary Project Benefits:** The project would restore 604 acres and nourish 13 acres of brackish marsh in the 617-acre project area. Approximately 550 acres of brackish marsh would be created and protected over the 20-year project life.

**Project Costs:** The total fully-funded cost for the project is \$23,380,486.

**Preparer(s) of Fact Sheet:**


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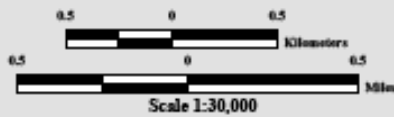
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**Cameron-Creole Watershed Grand Bayou Marsh Creation Project (PPL19 Candidate)**



 **Marsh Creation \***  
\* denotes proposed features



Map ID: USGS-NWRC 2009-11-0050  
Map Date: August 05, 2009

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U.S. Department of the Interior  
U.S. Geological Survey  
National Wetlands Research Center  
Coastal Restoration Field Station  
Baton Rouge, La  
Image Source:  
2008 Digital Orthophoto Quarter Quadrangles

**Project Name: Cheniere Ronquille Barrier Island Restoration Project**

**Coast 2050 Strategy:**

Regional Strategy 21 – Extend and maintain barrier headlands, islands, and shorelines

**Project Location:** Region 2, Barataria Basin, Plaquemines Parish, between Pass Ronquille and Pass Chaland.

**Problem:** The area is undergoing shoreline erosion, interior wetland loss, overwash, and breakup. The Gulf shoreline erosion rate increased from -14.6 feet/year in 1988 to 2000 to -38 feet/year in 1988 to 2006. Project area marshes are eroding at -11.8 feet/year during 2003 to 2006 as well as being converted to open water from internal breakup at an estimated rate of 3.16%/year.

**Goals:** The general project goal is to maintain shoreline integrity including preventing breaching/formation of tidal inlets for 20 years by repairing and reinforcing the existing shoreline with sand and marsh restoration. A minimum dune elevation of +4.0 feet NAVD88 at the end of the 20-year project life was selected as a design performance goal.

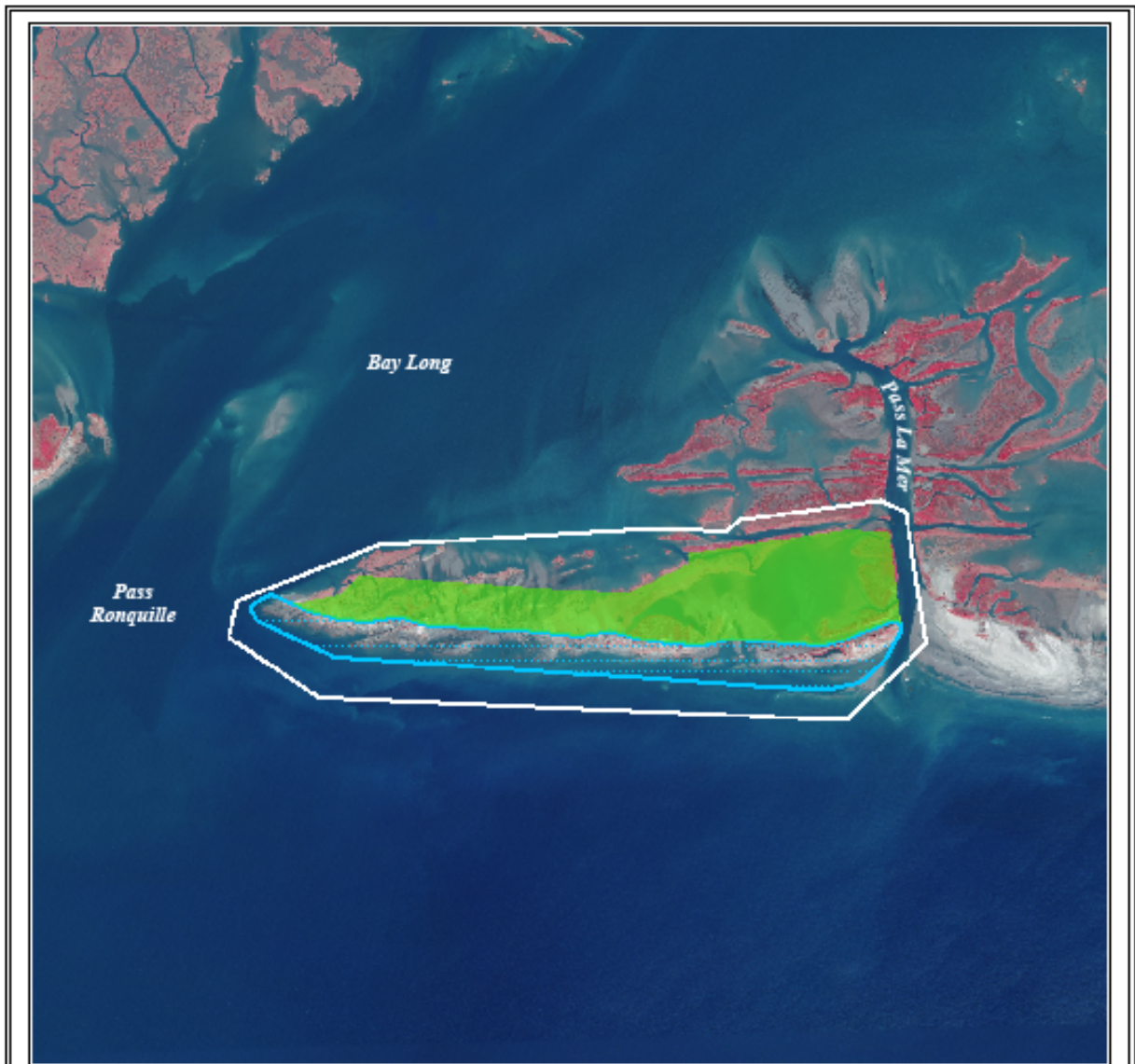
**Proposed Solution:** Cheniere Ronquille restoration would expand the Gulf shoreline structural integrity and associated protection by tying into two recently constructed projects to the east and address one of the remaining reaches of the Barataria/Plaquemines shoreline. The design includes fill for a beach and dune plus 20 years of advanced maintenance fill, as well as fill for marsh creation/nourishment. The location of the type and amount of sediment needed to construct this project has already been identified under the East Grand Terre Project presently under construction. Approximately 127 acres of beach/dune fill would be constructed with a dune crest at +6 feet NAVD88. Approximately 259 acres of marsh creation/nourishment would be constructed. Intensive dune plantings would be conducted by seeding and installing approved nursery stock. About half of the marsh platform would be planted with cordgrass and portions of the dune, swale, and marsh would be planted with appropriate woody species. Containment dikes would be breached no later than Year 3 to allow tidal exchange with the created marsh.

**Project Benefits:** The project would benefit 408 acres of island beach/dune and back barrier marsh and adjacent open water. Approximately 234 acres of beach/dune and back barrier marsh would be created/protected over the 20-year project life.

**Project Costs:** The total fully-funded cost for the project is \$43,828,285.




**Preparer(s) of Fact Sheet:**

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### Cheniere Ronquille Barrier Island Restoration (PPL19 Candidate)



-  Dune/Beach \*
-  Marsh Creation \*
-  Project Boundary

\* denotes proposed features



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U.S. Geological Survey  
National Wetlands Research Center  
Coastal Restoration Field Station  
Baton Rouge, La

Map ID: USGS-NWRC 2009-11-0380  
Map Date: August 20, 2009

Image Source:  
2008 Digital Orthophoto Quarter Quadrangles

**Project Name: Dedicated Sediment Delivery and Water Conveyance for Marsh Creation Near Big Mar Project**

**Coast 2050 Strategy:**

Coastwide Strategy – Dedicated dredging to create, restore, or protect wetlands

**Project Location:** Region 2, Breton Sound Basin, Plaquemines Parish, the marsh creation is located along the western shoreline of Lake Lery and the conveyance channel is located within Big Mar.

**Problem:** The upper Breton Sound marshes have long been subjected to subsidence, salt water intrusion, altered hydrology, and storm damage. After the passing of Hurricane Katrina in 2005, the Breton Sound marshes were devastated and land loss rates increased in the upper sound from 0.69%/year to 1.74%/year (USGS). The Caernarvon Freshwater Diversion Project is helping to reverse land loss in this area; however, as Big Mar fills in, flow that used to go down Delacroix Canal and into the marshes southwest of Big Mar is now mostly taking the path of least resistance into Lake Lery. Furthermore, the shoreline of Lake Lery is almost indistinguishable where the lake is coalescing with hundreds of acres of open water. Reestablishment of the Breton Sound marshes is dependent upon the direct reconstruction of lost marsh, reestablishing the lake rim, and optimizing the flow and outfall of the Caernarvon structure.

**Goals:** Project goals include: 1) creating approximately 434 acres of fresh to intermediate marsh via dredging the center of Lake Lery; 2) excavating a channel 7,850 feet long, 75 feet bottom width, and 7 feet deep through the Big Mar to facilitate Caernarvon outfall to 6,300 acres of marshes west and southwest of Big Mar; and 3) reducing the loss rate of adjacent interior marshes.

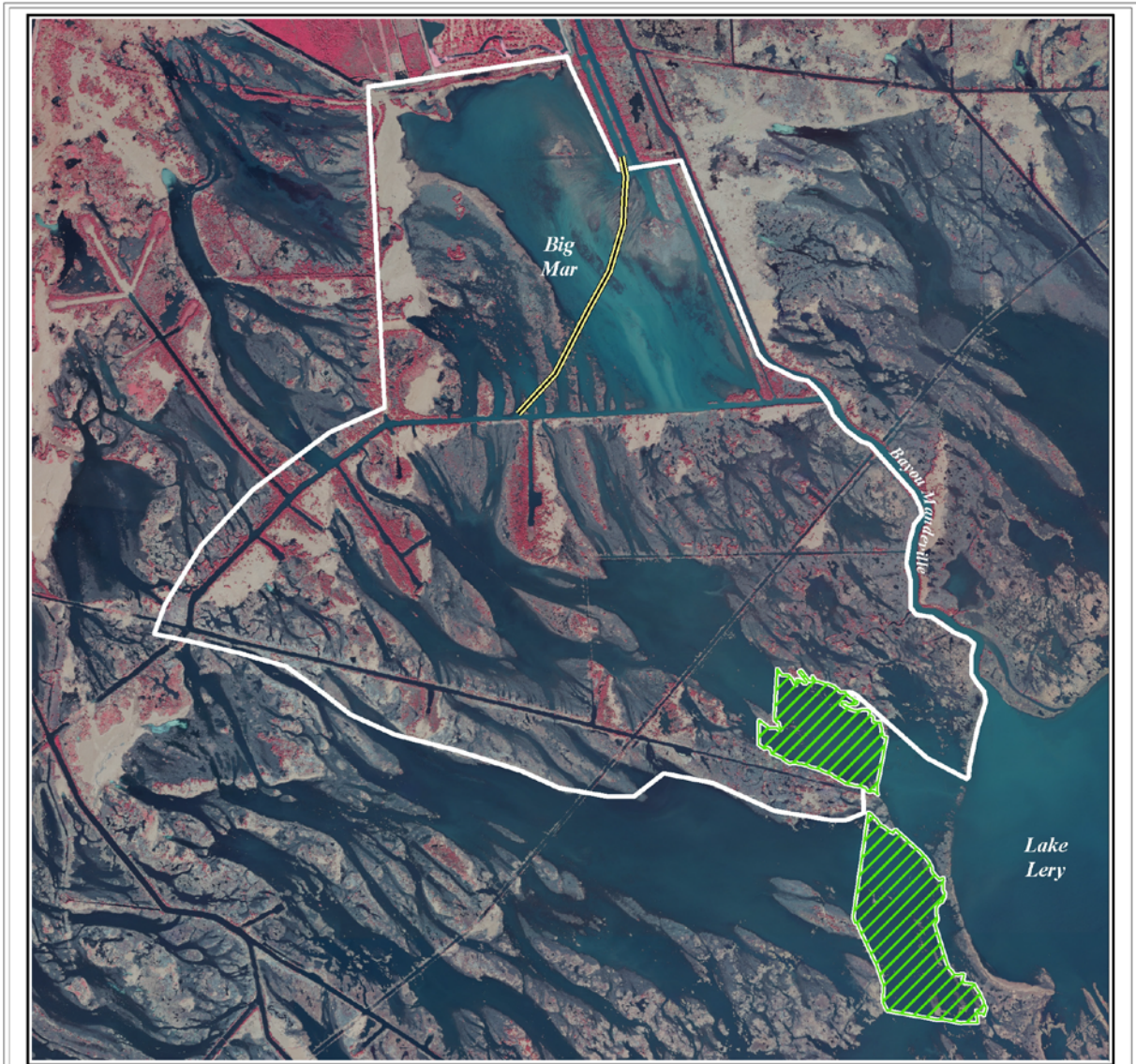
**Proposed Solution:** Project features include approximately 434 acres of marsh creation via dredging from Lake Lery. In addition, a 7,850 feet long conveyance channel will be dredged from the northeast confluence of Caernarvon Canal and Big Mar to near the southwest corner of Big Mar where it joins with Delacroix Canal. The excavated material will be beneficially used to build marsh in the Big Mar. Construction of this channel will help redirect flow from the Caernarvon diversion to the southwest wetlands of upper Breton Sound.

**Project Benefits:** The project would benefit 6,311 acres of fresh marsh and open water. Approximately 853 net acres of marsh would be created/protected over the 20-year project life.

**Project Costs:** The total fully-funded cost for the project is \$20,443,392.




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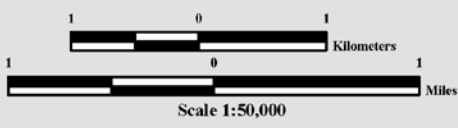
### Dedicated Sediment Delivery and Water Conveyance for Marsh Creation Near Big Mar (PPL19 Candidate)



-  Conveyance Channel \*
  -  Marsh Creation \*
  -  Project Boundary
- \* denotes proposed features



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 U.S. Department of the Interior  
 U.S. Geological Survey  
 National Wetlands Research Center  
 Coastal Restoration Field Station  
 Baton Rouge, La



Map ID: USGS-NWRC 2009-11-0375  
 Map Date: July 10, 2009

Image Source:  
 2008 Digital Orthophoto Quarter Quadrangles

**Project Name: Freshwater Bayou Marsh Creation Project**

**Coast 2050 Strategy:**

Coastwide Strategy – Dedicated dredging to create, restore, and protect wetlands

**Project Location:** Region 4, Mermentau Basin, Vermilion Parish, Big Marsh Mapping Unit, area west of Freshwater Bayou and north of the Freshwater Bayou lock.

**Problem:** This area was damaged by Hurricanes Rita, Gustav, and Ike. Currently, Freshwater Bayou threatens to breach into the large interior open water and establish a hydrologic connection that previously did not exist. This would exacerbate the environmental problems affecting marshes in this area. Additionally, interior marsh loss has increased and organic soils are being exported into Freshwater Bayou. Interior marsh loss will increase without construction of the proposed project.

**Goals:** The project goals include: 1) creating/nourishing marsh and associated edge habitat for aquatic species through pipeline sediment delivery via dedicated dredging from the Gulf of Mexico or beneficial use of maintenance dredging from the Freshwater Bayou Canal; and 2) restoring a wetland buffer between the large open water areas in the Mermentau Basin and Freshwater Bayou.

**Proposed Solution:** The project would beneficially use dredged material and/or dedicated dredged material to rebuild/nourish approximately 401 acres of marsh that was damaged or converted to shallow open water by Hurricanes Rita, Gustav, and Ike. Approximately 2 million cubic yards of dredged material from the Gulf of Mexico would be dedicated to two hurricane damaged areas in the Big Marsh unit. If possible, material and/or equipment would be used from the maintenance dredging of Freshwater Bayou to the maximum extent practical to reduce cost during construction. However, since that material is not available every year the proposed project costs and benefits are conservatively based on dedicated dredging offshore. Approximately 162 acres of marsh would be created and 24 acres would be nourished in the North Area, and approximately 149 acres of marsh would be created and 66 acres would be nourished in the South Area. Average water depths are approximately 1.7 feet.

**Project Benefits:** The project would benefit approximately 401 acres of fresh/intermediate marsh. Approximately 279 net acres would be created/protected over the 20-year project life.

**Project Costs:** The total fully-funded cost for the project is \$25,523,755.

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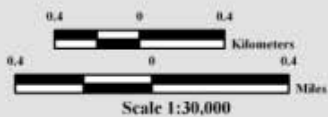




### Freshwater Bayou Marsh Creation (PPL19 Candidate)



-  Marsh Creation \*
-  Project Boundary
- \* denotes proposed features



Map ID: USGS-NWRC 2009-11-0276  
Map Date: July 24, 2009

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U.S. Department of the Interior  
U.S. Geological Survey  
National Wetlands Research Center  
Coastal Restoration Field Station  
Baton Rouge, La  
Image Source:  
2008 Digital Orthophoto Quarter Quadrangles

**Project Name: Fritchie Marsh Terracing and Marsh Creation Project**

**Coast 2050 Strategy:**

Coastwide Strategy – Dedicated dredging to create, restore, or protect wetlands

**Project Location:** Region 1, Pontchartrain Basin, St. Tammany Parish, within the Fritchie Marsh watershed bordered by Highway 90.

**Problem:** Although the CWPPRA PO-06 project was completed in 2001 and resulted in improved hydrology and marsh restoration throughout the area, a significant portion of the Fritchie Marsh was lost due to Hurricane Katrina. This once stable land mass was severely damaged by the passing storm where in some locations marsh was stacked over nine feet high along the tree line. Now shallow open water areas dominate the landscape which reduces the effectiveness of the CWPPRA PO-06 project. Wetlands in the project vicinity are being lost at the rate of -1.31%/year based on USGS data from 1985 to 2006. These marshes cannot recover without replacement of lost sediment, which is critical if the northshore marshes are to be sustained.

**Goals:** Project goals include: 1) creating 400 acres of intermediate marsh; 2) creating 130,000 linear feet of vegetated, earthen terraces; 3) reducing wave fetch and erosion of adjacent interior marshes; and 4) improving tidal connection and ingress/egress of marine organisms within the marsh creation area.

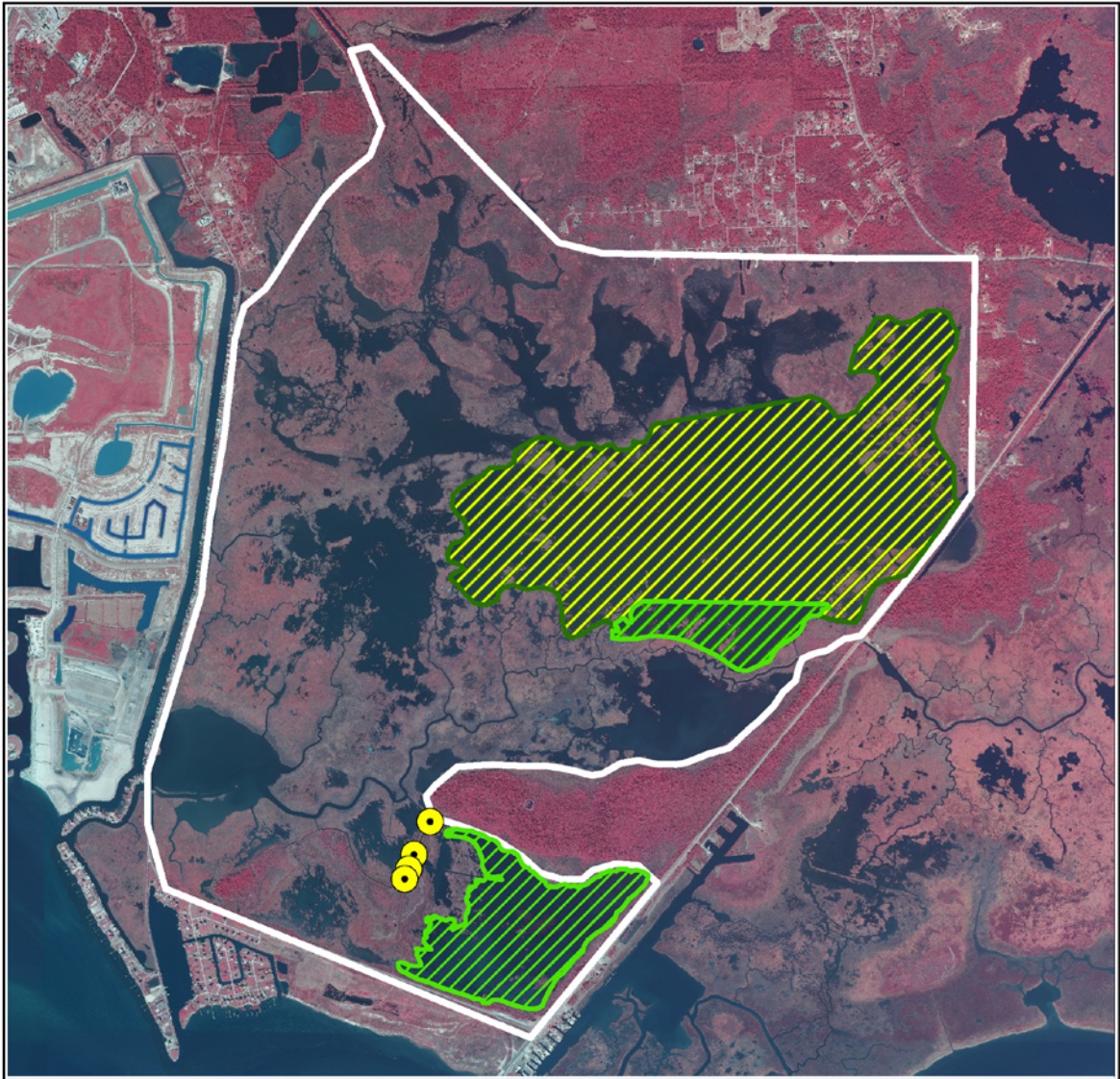
**Proposed Solution:** The project will construct approximately 400 acres of marsh platform, with 270 acres being created south of Salt Bayou in the southeastern corner of the Fritchie watershed, and 130 acres being created just north of Salt Bayou adjacent to the terrace field. Additionally, 130,000 linear feet of earthen terraces occupying 1,200 acres of open water will be constructed just north of Salt Bayou. Approximately 2 million cubic yards of material will be dredged from Lake Pontchartrain to build the marsh. The containment dikes will be degraded within three years of construction to allow for tidal exchange. The terraces are proposed with ten foot crowns and +3 feet elevation. The terraces will be planted immediately following compaction of the soil.

**Project Benefits:** The project would benefit 1726 acres of brackish fresh marsh and open water. Approximately 449 net acres of intermediate marsh would be created/protected over the 20-year project life.

**Project Costs:** The total fully-funded cost for the project is \$24,273,654.

**Preparer(s) of Fact Sheet:**

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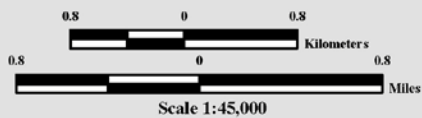


**Fritchie Marsh Terracing and  
Marsh Creation Project  
(PPL19 Candidate)**



-  Marsh Creation \*
-  Culverts \*
-  Terraces \*
-  Extended Boundary

\* denotes proposed features



Map ID: USGS-NWRC 2009-11-0287  
Map Date: July 27, 2009

Produced by:  
U.S. Department of the Interior  
U.S. Geological Survey  
National Wetlands Research Center  
Coastal Restoration Field Station  
Baton Rouge, La  
Image Source:  
2008 Digital Orthophoto Quarter Quadrangles

**Project Name: LaBranche East Marsh Creation Project**

**Coast 2050 Strategy:**

Coastwide Strategies – Dedicated dredging for wetlands creation, vegetative planting, and maintain or restore ridge functions

Regional Strategies – Dedicated delivery of sediment for marsh creation; dedicated dredging

**Project Location:** Region 1, Pontchartrain Basin, St. Charles Parish, between Lake Pontchartrain and I-10, bounded to the west by the Fall Canal and the initial Bayou LaBranche Wetland Creation Project (CWPPRA PO-17) and to the east by a pipeline canal.

**Problem:** Dredging of access/flotation canals for construction of I-10 resulted in increased salinity and altered hydrology that exacerbated conversion of wetland vegetation into shallow open water bodies.

**Goals:** Primary goal is to restore marsh that converted to shallow open water. Project implementation would result in an increase of fisheries and wildlife habitat, acreage, and diversity along with improving water quality. The proposed project would provide a storm buffer to I-10, the region’s primary westward hurricane evacuation route, and complement hurricane protection measures in the area.

**Proposed Solution:** Proposed solution consists of the creation of  $\pm$  729 acres of marsh and the nourishment of  $\pm$  202 acres of existing marsh using dedicated dredging from Lake Pontchartrain. In addition, 10,000 linear feet of tidal creeks would be created by pre-dredging water bottom before dredged material is placed. The marsh creation area would have a target elevation the same as average healthy marsh. It is proposed to place the dredged material in the target area with the use of low level retention dikes along the edge of the project area allowing overtopping of material to nourish the marsh fringe. Vegetative plantings would be utilized in the areas designated to be emergent marsh. Either  $\frac{1}{4}$  of the area would be planted at full density or  $\frac{1}{4}$  the density would be planted over the entire acreage.

**Project Benefits:** This project would benefit 931 acres of intermediate marsh and open water. The project will result in 715 net acres of marsh over the 20-year project life.

**Project Cost:** The total fully-funded cost for the project is \$32,323,291.

**Preparer(s) of Fact Sheet:**

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Lake Pontchartrain

### LaBranche East Marsh Creation (PPL19 Candidate)



-  Tidal Creek \*
-  Marsh Creation \*
-  Marsh Fill \*

\* denotes proposed features



Produced by:  
U.S. Department of the Interior  
U.S. Geological Survey  
National Wetlands Research Center  
Coastal Restoration Field Station  
Baton Rouge, LA

Map ID: USGS-NWRC 2009-11-0349  
Map Date: September 18, 2009

Image Source:  
2008 Digital Orthophoto Quarter Quadrangles

**Project Name: Lost Lake Marsh Creation and Hydrologic Restoration Project**

**Coast 2050 Strategy:**

Regional Strategy – Dedicated delivery of sediment for marsh building

Regional Strategy – Increase transfer of Atchafalaya River water to lower Penchant tidal marshes

**Project Location:** Region 3, Terrebonne Basin, Terrebonne Parish, near the vicinity of Lost Lake.

**Problem:** Significant marsh loss has occurred between Lake Pagie and Bayou DeCade to the point that little structural framework remains separating those two waterbodies. Northeast of Lost Lake, interior marsh breakup has resulted in large, interior ponds where wind/wave energy continues to result in marsh loss. West of Lost Lake, interior breakup has occurred as a result of ponding and the periodic entrapment of higher salinity waters during storm events.

**Goals:** Project goals include: 1) restore an important feature of structural framework between Lake Pagie and Bayou Decade to prevent the coalescence of those two water bodies; 2) increase the delivery of fresh water, sediments, and nutrients into marshes north and west of Lost Lake; and 3) reduce fetch in open water areas via construction of a terrace field. Specific Phase 0 goals include creating approximately 465 acres of marsh, increasing the delivery of fresh water into project area marshes by replacing 4 fixed-crest weirs and 2 plugs with variable-crest structures, and creating approximately 26 acres of marsh via the construction of 30,000 feet of terraces.

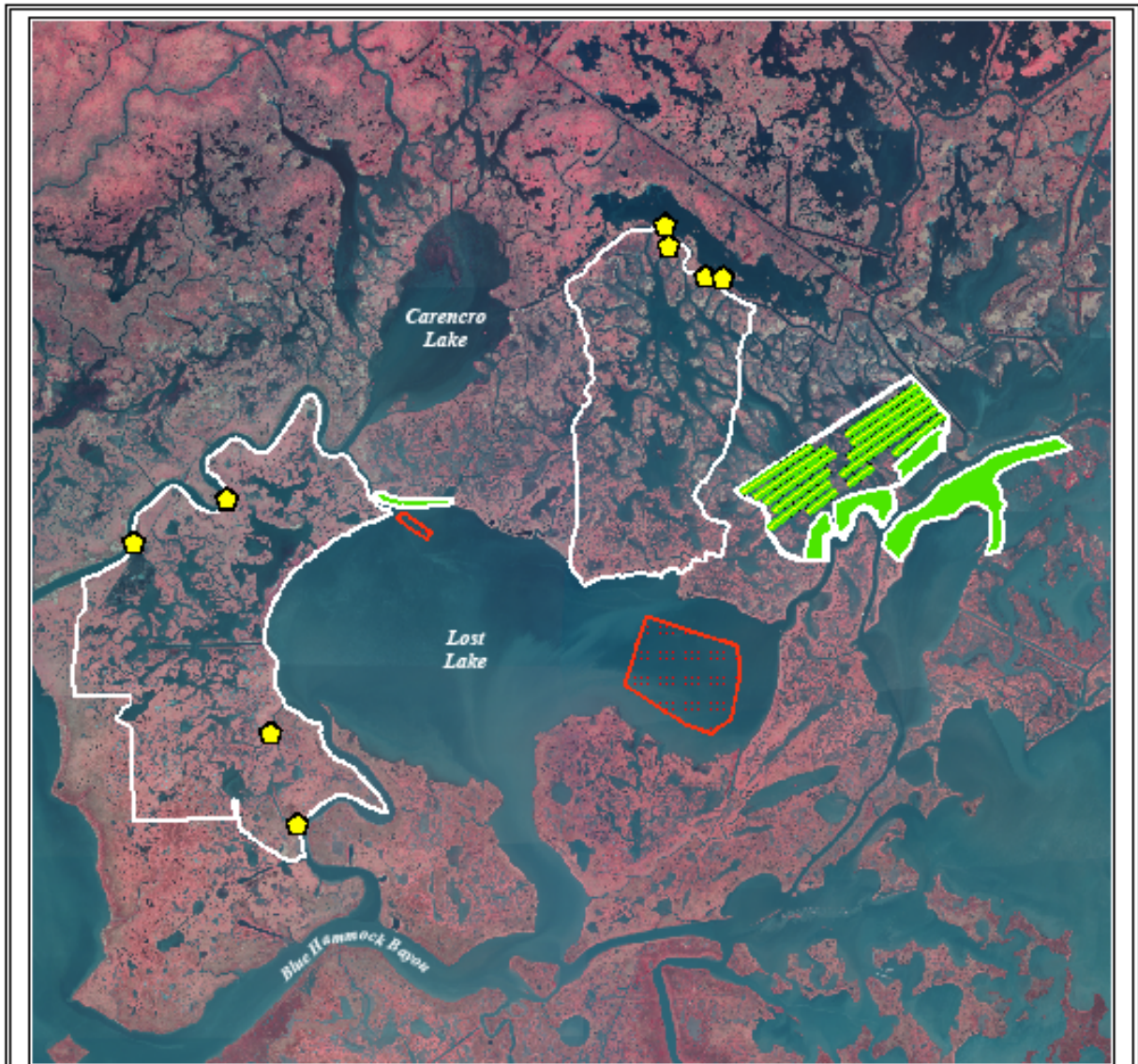
**Proposed Solution:** Approximately 465 acres of marsh will be created between Lake Pagie and Bayou DeCade, north of Bayou DeCade, and along the northwestern Lost Lake shoreline. In addition, 30,000 linear feet (26 acres) of terraces will be constructed to reduce fetch in an area of deteriorated marsh. Approximately 20,000 linear feet of tidal creeks will be constructed within the marsh creation cells. Four fixed-crest weirs and two plugs will be replaced with variable-crest structures to increase freshwater flow into surrounding marshes.

**Project Benefits:** The project would benefit 7,312 acres of marsh and open water habitats. A total of 749 net acres of marsh would be protected/created over the 20-year project life.

**Project Costs:** The total fully-funded cost for the project is \$22,943,866.

**Preparer(s) of Fact Sheet:**

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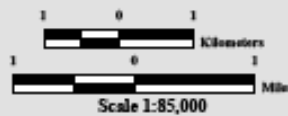
### Lost Lake Marsh Creation and Hydrologic Restoration (PPL19 Candidate)



- Water Control Structure \*
  - Marsh Creation \*
  - Project Boundary
  - Borrow Site \*
  - Terrace \*
- \* denotes proposed features



Produced by:  
U.S. Department of the Interior  
U.S. Geological Survey  
National Wetlands Research Center  
Coastal Restoration Field Station  
Baton Rouge, La



Map ID: USGS-NWRC 2009-11-0366  
Map Date: August 10, 2009

Image Source:  
2008 Digital Orthophoto Quarter Quadrangles

**Project Name: Monsecour Siphon Project**

**Coast 2050 Strategy:**

Coastwide Strategies – Diversions and river discharge; management of diversion outfall for wetland benefits

Regional Strategies – Restore and sustain marshes; construct most effective small diversions

**Project Location:** Region 2, Breton Sound Basin, Plaquemines Parish, north of Phoenix, LA.

**Problem:** This area has been disconnected from the Mississippi River since levees were constructed during the early 20<sup>th</sup> century. The lack of overbank flooding/crevasses ensures that wetlands here do not have sufficient sediment input to maintain elevation against subsidence. In addition, drainage canals and oil and gas canals and associated spoil banks probably create some undesirable impoundment and tidal scour/saltwater intrusion in the area. In addition to impoundment caused by canals and spoil banks, the area is probably somewhat naturally impounded due to natural ridges. Aerial photography clearly demonstrates the significant loss of marsh in this area.

**Goals:** The project goal is to reduce wetland loss rates by reintroducing an average of 1,145 cubic feet per second (cfs), and a maximum of 2,000 cfs, of Mississippi River water into the project area to increase sediment and nutrient loading.

**Proposed Solution:** Construct a siphon from the Mississippi River, with 2000 cfs maximum capacity (estimated average flow =1145 cfs). The project may require additional features for delivery and outfall management.

**Project Benefits:** The project would benefit 12,255 acres of intermediate marsh and open water. Approximately 990 net acres of intermediate and/or fresh marsh would be created/protected over the 20-year project life.

**Project Costs:** The total fully-funded cost for the project is \$10,607,905.

**Preparer(s) of Fact Sheet:**

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**Monsecour Siphon  
(PPL19 Candidate)**



Siphon \*

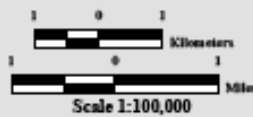


Project Boundary

\* denotes proposed features



Produced by:  
U.S. Department of the Interior  
U.S. Geological Survey  
National Wetlands Research Center  
Coastal Restoration Field Station  
Baton Rouge, LA



Map ID: USGS-NWRC 2009-11-0551  
Map Date: August 07, 2009

Image Source:  
2008 Digital Orthophoto Quarter Quadrangles



#### **IV. DESCRIPTION OF CANDIDATE DEMONSTRATION PROJECTS**

This section provides a concise narrative of each demonstration project. The project details provided include the Coast 2050 strategy, project location, problem, goals, proposed solution, benefits, costs, sponsoring agency, and contact persons.

**Project Name: ViperWall Demonstration Project**

**Coast 2050 Strategy:**

Coastwide – Maintenance of gulf, bay and lake shoreline integrity

**Project Location:** Applicable Statewide

**Problem:** Several shoreline/bankline areas within coastal Louisiana consist of unstable soil conditions, subsurface obstructions, accessibility problems, etc., which severely limit the alternatives of shoreline protection. The adopted standard across the state, where conditions allow, is the use of rock aggregate in either a revetment or foreshore installation. The major advantages of using rock are durability, longevity, and effectiveness. However, in areas where rock is not conducive for use and site limitations exist, current “proven” alternatives that provide equivalent advantages are limited.

**Goals:** The goal of this demonstration project is to fund Research and Development (R&D) through a local university or the Engineering Research and Development Center to test various configurations of ViperWall technology in a scientific lab under controlled conditions. This research would result in determining the most effective and efficient manner in which to dissipate wave action, reduce shoreline erosion, and encourage the entrapment of alluvial material. If R&D results in a viable effective product, a field trial will be conducted testing various materials under various wave climate conditions.

**Proposed Solution:** In Year 1, a wave tank analysis will be conducted to test effectiveness of current design. If proven effective, a field installation will take place in a low-energy environment at Location 1 (to be determined) and monitored for 1 year. Contingent on the results and performance at Location 1, a second installation will take place in a high-energy environment at Location 2 (Gulf of Mexico). Each location will be inspected and surveyed bi-annually to monitor shoreline and bathymetry changes for a minimum of 2 years. A close-out report will be provided in Year 5.

**Project Benefits:** The primary benefit expected from this project is the finding of a product that effectively reduces or eliminates wave action in areas where current standards are either non-acceptable or not economically justified.

**Project Costs:** The total fully-funded cost for the project is \$1,427,154.

**Preparer(s) of Fact Sheet:**

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**Project Name: EcoSystems Wave Attenuator Demonstration Project**

**Coast 2050 Strategy:**

Maintenance of bay and lake shoreline integrity

**Demonstration Project Location:** Region 4, Gulf shoreline at Rockefeller Refuge

**Problem:** Coastal Louisiana consists of areas with unstable soil conditions, subsurface obstructions, accessibility limitations, etc. which limit the types of shoreline protection suitable to provide adequate relief of shoreline erosion. Traditional methods have shown the most success are through the use of rock riprap. The major advantages of rock are the effectiveness and durability of protection that is provided. The disadvantages are the cost, supply, and site-specific problems with placement and handling of material. However, the same problems are also associated with other “non-rock” alternatives that have been tried as substitutes to provide equivalent protection against shoreline erosion.

**Goals:** The primary goal of this demonstration is to manufacture, deploy and test an alternative method of shoreline protection equivalent to traditional methods in areas where site conditions limit or preclude traditional methods.

**Proposed Solution:** Walter Marine has developed a method of protection against shoreline erosion using the EcoSystems Wave Attenuator. This product is a unit of EcoSystems discs mounted on piling with an innovative anchoring system, which dissipates wave action. The EcoSystems Wave Attenuator could be applicable for use as shoreline protection or in place of a channel plug. The intent of this demonstration project is to place the EcoSystems Wave Attenuator in an area where traditional restoration strategies would have used a rock plug or sheetpile for a channel closure. As a shoreline protection feature, a double row of pilings (5 feet on-center) would be driven and 4 foot diameter disks mounted on each piling along approximately 600 linear feet of shoreline. A second treatment will have a double row of pilings (7 feet on-center) driven and disks mounted on each piling along an adjacent 730 LF of shoreline. The project will evaluate the effectiveness of reducing wave energy and shoreline erosion at the two prescribed spacing between disks.

**Project Benefits:** If successful the project benefits include: 1) reduction in shoreline erosion associated with wave energy; 2) information obtained would allow a comparison with riprap structures; and 3) identification of other applications of EcoSystems Wave Attenuators.

**Project Costs:** The total fully-funded cost for the project is \$2,214,945.

**Preparer of Fact Sheet:**

John D. Foret, Ph.D., NOAA-NMFS, (337) 291-2107, [John.Foret@noaa.gov](mailto:John.Foret@noaa.gov)

**Project Name: Bayou Backer Demonstration Project**

**Coast 2050 Strategy:**

Maintenance of bay and lake shoreline integrity

**Project Location:** Region 3, Vermilion Bay or Weeks Bay shoreline.

**Problem:** Bayou Backer is a long-lasting wave energy reducer that is suited for wetlands protection and re-vegetation. Plugs are dispensed from rolls of 3-inche to 6-inche wide plastic strip. In very loose ground plugs up to 12 feet long are pushed 3 feet deep. This leaves two 3-foot long blades above the surface. Below the surface, a 6-foot long loop forms the anchor. In a recent test of the product, the plastic strips were 8 feet long with a 4-foot long loop in the mud and 2-foot long blades within the water column. Thus, the application is adaptable to site conditions. It is expected to last several years in our waters, and assist in abating shoreline erosion to allow plants recovery and establishment time. Wave pool testing was recently performed at Louisiana State University and can be seen in photos and videos at <http://www.grastic.com/backer>.

**Goals:** The goals of this demonstration project are to: 1) test the effectiveness of the bio-grass to reduce shoreline erosion; 2) determine the applicability of the bio-grass in coastal Louisiana shores; 3) test two spacing design for evaluation of shoreline protection versus cost effectiveness; and 4) allow existing plants recovery and establishment time.

**Proposed Solution:** Install triplicate plots of the following two spacing plans at two different types of shorelines; 8 rows of plugs, 1 foot spacing, or 3,000 plugs, along approximately 375 linear feet of shoreline (8 rows at 1 foot on-center = 8 plugs/linear feet of shoreline \* 375 linear feet of shoreline = 3,000 plugs). Each plug will be inserted up to a 16 foot depth. A second, equivalent, section of shoreline, 5 rows of plugs will be spaced 3 feet on center (5 rows at 3 feet on center = 8 plugs/3 linear feet of shoreline \* 375 linear feet of shoreline = 1,000 plugs). Total shoreline impacted is 4,500 linear feet with 24,000 plugs installed.

**Project Benefits:** If successful, the product could be a low- cost option in shoreline protection until vegetation establishes, direct creation of habitat in shallow waters where turbidity could be decreased, and used as an addition to both interior lake and exposed coastal bay shorelines and open bay waters.

**Project Costs:** The total fully-funded cost for the project is \$910,893.

**Preparer(s) of Fact Sheet:**

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## V. PROJECT SELECTION

On January 20, 2010, the CWPPRA Task Force made its selection for the 19<sup>th</sup> PPL. The CWPPRA Task Force selection for the 19<sup>th</sup> PPL is shown in Table 6.

**Table 6: The 19<sup>th</sup> Priority Project List**

1	2	3	4	5	6	7	8	9	10	11	12
Project Number	Project Name	Physical Type	Sponsoring Agency	Fully -Funded Total Cost	Fully-Funded Phase I Total Cost	Cumulative Fully-Funded Phase I Total Cost	Fully-Funded Phase II Total Cost	Cumulative Fully-Funded Phase II Total Cost	Fully-Funded Phase II/Increment I Total Cost (3 yr. C&QRM&M)	Cumulative Phase II/Increment I	Average Annual Habitat Units (AAHUs)
ME-31	Freshwater Bayou Marsh Creation	MC	NRCS	\$25,523,755	\$2,425,997	\$2,425,997	\$23,097,758	\$23,097,758	\$22,690,612	\$22,690,612	108
PO-75	LaBranche East Marsh Creation	MC	NRCS	\$32,323,291	\$2,571,273	\$4,997,270	\$29,752,018	\$52,849,776	\$29,056,723	\$51,747,335	339
BA-76	Cheniere Ronquille Barrier Island Restoration	BI	NMFS	\$43,828,285	\$3,419,263	\$8,416,533	\$40,409,022	\$93,258,798	\$39,942,806	\$91,690,141	190
TE-72	Lost Lake Marsh Creation and Hydrologic Restoration	MC/HR	USFWS	\$22,943,866	\$2,320,214	\$10,736,747	\$20,623,652	\$113,882,450	\$18,298,623	\$109,988,764	281
	<b>TOTALS</b>			\$124,619,197	\$10,736,747		\$113,882,450				918

Project Physical Type:  
 HR=Hydrologic Restoration  
 MC=Marsh Creation  
 BI=Barrier Island

Sponsoring Agencies:  
 USACE=US Army Corps of Engineers  
 USEPA=Environmental Protection Agency  
 NMFS=National Marine Fisheries Service  
 NRCS=Natural Resources Conservation Service  
 USFWS=US Fish and Wildlife Service





## **VI. DESCRIPTION OF PROJECTS SELECTED FOR PHASE I FUNDING**

This section provides a concise narrative of each selected project that was funded for Phase I. The project details provided include the Coast 2050 strategy, project location, problem, goals, solution, benefits, costs, sponsoring agency and contact persons, and a map identifying the project area and features if applicable.

**Project Name: Cheniere Ronquille Barrier Island Restoration Project**

**Coast 2050 Strategy:**

Regional Strategy 21 – Extend and maintain barrier headlands, islands, and shorelines

**Project Location:** Region 2, Barataria Basin, Plaquemines Parish, between Pass Ronquille and Pass Chaland.

**Problem:** The area is undergoing shoreline erosion, interior wetland loss, overwash, and breakup. The Gulf shoreline erosion rate increased from -14.6 feet/year in 1988 to 2000 to -38 feet/year in 1988 to 2006. Project area marshes eroded at -11.8 feet/year during 2003 to 2006 as well as being converted to open water from internal breakup at an estimated rate of 3.16%/year.

**Goals:** The general project goal is to maintain shoreline integrity including preventing breaching/formation of tidal inlets for 20 years by repairing and reinforcing the existing shoreline with sand and marsh restoration. A minimum dune elevation of +4.0 feet NAVD88 at the end of the 20-year project life was selected as a design performance goal.

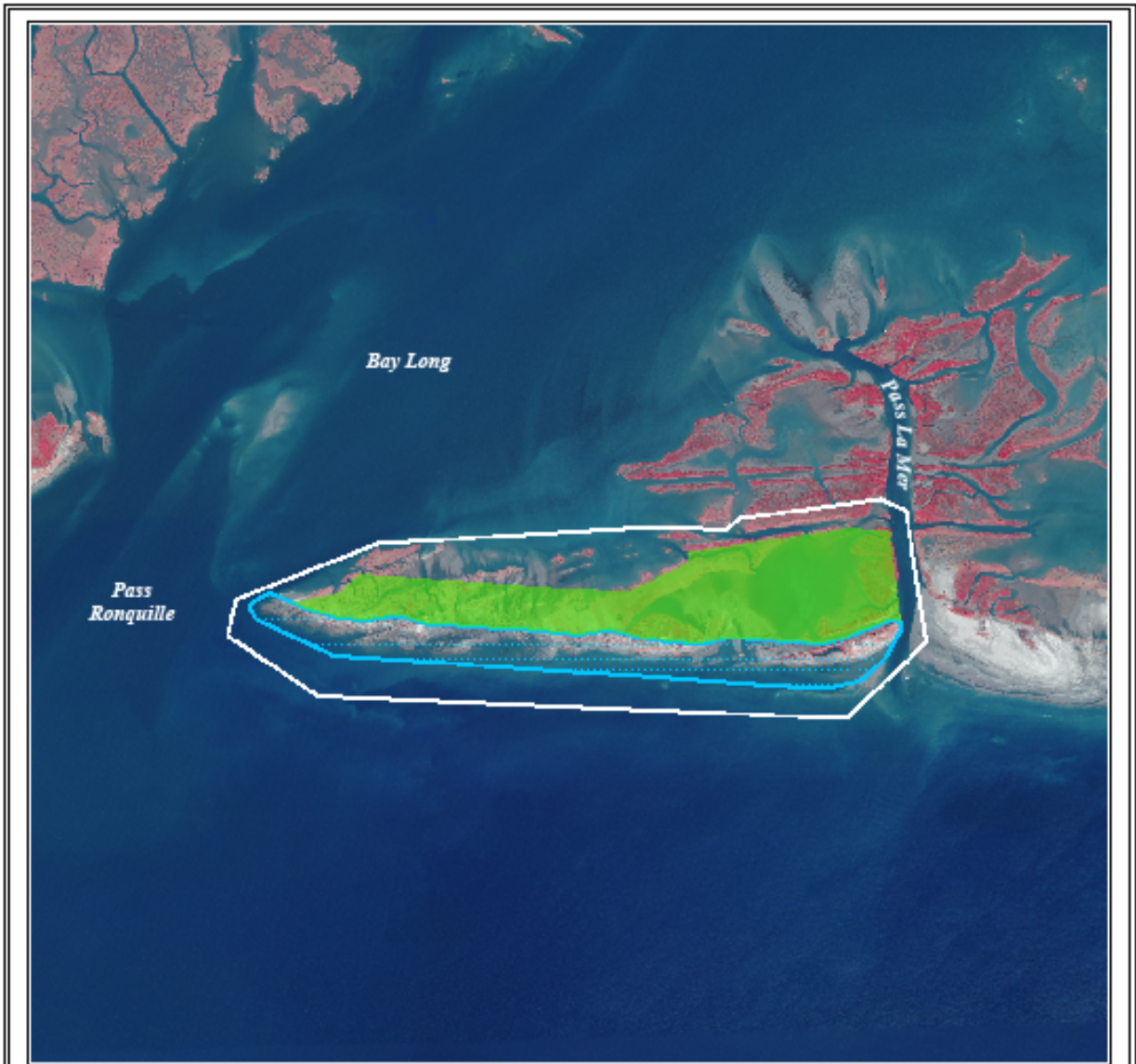
**Proposed Solution:** Cheniere Ronquille restoration would expand the Gulf shoreline structural integrity and associated protection by tying into two recently constructed projects to the east and address one of the remaining reaches of the Barataria/Plaquemines shoreline. The design includes fill for a beach and dune plus 20 years of advanced maintenance fill, as well as fill for marsh creation/nourishment. The location of the type and amount of sediment needed to construct this project has already been identified under the East Grand Terre Project presently under construction. Approximately 127 acres of beach/dune fill would be constructed with a dune crest at +6 feet NAVD88. Approximately 259 acres of marsh creation/nourishment would be constructed. Intensive dune plantings would be conducted by seeding and installing approved nursery stock. About half of the marsh platform would be planted with cordgrass and portions of the dune, swale, and marsh would be planted with appropriate woody species. Containment dikes would be breached no later than Year 3 to allow tidal exchange with the created marsh.

**Project Benefits:** The project would benefit 408 acres of island beach/dune and back barrier marsh and adjacent open water. Approximately 234 acres of beach/dune and back barrier marsh would be created/protected over the 20-year project life.

**Project Costs:** The total fully-funded cost for the project is \$43,828,285.




**Preparer(s) of Fact Sheet:**

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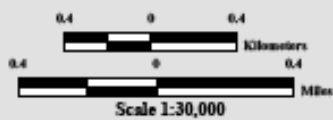


### Cheniere Ronquille Barrier Island Restoration (PPL19 Candidate)



-  Dune/Beach \*
-  Marsh Creation \*
-  Project Boundary

\* denotes proposed features



Map ID: USGS-NWRC 2009-11-0380  
Map Date: August 20, 2009

Produced by:  
U.S. Department of the Interior  
U.S. Geological Survey  
National Wetlands Research Center  
Coastal Restoration Field Station  
Baton Rouge, LA  
Image Source:  
2008 Digital Orthophoto Quarter Quadrangles

**Project Name: Freshwater Bayou Marsh Creation Project**

**Coast 2050 Strategy:**

Coastwide Strategy – Dedicated dredging to create, restore, and protect wetlands

**Project Location:** Region 4, Mermentau Basin, Vermilion Parish, Big Marsh Mapping Unit, area west of Freshwater Bayou and north of the Freshwater Bayou lock.

**Problem:** This area was damaged by Hurricanes Rita, Gustav, and Ike. Currently, Freshwater Bayou threatens to breach into the large interior open water and establish a hydrologic connection that previously did not exist. This would exacerbate the environmental problems affecting marshes in this area. Additionally, interior marsh loss has increased and organic soils are being exported into Freshwater Bayou. Interior marsh loss will increase without construction of the proposed project.

**Goals:** The project goals include: 1) creating/nourishing marsh and associated edge habitat for aquatic species through pipeline sediment delivery via dedicated dredging from the Gulf of Mexico or beneficial use of maintenance dredging from the Freshwater Bayou Canal; and 2) restoring a wetland buffer between the large open water areas in the Mermentau Basin and Freshwater Bayou.

**Proposed Solution:** The project would beneficially use dredged material and/or dedicated dredge material to rebuild/nourish approximately 401 acres of marsh that was damaged or converted to shallow open water by Hurricanes Rita, Gustav, and Ike. Approximately 2 million cubic yards of dredged material from the Gulf of Mexico would be dedicated to two hurricane damaged areas in the Big Marsh unit. If possible, material and/or equipment would be used from the maintenance dredging of Freshwater Bayou to the maximum extent practical to reduce cost during construction. However, since that material is not available every year the proposed project costs and benefits are conservatively based on dedicated dredging offshore. Approximately 162 acres of marsh would be created and 24 acres would be nourished in the North Area, and approximately 149 acres of marsh would be created and 66 acres would be nourished in the South Area. Average water depths are approximately 1.7 feet.

**Project Benefits:** The project would benefit approximately 401 acres of fresh/intermediate marsh. Approximately 279 net acres would be created/protected over the 20-year project life.

**Project Costs:** The total fully-funded cost for the project is \$25,523,755.

**Preparer(s) of Fact Sheet**



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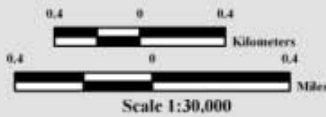
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### Freshwater Bayou Marsh Creation (PPL19 Candidate)



-  Marsh Creation \*
-  Project Boundary
- \* denotes proposed features



Map ID: USGS-NWRC 2009-11-0276  
Map Date: July 24, 2009

Produced by:  
U.S. Department of the Interior  
U.S. Geological Survey  
National Wetlands Research Center  
Coastal Restoration Field Station  
Baton Rouge, La

Image Source:  
2008 Digital Orthophoto Quarter Quadrangles

**Project Name: LaBranche East Marsh Creation Project**

**Coast 2050 Strategy:**

Coastwide Strategies – Dedicated dredging for wetlands creation, vegetative planting, and maintain or restore ridge functions

Regional Strategies – Dedicated delivery of sediment for marsh creation; dedicated dredging

**Project Location:** Region 1, Pontchartrain Basin, St. Charles Parish, between Lake Pontchartrain and I-10, bounded to the west by the Fall Canal and the initial Bayou LaBranche Wetland Creation Project (CWPPRA PO-17) and to the east by a pipeline canal.

**Problem:** Dredging of access/flotation canals for construction of I-10 resulted in increased salinity and altered hydrology that exacerbated conversion of wetland vegetation into shallow open water bodies.

**Goals:** Primary goal is to restore marsh that converted to shallow open water. Project implementation would result in an increase of fisheries and wildlife habitat, acreage, and diversity along with improving water quality. The proposed project would provide a storm buffer to I-10, the region’s primary westward hurricane evacuation route, and complement hurricane protection measures in the area.

**Proposed Solution:** Proposed solution consists of the creation of  $\pm$  729 acres of marsh and the nourishment of  $\pm$  202 acres of existing marsh using dedicated dredging from Lake Pontchartrain. In addition, 10,000 linear feet of tidal creeks would be created by pre-dredging water bottom before dredged material is placed. The marsh creation area would have a target elevation the same as average healthy marsh. It is proposed to place the dredged material in the target area with the use of low level retention dikes along the edge of the project area allowing overtopping of material to nourish the marsh fringe. Vegetative plantings would be utilized in the areas designated to be emergent marsh. Either  $\frac{1}{4}$  of the area would be planted at full density or  $\frac{1}{4}$  the density would be planted over the entire acreage.

**Project Benefits:** This project would benefit 931 acres of intermediate marsh and open water. The project will result in 715 net acres of marsh over the 20-year project life.

**Project Cost:** The total fully-funded cost for the project is \$32,323,291.

**Preparer(s) of Fact Sheet:**

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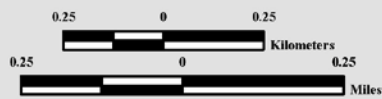
Lake Pontchartrain

### LaBranche East Marsh Creation (PPL19 Candidate)



- ==== Tidal Creek \*
- Marsh Creation \*
- Marsh Fill \*

\* denotes proposed features



Map ID: USGS-NWRC 2009-11-0349  
Map Date: September 18, 2009

Produced by:  
U.S. Department of the Interior  
U.S. Geological Survey  
National Wetlands Research Center  
Coastal Restoration Field Station  
Baton Rouge, La  
Image Source:  
2008 Digital Orthophoto Quarter Quadrangles

**Project Name: Lost Lake Marsh Creation and Hydrologic Restoration Project**

**Coast 2050 Strategy:**

Regional Strategy – Dedicated delivery of sediment for marsh building

Regional Strategy – Increase transfer of Atchafalaya River water to lower Penchant tidal marshes

**Project Location:** Region 3, Terrebonne Basin, Terrebonne Parish, near the vicinity of Lost Lake.

**Problem:** Significant marsh loss has occurred between Lake Pagie and Bayou DeCade to the point that little structural framework remains separating those two waterbodies. Northeast of Lost Lake, interior marsh breakup has resulted in large, interior ponds where wind/wave energy continues to result in marsh loss. West of Lost Lake, interior breakup has occurred as a result of ponding and the periodic entrapment of higher salinity waters during storm events.

**Goals:** Project goals include: 1) restore an important feature of structural framework between Lake Pagie and Bayou Decade to prevent the coalescence of those two water bodies, 2) increase the delivery of fresh water, sediments, and nutrients into marshes north and west of Lost Lake, and 3) reduce fetch in open water areas via construction of a terrace field. Specific Phase 0 goals include creating approximately 465 acres of marsh, increasing the delivery of fresh water into project area marshes by replacing 4 fixed-crest weirs and two plugs with variable-crest structures, and creating approximately 26 acres of marsh via the construction of 30,000 feet of terraces.

**Proposed Solution:** Approximately 465 acres of marsh will be created between Lake Pagie and Bayou DeCade, north of Bayou DeCade, and along the northwestern Lost Lake shoreline. In addition, 30,000 linear feet (26 acres) of terraces will be constructed to reduce fetch in an area of deteriorated marsh. Approximately 20,000 linear feet of tidal creeks will be constructed within the marsh creation cells. Four fixed-crest weirs and two plugs will be replaced with variable-crest structures to increase freshwater flow into surrounding marshes.

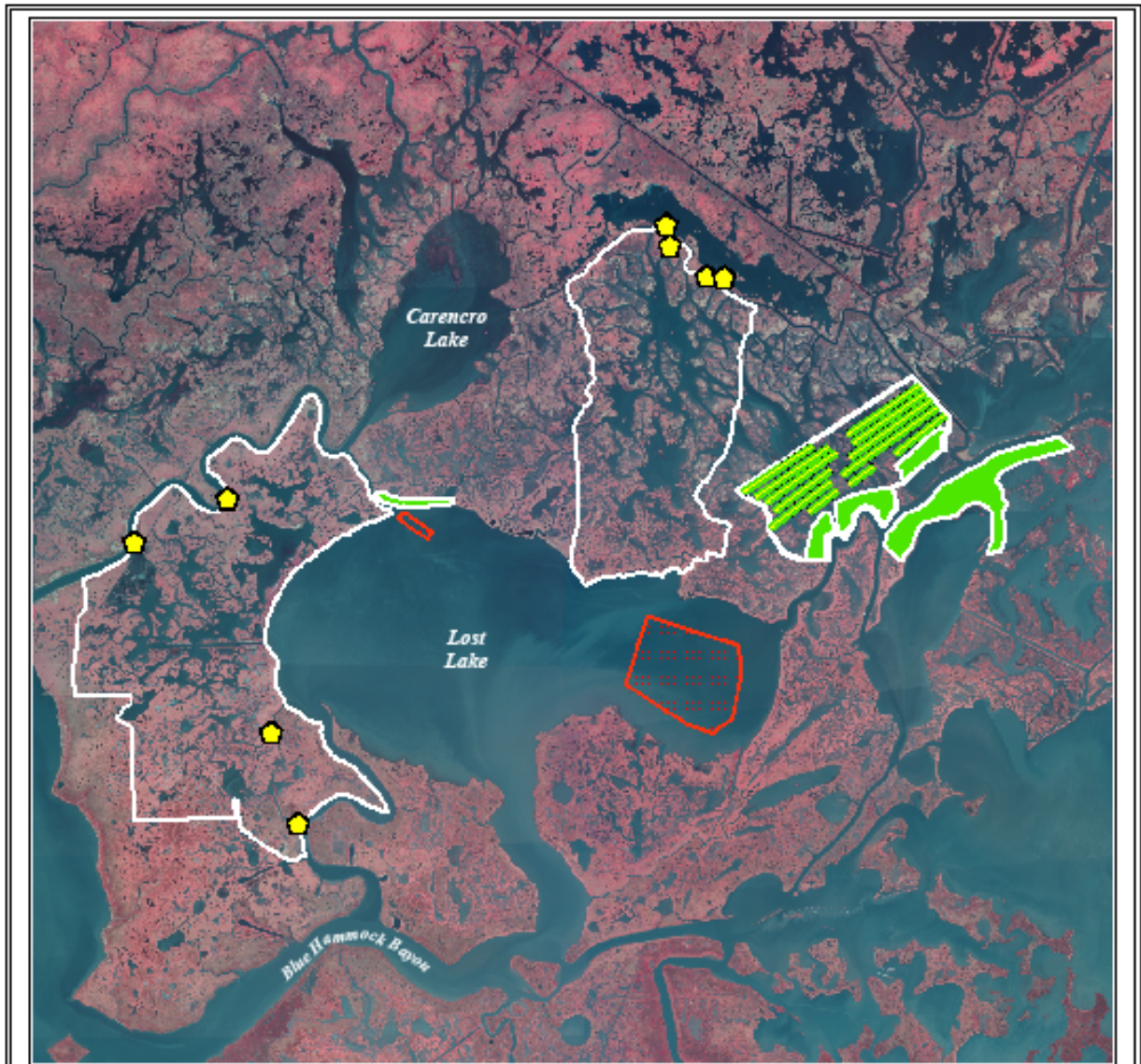
**Project Benefits:** The project would benefit 7,312 acres of marsh and open water habitats. A total of 749 net acres of marsh would be protected/created over the 20-year project life.

**Project Costs:** The total fully-funded cost for the project is \$22,943,866.

**Preparer(s) of Fact Sheet:**

Kevin Roy, USFWS, (337) 291-3120, [Kevin\\_Roy@fws.gov](mailto:Kevin_Roy@fws.gov)





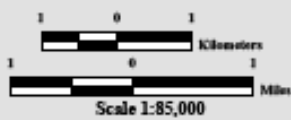
### Lost Lake Marsh Creation and Hydrologic Restoration (PPL19 Candidate)



- Water Control Structure \*
  - Marsh Creation \*
  - Project Boundary
  - Borrow Site \*
  - Terrace \*
- \* denotes proposed features



Produced by:  
 U.S. Department of the Interior  
 U.S. Geological Survey  
 National Wetlands Research Center  
 Coastal Restoration Field Station  
 Baton Rouge, La



Map ID: USGS-NWRC 2009-11-0366  
 Map Date: August 10, 2009

Image Source:  
 2008 Digital Orthophoto Quarter Quadrangles



## **VII. SUMMARY AND CONCLUSIONS**

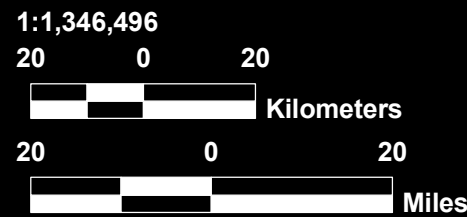
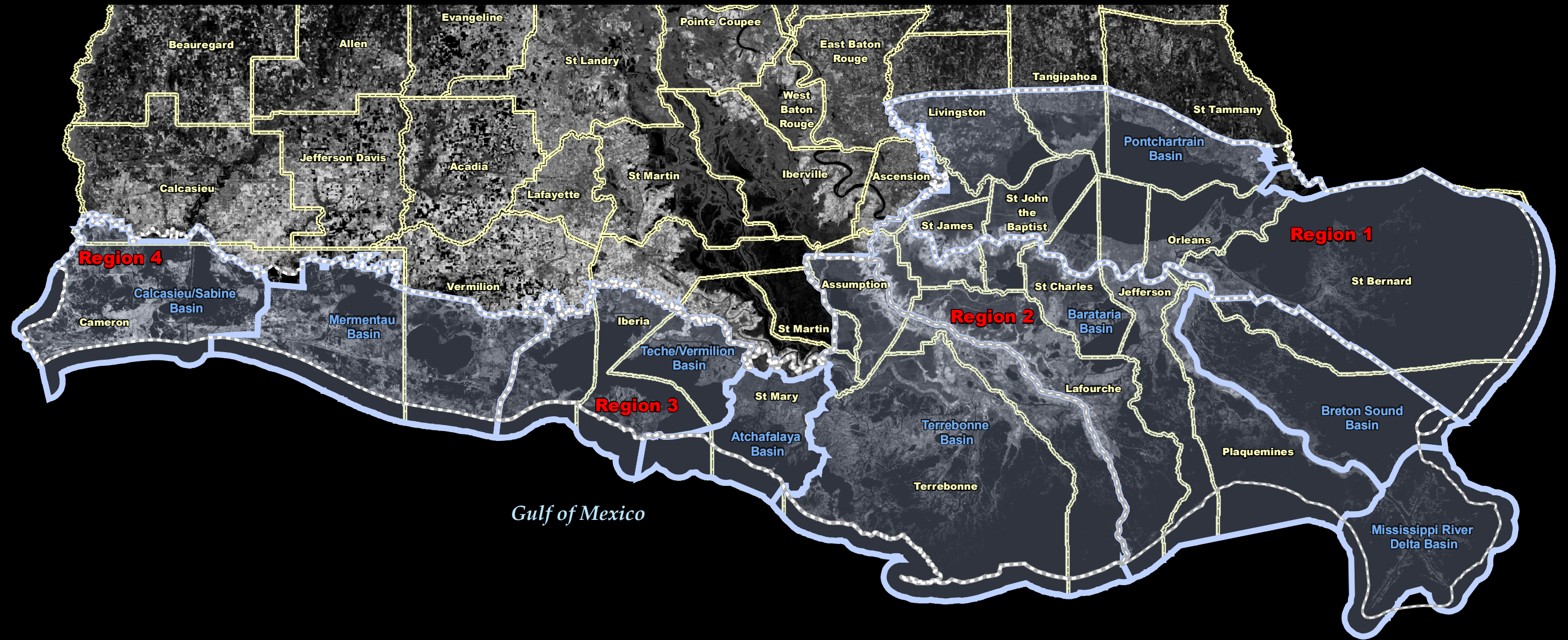
The 19<sup>th</sup> PPL consists of 4 projects, for a Phase I cost of \$10,736,747 and a Phase II cost of \$113,882,450, which will be funded as these projects mature. The total benefits of the projects are estimated to be 918 AAHUs, based on a comparison of future with and without-project conditions over the 20-year project life. The Task Force did not select any demonstration projects for the 19<sup>th</sup> PPL.

The CWPPRA Task Force believes the recommended projects represent the best strategy for addressing the immediate needs of Louisiana's coastal wetlands. The CWPPRA Task Force will conduct a final review of the plans and specifications for each project prior to the award of construction contracts by the lead Task Force agency and the allocation of construction funds by the Task Force.





# Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA) Hydrologic Basins and Coast 2050 Regions



- Region Boundary
- Hydrologic Basin
- Parish Boundary

Image Source:  
2009 Thematic Mapper Imagery

Produced by:  
U.S. Department of the Interior  
U.S. Geological Survey  
National Wetlands Research Center  
Coastal Restoration Field Station  
Baton Rouge, LA

Map ID: USGS-NWRC 2005-11-0319  
Map Date: July 14, 2010

## PLATE 2. SUMMARY OF PROJECTS 1-19 PRIORITY PROJECT LISTS

Deauthorized = underlined; Coastal Impact Assistance Program (CIAP) = *italics*

### 1<sup>st</sup> Priority Project List

#### U.S. Environmental Protection Agency

TE-20 Isles Dernieres Restoration East Island

#### U.S. Department of the Army

MR-03 West Bay Sediment Diversion

PO-17 Bayou LaBranche Wetland Creation

BA-19 Barataria Bay Waterway Wetland Creation

TV-03 Vermilion River Cutoff Bank Protection

#### U.S. Department of Commerce

BA-18 Fourchon Hydrologic Restoration

TE-19 Lower Bayou laChache Hydrologic Restoration

#### U.S. Department of Agriculture

BA-02 GIWW to Clovelly Hydrologic Restoration

TE-18 Vegetative Plantings - Timbalier Island Planting Demonstration

TE-17 Vegetative Plantings - Falgout Canal Planting Demonstration

CS-19 Vegetative Plantings - West Hackberry Planting Demonstration

ME-08 Vegetative Plantings - Dewitt-Rollover Planting Demonstration

#### U.S. Department of the Interior

PO-16 Bayou Sauvage National Wildlife Refuge Hydrologic Restoration, Phase 1

ME-09 Cameron Prairie Refuge National Wildlife Refuge Shoreline Protection

CS-18 Sabine National Wildlife Refuge Erosion Protection

CS-17 Cameron Creole Plugs

### 2<sup>nd</sup> Priority Project List

#### U.S. Environmental Protection Agency

TE-24 Isles Dernieres Restoration Trinity Island

#### U.S. Department of the Army

TE-23 West Belle Pass Headland Restoration

CS-22 Clear Marais Bank Protection

#### U.S. Department of Commerce

AT-02 Atchafalaya Sediment Delivery

TE-22 Point Au Fer Canal Plugs

AT-03 Big Island Mining

#### U.S. Department of Agriculture

CS-09 Brown Lake Hydrologic Restoration

ME-04 Freshwater Bayou Wetland Protection

BA-20 Jonathan Davis Wetland Restoration

CS-20 East Mud Lake Marsh Management

CS-21 Hwy. 384 Hydrologic Restoration

PO-06 Fritchie Marsh Creation

TV-09 Vermilion Bay/Boston Canal Shoreline Stabilization

BS-03a Caernarvon Diversion Outfall Management

#### U.S. Department of the Interior

PO-18 Bayou Sauvage National Wildlife Refuge Hydrologic Restoration, Phase 2

### 3<sup>rd</sup> Priority Project List

#### **U.S. Environmental Protection Agency**

TE-27 Whiskey Island Restoration

PO-20 Red Mud Demonstration

#### **U.S. Department of the Army**

PO-19 MRGO Disposal Area Marsh Protection

MR-06 Channel Armor Gap Crevasse

MR-07 Pass-a-Loutre Crevasse

#### **U.S. Department of Commerce**

BA-21 Bayou Perot/Bayou Rigolettes Marsh Restoration

TE-25 East Timaballier Island Sediment Restoration, Phase 1

TE-26 Lake Chapeau Sediment Input and Hydrologic Restoration

BA-15 Lake Salvador Shore Protection Demonstration

#### **U.S. Department of Agriculture**

BA-04c West Pointe-a la Hache Outfall Management

TV-04 Cote Blanche Hydrologic Restoration

CS-04a Cameron - Creole Maintenance

BS-04a White's Ditch Outfall Management

TE-28 Brady Canal Hydrologic Restoration

PO-9a Violet Freshwater Distribution

ME-12 Southwest Shore White Lake Demonstration

#### **U.S. Department of the Interior**

CS-23 Sabine Refuge Structure Replacement (Hog Island)

### 4<sup>th</sup> Priority Project List

#### **U.S. Environmental Protection Agency**

CS-26 Compost Demonstration

#### **U.S. Department of the Army**

BS-07 Grand Bay Crevasse

MR-08 Beneficial Use of Hopper Dredge Material Demonstration

#### **U.S. Department of Commerce**

PO-21 Eden Isles East Marsh Restoration

TE-30 East Timbalier Island Sediment Restoration, Phase 2

#### **U.S. Department of Agriculture**

CS-24 Perry Ridge Shore Protection

BA-22 Bayou L'Ours Ridge Hydrologic Restoration

BA-23 Baratavia Bay Waterway West Side Shoreline Protection

CS-25 Plowed Terraces Demonstration

TE-31 Flotant Marsh Fencing Demonstration

### 5<sup>th</sup> Priority Project List

#### **U.S. Environmental Protection Agency**

BA-25a Bayou Lafourche Siphon

BA-25b Mississippi River Reintroduction into Bayou Lafourche

#### **U.S. Department of the Army**

PO-22 Bayou Chevee Shoreline Protection

#### **U.S. Department of Commerce**

TV-12 Little Vermilion Bay Sediment Trapping

BA-24 Myrtle Grove Siphon

#### **U.S. Department of Agriculture**

BA-03c Naomi Outfall Management

CS-11b Sweet Lake/ Willow Lake Hydrologic Restoration

TE-29 Raccoon Island Breakwaters Demonstration

ME-13 Freshwater Bayou Bank Stabilization

#### **U.S. Department of the Interior**

TE-10 Grand Bayou Hydrologic Restoration

### 6<sup>th</sup> Priority Project List

#### U.S. Environmental Protection Agency

TE-33 Bayou Boeuf Pump Station

#### U.S. Department of the Army

TV-14 Marsh Island Hydrologic Restoration

TE-35 Marsh Creation East of the Atchafalaya River – Avoca Island

MR-10 Flexible Dustpan Demo at Head of Passes (Demo)

#### U.S. Department of Commerce

CS-27 Black Bayou Hydrologic Restoration

MR-09 Delta-Wide Crevasses

TV-15 Sediment Trapping at “The Jaws”

#### U.S. Department of Agriculture

TE-34 Penchant Basin Natural Resources Plan, Increment 1

TV-13a Oaks/Avery Canal Hydrologic Restoration Increment 1

BA-26 Barataria Bay Waterway East Side Shoreline Protection

TV-16 Cheniere au Tigre Sediment Trapping Demonstration

#### U.S. Department of the Interior

TE-32a Lake Boudreaux Freshwater Introduction

LA-03a Nutria Harvest for Wetland Restoration Demonstration

### 7<sup>th</sup> Priority Project List

#### U.S. Department of Commerce

BA-28 Grand Terre Vegetative Plantings

ME-14 Pecan Island Terracing

#### U.S. Department of Agriculture

BA-27 Barataria Basin Landbridge Shoreline Protection, Phase 1 and 2

TE-36 Thin Mat Floating Marsh Enhancement Demonstration

### 8<sup>th</sup> Priority Project List

#### U.S. Department of the Army

CS-28-1 Sabine Refuge Marsh Creation, Cycle 1

CS-28-2 Sabine Refuge Marsh Creation, Cycle 2

CS-28-3 Sabine Refuge Marsh Creation, Cycle 3

CS-28-4 Sabine Refuge Marsh Creation, Cycle 4

CS-28-5 Sabine Refuge Marsh Creation, Cycle 5

#### U.S. Department of Commerce

PO-25 Bayou Bienvenue Pump Station Diversion and Terracing

PO-24 Hopedale Hydrologic Restoration

#### U.S. Department of Agriculture

BA-27 Barataria Basin Landbridge, Shoreline Protection, Phase 2 Increment A

BA-27 Barataria Basin Landbridge, Shoreline Protection, Phase 2 Increment B

BA-27 Barataria Basin Landbridge, Shoreline Protection, Phase 2 Increment C

(These projects were merged with BA-27 after PPL 8 approval and are subsequently numbered as BA-27)

ME-11 Humble Canal Hydrologic Restoration

BS-09 Upper Oak River Freshwater Siphon

TV-17 Lake Portage Landbridge

### 9<sup>th</sup> Priority Project List

#### U.S. Environmental Protection Agency

BA-29 LA Highway 1 Marsh Creation

TE-40 Timbalier Island Dune and Marsh Restoration

TE-37 New Cut Dune and Marsh Restoration

#### U.S. Department of the Army

PO-26 Opportunistic Use of the Bonnet Carre Spillway

TV-11b Freshwater Bayou Bank Stabilization - Belle Isle Canal to Lock

MR-11 Periodic Introduction of Sediment and Nutrients at Selected Diversion Sites Demonstration

TV-19 Weeks Bay MC and SP/Commercial Canal/Freshwater Redirection

#### U.S. Department of Commerce

PO-27 Chandeleur Islands Marsh Restoration

TV-18 Four Mile Canal Terracing and Sediment Trapping

AT-04 Castille Pass Channel Sediment Delivery

PO-28 LaBranche Wetlands Terracing, Planting, and Shoreline Protection

BA-30 East Grand Terre Islands Restoration

#### U.S. Department of Agriculture

TE-39 South Lake Decade Freshwater Introduction

CS-29 Black Bayou Bypass Culverts Hydrologic Restoration

CS-30 Perry Ridge West Bank Stabilization

ME-17 Little Pecan Bayou Hydrologic Restoration

BA-27c Barataria Basin Landbridge Shoreline Protection, Phase 3

#### U.S. Department of the Interior

ME-16 Freshwater Introduction South of Hwy. 82

TE-41 Mandalay Bank Protection Demonstration



### 10<sup>th</sup> Priority Project List

#### U.S. Environmental Protection Agency

PO-30 Lake Borgne Shoreline Protection

BA-34 Small Freshwater Diversion to the Northwestern Barataria Basin

#### U.S. Department of the Army

MR-13 Benneys Bay Diversion

BA-33 Delta Building Diversion at Myrtle Grove

BS-10 Delta Building Diversion North of Fort St. Phillip

#### U.S. Department of Commerce

ME-18 Rockefeller Refuge Gulf Shoreline Stabilization

#### U.S. Department of Agriculture

TE-43 GIWW Bank Restoration of Critical Areas in Terrebonne

#### U.S. Department of the Interior

ME-19 Grand-White Lake Landbridge Restoration

TE-44 North Lake Mechant Landbridge Restoration

BS-11 Delta Management at Fort St. Phillip

CS-32 East Sabine Lake Hydrologic Restoration

TE-45 Terrebonne Bay Shore Protection Demonstration

### 11<sup>th</sup> Priority Project List

#### U.S. Environmental Protection Agency

PO-29 River Reintroduction into Maurepas Swamp

PO-31 Lake Borgne Shoreline Protection at Bayou Dupre

(This project merged with PO-30 after PPL 11 approval and is subsequently numbered as PO-30)

TE-47 Ship Shoal: Whiskey West Flank Restoration

#### U.S. Department of the Army

ME-21a Grand Lake Shoreline Protection, Tebo Point

ME-21b Grand Lake Shoreline Protection, O&M Only (Transferred)

#### U.S. Department of Commerce

BA-35 Pass Chalant to Grand Bayou Pass Barrier Shoreline Restoration

BA-37 Little Lake Shoreline Protection/Dedicated Dredging near Round Lake

BA-38 Barataria Barrier Island: Pelican Island and Pass La Mer to Chalant Pass

#### U.S. Department of Agriculture

BA-27d Barataria Basin Landbridge Shoreline Protection, Phase 4

LA-03b Coastwide Nutria Control Program

CS-31 Holly Beach Sand Management

TE-48 Raccoon Island Shoreline Protection/Marsh Creation, Ph 2

#### U.S. Department of the Interior

BA-36 Dedicated Dredging on the Barataria Basin Landbridge

ME-20 South Grand Chenier Hydrologic Restoration

TE-46 West Lake Boudreaux Shoreline Protection and Marsh Creation

### 12<sup>th</sup> Priority Project List

#### U.S. Environmental Protection Agency

BA-39 Bayou Dupont Sediment Delivery System

#### U.S. Department of the Army

TE-49 Avoca Island Diversion and Land Building

PO-32 Lake Borgne and MRGO Shoreline Protection

ME-22 South White Lake Shoreline Protection

MR-12 Mississippi River Sediment Trap

#### U.S. Department of Agriculture

LA-05 Freshwater Floating Marsh Creation Demonstration

### 13<sup>th</sup> Priority Project List

#### U.S. Environmental Protection Agency

TE-50 Whiskey Island Back Barrier Marsh Creation

#### U.S. Department of the Army

MR-14 Spanish Pass Diversion

LA-06 Shoreline Protection Foundation Improvements Demonstration

#### U.S. Department of Agriculture

TV-20 Bayou Sale Ridge Protection

#### U.S. Department of the Interior

PO-33 Goose Point/Point Platte Marsh Creation

### 14<sup>th</sup> Priority Project List

**U.S. Department of Commerce**

BA-40 Riverine Sand Mining/Scofield Island Restoration

**U.S. Department of Agriculture**

BS-12 White Ditch Resurrection

BA-41 South Shore of the Pen Shoreline Protection and Marsh Creation

TV-21 East Marsh Island Marsh Creation

### 15<sup>th</sup> Priority Project List

**U.S. Department of the Army**

BS-13 Bayou Lamoque Freshwater Diversion

**U.S. Environmental Protection Agency**

MR-15 Venice Ponds Marsh Creation and Crevasses

**U.S. Department of the Interior**

BA-42 Lake Hermitage Marsh Creation

**U.S. Department of Commerce**

ME-23 South Pecan Island Freshwater Introduction

### 16<sup>th</sup> Priority Project List

**U.S. Environmental Protection Agency**

TE-53 Enhancement of Barrier Island Vegetation Demonstration

**U.S. Department of the Army**

ME-24 Southwest Louisiana Gulf Shoreline Nourishment and Protection

**U.S. Department of Commerce**

TE-51 Madison Bay Marsh Creation and Terracing

TE-52 West Belle Pass Barrier Headland Restoration Project

**U.S. Department of Agriculture**

PO-34 Alligator Bend Marsh Restoration and Shoreline Protection

### 17<sup>th</sup> Priority Project List

**U.S. Environmental Protection Agency**

BS-15 Bohemia Mississippi River Reintroduction

**U.S. Department of the Interior**

BS-16 Caernarvon Outfall Management/Lake Lery Shoreline Restoration

**U.S. Department of Agriculture**

LA-09 Sediment Containment System for Marsh Creation Demonstration

BA-47 West Pointe a la Hache Marsh Creation

**U.S. Department of Commerce**

BA-48 Bayou Dupont Ridge Creation and Marsh Restoration

LA-08 Bioengineered Oyster Reef Demonstration

### 18<sup>th</sup> Priority Project List

**U.S. Environmental Protection Agency**

BS-18 Bertrandville Siphon

**U.S. Department of Agriculture**

TE-66 Central Terrebonne Freshwater Enhancement

CS-49 Cameron-Creole Freshwater Introduction

LA-16 Non-Rock Alternatives to Shoreline Protection Demonstration

**U.S. Department of Commerce**

BA-68 Grand Liard Marsh and Ridge Restoration

### 19<sup>th</sup> Priority Project List

**U.S. Department of Commerce**

BA-76 Cheniere Ronquille Barrier Island Restoration

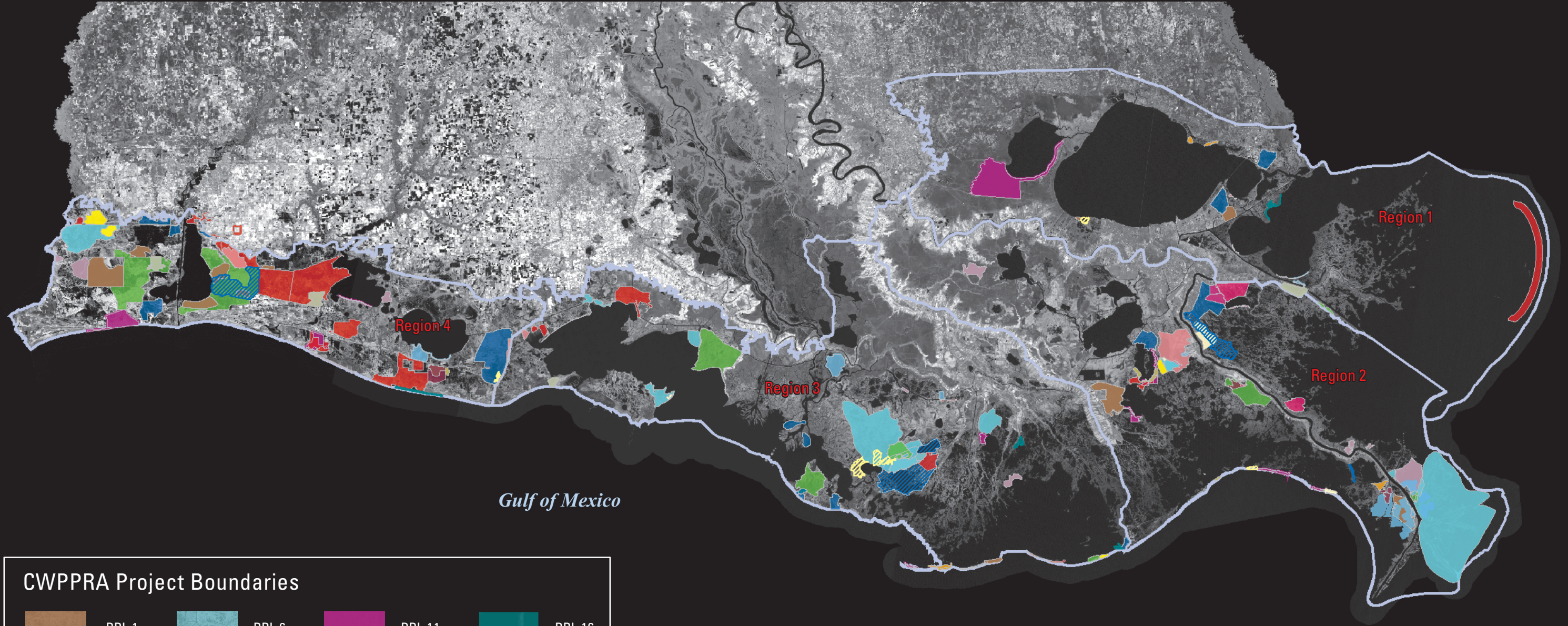
**U.S. Department of Agriculture**

ME-31 Freshwater Bayou Marsh Creation

PO-75 LaBranche East Marsh Creation

**U.S. Department of the Interior**

TE-72 Lost Lake Marsh Creation and Hydrologic Restoration



**CWPPRA Project Boundaries**

	PPL 1		PPL 6		PPL 11		PPL 16
	PPL 2		PPL 7		PPL 12		PPL 17
	PPL 3		PPL 8		PPL 13		PPL 18
	PPL 4		PPL 9		PPL 14		PPL 19
	PPL 5		PPL 10		PPL 15		

 Region Boundary

1:1,275,000

10 0 10 20

 Kilometers

10 0 10 20

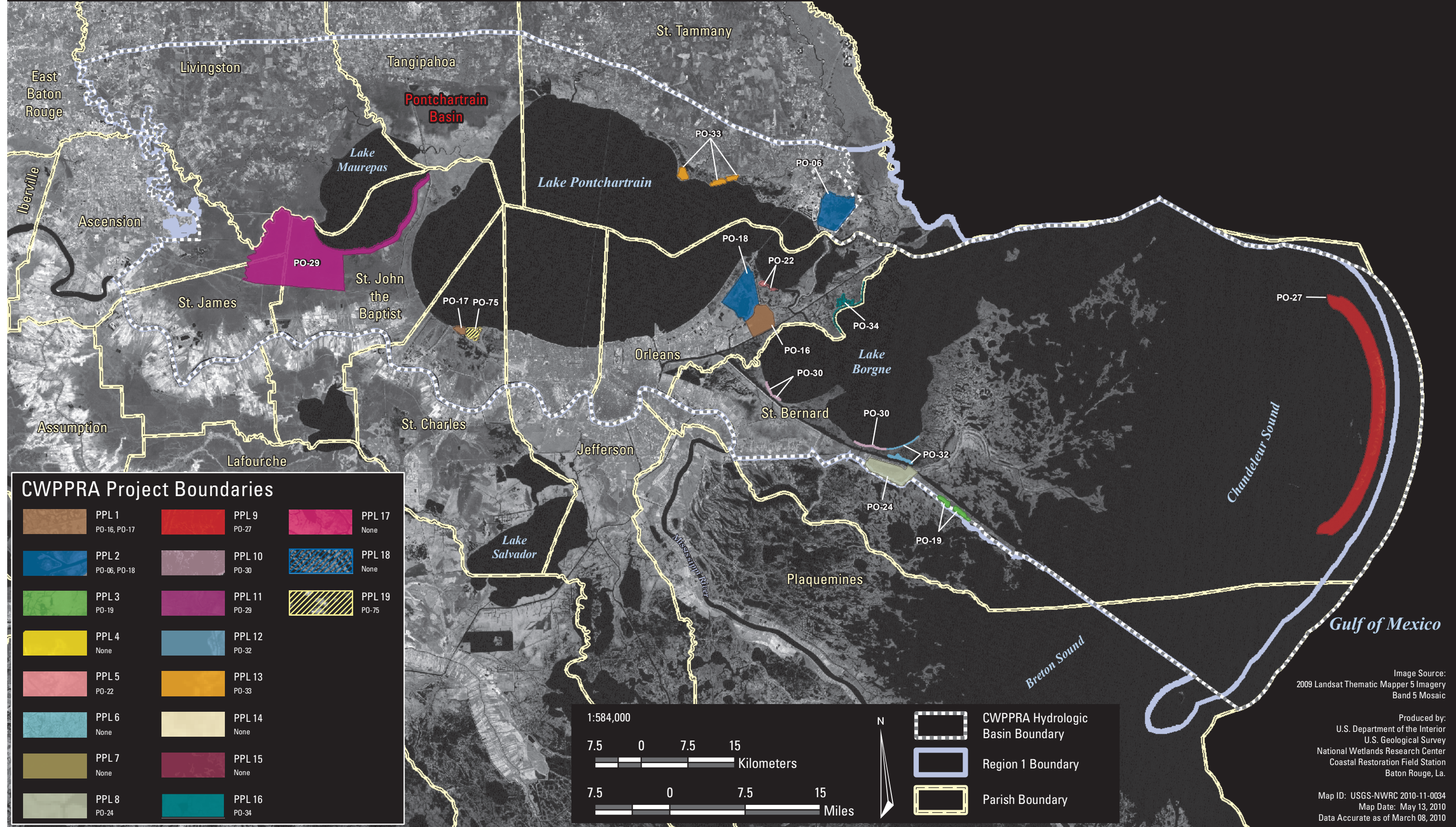
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Image Source:  
2009 Landsat Thematic Mapper 5 Imagery  
Band 5 Mosaic

Produced by:  
U.S. Department of the Interior  
U.S. Geological Survey  
National Wetlands Research Center  
Coastal Restoration Field Station  
Baton Rouge, La.

Map ID: USGS-NWRC 2010-11-0027  
Map Date: March 09, 2010  
Data accurate as of March 08, 2010



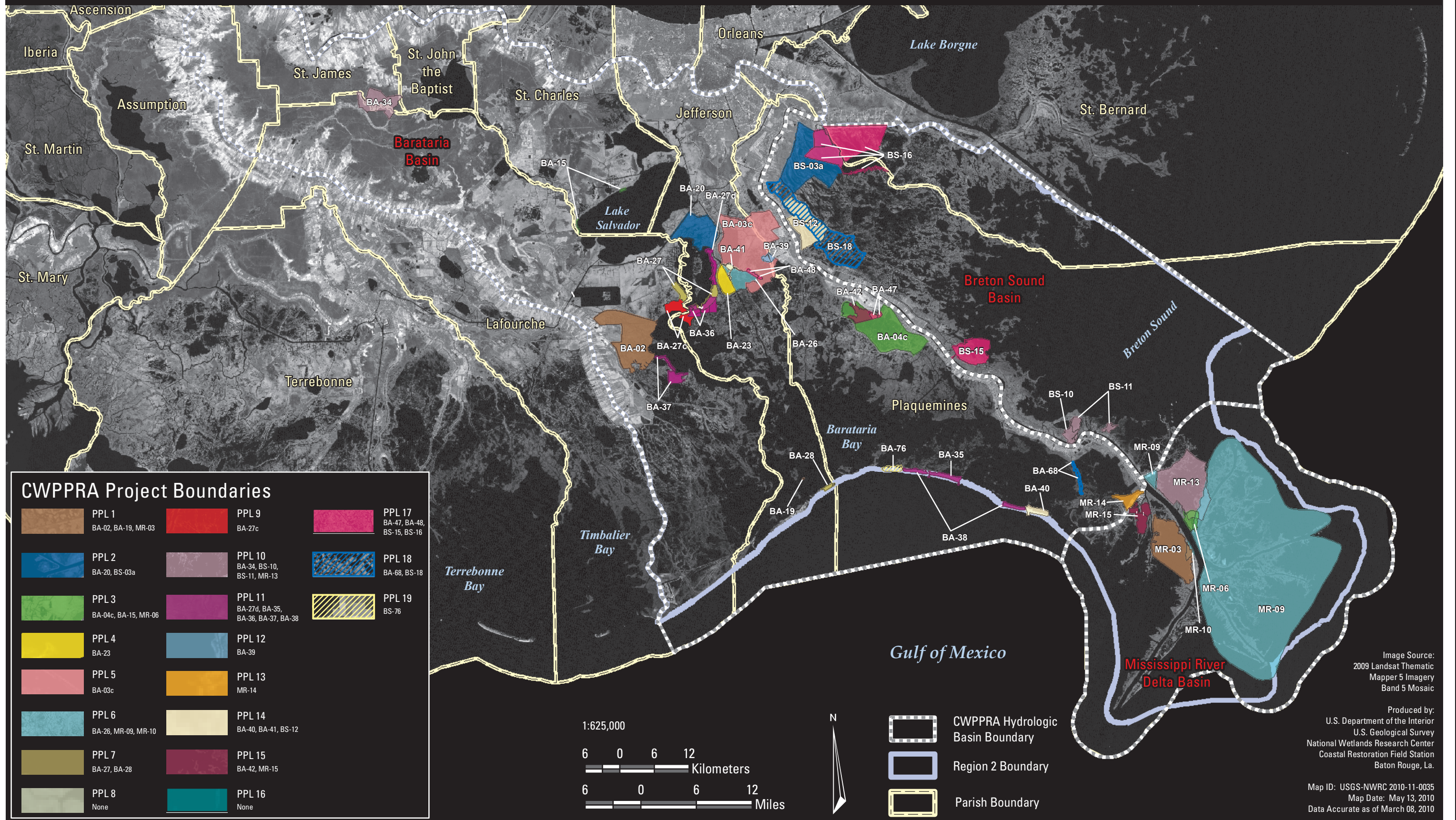
### CWPPRA Project Boundaries

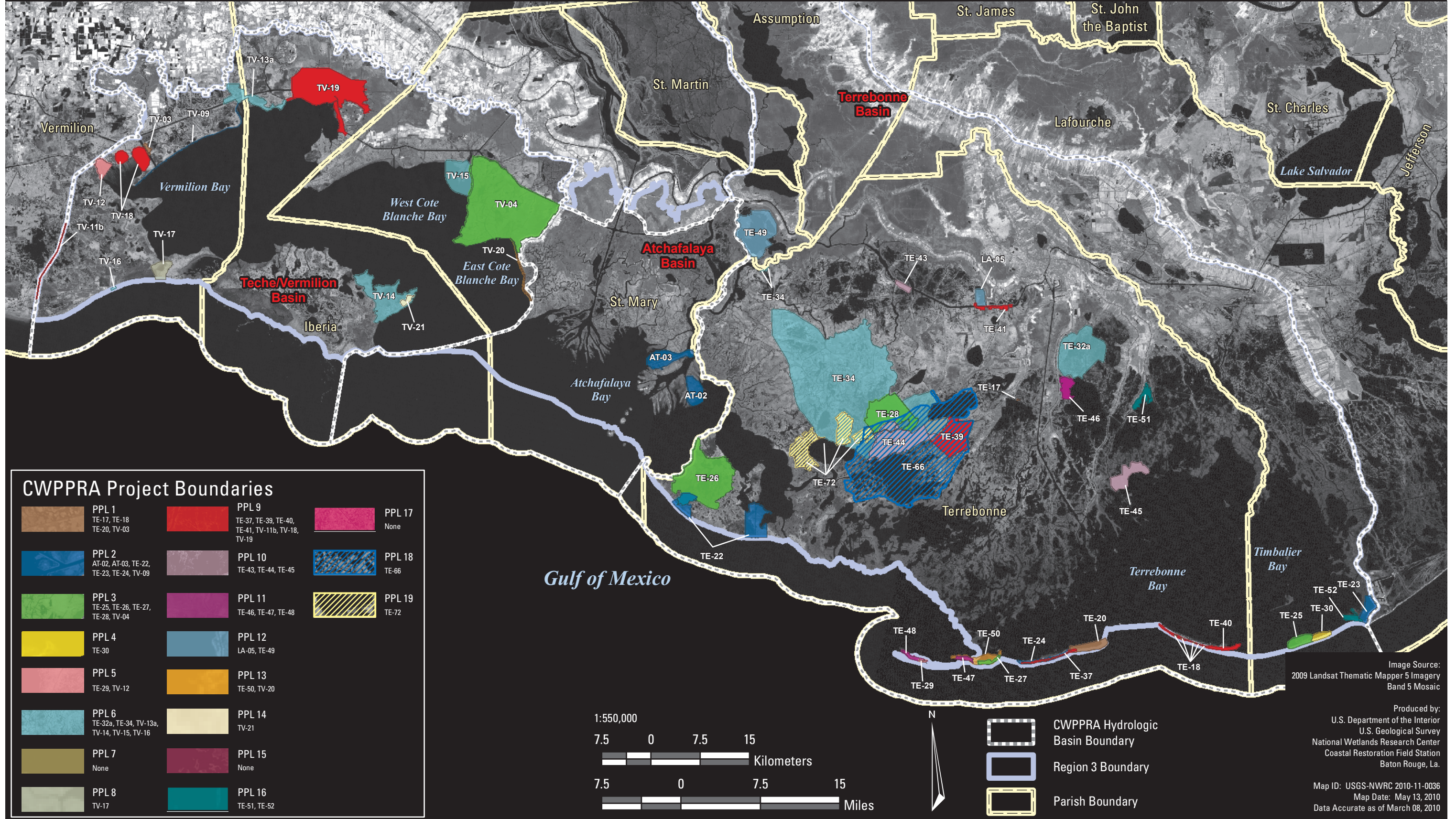
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	PPL 3 PO-19		PPL 11 PO-29		PPL 19 PO-75
	PPL 4 None		PPL 12 PO-32		
	PPL 5 PO-22		PPL 13 PO-33		
	PPL 6 None		PPL 14 None		
	PPL 7 None		PPL 15 None		
	PPL 8 PO-24		PPL 16 PO-34		

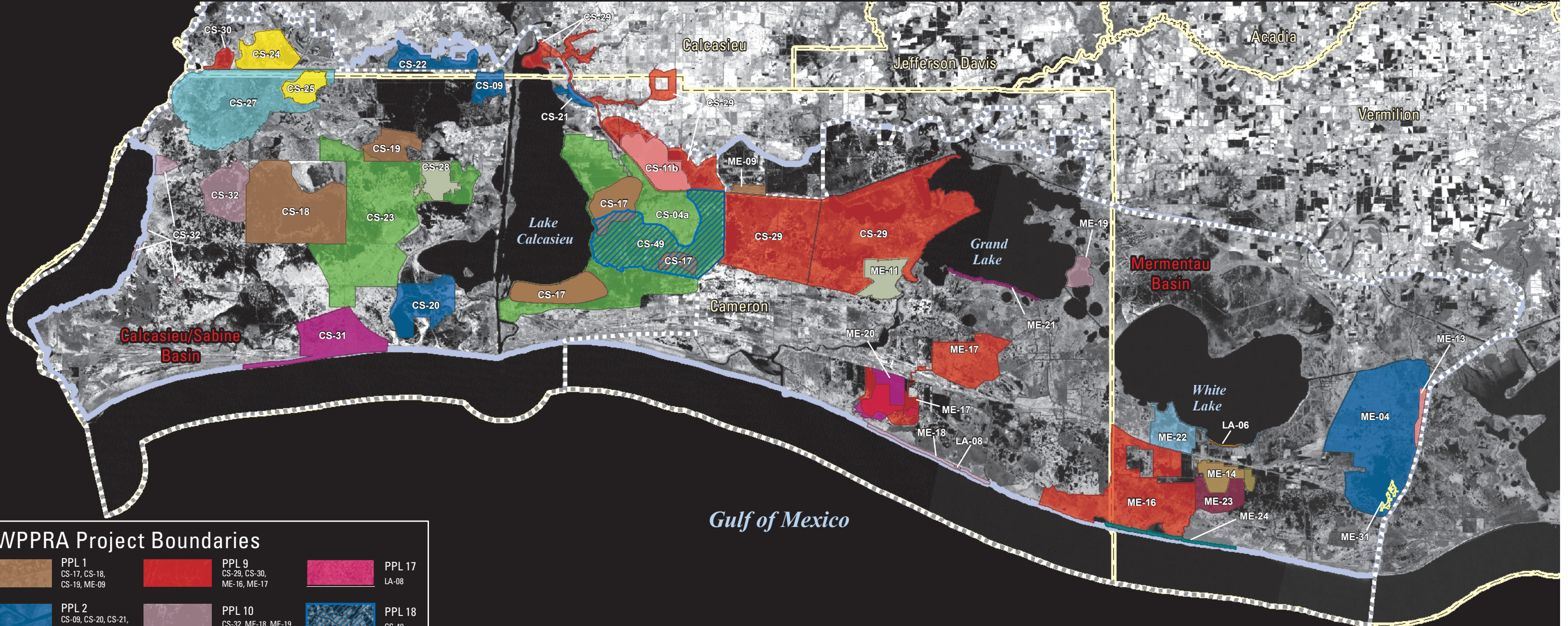
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U.S. Department of the Interior  
U.S. Geological Survey  
National Wetlands Research Center  
Coastal Restoration Field Station  
Baton Rouge, La.

Map ID: USGS-NWRC 2010-11-0034  
Map Date: May 13, 2010  
Data Accurate as of March 08, 2010

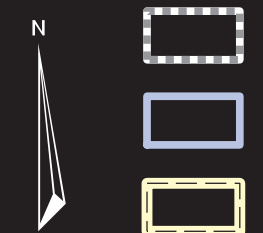
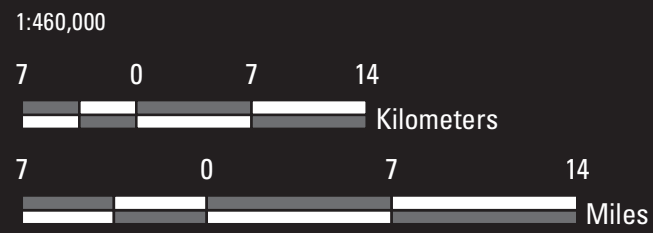






### CWPPRA Project Boundaries

	PPL 1 CS-17, CS-18, CS-19, ME-09		PPL 9 CS-29, CS-30, ME-16, ME-17		PPL 17 LA-08
	PPL 2 CS-09, CS-20, CS-21, CS-22, ME-04		PPL 10 CS-32, ME-18, ME-19		PPL 18 CS-49
	PPL 3 CS-04a, CS-23		PPL 11 CS-31, ME-20, ME-21		PPL 19 ME-31
	PPL 4 CS-24, CS-25		PPL 12 ME-22		
	PPL 5 CS-11b, ME-13		PPL 13 LA-06		
	PPL 6 CS-27		PPL 14 None		
	PPL 7 ME-14		PPL 15 ME-23		
	PPL 8 CS-28, ME-11		PPL 16 ME-24		



- CWPPRA Hydrologic Basin Boundary
- Region 4 Boundary
- Parish Boundary

Image Source:  
2009 Landsat Thematic  
Mapper 5 Imagery  
Band 5 Mosaic

Produced by:  
U.S. Department of the Interior  
U.S. Geological Survey  
National Wetlands Research Center  
Coastal Restoration Field Station  
Baton Rouge, La.

Map ID: USGS-NWRC 2010-11-0037  
Map Date: May 13, 2010  
Data Accurate as of March 08, 2010