



**State of Louisiana**

**Coastal Protection and Restoration Authority of Louisiana**

**Office of Coastal Protection and Restoration**

## **2010 Operations, Maintenance, and Monitoring Report**

for

### **Freshwater Bayou Canal Bank Stabilization**

State Project Number ME-13  
Priority Project List 5

December 2011  
Vermilion Parish

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2010 Operations, Maintenance, and Monitoring Report  
For  
Freshwater Bayou Canal Bank Stabilization (ME-13)

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## I. Introduction

The Freshwater Bayou Canal Bank Stabilization (ME-13) project area encompasses 1,169 ac (468 ha) of intermediate and brackish marsh along the west bank of Freshwater Bayou Canal (FBC) between its confluence with North Prong Belle Ile Bayou Canal and Sixmile Canal, approximately 12 miles (19.3 km) east-northeast of the town of Pecan Island in Vermilion Parish, Louisiana (figure 1). The project area borders the FBC to the east and varies in width from 0.25 - 1.0 mi (0.4 - 1.6 km) to the west to several north-south oilfield access canals which form an almost continuous, north-south line of spoil banks parallel to FBC.

Constructed between 1965 and 1967, the FBC channel extends from the Gulf Intracoastal Waterway (GIWW) at Intracoastal City to the Gulf of Mexico and includes a lock at the Gulf of Mexico designed to reduce saltwater intrusion into the fresh water and low salinity interior wetlands along the canal. When completed in 1967, the average width of the original FBC channel was 173 ft (53 m). By 1990, the average width of the channel had more than tripled to 583 ft (178 m) (Good et al. 1995). Brown and Root (1992) estimated that between 1968 and 1992, shoreline erosion along FBC averaged 12.5 ft/yr (3.8 m/yr) on each bank.

The main causes of wetland loss in the ME-13 project area are tidal scour and saltwater intrusion associated with the erosion of the spoil banks along the west bank of FBC. Most of this spoil bank has already eroded away, exposing fragile organic marsh soils to boat-wake induced shoreline erosion, tidal scour, and the impact of salinity spikes entering FBC from Little Vermilion Bay. Since the organic marsh soils behind the spoil banks are more erodible than the spoil banks, erosion rates can be expected to double or triple along shorelines where the spoil banks are no longer present (USACE-LDNR 1994; Good et al. 1995).

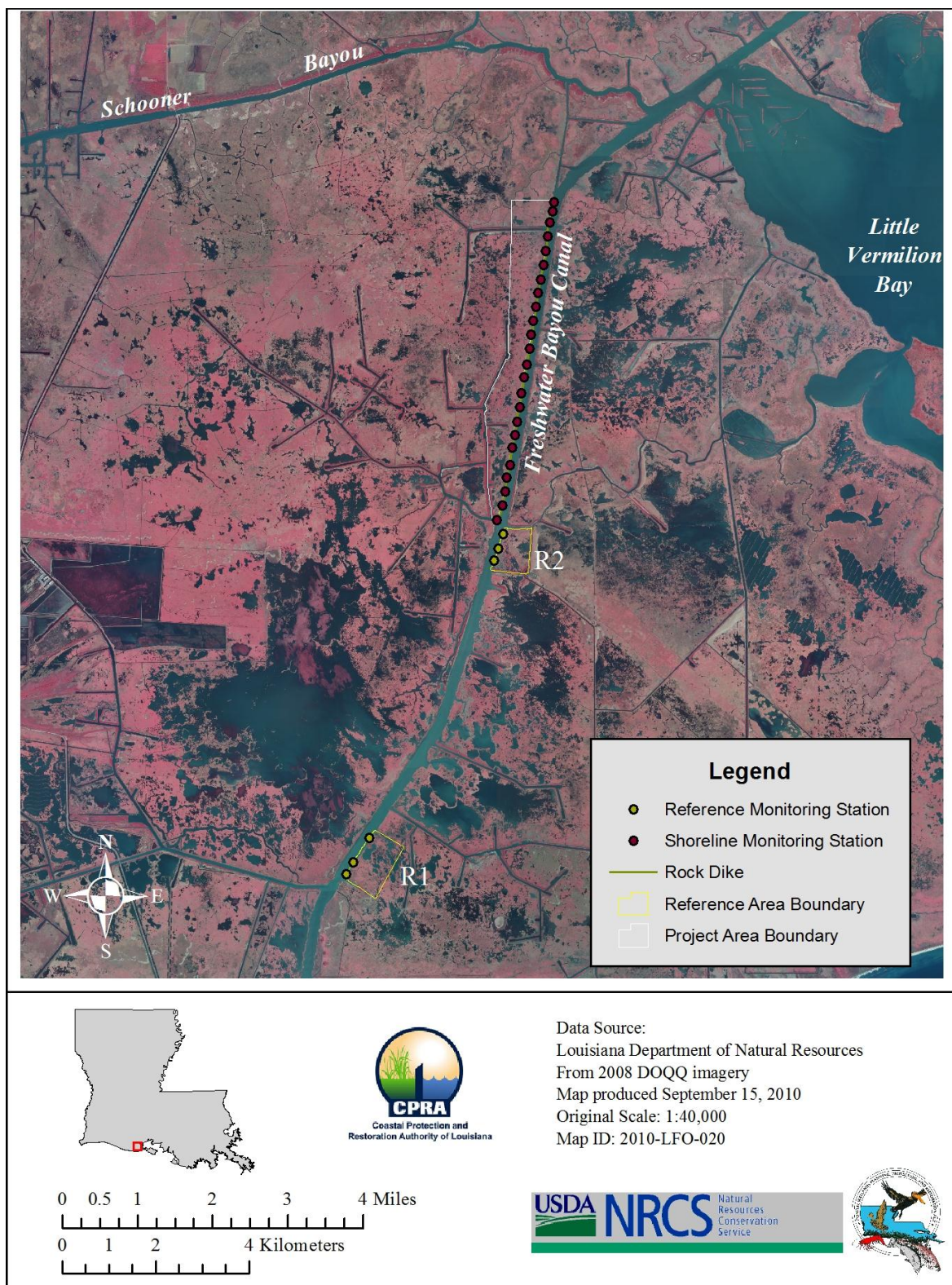
To prevent further wetland loss through bank erosion and subsequent tidal scour of shoreline marshes, approximately 23,193 linear ft (7,069 m) of free-standing rock dike was constructed in shallow water along the west bank of FBC between its confluence with Sixmile Canal on its north end and North Prong Belle Ile Bayou Canal on its south end. Construction of the rock dike began on March 1, 1998 and was completed on June 1, 1998.

Hurricane Rita struck the coast of southwestern Louisiana on September 24, 2005 with maximum storm surge of 8-9 ft (2.4 – 2.7 m) in the Freshwater Bayou area (FEMA 2006). USGS calculated the amount of land that changed to water resulting from the storm to be 98 square miles in southwestern Louisiana, 62 square miles in the Mermentau basin (Barras 2006). This loss can be attributed to several patterns. Shearing, which is ripping and removal of marsh vegetation in historically healthy marshes was observed in marshes bordering the east bank of Freshwater Bayou. The removal of remnant marsh from areas with historical land loss from the surge was observed due east of Pecan Island, south of Sweet Lake, and due east of Deep Lake.

Hurricane Ike struck near Galveston, Texas on September 13, 2008. A maximum storm surge of 7 - 8 ft (2.1 – 2.4 m) NAVD 88 was reported for the ME-13 project area (East et al. 2008).







**Figure 1.** Freshwater Bayou Canal Bank Stabilization (ME-13) project and reference areas.

## Maintenance Activity

### a. Project Feature Inspection Procedures

The purpose of the annual inspection of the Freshwater Bayou Bank Stabilization Project (ME-13) is to evaluate the constructed project features to identify any deficiencies and prepare a report detailing the condition of project features and recommended corrective actions needed. Should it be determined that corrective actions are needed, OCPR shall provide, in the report, a detailed cost estimate for engineering, design, supervision, inspection, and construction contingencies, and an assessment of the urgency of such repairs. As noted in Appendices A, B, and C, initial project goals included documenting inspections with photographs, creating a three-year budget projection, and taking field inspection notes.

An inspection team consisting of two representatives of OCPR and one representative of the Natural Resources Conservation Service (NRCS) performs annual visual inspections. If damage is apparent, OCPR and NRCS assign a team to perform a detailed inspection and report on the findings. The team documents the condition of the project features and may employ a survey party to make detailed measurements.

### b. Inspection Results

No inspection was conducted in calendar year 2009.

### c. Maintenance Recommendations

#### i. Immediate/ Emergency Repairs

#### ii. Programmatic/ Routine Repairs

### d. Maintenance History

**General Maintenance:** Below is a summary of completed maintenance projects and operation tasks performed since June 1998, the construction completion date of the Freshwater Bayou Canal Bank Stabilization Project (ME-13).

**2005 - Freshwater Bayou Canal Bank Stabilization Maintenance Project – LDNR (Luhr Bros. Contractor):** This maintenance project included the installation of approximately 20,987 tons of 1,250 lb gradation stone to repair 9,130 linear feet of bank. Quantity limitations prevented the repair of all sections required. Construction was completed on 12/15/2005. The cost associated with the engineering, design and construction of the Freshwater Bayou Canal Stabilization Maintenance Project is as follows:



Construction:	\$464,368.55
Engineering & Design:	\$ 2,234.46
Construction Administration:	\$ 5,625.00
Construction Oversight/As built:	<u>\$ 15,503.10</u>

**Project Total:** **\$487,731.11**

### **III. Operation Activity**

#### **a. Operation Plan**

There are no water control structures associated with this project, therefore no Structural Operation Plan is required.

#### **b. Actual Operations**

There are no water control structures associated with this project, therefore no Structural Operation Plan is required.

### **IV. Monitoring Activity**

Pursuant to a CWPPRA Task Force decision on August 14, 2003, to adopt the Coastwide Reference Monitoring System-Wetlands (CRMS-Wetlands) for CWPPRA, updates were made to the ME-13 Monitoring Plan to merge it with CRMS-Wetlands and provide more useful information for modeling efforts and future project planning while maintaining the monitoring mandates of the Breaux Act. There are no CRMS-Wetlands sites in the ME-13 shoreline project area.

#### **a. Monitoring Goals**

The objectives of the Freshwater Bayou Canal Bank Stabilization project are to protect the existing emergent wetlands along the west bank of Freshwater Bayou Canal from further deterioration and to prevent the widening of the Freshwater Bayou Canal channel into the project area wetlands.

The following goals will contribute to the evaluation of the above objectives:

1. Evaluate land/water ratios within the project and reference areas.





2. Determine the rate of shoreline change along the west bank of Freshwater Bayou Canal in the ME-13 project area and in the reference areas.

## **b. Monitoring Elements**

### **Aerial Photography:**

To document the pre-construction shoreline position along Freshwater Bayou Canal, and to measure land to open water ratios in the ME-13 project and reference areas, near-vertical, color-infrared aerial photography (1:12,000 scale) was obtained on December 9, 1996 and January 11, 1997. Post-construction aerial photography will be obtained in 2015 and similarly processed and analyzed for comparison. The photography is georectified by National Wetlands Research Center (NWRC) personnel using standard operating procedures described in Steyer et al. (1995).

### **Shoreline change**

To document changes in shoreline position along FBC, the distance from each of the 24 settlement plates installed at 1,000 ft (305 m) intervals along the dike to the adjacent vegetated marsh edge is determined by direct measurement using a steel tape. Using a Global Positioning System (GPS) unit, X-Y coordinates are used to relocate the vegetated marsh edge of the shoreline adjacent to each settlement plate over time, and to calculate the distance between each pair of points. Additional GPS readings are taken on a survey monument at the north end of the ME-13 rock dike at the beginning and end of each day. For comparison, the distance from six survey monuments to the vegetated marsh edge of the adjacent shoreline in the two reference areas on FBC opposite the ME-13 rock dike are similarly monitored concurrently. Changes in distance from the settlement plates and survey monuments to the adjacent shorelines are averaged to estimate shoreline erosion rates over time. Shoreline position relative to the 24 settlement plates and six reference area survey hubs will be documented at the same time of the year. This was done in 1998 (pre-construction), 2003 (post-construction), and 2009 and will be repeated in 2015.

## **c. Preliminary Monitoring Results and Discussion**

### **Aerial Photography:**

Aerial photography obtained pre-construction on December 19, 1996 (and January 11, 1997 for reference area R2), was analyzed to determine land-water ratios. The project area comprised 86.9% land to 13.1% water. Reference 1 was 92.9% land to 7.1% water, and Reference 2 was 82.6% land to 17.4% water (figure 2). No post construction photography has been collected to date.

### **Shoreline Change:**

For the period 1998-2003, erosion occurred at some project stations on the south end of the project (0 to -2 ft/yr) and at all reference stations (-5 to -26 ft/yr) (figure 3). On average for the 1998 to 2003 period the project shoreline slightly prograded while the reference shoreline eroded (table 1). An O&M maintenance event occurred in 2005 when the rock dike was lifted back to constructed elevation. Over the 2003 to 2009 period erosion occurred at most project (mostly 0 to -2 ft/yr) and reference stations (> -5 ft/yr) (table 1, figure 4). The reference stations eroded





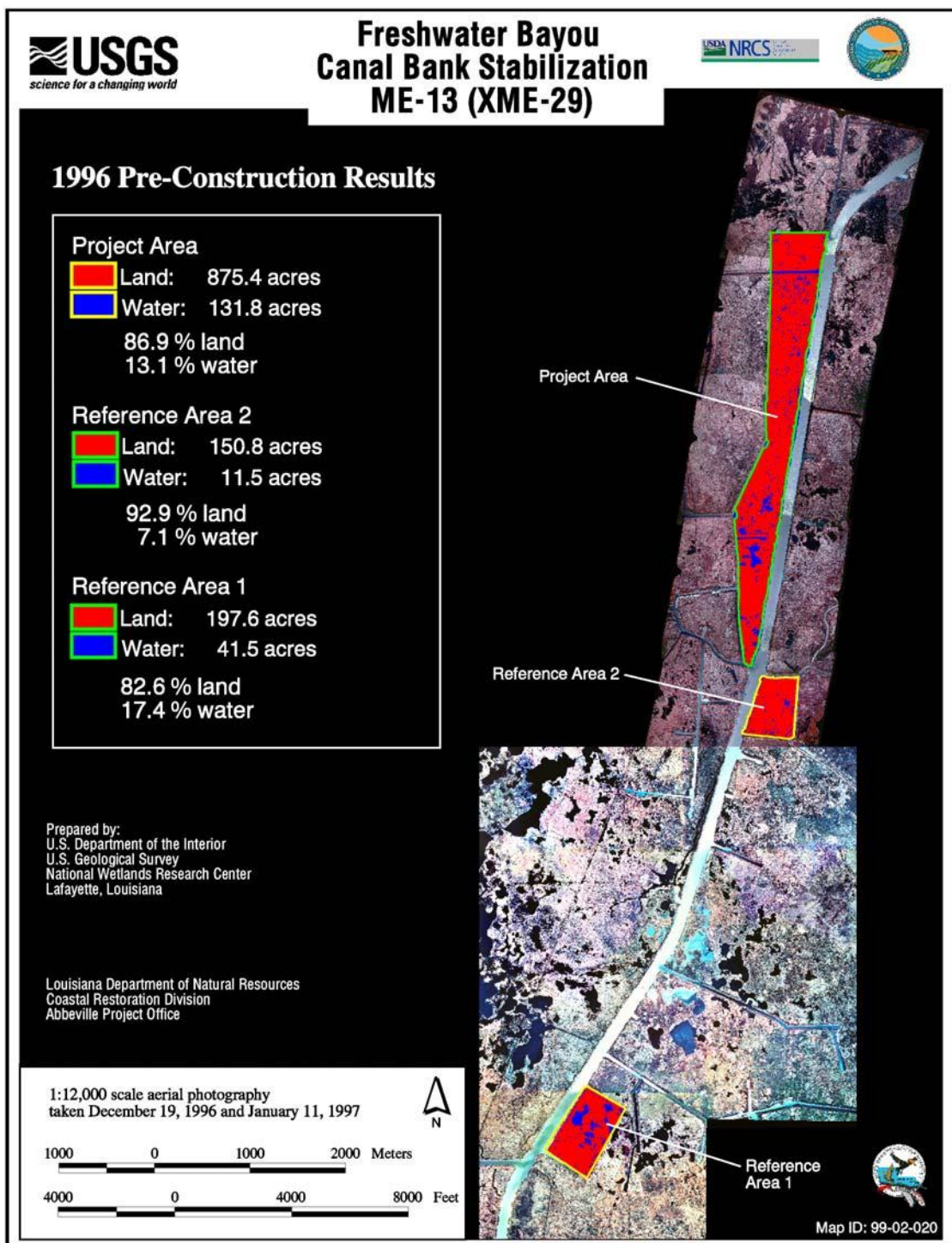
moer than 4x faster than the project area over the 2003 to 2009 period. The rock dike had once again settled by 2009 and erosion was again occurring at most project stations.

Table 1. ME-13 Shoreline Change Rates

	Project		Reference	
	ft/yr	m/yr	ft/yr	m/yr
1998-2003	0.84	0.26	-11.94	-3.64
2003-2009	-0.59	-0.15	-2.56	-0.78
1998-2009	-0.03	-0.01	-7.92	-2.41

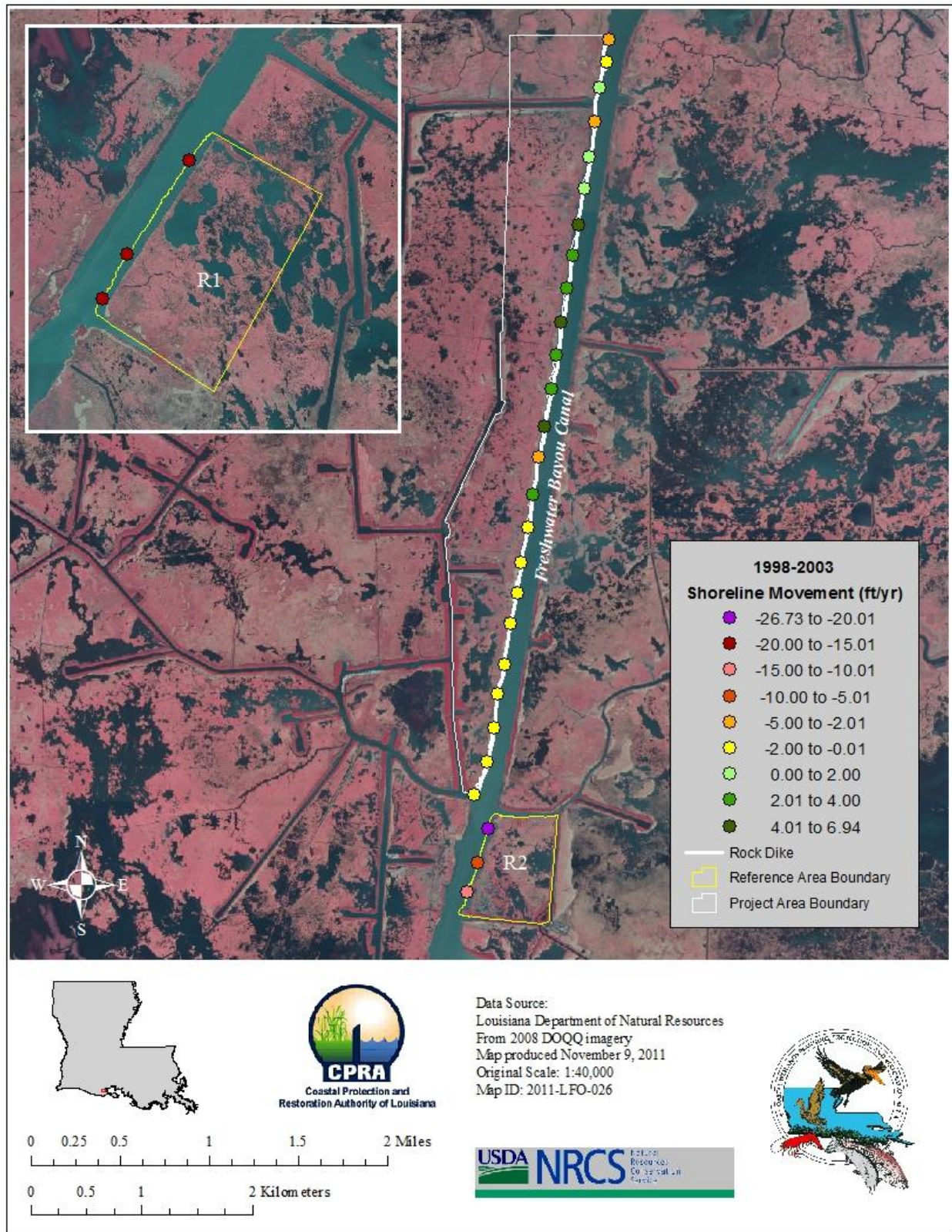
Over the entire period monitored, 1998 to 2009, the project area shoreline eroded much more slowly than the reference shoreline (table 1, figure 5). Portions of the shoreline behind the rocks prograded (42% of stations) while others eroded (58% of stations). The erosion was dispersed through the project length but appeared to be due to rock settling to below constructed height. The highest rate of shoreline erosion in the project area occurred in the southern portion where the shoreline retreated at a rate of almost -4 ft/yr during the period 1998-2009. The highest rate of shoreline erosion occurred at the north end of reference areas R2 (north unit) where the shoreline retreated -158.8 ft or -14.4 ft/yr during the period 1998-2009.

Variation in the shoreline retreat rate along the project and reference area shorelines may be related to the erodibility of the substrate. Marsh soils erode more rapidly than spoil bank soils, which erode more rapidly than shell ridges. Additionally, increases in erosion in some parts of the project area may be related to crown height of the rock dike, which has settled in some areas (figures 6-8).



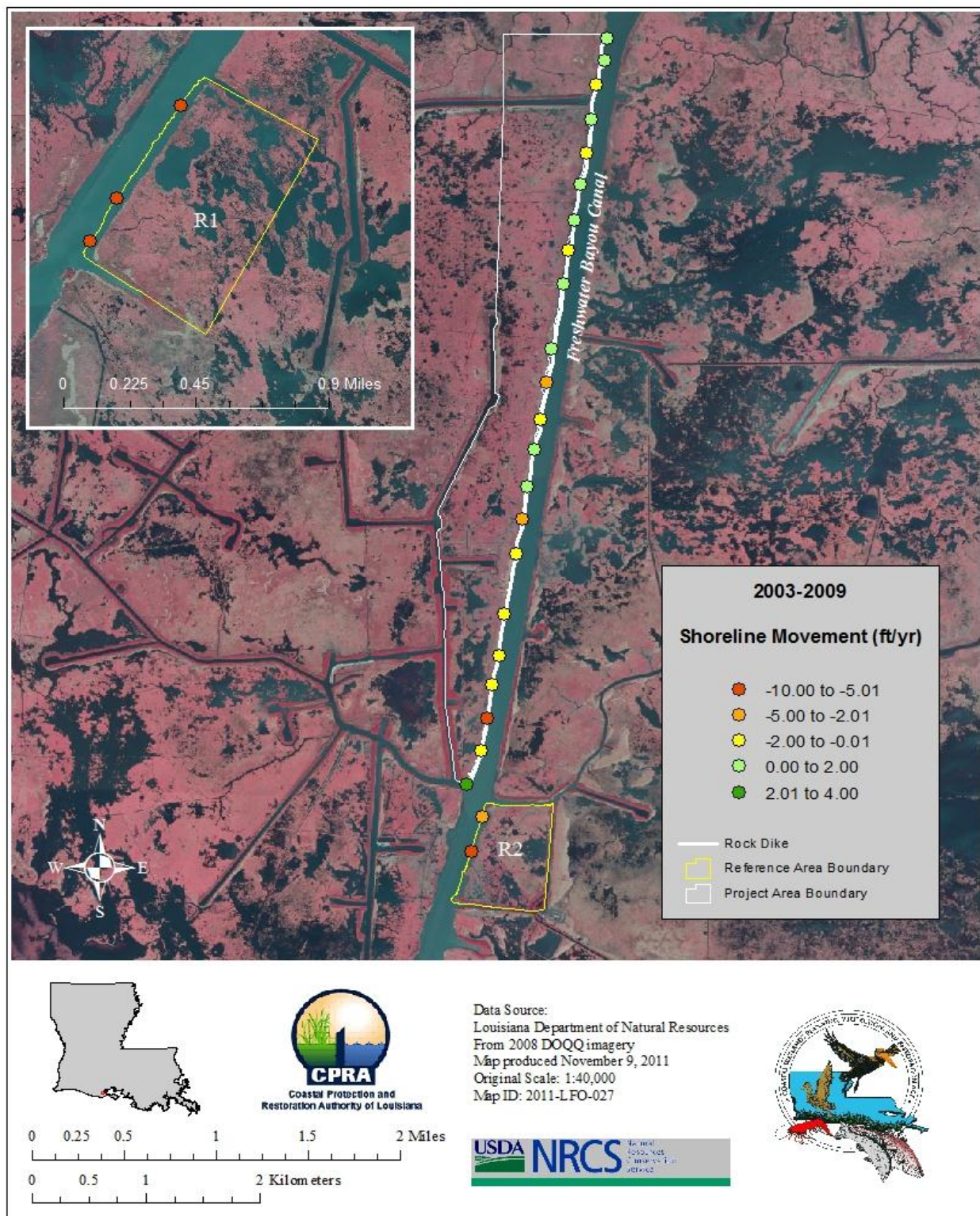
**Figure 2.** Pre-construction land to water analysis in the Freshwater Bayou Canal Bank Stabilization (ME-13) project and reference areas.





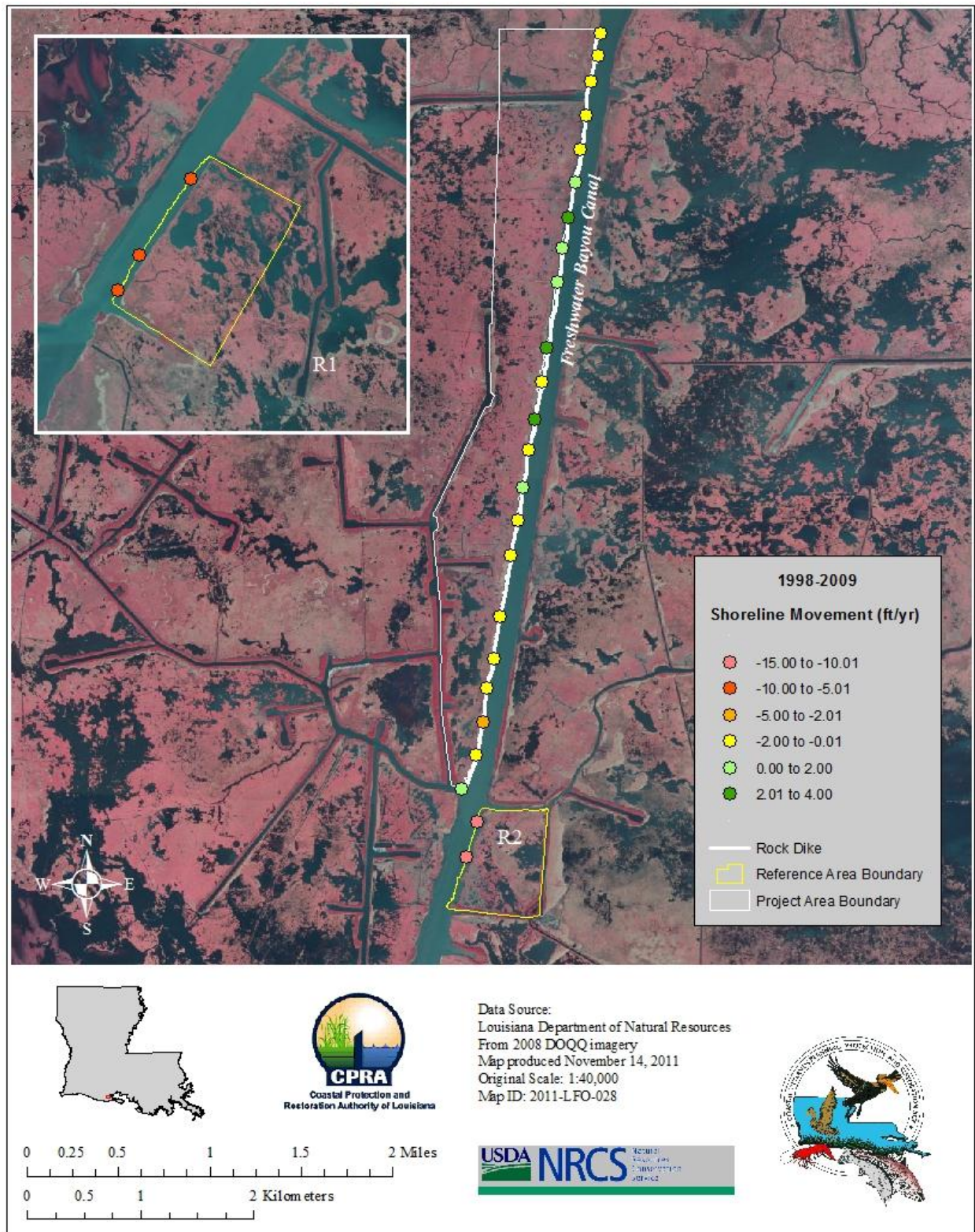
**Figure 3.** Shoreline change rate (ft/yr) along Freshwater Bayou Canal at the ME-13 project and reference area monitoring stations for the 23 July 1998 – 21 July 2003 time period.





**Figure 4.** Shoreline change rate (ft/yr) along Freshwater Bayou Canal at the ME-13 project and reference area monitoring stations for the 21 July 2003 – 30 July 2009 time period. Small symbol indicates that the station could not be located.





**Figure 5.** Shoreline change rate (ft/yr) along Freshwater Bayou Canal at the ME-13 project and reference area monitoring stations for the 23 July 1998 – 30 July 2009 time period. Small symbol indicates that the station could not be located.





**Figure 6.** Looking north at settled rock along Freshwater Bayou Canal in the ME-13 project area on 30 July 2009.



**Figure 7.** Another view looking north at settled rock along Freshwater Bayou Canal in the ME-13 project area on 30 July 2009.



**Figure 8.** A breach in the settled rock along Freshwater Bayou Canal in the ME-13 project area on 30 July 2009.

## **V. Conclusions**

### **a. Project Effectiveness**

The ME-13 project appears to be meeting its specific goal of reducing shoreline erosion along the west bank of Freshwater Bayou Canal behind the project rock dike when rock crown elevation is maintained at the as-built level. For the period 1998-2009, the shoreline was being maintained behind the protection of the rock dike where erosion was -0.03 ft/yr compared to the unprotected reference areas which were eroding at -7.92 ft/yr. Some portions of the project area accreted over 3 ft/yr. Project area erosion is occurring where the rock has settled to below the as-built elevation of 2.5 ft NAVD88. The highest rate of shoreline erosion of these sites occurred south of the project area where the shoreline retreated at a rate of almost -4 ft/yr during the period 1998-2009. The rock dike requires periodic additions of rock to be maintained. It appears as though any benefits derived from the 2005 rock lift O&M event had been reduced by 2009 and another event is warranted. Shoreline measurements in 2015 will provide further indications of project effectiveness.

### **b. Recommended Improvements**

### **c. Lessons Learned**

Variation in the shoreline retreat rate along the project and reference area shorelines may be related to the erodibility of the substrate. Marsh soils erode more rapidly than spoil bank soils, which erode more rapidly than shell ridges. Additionally, variability in the project area may also be related to crown height of the rock dike, which may require periodic additions of rock to be maintained, as evidenced by shoreline erosion at several sites in the project area located behind the rock dike, where crown height settled to less than 2.5 ft NAVD 88.



## REFERENCES

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- Hurricane Rita Flood Recovery Maps (Louisiana) [GIS data]. 2006. Washington, D. C.: Federal Emergency Management Agency (FEMA). Available: [http://www.fema.gov/hazard/flood/recoverydata/rita/rita\\_la-gis.shtm](http://www.fema.gov/hazard/flood/recoverydata/rita/rita_la-gis.shtm) [March 30, 2006].
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## **Appendix A**

### **Inspection Photographs**

No inspection was performed during 2009-2010 on this project.

## **Appendix B**

### **Three Year Budget Projection**



**FRESHWATER BAYOU CANAL BANK STABILIZATION / ME-13 / PPL5**  
**Three-Year Operations & Maintenance Budgets 07/01/2010 - 06/30/2013**

<u>Project Manager</u>	<u>O &amp; M Manager</u>	<u>Federal Sponsor</u>	<u>Prepared By</u>
Mel Guidry	Mel Guidry	NRCS	Mel Guidry

	2010/2011	2011/2012	2012/2013
<b>Maintenance Inspection</b>	\$ 5,909.00	\$ 6,086.00	\$ 6,269.00
<b>Structure Operation</b>	\$ -	\$ -	\$ -
<b>Administration</b>		\$ 50,000.00	\$ -
<b>Maintenance/Rehabilitation</b>			

10/11 Description:

E&D	\$ 287,520.00
Construction	
Construction Oversight	
Sub Total - Maint. And Rehab.	\$ 287,520.00

11/12 Description: Cap 17,000 LF of existing foreshore dike.

E&D	\$ -
Construction	\$ 2,875,200.00
Construction Oversight	\$ 191,680.00
Sub Total - Maint. And Rehab.	\$ 3,066,880.00

12/13 Description:

E&D	\$ -
Construction	\$ -
Construction Oversight	\$ -
Sub Total - Maint. And Rehab.	\$ -

	2010/2011	2011/2012	2012/2013
<b>Total O&amp;M Budgets</b>	<b>\$ 293,429.00</b>	<b>\$ 3,122,966.00</b>	<b>\$ 6,269.00</b>

<b>O &amp; M Budget (3 yr Total)</b>	<b>\$ 3,422,664.00</b>
<b>Unexpended O &amp; M Budget</b>	<b>\$ 50,817.00</b>
<b>Remaining O &amp; M Budget (Projected)</b>	<b>\$ (3,371,847.00)</b>



**OPERATION AND MAINTENANCE BUDGET WORKSHEET 07/01/2010-06/30/2011**  
**FRESHWATER BAYOU SHORELINE STABILIZATION /ME-13/ PPL 5**

DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	ESTIMATED TOTAL
O&M Inspection and Report	EACH	1	\$5,909.00	\$5,909.00
General Structure Maintenance	LUMP	1	\$0.00	\$0.00
Engineering and Design	LUMP	1	\$287,520.00	\$287,520.00
Operations Contract	LUMP	1	\$0.00	\$0.00
Construction Oversight	LUMP	1	\$0.00	\$0.00

**ADMINISTRATION**

LDNR / CRD Admin.	LUMP	1	\$0.00	\$0.00
FEDERAL SPONSER Admin.	LUMP	1	\$0.00	\$0.00
SURVEY Admin.	LUMP	0	\$0.00	\$0.00
OTHER				\$0.00
<b>TOTAL ADMINISTRATION COSTS:</b>				<b>\$0.00</b>

**MAINTENANCE / CONSTRUCTION**

**SURVEY**

SURVEY DESCRIPTION:					
Secondary Monument	EACH	0	\$0.00	\$0.00	
Staff Gauge / Recorders	EACH	0	\$0.00	\$0.00	
Marsh Elevation / Topography	LUMP	0	\$0.00	\$0.00	
TBM Installation	EACH	0	\$0.00	\$0.00	
OTHER				\$0.00	
TOTAL SURVEY COSTS:				\$0.00	

**GEOTECHNICAL**

GEOTECH DESCRIPTION:					
	Borings	EACH	0	\$0.00	\$0.00
	OTHER				\$0.00
	TOTAL GEOTECHNICAL COSTS:				\$0.00

**CONSTRUCTION**

CONSTRUCTION DESCRIPTION:						
	Rip Rap	LIN FT	TON / FT	TONS	UNIT PRICE	
		8000	2.15	17,224	\$0.00	\$0.00
		0	0	0	\$0.00	\$0.00
		0	0	0	\$0.00	\$0.00
	Filter Cloth / Geogrid Fabric	SQ YD	0	\$0.00	\$0.00	
	Navagation Aid	EACH	0	\$0.00	\$0.00	
	Signage	EACH	0	\$0.00	\$0.00	
	General Excavation / Fill	CU YD	0	\$0.00	\$0.00	
	Dredging	CU YD	0	\$0.00	\$0.00	
	Sheet Piles (Lin Ft or Sq Yds)		0	\$0.00	\$0.00	
	Timber Piles (each or lump sum)		0	\$0.00	\$0.00	
	Timber Members (each or lump sum)		0	\$0.00	\$0.00	
	Hardware	LUMP	1	\$0.00	\$0.00	
	Materials	LUMP	1	\$0.00	\$0.00	
	Mob / Demob	LUMP	1	\$0.00	\$0.00	
	Contingency	LUMP	1	\$0.00	\$0.00	
	General Structure Maintenance	LUMP	1	\$0.00	\$0.00	
	OTHER			\$0.00	\$0.00	
	OTHER			\$0.00	\$0.00	
	OTHER			\$0.00	\$0.00	
TOTAL CONSTRUCTION COSTS:					\$0.00	

**TOTAL OPERATIONS AND MAINTENANCE BUDGET:** **\$293,429.00**



**OPERATION AND MAINTENANCE BUDGET 07/01/2011-06/30/2012**  
**FRESHWATER BAYOU SHORELINE STABILIZATION/ME-13/PPL5**

DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	ESTIMATED TOTAL
O&M Inspection and Report	EACH	1	\$6,086.00	\$6,086.00
General Structure Maintenance	LUMP	1	\$0.00	\$0.00
Engineering and Design	LUMP	1	\$0.00	\$0.00
Operations Contract	LUMP	1	\$0.00	\$0.00
Construction Oversight	LUMP	1	\$191,680.00	\$191,680.00

**ADMINISTRATION**

LDNR / CRD Admin.	LUMP	1	\$50,000.00	\$50,000.00
FEDERAL SPONSER Admin.	LUMP	0	\$0.00	\$0.00
SURVEY Admin.	LUMP	0	\$0.00	\$0.00
OTHER				\$0.00
<b>TOTAL ADMINISTRATION COSTS:</b>				<b>\$50,000.00</b>

**MAINTENANCE / CONSTRUCTION**

**SURVEY**

SURVEY DESCRIPTION:				
Secondary Monument	EACH	0	\$0.00	\$0.00
Staff Gauge / Recorders	EACH	0	\$0.00	\$0.00
Marsh Elevation / Topography	LUMP	0	\$0.00	\$0.00
TBM Installation	EACH	0	\$0.00	\$0.00
OTHER				\$0.00
<b>TOTAL SURVEY COSTS:</b>				<b>\$0.00</b>

**GEOTECHNICAL**

GEOTECH DESCRIPTION:				
Borings	EACH	0	\$0.00	\$0.00
OTHER				\$0.00
<b>TOTAL GEOTECHNICAL COSTS:</b>				<b>\$0.00</b>

**CONSTRUCTION**

CONSTRUCTION DESCRIPTION:	Cap 17,000 LF of existing foreshore dike.				
Rip Rap	LIN FT	TON / FT	TONS	UNIT PRICE	
	17000	2.3	39,100	\$60.00	\$2,346,000.00
	0	0.0	0	\$0.00	\$0.00
	0	0.0	0	\$0.00	\$0.00
Filter Cloth / Geogrid Fabric	SQ YD	0		\$0.00	\$0.00
Navigation Aid	EACH	0		\$0.00	\$0.00
Signage	EACH	0		\$0.00	\$0.00
General Excavation / Fill	CU YD	0		\$0.00	\$0.00
Dredging	CU YD	0		\$0.00	\$0.00
Sheet Piles (Lin Ft or Sq Yds)		0		\$0.00	\$0.00
Timber Piles (each or lump sum)		0		\$0.00	\$0.00
Timber Members (each or lump sum)		0		\$0.00	\$0.00
Hardware	LUMP	1		\$0.00	\$0.00
Materials	LUMP	1		\$0.00	\$0.00
Mob / Demob	LUMP	1		\$50,000.00	\$50,000.00
Contingency	LUMP	1		\$479,200.00	\$479,200.00
General Structure Maintenance	LUMP	1		\$0.00	\$0.00
OTHER				\$0.00	\$0.00
OTHER				\$0.00	\$0.00
OTHER				\$0.00	\$0.00
<b>TOTAL CONSTRUCTION COSTS:</b>					<b>\$2,875,200.00</b>

**TOTAL OPERATIONS AND MAINTENANCE BUDGET: \$3,122,966.00**





**OPERATION AND MAINTENANCE BUDGET 07/01/2012-06/30/2013**  
**FRESHWATER BAYOU SHORELINE STABILIZATION/ME-13/PPL5**

DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	ESTIMATED TOTAL
O&M Inspection and Report	EACH	1	\$6,269.00	\$6,269.00
General Structure Maintenance	LUMP	1	\$0.00	\$0.00
Engineering and Design	LUMP	1	\$0.00	\$0.00
Operations Contract	LUMP	1	\$0.00	\$0.00
Construction Oversight	LUMP	1	\$0.00	\$0.00

**ADMINISTRATION**

LDNR / CRD Admin.	LUMP	1	\$0.00	\$0.00
FEDERAL SPONSER Admin.	LUMP	1	\$0.00	\$0.00
SURVEY Admin.	LUMP	1	\$0.00	\$0.00
OTHER				\$0.00
<b>TOTAL ADMINISTRATION COSTS:</b>				<b>\$0.00</b>

**MAINTENANCE / CONSTRUCTION**

**SURVEY**

SURVEY DESCRIPTION:					
Secondary Monument	EACH	0	\$0.00	\$0.00	
Staff Gauge / Recorders	EACH	0	\$0.00	\$0.00	
Marsh Elevation / Topography	LUMP	0	\$0.00	\$0.00	
TBM Installation	EACH	0	\$0.00	\$0.00	
OTHER				\$0.00	
TOTAL SURVEY COSTS:				\$0.00	

**GEOTECHNICAL**

GEOTECH DESCRIPTION:					
	Borings	EACH	0	\$0.00	\$0.00
	OTHER				\$0.00
	TOTAL GEOTECHNICAL COSTS:				\$0.00

**CONSTRUCTION**

CONSTRUCTION DESCRIPTION:						
	Rip Rap	LIN FT	TON / FT	TONS	UNIT PRICE	
		0	0.0	0	\$0.00	
		0	0.0	0	\$0.00	
		0	0.0	0	\$0.00	
	Filter Cloth / Geogrid Fabric	SQ YD	0		\$0.00	
	Navagation Aid	EACH	0		\$0.00	
	Signage	EACH	0		\$0.00	
	General Excavation / Fill	CU YD	0		\$0.00	
	Dredging	CU YD	0		\$0.00	
	Sheet Piles (Lin Ft or Sq Yds)		0		\$0.00	
	Timber Piles (each or lump sum)		0		\$0.00	
	Timber Members (each or lump sum)		0		\$0.00	
	Hardware	LUMP	1		\$0.00	
	Materials	LUMP	1		\$0.00	
	Mob / Demob	LUMP	1		\$0.00	
	Contingency	LUMP	1		\$0.00	
	General Structure Maintenance	LUMP	1		\$0.00	
	OTHER				\$0.00	
	OTHER				\$0.00	
	OTHER				\$0.00	
	TOTAL CONSTRUCTION COSTS:					\$0.00

**TOTAL OPERATIONS AND MAINTENANCE BUDGET:** **\$6,269.00**



## **Appendix C**

### **Field Inspection Notes**

No inspection was performed during 2009-2010 on this project.