



**State of Louisiana
Department of Natural Resources
Coastal Restoration Division and
Coastal Engineering Division**

**2005 Operations, Maintenance,
and Monitoring Report**

for

**Freshwater Bayou Canal Bank
Stabilization**

State Project Number ME-13
Priority Project List 5

June 2005
Vermilion Parish

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2005 Operations, Maintenance, and Monitoring Report
for
Freshwater Bayou Canal Bank Stabilization (ME-13)

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Preface

The Operations, Maintenance, and Monitoring (OM&M) Report format is a streamlined approach which combines the Operations and Maintenance annual project inspection information with the Monitoring data and analyses on a project-specific basis. This report includes monitoring data collected through December 2004, and annual Maintenance Inspections through June 2005.

The 2005 report is the second in a series of reports. For additional information on lessons learned, recommendations, and project effectiveness, please refer to the 2004 Operations, Maintenance, and Monitoring Report on the Louisiana Department of Natural Resources (LDNR) web site at dnr.louisiana.gov (Price and Guidry 2007).



I. Introduction

The Freshwater Bayou Canal Bank Stabilization (state project no. ME-13, Coastal Wetlands Planning, Protection and Restoration Act [CWPPRA] project no. XME-29) 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 Six Mile 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 (U.S. Army Corps of Engineers [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.



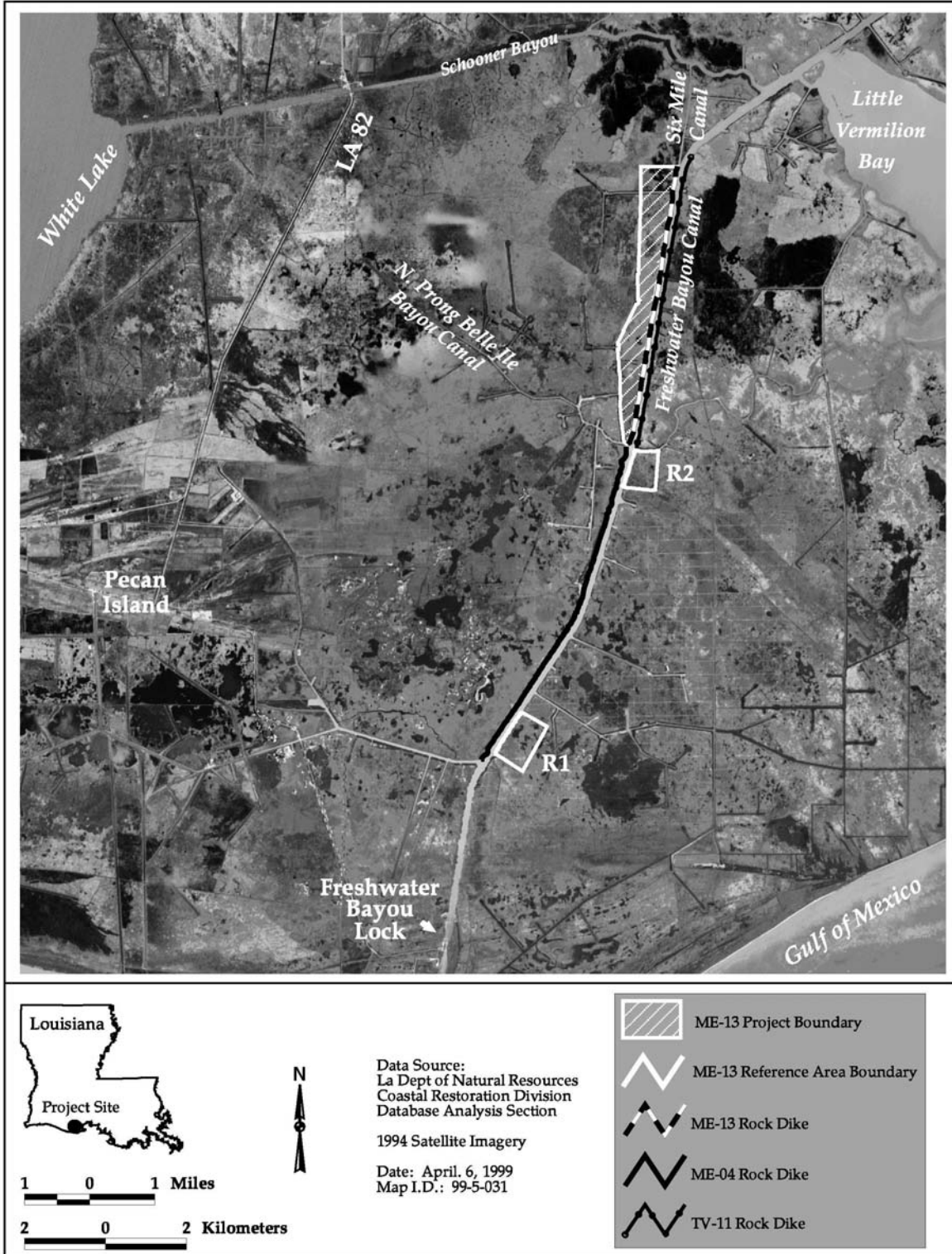


Figure 1. Freshwater Bayou Canal Bank Stabilization (ME-13) project and reference areas.



II. 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, LDNR 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 LDNR and one representative of the Natural Resources Conservation Service (NRCS) performs annual visual inspections. If damage is apparent, LDNR 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 2005 since this project is currently under a maintenance event.

c. Maintenance Recommendations

i. Immediate/ Emergency Repairs

Construction to repair/elevate the rock dike started Summer 2005.

ii. Programmatic/ Routine Repairs

None

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 (Luh 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 December 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>
TOTAL CONSTRUCTION COST:	\$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 required structural operations.

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.

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 FBC 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 FBC in the ME-13 project area and in the reference areas.

b. Monitoring Elements

Aerial Photography:

To document the pre-construction shoreline position along FBC, 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. The original photography was checked for flight accuracy, color correctness, and clarity and was subsequently archived. Aerial photography was scanned, mosaicked, and georectified by U.S. Geological Survey/National Wetlands Research Center (USGS/NWRC) personnel according to standard operating procedures (Steyer et al. 1995, revised 2000). No additional aerial photography will be obtained.

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-04 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-04 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 6 reference area survey hubs will be documented at the same time of the year. This was done in 1998 (pre-construction) and 2003 (post-construction), and will be repeated in 2009 and 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, while Reference 1 was 92.9% land to 7.1% water, and Reference 2 was 82.6% land to 17.4% water (figure 2).

Shoreline Change:

Analysis of post-construction data collected on July 21, 2003, at the shoreline monitoring stations for the five-year period beginning July 21, 1998, and ending July 21, 2003, produced the



following results. Tables showing measurements at individual stations are available in the 2003 Operations, Maintenance, and Monitoring Report (Vincent and Guidry 2004).

- The project area shoreline prograded at an average rate of 0.84 ft/yr (0.26 m/yr) (figure 3), and the reference area shorelines eroded at an average rate of -11.94 ft/yr (-3.64 m/yr) (figure 4).
- The highest rate of shoreline erosion occurred at the north end of reference areas R2 (north unit) at station ME13-25R, where the shoreline retreated 89.0 ft (27.1 m).
- The variability in shoreline change along the project area shoreline was significantly different than the variability along the reference area shorelines ($p < 0.0001$) for this time period.

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 be related to crown height of the rock dike.



1996 Pre-Construction Results

Project Area

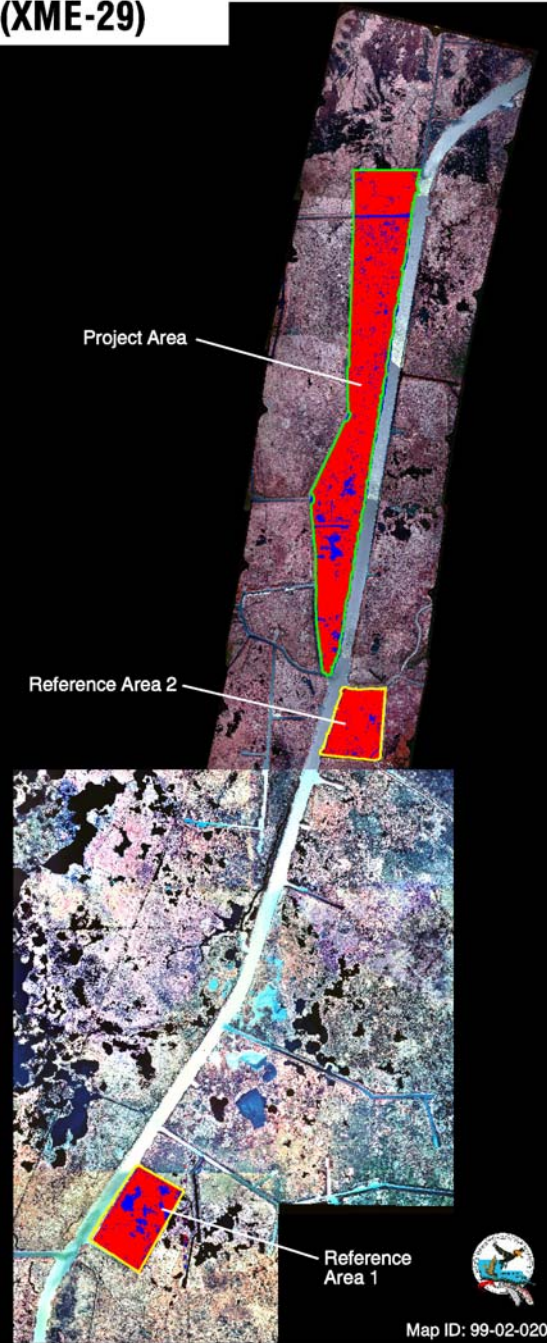
Land: 875.4 acres
Water: 131.8 acres
86.9 % land
13.1 % water

Reference Area 2

Land: 150.8 acres
Water: 11.5 acres
92.9 % land
7.1 % water

Reference Area 1

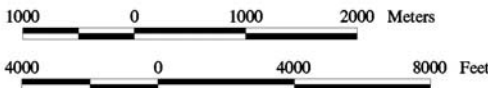
Land: 197.6 acres
Water: 41.5 acres
82.6 % land
17.4 % water



Prepared by:
U.S. Department of the Interior
U.S. Geological Survey
National Wetlands Research Center
Lafayette, Louisiana

Louisiana Department of Natural Resources
Coastal Restoration Division
Abbeville Project Office

1:12,000 scale aerial photography
taken December 19, 1996 and January 11, 1997



Map ID: 99-02-020

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

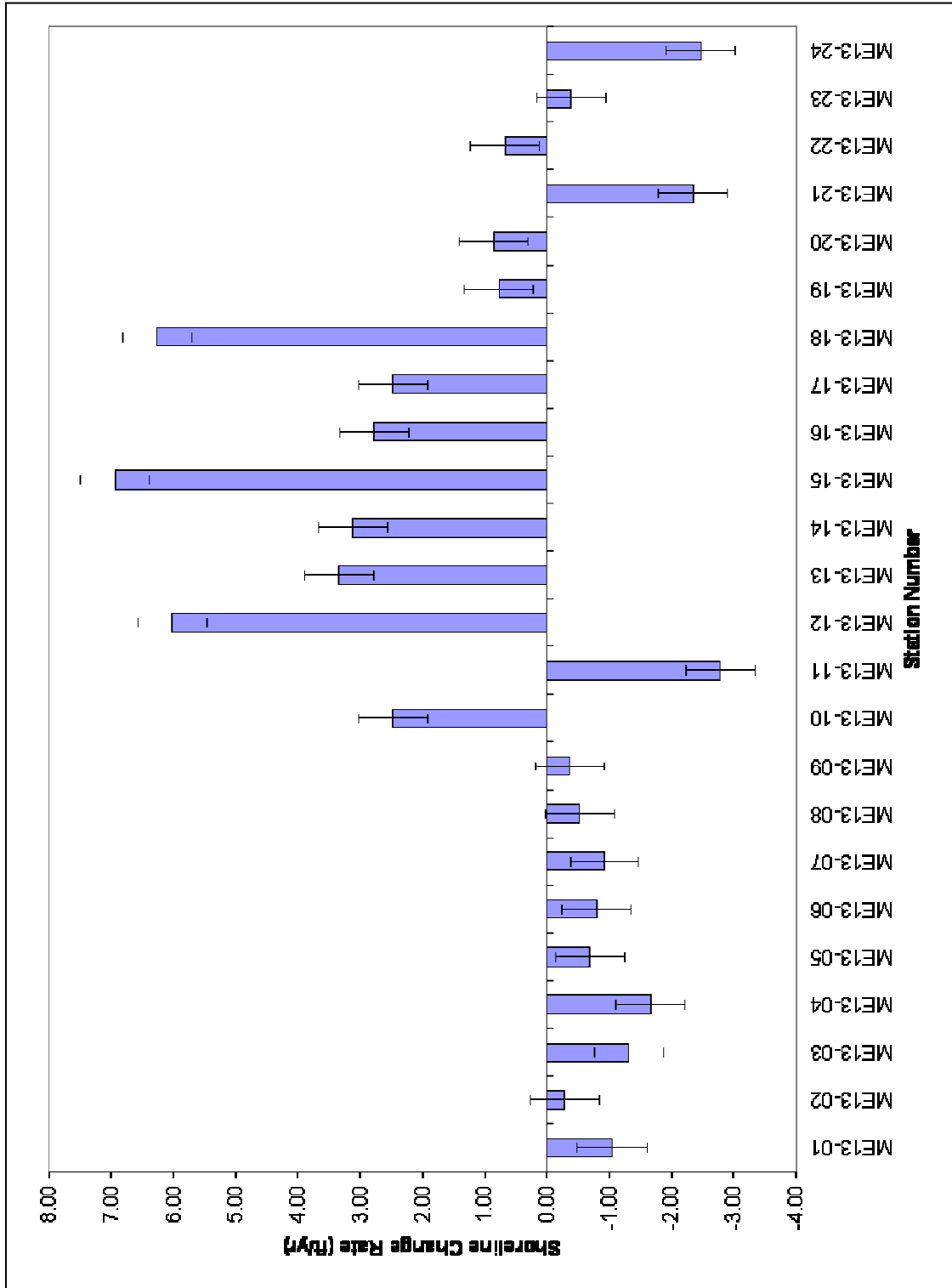


Figure 3. Shoreline change rate (ft/yr) along Freshwater Bayou Canal at the ME-13 project area stations for the July 23, 1998 – July 21, 2003 time period. Error bars represent ± 1 standard error of the mean of all stations.



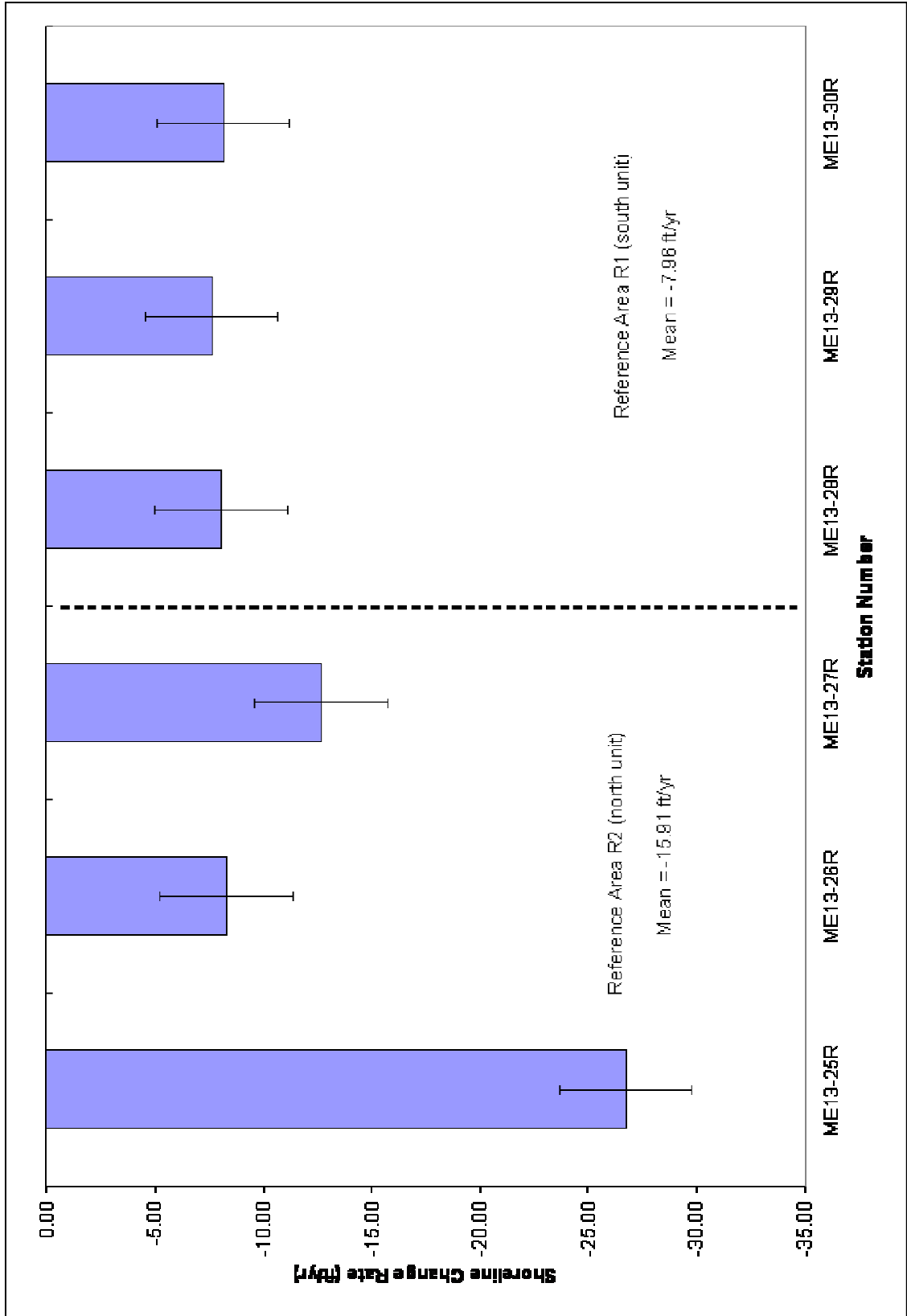


Figure 4. Shoreline change rate (ft/yr) along Freshwater Bayou Canal at the ME-13 reference area monitoring stations for the 23 July 1998 – 21 July 2003 time period. Error bars represent ± 1 standard error of the mean of all six reference stations.



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. The shoreline is prograding behind the protection of the rock dike and the unprotected reference areas are eroding. Shoreline measurements in 2009 will provide further indications of project effectiveness. Similar responses have been documented in other shoreline protection projects throughout the state, particular in the western portions.

b. Recommended Improvements

Maintenance of the rock dike, as recommended in the 2004 O M & M report, is under construction.

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.



VI. REFERENCES

- Brown and Root, Inc. 1992. Conceptual engineering report for Freshwater Bayou Canal bank stabilization, Vermilion Parish, Louisiana. Prepared for Louisiana Department of Natural Resources/Coastal Restoration Division. Belle Chase, La.: Brown and Root, Inc. 26 pp.
- Good, B., J. Buchtel, D. Meffert, J. Radford, K. Rhinehart, and R. Wilson 1995. Louisiana's major coastal navigation channels. Unpublished report. Baton Rouge: Louisiana Department of Natural Resources, Office of Coastal Management and Restoration. 57 pp.
- Price, J. and M. Guidry 2007. 2004 Operations, maintenance, and monitoring report for Freshwater Bayou Canal bank stabilization project (ME-13). Louisiana Department of Natural Resources, Coastal Restoration Division and Coastal Engineering Division, Lafayette. 21 pp.
- Steyer, G. D., R. C. Raynie, D. L. Steller, D. Fuller, and E. Swenson 1995. Quality management plan for Coastal Wetlands Planning, Protection, and Restoration Act monitoring plan. Open-file series 95-01. Baton Rouge: Louisiana Department of Natural Resources, Coastal Restoration Division. 108 pp., plus 3 appendices.
- U. S. Army Corps of Engineers and Louisiana Department of Natural Resources 1994. Freshwater Bayou Canal bank stabilization (XME-29). Candidate project information sheet for wetland value assessment. Unpublished report. Baton Rouge: Louisiana Department of Natural Resources, Coastal Restoration Division. 16 pp.
- Vincent, K. A. and M. Guidry. 2004. 2003 Operations, maintenance, and monitoring report for Freshwater Bayou Canal bank stabilization (ME-13). Lafayette, La.: Louisiana Department of Natural Resources, Coastal Restoration Division.



Appendix A (Inspection Photographs)

No inspection was conducted in calendar year 2005 because this project is currently under a maintenance event, therefore no photographs are available.



Appendix B (Three-Year Budget Projection)

FRESHWATER BAYOU / ME13 / PPL 5 Three-Year Operations & Maintenance Budgets 07/01/2005 - 06/30/08

Project Manager	O & M Manager	Federal Sponsor
		NRCS
Prepared By		

	2005/2006	2006/2007	2007/2008
Maintenance Inspection	\$ 4,955.00	\$ 5,119.00	\$ 5,288.00
Structure Operation	\$ -	\$ -	\$ -
Administration	\$ 31,432.00	\$ -	\$ -

Maintenance/Rehabilitation

05/06 Description:

	E&D				
	Construction	\$	392,900.00		
	Construction Oversight	\$	20,000.00		
	Sub Total - Maint. And Rehab.	\$	412,900.00		

06/07 Description:

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

07/08 Description:

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

	2005/2006	2006/2007	2007/2008
Total O&M Budgets	\$ 449,287.00	\$ 5,119.00	\$ 5,288.00



OPERATION AND MAINTENANCE BUDGET WORKSHEET 07/01/2005-06/30/2006
FRESHWATER BAYOU SHORELINE STABILIZATION /ME-13/ PPL 5

DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	ESTIMATED TOTAL
O&M Inspection and Report	EACH	1	\$4,955.00	\$4,955.00
General Structure Maintenance	LUMP	1	\$0.00	\$0.00
Engineering and Design	LUMP	1		\$0.00
Operations Contract	LUMP	1	\$0.00	\$0.00
Construction Oversight	LUMP	1	\$20,000.00	\$20,000.00

ADMINISTRATION

LDNR / CRD Admin.	LUMP	1	\$15,716.00	\$15,716.00
FEDERAL SPONSER Admin.	LUMP	1	\$15,716.00	\$15,716.00
SURVEY Admin.	LUMP	0	\$0.00	\$0.00
OTHER				\$0.00
TOTAL ADMINISTRATION COSTS:				\$31,432.00

MAINTENANCE / CONSTRUCTION

SURVEY

SURVEY DESCRIPTION:	UNIT	EST. QTY.	UNIT PRICE	ESTIMATED TOTAL
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:	UNIT	EST. QTY.	UNIT PRICE	ESTIMATED TOTAL
Borings	EACH	0	\$0.00	\$0.00
OTHER				\$0.00
TOTAL GEOTECHNICAL COSTS:				\$0.00

CONSTRUCTION

CONSTRUCTION DESCRIPTION:	UNIT	EST. QTY.	UNIT PRICE	ESTIMATED TOTAL
Rip Rap	LIN FT	8000	\$21.65	\$382,900.00
	TON / FT	2.15		
	TONS	17,224		
	UNIT PRICE		\$0.00	\$0.00
		0	\$0.00	\$0.00
		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	\$10,000.00	\$10,000.00
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:				\$392,900.00

TOTAL OPERATIONS AND MAINTENANCE BUDGET: \$449,287.00



OPERATION AND MAINTENANCE BUDGET 07/01/2006-06/30/2007
FRESHWATER BAYOU SP/ME-13/PPL5

DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	ESTIMATED TOTAL
O&M Inspection and Report	EACH	1	\$5,119.00	\$5,119.00
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	0	\$0.00	\$0.00
FEDERAL SPONSER Admin.	LUMP	0	\$0.00	\$0.00
SURVEY Admin.	LUMP	0	\$0.00	\$0.00
OTHER				\$0.00
TOTAL ADMINISTRATION COSTS:				\$0.00

MAINTENANCE / CONSTRUCTION

SURVEY

SURVEY DESCRIPTION:	UNIT	EST. QTY.	UNIT PRICE	ESTIMATED TOTAL
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:	UNIT	EST. QTY.	UNIT PRICE	ESTIMATED TOTAL
Borings	EACH	0	\$0.00	\$0.00
OTHER				\$0.00
TOTAL GEOTECHNICAL COSTS:				\$0.00

CONSTRUCTION

CONSTRUCTION DESCRIPTION:	UNIT	EST. QTY.	UNIT PRICE	ESTIMATED TOTAL
Rip Rap	LIN FT	0	\$0.00	\$0.00
	TON / FT	0.0	\$0.00	\$0.00
	TONS	0	\$0.00	\$0.00
		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	\$0.00	\$0.00
Contingency	LUMP	1	\$0.00	\$0.00
General Structure Maintenance	LUMP	1	\$0.00	\$0.00
OTHER				\$0.00
OTHER				\$0.00
OTHER				\$0.00
TOTAL CONSTRUCTION COSTS:				\$0.00

TOTAL OPERATIONS AND MAINTENANCE BUDGET: **\$5,119.00**



OPERATION AND MAINTENANCE BUDGET 07/01/2007-06/30/2008
FRESHWATER BAYOU SP/ME-13/PPL5

DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	ESTIMATED TOTAL
O&M Inspection and Report	EACH	1	\$5,288.00	\$5,288.00
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
TOTAL ADMINISTRATION COSTS:				\$0.00

MAINTENANCE / CONSTRUCTION

SURVEY

SURVEY DESCRIPTION:	UNIT	EST. QTY.	UNIT PRICE	ESTIMATED TOTAL
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:	UNIT	EST. QTY.	UNIT PRICE	ESTIMATED TOTAL
Borings	EACH	0	\$0.00	\$0.00
OTHER				\$0.00
TOTAL GEOTECHNICAL COSTS:				\$0.00

CONSTRUCTION

CONSTRUCTION DESCRIPTION:	UNIT	EST. QTY.	UNIT PRICE	ESTIMATED TOTAL
Rip Rap	LIN FT	0	\$0.00	\$0.00
	TON / FT	0.0	\$0.00	\$0.00
	TONS	0	\$0.00	\$0.00
		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	\$0.00	\$0.00
Contingency	LUMP	1	\$0.00	\$0.00
General Structure Maintenance	LUMP	1	\$0.00	\$0.00
OTHER				\$0.00
OTHER				\$0.00
OTHER				\$0.00
TOTAL CONSTRUCTION COSTS:				\$0.00

TOTAL OPERATIONS AND MAINTENANCE BUDGET: \$5,288.00



Appendix C (Field Inspection Notes)

No inspection was conducted in calendar year 2005 because this project is currently under a maintenance event, therefore no field inspection notes are available.

