State of Louisiana

Coastal Protection and Restoration Authority of Louisiana (CPRA)

2015 Operations, Maintenance, and Monitoring Report

for

Vermilion River Cutoff Bank Protection (TV-03)

State Project Number TV-03
Priority Project List 1

May 2015
Vermilion Parish

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2015 Operations, Maintenance, and Monitoring Report
For
Vermilion River Cutoff (TV-03)

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Preface

This report includes monitoring data collected through July 2014, and annual Maintenance Inspections through June 2015. The Vermilion River Cutoff (TV-03) project is federally sponsored by the U.S. Army Corps of Engineers (COE) and locally sponsored by the Coastal Protection and Restoration Authority of Louisiana (CPRA) under the Coastal Wetlands Planning, Protection, and Restoration Act (CWPPRA, Public Law 101-646, Title III). TE-52 is listed on the 1st CWPPRA Priority Project List (PPL-1).

The 2015 report is the 4th report in a series of reports. For additional information on lessons learned, recommendations and project effectiveness please refer to previous OM&M reports (2004, 2005, and 2007) as well as annual O&M inspection reports (2005-2015) on the CPRA website: http://cims.coastal.la.gov/

I. Introduction

The Vermilion River Cutoff Project area consists of approximately 194.2 acres (78.6 ha) of brackish marsh and open water, located in Vermilion Parish, Louisiana. The Vermilion River Cutoff, near Intracoastal City, La., was constructed in 1947 to connect the Vermilion River and the Gulf Intracoastal Waterway (GIWW) with Vermilion Bay for navigational purposes. A large section of the west bank of the Vermilion River Cutoff has eroded as a result of both bay-side wave action and boat wakes within the cutoff. Erosion of the west bank of the Vermilion River Cutoff, estimated at 23.3 ft/yr (7.1 m/yr) from comparisons of 1955–1985 aerial photography, has occurred to the extent that the land bridge between the cutoff and Vermilion Bay, to the west, is breached in several places (LDNR 1991). Erosion rates from 1948 to 1972 for Vermilion Bay near Onion Bayou as estimated by the Louisiana Department of Transportation and Development was 1.6 ft/yr (0.5 m/yr) (Adams et al., 1978). The shoreline retreat from 1948 to 1972 for Vermilion Bay (Mud Point to Lake Cleodis) as estimated by the Louisiana Department of Transportation and Development was 2.6 ft/yr (0.8 m/yr). Erosion on the east bank threatens to breach the land bridge between the cutoff and Onion Lake.

The project was originally designed to stabilize the west side of the cutoff by armoring the three remaining land points adjacent to Vermilion Bay with limestone rip-rap. It was also designed to protect the east side of the cutoff from further erosion through the use of 8,900 ft (2,713 m) freestanding rock breakwater. The original plan was redesigned due to cost overruns. The continuous dike along the west bank and sediment trapping features were eliminated. The constructed project consists of 6,269 ft (1,911 m) of foreshore rock dike along the east bank of Vermilion River Cutoff. The original boundary for the project area in 1993 did not include the entire area where the shoreline structure was constructed. The revised boundary for the project area was adjusted to encompass the rock dike to better evaluate the project area over time. Construction of the breakwater was complete in February 1996 (Figure 1).

Hurricane Rita struck the coast of southwestern Louisiana on September 24, 2005 with maximum storm surge of 10 ft (3.1 m) in the TV-03 project area. The United States Geological

Service (USGS) calculated the amount of land that changed to water resulting from the storm to be 98 square miles in southwestern Louisiana, 5 square miles in the Teche/Vermilion basin (Barras 2006). This loss can be attributed to shearing, which is ripping and removal of marsh vegetation in historically healthy marshes. Shearing was observed bordering the east bank of Freshwater Bayou. The removal of remnant marsh from areas with historical land loss was observed in the marsh west of Pecan Island.

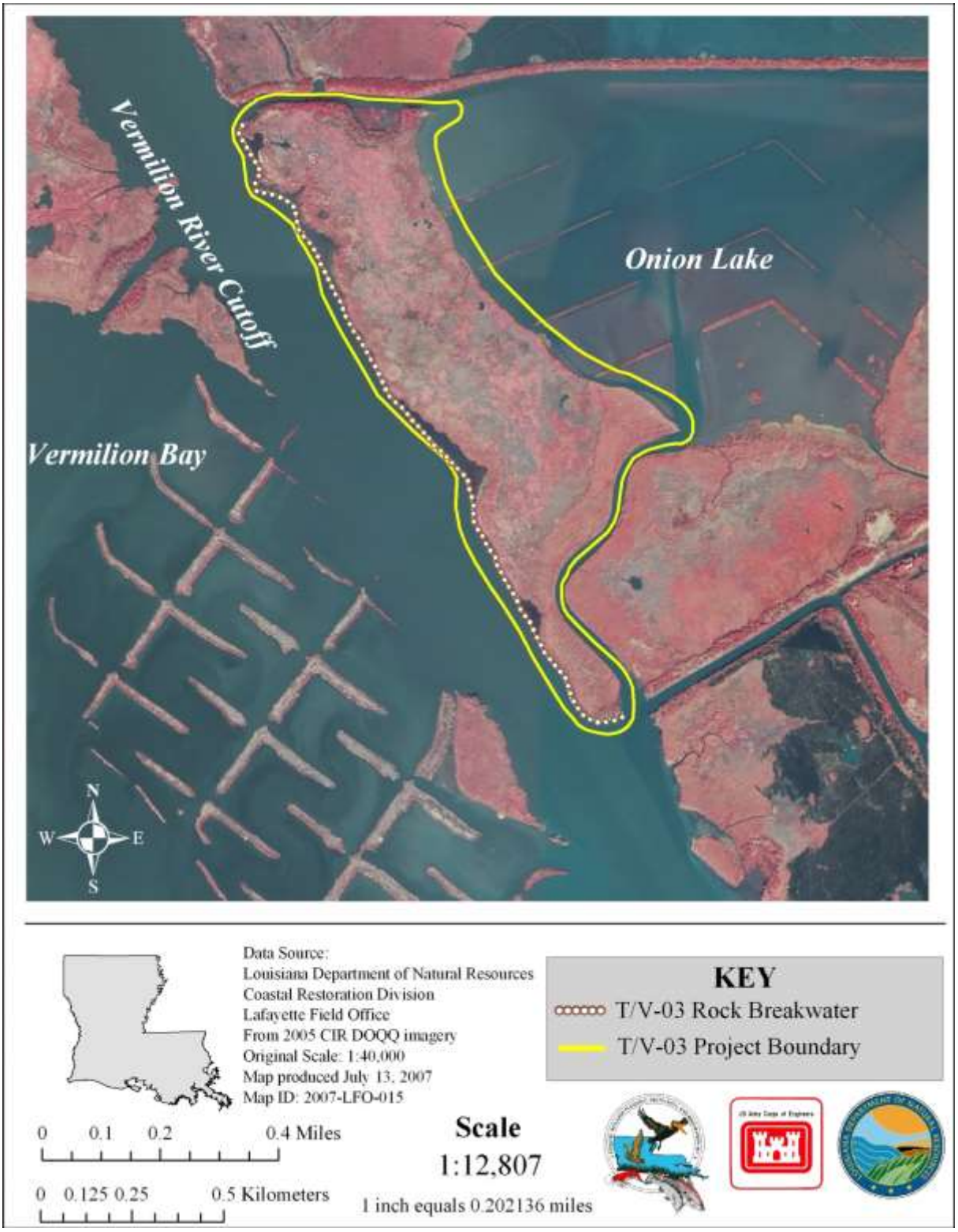

Figure 1. Vermilion River Cutoff (TV-03) project area map showing location of rock breakwater.

II. Maintenance Activity

a. Project Feature Inspection Procedures

The purpose of the annual inspection of the Vermilion River Cut-Off Project (TV-03) 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, CPRA 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. The annual inspection report also contains a summary of maintenance projects which were completed since completion of constructed project features and an estimated projected budget for the upcoming three (3) years for operation, maintenance and rehabilitation. The three (3) year projected operation and maintenance budget is shown in Appendix C. This project was previously inspected on March 29, 2004 and October 4, 2005.

An inspection of the Vermilion River Cut-Off Project (TV-03) was held on June 24, 2015 under partly cloudy skies and hot temperatures. In attendance were John Foret and Donna Rogers from NOAA for other projects and Stan Aucoin with CPRA. Parties met at the Lafayette Field Office of CPRA and proceeded to the public boat launch in Intracoastal City in Vermilion Parish, LA. The annual inspection began at approximately 12:00 pm at the southern end of the rock dike on the Vermilion River Cut-Off.

The field inspection included a complete visual inspection of the entire project site. Staff gauge readings were used, when available, to determine approximate elevations of water and rock weirs. Photographs were taken at each project feature (see Appendix B) and Field Inspection notes were completed in the field to record measurements and deficiencies (see Appendix D).

b. Inspection Results

<u>Site 1—Foreshore rock dike</u>

The foreshore dike is in excellent condition with no maintenance required or foreseen. Water level at the time of this inspection was approximately +1.0 NAVD. (Photos, Appendix A, Photos 1-2).

c. Maintenance Recommendations

i. Immediate/ Emergency Repairs

None

ii. Programmatic/ Routine Repairs

None

d. Maintenance History

General Maintenance: Below is a summary of completed maintenance projects and operation tasks performed since March 1996, the construction completion date of the Vermilion River Cut-Off Bank Protection Project.

September 2005 - Luhr Brothers, Inc.
Provided labor and materials to restore the rock dike to original constructed elevations. Approximately 5,573 tons of rock were placed over the sections of dike that were below permitted elevation of +3.5 NAVD88. The project was completed in September, 2005.

TOTAL CONSTRUCTION COST: $130,655.45

December 2011 Staff Gauge:
Installed a staff gauge in Vermilion River Cutoff near Onion Lake at N 29° 46'21.73", W 92° 07' 55.95".

III. Operation Activity

a. Operation Plan

There are no water control structures associated with this project which require operations.

b. Actual Operations

There are no water control structures associated with this project which require 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 TV-03 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. No CRMS-*Wetlands* sites are located within the TV-03 project area.

a. Monitoring Goals

The objectives of the Vermilion River Cutoff project are:

1. Maintain and protect approximately 67 ac (27 ha) of brackish marsh along the eastern side of the Vermilion River Cutoff that will contribute to protecting the integrity of several thousand acres of the Onion Lake wetland complex.

    a. Prevent the Vermilion River Cutoff from widening into adjacent marshes.

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

1. Decrease the rate of shoreline erosion along the east bank of the Vermilion River Cutoff adjacent to Onion Lake through the use of a rock breakwater.

b. Monitoring Elements

Aerial Photography

To document vegetated and non-vegetated areas, near vertical color-infrared aerial photography (1:12,000 scale with ground controls) was obtained in 1993 (pre-construction) and post-construction in 2002. The original photographs were checked for flight accuracy, color correctness, and clarity and were subsequently archived. Aerial photographs were scanned, mosaicked, and georectified by USGS/NWRC personnel according to standard operating procedures (Steyer et al. 1995, revised 2000). No additional photography is scheduled.

Shoreline Change

Shoreline movement was documented using Differential Global Positioning System (DGPS) in 1995, 1999, 2002, 2006 and 2014 to provide a template for mapping shoreline changes and movement over time. Shoreline positions for 1999 were compared to historical data sets available in digitized format for 1993.

Shoreline markers were established at the vegetated marsh edge along the original shoreline adjacent to the breakwater post-construction in 1998 and direct measurements were taken from the settlement plate to the vegetated marsh edge. Measurements were also collected in 2000, 2002, 2006 and 2014 post-construction.

c. Monitoring Results and Discussion

Aerial Photography

The original boundary for the project area in 1993 did not include the entire area where the shoreline structure was constructed. The revised boundary for the project area was adjusted to encompass the rock dike to better evaluate the project area over time. Comparison of the 1993 land to water analysis to the analysis for 2002 shows an increase in land by one acre (Figures 2 and 3). This is likely attributed to inclusion of the dike footprint and partial terraces in the "land" delineation. The significant finding is no net loss in the project boundary. Furthermore, the land to water analysis for 2002 indicates 45 acres of open water and 149 acres of land in the project area (Figure 3).

Shoreline Change

The data used for the shoreline analysis was from DGPS acquired by CPRA personnel. Analysis of baseline DGPS taken in 1997 acquired by USGS was compared to 1999, 2002, 2006,

2011 and 2014 DGPS which was acquired by CPRA. The results of a shoreline analysis from 1997 to 2014 shorelines are mapped in Figure 4. Change rates were calculated in m/yr for the length of the project area along transects spaced 20m apart. Results change rates were determined and averaged from each transect along the shoreline. The rate of change for the project area behind the rock for the period of record November 1997 to July 2014 is an average gain of 0.22 m/yr. The results of the analysis from 2006 to 2014 DGPS are mapped in Figure 5. The rate of change for the project area is an average gain of 0.73 m/yr.

Direct shoreline measurements taken from each settlement plate (Figure 6) to the vegetated edge of the marsh behind the rock breakwater in the project area indicate an overall progradation of the shoreline. Shoreline change at settlement plates from 1998 to 2014 ranged from -0.04 m/yr to 0.95 m/yr and averaged 0.34 m/yr. Change rates between time intervals show a decrease in erosion over time at the settlement plates (Table 1).

In 1999, 2002, 2006, 2011 and 2014, ancillary DGPS data were collected along the west bank of Vermilion River Cut-Off project and surrounding the island (Figure 7). The DGPS line data were converted to a closed polygon feature and acreages were calculated. From 1999 to 2006 acreage of the island decreased by 2.6 acres. However from 2006 to present the area of the island has increased by 2.5 acres. This increase is due to the island shifting westward and merging with a nearby terrace. The current island acreage (13.4) is comparable to that of the original 1999 measurement of 13.3 acres.

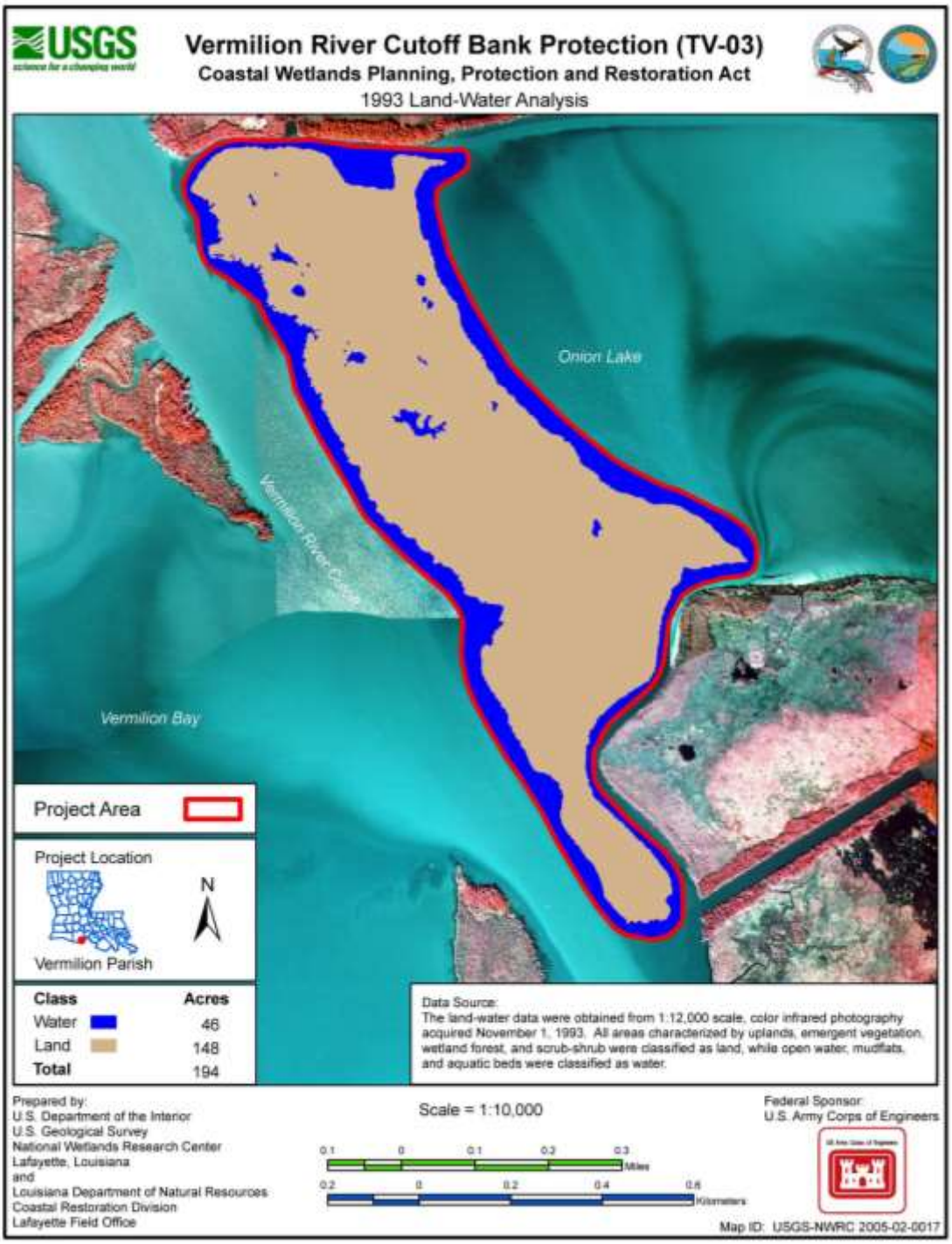

Figure 2. Pre-construction Land to Water analysis for Vermilion River Cutoff (TV-03) project area for 1993.

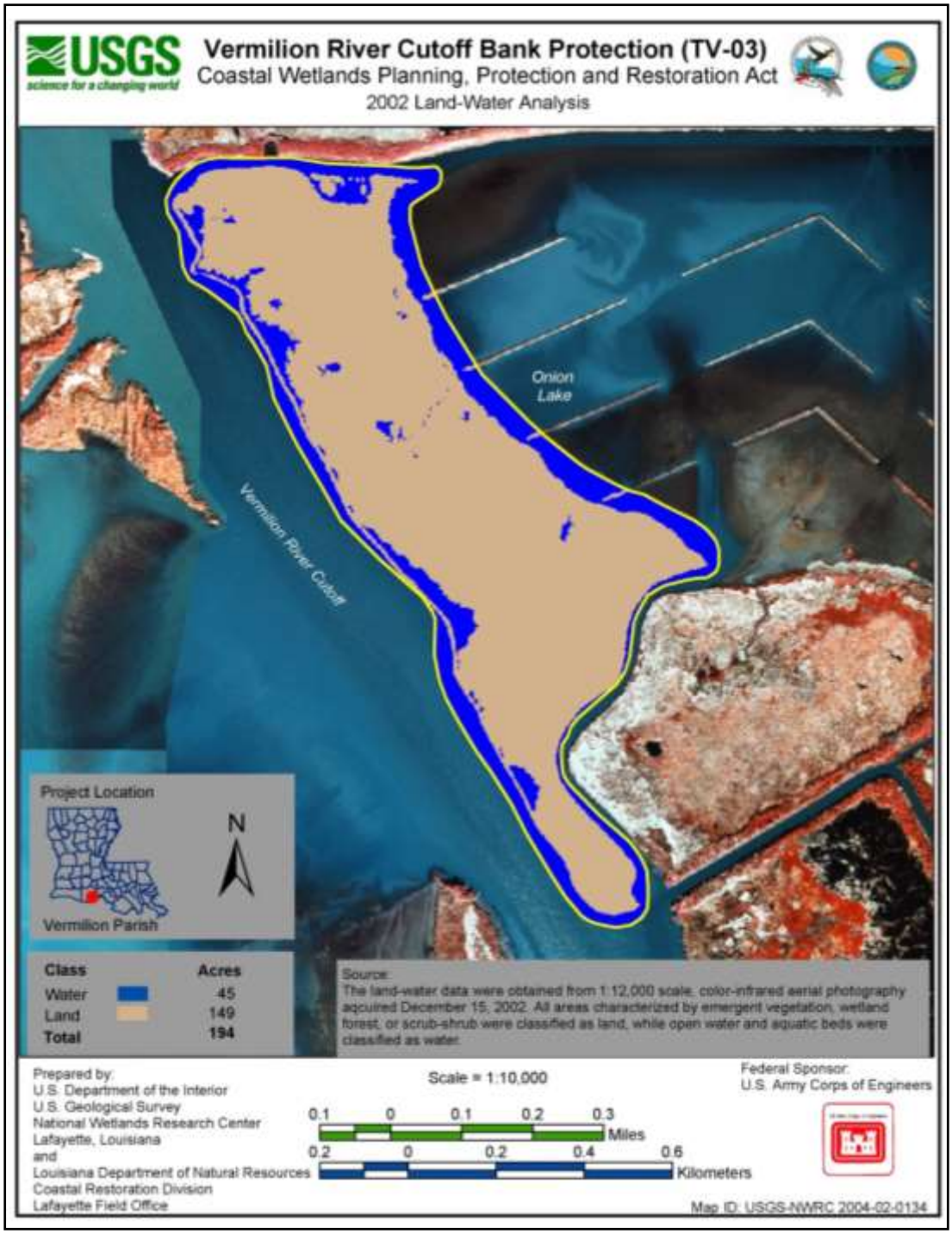

Figure 3. Land to Water analysis for Vermilion River Cutoff (TV-03) project area for 2002.

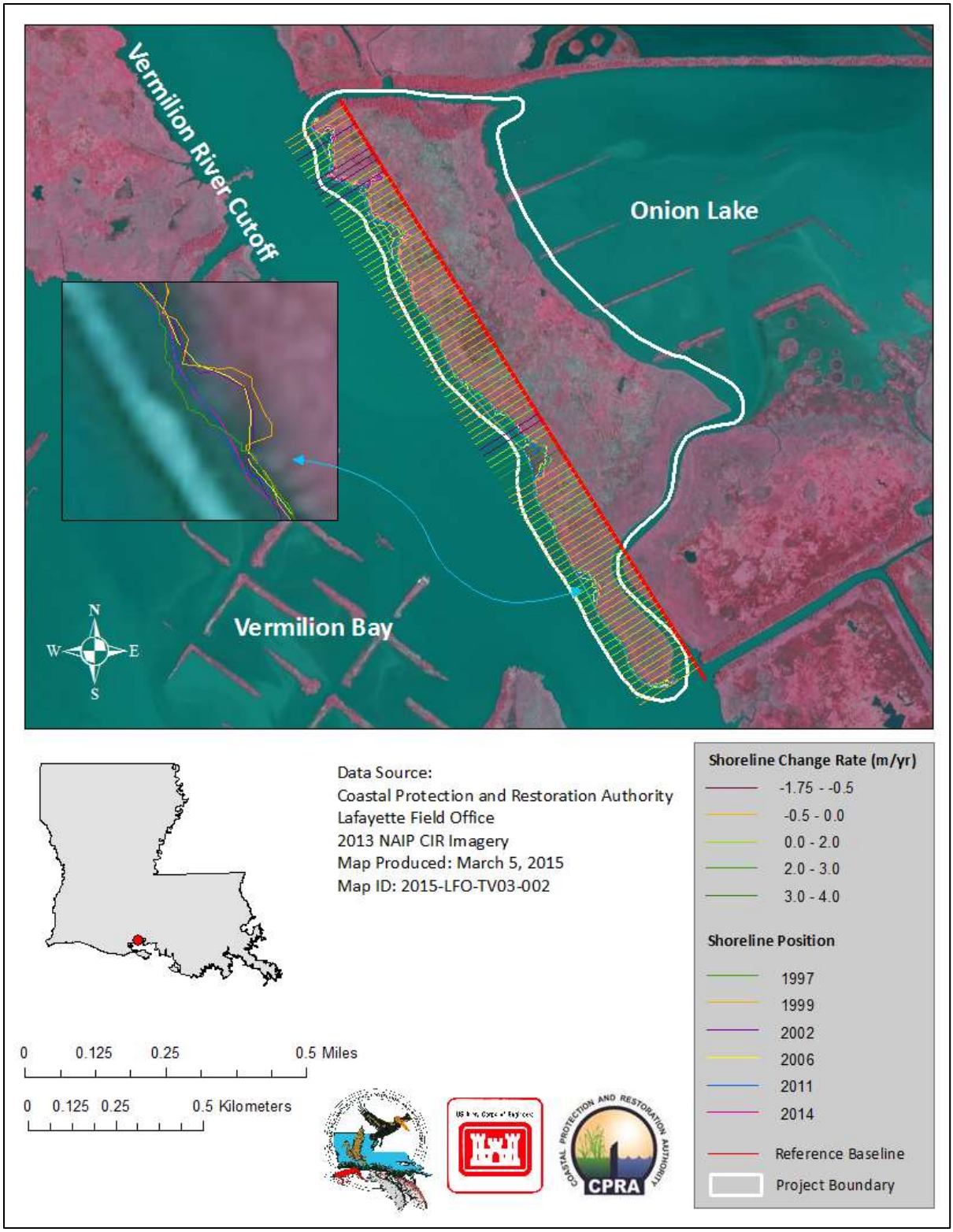

Figure 4. Shoreline change map of the Vermilion River Cutoff (TV03) project for 1997-2014.

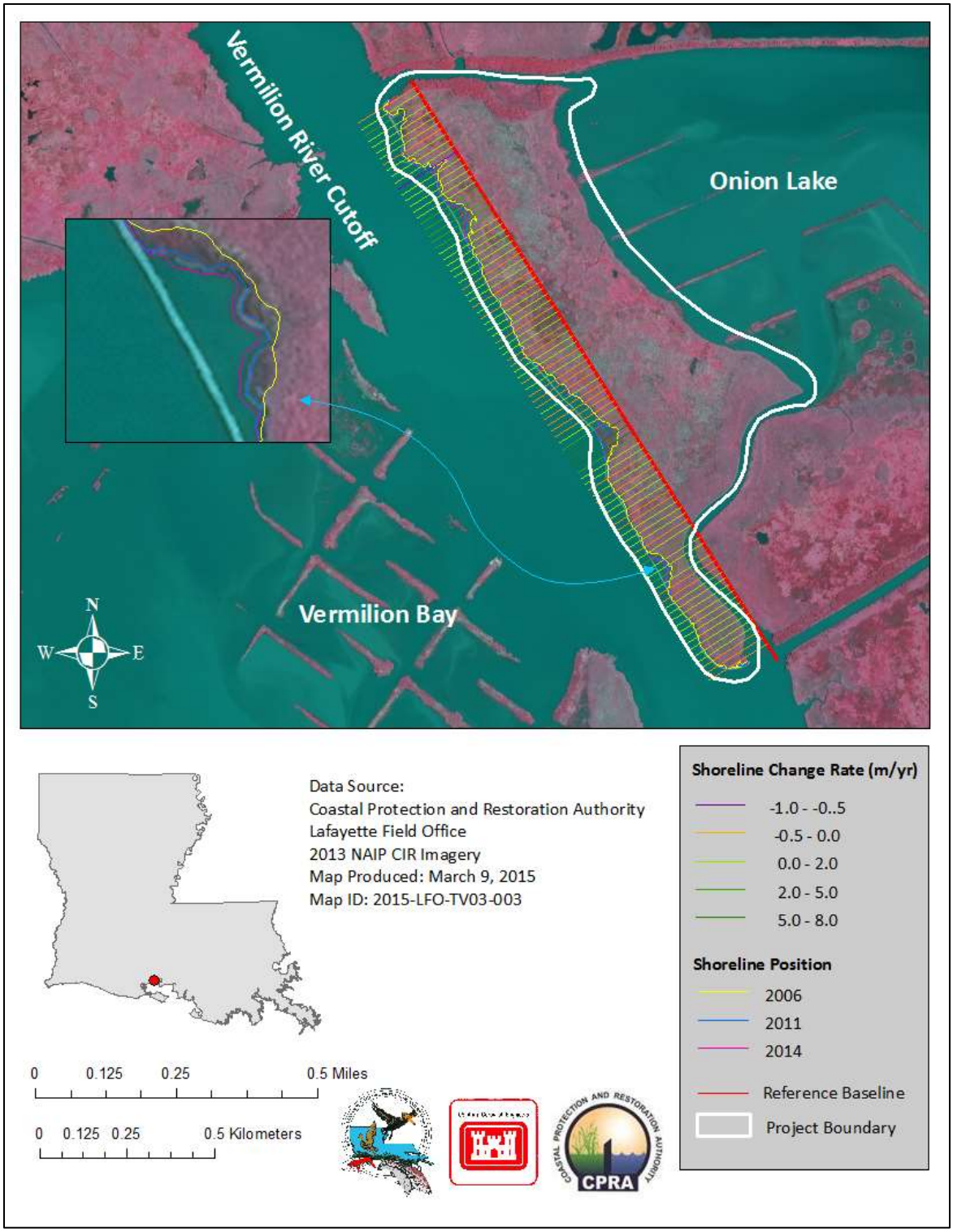

Figure 5. Shoreline change map of the Vermilion River Cutoff (TV03) project for 2006-2014.

Figure 6. Settlement plate 1007 in the Vermilion River Cutoff (TV03) project at the southern end of the rock breakwater.

Settlement Plate	1998 Distance (m)	2000 Distance (m)	2002 Distance (m)	2006 Distance (m)	2014 Distance (m)	1998-2014 Change in Distance (m)	1998-2014 Shoreline Change Rate (m/yr)
1003	19.3	19.3	15.3	11.5	4.12	15.2	0.95
1004	12.5	12.5	11.2	5.9	3.14	9.3	0.58
1005	21.5	19.9	16.9	20.2	22.1	-0.6	-0.04
1006	7.1	7.1	8.5	7.8	4.57	2.6	0.16
1007	4.2	3.6	4.2	3.1	3.05	1.2	0.07

Table 1. Shoreline change rate (m/yr) at TV-03 settlement plates.

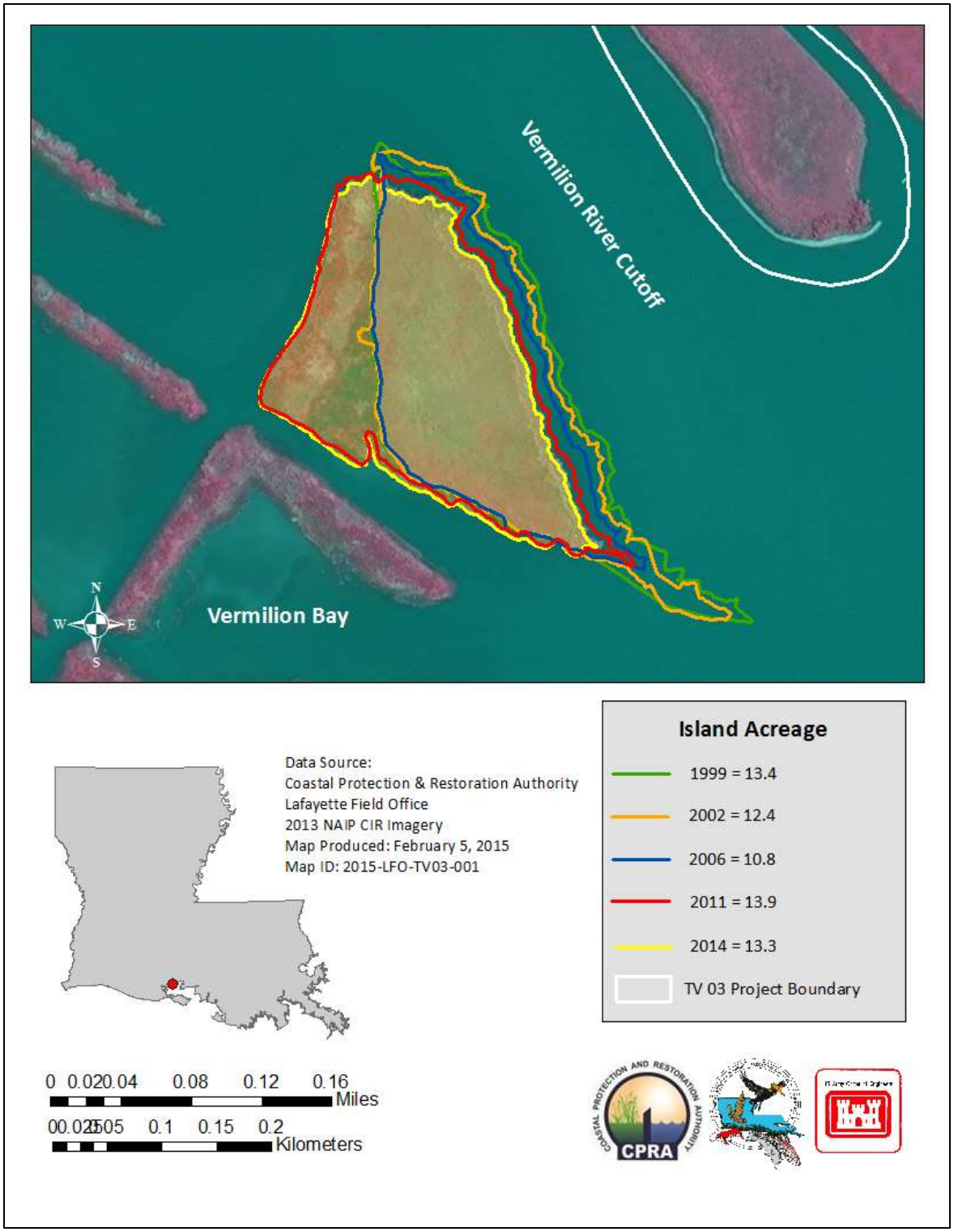

Figure 7. Land change map of the island located across from the Vermilion River Cutoff (TV03) project area.

V. Conclusions

a. Project Effectiveness

The TV-03 project appears to be functioning as designed. The shoreline behind the foreshore rock dike is prograding at four of five monitoring stations and the shoreline survey performed in 2014 showed an overall gain of 0.22 m/yr over the project's lifespan. From 1996 to 2002 results from aerial photography indicate that land area in the project area has increased by one acre. The area measurement of the adjacent island from 2014 is comparable to original measurement taken in 1999. The island has shifted westward and is encompassing a nearby terrace.

b. Recommended Improvements

While the dike has settled some in places over the years, the project is in very good condition and functioning as designed.

c. Lessons Learned

d. End of Project Life

The Vermilion River Cutoff Protection Project is in good condition and should continue to provide shoreline protection well beyond the 20 year project life without future maintenance. In general, shoreline protection projects along inland waterways have proven to be successful at abating erosion and facilitating growth and expansion of vegetation without the need for extensive maintenance.

VI. Literature Cited

Adams, R. D., P. J. Banas, R. H. Baumann, J. H. Blackmon, and W. G. McIntire 1978. Shoreline erosion in coastal Louisiana: inventory and assessment. Baton Rouge: Louisiana Department of Transportation and Development, Coastal Resources Program. 139 pp.

Barras, John A., 2006, Land area change in coastal Louisiana after the 2005 hurricanes—a series of three maps: U.S. Geological Survey Open-File Report 06-1274.

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Steyer, G. D., R. C. Raynie, D. L. Steller, D. Fuller, and E. Swenson 1995, 2000. Quality management plan for coastal Wetlands Planning, Protection, and Restoration Act Monitoring Program. Open-file report no. 95-01. Baton Rouge, La.: Louisiana Department of Natural Resources Division. 97pp. Plus appendices.

APPENDIX A

(Inspection Photographs)

Photo No. 1—north end of dike

Photo No. 2—typical reach of dike

APPENDIX B

(Three Year Budget Projection)

VERMILION RIVER CUT OFF/ TV-03 / PPL 1

Three-Year Operations & Maintenance Budgets 07/01/2015 - 06/30/2018

Project Manager	O & M Manager	Federal Sponsor	Prepared By
Pat Landry	*Stan Aucoin*	*COE*	*Stan Aucoin*

	2015/2016 (-20)	2016/2017 (-21)	2017/2018 (-22)
Maintenance Inspection	$ 6,851.00	$ 7,057.00	$ 7,269.00
Structure Operation			
State Administration		$ -	$ -
Federal Administration		$ -	$ -
Maintenance/Rehabilitation			

15/16 Description:

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

16/17 Description

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

17/18 Description:

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

	2015/2016 (-20)	2016/2017 (-21)	2017/2018 (-22)
Total O&M Budgets	**$ 6,851.00**	**$ 7,057.00**	**$ 7,269.00**

O &M Budget (3 yr Total)	**$ 21,177.00**
Unexpended O & M Budget	**$ 10,919.00**
Remaining O & M Budget (Projected)	**$ (10,258.00)**

OPERATION AND MAINTENANCE BUDGET WORKSHEET

VERMILION RIVER CUT OFF / PROJECT NO. TV-03 / PPL NO. 1/ 2015-2016

DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	ESTIMATED TOTAL
O&M Inspection and Report	EACH	1	$6,851.00	**$6,851.00**
General Structure Maintenance	LUMP	0	$0.00	**$0.00**
Engineering and Design	LUMP	0	$0.00	**$0.00**
Operations Contract	LUMP	0	$0.00	**$0.00**
Construction Oversight	LUMP	0		**$0.00**

ADMINISTRATION

LDNR / CRD Admin.	LUMP	0	$0.00	$0.00
FEDERAL SPONSOR 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:					
	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:	Vegetative plantings on terraces.					
	Rip Rap	LIN FT	TON / FT	TONS	UNIT PRICE	
	Bank Paving	0	0.0	0	$0.00	$0.00
		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	0	$0.00	$0.00
	Materials		LUMP	0	$0.00	$0.00
	Mob / Demob		LUMP	0	$0.00	$0.00
	Contingency		LUMP	0	$0.00	$0.00
	General Structure Maintenance		LUMP	0	$0.00	$0.00
	Vegetative Plantings		EACH	0	$0.00	$0.00
	OTHER				$0.00	$0.00
	OTHER				$0.00	$0.00
					TOTAL CONSTRUCTION COSTS:	**$0.00**

TOTAL OPERATIONS AND MAINTENANCE BUDGET: $6,851.00

OPERATION AND MAINTENANCE BUDGET WORKSHEET

VERMILION RIVER CUT OFF / PROJECT NO. TV-03 / PPL NO. 1/ 2016-2017

DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	ESTIMATED TOTAL
O&M Inspection and Report	EACH	1	$7,057.00	**$7,057.00**
General Structure Maintenance	LUMP	0	$0.00	**$0.00**
Engineering and Design	LUMP	0	$0.00	**$0.00**
Operations Contract	LUMP	0	$0.00	**$0.00**
Construction Oversight	LUMP	0		**$0.00**

ADMINISTRATION

LDNR / CRD Admin.	LUMP	0	$0.00	$0.00
FEDERAL SPONSOR 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:					
	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:	Vegetative plantings on terraces.					
	Rip Rap	LIN FT	TON / FT	TONS	UNIT PRICE	
	Bank Paving	0	0.0	0	$0.00	$0.00
		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	0	$0.00	$0.00
	Materials		LUMP	0	$0.00	$0.00
	Mob / Demob		LUMP	0	$0.00	$0.00
	Contingency		LUMP	0	$0.00	$0.00
	General Structure Maintenance		LUMP	0	$0.00	$0.00
	Vegetative Plantings		EACH	0	$0.00	$0.00
	OTHER				$0.00	$0.00
	OTHER				$0.00	$0.00
					TOTAL CONSTRUCTION COSTS:	**$0.00**

TOTAL OPERATIONS AND MAINTENANCE BUDGET: $7,057.00

OPERATION AND MAINTENANCE BUDGET WORKSHEET

VERMILION RIVER CUT OFF / PROJECT NO. TV-03 / PPL NO. 1/ 2017-2018

DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	ESTIMATED TOTAL
O&M Inspection and Report	EACH	1	$7,269.00	**$7,269.00**
General Structure Maintenance	LUMP	0	$0.00	**$0.00**
Engineering and Design	LUMP	0	$0.00	**$0.00**
Operations Contract	LUMP	0	$0.00	**$0.00**
Construction Oversight	LUMP	0		**$0.00**

ADMINISTRATION

LDNR / CRD Admin.	LUMP	0	$0.00	$0.00
FEDERAL SPONSOR 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:					
	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:	Vegetative plantings on terraces.					
	Rip Rap	LIN FT	TON / FT	TONS	UNIT PRICE	
	Bank Paving	0	0.0	0	$0.00	$0.00
		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	0	$0.00	$0.00
	Materials		LUMP	0	$0.00	$0.00
	Mob / Demob		LUMP	0	$0.00	$0.00
	Contingency		LUMP	0	$0.00	$0.00
	General Structure Maintenance		LUMP	0	$0.00	$0.00
	Vegetative Plantings		EACH	0	$0.00	$0.00
	OTHER				$0.00	$0.00
	OTHER				$0.00	$0.00
					TOTAL CONSTRUCTION COSTS:	**$0.00**

TOTAL OPERATIONS AND MAINTENANCE BUDGET: $7,269.00

APPENDIX C

(Field Inspection Notes)

MAINTENANCE INSPECTION REPORT CHECK SHEET

Project No. / Name: TV-03 Vermilion River Cut-Off

Date of Inspection: June 24, 2015 Time: 12:00 pm

Structure No. N/A

Inspector(s): Stan Aucoin (CPRA)
John Foret and Donnal Rogers (NMFS)

Structure Description: Foreshore Rock Dike

Water Level - 1.0ft

Type of Inspection: Annual

Weather Conditions: partly cloudy and hot

Item	Condition	Physical Damage	Corrosion	Photo #	Observations and Remarks
Steel Bulkhead / Caps	N/A				
Steel Grating	N/A				
Stop Logs	N/A				
Hardware	N/A				
Timber Piles	N/A				
Timber Wales	N/A				
Galv. Pile Caps	N/A				
Cables	N/A				
Signage /Supports	N/A				
Rip Rap (fill) (foreshore dike)	Good			1,2	The foreshore dike was in very good condition.
Earthen Embankment	N/A				

What are the conditions of the existing levees?
Are there any noticeable breaches?
Settlement of rock plugs and rock weirs?
Position of stoplogs at the time of the inspection?
Are there any signs of vandalism?