Coastal Protection and Restoration Authority of Louisiana

State of Louisiana
Department of Coastal Protection and Restoration
Operations Division

2011 Annual Inspection Report

for

DELTA WIDE CREVASSES (MR-09)

State Project Number MR-09
Priority Project List 6

January 12, 2012
Plaquemines Parish

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I. Introduction

Delta Wide Crevasses (MR-09) was authorized by Section 303(a) of Title III Public Law 101-646, the Coastal Wetlands Planning Protection and Restoration Act (CWPPRA) enacted on November 29, 1990 as amended. The Delta Wide Crevasses Project was approved on the sixth (6^{th}) Priority Project List and project area is located within two wildlife management/refuge areas, both in Plaquemines Parish, La. The northern half of the project is located in the Delta National Wildlife Refuge. The southern half is located in the Pass-a-Loutre State Wildlife Management Area (PALWMA). The necessary agreements to allow project construction and operation to proceed have been executed between CPRA and the above-referenced parties.

II. Inspection Purpose and Procedures

The purpose of the annual inspection of the Delta Wide Crevasses Project (MR-09) is to evaluate the constructed project features to identify any deficiencies and prepare a report detailing the condition of the project features and recommended corrective actions. Should it be determined that corrective actions are needed, CPRA shall provide a detailed cost estimate for the following: engineering, design, supervision, inspection, construction contingencies, and an assessment of the urgency of such repairs (O&M Plan August 1, 2007). The annual inspection report also contains a summary of maintenance projects and a three (3) year projected budget for operation, maintenance, and rehabilitation. The projected operation and maintenance budget is shown in Appendix C. A summary of past maintenance projects since completion of the Delta Wide Crevasses Project in 1999 is outlined in Section IV.

This annual inspection of the Delta Wide Crevasse Project (MR-09) was held on July 19, 2011. Weather conditions were partly cloudy with scattered showers. Winds were out of the S/SE at 5-7 knots. At 0800 hours the Mississippi River Stage at the COE Gage in Venice, La. was +3.06 feet NAVD 88. The reading at the head of Passes gage was +2.63 NAVD88. In attendance were Tom Bernard, CPRA; Kyle Breaux, CPRA; Bryan Gossman, CPRA; Shane Granier, LDWF; Trebor Victorino, LDWF; Phillip Parker, NOAA; and John Foret, NOAA. The inspection team met with Louisiana Department of Wildlife and Fisheries (LDWF) personnel at the LDWF/ PALWMA Camp/Headquarters. LDWF vessels transported the team to each crevasse site. Soundings were taken through each cut.

The historical high river stages during the past few months have contributed large amounts of sediment to each crevasse and receiving bay.

III. Project Description and History

The project area is located in Plaquemines Parish, southeast of Venice, Louisiana on the active Mississippi River Delta (Figure 1). This project utilizes the major process that forms subaerial land in the lower Mississippi River Delta – the formation of crevasses. Crevasses are breaks in a levee or natural ridge that allow overbank deposition of sediments to occur in adjacent interdistributary receiving bays. This deposition of sediments causes land formation that is controlled by the processes of distributary mouth-bar islands. Coleman and Gagliano (1964) ordered the mouth-bar island process into crevasse sub-delta and crevasse-splay based on relative size. Crevasse sub-deltas consist of relatively large receiving bays that have areal extents of 115-154 sq mi. (300-400 sq km) and depths of 32-49 ft (10-15 m). The process by which these sub-deltas are formed is referred to as “bay filling” (Coleman and Gagliano 1964). Crevasse-splays are a smaller sub-unit that are distinguished from sub-deltas in that their size, frequency, and expected life spans are smaller generally having a receiving bay extent of approximately 0.234 sq mi. (0.59 sq km) (Boyer 1996).

The project consists of maintaining presently existing crevasse-splays, the construction of new crevasse-splays, and future maintenance of selected crevasse-splays in both the PALWMA and the Delta National Wildlife Refuge (DNWR). The PALWMA covers 66,000 ac (26,709 ha) between Pass-A-Loutre and South Pass and is owned and managed by the LDWF. The DNWR covers 48,000 ac (19,425 ha) from just north of Main Pass southward to Pass-A-Loutre and is owned and managed by the U.S. Fish and Wildlife Service (USFWS). It is understood that the natural cycle of crevasse-splays is a temporary event that is rarely active for more than 10 to 15 years. This process of crevasse-splay deposition, building, and subsidence will all be considered in the evaluation of this project.

The usefulness of crevasses as a tool of wetland and coastal management on the Mississippi River Delta began to be realized in the early 1980's. The Coastal Protection & Restoration Authority of Louisiana (CPRA) constructed three new crevasses in 1986 (on Pass-A-Loutre, South Pass, and Loomis Pass) that produced over 657 ac (266 ha) of emergent marsh from 1986 to 1991, and four crevasses in 1990 (two each on South Pass and Pass-A-Loutre) that produced over 400 ac (162 ha) of emergent marsh from 1990 to 1993 (LDNR 1993; Trepagnier 1994). Thirteen crevasses included in the CPRA Small Sediment Diversions Project cumulatively produced 313 ac (127 ha) of emergent marsh between 1986 and 1993; land growth rates ranged from 28 to 103 ac (11.3 to 41.7 ha) per crevasse for the older crevasses (4 to 10 years old) and 0.5 to 12 ac (0.2 to 4.9 ha) for the younger crevasses (0 to 2 years old) (LDNR 1996). Boyer et al. (1997) concluded that crevasses in the DNWR accumulated land at about 11.6 ac/yr (4.7 ha/yr), but subaerial growth did not occur for 2-3 years after the crevasses were constructed.

The project features covered by this inspection are inclusive of and are identified as the Delta Wide Crevasses (MR-09). The intention of the annual inspection is to maintain the project in a condition that will generally provide the anticipated benefits that the project was based on. There is no requirement that this project function to any standard beyond the 20-year economic life; except that it is not left as a hazard to navigation or a detriment to the environment. A site map showing the project boundary within the Delta Wide Crevasses project benefit area is shown in Appendix A identifying all of the project features within the project area.

IV. Summary of Past Maintenance Projects

General Maintenance: Below is a summary of completed maintenance project:

Originally dredged in 1999, crevasses No. 9, 11, and 12 in the PALWMA had completely silted in and did not function as originally intended. The first maintenance cycle took place in 2005. This maintenance dredging contract re-dredged those three crevasses to their original design dimensions and dredged two new crevasses in the same area. Those were NC-1 and NC-3. Also constructed in this maintenance contract was crevasse No. 81, which is located on Baptiste Collette in the Delta Wildlife Management Area. See Appendix A for locations of the maintenance sites.

V. Inspection Results of Crevasses Dredged in 2005 (See Appendix "B" for Project Photos)

A. Crevasse No. NC-1 (2005): (1,000 ft. X 100 ft. X -8.0 ft. NAVD 88) This crevasse appears to be in good condition. Soundings indicate that it has retained slightly more than half of its originally constructed depth. The interior indicates that river water is flowing very well through the channel carrying large amounts of sediment, and the spoil from the dredging of the crevasse is heavily vegetated throughout the deposited bay area.

B. Crevasse No. NC-3 (2005): (1,400 ft. X 100 ft. X -8.0 ft. NAVD 88) This is the second of the two new crevasses and the only one on South Pass. It is functioning very well, and flowing with a very swift current bringing much needed sediments into the interior bays. Our soundings show that the crevasse is maintaining its original depth throughout its channel length and the spoil from the crevasse dredging has completely vegetated. New spoil deposits from this high water season can also been seen in the inner bay.

C. Crevasse No. 9 (1999): (2,200 ft. X 75 ft. X -8.0 ft. NAVD 88) Good flow is being maintained in this dog-leg shaped crevasse. Its location allows for swift currents during the present high river stages. Soundings indicate that this crevasse has maintained 80% of its original depth throughout its length. The spoil deposition from this cut is very heavily vegetated and seems to have increased in size.

D. Crevasse No. 11 (1999): (2,600 ft. X 100 ft. X -8.0 ft. NAVD 88) This re-dredged crevasse (1999) is maintaining a good flow throughout its length. Soundings indicate that it has maintained over 80% of its original depth throughout, which is partly due to the swift current. The spoil deposited in the inner lagoon area has vegetated very heavily and appears to be in excellent condition. Wild rice is now growing in the interior receiving bay.

E. Crevasse No. 12 (1999): (2,000 ft. X 75 ft. X -8.0 ft. NAVD 88) Despite being located off of the main channel, this crevasse appears to be functioning very well. There is sufficient current to carry sediments to the inner section of the bays and lagoons despite maintaining only slightly more than half its original depth. This crevasse had been originally dredged in (1999).

F. Crevasse No. 81 (2005): (1,200 ft. X 100 ft. X -8.0 ft. NAVD 88) This crevasse is located off of Baptiste Collette in the Delta Wildlife Management Area. The close proximity of this crevasse to the Mississippi River allows for a strong current flow. Despite soundings indicating that the mouth of this crevasse has silted up from the large amounts of sediments moving into the cut, there is still some sediments being carried into the interior marsh area. The 3.5' draft of the boat was too deep to travel into the crevasse.

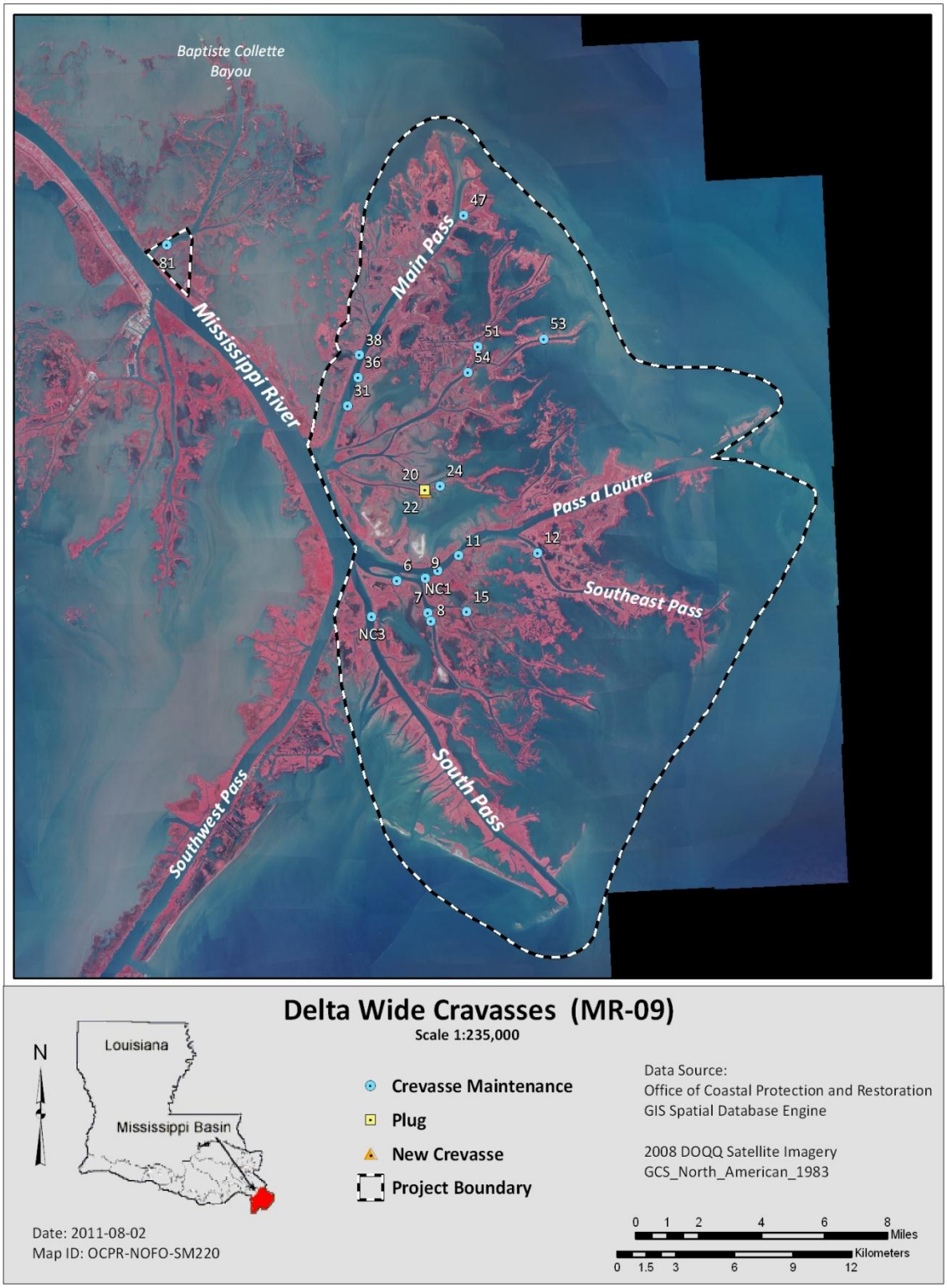
VI. Conclusions and Recommendations

As a result of the inspection, the team concluded that all project features are functioning and should continue to do so without any immediate maintenance; however, abnormally high river stages, during the past four seasons, caused increased shoaling in the Southwest Pass channel. This brought on more Mississippi River dredging by the Corps of Engineers and the deposition of that material in the flowage in Pass-a-Loutre. This additional shoal material, combined with the high river flows, added to the sediment load introduced into the pass and subsequently the crevasses areas. Those sediment loads were noticeable during the inspection and are contributing highly to the success of this project. They are also contributing to excessive shoaling occurring in the crevasses. Local and federal sponsors have agreed that it would not be prudent to conduct any maintenance dredging of the existing crevasses in the coming year.

At this time no immediate action will be taken for maintenance of the existing crevasses. CPRA, NOAA, LDWF, and USFWS will initiate a feasibility study of the identified additional areas to be potentially dredged in 2012/13. It is also recommended that we not return to Baptiste Collette to either maintain or dredge new crevasses at this time – more alternate sites can be found in the Pass-a-Loutre area. The strong current and high sediment load funneled through Baptiste Collette shoaled up these crevasses within the first high water period after dredging rendering them inefficient for the long term (5-years plus).

As of October 2011, the plan is to dredge new sites in the PALWMA and in the DNWR. LDWF has identified two new locations that could be added to a new dredging cycle on South Pass just south of Crevasse # NC-3. We have also asked LDWF to identify additional sites that could be added to the new dredging cycle. USFWS has identified four new locations along Main Pass and two new locations along Octave Pass for construction consideration.

APPENDIX A
Project Features Map



APPENDIX B
Photographs

Crevasse No. 12 (View 1) Looking into crevasse from South East Pass.

Crevasse No. 12 (View 2) Looking west. Vegetated spoil area in center of view.

Crevasse No. 11. (View 1) Looking back to Pass a Loutre. Crevasse has maintained its constructed width throughout.

Crevasse No. 11. (View 2) Heavily vegetated crevasse dredging spoil in bay area, foreground.

Crevasse No. NC-1. (View 1) Looking south. Notice heavily vegetated construction easement from crevasse dredging.

Crevasse No. NC-1. (View 2) Vegetated spoil deposition in inside bay area.

Crevasse No. 9. (View 1) From Pass-a-Loutre looking south into the crevasse. Original width has been maintained.

Crevasse No. 9. (View 2) Crevasse end looking at spoil area vegetation sediment deposits from the recent high river.

Crevasse No. NC-3. (View 1) Looking into crevasse from South Pass showing heavy vegetation on both banks.

Crevasse No. NC-3. (View 2) Crevasse terminus looking east into open pond area. Notice shallow depth of water in center. This crevasse has maintained all of its original dimensions.

Crevasse No. 81. (View 1) Looking south from Baptiste Collette channel. Material build-up at channel edge prevented the inspection team from entering the channel.

Appendix C
Three Year Operations & Maintenance Budget

PPL 6																				OCPR Project Estimate	CWPPRA Allocated Money
Approved O&M	Year 0	Year - 1	Year -2	Year -3	Year -4	Year -5	Year -6	Year -7	Year -8	Year -9	Year -10	Year -11	***Year -12***	***Year -13***	***Year -14***	Year -15	Year -16	Year - 17	Year -18	Year -19	Project Life
June 2009	FY00	FY01	FY02	FY03	FY04	FY05	FY06	FY07	FY08	FY09	FY10	FY11	***FY12***	***FY13***	***FY14***	FY15	FY16	FY17	FY18	FY19	Budget
State O&M	$0	$5,530	$0	$5,821	$1,038,284	$6,128	$0	$6,451	$0	$1,217,164	$0	$7,148	$0	$7,525	$1,376,120	$7,921	$0	$8,338	$0	$8,777	$3,695,207
Corps Admin																					$0
Federal S&A																					$0
Total																					$3,695,207
Projected O&M Expenditures																					Remaining Project Life
Maintenance Inspection													$7,525	$7,721	$7,921	$8,127	$8,339	$8,555	$8,778	$9,006	$65,973
General Maintenance														$0							$0
Structure Operation														$0							$0
Federal S&A														$10,258							$10,258
State S&A														$15,387							$15,387
E&D														$76,935							$76,935
Surveys														$30,774							$30,774
Construction														$1,102,735							$1,102,735
Construction Oversight														$153,870							$153,870
Total					$840,551	$0	$0	$0	$0	$0	$0	$0	$7,525	$1,397,680	$7,921	$8,127	$8,339	$8,555	$8,778	$9,006	$2,713,418

Total O&M Expenditures from COE Report (Ince	$981,789.44	From 5/23/11	**Current O&M Budget less COE Admin**	$3,695,207			Current Project Life Budget less COE Admin	$3,695,207
State O&M Expenditures not submitted for in-k	$0		*(State O&M Currently Funded + Fed S&A Currently Funded)*				*(State O&M Prorject Life Budget + Fed S&A Project Life Budge*	
Federal Sponsor MIPRs (if applicable) (REQUEST	$0		**Remaining Available O&M Budget**	$2,713,418			Total Projected Project Life Budget	$3,695,207
Total Estimated O&M Expenditures (as of May 2	**$981,789.44**		*(Current O&M - Total Est. O&M Expenditures)*				*(Remaining Project Life + Total Estimated O&M Expenditures)*	
			Incremental Funding Request Amount FY12-FY14	**$ (1,300,291.52)**	Unexpended		**Project Life Budget Request Amount**	**$0**

Appendix D
Field Inspection Form

Project No. / Name:	Delta Wide Crevasses MR-09	Date of Inspection:	July 19, 2011 Time: 10:00 AM
Crevasse No.	**See Report Section III**	Inspector(s):	OCPR: Tom Bernard, Kyle Breaux, Bryan Gossman; NMFS: John Foret, Phillip Parker; LDWF: Trebor Victorino, Shane Granier
Crev. / Terr. Specs.	See Report Section III	Water Level:	3.06 NAVD88 at Venice, La. Time: 8:00 AM
Type of Inspection:	2011 Annual Inspection	Weather Conditions:	Cloudy, Breezy, Wind SSE @ 5-10mph

Item	Condition	Physical Damage	Dimensions	Photo	Observations and Remarks
Crevasse # NC-1	Good	None	1,000 ft X 100 ft by -8.0' NAVD 88	Appendix B	This new crevasse (2005) appears to be in good condition. Soundings read 4.5'-5' at the inlet, ~7' halfway through, and 4' at the terminus. The interior indicates that river water is slowing very well through the channel carrying large amounts of sediment. The spoil from the dredging of the crevasse is heavily vegetated throughout the deposited bay area.
Crevasse # NC-3	Excellent	None	1,400 ft X 100 ft by -8.0' NAVD 88	Appendix B	This new crevasse (2005) off of South Pass is functioning very well, seems to be flowing swiftly. This crevasse maintains a -10'+ throughout the channel. Soundings read 9' at the inlet, 12' halfway through, and 13.5' at the terminus. The interior bay is heavily silted and full of vegetation.
Crevasse # 9	Very Good	None	2,200 ft X 75 ft by -8.0' NAVD 88	Appendix B	Good flow is being maintained by this dog-leg shaped crevasse. From the flow velocity, that good water depth (average -7') is being maintained throughout its length. Dredge spoil from the crevasse has vegetated (alligator grass) very well throughout.
Crevasse # 11	Very Good	None	2,600 ft X 100 ft by -8.0' NAVD 88	Appendix B	This re-dredged, very wide crevasse maintains a good flow throughout its length and appears to be carrying much needed river sediments into the interior marsh areas. Soundings read approximately 7' throughout, shoaling to only 3' at the terminus. Spoil has heavily vegetated (some wild rice) throughout the interior bays.
Crevasse # 12	Very Good	None	2,000 ft X 75 ft by -8.0' NAVD 88	Appendix B	Currents are moderate to swift through this crevasse, despite it being located off of the main channel. Soundings read 10' at the inlet, 5'-6' halfway through, and 4' at the terminus. The spoil from the crevasse excavation has vegetated very heavily with roso cane. New vegetation has grown along the banks..
Crevasse # 81	Poor	None	1,200 ft X 100 ft by -8.0' NAVD 88	Appendix B	This crevasse is located on the south bank of Baptiste Collette just off of the Miss. River. Due to its location, it is receiving strong current and heavy sediment loads. The dredge spoil has vegetated very nicely; however, it's location causes it to shoal at the inlet (3'-4' depth) during the first high river and renders it inefficient for the long term.