

**LOUISIANA COASTAL PROTECTION AND RESTORATION
FINAL TECHNICAL REPORT**

STAKEHOLDER APPENDIX

June 2009



**U. S. Army Corps of Engineers
New Orleans District
Mississippi Valley Division**

Purpose

The Louisiana Coastal Protection and Restoration (LACPR) Technical Report has been developed by the United States Army Corps of Engineers (USACE) in response to Public Laws 109-103 and 109-148. Under these laws, Congress and the President directed the Secretary of the Army, acting through the Chief of Engineers, to:

- Conduct a comprehensive hurricane protection analysis and design in close coordination with the State of Louisiana and its appropriate agencies;
- Develop and present a full range of flood control, coastal restoration, and hurricane protection measures exclusive of normal policy considerations for South Louisiana;
- Consider providing protection for a storm surge equivalent to a Category 5 hurricane; and
- Submit preliminary and final technical reports.

The purpose of this appendix is to summarize some of the important stakeholder interactions and input that contributed to the development of the LACPR technical report. Additional stakeholder involvement related to the multi-criteria decision analysis process is described in the main report and the Risk-Informed Decision Framework Appendix.

Introduction

The success of creating a comprehensive plan for hurricane risk reduction for the Louisiana Gulf Coast requires the input from multiple stakeholders, including local residents, business interests, non-governmental organizations, other Federal agencies, etc. The State of Louisiana and the USACE New Orleans District set out to develop a plan through the State's Master Plan for Coastal Protection and Restoration. On May 30, 2007, the State Master Plan was approved by the Louisiana Legislature. The vision expressed within the State Master Plan continued as the State and USACE work together on the Congressionally-authorized LACPR effort. This technical evaluation presents a range of alternatives to the Administration, Congress, the State legislature, stakeholders and the public for reducing risk to people and assets, which includes the rebuilding of coastal wetland storm buffers.

In order to obtain stakeholder input, the USACE held four sets of workshops across the coast over a 14-month period. Stakeholders were recruited by the New Orleans District to participate in these workshops based on their participation in previous LACPR stakeholder meetings and/or their affiliation with a particular organization (including business, government, and non-profit representing a diverse set of stakeholder interests). These groups and individuals were invited by the LACPR technical team in advance to ensure diversity of opinions.

During each round, meetings were held in New Orleans, Houma, Abbeville and Lake Charles. At the first round of meetings USACE and State representatives provided attendees with an overview of the effort and the outline for State and USACE coordination.

A second round of meetings was held during the fall of 2007, which provided stakeholders the opportunity to provide their thoughts on tradeoffs and values on plan outputs. In the spring of

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2008, the team traveled across the State again to provide and update and prepare stakeholders for the swing weighting workshops.

The most recent round of meetings was held in July 2008. The objective of these workshops was to conduct sessions with key stakeholders where their weights were elicited and their weight judgments summarized.

In addition to the stakeholder workshops, the team also communicated with stakeholders via e-mail, published updates and the project website.

Stakeholder involvement has been a critical component of the LACPR technical effort and will continue to be as coastal protection and restoration planning in Louisiana continues.

Attachments to this Appendix

Attachment 1 is a list of stakeholders the LACPR team has contacted as part of the stakeholder involvement initiative. The purpose of the stakeholder involvement initiative is to inform and engage interested parties of progress on LACPR. The plan is directed toward citizens of the United States, the State of Louisiana, members of Congress, USACE partners, stakeholders and the media.

Attachment 2 is a comparison of the coastal restoration and risk reduction measures in the LACPR report with two other plans developed by important stakeholders in the LACPR effort—the State of Louisiana’s Coastal Protection and Restoration Authority (CPRA) and the Multiple Lines of Defense Assessment Team, a group of non-governmental scientists, etc. The State Master Plan titled *Integrated Ecosystem Restoration and Hurricane Protection: Louisiana’s Comprehensive Master Plan for a Sustainable Coast* can be downloaded from www.lacpra.org. The Assessment Team’s *Comprehensive Recommendations Supporting the Use of the Multiple Lines of Defense Strategy to Sustain Coastal Louisiana* can also be downloaded from www.mlods.org.

Attachment 3 presents another stakeholder plan proposed by the Flood Protection Alliance—the Inner Levee Plan, which is also referred to as the Compartment Plan. The Compartment Plan consists of a containment system to inhibit flood waters from flowing unencumbered across portions of New Orleans. A brief presentation of the plan is followed by the results of an independent study that was published in a Dutch magazine in August 2007. Haskoning Inc. analyzed the compartment plan using a flooding and damage model and concluded that the compartment plan has potential benefits that merit further investigation.

Key Messages

The following summarizes the key messages that have been presented to the public and stakeholders of LACPR:

- As a result of the 2005 hurricane season's severity, Congress directed the USACE to produce a comprehensive Category 5 hurricane and storm damage risk reduction analysis for coastal Louisiana.
 - A Preliminary Technical Report was submitted to Congress in July 2006.
 - The Final Technical Report will identify and describe a full range of hurricane risk reduction alternatives for coastal Louisiana.

- The USACE and the State of Louisiana are working together using the best available science and engineering.
 - Scientists and engineers from universities, private firms, environmental organizations, international groups, and State and Federal government agencies have come together to work on this vital effort.
 - The USACE is coordinating this effort with the State's Coastal Protection and Restoration Authority, which oversees hurricane risk reduction and coastal restoration activities.
 - The USACE and the LACPR team have made a concerted effort to use the best available scientific and engineering information and to work closely with its partners and the public.

- Reducing risk to Louisiana's citizens, natural resources and industries from the effects of hurricanes and other natural disasters is an integral part of the USACE's mission.
 - The first line of defense against storm damage effects is Louisiana's coast, including barrier islands, marshes, ridges, and coastal forests.
 - The USACE has completed emergency repairs to 169 miles of levees and floodwalls damaged during Hurricane Katrina, restoring the hurricane damage risk reduction system to Congressionally-authorized pre-disaster condition.

- Louisiana citizens are a vital part of the restoration process. Everyone makes a difference.
 - Building a strong structural hurricane risk reduction system, including levees and other barrier structures, coupled with a restored and sustainable coastal ecosystem, offers the best opportunity for reducing risk to coastal Louisiana's citizens and economy.
 - Get involved. Check out www.lacpr.usace.army.mil to read the LACPR reports; find out more about upcoming public meetings; and provide your input.

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List of Stakeholder Activities

The following table presents a list of stakeholder and/or public interactions since completion of the Preliminary Technical Report. The list of outreach activities from December 2005 to June 2006 is included as an enclosure to the LACPR Preliminary Technical Report.

Date	Event	Location
1 JUN 06	LACPR presentation to National Research Council	New Orleans, LA
2 JUN 06	Tulane Engineering Forum	New Orleans, LA
2 JUN 06	LACPR presentation to Lower Mississippi River Symposium	New Orleans, LA
5 JUN 06	New Orleans Geological Society	New Orleans, LA
6 JUN 06	LACPR presentation to PACE	Baton Rouge, LA
6 JUL 06	Interview with Weekly Reader	New Orleans, LA
11 JUL 06	Briefing to Navigation Interests - Port of N.O.	New Orleans, LA
13 JUL 06	Mississippi River Forum - MRGO Study Announcement and Overview Briefing	USACE New Orleans District
18 JUL 06	Media interview - UK New Civil Engineer	USACE New Orleans District
20 JUL 06	Coalition to Restore Coastal LA Board meeting	New Orleans, LA
27 JUL 06	MRGO-3D interagency kickoff meeting	USACE New Orleans District
1 AUG 06	Media interview - BBC Radio	USACE New Orleans District
5 AUG 06	Lake Catherine Stakeholders and State of Louisiana CPRA	Baton Rouge, LA
9 AUG 06	MRGO Resource Agencies briefing	USACE New Orleans District
16 AUG 06	Congressional staff briefing - House Committee on Transportation and Infrastructure	USACE New Orleans District
24 AUG 06	MS River Commission Low Water Inspection	Atchafalaya River
25 AUG 06	Briefing Loyola University Law School	New Orleans
31 AUG 06	Media interview - WLAE interview	New Orleans
13 SEP 06	LACPR presentation to Society of American Military Engineers	Metairie, LA
25 SEP 06	Rebuilding New Orleans Region Forum	New Orleans, LA
3 OCT 06	LACPR presentation to Gulf of Mexico Fishery Management Council - Louisiana/Mississippi Habitat Protection Advisory Panel	Kenner, LA
6 OCT 06	Vietnamese Military delegation	New Orleans, LA
9-11 OCT 06	Workshop with Rijkswaterstaat	The Haag, Netherlands

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Date	Event	Location
23 OCT 06	Geological Society of America	Philadelphia, PA
24 OCT 06	MRGO Stakeholders	New Orleans, LA
25 OCT 06	Briefing to St. Tammany Parish Council	Abita Springs, LA
26 OCT 06	Media interview - Times Picayune	New Orleans, LA
31 OCT 06	State Master Plan Interdisciplinary Technical Team Plan Formulation Meeting	Baton Rouge, LA
3 NOV 06	Lake Pontchartrain Basin Foundation	Metairie, LA
4 NOV 06	Lake Catherine Civic Association	New Orleans, LA
7 NOV 06	Chandeleur Islands - USGS information exchange	USACE New Orleans District
8 NOV 06	CPRA Presentation of Preliminary Draft State Master Plan by Interdisciplinary Planning Team	Baton Rouge, LA
14 NOV 06	LACPR presentation to Marine Club of New Orleans	New Orleans, LA
17 NOV 06	Media interview - Times Picayune	New Orleans, LA
21 NOV 06	St. Tammany Parish Council	St. Tammany, LA
29 NOV 06	Preliminary Draft State Master Plan public release	New Orleans, LA
1 DEC 06	Public Meeting in Slidell	Slidell, LA
4 DEC 06	Chief of Engineer's Environmental Advisory Board Presentation	USACE New Orleans District
5 DEC 06	St. Bernard Parish Council	Chalmette, LA
6 DEC 06	Preliminary Draft State Master Plan presentation to Association of Levee Boards of Louisiana	New Orleans, LA
11 DEC 06	CPRA Public Meeting	Houma, LA
11 DEC 06	LACPR presentation to Restore America's Estuaries Conference	New Orleans, LA
12 DEC 06	Coastal Protection and Restoration Authority - Public Meeting	Baton Rouge, LA
13 DEC 06	Media Interview - Times Picayune	New Orleans
14 DEC 06	Preliminary Draft State Master Plan public comment meeting	Covington, LA
21 DEC 06	Public Meeting in Slidell	Slidell, LA
16 JAN 07	LACPR presentation to Office of the President, Jefferson Parish	Gretna, LA
19 JAN 07	Brief Senate Committee on the Environment and Public Works Staff	Washington, D.C.
2 FEB 07	Louisiana Landowners Association	Baton Rouge, LA
8 FEB 07	Lake Pontchartrain Basin Foundation - St. Bernard Parish Council	Chalmette, LA
13-16 FEB 07	Aquaterra Conference	Amsterdam, The Netherlands

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Date	Event	Location
26 FEB 07	CPRA Draft Master Plan Public Hearing	Houma, LA
27 FEB 07	CPRA Draft Master Plan Public Hearing	Lake Charles, LA
28 FEB 07	CPRA Draft Master Plan Public Hearing	New Orleans, LA
1 MAR 07	CPRA Draft Master Plan Public Hearing	Abbeville, LA
8 MAR 07	Media Interview - Newsweek	New Orleans
8 MAR 07	Media Interview – New York Times	New Orleans
15-16 MAY 07	NGO Engagement Workshop	Vicksburg, MS
19 JUNE	Stakeholder Engagement Meeting – Round 1	New Orleans, LA
20 JUNE	Stakeholder Engagement Meeting – Round 1	Houma, LA
21 JUNE	Stakeholder Engagement Meeting – Round 1	Lake Charles, LA
28 JUNE	Stakeholder Engagement Meeting – Round 1	Abbeville, LA
28 JUNE	Media Interview – KFLY-TV Lafayette, LA	Abbeville, LA
10 SEP 07	Citizens for a Safer Jefferson	Jefferson, LA
19 SEP 07	NGO Engagement Workshop	Baton Rouge, LA
25 SEP 07	Media Interview – Engineering News Record	New Orleans, LA
25 SEP 07	Meeting with Hancock County Mississippi local elected officials	Bay St. Louis, MS
28 SEP 07	Loyola and Georgetown Law Students - Topics included development of decision making for hurricane projects starting with Lake Ponchartrain and Vic. And how LACPR will be breaking new ground in looking beyond NED analyses. Presented Scenario Based Planning, Risk and MCDA concepts.	New Orleans, LA
16 OCT 07	Agency Engagement Meeting – Direct Weighting Exercise	Baton Rouge, LA
22 OCT 07	Stakeholder Engagement Meeting – Round 2 – Direct Weighting Exercise	New Orleans, LA
23 OCT 07	Stakeholder Engagement Meeting – Round 2 – Direct Weighting Exercise	Houma, LA
24 OCT 07	Stakeholder Engagement Meeting – Round 2 – Direct Weighting Exercise	Lake Charles, LA
25 OCT 07	Stakeholder Engagement Meeting – Round 2 – Direct Weighting Exercise	Abbeville, LA
1 NOV 07	Participation in IER NGO Open House and meeting	New Orleans, LA
15 JAN 08	Woodland Oaks Civic Association	Harvey, LA
17 JAN 08	MRGO Brief at IER Meeting	St. Bernard, LA
7 FEB 08	MRGO Brief at IER Meeting	New Orleans East, LA
7 FEB 08	Interview with Plaquemine’s Gazette re: Non Structural Measures	New Orleans, LA
11-12 FEB 08	NGO Engagement Workshop	Vicksburg, MS
11-14 FEB 08	Value Engineering Workshop	New Orleans, LA

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Date	Event	Location
13 FEB 08	Society of American Military Engineers Meeting	New Orleans, LA
25 FEB 08	Citizens for a Safer Jefferson	Jefferson, LA
24-25 MAR 08	NGO Engagement Workshop	New Orleans, LA
4 APR 08	Presentation to Columbian Delegation	New Orleans, LA
14 APR 08	Stakeholder Engagement Meeting – Round 3 – Draft Report Explanation	New Orleans, LA
16 APR 08	Presentation to Tulane Law School class	New Orleans, LA
16 APR 08	Stakeholder Engagement Meeting – Round 3 – Draft Report Explanation	Houma, LA
22 APR 08	Stakeholder Engagement Meeting – Round 3 – Draft Report Explanation	Abbeville, LA
23 APR 08	Stakeholder Engagement Meeting – Round 3 – Draft Report Explanation	Lake Charles, LA
11 APR 08	Mississippi River Commission – High Water Brief	New Orleans, LA
9 MAY 08	Tulane Engineering Forum	New Orleans, LA
12 MAY 08	Recreation Focus Group Meeting	Metairie, LA
14 MAY 08	Recreation Focus Group Meeting	Abbeville, LA
14 MAY 08	Interview with Cain Burdeau re: NAS Comments to Draft Report	New Orleans, LA
15 MAY 08	Recreation Focus Group Meeting	Lake Charles, LA
19 -22 MAY 08	USACE Planning Community of Practice Conference	San Antonio, TX
21 MAY 08	Interview with Glen Boyd (ABC 26) re: LACPR progress and NAS comments	New Orleans, LA
25 JULY 08	Regional Working Group Meeting – Teleconference	New Orleans, LA
28 JULY 08	Stakeholder Engagement Meeting – Round 4 – Swing Weighting Exercise	Abbeville, LA
29 JULY 08	Stakeholder Engagement Meeting – Round 4 – Swing Weighting Exercise	Lake Charles, LA
29 JULY 08	Federal Principals Group Meeting	Washington, DC
30 JULY 08	Stakeholder Engagement Meeting – Round 4 – Swing Weighting Exercise	New Orleans, LA
31 JULY 08	Stakeholder Engagement Meeting – Round 4 – Swing Weighting Exercise	Houma, LA
11-13 OCT 08	Restore America's Estuaries Conference	Providence, RI

Note: Additional stakeholder involvement activities subsequent to October 2008 and related to the multi-criteria decision analysis process are described in the Risk-Informed Decision Framework Appendix.

Attachment 1 - LACPR Stakeholders

The following stakeholders receive periodic updates on LACPR through email and/or postal service. In addition, these stakeholders were invited to participate in stakeholder meetings:

- Abbeville / Vermillion Chamber
- Alabama Coushatta Tribe of Texas
- All Congregations Together (ACT)
- American Shrimp Processors Association
- Amite River Basin Drainage & Water Conservation
- AmSouth Bank
- Anadarko Petroleum Corporation
- ANR Pipeline Company
- Apartment Association of Greater New Orleans
- Appachois
- Archdiocese of New Orleans
- Ascension Parish
- Associated Branch Pilots
- Associated Federal Pilots and Docking Masters of LA
- Assumption Parish Government
- Atchafalaya Basin
- Atchafalaya River Company
- Audubon Nature Institute
- Avery Island, Inc.
- Avoyelles Farm Bureau
- Barataria Terrebonne National Estuary Program
- Baton Rouge Metropolitan Council
- Biloxi Marsh Corporation
- Biloxi-Chitimacha Confederation of Muskogee
- BNSF Railroad
- Bossier Levee District
- Buquet Distributing Company, Inc.
- Caddo Levee District
- Caddo Nation of Oklahoma
- Calcasieu Parish Government
- Cameron Parish Assessor
- Cameron Parish Club
- Cameron Parish Government
- Cameron Parish Planning Department
- Cameron Parish Police Jury
- Chamber of Lafouche & Bayou Region
- Chitimacha Tribe
- Chitimacha Tribe of Louisiana
- Choctaw Nation of Oklahoma

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- Citizens for a Safer Jefferson Parish
- Citizens for One Greater New Orleans
- City of Bay St. Louis
- City of Covington
- City of Kaplan
- City of Lake Charles
- City of Morgan City
- City of New Orleans
- City of New Orleans Planning Commission
- City of New Orleans, Office of Emergency Preparedness
- City of Westwego
- City Parish Department of Public Works
- CN Railroad
- Coalition to Restore Coastal Louisiana
- Coastal Conservation Association
- Coastal Zone Management Advisory Committee
- Conoco Phillips
- Continental Land & Fur Company
- Coushatta Tribe of Louisiana
- Crescent River Port Pilots' Association
- CSX Intermodal
- CSX Transportation
- CURE
- Delgado Community College
- Delta Commercial Fisherman's Association
- Desire Street Ministries
- DeSoto Farm Bureau
- Dillard University
- Dominion Exploration and Production
- Ducks Unlimited
- East Cameron Port, Harbor & Terminal District
- East Jefferson Levee Board
- East Levee Authority
- El Paso Energy Services
- Environmental Defense Fund
- Episcopal Diocese of Louisiana
- Erath Town Council
- Evangeline Farm Bureau
- Exxon Mobil
- Fannie Mae
- Fidelity Homestead Association
- Fifth Louisiana Levee Board
- First NBC Bank

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- Franklin Farm Bureau
- Freeport-McMoRan, Inc.
- Full Gospel Baptist
- Governor's Advisory Commission on Coast Agencies
- Grand Isle Independent Levee Board
- Grand Isle Port Commission
- Greater Baton Rouge Chamber of Commerce
- Greater Lafourche Port Commission
- Greater New Orleans, Inc.
- Gulf Coast Bank & Trust Company
- Gulf Intracoastal Canal Association
- Gulf Oyster Industry Council
- Gulf Restoration Network
- Gulf States Maritime Association
- Gulf-States Marine Fisheries Commission
- Hancock County Board of Supervisors
- Harry Bourg Corp.
- Harvey Canal Industrial Association
- Heather Szapary, LLC
- Holy Cross Neighborhood Association
- Houma Terrebonne Chamber of Commerce
- Hunt Petroleum Corporation
- Iberia Parish Government
- Iberville Farm Bureau
- Jefferson
- Jefferson Parish Environmental Dept.
- Jena Band of Choctaw Indians
- Kansas City Southern Railway
- Kerr-McGee Oil and Gas Corporation
- Koch Industries
- Lafayette Economic Development Corporation
- Lafayette Farm Bureau
- Lafouche Parish Government
- Lafourche Basin Levee Board
- Lafourche Parish Farm Bureau
- Lake Borgne Basin Levee Board
- Lake Charles Harbor and Terminal District
- Lake Charles Pilots Association
- Lake Ponchartrain Basin Foundation
- Liberty Bank
- Livingston Parish Government
- Louisiana Alligator Farmers and Rangers Association
- Louisiana Association of Business and Industry

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- Louisiana Audubon Council
- Louisiana Banking Commissioner
- Louisiana Cattleman's Association
- Louisiana Crawfish Producers Association
- Louisiana Delta River Railroad
- Louisiana Department of Natural Resources
- Louisiana Department of Transportation & Development
- Louisiana Department of Wildlife & Fisheries
- Louisiana Farm Bureau
- Louisiana Farm Bureau Federation
- Louisiana Inshore Shrimpers Association
- Louisiana Landowners Association
- Louisiana Natural Freshwater Catfish Association
- Louisiana One Coalition
- Louisiana Recovery Authority
- Louisiana Seafood Management Council
- Louisiana Seafood Processors Council
- Louisiana Shrimp Association
- Louisiana State University
- Louisiana State University Agricultural Center
- Louisiana Universities Marine Consortium (LUMCON)
- Louisiana Wildlife Federation
- Loyola University
- Marathon Oil Company
- Miami Corporation
- Mississippi Band of Choctaw Indians
- Mississippi Department of Marine Resources
- Mississippi River Basin Alliance
- Morehouse Farm Bureau
- Morgan City Government
- Morgan City Harbor and Terminal District
- Murphy Exploration and Production
- Natchitoches Levee & Drainage District
- National Audubon Society
- National Fish and Wildlife Foundation
- National Fisheries Institute
- National Park Service
- National Wildlife Federation
- Nature Conservancy
- Navios Ship Agencies
- Neighbor Works America
- Neighborhood Housing Services of New Orleans, Inc.
- Neighborhoods Partnership Network

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- New Orleans & Gulf Coast Railway
- New Orleans Business Council
- New Orleans Chamber of Commerce
- New Orleans City Council
- New Orleans Convention and Visitors Bureau
- New Orleans Hispanic Chamber of Commerce
- New Orleans Office of Recovery Management
- New Orleans Public Belt Railroad
- New Orleans Redevelopment Authority
- New Orleans Sewage and Water Board
- New Orleans-Baton Rouge Steamship Pilots Association
- Nineteenth Louisiana Levee District
- Norfolk Southern Railroad
- North American Land Company/Sweet Lake Land & Oil
- North Lafourche Conservation, Levee & Drainage District
- NRCS
- Office of Charlie Melancon
- Office of Congressman Boustany
- Office of Jim McCrery
- Office of Richard Baker
- Office of Rodney Alexander
- Office of Senator David Vitter
- Office of Senator Mary Landrieu
- Office of William Jefferson
- Orleans Audubon Society
- Orleans Parish Government
- Plaquemines Levee Board
- Plaquemines Parish Government
- Plaquemines Port, Harbor and Terminal District
- Point-Au-Chien Tribe
- Pointe Coupee Farm Bureau
- Pontchartrain Levee Board
- Port Fonrchon
- Port of Greater Baton Rouge
- Port of Lake Charles Harbor
- Port of New Orleans
- Port of South Louisiana
- Preservation Resource Center
- Providence Engineering
- Provosty & Gankendorff, LLC
- Quapaw Tribe of Oklahoma
- Rapides Farm Bureau
- Red River Levee & Drainage District

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- Red River, Atchafalaya & Bayou Boeuf
- Regional Transit Authority
- Regions Bank
- Restore or Retreat
- Seminole Nation of Oklahoma
- Seminole Tribe of Florida
- Shannon & Wilson, Inc.
- Shell Chemical Co.
- Shell Exploration and Production
- Shell Pipeline
- Sierra Club
- South Lafourche Levee District
- Southeast Louisiana Flood Protection Authority - East Bank
- Southeast Louisiana Flood Protection Authority - West Bank
- Southern University of New Orleans
- Southwest Pass Oyster Dealers & Growers Association
- St. Bernard Parish Coastal Zone Advisory Comm.
- St. Bernard Parish Government
- St. Bernard Port Harbor & Terminal District
- St. Charles Farm Bureau
- St. Charles Parish Government
- St. James East Farm Bureau
- St. James Parish Government
- St. John the Baptist
- St. Martin Farm Bureau
- St. Martin Parish Government
- St. Mary Industrial Group
- St. Mary Parish Council
- St. Mary Parish Government
- St. Tammany Economic Development Foundation
- St. Tammany Parish Government
- State of Louisiana Coastal Protection & Restoration Authority
- Stream Companies
- Tangipahoa Parish Government
- Teche-Vermilion Fresh Water District
- Tensas Basin Levee District
- Terrebonne Coastal Zone Mgmt & Restoration Advisory
- Terrebonne Farm Bureau
- Terrebonne Parish Government
- Terrebonne Parish School Board
- Terrebonne Port Commission
- Thibodaux Chamber of Commerce
- Town of Berwick

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- Town of Grand Isle
- Town of Jean Lafitte
- Tulane Institute on Water Resources Law & Policy
- Tunica-Biloxi Tribe of Louisiana
- U.S. Fish and Wildlife Service
- Union Pacific Railroad
- United Houma Nation
- University of New Orleans
- Urban League of Greater New Orleans
- VDOHSED AHTD
- Vermillion Advisory / Vermillion SWCD
- Vermillion Corp.
- Vermillion Farm Bureau
- Vermillion Parish Cattleman's Association
- Vermillion Parish Emergency Preparedness
- Vermillion Parish Office of Homeland Security
- Vermillion Parish Police Jury
- Vermillion Parish School System
- Waist Deep Duck, LLC
- West Baton Rouge Farm Bureau
- West Cameron Port, Harbor & Terminal District
- West Jefferson
- Whitney Bank
- Williams Gas Pipeline-Transco
- Women of the Storm
- Wooland Oaks Civic Association
- Xavier University

Attachment 2 - Comparison of LACPR with the State Master Plan and Multiple Lines of Defense Assessment Team Report

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Introduction

The purpose of this document is to compare risk reduction and coastal restoration measures for South Louisiana contained in three reports, which were developed subsequent to the hurricanes of 2005 with similar objectives. The three reports to be compared are listed in Table 1 below.

TABLE 1. REPORTS ADDRESSED IN THIS DOCUMENT				
Full Title	Abbreviation	Prepared By	Version	Website
Louisiana Coastal Protection and Restoration	LACPR	United States Army Corps of Engineers (USACE)	June 2009	www.lacpr.usace.army.mil
Integrated Ecosystem Restoration and Hurricane Protection: Louisiana's Comprehensive Master Plan for a Sustainable Coast	SMP	State of Louisiana's Coastal Protection and Restoration Authority (CPRA)	Approved by State Legislature in May 2007	www.lacpra.org
Comprehensive Recommendations Supporting the Use of the Multiple Lines of Defense Strategy to Sustain Coastal Louisiana	MLODS	Multiple Lines of Defense Assessment Team (non-governmental scientists, etc.)	2008 Report (Version 1)	www.mlods.org

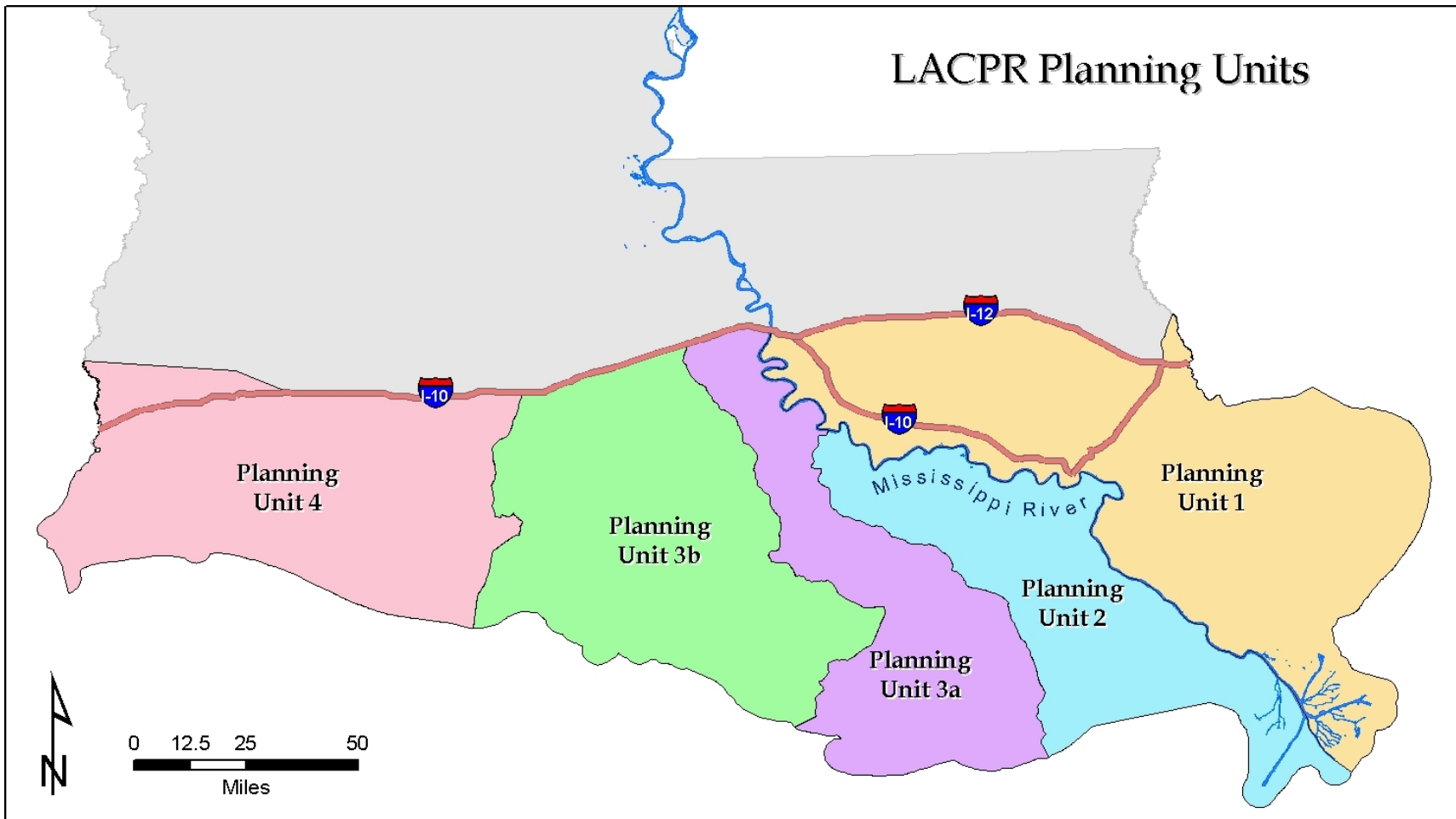
In contrast to other coastal restoration studies, plans and programs which focus primarily on ecological issues, the above reports attempt to integrate hurricane risk reduction and coastal restoration through programmatic, structural, nonstructural, and coastal restoration measures. Although it would also be useful to compare other coastal restoration plans and programs such as Coast 2050, LCA, CIAP and CWPPRA, this document primarily addresses the similarities and differences between the alternatives considered in LACPR, and recommendations presented in the SMP and MLODS reports. When information was readily available, comparisons were made to measures in other programs or plans, such as CWPPRA, LCA, and CIAP.

The MLODS report includes or presents specific measures and recommendations from the non-governmental organization perspective. The SMP, prepared by the CPRA, presents a series of recommended hurricane protection and coastal restoration measures for a sustainable coast, but it still contains many options and unanswered questions. The LACPR technical report presents a full range of options for hurricane risk reduction and detailed technical evaluation of each as well as a recommended final array of options.

The SMP provides the overarching vision for the LACPR effort. The LACPR and SMP are most similar since they were developed in close partnership; however, in some cases the SMP has ruled out alternatives that LACPR is still evaluating to address legislative requirements, and in some cases LACPR screened out alternatives that still appear in the SMP, based on more detailed evaluations and comparison of tradeoffs. The State has also identified "urgent early actions," which are a subset of the full set of measures in the State Master Plan. Those urgent early actions listed in the State's 2009 and 2010 Annual Plans are noted in this document.

Planning Unit and Location Maps

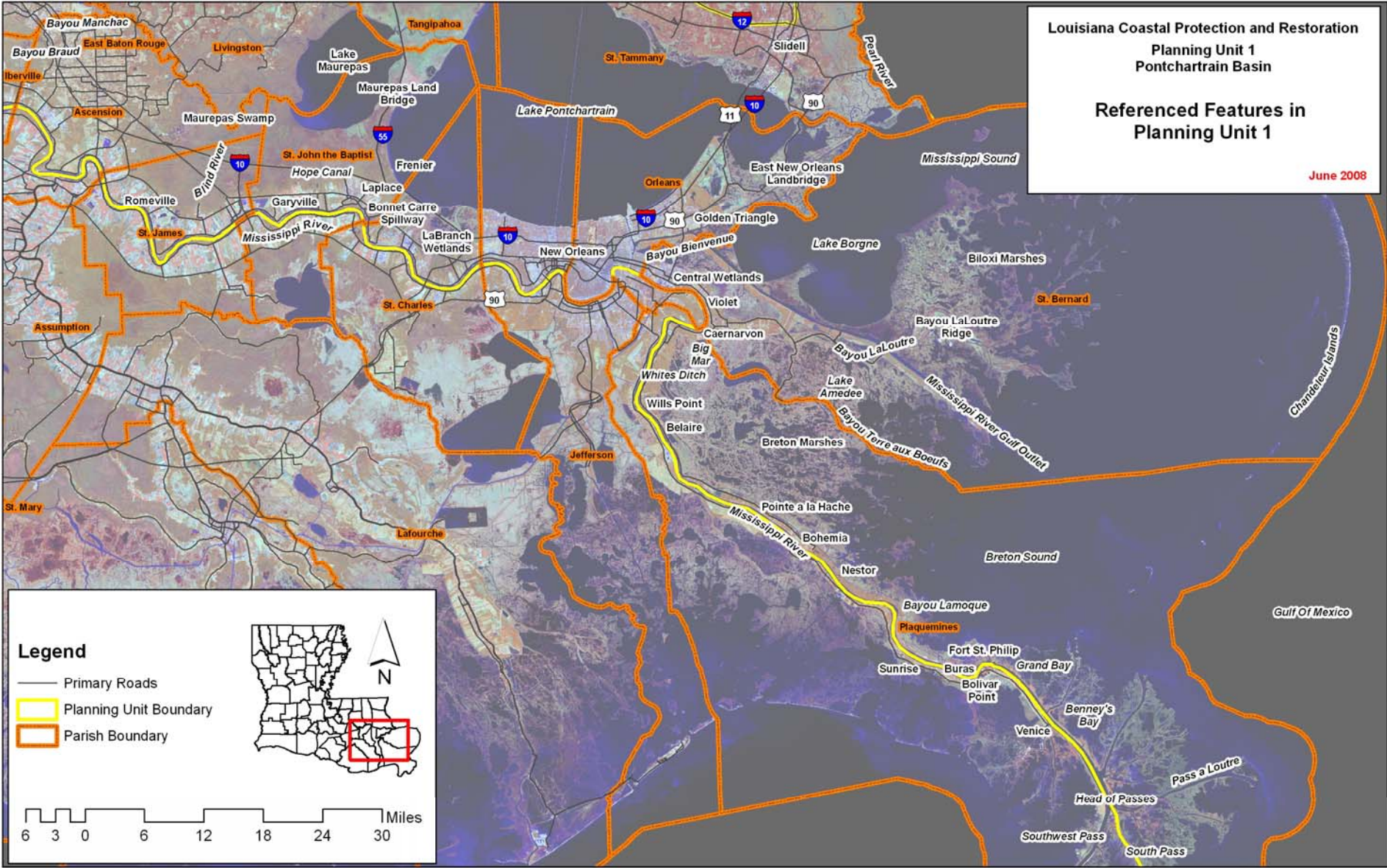
Although the planning areas for each effort are similar, the MLODS planning units were adopted from the SMP and are identical to the SMP planning units. The LACPR planning units have similar east-west boundaries but were extended up to or beyond I-10 because of uncertainty in the surge limits at the beginning of the effort. When comparing measures, the east-west boundaries are more important than the specific location of the northern boundaries; therefore, a single planning unit map is referenced here. Following the planning unit map is a series of maps for each planning unit identifying geographical place names that are used in the three plans to denote locations of structural, nonstructural, and coastal restoration measures.

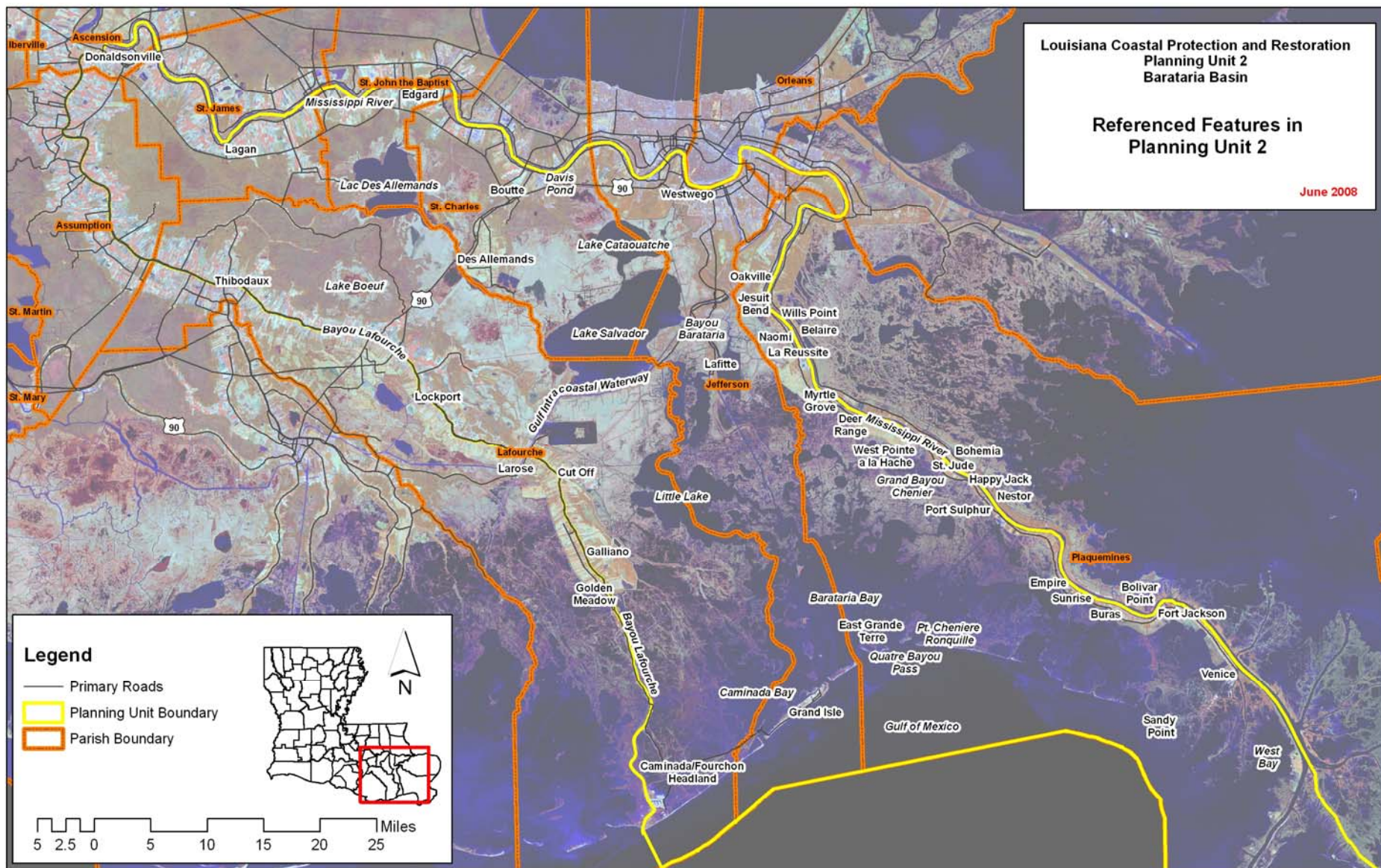


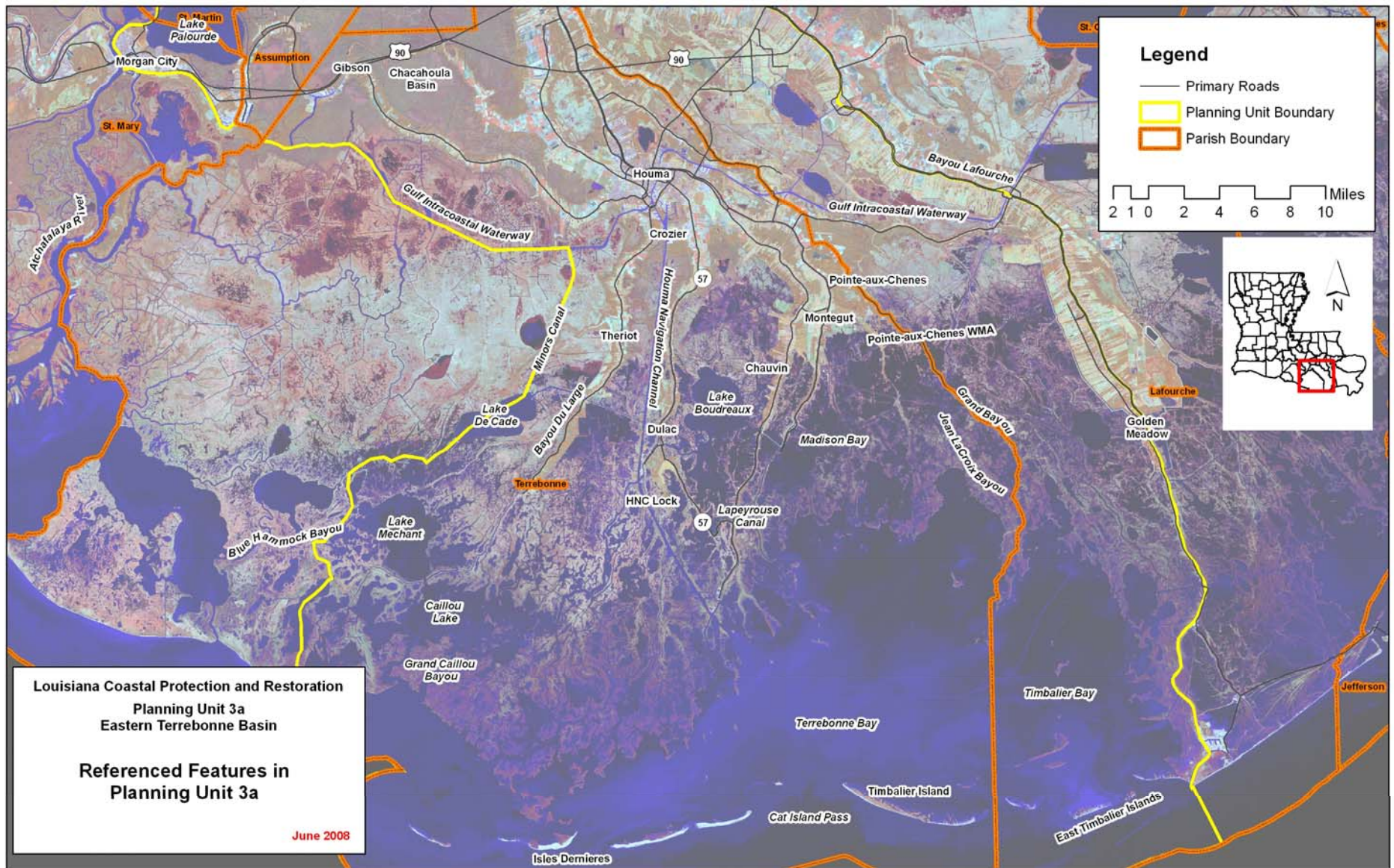
Louisiana Coastal Protection and Restoration
 Planning Unit 1
 Pontchartrain Basin

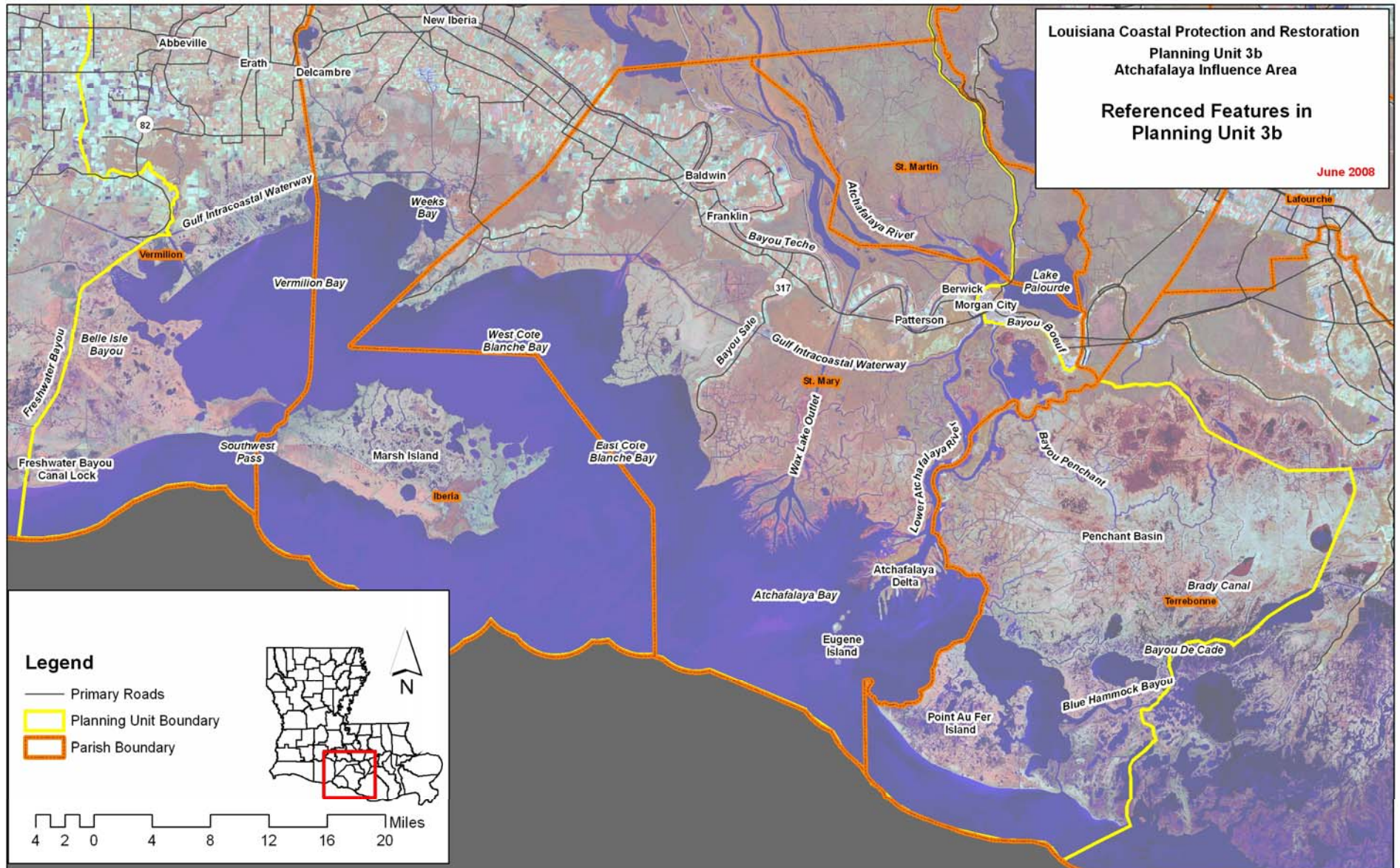
Referenced Features in
 Planning Unit 1

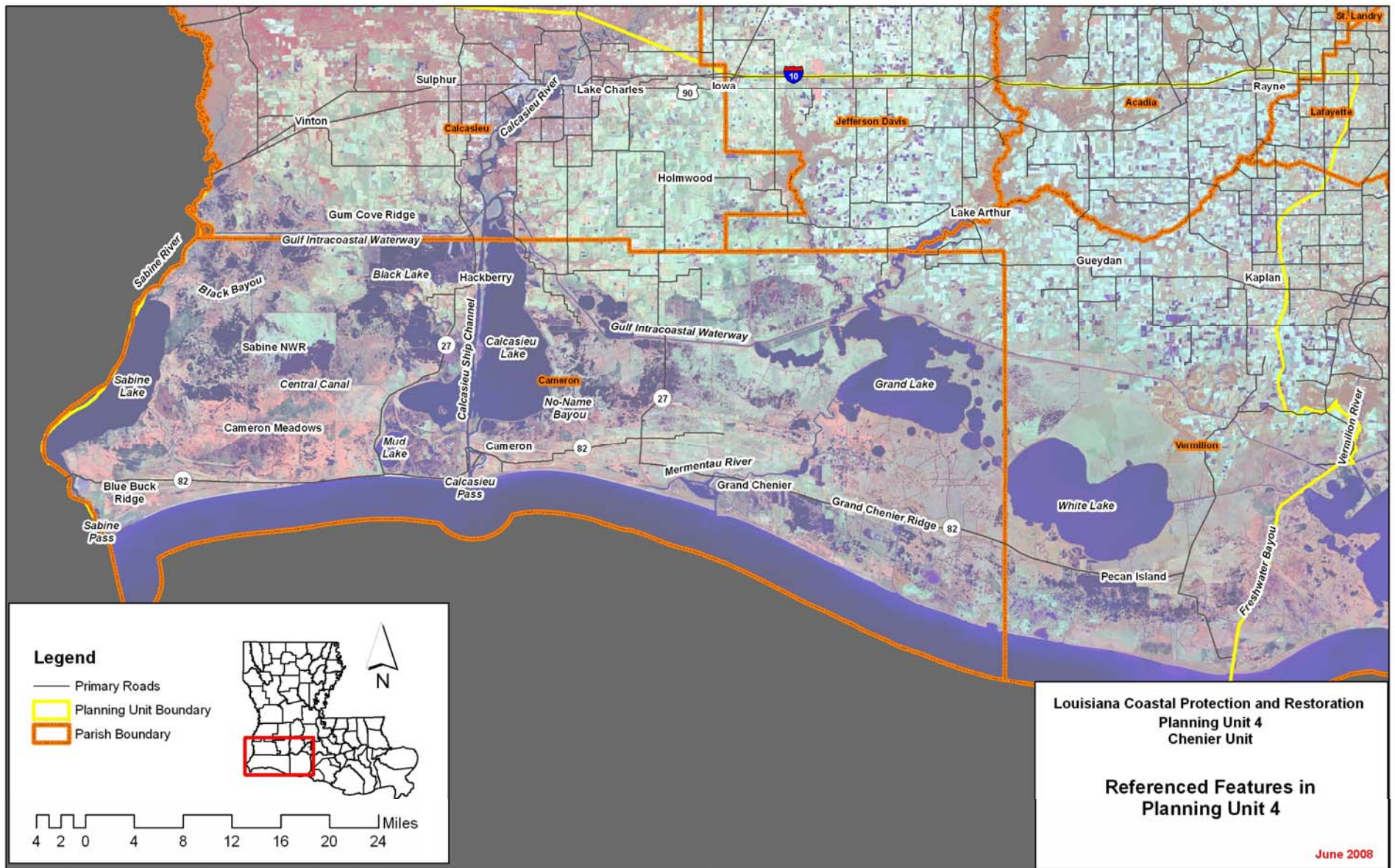
June 2008











Large-Scale Planning and Programmatic Measures

Table 2 presents a comparison of programmatic or large-scale planning measures in the three reports noting differences and similarities of each effort. The SMP measures are listed first because they are specifically enumerated in Appendix A to the SMP.

TABLE 2. LARGE-SCALE PLANNING AND PROGRAMMATIC MEASURES		
SMP	LACPR	MLODS
LSP-1 – Mississippi River Delta Management - Large diversions (greater than 50,000 cfs) and alternative navigation channel alignments will be investigated. (Identified as an “Urgent Early Action.”)	LACPR addresses the need for multiple small to medium scale diversions to allow greater flexibility in introducing freshwater, sediment, and nutrients into coastal estuaries. The Final Technical Report also describes future studies needed to evaluate the merits of large scale diversions similar to LSP-1.	Proposes that the “River Flood Restoration Action Plan” would be an action plan to be implemented in the event of exceptionally high water on the MS or Atchafalaya Rivers. The goal of the action plan is to maximize restoration benefits to the coast during a major flood event by introducing freshwater, sediment and nutrients into the coastal estuaries.
LSP-2 – Optimize Flow Distribution at Old River Control Structure - Identify and analyze operational changes from the mandated 70/30% flow distribution between the MS and Atchafalaya Rivers at Old River Complex. (Identified as an “Urgent Early Action.”)	Further analysis of Old River Control Structure was viewed as beyond scope of current effort. Final Technical Report addresses further study needs to reevaluate operation.	Proposes re-evaluating the operational goals of the Old River Control Structure and therefore the discharge allocation.
LSP-3 – Backfill and/or Plug Non-Essential Oil and Gas Canals Canals identified through this effort would be restored through marsh creation measures included in the individual planning units.	Not specifically mentioned in the LACPR report but such canals would be potentially impacted in overall marsh creation proposals. To be addressed in subsequent study efforts.	Not specifically mentioned in the report.
LSP-4 – Chenier Plain Freshwater and Sediment Management and Reallocation Formulate a comprehensive hydrologic and sediment management plan. Examine structural and nonstructural alternatives that most effectively utilize the freshwater and sediment resources in the study area. (Identified as an “Urgent Early Action.”)	USACE is partnering with the State to conduct the Southwest Coastal Feasibility Study. Programmatic issues such as LSP-4 to be appropriately addressed in scope of work for this study.	Not specifically mentioned in the report.
LSP-5 – Sediment Inventory and Allocation (a) Beneficial Use of Dredged Material - Formulate and	Consistent with the USACE National Regional Sediment Management	Not specifically mentioned in the report.

TABLE 2. LARGE-SCALE PLANNING AND PROGRAMMATIC MEASURES

SMP	LACPR	MLODS
<p>implement a course of action that maximizes beneficial use of material dredged from navigation channels as a tool to attain Master Plan objectives. Funds would be used for the incremental costs of restoration activities above and beyond the base plan selected by the USACE O&M program. (b) Dedicated Dredging from Rivers and Offshore - Complete a sediment inventory of riverine, navigation channel, and offshore sources of sediment. (Identified as an “Urgent Early Action.”)</p>	<p>Program</p>	
<p>PM-1 – Applied Coastal Engineering and Science Program</p> <ul style="list-style-type: none"> • Reduce key uncertainties and promote advances in S&T fields • Build off LCA S&T program <p>(Identified as an “Urgent Early Action.”)</p>	<p>The USACE also plans to build off the LCA S&T program to reduce key uncertainties and promote advances in S&T as discussed in Section 17 of the LACPR report.</p>	<p>Not specifically mentioned in the report.</p>
<p>PM-2 – Coordination with Hazard Mitigation Programs Related to planning and implementation of nonstructural measures, e.g. hazard mitigation grants, hurricane evacuation plans, relocation assistance, local compliance with NFIP regulations, including elevating structures, emergency action plans, inhibiting development in low lying areas (zoning), etc. (Identified as an “Urgent Early Action.”)</p>	<p>The role of others in State Master Plan implementation, including hazard mitigation planning, is discussed in Section 17 of the LACPR report.</p>	<p>Not specifically mentioned in the report.</p>
<p>PM-3 – CPRA Management and Capacity Building</p> <ul style="list-style-type: none"> • Remove existing constraints to implementation of the SMP • Federal partnerships to establish dedicated funding streams and cost sharing agreements • Need to obtain Congressional authority and appropriations • Passing necessary land use planning policies and legislation required for responsible growth in coastal LA <p>(Identified as an “Urgent Early Action.”)</p>	<p>Collaboration and coordination issues with the CPRA and other Federal agencies are addressed in Section 17 of the LACPR report.</p>	<p>Not specifically mentioned in the report.</p>

Nonstructural Measures

This section begins with a general comparison of nonstructural measures and strategies in the three reports and then lists the specific measures in each report.

General Comparison of Nonstructural Measures and Strategies

TABLE 3. GENERAL COMPARISON OF NONSTRUCTURAL MEASURES AND STRATEGIES			
Topic	LACPR	SMP	MLODS
Warning and Preparedness	Includes a paragraph on the State of LA’s Emergency Alert System and Evacuation Planning as an important component of any plan.	States that “DOTD is working with the LA State Police and the Governor’s Office of Homeland Security and Emergency Preparedness to continually improve emergency plans for hurricane evacuation.”	Lists warning and preparedness as early warning, evacuation, and moving assets from harm.
Evacuation Routes	Attachment 1 to the Nonstructural Plan Component Appendix describes the need for “An Implementation Program for Flood Risk Reduction Using Nonstructural Measures.” It references the State Master Plan’s approach to evacuation routes and the fact that State, local and Federal emergency planners have already evaluated and updated regional evacuation plans.	Raise evacuation routes and armor where necessary. Listed as specific measures by planning unit (see SMP table below).	Evacuation routes are lines of defense and need to be geographically integrated with other LOD to anticipate their performance and evaluate the requirements to be effective evacuation routes. Includes map of the official evacuation route for LA. Lists certain highways and interstates that should be elevated. Identifies critical areas in need of improvements.
Smart Growth/Zoning/Land Use Planning	The nonstructural appendix states that “Individual property owners and local governments have responsibility for local land-use decisions and building patterns and the success of many Federal	Recommends enforcing appropriate land use and zoning regulations by local interests, especially to prevent development of wetlands inside levees.	Report references Louisiana style of “Smart Growth,” i.e. homes on high ground and wetlands on the low ground and states that “Fortunately, the focus on ridges for development and protection in south Louisiana is the traditional pattern of land use.”

TABLE 3. GENERAL COMPARISON OF NONSTRUCTURAL MEASURES AND STRATEGIES

Topic	LACPR	SMP	MLODS
	<p>programs depends upon the fulfillment of these responsibilities.” LACPR evaluates two possible future land use scenarios—compact and dispersed.</p>		
Flood Insurance	<p>Report states that “As emphasized in the State Master Plan, all residents of coastal Louisiana should buy flood insurance.”</p>	<p>Recommends that all residents of coastal Louisiana should purchase flood insurance, even those inside levee systems.</p>	<p>Recommends that “Flood insurance – adequate insurance” be considered as a nonstructural measure. Gives examples of how flood insurance rates can be reduced by elevating structures above the base flood elevation.</p>
Elevating Structures	<p>Elevating structures is one component of the nonstructural alternatives that were evaluated as well as the recommended final array of alternatives. Potential raise-in-place areas are based on depths up to 14ft. Raise-in-place areas shown on maps.</p>	<p>References FEMA guidelines for buildings. State plan includes elevating buildings as a general measure, but no specific areas identified.</p>	<p>Report states that elevating structures is one of the measures that can be taken individually to mitigate personal choices made that create exposure to the loss of assets. Report states: Just as the USACE adds 2 to 3 feet of freeboard to every levee design, residents are encouraged to add freeboard to the home elevation designs, to ensure a level of protection in the face of sea level rise and future uncertainties. It is better to err on the high side when elevating or otherwise implementing mitigation measures to assets such as homes and businesses.”</p>
Buyouts	<p>Buyouts are one component of the nonstructural alternatives that were evaluated as well as the recommended final array of alternatives. Potential buyout areas are based on FEMA V-zones and depth of inundation above 14ft. Buyout areas shown on maps.</p>	<p>State plan includes buyouts as a general measure, but no specific areas identified on maps.</p>	<p>Report states that “In terms of mitigating effects of moving surge water, the first choice is to relocate.” No specific buyout/relocation areas identified. Report states that relocating is one of the measures that can be taken individually to mitigate personal choices made that create exposure to the loss of assets.</p>
Floodproofing	<p>Identifies wet and dry flood proofing as types of nonstructural measures.</p>	<p>Included in the FEMA Hazard Mitigation Grant Program?</p>	<p>Lists flood proofing as elevating or water tight structures. Report states that “Flood-proofing non-residential structures within levee protection</p>

TABLE 3. GENERAL COMPARISON OF NONSTRUCTURAL MEASURES AND STRATEGIES

Topic	LACPR	SMP	MLODS
			should also be seriously considered.” Report also states that flood-proofing is one of the measures that can be taken individually to mitigate personal choices made that create exposure to the loss of assets.
Building Codes	Reports states that citizens must comply with the provisions of the 2007 Louisiana State Uniform Construction Code	Reports states that citizens must comply with the provisions of the 2007 Louisiana State Uniform Construction Code	References FEMA’s Coastal Construction Manual and other information for building and recovery in an exposed coastal environment. States that “the new revised state building code and local building codes should be followed and enforced.” Report states “Although requirements for elevation of new homes is currently managed through FEMA and local parish authorities, such as local zoning, the State could affect elevation requirements through statewide building codes. After Hurricane Katrina, the state legislated new building codes for the entire state, but these much-needed code standards primarily addressed wind hazard and not flood related hazard. This situation can and should be changed so that statewide building codes address home elevation that exceeds federal guidance and should include strong disincentives for slab-on-grade buildings within the 1000 year surge floodplain.”
FEMA-approved hazard mitigation plans (for critical facilities)	The nonstructural appendix includes an analysis of critical facilities. It also states that FEMA’s Hazard Mitigation Grant Program has funding and eligibility requirements that limit its effectiveness in reducing residual risk.	Parish hazard mitigation plans for safeguarding critical facilities.	Not specifically addressed.
Compartmentalization/ Inner Levees/Urban	Attachment 3 to the Stakeholder Appendix presents the Flood	Metro areas should consider a compartmentalization	References the Bring New Orleans Back polder plan. Report states that the use of urban polders is

TABLE 3. GENERAL COMPARISON OF NONSTRUCTURAL MEASURES AND STRATEGIES

Topic	LACPR	SMP	MLODS
Polders	Protection Alliance’s (formerly Bring New Orleans Back Commission’s) inner levee plan as well as the results of an independent study by Haskoning, Inc., which concluded that the plan has merit.	system, similar to the Bring New Orleans Back Commission plan.	complex both hydrologically and socially and, therefore, requires careful consideration. For example, urban polders can create acute trade-offs of one person’s enhanced flood protection being partially provided by another person’s reduction in flood protection. Polders are not recommended until further investigation.
Relief and Recovery	Not specifically addressed.	Not specifically addressed.	Lists clean-up incentives, pre-contracting for clean up as nonstructural options. References “Extensive information is available for building and recovery in an exposed coastal environment. For example, FEMA has a comprehensive “Coastal Construction Manual” available to download free on the FEMA website (fema.gov; do a search for the Coastal Construction Manual, FEMA 55). In addition, books, publications, and fact sheets have been available since the early 1980s from parish or community floodplain administrators domiciled in the local government complex, the state floodplain section, LDOTD, in parish and community libraries, and free on the Louisiana State University (LSU) Agriculture Center website.
Programmatic Authority for Nonstructural Measures	An attachment to the nonstructural appendix presents a rationale and potential strategy for creating a program to implement nonstructural measures in support of LACPR objectives.	Not specifically addressed.	Not specifically addressed. Report states that “Many non-structural measures are actions that can be undertaken by an individual, family, or a small business on their own initiative with less need for governmental processes of authority.”

Specific Nonstructural Measures and Strategies

TABLE 4. LACPR NONSTRUCTURAL MEASURES	
No. from LACPR Report	Description (Note: All of the LACPR nonstructural alternatives include sustaining the coastal landscape through restoration.)
NS-100	In each planning unit, implement comprehensive, stand alone 100-year nonstructural measures, i.e. buyouts and raise in place. For planning units 1, 3a, and 4, NS-100 is included in the final array.
NS-400	In each planning unit, implement comprehensive, stand alone 400-year nonstructural measures, i.e. buyouts and raise in place. NS-400 is included in the final array for all planning units.
NS-1000	In each planning unit, implement comprehensive, stand alone 1000-year nonstructural measures, i.e. buyouts and raise in place. For planning units 1, 3a, 3b, and 4, NS-100 is included in the final array.
C-(<i>Structural code</i>)	For every structural/coastal alternative, there are complementary nonstructural measures outside the levee systems to make each structural plan more comprehensive.
Final Array	A significant portion of the plans in the final array—12 or almost half—are nonstructural plans. At least one nonstructural plan is included in each of the five planning units. In addition, counting the included comprehensive plan combinations, 24 of the 27 plans in the final array include a nonstructural component.

TABLE 5. SMP NONSTRUCTURAL MEASURES	
No. from SMP	Description
1-8	Raise/maintain evacuation routes located outside the hurricane protection systems. Identified as an “Urgent Early Action” but no specific projects yet identified.
2-7	Raise/maintain evacuation routes located outside the hurricane protection systems. Identified as an “Urgent Early Action.” 1. SW Coastal Louisiana Study 2. Raising of LA 23 at LeReussite 3. Raising of LA 1 Floodgate and Lock Structure
3a-5	Raise/maintain evacuation routes located outside the hurricane protection systems.
3b-4	Raise/maintain evacuation routes located outside the hurricane protection systems. Identified as an “Urgent Early Action.” 1. Henry Hub Access Improvements 2. Intracoastal City Street Improvements 3. Thorguson Road Improvements.
4-3	Raise/maintain highways 82 and 27 (SW Coastal Louisiana Study). Identified as an “Urgent Early Action.”

TABLE 6. MLODS NONSTRUCTURAL MEASURES

No. from MLODS	Description
All Planning Units	<p>Evacuation – The MLODS proposes that evacuation routes are Lines of Defense and that the routes need to be geographically integrated with other Lines of Defense to anticipate their performance and evaluate the requirements to be effective evacuation routes. State and local authorities should coordinate evacuation planning to facilitate quick and uncomplicated evacuation of residents in the path of a potential threat. Every effort should be made to educate the public on the evacuation plans and risks associated with the protection system at the time of the threat. Municipal Drainage - Areas within structural protection systems need adequate capacity for drainage, which will generally require pump capacity to pump water to the flood side of the levee. With ridge alignments, it is more likely that treated wastewater and storm water can be diverted to adjacent wetlands to establish robust marsh and wetland forest buffers directly in front of backlevees, reducing municipal cost for wastewater treatment. In these areas, utilizing outfall management of storm water and treated wastewater may establish a cypress buffer that can provide significant additional protection benefit.</p>
Planning Unit 1	<p>Elevation - Recommends elevating buildings within the 1,000 year surge floodplain. Municipal Drainage within Levees - Levee-enclosed areas need adequate drainage for rainfall events alone or in conjunction with storm surge. Pump stations should be storm-proofed and located on the perimeter of the flood protection system. In general, drainage or navigation canals should not allow storm surge within the leveed areas. Evacuation Routes - The portion of Interstate -10 on the Southshore of Lake Pontchartrain needs to be elevated or be within the levee system to allow for safe evacuation and return of first responders.</p>
Planning Unit 2	<p>Evacuation Routes – 1. Louisiana Highway 1 (section below Larose) should be entirely, or at least partially, elevated. 2. Highway 90 and I-49 replacement across the Barataria Basin needs to be considered as an important evacuation route. The new I-49 roadway should be an elevated causeway outside of the levee system. 3. Highway 3124 to Lafitte should be elevated to allow extended evacuation opportunity and to allow rapid re-entry to these municipalities isolated with ring levees.</p>
Planning Unit 3a	<p>Evacuation Routes – Louisiana Highway 315, 55, 56 and 57 need to be evaluated for adequate evacuation considering the proposed levee alignment for Planning Unit 3a. Elevated roadways connecting the ring levees to Houma should be considered.</p>
Planning Unit 3b	<p>Evacuation Routes – No specific roads mentioned.</p>
Planning Unit 4	<p>Elevation - Greater Lake Charles region - In lieu of a levee enhanced non-structural measures is recommended. Programs to subsidize home elevation inside or outside of the proposed levee system should be immediately expanded. Evacuation Routes – Most of Highway 82 was constructed on the natural cheniers of this region and is, therefore, located on a soil foundation that is already elevated above marsh surface elevation. Further elevating the highway on earthen foundation may enhance it as a barrier to storm surge. However, any modifications to the highway should not be detrimental to the marsh or marsh hydrology. It is also recommended that vulnerable areas of the highway be armored to prevent washouts and ensure the road can be used for re-entry of first responders.</p>

Structural Measures

This section begins with a general comparison of structural measures and strategies in the three reports. The rest of the Structural Measures section is organized by planning unit. The following steps were then taken to compare structural measures in the LACPR, SMP, and MLODS reports.

1. For each planning unit, measures from each of the three reports are listed in **individual tables** for the LACPR measures, SMP measures, and MLODS measures. Measures are numbered according to each plan's numbering system.
2. Following the three tables described above, a **summary table** organizes measures by location, geographic feature, or function (as appropriate) and then lists the measures in each report related to solving problems in those areas. Numbers in parentheses correspond to measure numbers in each of the reports. The Comments/Other column includes any related existing authorizations/projects/studies in bold.
3. At the end of the section, similarities and differences of major areas are discussed.

General Comparison of Structural Measures and Strategies

TABLE 7. GENERAL COMPARISON OF STRUCTURAL MEASURES AND STRATEGIES			
Topic	LACPR	SMP	MLODS
Levels of risk reduction	Report includes plans at 100-year, 400-year, and/or 1000-year levels of risk reduction.	Master plan includes plans at either 100-year or 500-year levels of risk reduction.	Proposed levees are intended to provide, in conjunction with the coastal lines of defense, either 100-year or 400-year level of risk reduction.
Continuous vs. Non-continuous (Ring or Back) Levees	Contains a combination of continuous levees and non-continuous levees. Some of the continuous levees are trans-estuary levees.	Same as LACPR	There is no single barrier levee proposed for the coast. Plan only supports sub-regional back levee alignments or ring levees close to development, not trans-estuary levees. The longest alignment east to west is about 50 miles long (New Orleans and Franklin areas).
Existing vs. New Levees	Includes a number of alternatives requiring new levees. Many of the levee alternatives cut through wetlands and would have substantial mitigation requirements.	Same as LACPR.	Levee alignments generally follow current levee alignments and take advantage of existing foundations for levee improvement while minimizing the mitigation needed for new levee alignments. Levees are tightly positioned around major municipalities and are generally on the perimeter of ridges or the upland interface where soil foundations are superior.
Enclosing Wetlands with Levees	Some of the levee alternatives would enclose wetlands similar to the SMP.	MLODS report claims that the State's proposed levee alignments could enclose as much as 2,000 square miles.	MLODS rejects the leaky levee concept and objects to enclosing wetlands. Their levee plans avoid enclosing wetlands by relying solely on back levees.

Specific Structural Measures in Planning Unit 1

TABLE 8. LACPR STRUCTURAL MEASURES IN PLANNING UNIT 1 FINAL ARRAY	
No. from LACPR Report	Description
LP-a-100-1/ C-LP-a-100-1	Construct barrier-weir and levees to reduce risk to the Lake Pontchartrain area. Raise upper Plaquemines levees to 100-year level of risk reduction.

TABLE 9. SMP STRUCTURAL MEASURES IN PLANNING UNIT 1	
No. from SMP	Description
1-1	Lake Pontchartrain Barrier Plan: Caernarvon to Pearl River Hurricane Protection – 3 alternatives (analyzed at 500-yr) as follows: Lake Pontchartrain Barrier Alignment #1 – Interior at Golden Triangle; Lake Pontchartrain Barrier Alignment #2 – Rim of Lake Borgne; Lake Pontchartrain Barrier Alignment #3 – Lake Borgne
1-2	Caernarvon to White Ditch Hurricane Protection – Plaquemines Parish (East Bank) – Provide 100-year from Caernarvon to White Ditch.
1-3	Pointe a la Hache to Phoenix Hurricane Protection – maintain existing levees in Plaquemines Parish
1-4	St. Bernard 40 Arpent Levee at greater than 100-year
1-5	West Shore Lake Pontchartrain levees at 100-year
1-6	Lake Pontchartrain and Vicinity – raise levees to greater than 100-year (analyzed at 500-yr)
1-7	North Shore of Lake Pontchartrain & Lake Maurepas Hurricane Protection – To be determined based on residual risk from barrier plan

TABLE 10. MLODS STRUCTURAL MEASURES IN PLANNING UNIT 1	
No. from MLODS Report	Description
1	Greater NO region including Orleans, Jefferson, St. Charles, St. John and St. Bernard Parishes - Levee improvements - 400 year protection provided by improvements to the Flood Protection System
2	Greater Slidell – New levee along the upland interface – 400 year protection provided by the Flood Protection System
3	East Bank Plaquemines – Levee improvements – minimum 100-year protection provided by the Flood Protection System
4	South Point of Lake Pontchartrain – New levee – 400 year protection for Hwy 11 and I-10 provided by the Flood Protection System for evacuation and re-entry
5	Elevate Hwy 90 foundation minimum +8 feet msl

TABLE 11. PLANNING UNIT 1 STRUCTURAL MEASURE SUMMARY COMPARISON TABLE

(Green highlights denote common measures)

Area	LACPR	SMP	MLODS	Comments/Other
New Orleans (East Bank of MS River)	Final array includes: Barrier-weir providing “Cat 5” protection (LP-a-100-1/C-LP-a-100-1)	(1-1) Recommends barrier to give New Orleans greater than 100-year risk reduction. (1-6) Lake Pontchartrain and Vicinity improvements (includes compartmentalization)	(1) 400-year alternatives with or without partial barrier (The Rigolets would remain open).	Related to the existing Lake Pontchartrain and Vicinity project. SMP measures 1-1 and 1-6 say that the State is waiting on LACPR to “inform and ultimately define the technically feasible level of protection.” State has identified measures 1-1 and 1-6 as “urgent early actions.”
Alignment along rim of Lake Borgne	An alignment along rim of Lake Borgne was evaluated as part of the 400- and 1000-yr alternatives but was not included in the final array.	(1-1) Included as one of the three barrier options.	No alignments along the rim of Lake Borgne.	Related to the existing Lake Pontchartrain and Vicinity project.
Hwy 90-Orleans Land Bridge	No measure to specifically elevate Hwy 90, but one of the barrier-weir alignments follows Hwy 90 which could require the highway to be raised.	(1-1) No recommendation to elevate Hwy 90, but the highway and land bridge would get some surge reduction from the barrier.	(5) Elevate Hwy 90 foundation minimum of +8 feet msl	Related to the existing Lake Pontchartrain and Vicinity project.
Bayou Savage (Maxtent Canal)	Secondary levees interior to the Lake Pontchartrain and Vicinity project are considered a refinement of the plan for future consideration and are not included in the primary alternatives.	(1-1) Raise the Maxtent Canal levee to greater than 100-year.	(4) New 400-yr levee to protect Hwy 11 and I-10. One possible change is to not improve the existing levee around Bayou Savage and instead to raise the Maxtent Canal levee to be the primary line of defense. The other levee surrounds just the tip of the Southshore.	Related to the existing Lake Pontchartrain and Vicinity project.
Slidell	Slidell would receive some level of risk reduction from the barrier-weir.	(1-1) Barrier to give New Orleans area greater than 100-year risk reduction; levees in Slidell to be determined based on residual risk from barrier plan	(2) 400-year ring levee around Slidell	Related to the existing Lake Pontchartrain and Vicinity project

TABLE 11. PLANNING UNIT 1 STRUCTURAL MEASURE SUMMARY COMPARISON TABLE

(Green highlights denote common measures)

Area	LACPR	SMP	MLODS	Comments/Other
Other areas of the Northshore	Northshore would receive some level of risk reduction from the barrier-weir.	(1-7) Northshore levees to be determined based on residual risk from barrier plan	No levees across the Northshore.	Related to the existing Lake Pontchartrain and Vicinity project. State has identified measure 1-7 as an “urgent early action.”
Westshore (Laplace)	Evaluated the Westshore levee around Laplace but it was not included in the final array.	(1-5) Westshore at 100-yr.	Ambiguous. Map shows Westshore levee but table in report only describes improvements to the existing alignment which would not include Westshore.	USACE is also evaluating structural options for the Laplace area through the West Shore Lake Pontchartrain Study .
St. Bernard	Secondary levees interior to the Lake Pontchartrain and Vicinity project are considered a refinement of the plan for future consideration and are not included in the primary alternatives.	(1-4) Raise 40 Arpent Levee on the east side of St. Bernard Parish to greater than 100-yr.	Presents an un-modeled alternative that includes “directing water” across Bayou Terre aux Boeufs ridge in St. Bernard.	State has identified measure 1-4 as an “urgent early action.”
Plaquemines Parish (East Bank)	Barrier-weir includes raising levees on the east bank of Plaquemines Parish only as far down as Oakville.	(1-2) 100-yr levees from Caernarvon to White Ditch. (1-3) Pointe a la Hache to Phoenix Hurricane Protection – maintain existing levees in Plaquemines Parish	(3) 100-yr levees on the east bank of Plaquemines extending down as far as Bohemia.	Related to the existing New Orleans to Venice project.

Specific Structural Measures in Planning Unit 2

TABLE 12. LACPR STRUCTURAL MEASURES IN PLANNING UNIT 2 FINAL ARRAY

No. from LACPR Report	Description
WBI-100-1/ C-WBI-100-1	Construct new sector gate on Bayou Barataria to reduce risk on the West Bank.
C-R-100-2	Construct new sector gate on Bayou Barataria to reduce risk on the West Bank. Extend West Bank and Vicinity levees to Boutte and construct/raise Lafitte ring levees to 100-year level of risk reduction.

TABLE 12. LACPR STRUCTURAL MEASURES IN PLANNING UNIT 2 FINAL ARRAY

No. from LACPR Report	Description
C-G-100-1	Similar structural features as PU2-WBI-100-1 but with additional barrier-weir and levees along the GIWW to reduce risk to areas within the Barataria Basin. Also reduces risk to the Lafitte area.

TABLE 13. SMP STRUCTURAL MEASURES IN PLANNING UNIT 2

No. from SMP	Description
2-1	Donaldsonville to the Gulf Hurricane Protection – 3 alternative alignments: Donaldsonville to the Gulf Alignment #1- Swamp; Donaldsonville to the Gulf Alignment #2 – Hwy 90; Donaldsonville to the Gulf Alignment #3 – GIWW.
2-2	West Bank and Vicinity - From upper Plaquemines to Oakville on the west bank, provide greater than 100-year.
2-3	Larose to Golden Meadow
2-4	Oakville to Myrtle Grove Hurricane Protection Plaquemines Parish (West Bank) From Oakville to Myrtle Grove on the west bank provide 100-year.
2-5	Myrtle Grove to Venice Hurricane Protection - Federalize drainage levee south of Myrtle Grove and bring it to the same elevation as other levees in southern Plaquemines.
2-6	Grand Isle and Vicinity Protection and Shoreline Stabilization – Combines coastal restoration with structural improvements (also listed under coastal measures).

TABLE 14. MLODS STRUCTURAL MEASURES IN PLANNING UNIT 2

No. from MLODS Report	Description
1	St. James, St. John & St. Charles Parish west bank - Back levee on upland wetland margin for surge and diversion flood protection - 400year protection provided by FPS
2	Jefferson and Orleans Parish West Bank – Back levee & existing alignment on the Orleans West Bank- 400year protection provided by FPS
3	Myrtle Grove to Happy Jack – Back levee (ring levee) to 400-yr
4	Port Sulphur to Empire – Back levee (ring levee) to 100-yr
5	Buras to Venice – Back levee (ring levee) to 100-yr
6	Thibodeaux to Cut Off – 400-year back levee
7	Galliano to Golden Meadow – 100-year back levee
8	Lafitte – 400-year ring levee

TABLE 15. PLANNING UNIT 2 STRUCTURAL MEASURE SUMMARY COMPARISON TABLE

(Green highlights denote common measures)

Area	LACPR	SMP	MLODS	Comments/Other
New Orleans	<p>Alternatives in the final array:</p> <ul style="list-style-type: none"> WBI-100-1/C-WBI-100-1 sector gate (included in all alternatives). C-G-100-1 barrier-weir along the GIWW. <p>Alternatives being further analyzed under Donaldsonville to the Gulf Feasibility Study.</p>	<p>(2-1) Donaldsonville to the Gulf alternatives (includes Hwy 90 alignment) working in conjunction with (2-2) West Bank and Vicinity to provide to provide greater than 100-yr</p>	<p>(2) Raise existing West Bank levees to 400-year alignment similar to State’s “Hwy 90” alignment and LACPR’s “ridge” alignment.)</p>	<p>Related to the West Bank and Vicinity project and the Donaldsonville to the Gulf Feasibility Study. SMP measure 2-1 says that the State is waiting on LACPR to “inform and ultimately define the technically feasible level of protection.” State has identified measures 2-1 and 2-2 as “urgent early actions.” MLODS does not support the GIWW barrier-weir alignment.</p>
St. John the Baptist, St. James and St. Charles Parish	<p>Alternatives in the final array:</p> <ul style="list-style-type: none"> Extend West Bank and Vicinity levees to Boutte (C-R-100-2) GIWW barrier-weir (C-G-100-1). <p>Alternatives being further analyzed under Donaldsonville to the Gulf Feasibility Study.</p>	<p>(2-1) Area would receive risk reduction from any of the State’s three Donaldsonville to the Gulf options (includes ridge alignment).</p>	<p>(1) New 400-year back levee on upland wetland margin (ridge alignment)</p>	<p>Related to the Donaldsonville to the Gulf Feasibility Study.</p>
Des Allemands	<p>GIWW barrier-weir (C-G-100-1) would reduce risk to area within existing Des Allemands ring levee. Alternatives being further analyzed under Donaldsonville to the Gulf Feasibility Study.</p>	<p>(2-1) Included in all three Donaldsonville to the Gulf alignments.</p>	<p>Shown on a map as having a ring levee, which also encompasses Paradis and Bayou Gauche; not specifically listed in measures or recommendations.</p>	<p>Related to the Donaldsonville to the Gulf Feasibility Study.</p>
Central basin communities (e.g. Lafitte)	<p>C-R-100-2 and C-G-100-1. Alternatives being further analyzed under Donaldsonville to the Gulf Feasibility Study.</p>	<p>(2-1) Included in all three Donaldsonville to the Gulf alignments; 100-year risk reduction to Lafitte and other central basin communities</p>	<p>(8) 400-year ring levee around Lafitte</p>	<p>Related to the Donaldsonville to the Gulf Feasibility Study.</p>

TABLE 15. PLANNING UNIT 2 STRUCTURAL MEASURE SUMMARY COMPARISON TABLE

(Green highlights denote common measures)

Area	LACPR	SMP	MLODS	Comments/Other
Plaquemines (West Bank)	No changes proposed to existing structural measures on the West Bank of Plaquemines.	(2-4) From Oakville to Myrtle Grove on the west bank provide 100-year. (2-5) Federalize drainage levee south of Myrtle Grove and bring it to the same elevation as other levees in southern Plaquemines.	(3) 400-year Myrtle Grove to Happy Jack ring levee; (4) 100-year Port Sulphur to Empire ring levee; and (5) 100-year Buras to Venice ring levee	Related to the existing New Orleans to Venice project and the La Reussite to St. Jude Study for upper Plaquemines Parish.
Larose to Golden Meadow ring levee communities	Larose to Golden Meadow authorized at 100-year. No changes proposed.	(2-3) Larose to Golden Meadow at 100-year	(7) Proposes cutting spillway through the existing Larose to Golden Meadow ring levee and making a 100-year ring levee from Galliano to Golden Meadow	Related to the existing Larose to Golden Meadow project.
Bayou Lafourche communities outside of Larose to Golden Meadow	GIWW barrier-weir (C-G-100-1) would reduce risk to area. Alternatives being further analyzed under Donaldsonville to the Gulf Feasibility Study.	(2-1) Included in all three Donaldsonville to the Gulf alignments.	(6) 400-year back levee from Thibodaux to Cut Off	Related to the Donaldsonville to the Gulf Feasibility Study .
Grand Isle	No changes to the existing authorization proposed in LACPR.	(2-6) Grand Isle and Vicinity Protection and Shoreline Stabilization – Combines coastal restoration with structural improvements.	No corresponding measure.	Related to the existing Grand Isle and Vicinity project.

Specific Structural Measures in Planning Unit 3a

TABLE 16. LACPR STRUCTURAL MEASURES IN PLANNING UNIT 3A FINAL ARRAY	
No. from LACPR Report	Description
C-M-100-1	Construct Morganza to the Gulf levee with extension tying into high ground west of Morgan City at 100-year design level.
C-M-100-2	Construct Morganza to the Gulf levee with with tieback to high ground south of Thibodaux and ring levee around Morgan City at 100-year design level.

TABLE 17. SMP STRUCTURAL MEASURES IN PLANNING UNIT 3A	
No. from SMP	Description
3a-1	Morganza to the Gulf Hurricane Protection: Alternative Alignment #1 – Project Awaiting Authorization. Morganza to the Gulf alignment (authorized) at 100-year for Dulac, Montegut, and Chauvin. Alternative Alignment #2 – Pointe au Chien to Golden Meadow. Similar to the above but with alignment connecting Pointe au Chien to Golden Meadow.
3a-2	Gibson to Houma Hurricane Protection – to provide hurricane protection from Gibson to Miners Canal; would connect the Federal Lower Atchafalaya River levee alignment at Gibson with the Morganza to the Gulf levee alignment near Houma.
3a-3	Morgan City to Gibson Hurricane Protection – to provide hurricane protection to assets from Morgan City to Gibson; alignment would follow the Federal Lower Atchafalaya River barrier plan.
3a-4	Houma and Vicinity Hurricane Protection - greater than 100-year for Houma/Thibodaux (analyzed at 500-year) by either raising the Morganza alignment or by building an inner barrier along the GIWW.

TABLE 18. MLODS STRUCTURAL MEASURES IN PLANNING UNIT 3A	
No. from MLODS Report	Description
1	Greater Houma, including Chauvin, Montegut and Crozier – New 400-yr levee at including lock on HNC
2	Theriot- ring levee at 100-year
3	Dulac – ring levee at 100-year

TABLE 19. PLANNING UNIT 3A STRUCTURAL MEASURE SUMMARY COMPARISON TABLE

(Green highlights denote common measures)

Area	LACPR	SMP	MLODS	Comments/Other
Houma/Thibodaux	Variations on the authorized Morganza to the Gulf alignment	(3a-4) Greater than 100-year through raising Morganza or inner barrier along GIWW and (3a-1) Variations on authorized Morganza to the Gulf alignment	(1) 400-year levee around Houma/Thibodaux, Montegut, Chauvin, and Crozier (shorter than the authorized Morganza levee, but longer than the GIWW alignment). MLOD opposes authorized Morganza alignment.	Related to the recently authorized Morganza to the Gulf project. Since the Morganza project was not authorized at the beginning of the LACPR analysis, it was treated as an alternative rather than as part of the base condition. The Morganza project is undergoing a post-authorization change as the result of new H&H methodologies and higher construction costs. State has identified measures 3a-1 and 3a-4 as “urgent early actions.”
Montegut and Chauvin	(C-M-100-1 or C-M-100-2) Included in 100-year authorized Morganza alignment	(3a-1) Included in 100-year authorized Morganza alignment	(1) Included in 400-year levee as described above	Related to the recently authorized Morganza to the Gulf project. All reports show at least a 100-year level of risk reduction for the Montegut/Chauvin area.
Theriot and Dulac	(M-100-1 or M-100-2) Included in 100-year authorized Morganza alignment	(3a-1) Included in 100-year authorized Morganza alignment	(2) and (3) 100-year ring levees	Related to the recently authorized Morganza to the Gulf project. All reports show 100-year level of risk reduction for the Theriot/Dulac area.
Areas between Morgan City and Houma	Continuous and/or ring levees around Morgan City at 100-yr level of risk reduction	(3a-2) and (3a-3) 100-year levees on the east side of Morgan City and existing levees on the west side of Morgan City	Improve existing Morgan City ring levee to 400-yr. (listed in PU3b section)	Related to the existing Morgan City and Vicinity project. State has identified measure 3a-2 as an “urgent early action.”

Specific Structural Measures in Planning Unit 3b

TABLE 20. LACPR STRUCTURAL MEASURES IN PLANNING UNIT 3B FINAL ARRAY	
No. from LACPR Report	Description
C-G-100-1	Raise ring levee around Patterson/Berwick to 100-year design level and construct levee along the GIWW west to the boundary of Planning Unit 4 at the 100-year design level.
C-F-100-1	Raise ring levee around Patterson/Berwick to 100-year design level and construct levee along the edge of development north of the GIWW to high ground west of Abbeville at the 100-year design level.
C-RL-100-1	Raise ring levee around Patterson/Berwick to 100-year design level and construct ring levees around Franklin/Baldwin, New Iberia, Erath, Delcambre, and Abbeville at the 100-year design level.

TABLE 21. SMP STRUCTURAL MEASURES IN PLANNING UNIT 3B	
No. from SMP	Description
3b-1	Lafayette and Vicinity Hurricane Protection – proposed alignment begins west of Abbeville and ends east of New Iberia; study required; greater than 100-year risk reduction recommended.
3b-2	Wax Lake Outlet to New Iberia Hurricane Protection
3b-3	Maintain existing levee protection for Morgan City and Berwick

TABLE 22. MLODS STRUCTURAL MEASURES IN PLANNING UNIT 3B	
No. from MLODS Report	Description
1	Morgan City – Improve existing levee to 400-year (discussed in PU3a section)
2	Berwick/Patterson – Improve existing levee to 400-year
3	Bayou Sale – Improve existing levee to 400-year
4	Franklin to New Iberia – New 400-year levee

TABLE 23. PLANNING UNIT 3B STRUCTURAL MEASURE SUMMARY COMPARISON TABLE

(Green highlights denote common measures)

Area	LACPR	SMP	MLODS	Comments/Other
Berwick/Patterson	All comprehensive alternatives in final array include raising existing ring levees to 100-year.	(3b-3) Maintain existing levees	(2) Improve levee to 400-year.	The LACPR no action alternative for this area would be consistent with the SMP but not with the MLODS recommendation. These measures may be reevaluated in the Southwest Coastal LA Feasibility Study .
Bayou Sale	All comprehensive alternatives in final array include risk reduction in this area at the 100-year level.	(3b-3) Maintain existing levees	(3) Improve levee to 400-year	The LACPR no action alternative for this area would be consistent with the SMP but not with the MLODS recommendation. These measures may be reevaluated in the Southwest Coastal LA Feasibility Study .
Franklin to New Iberia	All comprehensive alternatives in final array include risk reduction in this area at the 100-year level (continuous GIWW levee, continuous inland levee , or ring levees).	(3b-2) New continuous inland alignment at 100-year level	(4) New continuous levees at 400-year	These measures may be reevaluated in the Southwest Coastal LA Feasibility Study .
New Iberia to Abbeville (includes Erath and Delcambre)	Continuation of the levees as described for Franklin to New Iberia above	(3b-1) Continuation of levees described above at potentially greater than 100-year levee--awaiting further analysis.	Map shows continuation of levees described above; however, text says levees only go from Franklin to New Iberia.	(3b-1) Lafayette & Vicinity Hurricane Protection has been identified by the State as an “Urgent Early Action.” These measures may be reevaluated in the Southwest Coastal LA Feasibility Study .

Note: In Planning Unit 3b, there are no existing hurricane risk reduction projects. The **Atchafalaya Basin Levees** project and the **Lower Atchafalaya Basin Reevaluation Study** are related to river flooding from the Atchafalaya River.

Specific Structural Measures in Planning Unit 4

TABLE 24. LACPR STRUCTURAL MEASURES IN PLANNING UNIT 4 FINAL ARRAY	
No. from LACPR Report	Description
C-RL-100-1	Construct ring levees to the east and west of Lake Charles; construct a series of levees within Lake Charles to separate the river from the land; and construct ring levees around Kaplan and Gueydan to the 100-year design level.
C-RL-400-1	Construct ring levees to the east and west of Lake Charles; construct a series of levees within Lake Charles to separate the river from the land; and construct ring levees around Kaplan and Gueydan to the 400-year design level.
C-RL-1000-1	Construct ring levees to the east and west of Lake Charles; construct a series of levees within Lake Charles to separate the river from the land; and construct ring levees around Kaplan and Gueydan to 1000-year design level.

TABLE 25. SMP STRUCTURAL MEASURES IN PLANNING UNIT 4	
No. from SMP	Description
4-1	Lake Charles and Vicinity Hurricane Protection – hurricane protection for concentrated and strategic assets in the Lake Charles metropolitan area, which includes Vinton, Sulphur, Lake Charles and Iowa. Tentatively analyzed at 500-year level of risk reduction, but awaiting results of LACPR to determine level of risk reduction. Plan assumes greater than 100-year risk reduction desired/needed.
4-2	Abbeville to Lake Charles Hurricane Protection – protect assets located between Lake Charles metro area and the Lafayette, Abbeville metro areas, which includes Kaplan, Gueydan, Lake Arthur, and Holmwood either by raised highways and fortified spoil banks or a levee along the GIWW (plan acknowledges that more analysis needed). Tentatively analyzed at 100-year level of risk reduction, but awaiting results of LACPR to determine level of risk reduction.

TABLE 26. MLODS STRUCTURAL MEASURES IN PLANNING UNIT 4	
No. from MLODS Report	Description
1	Greater Lake Charles region – In lieu of a levee enhanced non-structural measures is recommended
2	Gueydan – 100-year ring levee on existing alignment
3	Kaplan – new 100-year ring levee

TABLE 27. PLANNING UNIT 4 STRUCTURAL MEASURE SUMMARY COMPARISON TABLE

(Green highlights denote common measures)

Area	LACPR	SMP	MLODS	Comments/Other
Lake Charles area	Ring levees at the 100, 400, or 1000-year levels.	(4-1) Greater than 100-year ring levee	No structural measures.	SMP measure (4-1) says that the State is waiting on LACPR to “inform and ultimately define the technically feasible level of protection.” (4-1) has also been identified by the State as an “Urgent Early Action.” These measures may be reevaluated in the Southwest Coastal LA Feasibility Study .
Kaplan and Gueydan	Ring levees at the 100-year, 400-year, or 1000-year level.	(4-2) Either continuous 100-year levee along the GIWW or by elevating the highway. Further study required.	(2) and (3) 100-year ring levees	These measures may be reevaluated in the Southwest Coastal LA Feasibility Study .
Additional communities between Abbeville and Lake Charles	No structural measures.	(4-2) Either continuous 100-year levee along the GIWW or by elevating the highway. Further study required.	No structural measures.	These measures may be reevaluated in the Southwest Coastal LA Feasibility Study .

Summary of Similarities and Differences for the Lake Pontchartrain Basin (Planning Unit 1) and Barataria Basin (Planning Unit 2)

Greater New Orleans (East Bank)

Issues: Should some type of barrier be built to reduce storm surge from entering Lake Pontchartrain? What level of risk reduction should the metro New Orleans area receive?

LACPR is evaluating two different ways to reduce risk in the New Orleans area (both Northshore and Southshore)—either 1. Construct a barrier-weir to block surge from entering Lake Pontchartrain or 2. Construct levees close to development (“high level plan”). LACPR has 7 alternatives employing the barrier-weir concept and 4 alternatives employing the high level concept. In Table PU1-1 below, the barrier-weir alternatives start with “LP” and the high level alternatives start with “HL.” LACPR is looking at plans that provide 100-year, 400-year, or 1000-year risk reduction.

SMP - only supports the barrier concept and says that “an outer barrier must be built (p. 73).” The SMP presents three different barrier alignments: 1. Interior at Golden Triangle 2. Rim of Lake Borgne and 3. Lake Borgne (p. 75). LACPR has evaluated alignments similar to the first two but screened out the “Lake Borgne” alignment. The State recommends greater than 100-year risk reduction for the Greater New Orleans area.

MLODS – appears to recommend that levee improvements be made to increase the level of risk reduction in the New Orleans area to 500-year without a barrier; also includes an “un-modeled alternative” that shows a 500-year levee along Hwy 90; however, this alternative is not a complete barrier because surge could still pass through The Rigolets into Lake Pontchartrain.

Summary: The SMP promotes the barrier concept at a greater than 100-year level of risk reduction. MLODS supports a 500-year level of risk reduction most likely by raising existing levees without a barrier. LACPR is still evaluating both approaches (barrier and no barrier) at a range of risk reduction levels from 100-year to 1000-year.

Slidell and Other Parts of the Northshore

Issues: Should a ring levee be built around Slidell? Should levees be built along the Northshore of Lake Pontchartrain? What level of risk reduction should the Slidell area receive?

LACPR is evaluating alternatives that reduce risk in Slidell in two different ways: 1. Series of ring levees across the Northshore and 2. Ring levee around Slidell. In Table PU1-1 below, the Northshore ring levee plans end in “-2” and the Slidell ring levee plans end in “-3.” There are 4 alternatives that include levees across the entire Northshore and 4 alternatives that include the Slidell ring levee only. LACPR is looking at plans that provide 100-year, 400-year, or 1000-year risk reduction for Slidell and other parts of the Northshore.

SMP – The barrier plan would indirectly reduce risk to Slidell and other parts of the Northshore by reducing surge in Lake Pontchartrain. The SMP contains no levees close to development other than the levee connecting the barrier to high ground east of Slidell. The State recommends greater than 100-year risk reduction for the Greater New Orleans area, which includes Slidell.

MLODS recommends a new levee along the upland interface around Slidell at 500-year protection. MLODS has no other levees across the Northshore.

Summary: Neither the SMP nor the MLODS report emphasizes levees across the Northshore, but the LACPR report is still evaluating them as an option. LACPR is evaluating the Slidell ring levee as recommended in the MLODS report. The SMP doesn't include a ring levee around Slidell.

Barataria Basin including West Bank of New Orleans

Issues: To what level of risk reduction should the existing West Bank and Vicinity project be improved? Should a sector gate be added? Should the Barataria Basin remain open or be closed along the GIWW?

LACPR is evaluating three primary structural options that were presented in the **SMP**: 1. Leave Barataria Basin open and raise existing levees in the West Bank and Vicinity and Larose to Golden Meadow projects. 2. Leave Barataria Basin open and construct new alignments along ridges and around central communities up to Highway 90 in addition to raising existing levees 3. Partially close Barataria Basin by constructing a barrier-weir (still have to construct or make improvements to some levees close to development). Note: Donaldsonville to the Gulf is also considering a non-overtopping barrier across the GIWW, which was screened out in LACPR.

MLODS recommends a plan very similar to the State's "Hwy 90" alignment and LACPR's "ridge" alignment.

Summary: The LACPR and SMP alternatives are very closely aligned. The MLODS recommendation resembles the LACPR ridge alignment, but LACPR is not evaluating a spillway through the existing Larose to Golden Meadow ring levee as shown on the MLODS map.

Coastal Restoration Measures

This section begins with a general comparison of coastal restoration measures and strategies in the three reports. The rest of the Coastal Restoration Measures section is organized by planning unit.

The following steps were taken to compare coastal restoration measures in the LACPR, SMP, and MLODS reports.

4. For each planning unit, measures from each of the three reports are listed in individual tables grouped as LACPR measures, SMP measures, and MLODS measures. Measures are numbered according to each plan’s numbering system.
5. Following the three tables described above, a summary table organizes measures by location, geographic feature, or function (as appropriate) and then lists the measures in each report related to solving problems in those areas. Numbers in parentheses correspond to measure numbers in each of the reports. The LACPR measures were numbered in the order they appear in the LACPR *Coastal Restoration Plan Component Appendix*. Those rows shaded in green have the greatest degree of consistency.
6. At the end of this section, areas of consensus across plans are identified by planning unit to help prioritize coastal restoration efforts. Landscape features/measures that appear in two or more reports are identified.

General Comparison of Coastal Restoration Measures and Strategies

TABLE 28. GENERAL COMPARISON OF COASTAL RESTORATION MEASURES AND STRATEGIES			
Topic	LACPR	SMP	MLODS
Restoration Features (Priority and Consistency with Other Efforts)	LACPR coastal restoration alternatives put priority on coastal restoration projects that would work together to offer storm surge risk reduction, which is consistent with the MLODS report.	Appears to be consistent with LACPR and MLODS. One of the State’s Annual Plan prioritizing criteria includes projects that protect concentrated and strategic assets that were identified as needed greater than 100-year protection.	Report states that most of the proposed restoration features have been vetted through prior planning efforts and are included in Coast 2050 or the SMP. MLODS recommends putting a higher priority on coastal restoration projects that also offer storm risk reduction.
Number and Type of Diversions	Approx. 27 land building or land sustaining diversions in R1 alternatives.	Approx. 19 land building or land sustaining diversions. The SMP defines land building diversions as very large diversions such as the MS River Delta Management Plan.	In all, 28 diversions, three controlled crevasse-type pulsing diversions, and three land-building diversions are proposed. Three types: 1. Sustaining diversions (generally less than 40,000 cfs) 2. Delta-building diversions (over 75,000 cfs) 3. Controlled-crevasse diversions periodic discharges when the river is exceptionally high so that large

TABLE 28. GENERAL COMPARISON OF COASTAL RESTORATION MEASURES AND STRATEGIES

Topic	LACPR	SMP	MLODS
<p>Quantity of the Mississippi River used for Diversions</p>	<p>For the R1 alternatives (Dec – May), the total amount diverted from the Mississippi River would be an average of around 186,000 cfs with a high flow of around 331,000 cfs. The R2 pulsed diversions would have a greater range of flows. In general, no more than 525,000 cfs would be taken out of the river at any one time. Actual operation would depend on multiple factors such as river stage.</p>	<p>SMP diversions could range from under 100,000 cfs to over 250,000 cfs.</p>	<p>scale overland flow is possible <i>without a large deep-water conveyance channel</i>. The total (maximum) spring-time discharge capacity proposed for the Mississippi River diversions is 436,050 cfs (Planning Units 1, 2 and 3a). Most of this discharge is roughly split east and west of the river between Planning Units 1 and 2. Would maintain at least 300,000 cfs flowing past New Orleans.</p>
<p>Marsh Creation</p>	<p>Approx. 318,000 to 368,000 acres coast wide.</p> <p>By planning unit (all values are approx.): PU1: 63K acres PU2: 26K (doesn't include barrier island restoration acres) PU 3a: 116K (Alts R1 and R2) PU3b: 33K (Alt R1); 55K (Alt R2) PU4: 80K (Alt R1); 108K (Alt R2)</p>	<p>Approx. 363,000 acres coast wide.</p> <p>By planning unit (all values are approx.): PU1: 111K acres PU2: 90K PU3a: 98K PU3b: 17K PU4: 47K (Note: Figures based on LACPR Habitat Evaluation Team's assessment of State's R3 alternative)</p>	<p>Approx. 60,000 acres (93 square miles) proposed, which represents just 4.6% of the historical land loss of the coast. Marsh creation projects are located only on lines of defenses such as marsh land bridges. Large scale marsh management is avoided except for the Chenier Plain where modest management is necessary to restore the historical hydrology and extent of freshwater marsh. Cost to construct 60,000 acres by pumping sediment will be at least \$1.6 billion.</p>
<p>Ridge Restoration</p>	<p>No ridge restoration in Alternative R1. The LACPR Habitat Evaluation Team felt that too much marsh had to be destroyed to restore the ridges.</p>	<p>Includes the following ridge restoration measures: Bayou la Loutre ridge, ridges in Barataria, and ridges in Terrebonne.</p>	<p>Four ridges are proposed for restoration. Restoration of natural ridges is limited to those ridges located at strategic locations that may mitigate or impede movement of surge water inland.</p>
<p>Barrier Reefs/Oyster Reefs</p>	<p>The only barrier reef restoration measure is in PU3b from Eugene Island to Pointe au Fer Island.</p>	<p>The only barrier/oyster reef restoration measure is in PU1 near the Biloxi landbridge.</p>	<p>Recommends restoring traditional 3-dimensional oyster reefs in several areas across the coast. Mining of oyster shell material in critical oyster reefs or</p>

TABLE 28. GENERAL COMPARISON OF COASTAL RESTORATION MEASURES AND STRATEGIES

Topic	LACPR	SMP	MLODS
			shoreline reaches should be severely limited.
Includes Salinity/Wetland Habitat Goals	No. Compares alternatives at the wetland acres level and doesn't predict or evaluate wetland habitat types.	Not mentioned in main report.	Yes. One of the two "essential elements" of the MLODS is to "define wetland habitat goals and sustain." Wetland habitat goals include swamp, fresh marsh, intermediate marsh, brackish marsh and salt marsh. Requires a corresponding salinity gradient goal. Goals are based on 1900 conditions except in Atchafalaya and Vermilion Bays. MLODS states that "it is necessary to agree on the basic habitat distribution for the coast."
Restore Extensive Cypress Swamps	Not specifically mentioned. (but recommended in the Dutch plan)	Not mentioned in main report.	Proposes to restore extensive cypress swamps adjacent to the levees. For levees with adjacent areas of intermediate habitat, recommend using outfall management of stormwater and treated wastewater to establish a cypress buffer.

Specific Coastal Restoration Measures in Planning Unit 1

TABLE 29. LACPR COASTAL RESTORATION MEASURES IN PLANNING UNIT 1	
No.	Description (Measures that are part of the R1/R2 alternatives)
1	Blind River Diversion - flows for sustaining entire south Maurepas swamp split between Blind River and Hope Canal
2	Hope Canal Diversion - flows for sustaining entire south Maurepas swamp split between Blind River and Hope Canal
3	LaBranche Diversion – diversion directly into LaBranche wetlands to sustain those wetlands
4	Bayou Bienvenu Diversion – to reduce East New Orleans landbridge loss rates by 50%
5	East New Orleans land bridge Marsh Creation – 7,996 acres
6	Bayou LaLoutre Diversion – (In lieu of Violet) sized to sustain the Biloxi Marshes
7	Biloxi Marshes Shore Protection – 254,500 linear feet of protection around outer perimeter
8	Biloxi Marshes Marsh Creation – 33,553 acres of marsh creation with armored containment dikes where not already provided by Biloxi Marshes Shore Protection measure
9	Bayou Terre aux Boeufs Diversion - flows to sustain marshes between MRGO and Bayou Terre aux Boeufs
10	Bayou Terre aux Boeufs Marsh Creation – 2,591 acres in upper basin
11	Breton Sound Strategic Land Bridge – a band of marsh from MRGO to Miss. River (14,579 acres) plus marsh creation along either side of Bayou LaLoutre
12	Caernarvon Diversion – sized to sustain all marshes between Bayou Terre aux Boeufs and the Miss. River
13	Caernarvon Area Marsh Creation – Marsh creation along protection levee from Big Mar south to Pheonix (4,936 acres)
14	Bayou Lamoque Diversion – to sustain receiving area marshes
15	Grand Bay Diversion – sized to sustain receiving area marshes

TABLE 30. SMP COASTAL RESTORATION MEASURES IN PLANNING UNIT 1	
No. from SMP (Appendix A)	Description
1-9	Mississippi River Diversion at Hope Canal – freshwater and sediment diversion into Maurepas Swamp via Hope Canal. Approx. 2,000 cfs
1-10	Mississippi River Diversion at Convent/Blind River - freshwater and sediment diversion into Maurepas Swamp via Blind River. Approx. 5,000 cfs
1-11	Shoreline Stabilization on Maurepas LandBridge
1-12	St. Tammany Marsh Restoration
1-13	Shoreline Protection on South Shore of Lake Pontchartrain
1-14	East Orleans Landbridge Restoration
1-15	Close MRGO at Bayou LaLoutre Ridge
1-16	MRGO Shoreline Stabilization
1-17	Central Wetlands Restoration

TABLE 30. SMP COASTAL RESTORATION MEASURES IN PLANNING UNIT 1	
No. from SMP (Appendix A)	Description
1-18	Marsh Restoration Using Dredged Material at Golden Triangle
1-19	MS River Diversion at Violet
1-20	Maintain MRGO-Lake Borgne Landbridge
1-21	Modify Authorization of Caernarvon Diversion
1-22	Maintain and Restore the Breton Sound Marshes
1-23	MS River Diversion at White Ditch
1-24	Maintain and Restore the Biloxi Landbridge and Barrier Reefs
1-25	Restore Bayou La Loutre Ridge
1-26	MS River Diversion at Bayou Lamoque
1-27	Barrier Shoreline Restoration: Chandeleur Islands

TABLE 31. MLODS COASTAL RESTORATION MEASURES IN PLANNING UNIT 1	
No. from MLODS Report	Description
6	Maurepas land bridge – Restore/enhance wetland forests with diversions. Use treated effluent, conservation – 1000 acres marsh creation by 2025 dedicated dredging.
7	Jefferson and Orleans lakefront – Construct wetland buffer in front of existing levee alignment – 1600 acres marsh creation by 2025.
8	East Orleans land bridge – Restore/enhance marsh & natural ridges w/ marsh creation and shoreline protection – restore marsh ~6000 acres of marsh creation by 2025.
9	MRGO-Lake Borgne Land Bridge – Restore/enhance marsh & natural ridges with marsh creation & Shoreline Protection – constrict MRGO – 4 th Supp Projects – 1000 acres marsh creation by 2025.
10	Bayou la Loutre ridge – Close MRGO at ridge and restore soils and reforest Bayou la Loutre ridge
11	Biloxi Marsh – Restore oyster barrier reefs and maintain marsh land bridges – utilizing Violet diversion and placement of reef material and 5000 acres marsh creation by 2025.
12	Chandeleur islands – Restore Chandeleur islands to pre-Hurricane Georges extent
13	Breton/Terre aux Boeufs basins – Restore/maintain marsh with Caernarvon diversion and marsh creation 5000 acres by 2025.
14	Bayou Manchac – MS River reintroduction max. design discharge 200 cfs
15	Bayou Braud – MS River reintroduction max. design discharge 200 cfs
16	Blind River Basin Diversion: Romeville to Blind R. Basin – MS River reintroduction, max. design discharge 8000 cfs
17	Garyville to Maurepas Swamp – MS River reintroduction, max 3000 cfs
18	Bonnet Carre Spillway to Frenier – MS River reintroduction max. 5000 cfs
19	Bonnet Carre Spillway wetlands – MS River reintro max 1000 cfs
20	Bonnet Carre Spillway to LaBranche wetlands – MS River reintroduction, max. discharge 4000 cfs

TABLE 31. MLODS COASTAL RESTORATION MEASURES IN PLANNING UNIT 1

No. from MLODS Report	Description
21	Violet to Biloxi Marsh & Breton Sound – MS River reintro max. 20,000 cfs to Central Wetlands, Biloxi Marsh, MS sound
22	Caernarvon to Lake Amedee – MS River reintro max. 8000 cfs
23	White Ditch – MS River reintro max 500 cfs (or 1000 cfs?)
24	Bohemia to Ft. St. Phillip – Restore overbank flow and increase diversions to rebuild natural levee max. 50,000 to 100,000 cfs: includes existing Bohemia diversion, CWPPRA proposed diversion, Bayou Lamoque, N St. Phillip, and additional improvement to overbank flow (all uncontrolled discharges)
25	Benney’s Bay – MS River reintroduction max 50,000 cfs
26	Bellaire to Poverty Point – Controlled crevasse from the Mississippi River, Maximum discharge flood year 200,000 cfs.
27	Bohemia to Nestar - Controlled crevasse from the Mississippi River, Maximum discharge flood year 200,000 cfs.
28	Head of Passes – Closure of Southwest and South Pass, Pass a Loutre deep-draft navigation channel with a min. discharge of 200,000 cfs

TABLE 32. PLANNING UNIT 1 COASTAL RESTORATION SUMMARY COMPARISON TABLE

(Green highlights denote common measures)

Area	LACPR	SMP	MLODS	Comments/Other
Maurepas Land Bridge	No corresponding measure.	(1-11) Shoreline Stabilization on Maurepas Land Bridge	(6) Restore/enhance wetland forests with diversions (see Maurepas Swamp diversions below), use treated effluent, conservation – 1000 acres dedicated dredging (18) Max 5,000 cfs diversion from Bonnet Carre Spillway to Frenier (southern end of the Maurepas land bridge)	In the MLODS report, the measure description in the table for (6) is inconsistent with the project features listed in the full description of (6). State has identified measure 1-11 as an “urgent early action.”
Maurepas Swamp/Blind River Basin swamp	Two diversions: Flows for sustaining entire south Maurepas swamp split between (1) Blind River diversion and (2) Hope Canal diversion	Two diversions: 2,000 cfs diversion at (1-9) Hope Canal and 5,000 cfs diversion at (1-10) Convent/Blind River into Maurepas Swamp	Two diversions: (16) Blind River Basin Diversion max 8000 cfs and (17) Garyville into Maurepas Swamp Diversion max 3000 cfs (same as part of measure 6 above)	Hope Canal diversion appears to be the same as CWPPRA project PO-29: River Reintroduction into Maurepas Swamp (max 2000 cfs). CIAP currently has 1500 cfs Blind River reintroduction under E&D. State has identified measures 1-9 and 1-10 as “urgent early actions.”
Bonnet Carre/ LaBranche Wetlands	(3) LaBranche Wetlands Diversion directly into LaBranche wetlands.	No corresponding measure.	(19) Manage the Bonnet Carre spillway to direct up to 1000 cfs to wetland marsh/forest within the spillway; (20) Bonnet Carre	CWPPRA approved project similar to MLODS measure (19) in 1999 but never completed it. WRDA 2007 also proposes a Bonnet Carre

TABLE 32. PLANNING UNIT 1 COASTAL RESTORATION SUMMARY COMPARISON TABLE

(Green highlights denote common measures)

Area	LACPR	SMP	MLODS	Comments/Other
	(The LACPR Habitat Evaluation Team prefers the LaBranche diversion directly into the wetlands rather than the Bonnet Carre diversion into the lake.)		Spillway to LaBranche wetlands – MS River reintroduction, max. discharge 4000 cfs	freshwater diversion. Opportunistic Use of the Bonnet Carre Spillway” is an LCA measure.
St. Tammany Marsh Restoration	No corresponding measure.	(1-12) Dedicated dredging and vegetative plantings to fortify the lake rim and restore marshes.	No corresponding measure.	
Southshore of Lake Pontchartrain	No corresponding measure.	(1-13) Shoreline Protection on South Shore of Lake Pontchartrain: 11.4 miles of shoreline stabilization and 300 ft wide marsh buffer	(7) Jefferson and Orleans lakefront – Construct wetland buffer in front of existing levee alignment – 1600 acres marsh creation.	
East New Orleans land bridge	(4) Bayou Bienvenue Diversion – to reduce East New Orleans land bridge loss rates by 50% and (5) Marsh Creation – 7,996 acres @ 900 acres/year	(1-14) East Orleans Land Bridge Restoration. Features include dedicated dredging for marsh and ridge restoration and shoreline stabilization for approx. 38,000 acres of marsh and 145 miles of shoreline and ridges.	(8) East Orleans Land Bridge Restore/enhance marsh & natural ridges w/ marsh creation and shoreline protection – restore marsh ~6000 acres of marsh creation	In addition to the Bayou LaLoutre Diversion, the LACPR Habitat Evaluation Team proposed the Bayou Bienvenue Diversion as an alternate location to the Violet Canal location. State has identified measure 1-14 as an “urgent early action.”
MRGO-Bayou LaLoutre Ridge	Corps proposing to close MRGO at the Bayou LaLoutre Ridge with a rock dam as the MRGO deep-draft de-authorization recommendation	(1-15) Close MRGO at Bayou LaLoutre Ridge and (1-25) Restore Bayou La Loutre Ridge	(10) Close MRGO at Bayou la Loutre ridge and restore soils and reforest Bayou la Loutre ridge	State has identified measure 1-15 as an “urgent early action.”
MRGO Shoreline	No corresponding measure.	(1-16) MRGO Shoreline Stabilization	No corresponding measure	
MRGO-Lake Borgne Landbridge	(4) Marshes sustained by Bayou Bienvenue diversion	(1-18) Marsh Restoration Using Dredged Material at Golden Triangle; (1-20) Maintain MRGO-Lake Borgne	(9) MRGO-Lake Borgne Land Bridge – Restore/enhance marsh & natural ridges with marsh creation & Shoreline Protection – constrict	State has identified measure 1-20 as an “urgent early action.”

TABLE 32. PLANNING UNIT 1 COASTAL RESTORATION SUMMARY COMPARISON TABLE

(Green highlights denote common measures)

Area	LACPR	SMP	MLODS	Comments/Other
		Landbridge using dedicated dredging and bankline stabilization.	– 4 th Supp Projects	
Central Wetlands/ Biloxi Marshes/ Landbridge/ Barrier Reefs	(6) Bayou LaLoutre Diversion – (In lieu of Violet) sized to sustain the Biloxi Marshes; (7) Biloxi Marshes Shore Protection – 254,500 linear feet of protection around outer perimeter; and (8) Biloxi Marshes Marsh Creation – 33,553 acres of marsh creation with armored containment dikes where not already provided by Biloxi Marshes Shore Protection measure	(1-17) Central Wetlands Restoration – pipeline conveyance of sediments dredged from the MS River, hydraulic management, vegetative planting, treated effluent; (1-19) MS River Diversion at Violet at max 50,000 cfs; (1-24) Maintain and Restore the Biloxi Landbridge and Barrier Reefs	(11) Restore oyster barrier reefs and maintain marsh land bridges – utilizing Violet diversion and placement of reef material and 5000 acres marsh creation; and (21) Violet to Biloxi Marsh & Breton Sound – MS River reintro max. 20,000 cfs to Central Wetlands, Biloxi Marsh, MS sound	The State is pursuing E&D on a 5,000 cfs diversion at Violet using CIAP funds (PO-35 EB). The State is also pursuing E&D on “Biloxi Marsh Shoreline Protection and Restoration Project (PO-35 SF).” State has identified measures 1-17, 1-19, and 1-24 as “urgent early actions.”
Marshes adjacent to MS River in Plaquemines Parish (White Ditch diversion)	No corresponding measure; however, the White Ditch diversion is listed as a top priority along with the Caernarvon diversion in the <i>Coastal Restoration Plan Component Appendix</i> .	(1-23) MS River Diversion at White Ditch (10,000 cfs)	(23) White Ditch – MS River reintro max 500 cfs (recommending CWPPRA project as designed)	White Ditch diversion is an approved CWPPRA PPL 14 project at 500 cfs (BS-12)
Bayou Terre aux Boeufs/Upper Breton Sound marshes	(9) Diversion – flows to sustain marshes between MRGO and Bayou Terre aux Boeufs; (10) Marsh Creation – 2,591 acres in upper basin; (11) Breton Sound Strategic Land Bridge – a band of marsh from MRGO to Miss. River (14,579 acres) plus marsh creation along either side of Bayou LaLoutre; (12) Caernarvon Diversion – sized to sustain all marshes between	(1-21) Modify Authorization of Caernarvon Diversion; (1-22) Maintain and Restore the Breton Sound Marshes	(13) Breton/Terre aux Boeufs basins – Restore/maintain marsh with Caernarvon diversion and marsh creation 5000 acres; (22) Caernarvon to Lake Amedee – MS River reintro max. 8000 cfs	Caernarvon is currently constructed as a max 8,800 cfs freshwater diversion. State has identified measure 1-21 as an “urgent early action.”

TABLE 32. PLANNING UNIT 1 COASTAL RESTORATION SUMMARY COMPARISON TABLE

(Green highlights denote common measures)

Area	LACPR	SMP	MLODS	Comments/Other
	<p>Bayou Terre aux Boeufs and the Miss. River; (13) Caernarvon Area Marsh Creation – Marsh creation along protection levee from Big Mar south to Phoenix (4,936 acres)</p>			
<p>Bayou Lamoque</p>	<p>(14) Bayou Lamoque Diversion</p>	<p>(1-26) MS River Diversion at Bayou Lamoque: remove existing gates and allow to free flow 12,000 cfs</p>	<p>(24) Bohemia to Ft. St. Phillip – Restore overbank flow and increase diversions to rebuild natural levee max. 50,000 to 100,000 cfs: includes existing Bohemia diversion, CWPPRA proposed diversion, Bayou Lamoque diversion, N St. Phillip, and additional improvement to overbank flow (all uncontrolled discharges)</p>	<p>Bohemia MS River Reintroduction is a 10,000 cfs CWPPRA project under E&D (BS-15); Delta Building Diversion N. of Fort St. Phillip is a 5,400 cfs CWPPRA project under E&D (BS-10); Bayou Lamoque Freshwater Diversion is a 13,000 cfs CIAP project under E&D (also CWPPRA project BS-13 from PPL15). The Bayou Lamoque diversion is a LACPR Habitat Evaluation Team priority. State has identified measure 1-26 as an “urgent early action.”</p>
<p>Grand Bay</p>	<p>(15) Grand Bay Diversion</p>	<p>No corresponding measure.</p>	<p>No corresponding measure.</p>	<p>CWPPRA sediment diversion project PBS-6 Grand Bay Crevasse was deauthorized in 1998 because major landowner indicated non-support of the project.</p>
<p>Mississippi River Delta (Benney’s Bay)</p>	<p>No corresponding measure.</p>	<p>No corresponding measure.</p>	<p>(25) Benney’s Bay (CWPPRA project at 50,000 cfs)</p>	<p>Benney’s Bay is a 50,000 cfs CWPPRA sediment diversion under E&D (MR-13). The LACPR Habitat Evaluation Team did not include this measure because it considered this area to be an inefficient location for use of limited sediment resources.</p>

TABLE 32. PLANNING UNIT 1 COASTAL RESTORATION SUMMARY COMPARISON TABLE

(Green highlights denote common measures)

Area	LACPR	SMP	MLODS	Comments/Other
Swamps south and east of Baton Rouge	No corresponding measure.	No corresponding measure.	(14) Bayou Manchac – MS River reintroduction max. design discharge 200 cfs; (15) Bayou Braud – MS River reintroduction max. design discharge 200 cfs	
Chandeleur Islands	No corresponding measure.	(1-27) Barrier Shoreline Restoration: Chandeleur Islands	(12) Chandeleur islands – Restore Chandeleur islands to pre-Hurricane Georges extent	
MS River Spillways	LACPR evaluated spillways at a conceptual level, but they are not part of the coastal restoration measures.	No corresponding measure.	(26) Bellaire to Poverty Point – Controlled crevasse; (27) Bohemia to Nestar - Controlled crevasse	
Delta Management	No corresponding measure.	Mississippi River Delta Management shown as diversions on Figure 10. Two locations suggested: Myrtle Grove/Phoenix or east and west at Venice.	(28) Head of Passes – Closure of Southwest and South Pass, Pass a Loutre deep-draft navigation channel	

Specific Coastal Restoration Measures Planning Unit 2

TABLE 33. LACPR COASTAL RESTORATION MEASURES IN PLANNING UNIT 2	
No.	Description (Measures that are part of the R1/R2 alternatives)
1	Lagan Diversion – sized to sustain a portion of upper basin swamps
2	Edgard Diversion – sized to sustain remaining Lac des Allemands portion of upper basin wetlands
3	Davis Pond Freshwater Diversion reauthorization
4	Naomi Diversion – sized to sustain receiving area
5	Myrtle Grove Diversion – sized to sustain receiving area
6	Strategic Marsh Creation in lower basin – 22,573 acres @ 900 ac per year
7	North Bay Rim Marsh Creation/Protection – 3,538 acres along northern border of Barataria Bay @ 900 ac per year
8	West Point a la Hache Diversion – sized to sustain receiving area
9	Port Sulphur Diversion – sized to sustain receiving area
10	Buras Diversion – sized to sustain receiving area
11	Fort Jackson Diversion – sized to sustain receiving area
12	Barrier Islands Restoration – 15,029 acres @ 900 acres/year

TABLE 34. SMP COASTAL RESTORATION MEASURES IN PLANNING UNIT 2	
No. from SMP (Appendix A)	Description
2-6	Grand Isle and Vicinity Protection and Shoreline Stabilization (also listed under structural measures)
2-8	Upper Barataria Basin Hydrologic Improvements at Hwy 90
2-9	Move Freshwater to Terrebonne Basin from Barataria Basin via GIWW
2-10	Mississippi River Diversion at Bayou Lafourche
2-11	Mississippi River at Strategic Locations in Upper Barataria Basin
2-12	Modify Authorization of Davis Pond Diversion
2-13	Mississippi River Diversion at Myrtle Grove with Dedicated Dredging
2-14	Mississippi River Diversion at West Pointe a la Hache with Dedicated Dredging
2-15	Marsh Restoration Using Dredged Material in Barataria Basin
2-16	Ridge Habitat Restoration in Barataria Basin
2-17	Barrier Shoreline Restoration: Barataria Basin
2-18	Bankline Protection to Gulf Intracoastal Waterway (GIWW)

TABLE 35. MLODS COASTAL RESTORATION MESAURES IN PLANNING UNIT 2

No. from MLODS Report	Description
9	Westwego to Lockport Land Bridge - Maintain marsh to present extent with aggressive use of Davis Pond Diversion
10	Barataria Basin Land Bridge - Restore marsh to ~1983 extent Use marsh creation - 15,000 acres (long-distance pumping from River), restore canals, shoreline protection & aggressive use of Jesuit Bend Diversion (#21)
11	Golden Meadow to Myrtle Grove - Restore marsh to ~1983 extent, Use marsh creation - 6000 acres (long distance pumping), shoreline protection & aggressive use of Myrtle Grove Diversion (#22) & restore canals,
12	Port Sulphur to Empire - Restore marsh buffer adjacent to levee with marsh creation/beneficial use dredge material (3000 acres)
13	Buras to Venice - Restore marsh buffer adjacent to levee with marsh creation/beneficial use dredge material (5000 acres)
14	Sandy Point to Quatre Bayou Pass - Restore Gulf shoreline & barrier islands, close unneeded navigation channels
15	East Grande Terre to Pt. Chenier Ronquille - Construct offshore breakwaters to trap sand of terminal end shoreline drift
16	Northeast of Fourchon Headland - Development of oyster reefs and restore marsh with marsh creation (3000 acres)
17	Restore ridge along Bayou Grand Chenier - Restore ridge integrity of Bayou Grande Cheniere
18	1000 cfs diversion near Lagan in St. James Parish
19	1000 cfs diversion near Edgard in St. John the Baptist Parish
20	10,500 cfs Davis Pond Diversion
21	10,000 cfs diversion at Jesuit Bend in Plaquemines Parish
22	20,000 cfs diversion at Myrtle Grove in Plaquemines Parish
23	10,000 cfs diversion near Deer Range in Plaquemines Parish
24	Sunrise to Bolivar Point - Land building diversion directed eastward toward Bay Adams, annual discharge 100,000 to 140,000 cfs, possibly located in or part of spillway structure proposed
25	25,000 cfs West Bay diversion in Plaquemines Parish
26	Controlled hurricane surge spillway east to west or west to east across Bayou Lafourche, also used for flood year pulse events east to west discharge
27	Restoration of the Caminada Headland near Fourchon

TABLE 36. PLANNING UNIT 2 COASTAL RESTORATION SUMMARY COMPARISON TABLE

(Green highlights denote common measures)

Area	LACPR	SMP	MLODS	Comments/Other
Upper Barataria Basin (near Hwy 90)	No corresponding measure.	(2-8) Upper Barataria Basin Hydrologic Improvements at Hwy 90	No corresponding measure.	
Barataria Basin to Terrebonne Basin	No corresponding measure.	(2-9) Move Freshwater to Terrebonne Basin from Barataria Basin via GIWW (same measure also appears in Planning Unit 3a)	No corresponding measure.	
Upper Barataria Basin (near Donaldsonville)	No corresponding measure in LACPR	(2-10) Mississippi River Diversion at Bayou Lafourche (max 1000 cfs)	Bayou Lafourche diversion maxi discharge design 1000 cfs (discussed in PU3a section)	A 1,000 cfs Bayou Lafourche siphon/pump is a LACPR Habitat Evaluation Team priority. State has identified measure 2-10 as an “urgent early action.”
Upper Barataria Basin (Swamps in St. James Parish)	(1) Lagan Diversion	(2-11) Mississippi River at Strategic Locations in Upper Barataria Basin (1000 cfs)	(18) 1000 cfs diversion near Lagan in St. James Parish	
Lac des Allemands	(2) Edgard Diversion	(2-11) Mississippi River at Strategic Locations in Upper Barataria Basin (1000 cfs)	(19) 1000 cfs diversion near Edgard in St. John the Baptist Parish	
Barataria Basin Land Bridge north of Lake Salvador	(3) Davis Pond Freshwater Diversion reauthorization	(2-12) Modify Authorization of Davis Pond Diversion to increase wetland restoration outputs	(9) Westwego to Lockport Land Bridge: beneficial use of treated wastewater, select shoreline protection; (20) 10,500 cfs Davis Pond Diversion (operational changes)	Davis Pond is an existing 10,650 cfs freshwater diversion. The reauthorization is a high priority for LACPR. State has identified measure 2-12 as an “urgent early action.”
Barataria Basin Land Bridge south of Lake Salvador	(4) Naomi Diversion (also CWPPRA projects)	No corresponding measure.	(10) Barataria Basin Land Bridge measures: significant marsh creation to restore marsh to the ~1974 extent, selective shoreline protection, infill oil and gas canals; (21) 10,000 cfs diversion at Jesuit Bend	Naomi is an existing siphon.

TABLE 36. PLANNING UNIT 2 COASTAL RESTORATION SUMMARY COMPARISON TABLE

(Green highlights denote common measures)

Area	LACPR	SMP	MLODS	Comments/Other
Land bridge between Myrtle Grove and Golden Meadow	(5) Myrtle Grove Diversion; (6) Strategic Marsh Creation in lower basin – 22,573 acres @ 900 ac per year	(2-13) Diversion at Myrtle Grove with Dedicated Dredging	(11) Golden Meadow to Myrtle Grove land bridge measures; significant marsh creation to restore to the 1983 extent (approx 6000 acres) (22) Diversion at Myrtle Grove (23) Diversion near Deer Range	A 15,000 cfs delta building diversion at Myrtle Grove is authorized by WRDA. Myrtle Grove is also a LACPR Habitat Evaluation Team priority. State has identified measure 2-13 as an “urgent early action.”
North rim of Barataria Bay	(7) North Bay Rim Marsh Creation/Protection – 3538 acres along northern border of Barataria Bay @ 900 ac per year	No corresponding measure.	No corresponding measure.	
South of Myrtle Grove (West Point a la Hache diversion)	(8) West Point a la Hache Diversion	(2-14) Mississippi River Diversion at West Pointe a la Hache (replace existing siphon with a diversion of 2,500 to 15,000 cfs) and with Dedicated Dredging for approx. 16,500 acres of wetlands.	No corresponding measure.	West Point a la Hache is an existing siphon with max. 2,100 cfs capacity. State has identified measure 2-14 as an “urgent early action.”
Lower Barataria Basin (Port Sulphur Diversion)	(9) Port Sulphur Diversion – sized to sustain receiving area	No corresponding measure.	(12) Port Sulphur to Empire – marsh creation adjacent to lower Plaquemines levees.	The Port Sulphur diversion is a LACPR Habitat Evaluation Team priority.
Lower Barataria Basin (Sunrise/Buras area)	(10) Buras Diversion – sized to sustain receiving area	No corresponding measure.	(13) Buras to Venice – marsh creation adjacent to Lower Plaquemines levees; (24) 150,000 cfs land building diversion near Sunrise in Plaquemines Parish	The Buras diversion is a LACPR Habitat Evaluation Team priority.
Lower Barataria Basin (Ft. Jackson)	(11) Fort Jackson Diversion – sized to sustain receiving area	No corresponding measure.	No corresponding measure.	Fort Jackson is a proposed sediment diversion under CWPPRA at max. 15,000 cfs. Also, included as a LACPR Habitat Evaluation Team priority.

TABLE 36. PLANNING UNIT 2 COASTAL RESTORATION SUMMARY COMPARISON TABLE

(Green highlights denote common measures)

Area	LACPR	SMP	MLODS	Comments/Other
Mississippi River Delta (West Bay)	No changes specified to existing diversion.	No changes specified to existing diversion.	(25) Maintain existing 25,000 cfs West Bay diversion (don't increase to 50,000 cfs)	West Bay Sediment Diversion is a constructed CWPPRA project at 25,000 cfs. The current plan is to modify the crevasse breach to increase the discharge to 50,000 cfs.
Barrier Island Restoration	(12) Barrier Islands Restoration – 15,029 acres @ 900 acres/year	(2-17) Barrier Shoreline Restoration: Barataria Basin (includes the Caminada Headland between Belle Pass and Caminada Pass)	(14) Sandy Point to Quatre Bayou Pass shoreline restoration, including CWPPRA projects, closure of unneeded navigation channels, Shell Island project in LCA (15) East Grande Terre to Pt. Chenier Ronquille – construction of offshore breakers; (27) Restoration of the Caminada Headland near Fourchon; beach nourishment, marsh creation, ridge restoration.	State has identified measure 2-17 as an “urgent early action.” The “Caminada Headland near Fourchon” project is similar to a plan in the LCA study.
Bankline Protection for GIWW	No corresponding measure	(2-18) Bankline Protection for GIWW	No corresponding measure.	
Marsh Restoration using Dredged Material in Barataria Basin	LACPR recommends selected marsh creation measures such as (6) and (7) above; however, LACPR doesn't have any marsh creation measures on the scale of the SMP measure (2-15)	(2-15) create approx. 148,000 acres of marsh via slurry pipelines with pumps and outlet units as identified in the CH2Mhill Third Delta report.	MLODS has selected marsh creation measures such as (16) marsh creation northeast of Fourchon Headland, but because of the high cost of marsh creation, the report recommends “more selective restoration” than the State plan.	State has identified measure 2-15 as an “urgent early action.”
Ridge Habitat Restoration in Barataria Basin	No corresponding measure.	(2-16) Restore approx. 23 miles of natural ridge by increasing ridge elevation and width with dredged material, planting of woody vegetation and native wetland plants. Targeted ridges	(17) Restore ridge along Bayou Grand Chenier	

TABLE 36. PLANNING UNIT 2 COASTAL RESTORATION SUMMARY COMPARISON TABLE

(Green highlights denote common measures)

Area	LACPR	SMP	MLODS	Comments/Other
		<p>include: Bayou Lafourche, Bayou L'Ours, Bayou Grande Cheniere, Caminada Chenier, Bayou Dupont, and original channel of Bayou Barataria east of Dupre cut.</p>		
<p>Bayou Lafourche Spillway</p>	<p>No corresponding measure.</p>	<p>No corresponding measure.</p>	<p>(26) Controlled spillway across Bayou Lafourche ridge south of Cutoff</p>	<p>LACPR evaluated MS River spillways at a conceptual level, but they are not part of the coastal restoration measures.</p>

Specific Coastal Restoration Measures Planning Unit 3a

TABLE 37. LACPR COASTAL RESTORATION MEASURES IN PLANNING UNIT 3A	
No.	Description (Measures that are part of the R1 alternative)
1	Houma Navigation Canal Lock Multi-purpose Operation
2	Convey Atchafalaya River water via Gulf Intracoastal Waterway
3	Lapeyrouse Canal diversion
4	Blue Hammock diversion
5	Upper Lake Boudreaux Basin Mississippi River Diversion
6	East Terrebonne Mississippi River Diversion
7	Grand Bayou & Jean LaCroix Basins Mississippi River Diversions
8	Pipeline Conveyance Marsh Creation (92,174 acres)
9	North Terrebonne Bay Rim Marsh Creation (3,158 acres)
10	DuLarge to Grand Caillou Landbridge Marsh Creation (1,170 acres)
11	South Caillou Lake Landbridge Marsh Creation (19,964 acres)
12	Isles Dernieres Restoration
13	Timbalier Islands Restoration

TABLE 38. SMP COASTAL RESTORATION MEASURES IN PLANNING UNIT 3A	
No. from SMP (Appendix A)	Description
3a-6	Bankline Protection for Houma Navigation Canal
3a-7	Multipurpose Operation of the Houma Navigation Canal Lock
3a-8	Bankline Protection for Gulf Intracoastal Waterway
3a-9	Marsh Restoration Using Dredged Material in Terrebonne Basin
3a-10	Chacahoula Basin Plan
3a-11	Freshwater Introduction via Blue Hammock Bayou
3a-12	Ridge Habitat Restoration in Terrebonne Basin
3a-13	Maintain Landbridge between Caillou Lake and Gulf of Mexico
3a-14	Barrier Shoreline Restoration: Terrebonne Basin
2-9	Move Freshwater to Terrebonne Basin from Barataria Basin via GIWW
3b-6	Convey Atchafalaya River Water Eastward via GIWW to Benefit Eastern and Lower Terrebonne Marshes

TABLE 39. MLODS COASTAL RESTORATION MEASURES IN PLANNING UNIT 3A	
No. from MLODS Report	Description
4	Lake Boudreaux Basin – Restore marsh to 1978 extent with marsh creation (7000 acres), restore hydrologic connections and restore canals.
5	W. Pointe au Chien WMA (Madison Bay) – Restore marsh to 1978 extent with marsh creation (12,500 acres), restore hydrologic connections and restore canals.
6	E. Point au Chien WMA (Madison Bay) – Restore marsh to 1978 extent with marsh creation (12,500 acres) and restore canals.
7	Caillou Lake to Upper Timbalier Bay – Aggressive oyster reef restoration and restore marsh with marsh creation (8000 acres).
8	Houma Navigation Canal – Construct multi-purpose lock structure including salinity control.
9	Hwy 57 and other artificial hydrologic barriers – Restore hydrology with additional culverts to Lake Boudreaux Basin.
10	Isle Derniers Barrier Island – Maintain barrier islands with Ship Shoal sand
11	Cat Island Pass – Construct offshore breakwaters to trap sand of terminal ends shoreline drift
12	East and West Timbalier Islands – Maintain barrier islands with Ship Shoal sand
13	South of Cut Off, Bayou Lafourche – Controlled hurricane surge relief spillway: east to west or west to east across Bayou Lafourche, also used for flood year pulse events east to west discharge freshwater.
14	Lake Palourde (East Atchafalaya Restoration Spillway) or Bayou Penchant Diversion – Outfall management to enhance freshwater movement from Lake Palourde diversion (in Planning Unit 3b) to central Terrebonne Parish
15	Mississippi River Diversions into Terrebonne Basin - Bayou Lafourche and sustaining diversion - Divert approximately 30,000 cfs from Mississippi River through the Barataria Basin and into eastern Terrebonne Basin through a new, regional conveyance canal.
16	Management of Freshwater discharge through the GIWW - ~Outfall management of Atchafalaya Discharge via GIWW for bald cypress forests near levee

TABLE 40. PLANNING UNIT 3A COASTAL RESTORATION SUMMARY COMPARISON TABLE				
(Green highlights denote common measures)				
Area	LACPR	SMP	MLODS	Comments/Other
Barataria Basin to Terrebonne Basin	No corresponding measure.	(2-9) Move Freshwater to Terrebonne Basin from Barataria Basin via GIWW (same measure also appears in Planning Unit 2)	No corresponding measure.	
Houma Navigation Canal	(1) HNC Lock Multi-purpose Operation	(3a-7) Multipurpose Operation of the Houma Navigation Canal Lock; (3a-6) Bankline Protection for Houma Navigation Canal	(8) Houma Navigation Canal – Construct multi-purpose lock structure including salinity control.	State has identified measure 3a-7 as an “urgent early action.”

TABLE 40. PLANNING UNIT 3A COASTAL RESTORATION SUMMARY COMPARISON TABLE

(Green highlights denote common measures)

Area	LACPR	SMP	MLODS	Comments/Other
Atchafalaya River/GIWW	(2) Convey Atchafalaya River water eastward via GIWW	(3b-6) Convey Atchafalaya River Water Eastward via GIWW to Benefit Eastern and Lower Terrebonne Marshes; (3a-8) Bankline Protection for Gulf Intracoastal Waterway	(14) Lake Mechant/Lake Decade region (East Atchafalaya Restoration Spillway) – Outfall management to enhance freshwater movement from Lake Palourde diversion (in Planning Unit 3b) to central Terrebonne Parish	State has identified measure 3b-6 as an “urgent early action.”
Lapeyrouse Canal	(3) Lapeyrouse Canal diversion	No corresponding measure.	No corresponding measure.	
Blue Hammock Bayou	(4) Blue Hammock diversion (also listed in PU3b)	(3a-11) Freshwater Introduction via Blue Hammock Bayou	No corresponding measure.	State has identified measure 3a-11 as an “urgent early action.”
Upper Lake Boudreaux Basin	(5) Upper Lake Boudreaux Basin Mississippi River Diversion	No corresponding measure.	(4) Lake Boudreaux Basin – Restore marsh to 1978 extent with marsh creation (7000 acres), restore hydrologic connections. (9) Hwy 57 and other artificial hydrologic barriers – Restore hydrology with additional culverts to Lake Boudreaux Basin.	
East Terrebonne	(6) East Terrebonne Mississippi River Diversion	No corresponding measure.	No corresponding measure.	
Grand Bayou & Jean LaCroix Basins	(7) Grand Bayou & Jean LaCroix Basins Mississippi River Diversions	No corresponding measure.	No corresponding measure.	Related to CWPPRA project XTE-49?

TABLE 40. PLANNING UNIT 3A COASTAL RESTORATION SUMMARY COMPARISON TABLE

(Green highlights denote common measures)

Area	LACPR	SMP	MLODS	Comments/Other
Terrebonne Basin Marsh Creation	(8) Pipeline Conveyance Marsh Creation (92,174 acres); (9) North Terrebonne Bay Rim Marsh Creation (3,158 acres); (10) DuLarge to Grand Caillou Landbridge Marsh Creation (1,170 acres); (11) South Caillou Lake Landbridge Marsh Creation (19,964 acres)	(3a-9) Marsh Restoration Using Dredged Material in Terrebonne Basin (approx. 11,400 acres); (3a-13) Maintain Landbridge between Caillou Lake and Gulf of Mexico	(5) W. Pointe au Chien WMA (Madison Bay) – Restore marsh to 1978 extent with marsh creation (12,500 acres), restore hydrologic connections; (6) E. Point au Chien WMA (Madison Bay) – Restore marsh to 1978 extent with marsh creation (12,500 acres); (7) Caillou Lake to Upper Timbalier Bay – Aggressive oyster reef restoration and restore marsh with marsh creation (8000 acres).	State has identified measures 3a-9 and 3a-13 as “urgent early actions.” Terrebonne Bay Shoreline Protection and Marsh Creation is a project recommended for study under CWPPRA.
Barrier Island Restoration in Terrebonne Basin	(12) Isles Dernieres Restoration; (13) Timbalier Islands Restoration	(3a-14) Barrier Shoreline Restoration: Terrebonne Basin	(10) Isle Derniers Barrier Island – Maintain barrier islands with Ship Shoal sand; (12) East and West Timbalier Islands – Maintain barrier islands with Ship Shoal sand	State has identified measure 3a-14 as an “urgent early action.”
Chacahoula Basin Plan	No corresponding measure.	(3a-10) Chacahoula Basin Plan	No corresponding measure.	
Ridge Habitat Restoration in Terrebonne Basin	No corresponding measure.	(3a-12) Ridge Habitat Restoration in Terrebonne Basin	No corresponding measure.	
Cat Island Pass	No corresponding measure.	No corresponding measure.	(11) Cat Island Pass – Construct offshore breakwaters to trap sand of terminal ends shoreline drift	
South of Cut Off, Bayou Lafourche	No corresponding measure.	No corresponding measure.	(13) Controlled hurricane surge relief spillway: east to west or west to east across Bayou Lafourche, also used for flood	

TABLE 40. PLANNING UNIT 3A COASTAL RESTORATION SUMMARY COMPARISON TABLE

(Green highlights denote common measures)

Area	LACPR	SMP	MLODS	Comments/Other
			year pulse events east to west discharge freshwater.	
Bayou Lafourche near Donaldsonville	Initially designed under the CWPPRA program but currently being developed by the State.	Mississippi River Diversion at Bayou Lafourche (discussed in PU2 section)	(15) Bayou Lafourche – Bayou Lafourche diversion maximum discharge design 30,000 cfs	

Specific Coastal Restoration Measures Planning Unit 3b

TABLE 41. LACPR COASTAL RESTORATION MEASURES IN PLANNING UNIT 3B

No.	Description (Measures that are part of the R1 alternative)
1	Penchant Basin Plan
2	Convey Atchafalaya River water via GIWW
3	Relocate the Navigation Channel through Lower Atchafalaya River Delta
4	Increase Sediment Transport down the Wax Lake Outlet
5	Barrier Reef from Eugene Island to Pointe au Fer Island
6	Blue Hammock Bayou Freshwater Introduction (benefits in PU3a)
7	Gulfshore Protection at Pointe au Fer Island
8	Freshwater Bayou Bank Protection, Belle Isle to Lock
9	Southwest Pass Bank Protection
10	Marsh Island Shoreline Protection
11	Gulfshore Protection from Freshwater Bayou to Southwest Pass
12	Shoreline Protection at Vermilion Bay & West Cote Blanche Bay
13	East Cote Blanche Bay Shore Protection
14	Bayou De Cade Area Marsh Creation (5,870 acres)
15	Brady Canal Area Marsh Creation (2,731 acres)
16	Pointe au Fer Island Marsh Creation (1,462 acres)
17	Marsh Island Marsh Creation (7,883 acres)
18	Wax Lake Outlet Delta Marsh Creation (4,736 acres)
19	Bayou Penchant Area Marsh Creation (6,554 acres)
20	Terrebonne GIWW Area Marsh Creation (3,977 acres)

TABLE 42. SMP COASTAL RESTORATION MEASURES IN PLANNING UNIT 3B	
No. from SMP (Appendix A)	Description
3b-5	Barrier Island Restoration: Point au Fer Island
3b-6	Convey Atchafalaya River Water Eastward via GIWW to Benefit Eastern and Lower Terrebonne Marshes
3b-7	Bankline Stabilization of Freshwater Bayou from Belle Isle Bayou to Freshwater Bayou Canal Lock
3b-8	Increase Sediment Transport Down Wax Lake Outlet
3b-9	Southwest Pass Shoreline Stabilization
3b-10	Barrier Shoreline Restoration: Freshwater Bayou to South Point/Marsh Island
3b-11	Bankline Protection for GIWW
3b-12	Raynie Marsh Restoration
3b-13	Convey Atchafalaya River Water Westward via GIWW
3b-14	Marsh Restoration Using Dredged Material at Weeks Bay
3b-15	Marsh Restoration Using Dredged Material at Marsh Island
3b-16	Marsh Restoration using Dredged Material at Point au Fer
3b-17	Stabilize Shoreline of Vermilion, East and West Cote Blanche Bays
3b-18	Freshwater Introduction into Central and Lower Terrebonne Marshes
3b-19	Fortify Spoil Banks of GIWW and Freshwater Bayou

TABLE 43. MLODS COASTAL RESTORATION MEASURES IN PLANNING UNIT 3B	
No. from MLODS Report	Description
5	South Marsh Island – Restore to ~1978 marsh extent with marsh creation (500 acres)
6	Outer Atchafalaya Bay – Restore structural oyster reefs at appropriate isohaline conditions
7	Ponte au Fer Island – Restore to ~1978 marsh extent with marsh creation (1000 acres)
8	Wax Lake Outlet – Maintain status quo of active delta
9	Atchafalaya Delta – Reduced discharge for the Lake Poulourde diversion (~20,000 acres)
10	Lake Palourde to Penchant Basin (East Atchafalaya Restoration Spillway) – Atchafalaya River diversion, max. discharge 20,000 cfs
11	GIWW- Hwy 317 to Hwy 82 – Outfall management to convey freshwater east of Hwy 82

TABLE 44. PLANNING UNIT 3B COASTAL RESTORATION SUMMARY COMPARISON TABLE

(Green highlights denote common measures)

Area	LACPR	SMP	MLODS	Comments/Other
Penchant Basin	(1) Penchant Basin Plan			
Atchafalaya River/GIWW	(2) Convey Atchafalaya River water via GIWW	(3b-6) Convey Atchafalaya River Water Eastward via GIWW to Benefit Eastern and Lower Terrebonne Marshes; (3b-13) Convey Atchafalaya River Water Westward via GIWW	(11) GIWW- Hwy 317 to Hwy 82 – Outfall management to convey freshwater east of Hwy 82	(3b-6) and (3b-13) have been identified by the State as an “Urgent Early Action.”
Lower Atchafalaya River Delta	(3) Relocate the Navigation Channel through Lower Atchafalaya River Delta	No corresponding measure.	(9) Atchafalaya Delta – Reduced discharge for the Lake Poulourde diversion (~20,000 acres); (10) Lake Palourde to Penchant Basin (East Atchafalaya Restoration Spillway) – Atchafalaya River diversion, max. discharge 20,000 cfs	
Wax Lake Outlet	(4) Increase Sediment Transport down the Wax Lake Outlet; (18) Wax Lake Outlet Delta Marsh Creation (4,736 acres)	(3b-8) Increase Sediment Transport Down Wax Lake Outlet	(8) Wax Lake Outlet – Maintain status quo of active delta	
Pointe au Fer Island	(7) Gulfshore Protection at Pointe au Fer Island; (16) Pointe au Fer Island Marsh Creation (1,462 acres)	(3b-5) Barrier Island Restoration: Point au Fer Island; (3b-16) Marsh Restoration using Dredged Material at Point au Fer	(7) Pointe au Fer Island – Restore to ~1978 marsh extent with marsh creation (1000 acres)	A State dedicated dredging project at Point Au Fer (LA-01f) project was completed in 2007. Measure 3b-16 has been identified by the State as an “Urgent Early Action.”
Blue Hammock Bayou	(6) Blue Hammock Bayou Freshwater Introduction (benefits in PU3a)	(3a-11) Freshwater Introduction via Blue Hammock Bayou (from PU3a)	No corresponding measure.	

TABLE 44. PLANNING UNIT 3B COASTAL RESTORATION SUMMARY COMPARISON TABLE

(Green highlights denote common measures)

Area	LACPR	SMP	MLODS	Comments/Other
Freshwater Bayou Bank Protection	(8) Freshwater Bayou Bank Protection, Belle Isle to Lock	(3b-7) Bankline Stabilization of Freshwater Bayou from Belle Isle Bayou to Freshwater Bayou Canal Lock; (3b-19) Fortify Spoil Banks of GIWW and Freshwater Bayou	No corresponding measure.	
Southwest Pass	(9) Southwest Pass Bank Protection	(3b-9) Southwest Pass Shoreline Stabilization	No corresponding measure.	
Marsh Island	(10) Marsh Island Shoreline Protection; (17) Marsh Island Marsh Creation (7,883 acres)	(3b-10) Barrier Shoreline Restoration: Freshwater Bayou to South Point/Marsh Island; (3b-15) Marsh Restoration Using Dredged Material at Marsh Island	(5) South Marsh Island – Restore to ~1978 marsh extent with marsh creation (500 acres)	
Vermilion Bay, East and West Cote Blanche Bays	(12) Shoreline Protection at Vermilion Bay & West Cote Blanche Bay; (13) East Cote Blanche Bay Shore Protection	(3b-17) Stabilize Shoreline of Vermilion, East and West Cote Blanche Bays	No corresponding measure.	
Bayou De Cade Area	(14) Bayou De Cade Area Marsh Creation (5,870 acres)	No corresponding measure.	No corresponding measure.	
Brady Canal Area	(15) Brady Canal Area Marsh Creation (2,731 acres)	No corresponding measure.	No corresponding measure.	
Bayou Penchant Area	(19) Bayou Penchant Area Marsh Creation (6,554 acres)	No corresponding measure.	No corresponding measure.	
Central and Lower Terrebonne Marshes	No corresponding measure.	(3b-18) Freshwater Introduction into Central and Lower Terrebonne Marshes	No corresponding measure.	

TABLE 44. PLANNING UNIT 3B COASTAL RESTORATION SUMMARY COMPARISON TABLE

(Green highlights denote common measures)

Area	LACPR	SMP	MLODS	Comments/Other
Terrebonne GIWW Area	(20) Terrebonne GIWW Area Marsh Creation (3,977 acres)	No corresponding measure.	No corresponding measure.	
Bankline Protection for GIWW	No corresponding measure.	(3b-11) Bankline Protection for GIWW	No corresponding measure.	Measure 3b-11 has been identified by the State as an “Urgent Early Action.”
Raynie Marsh	No corresponding measure.	(3b-12) Raynie Marsh Restoration	No corresponding measure.	Measures 3b-12 has been identified by the State as an “Urgent Early Action.”
Weeks Bay	No corresponding measure.	(3b-14) Marsh Restoration Using Dredged Material at Weeks Bay	No corresponding measure.	Related to “Weeks Bay” project in WRDA (CWPPRA project TV-19): Weeks Bay Marsh Creation and Shore Protection/Commercial Canal Freshwater Redirection
Outer Atchafalaya Bay	(5) Barrier Reef from Eugene Island to Pointe au Fer Island	No corresponding measure.	(6) Outer Atchafalaya Bay – Restore structural oyster reefs at appropriate isohaline conditions	
Gulfshore Protection Freshwater Bayou to Southwest Pass	(11) Gulfshore Protection from Freshwater Bayou to Southwest Pass	No corresponding measure.	No corresponding measure.	

Specific Coastal Restoration Measures Planning Unit 4

TABLE 45. LACPR COASTAL RESTORATION MEASURES IN PLANNING UNIT 4	
No.	Description (Measures that are part of the R1 alternative)
1	Marsh Creation at Mud Lake (5,669 acres)
2	Marsh Creation at South Grand Chenier (8,575 acres)
3	Marsh Creation at South Pecan Island (9,851 acres)
4	Marsh Creation at East Pecan Island (7,184 acres)
5	Marsh Creation at No-Name Bayou (2,151 acres)
6	Marsh Creation at NW Calcasieu Lake (23,187 acres)
7	Marsh Creation at East Calcasieu Lake (14,141 acres)
8	Marsh Creation at Black Bayou (4,769 acres)
9	Marsh Creation at Gum Cove (3,261 acres)
10	Marsh Creation at Cameron Meadows (1,293 acres)
11	Marsh Creation at Central Canal (120 acres)
12	GIWW bank stabilization
13	Grand Lake bank stabilization
14	White Lake bank stabilization
15	Gulf Shoreline Stabilization (Sabine River to Calcasieu River)
16	Gulf Shoreline Stabilization (Calcasieu River to Freshwater Bayou)

TABLE 46. SMP COASTAL RESTORATION MEASURES IN PLANNING UNIT 4	
No. from SMP (Appendix A)	Description
4-4	Bankline protection for GIWW
4-5	Restore and maintain the Mermentau Lakes Basin integrity
4-6	Stabilize Grand Lake Shoreline
4-7	Stabilize White Lake Shoreline
4-8	Bankline stabilization of Freshwater Bayou
4-9	Salinity control structure at Calcasieu Pass
4-10	Barrier Shoreline Restoration: Sabine River to Calcasieu River
4-11	Barrier Shoreline Restoration: Calcasieu River to Freshwater Bayou
4-12	Marsh restoration using dredged material south of Highway 82 (3000 acres south of Hwy 82, east and west of the Calcasieu Ship Channel)
4-13	Beneficial uses of dredged material from Calcasieu Ship Channel
4-14	Salinity control structure at Sabine Pass

TABLE 46. SMP COASTAL RESTORATION MEASURES IN PLANNING UNIT 4

No. from SMP (Appendix A)	Description
4-15	Fortify spoil banks of GIWW and Freshwater Bayou
4-16	Stabilize Calcasieu Lake Shoreline
4-17	Stabilize Sabine Lake Shoreline
4-18	Mermentau Basin Watershed Management Plan to retain freshwater resources
4-19	Sabine Basin Watershed Management
4-20	Hydrologic improvements in Mermentau Basin at Highways 82 and 27

TABLE 47. MLODS COASTAL RESTORATION MEASURES IN PLANNING UNIT 4

No. from MLODS Report	Description
4	Black Lake – Hackberry – Restore marsh to ~1978 extent – beneficial/dedicated dredging for marsh creation (5000 acres)
5	East Calcasieu Lake – Restore and maintain land bridge with shoreline protection and marsh creation to ~1978 extent (500 acres)
6	White Lake – Grand Lake Land Bridge – Restore and maintain land bridge with shoreline protection and marsh creation to ~1978 extent (1000 acres)
7	Calcasieu Landbridge and Shoreline – Stabilize and restore the Calcasieu Landbridge and stabilize the gulf shoreline; marsh creation (1000 acres)
8	Marsh seaward of Grand Chenier – Restore and maintain land bridge with marsh creation (1500 acres)
9	Grand Chenier ridges – Restore ridges and upland forests on prominent ridges
10	Hackberry & Blue Buck ridges – restore ridges and upland forests on prominent ridges
12	Calcasieu Pass – Salinity control structure.
13	Sabine-Neches Waterway – Salinity control structure.
14	South of White and Grand Lakes – Flap-gate culverts.
15	GIWW at Gum Cove Ridge – Salinity control structure
16	Sabine River to Sabine National WR – Sabine River discharge southwest to Sabine NWR, max discharge 5000 cfs.
17	GIWW – outfall management to convey freshwater east of Hwy 82. max discharge 2000 cfs.
18	Red River/Bayou Beouf – Diversion to convey freshwater through the upper Mermentau Basin and into the lower basin – will also be used heavily to flush saltwater from agricultural land and marshes following a storm surge. (2000 cfs typical; 12,000 cfs following a storm surge)
19	Mermentau Basin Hydrologic Management Plan

TABLE 48. PLANNING UNIT 4 COASTAL RESTORATION SUMMARY COMPARISON TABLE

(Green highlights denote common measures)

Area	LACPR	SMP	MLODS	Comments/Other
South of Calcasieu Lake	(1) Marsh creation at Mud Lake (5,669 acres); (5) Marsh Creation at No-Name Bayou (2,151 acres)	No corresponding measure.	(7) Calcasieu Landbridge and Shoreline – Stabilize and restore the Calcasieu Landbridge and stabilize the gulf shoreline; marsh creation (1,000 acres)	
East and West of Calcasieu Lake	(6) Marsh Creation at NW Calcasieu Lake (23,187 acres); (7) Marsh Creation at East Calcasieu Lake (14,141 acres)	(4-12) Marsh restoration using dredged material south of Highway 82 (3,000 acres south of Hwy 82, east and west of the Calcasieu Ship Channel)	(4) Black Lake – Hackberry – Restore marsh to ~1978 extent – beneficial/dedicated dredging for marsh creation (5000 acres); (5) East Calcasieu Lake – Restore and maintain land bridge with shoreline protection and marsh creation to ~1978 extent (500 acres)	
South Grand Chenier area	(2) Marsh creation at South Grand Chenier (8,575 acres)	No corresponding measure.	(8) Marsh seaward of Grand Chenier – Restore and maintain land bridge with marsh creation (1,500 acres)	
Pecan Island area	(3) Marsh creation at South Pecan Island (9,851); (4) Marsh creation at East Pecan Island (7,184 acres)	SMP shows marsh creation in South Pecan Island as part of measure (4-13) Beneficial uses of dredged material from Calcasieu Ship Channel.	(8) Marsh seaward of Grand Chenier – Restore and maintain land bridge with marsh creation (1,500 acres)	
Black Bayou	(8) Marsh Creation at Black Bayou (4,769 acres)	No corresponding measure.	No corresponding measure.	
Gum Cove	(9) Marsh Creation at Gum Cove (3,261 acres)	No corresponding measure.	(15) GIWW at Gum Cove Ridge – Salinity control structure	
Chenier Ridges	No corresponding measure.	No corresponding measure.	(9) Grand Chenier ridges – Restore ridges and upland forests on prominent ridges; (10) Hackberry & Blue Buck ridges – restore	

TABLE 48. PLANNING UNIT 4 COASTAL RESTORATION SUMMARY COMPARISON TABLE

(Green highlights denote common measures)

Area	LACPR	SMP	MLODS	Comments/Other
			ridges and upland forests on prominent ridges	
Cameron Meadows	(10) Marsh Creation at Cameron Meadows (1,293 acres)	No corresponding measure.	No corresponding measure.	
Central Canal	(11) Marsh Creation at Central Canal (120 acres)	No corresponding measure.	No corresponding measure.	
GIWW bank stabilization	(12) GIWW bank stabilization	(4-4) Bankline protection for GIWW; (4-15) Fortify spoil banks of GIWW and Freshwater Bayou	No corresponding measure.	(4-15) has been identified by the State as an “Urgent Early Action.”
GIWW Outfall	No corresponding measure.	No corresponding measure.	(17) GIWW – outfall management to convey freshwater east of Hwy 82. max discharge 2000 cfs.	
Grand Lake and White Lake	(13) Grand Lake Bank Stabilization; (14) White Lake bank stabilization	(4-6) Stabilize Grand Lake Shoreline; (15) Stabilize White Lake Shoreline	(6) White Lake – Grand Lake Land Bridge – Restore and maintain land bridge with shoreline protection and marsh creation to ~1978 extent (1000 acres)	
Gulf Shoreline	(15) Gulf Shoreline Stabilization (Sabine River to Calcasieu River); (16) Gulf Shoreline Stabilization (Calcasieu River to Freshwater Bayou)	(4-10) Barrier Shoreline Restoration: Sabine River to Calcasieu River; (4-11) Barrier Shoreline Restoration: Calcasieu River to Freshwater Bayou	(7) Calcasieu Landbridge and Shoreline – Stabilize and restore the Calcasieu Landbridge and stabilize the gulf shoreline	(4-11) has been identified by the State as an “Urgent Early Action.”
Calcasieu Pass	No corresponding measure.	(4-9) Salinity control structure at Calcasieu Pass	(12) Calcasieu Pass – Salinity control structure.	

TABLE 48. PLANNING UNIT 4 COASTAL RESTORATION SUMMARY COMPARISON TABLE

(Green highlights denote common measures)

Area	LACPR	SMP	MLODS	Comments/Other
Calcasieu Lake	No corresponding measure.	(4-16) Stabilize Calcasieu Lake Shoreline	No corresponding measure.	
Sabine Pass	No corresponding measure.	(4-14) Salinity control structure at Sabine Pass	(13) Sabine-Neches Waterway – Salinity control structure.	
Sabine River	No corresponding measure.	No corresponding measure.	(16) Sabine River to Sabine National WR – Sabine River discharge southwest to Sabine NWR, max discharge 5000 cfs.	Is this related to the “Sabine National Wildlife Refuge Area B” project in WRDA?
Sabine Lake	No corresponding measure.	(4-17) Stabilize Sabine Lake Shoreline	No corresponding measure.	
Sabine Basin	No corresponding measure.	(4-19) Sabine Basin Watershed Management	No corresponding measure.	
Freshwater Bayou	No corresponding measure.	(4-8) Bankline stabilization of Freshwater Bayou	No corresponding measure.	
Mermentau Basin	No corresponding measure.	(4-5) Restore and maintain the Mermentau Lakes Basin integrity; (4-18) Mermentau Basin Watershed Management Plan to retain freshwater resources; (4-20) Hydrologic improvements in Mermentau Basin at Highways 82 and 27	(14) South of White and Grand Lakes – Flap-gate culverts; (18) Red River/Bayou Beouf – Diversion to convey freshwater through the upper Mermentau Basin and into the lower basin – will also be used heavily to flush saltwater from agricultural land and marshes following a storm surge. (2000 cfs typical; 12,000 cfs following a storm surge)	(4-5) and (4-18) have been identified by the State as an “Urgent Early Action.”

Areas of Consensus for Coastal Restoration Measures

TABLE 49. MEASURES IN ALL THREE REPORTS

Planning Unit	Area/Landscape Feature	Measure/Solution	Comments
1	Maurepas Swamp/Hope Canal/Blind River Basin	Two diversions	Similar to CWPPRA project PO-29. The LACPR Habitat Evaluation Team noted these as high priority diversions for the Pontchartrain Basin.
1	East New Orleans land bridge	Marsh creation and/or stabilization	
1	MRGO at Bayou la Loutre ridge	Close MRGO	SMP recommends restoring the ridge but LACPR does not.
1	MRGO-Lake Borgne Landbridge	Stabilize landbridge by marsh creation, diversions, and/or bank stabilization	
1	Biloxi Marshes/Landbridge/Barrier Reefs	Violet/Bayou La Loutre diversion, marsh creation, shore stabilization, barrier reef restoration.	WRDA 2007 authorized construction of a diversion at or near Violet.
1	Bayou Terre aux Boeufs/Upper Breton Sound marshes	Marsh creation, modification of Caernarvon diversion	Caernarvon is a LACPR Habitat Evaluation Team priority diversion.
1	Bayou Lamoque	Diversion	Bayou Lamoque Freshwater Diversion is a 13,000 cfs CIAP project under E&D (also CWPPRA project BS-13 from PPL15). The Bayou Lamoque diversion is a LACPR Habitat Evaluation Team priority.
2	Upper Barataria Basin	Two diversions at strategic locations (e.g. Lagan and Edgard)	
2	Barataria Basin north of Lake Salvador	Modify Davis Pond diversion	Reauthorizing Davis Pond is a LACPR Habitat Evaluation Team priority.
2	Barataria Basin Landbridge	Myrtle Grove diversion and marsh creation	WRDA 2007 authorized a 15,000 cfs delta building diversion at Myrtle Grove. Myrtle Grove is also a LACPR Habitat Evaluation Team priority.
2	Barrier Islands in Barataria	Barrier Island Restoration	
2	Lower Barataria Basin (Sunrise to Venice area)	Diversion or spillway	The MLODS proposes controlled surge relief spillways near Sunrise. The State proposes a delta management diversion at

TABLE 49. MEASURES IN ALL THREE REPORTS			
Planning Unit	Area/Landscape Feature	Measure/Solution	Comments
			Boothville/Venice.
3a	Houma Navigation Canal	multi-purpose lock	
3a	Terrebonne Basin Marsh Creation	Marsh creation and restoration	
3a	Barrier Island Restoration in Terrebonne Basin	Restoration of Timbalier Islands and Isles Dernieres	
3a/3b	Atchafalaya River/GIWW	Convey Atchafalaya River water via GIWW to Terrebonne Parish	
3b	Pointe au Fer Island	Marsh creation	
3b	Marsh Island	Shoreline protection/marsh creation	
4	East and West of Calcasieu Lake	Marsh creation	Over 37, 000 acres in LACPR; approx. 3,000 acres in SMP; approx. 5,500 acres in MLODS
4	South Pecan Island area	Marsh creation	Approx. 9,800 acres in LACPR; less than 1,500 acres in MLODS; number of acres not specified in SMP
4	Grand Lake and White Lake	Bank/shoreline stabilization	
4	Gulf Shoreline	Shoreline stabilization	

TABLE 50. MEASURES IN LACPR AND SMP (BUT NOT MLODS)			
Planning Unit	Area/Landscape Feature	Measure/Solution	Comments
2	South of Myrtle Grove (Point a la Hache)	Diversion	
3a/3b	Blue Hammock Bayou	Blue Hammock Diversion	
3b	Wax Lake Outlet	Increase Sediment Transport Down Wax Lake Outlet	
3b	Freshwater Bayou Bank Protection	Bank stabilization	
3b	Southwest Pass	Bank stabilization	
3b	Vermilion Bay and East and West Cote Blanche Bays	Shoreline protection/stabilization	
4	GIWW bank stabilization	Bank stabilization	

TABLE 51. MEASURES IN LACPR AND MLODS (BUT NOT SMP)

Planning Unit	Area/Landscape Feature	Measure/Solution	Comments
1	LaBranche Wetlands	Diversion	
2	Lower Barataria Basin (Port Sulphur/Bohemia area)	Diversion or Spillway	LACPR proposes at diversion at Port Sulphur. The MLODS proposes controlled surge relief spillways near Bohemia.
3a	Upper Lake Boudreaux Basin	Diversion, culverts, and/or marsh creation	
3b	Outer Atchafalaya Bay	Restore barrier/oyster reefs	
4	South of Calcasieu Lake/Calcasieu Landbridge	Marsh creation	Over 7,800 acres in LACPR; approx. 1,000 acres in MLODS
4	South Grand Chenier area	Marsh creation	Approx. 8,575 acres in LACPR; approx. 1,500 acres in MLODS

TABLE 52. MEASURES IN SMP AND MLODS (BUT NOT LACPR)

Planning Unit	Area/Landscape Feature	Measure/Solution	Comments
1	Marshes adjacent to MS River in Plaquemines Parish	White Ditch diversion	CWPPRA project #BS-12
1	Chandeleur Islands	Barrier shoreline restoration	
2	Bayou Grande Chenier	Ridge restoration	
2/3a	Bayou Lafourche near Donaldsonville	Bayou Lafourche diversion	Related to CWPPRA project #BA-25b?
4	Calcasieu Pass	Salinity control structure	
4	Sabine Pass	Salinity control structure	
4	Mermentau Basin	Diversion, watershed management plan, hydrologic improvements	

TABLE 53. PRIORITY MEASURES IN LACPR NOT CONTAINED IN SMP OR MLODS

Planning Unit	Area/Landscape Feature	Measure/Solution	Comments
2	Lower Barataria Basin	Fort Jackson Diversion	

Attachment 3

Flood Protection Alliance –
Inner Levee Plan

Inner Levee Plan Proposed by Flood Protection Alliance (East Bank of Greater New Orleans)

Description: Containment system to inhibit flood waters from flowing unencumbered across portions of the city. Includes connecting natural ridges, drainage canal levees and elevated railway right of ways and gating sewer pipes, repairing roadways at Parish lines, constructing moveable gate at Bayou St. John and retrofitting underpasses (see photos to right).

Beneficial Considerations: Contains overtopping in confined areas; near term benefit – while perimeter strengthened; attractive time line; minimal environmental impacts; manageable construction; can be implemented in stages; pumps for over topping / interior drainage remain operational; personal & property safety; confidence builder.

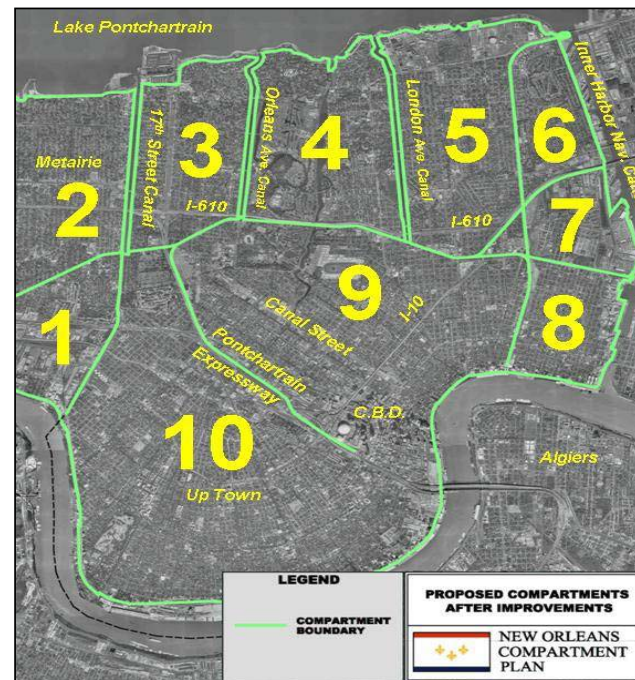
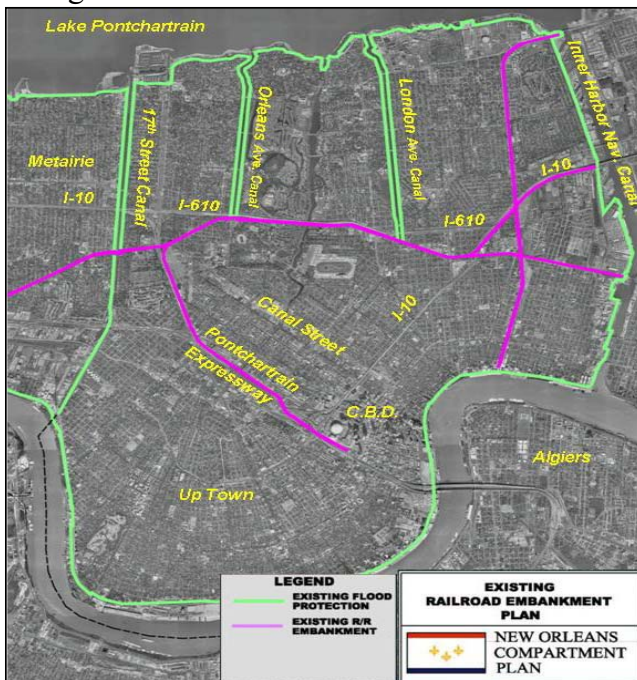
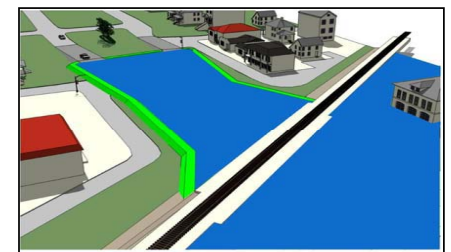
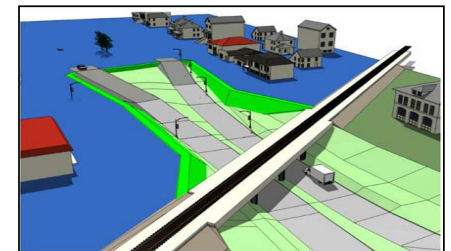
Challenges: Engineering; elevating railroad beds; numerous closure structures; authority or jurisdiction challenges.



Typical Railroad Underpass

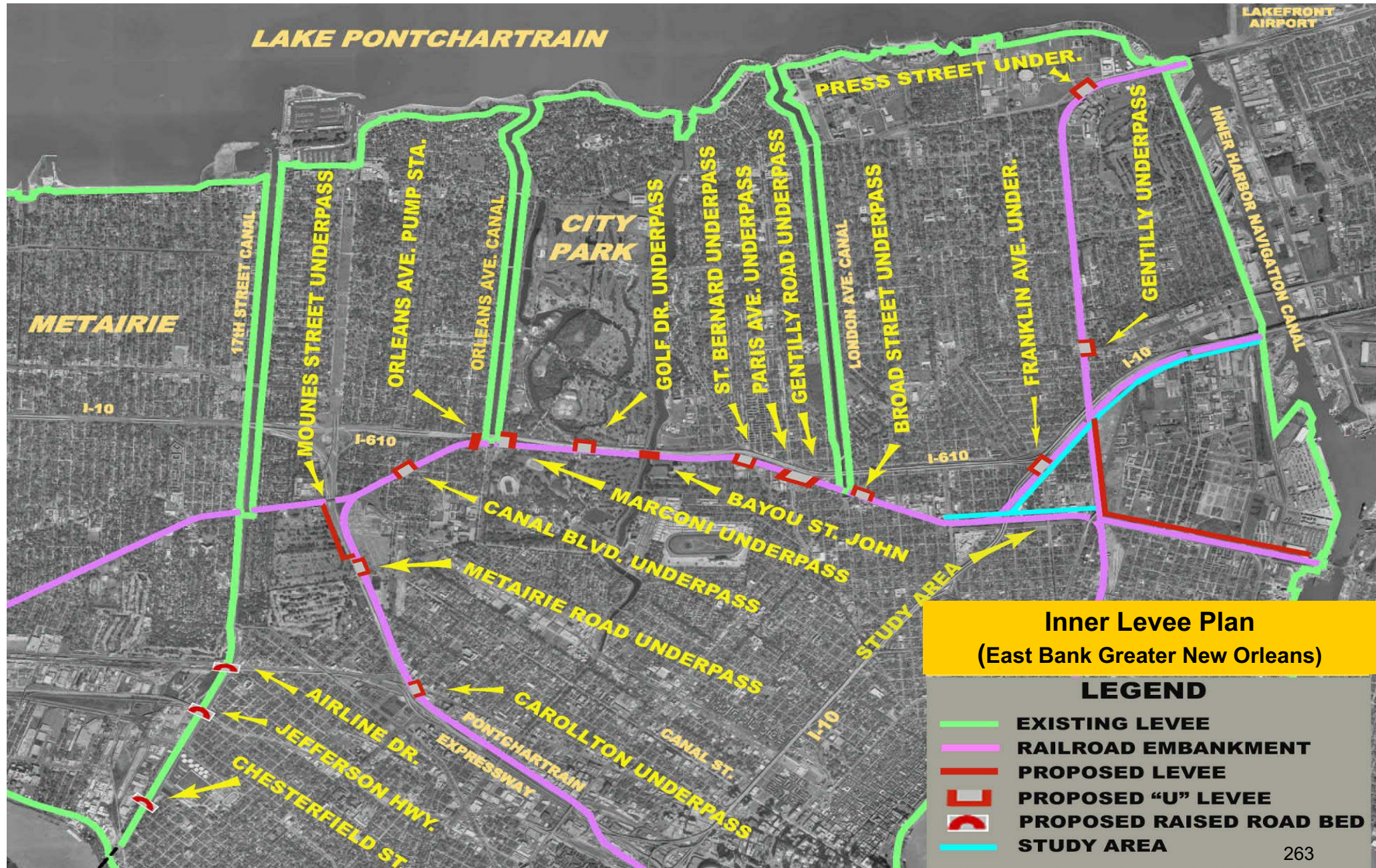


Railroad Underpass – “U” Levee Added



LAKE PONTCHARTRAIN

LAKEFRONT AIRPORT



Inner Levee Plan (East Bank Greater New Orleans)

LEGEND

- EXISTING LEVEE
- RAILROAD EMBANKMENT
- PROPOSED LEVEE
- PROPOSED "U" LEVEE
- PROPOSED RAISED ROAD BED
- STUDY AREA

Flood risk analysis Compartment Plan New Orleans¹

A flood risk analysis has been executed to roughly investigate the effectiveness of the compartment plan from Bring New Orleans Back for the New Orleans Metro area (Figure 1). For this purpose, we have used an existing 2D flooding model from Delft Hydraulics as a starting point. This model includes the various breaches along the canals and predicts the two-dimensional spreading of the water in time and space. It should be noted, however, that several aspects are not included in the model (rainfall, drainage system). Figure 2 shows the flooded area during Katrina at Tuesday 30th August 2005 (12pm). Despite the model limitations, a comparison with the time line of Katrina in the IPET reports shows that the flooding in time and space is predicted with a reasonable accuracy.

We have implemented the compartment plan from Bring New Orleans Back to investigate the effectiveness of this plan. Two alternatives are evaluated: low inner levees and high inner levees. Figure 2 shows the flooded area during Katrina at Tuesday 30th August 2005 (12pm) including the compartment plan (high inner levees alternative). The model results clearly show the impact of this compartment plan on the flooding behaviour.

Finally, we have analyzed the effects of this compartment plan in terms of damage (Table 1). The damage during Katrina for this area is estimated at 10 billion USD. With the compartment alternatives, this damage reduces with 1.5 – 6 billion USD. The results indicate that a more in-depth cost-benefit study regarding compartments is worthwhile to reduce the flood risk in the low-lying and densely populated area of New Orleans.

For more information:

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¹ Disclaimer:

This message is not intended to provide construction, engineering or architectural advice. If such advice is required, it should be obtained in the form of complete plans and drawings. Unless complete drawings and plans are prepared and contracted for that enable construction, Haskoning Inc. does not guarantee the accuracy, completeness, efficacy, timeliness or correct sequencing of any information contained herein. Haskoning Inc.'s advice is subject to further review and this is not final until a written recommendation is rendered indicating final advice.

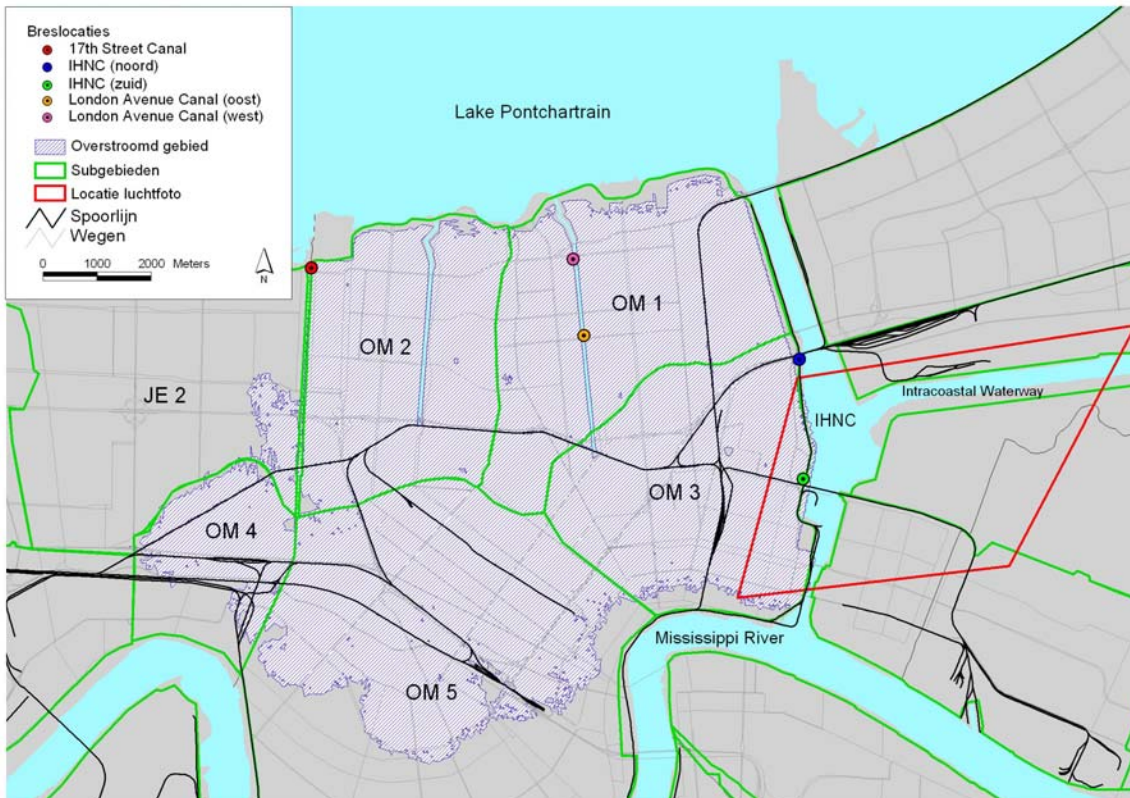


Figure 1: New Orleans Metro area with the economic subunits (OM1...OM5) and the locations of the breaches during Katrina.

Economic subunit	Existing situation (x 10⁹ \$)	Low inner levees (x 10⁹ \$)	High inner levees (x 10⁹ \$)
OM01	2.5	2.5	1.8
OM02	1.8	1.8	1.5
OM03	2.3	2.4	1.0
OM04	0.4	No damage	No damage
OM05	3.4	2.2	No damage
Total	10.4	8.8	4.2

Table 1: Expected direct damage in billions of dollars for the Katrina scenario using pre-Katrina damage numbers. The economic subareas are shown in Figure 1.

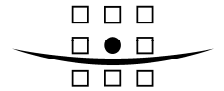
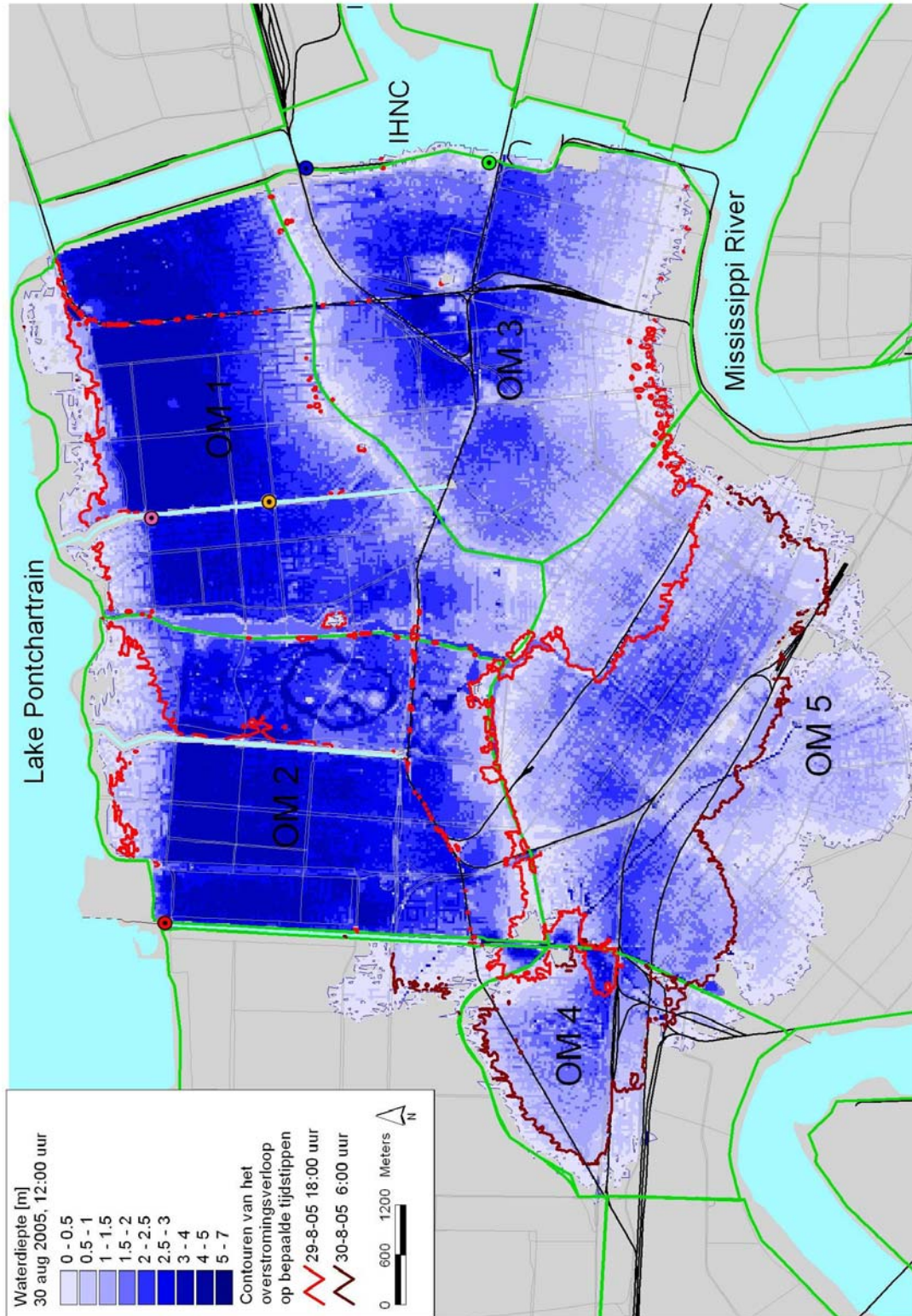


Figure 2: Present situation with breaches at IHNC, London Avenue Canal and 17th Street Canal during Katrina.



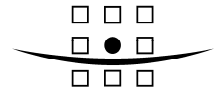


Figure 3: Situation with the compartment plan from Bring New Orleans Back with breaches at IHNC, London Avenue Canal and 17th Street Canal during Katrina.

