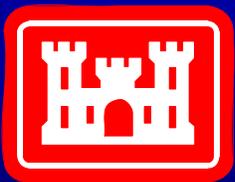


# Integrating Storm Protection and Coastal Restoration for Louisiana



**US Army Corps  
of Engineers®**  
New Orleans District

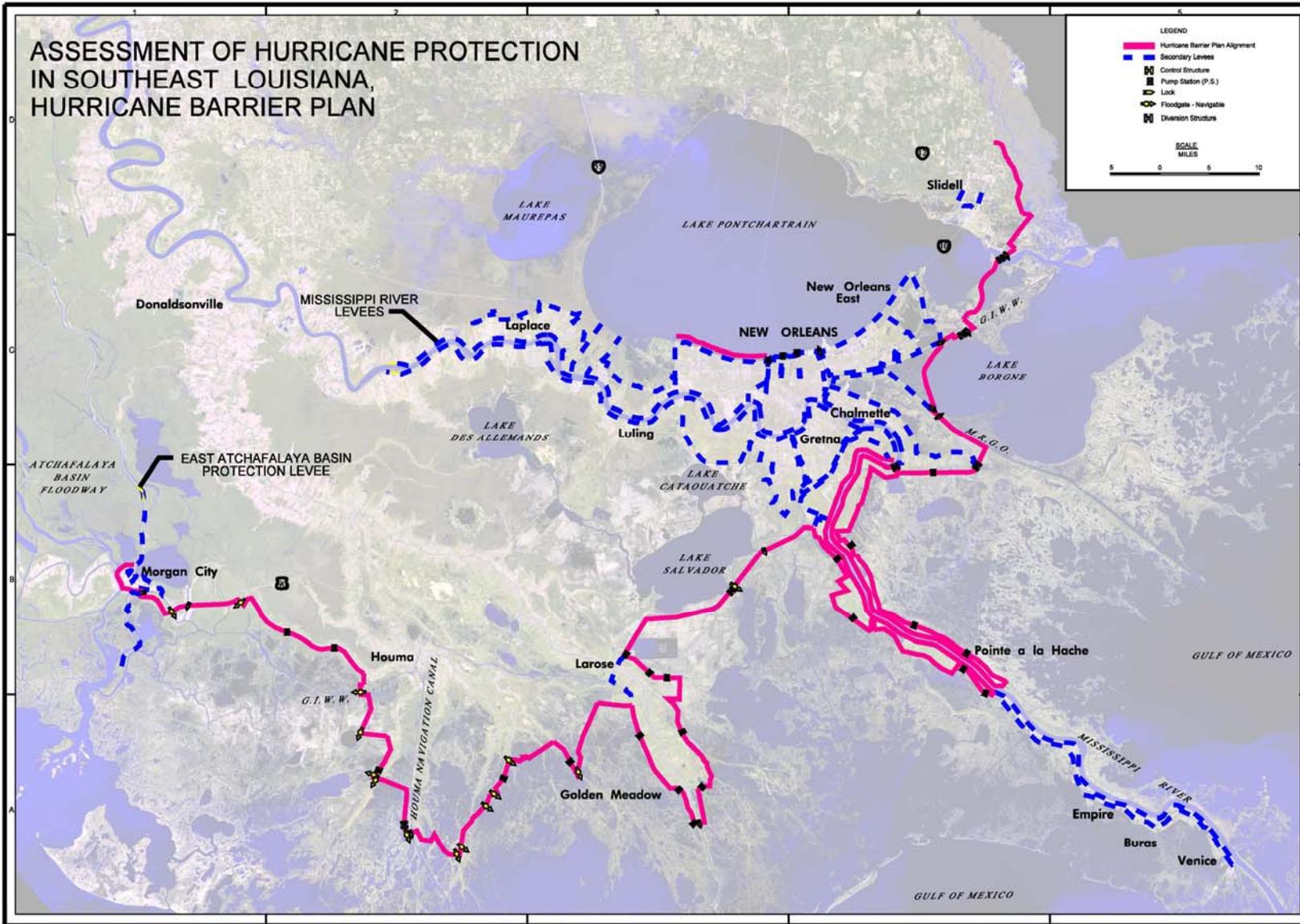
# Overview

- Increasing hurricane protection in southern LA
- Hurricane impacts to the coast
- Storm surge reduction
- Coordination
- Integrating coastal restoration plans

# Increasing Hurricane Protection in Southern LA



# ASSESSMENT OF HURRICANE PROTECTION IN SOUTHEAST LOUISIANA, HURRICANE BARRIER PLAN



**US ARMY CORPS OF ENGINEERS  
NEW ORLEANS DISTRICT**

DATE	DRAWN	CHECKED	APPROVED	DATE	DRAWN	CHECKED	APPROVED

PROJECT	NO. 10000000000000000000	DATE	10/1/2000	SCALE	AS SHOWN
DESIGNED BY		CHECKED BY		DATE	
DRAWN BY		APPROVED BY		DATE	
DATE					

U.S. ARMY CORPS OF ENGINEERS  
CORPS OF INGENIERS  
MISSISSIPPI VALLEY DIVISION

ASSESSMENT OF HURRICANE PROTECTION IN  
SOUTHEAST LOUISIANA  
**HURRICANE BARRIER PLAN**

SHEET IDENTIFICATION NUMBER  
**PLATE 20**



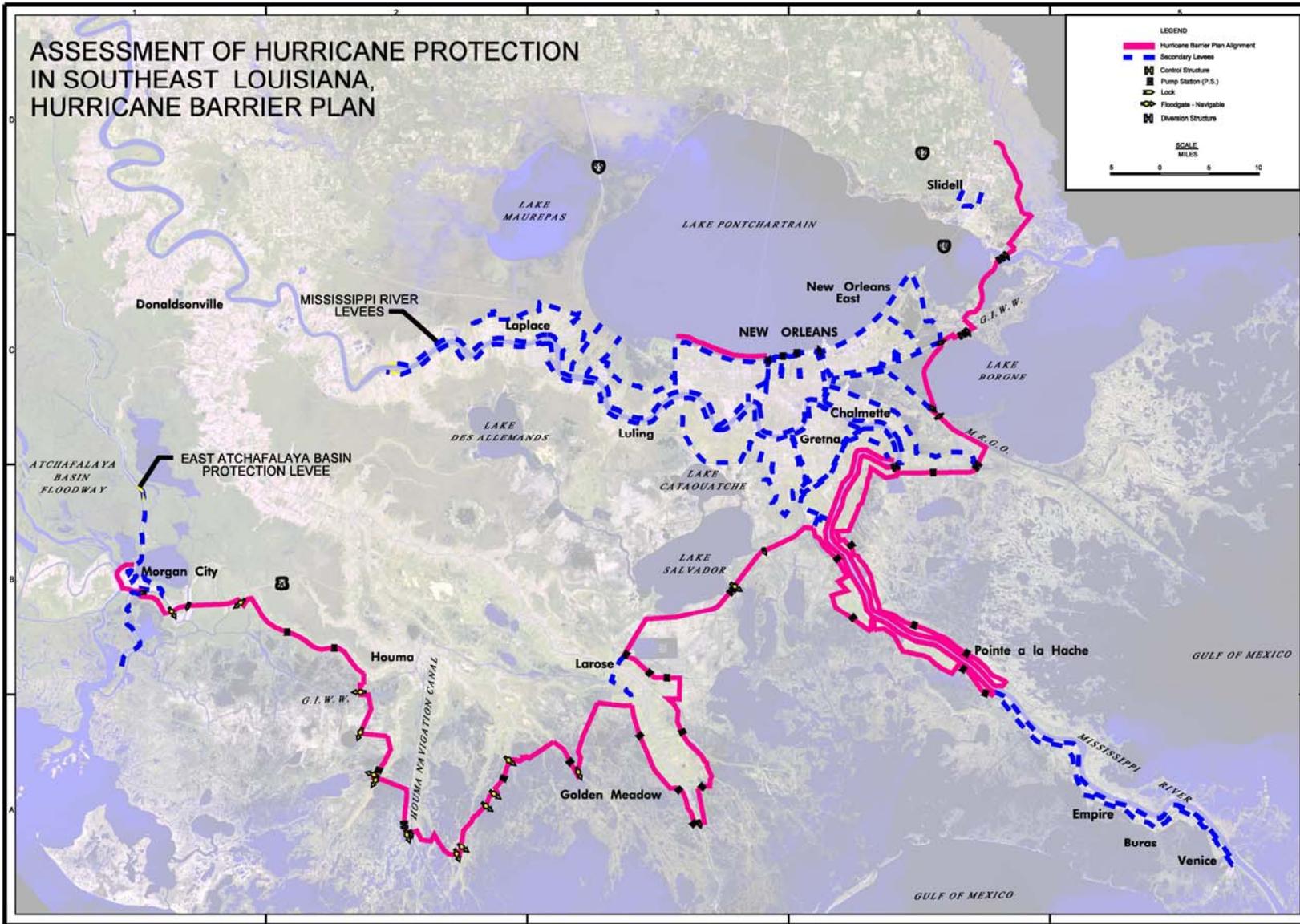








# ASSESSMENT OF HURRICANE PROTECTION IN SOUTHEAST LOUISIANA, HURRICANE BARRIER PLAN



**LEGEND**

- Hurricane Barrier Plan Alignment
- - - Secondary Levees
- Control Station (P.S.)
- Pump Station (P.S.)
- Lock
- Floodgate - Navigable
- Diversion Structure

**SCALE**  
MILES  
0 5 10

**US ARMY CORPS OF ENGINEERS  
NEW ORLEANS DISTRICT**

NO.	DATE	REVISION	DATE	REVISION	DATE	REVISION

PROJECT: ASSESSMENT OF HURRICANE PROTECTION IN SOUTHEAST LOUISIANA  
 DISTRICT: MISSISSIPPI VALLEY DIVISION  
 DIVISION: MISSISSIPPI VALLEY DIVISION  
 PROJECT NO.: 10000000000000000000  
 DRAWING NO.: 10000000000000000000  
 SHEET NO.: 10000000000000000000  
 DATE: 10/10/00  
 BY: J. J. JENSEN  
 CHECKED BY: J. J. JENSEN

**ASSESSMENT OF HURRICANE PROTECTION IN SOUTHEAST LOUISIANA  
HURRICANE BARRIER PLAN**

SHEET IDENTIFICATION NUMBER  
**PLATE 20**



# Hurricane Impacts to the Coast

# Direct Wetland Losses

- Caernarvon: Mississippi River diversion to create new wetlands (Multimillion dollar investment; 1991)
- Breton Sound Region (133 mi<sup>2</sup>) Preliminary Estimate ~ 26 % loss
  - Initial: wind & wave
  - Secondary: saltwater intrusion, increased susceptibility to storms

# Historic and Projected Landloss in the Vicinity of the Caernarvon Diversion



From USGS landloss map



Historic loss (1932-2000)



Projected loss (2000-2050)

*Landsat Thematic Mapper 5 Hurricane Katrina Comparison Images  
Upper Breton Sound Area*

April 16, 2004

September 7, 2005



Source: USGS NWRC  
Landsat Thematic Mapper Satellite Imagery provided by EROS Data Center  
Bands 4 (near-ir), 5 (mid-ir), and 3 (visible red) displayed

Draft: Sept. 28, 2005



**USGS**  
science for a changing world

# Storm Surge Reduction

# Strategic Natural Lines of Defense

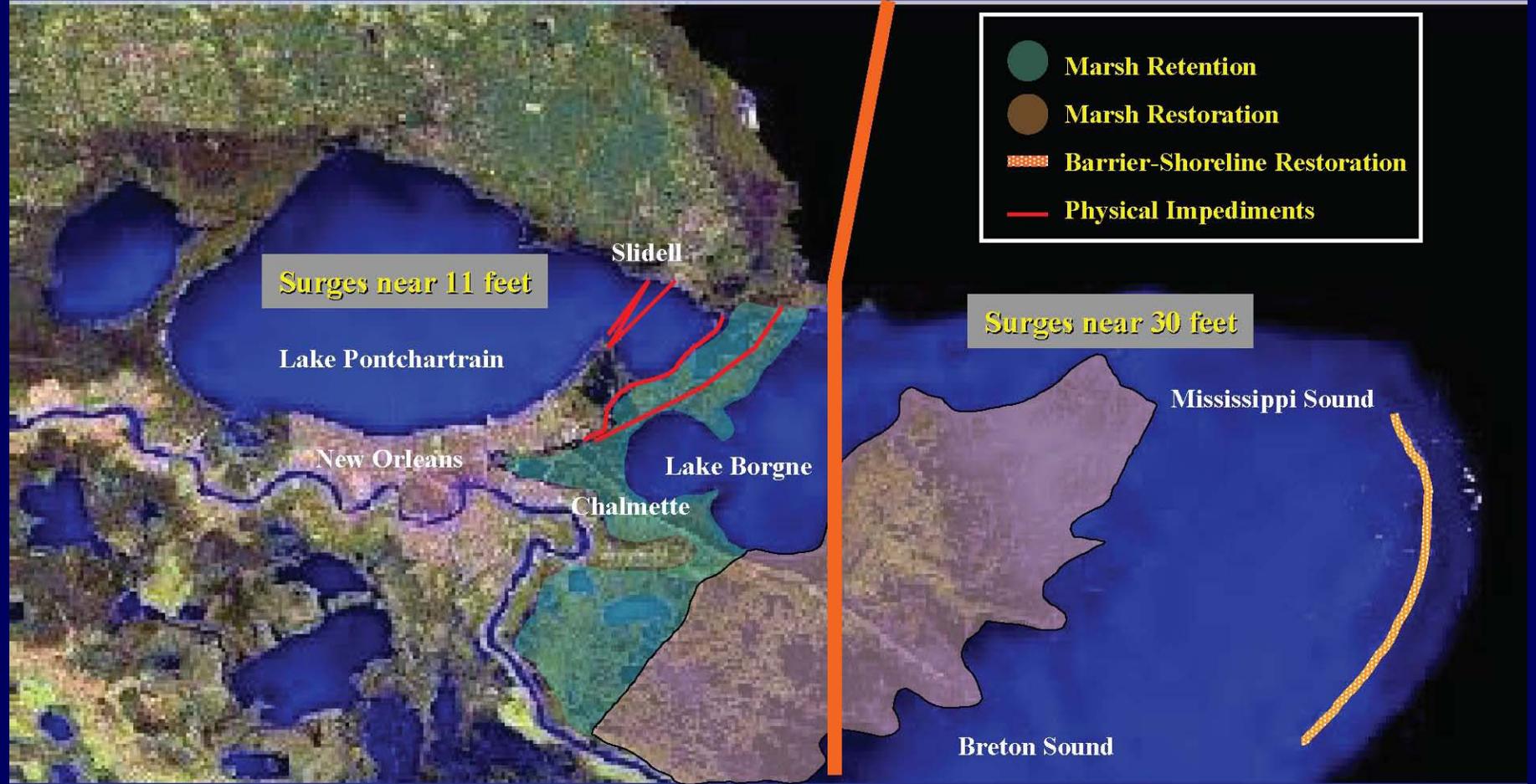


# Coastal Lines of Defense

- Wetlands provide flood water storage
- Natural habitat features (forested ridges, marsh and islands) buffer the coastal area from storms and provide other ecosystem benefits
- LA coast wetlands restoration supports coastal protection and recovery
- Surge reduction benefits more important in lower intensity storm events with more frequent return intervals

# Storm Surge Reduction

- **The concept of natural lines of storm surge defense is based on the hydraulic principle that surge elevation is effectively reduced by the friction of flowing over a vegetated land mass.**
- **Historically an engineering “rule of thumb” has been used for estimating potential storm surge reduction in LA.**
- **The engineering “rule of thumb” for the effect of coastal wetlands in reducing storm surge elevation provides for an estimated one foot of surge reduction for each 2.7 miles of wetlands over which the surge must flow.**

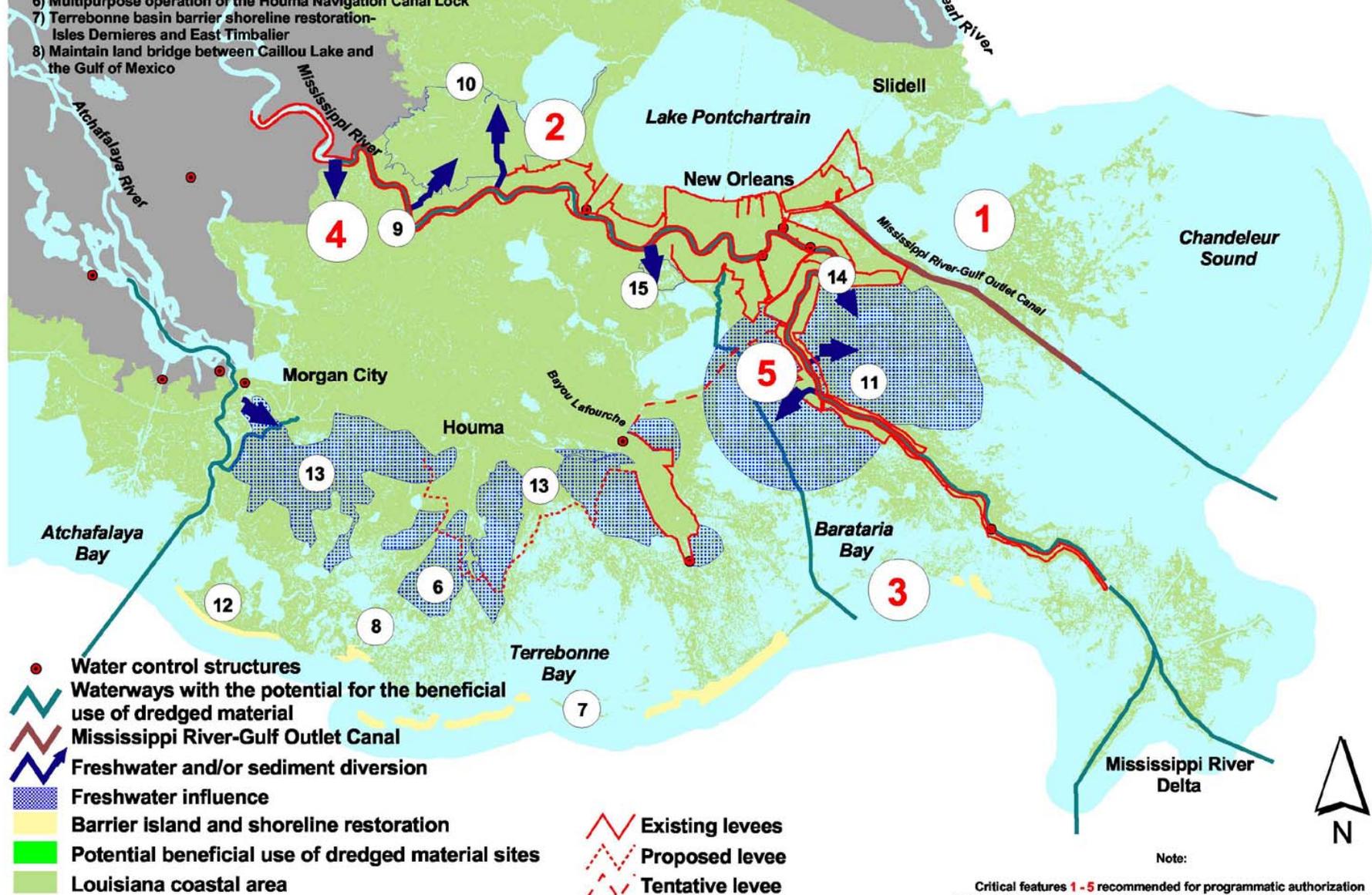


# LA Coastal Restoration Plan

# Louisiana Coastal Area Ecosystem Restoration Plan

**Critical restoration features:**

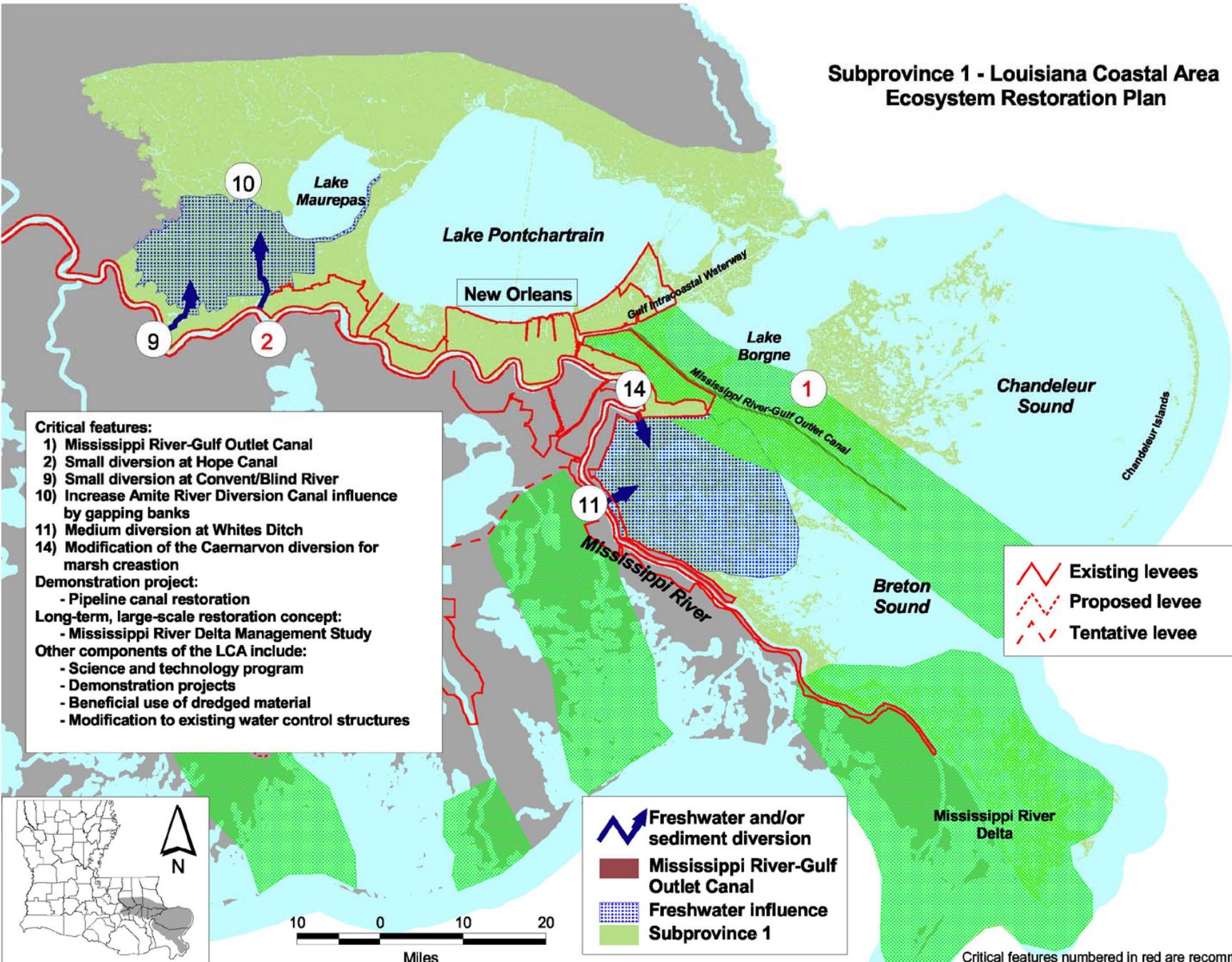
- |  |   |
|--|---|
| 1) Mississippi River-Gulf Outlet Canal (MRGO)  | 9) Small diversion at Convent/Blind River                           |
| 2) Small diversion at Hope Canal   | 10) Increase Amite River Diversion Canal influence by gapping banks |
| 3) Barataria Basin barrier shoreline restoration-Caminada headlands and Shell Island | 11) Medium diversion at Whites Ditch                                |
| 4) Small Bayou Lafourche reintroduction  | 12) Gulf shoreline stabilization at Point Au Fer Island             |
| 5) Medium diversion with dedicated dredging at Myrtle Grove                          | 13) Convey Atchafalaya River water to northern Terrebonne marshes   |
| 6) Multipurpose operation of the Houma Navigation Canal Lock                         | 14) Modification of the Caernarvon diversion for marsh creation     |
| 7) Terrebonne basin barrier shoreline restoration-Isles Dernieres and East Timbalier | 15) Modification of the Davis Pond diversion for marsh creation     |
| 8) Maintain land bridge between Caillou Lake and the Gulf of Mexico                  |   |



Note:

Critical features 1 - 5 recommended for programmatic authorization  
 Critical features 6 - 15 recommended for approval with future authorization

# Subprovince 1 - Louisiana Coastal Area Ecosystem Restoration Plan



- Critical features:**
- 1) Mississippi River-Gulf Outlet Canal
  - 2) Small diversion at Hope Canal
  - 9) Small diversion at Convent/Blind River
  - 10) Increase Arite River Diversion Canal influence by gapping banks
  - 11) Medium diversion at Whites Ditch
  - 14) Modification of the Caernarvon diversion for marsh creation
- Demonstration project:**
- Pipeline canal restoration
- Long-term, large-scale restoration concept:**
- Mississippi River Delta Management Study
- Other components of the LCA include:**
- Science and technology program
  - Demonstration projects
  - Beneficial use of dredged material
  - Modification to existing water control structures

- Existing levees
- Proposed levee
- Tentative levee

- Freshwater and/or sediment diversion
- Mississippi River-Gulf Outlet Canal
- Freshwater influence
- Subprovince 1



Critical features numbered in red are recommended for programmatic authorization.

# Prioritization

- The N-T Plan and all larger plans provide restoration below the existing or proposed storm protection
- The critical features provide benefit to lines of defense
- Requires increased priority and development:
  - Beneficial Use of Dredged Material
  - Modifications to Existing Structures
  - Restoration of historic hydrology and geomorphic-structure

# LCA Recommended Plan

## Louisiana Coastal Area Ecosystem Restoration

