



A Primer on the Management of Louisiana's Coastal Resources

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Louisiana Office of Coastal Protection and Restoration

Presentation to the
NASA Applied Sciences Gulf Workshop

New Orleans, Louisiana

8 December 2009

OUTLINE

- Issues challenging coastal Louisiana (natural and man-made)
 - Subsidence
 - Land Loss
 - Hypoxia
- What's at Stake?
- Ongoing activities to mitigate these challenges
 - Protection and restoration projects
 - Ongoing research & development activities

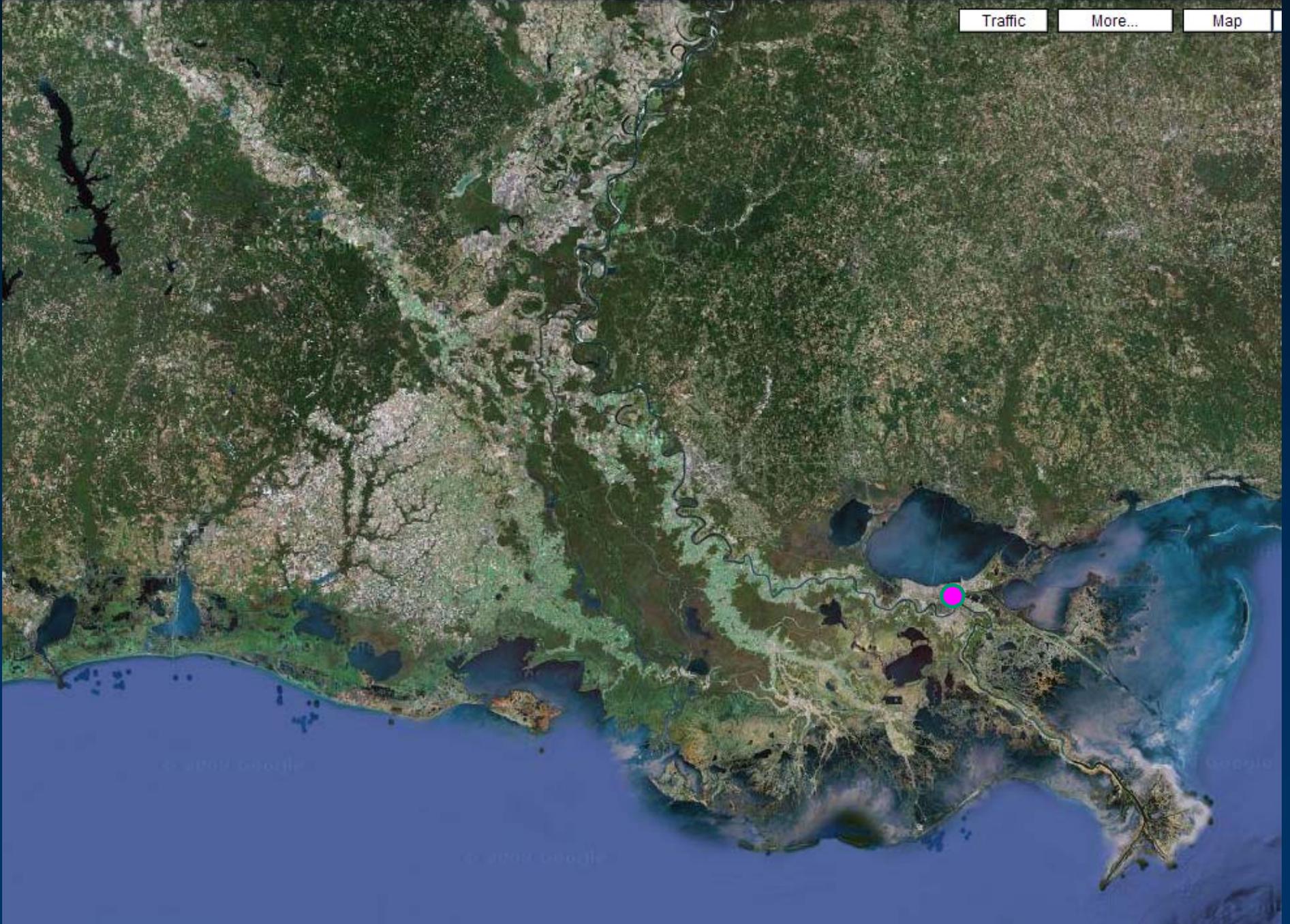
THE ISSUES

Life on a Delta

Traffic

More...

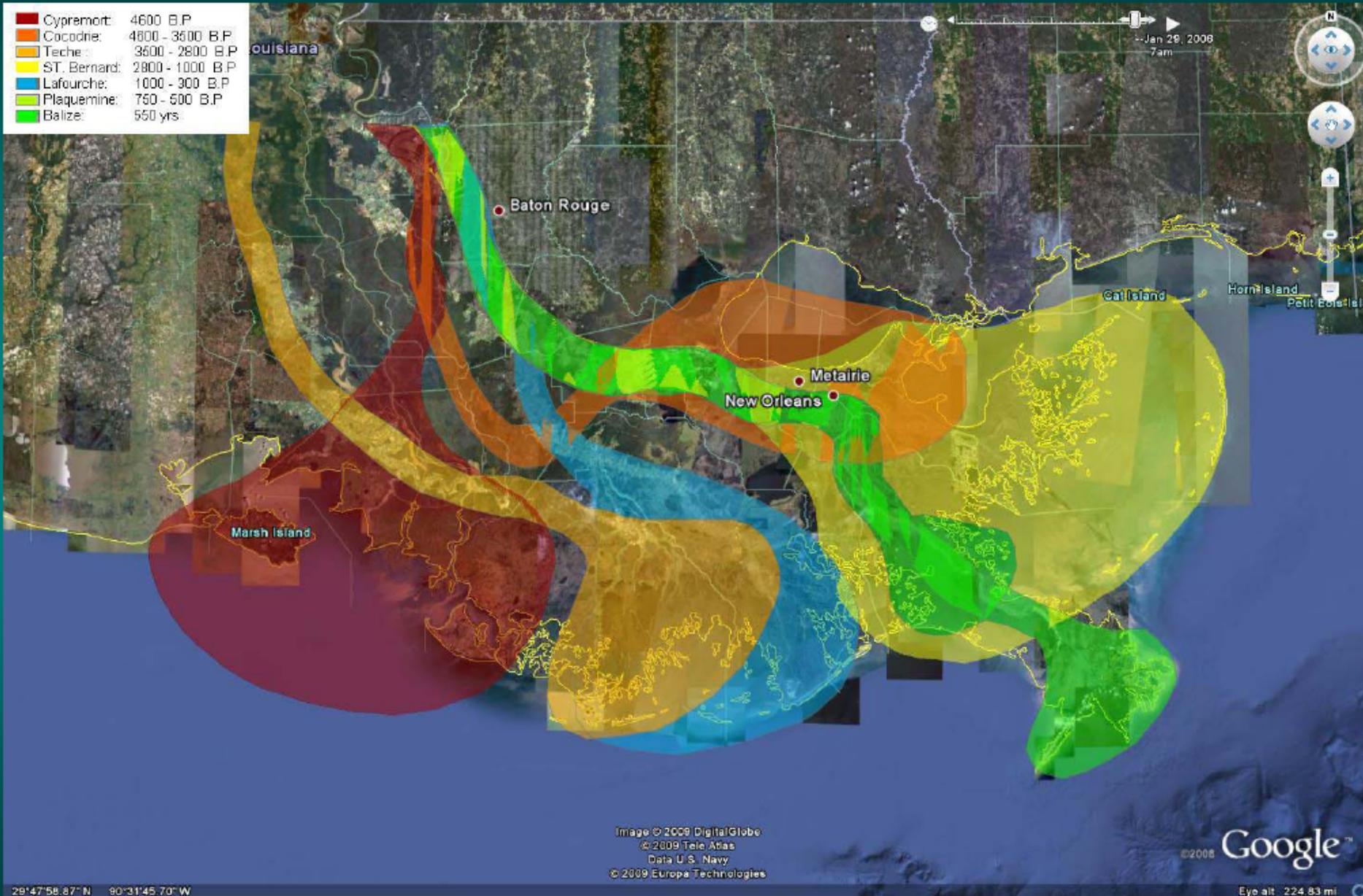
Map



© 2009 Google

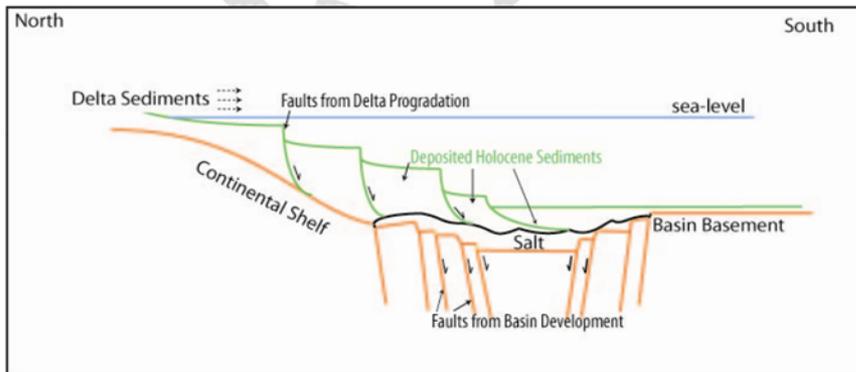
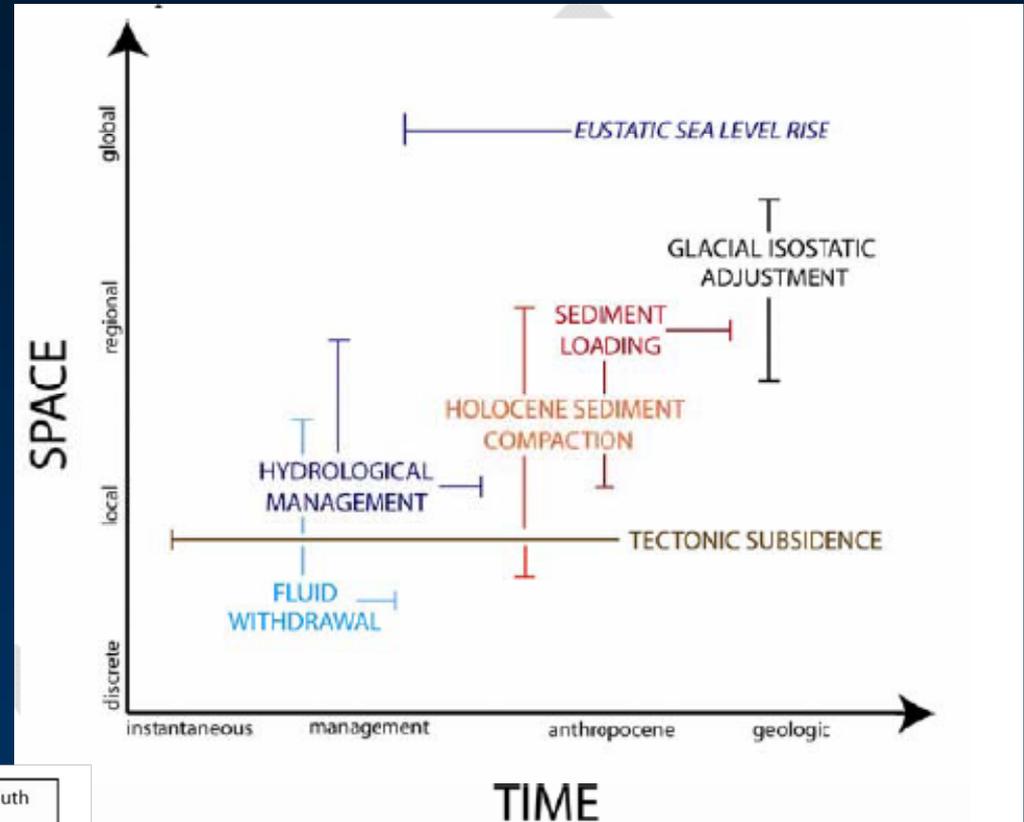
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Mississippi Delta Subaerial Evolution

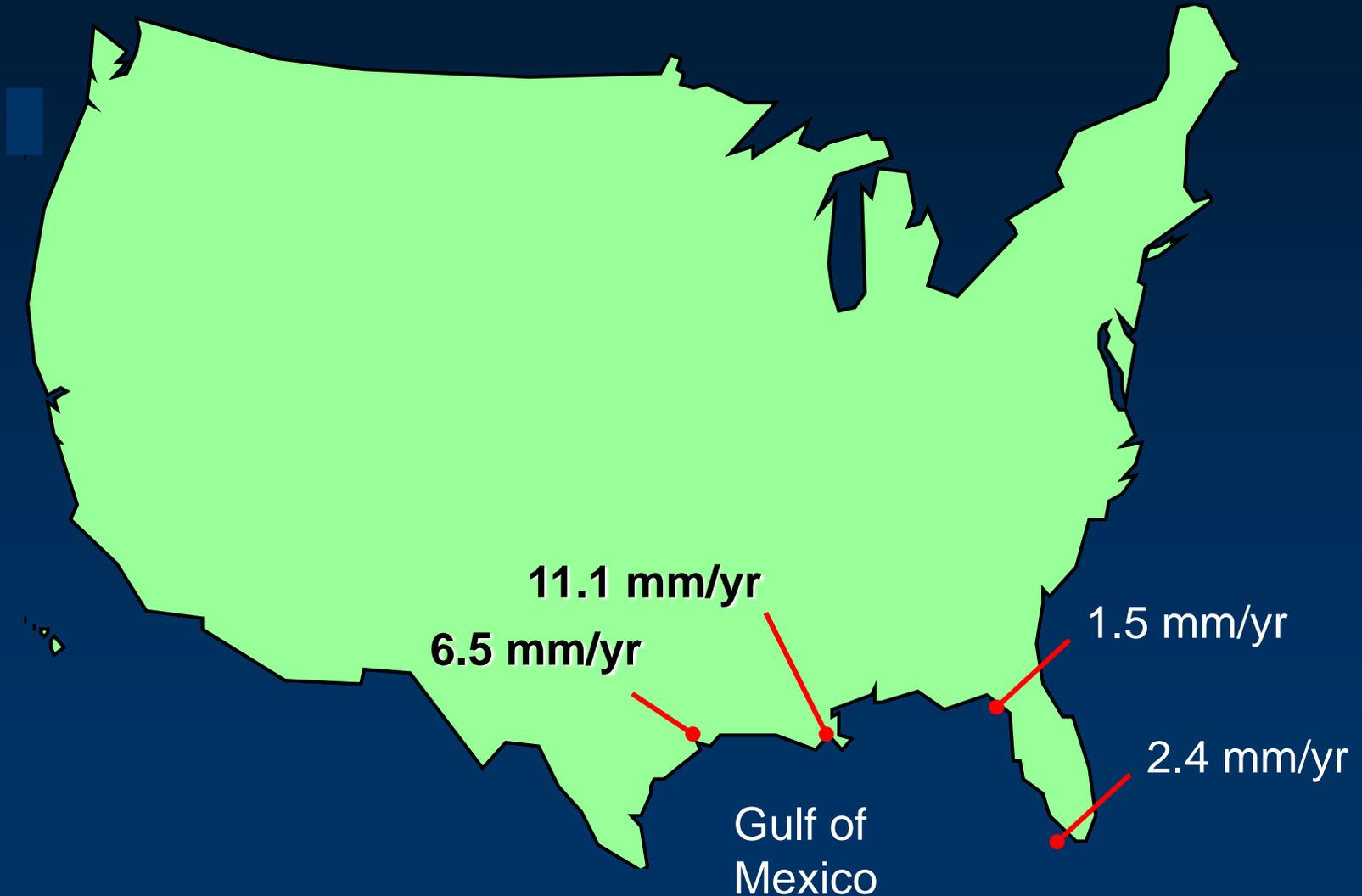


ISSUE: SUBSIDENCE

- Naturally high subsidence
 - Consolidation
 - Underlying geology
- Exacerbated by
 - Insufficient overbank flooding
 - Subterranean fluid withdrawal



OBSERVATIONS OF RELATIVE SLR: NORTHERN GULF OF MEXICO

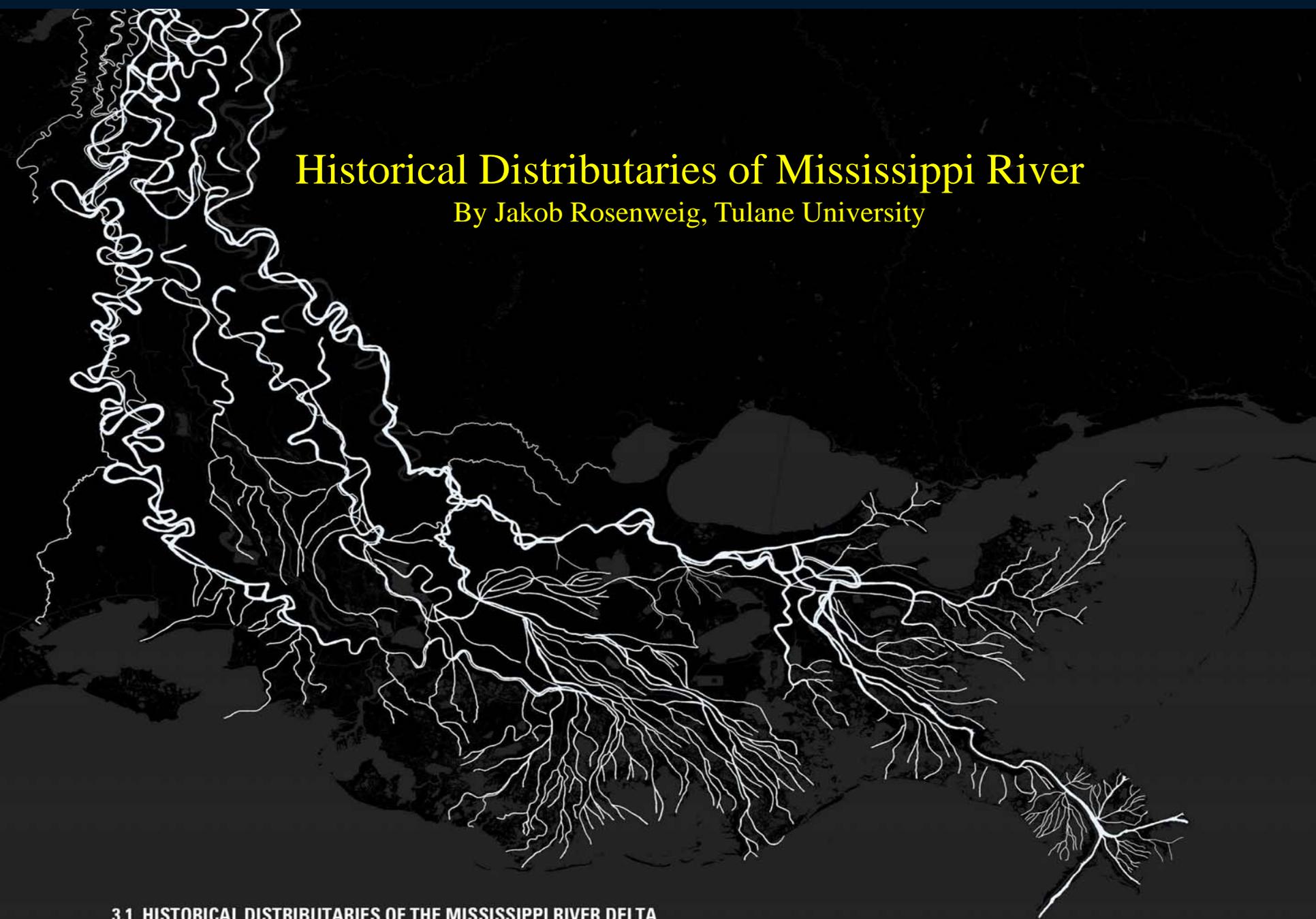


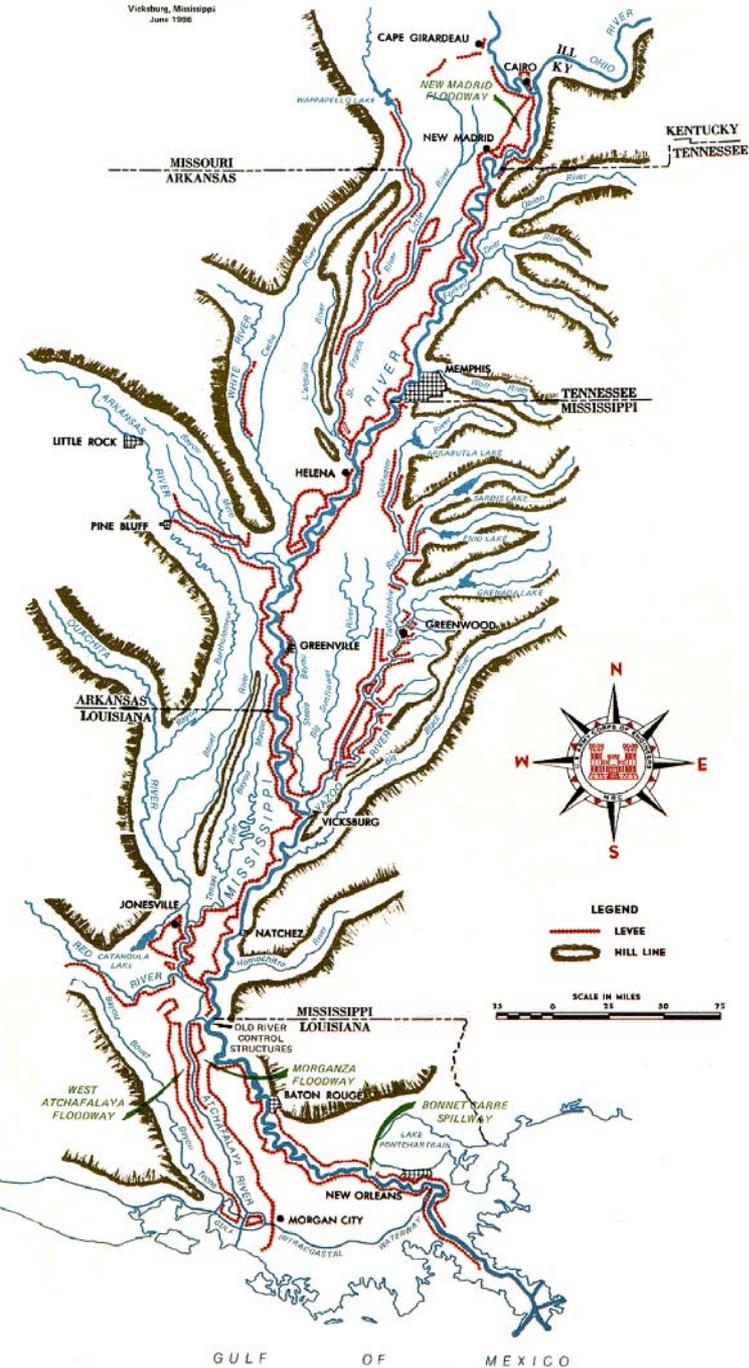
ISSUE: LAND LOSS

- “Perfect Storm” of
 - Insufficient freshwater and sediment delivery to the wetlands
 - Impoundment of wetland behind/within levees and spoil banks
 - Accelerating eustatic sea level rise
 - Dredging of canals and shipping channels
 - Saltwater intrusion
 - Frequent storm impacts during the past decade

Historical Distributaries of Mississippi River

By Jakob Rosenweig, Tulane University





THE MISSISSIPPI RIVER IS NOW LEVEED FROM CAIRO, ILLINOIS, TO VENICE, LOUISIANA



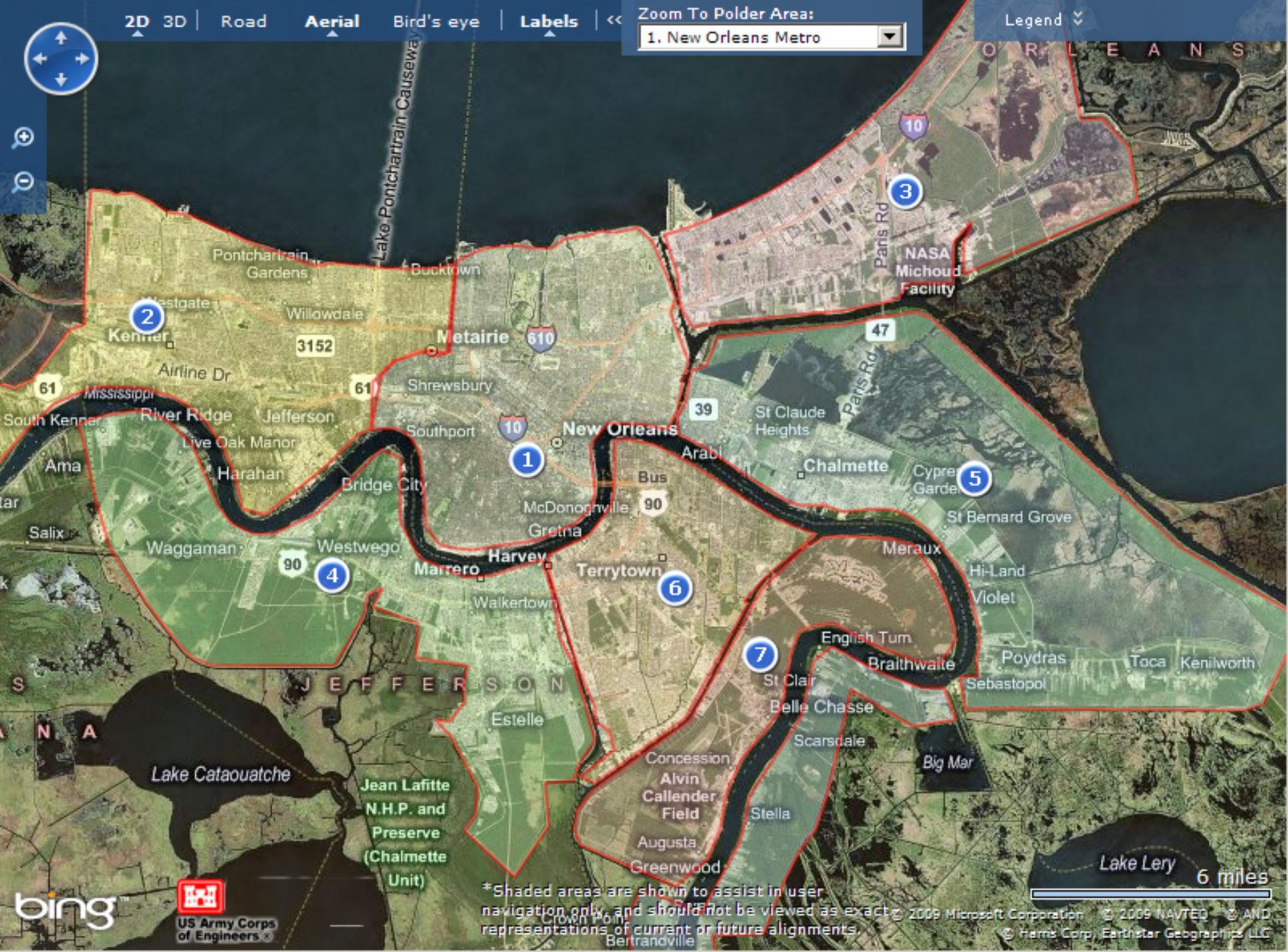
Credit: Zina Deretsky, National Science Foundation



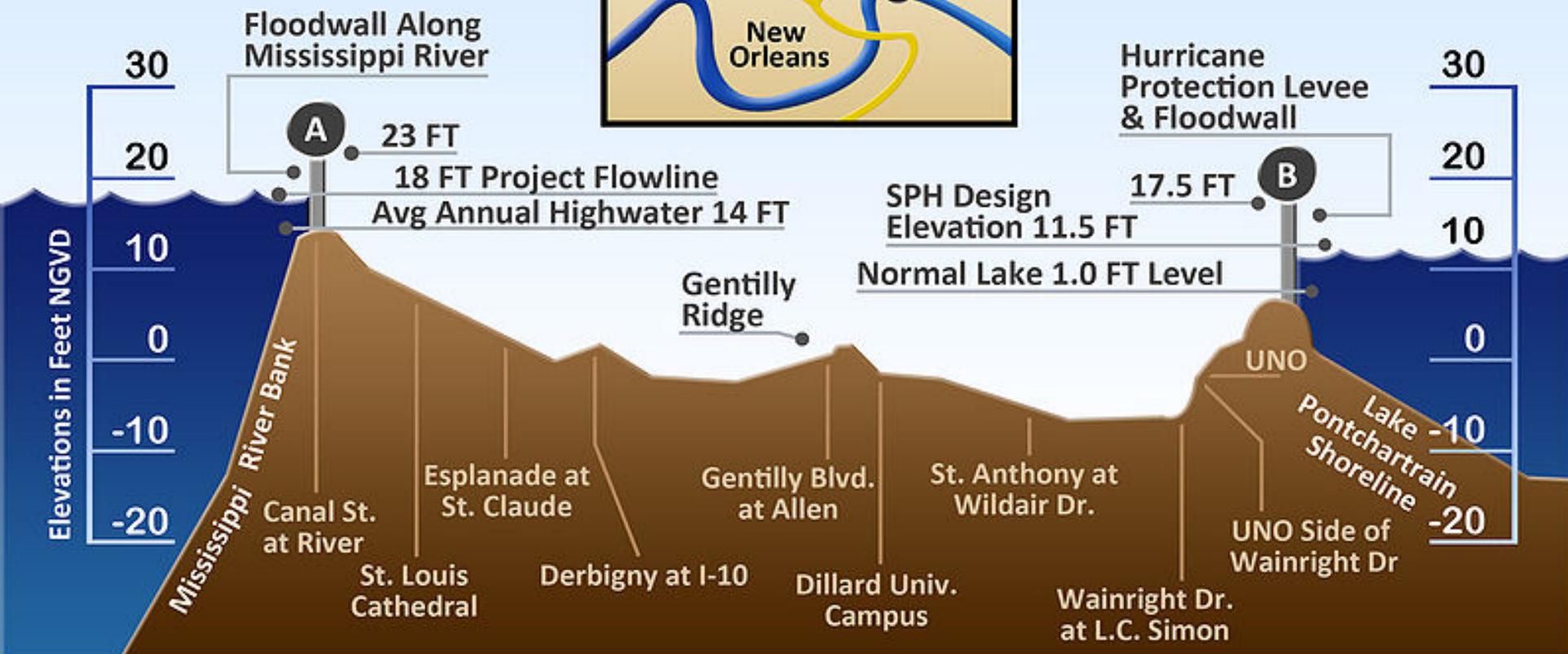
MISSISSIPPI RIVER SEDIMENT PLUME

5 MARCH 2001

http://earthobservatory.nasa.gov/Newsroom/NewImages/Images/modis_mississippi_sed_lrg.jpg



New Orleans Area Map

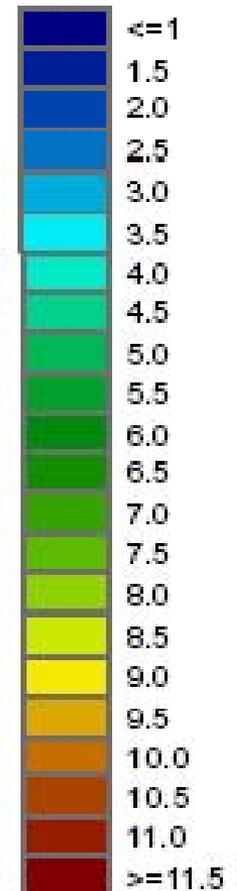


City of New Orleans Ground Elevations

From Canal St. at the Mississippi River to the Lakefront at U.N.O.

Estimated Water Depth – based on a lake level of 2.37 feet as recorded by gage 073802330 on 09-02-2005

Flood Depth (feet)



Flood depth estimated from 10-m elevation data derived from 5-m lidar data collected in 2002.

(Background image: Landsat image acquired on 01-21-2000)

ISSUE: HYPOXIA



Basin Facts

- Drains 31 states & 2 Canadian provinces
- Total area drained 1.2 million square miles



NOAA

NATIONAL OCEANIC AND
ATMOSPHERIC ADMINISTRATION
UNITED STATES DEPARTMENT OF COMMERCE



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Weather.gov Forecast

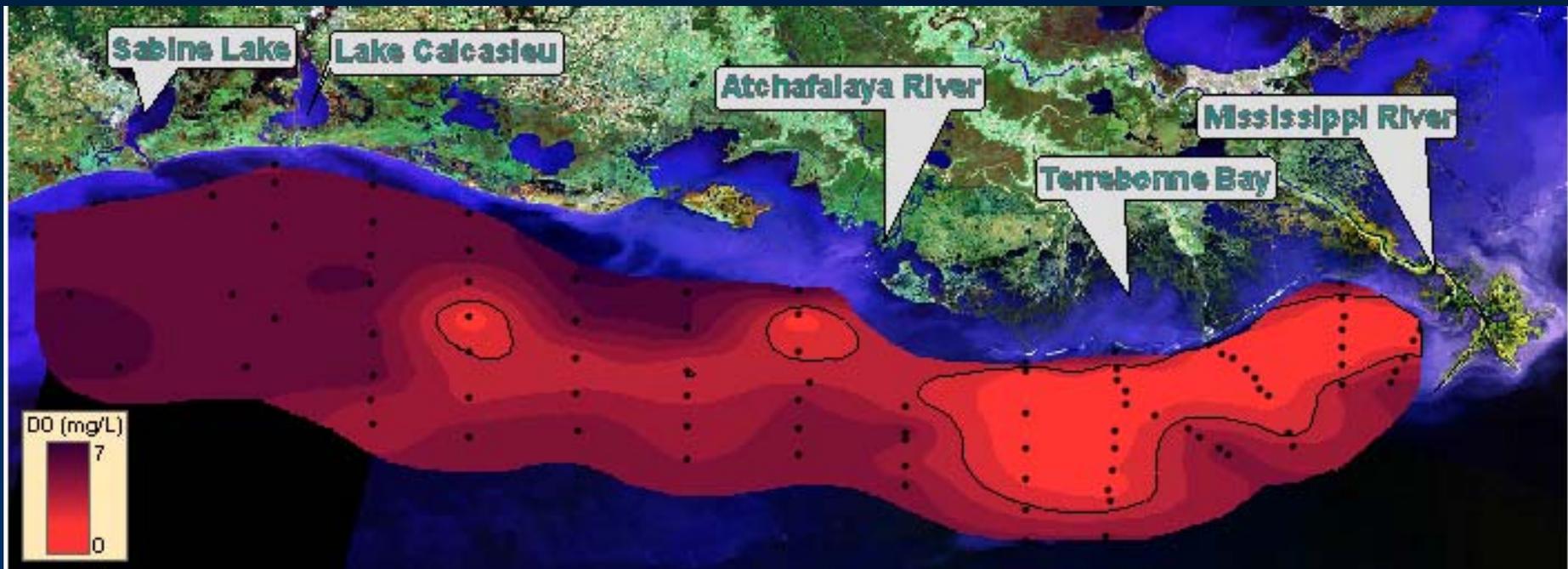
City, ST [» GO](#)

[» Active Weather Alerts](#)

[» NOAA Organizations](#)

Smaller Than Expected, But Severe, Dead Zone in Gulf of Mexico

July 27, 2009



http://www.noaanews.noaa.gov/stories2009/images/deadzone_072709.jpg

Only 3000 square miles in 2009!

WHAT'S AT STAKE?

Why should I care?

 Energy

 Fisheries

 Commerce

 Culture



LOOP's Marine Terminal

- 1st Top producer of domestic and offshore oil & gas
- 1st Top domestic reserves of oil and gas
- 1st Top in foreign oil import volume
- 1st Natural gas processing capacity
- 1st producer of offshore revenues for US Treasury

 Energy

 Fisheries

 Commerce

 Culture



LOUISIANA'S COASTAL ZONE POPULATION > 2 MILLION

 Energy

 Fisheries

 Commerce

 Culture



<http://www.mardigrasindians.com/indirank.html>

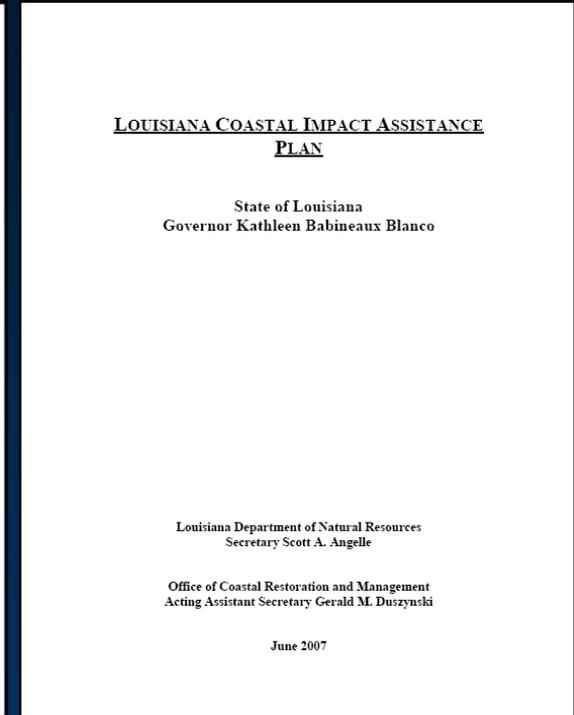
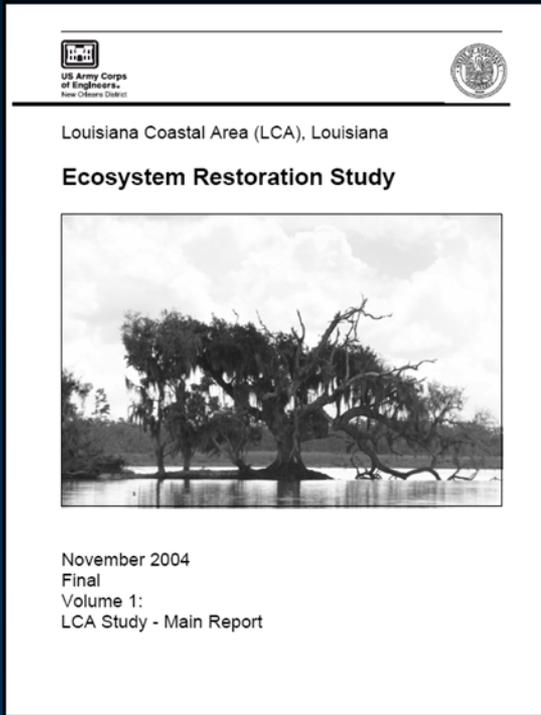
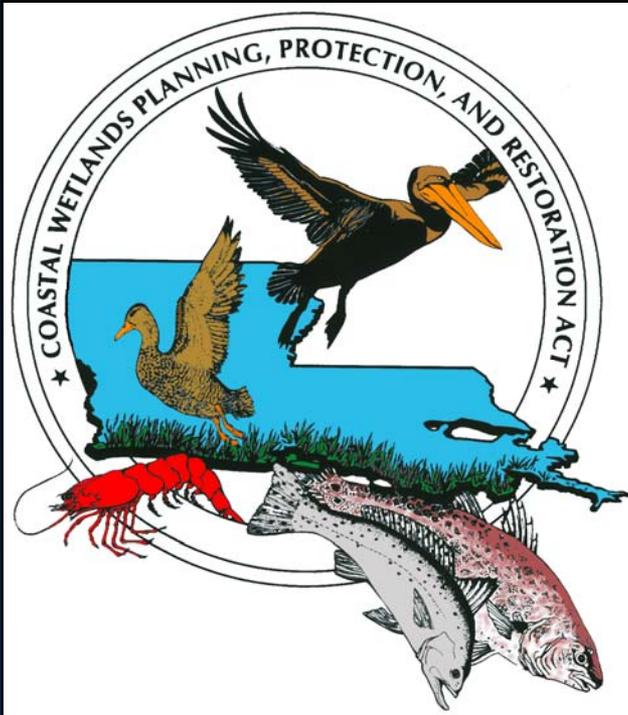
<http://image.wetpaint.com/image/1/T1eCaENHwTvfQ3npsNFaA1947607>



THE RESPONSE

Protection and Restoration Projects

Principle Programs for Restoration in Coastal Louisiana



- Originally passed in 1990
- Extended through 2019 by Congress in 2004
- Total authorized funding: \$2.4B

- Authorized in 2007
- Total authorized funding: \$1.96B (+ 50% contingency)

- Authorized in Energy Policy Act of 2005
- ~ \$540M

PROJECT TYPES

- Ecosystem Restoration
 - Barrier Island Restoration
 - Marsh Creation
 - River Diversions
 - Shoreline Protection
- Hurricane Protection
 - Floodgates
 - Levee Raising and Restoration
- More than \$17B in work at present

RESTORATION: Barrier Island Restoration



2004 8 17

RESTORATION

CAERNARVON

CAPABLE OF 8000 CFS

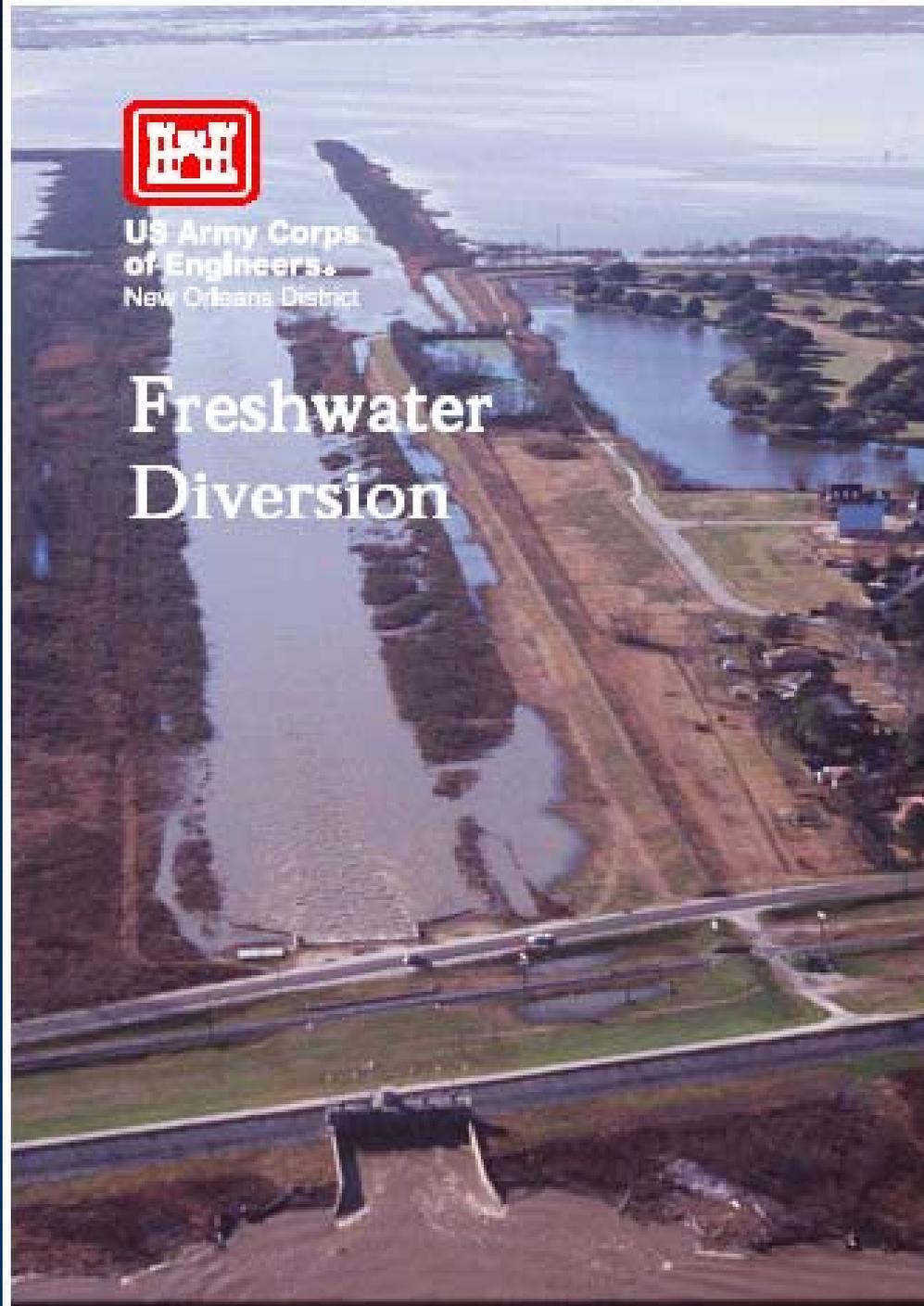
PROJECT ANTICIPATED
TO BENEFIT 77,000
ACRES

COST: \$26.1 MILLION



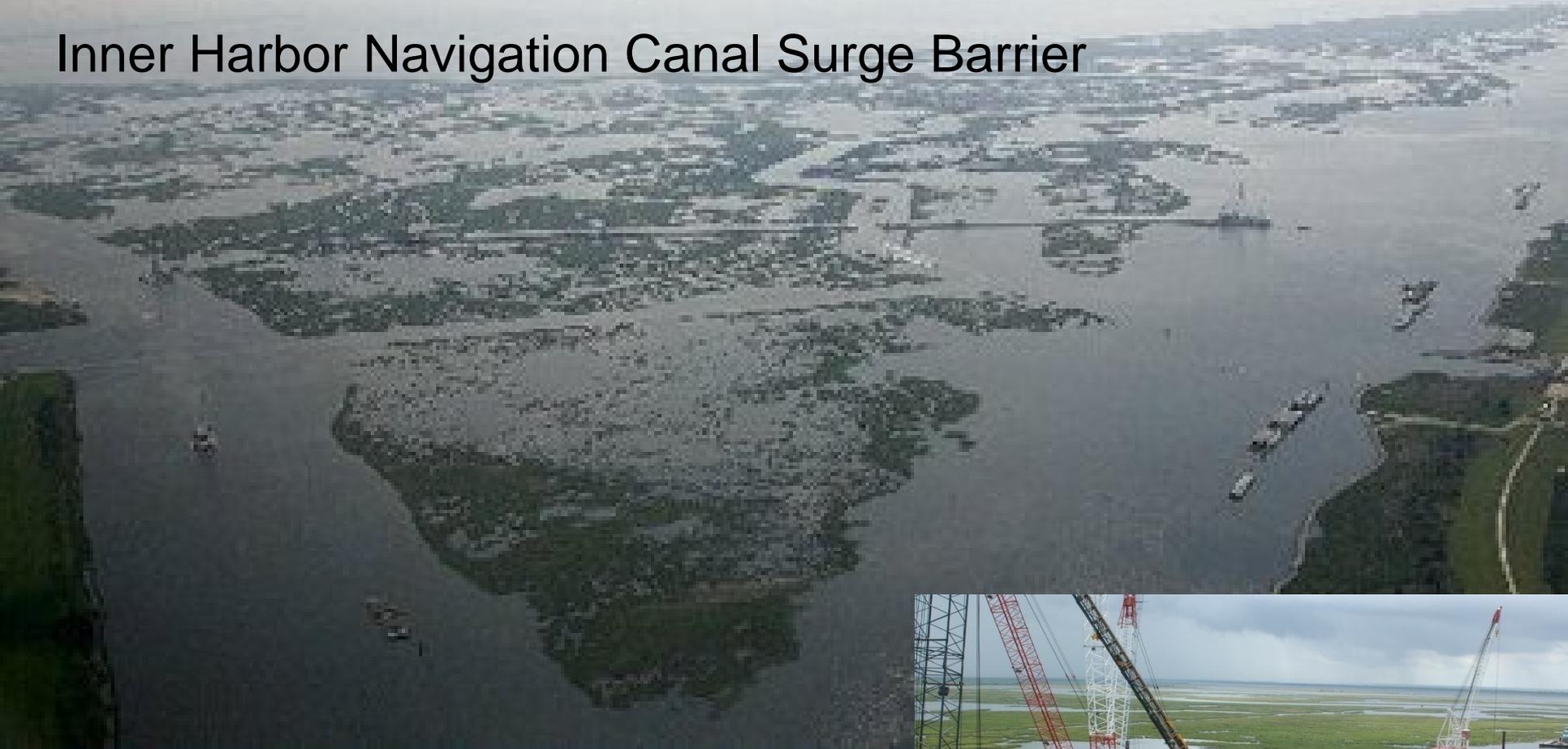
US Army Corps
of Engineers
New Orleans District

Freshwater
Diversion



HURRICANE PROTECTION

Inner Harbor Navigation Canal Surge Barrier



\$700 million project to cut “the funnel”

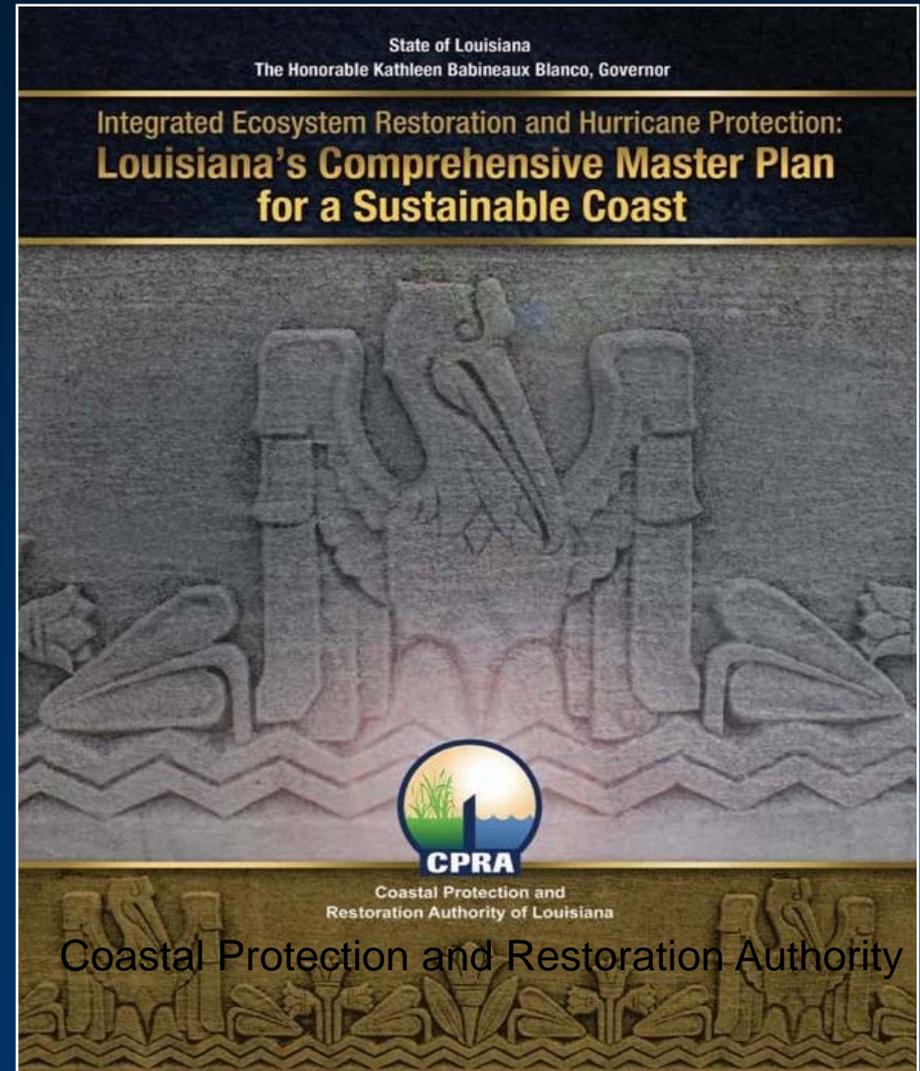


THE RESPONSE

State Organizational Changes

Master Plan Objectives

- Reduce risk to communities
- Restore sustainability to the coastal ecosystem
- Maintain a diverse array of fish and wildlife habitats
- Sustain Louisiana's unique heritage and culture



Organizational Changes

Office of Coastal Protection & Restoration

July 1, 2009



Hurricane
Protection



Ecosystem
Restoration



Planning

Project
Management

Engineering

Operations

LACES

CRMS-Wetlands

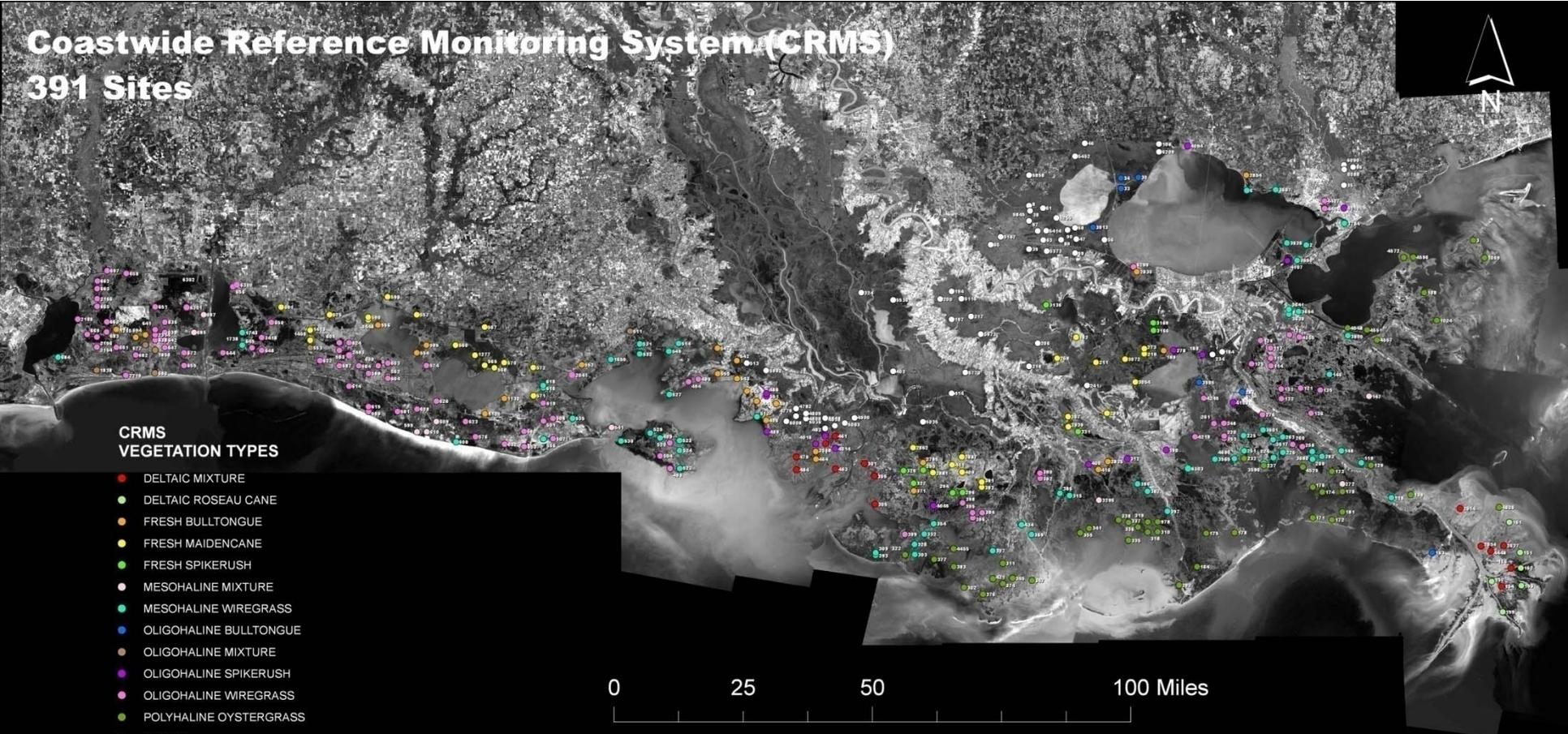
Coastwide Reference Monitoring System (CRMS)

391 Sites

CRMS VEGETATION TYPES

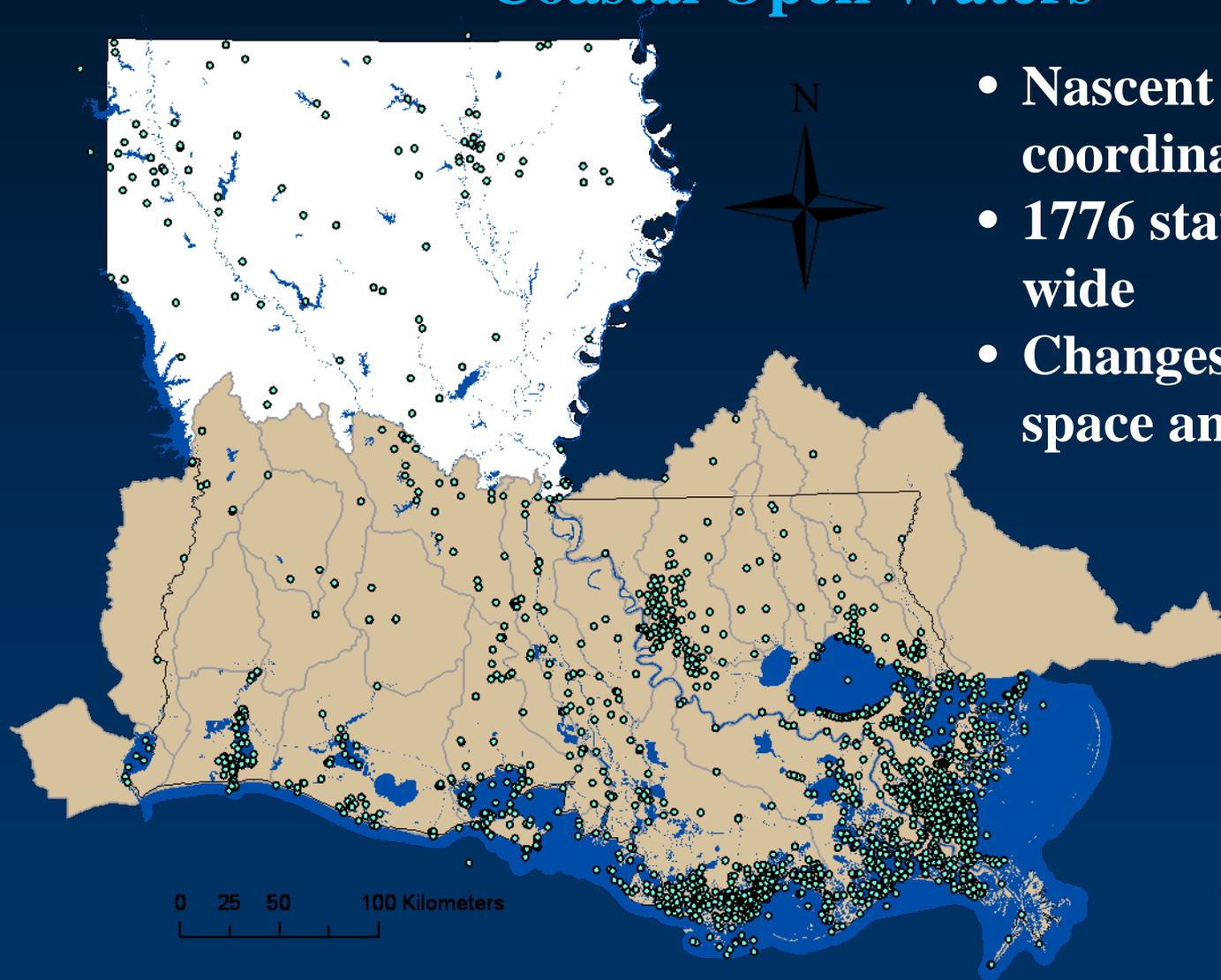
- DELTAIC MIXTURE
- DELTAIC ROSEAU CANE
- FRESH BULLTONGUE
- FRESH MAIDENCANE
- FRESH SPIKERUSH
- MESOHALINE MIXTURE
- MESOHALINE WIREGRASS
- OLIGOHALINE BULLTONGUE
- OLIGOHALINE MIXTURE
- OLIGOHALINE SPIKERUSH
- OLIGOHALINE WIREGRASS
- POLYHALINE OYSTERGRASS
- SWAMP

0 25 50 100 Miles



COMPREHENSIVE MONITORING

Coastal Open Waters



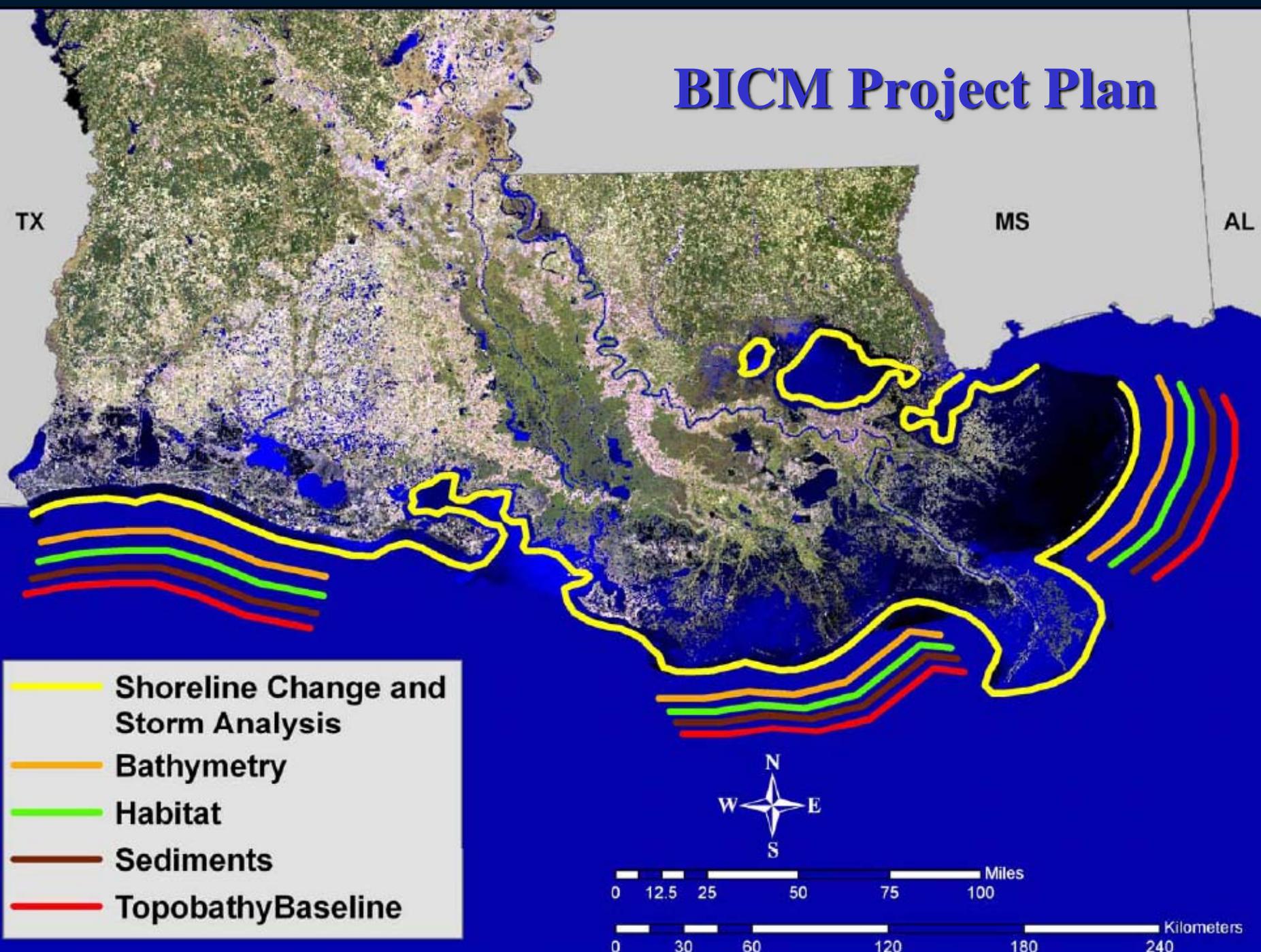
- Nascent multi-agency coordination effort
- 1776 stations State-wide
- Changes over both space and time

BICM Project Plan

TX

MS

AL



- Shoreline Change and Storm Analysis
- Bathymetry
- Habitat
- Sediments
- TopobathyBaseline



Systematic Analysis of Sediment Resource Availability

USACE Main | Who We Are | Missions | History | Related Links | Kids Corner

US Army Corps of Engineers

New Orleans District's Regional Sediment Management Program

**RELEVANT
READY
RESPONSIVE
RELIABLE**

Proudly serving the Armed Forces and the Nation now and in the future.

Home | About RSM | Projects | GIS Mapping | Data & Downloads | Documents | Contact Us

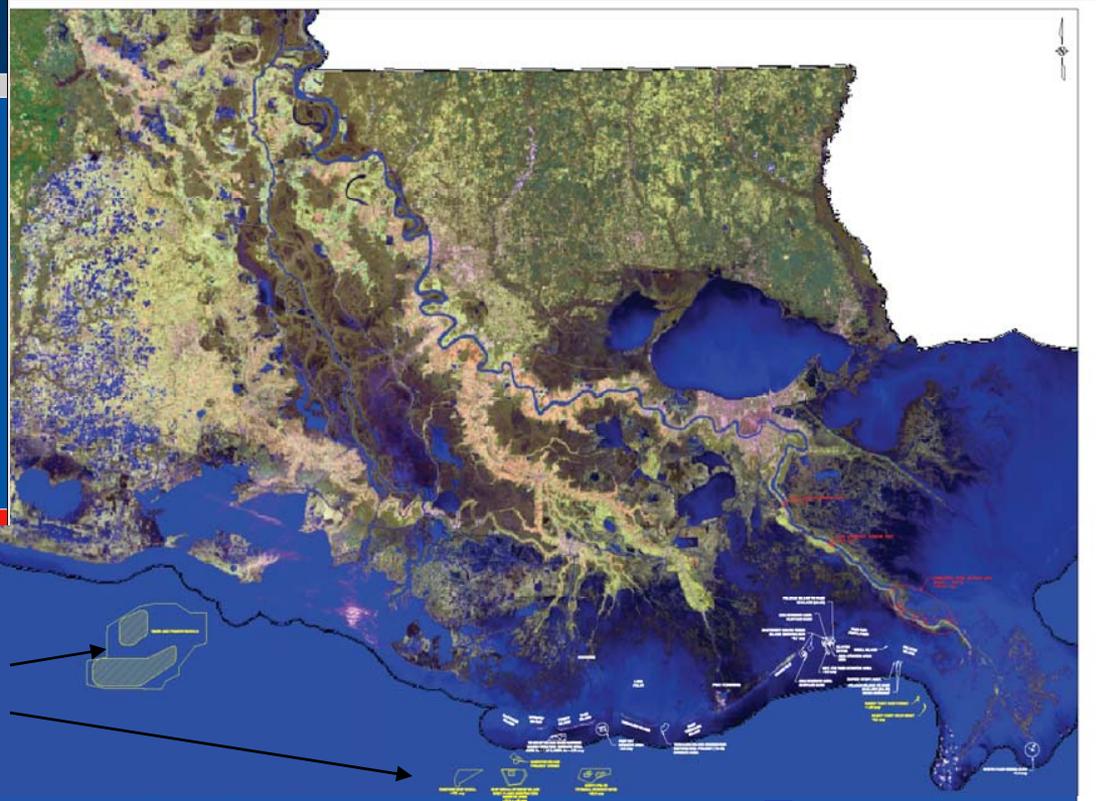
Featured Links
[RSM Animation](#)
[Benefits of RSM](#)
[RSM Project Status](#)

New Orleans District
Regional Sediment Management

In the past, the U.S. Army Corps of Engineers (USACE) has focused on managing sediment at coastal projects on a project-by-project basis. This approach to sediment management may not adequately consider the impact of individual projects on adjacent projects or on the sediment system. To address this issue, the USACE has initiated the Regional Sediment Management Program (RSM). Regional sediment management is what the U.S. Army Corps of Engineers calls an approach to managing sediment as a resource in the context of the Nation's river and coastal systems. This approach brings Corps engineers, policy makers, and managers to one table along with state representatives, conservationists, harbor, coastal, and port stakeholders, as well as the general public.

[Read more about this RSM program](#)

US Army Corps of Engineers | New Orleans District Home | eCoastal Home | RSM User Login



Louisiana Sediment Management Plan

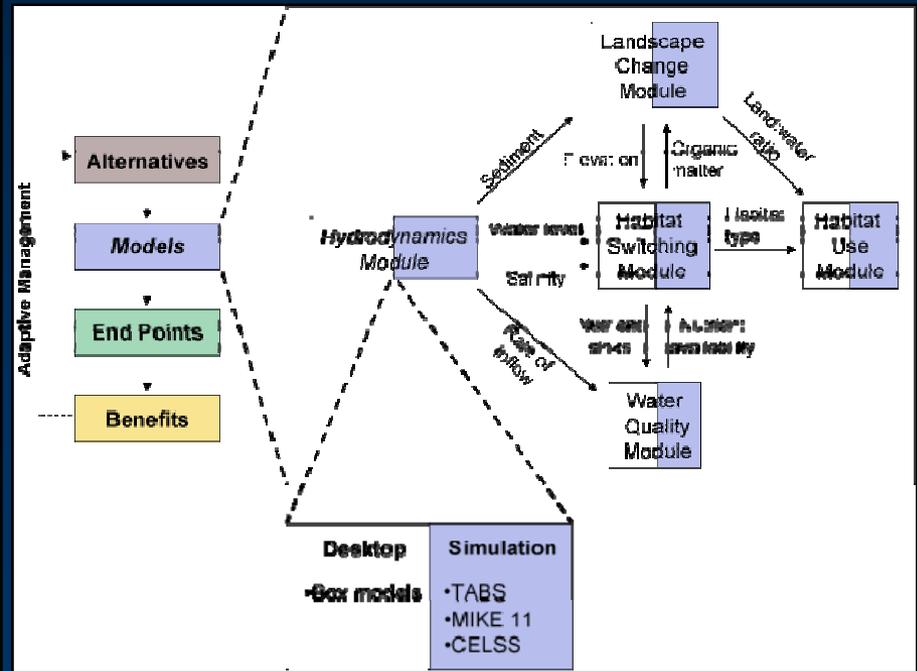
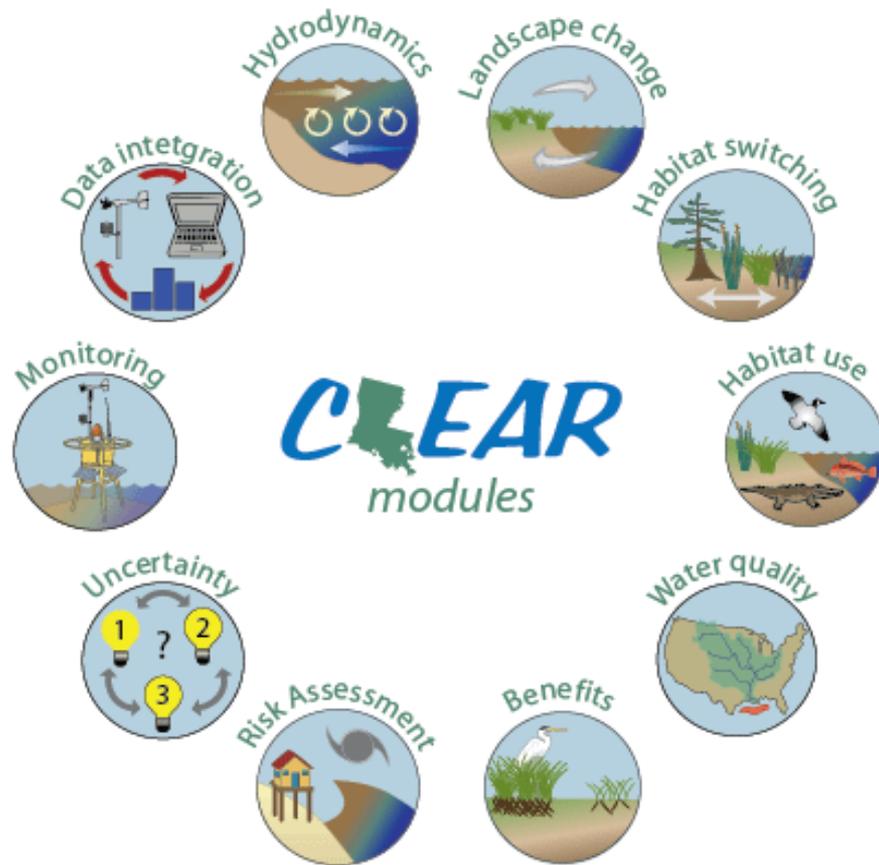
Khalil & Cantu, 2008

REV	DATE	DESCRIPTION	BY	DRAWN BY: KHALIL CANTU	DESIGNED BY: BYRON KEAL	LOUISIANA BORROW AREAS	VICINITY MAP
						FEDERAL PROJECT NUMBER: FEDERAL PROJECT NUMBER: APPROVED BY:	DATE: MARCH 2008 SHEET: 1 OF 1

LOUISIANA DEPARTMENT OF NATURAL RESOURCES
 COASTAL ENGINEERING DIVISION
 617 NORTH NINE STREET
 BATON ROUGE, LOUISIANA 70802

COMPREHENSIVE MODELING

CLEAR Coastal Louisiana Ecosystem Assessment & Restoration
Providing scientific evaluation for restoration management



OCPR LACES AR&D: Coordinating Partners



**Louisiana Coastal Area
Science & Technology Office**



Louisiana Transportation Research Center

Sponsored jointly by the Louisiana Department of Transportation and Louisiana State University



CREST

**Coastal Restoration and Enhancement
through Science and Technology**



NGI
NORTHERN GULF INSTITUTE

APPLIED SCIENCE PROGRAM

Gulf of Mexico Initiative

GULF OF
MEXICO
ALLIANCE

Northern Gulf of Mexico (NGOM)

Ecosystem Change and Hazard Susceptibility Project

THANKS FOR YOUR TIME, AND
CONGRATULATIONS ON YOUR
AWARDS

ANY QUESTIONS?

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