
U.S. ARMY CORPS OF ENGINEERS
NEW ORLEANS
DISTRICT
SERVING THE ARMY...SERVING THE NATION

WEST BAY SEDIMENT DIVERSION

Presentation
to
Tulane Engineering Forum

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Overview of Presentation

- Land building and land loss in coastal Louisiana
- Economic and ecological significance of resources
- West Bay Sediment Diversion Project
- Project design information / construction plans
- Lessons learned for project managers
- Summary

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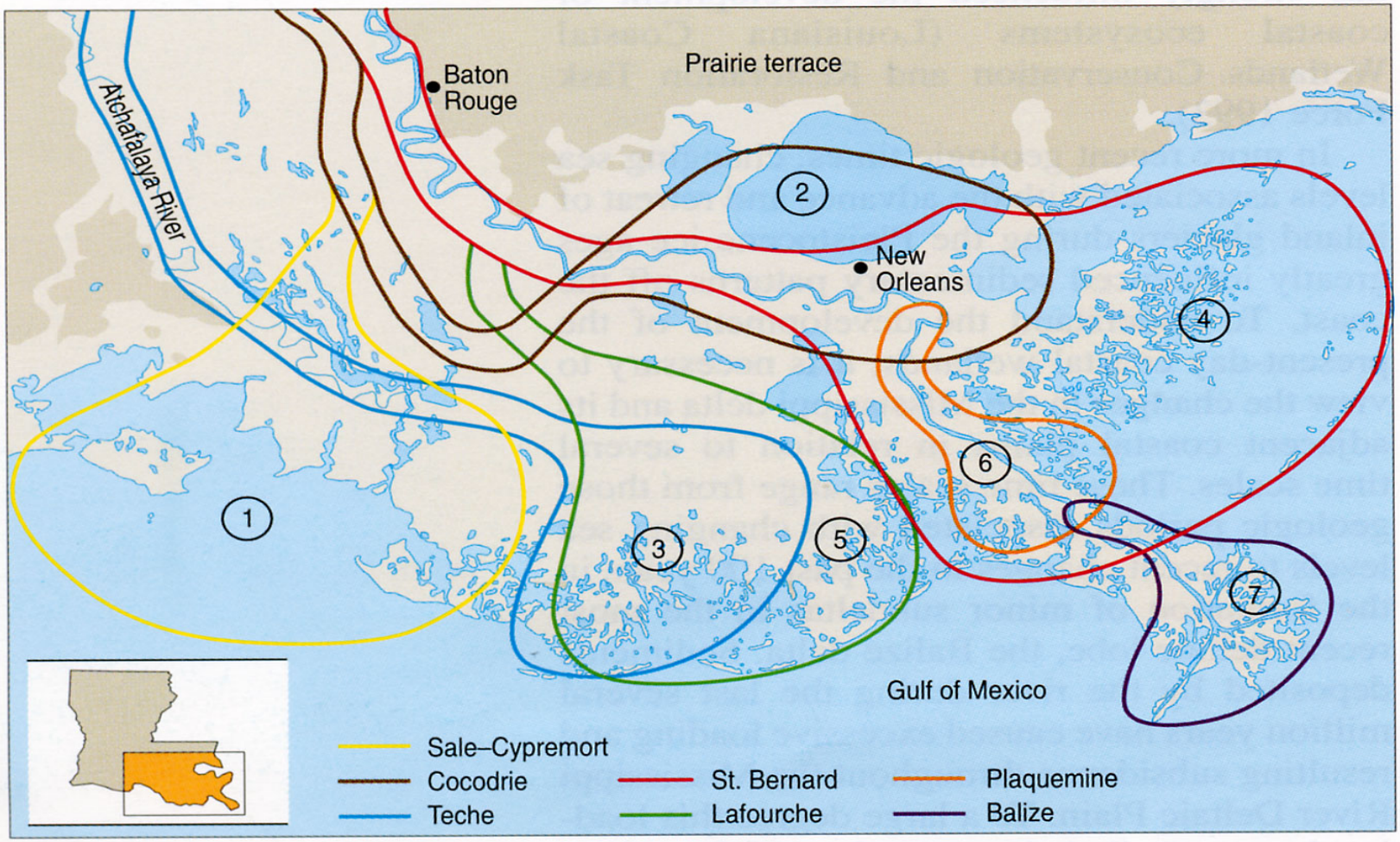
New Orleans District

Land Building and Land Loss in Coastal Louisiana

Mississippi River Drainage Basin

Ancient Delta Lobes of the Mississippi River Built Coastal Louisiana



Modern Mississippi River Subdeltas

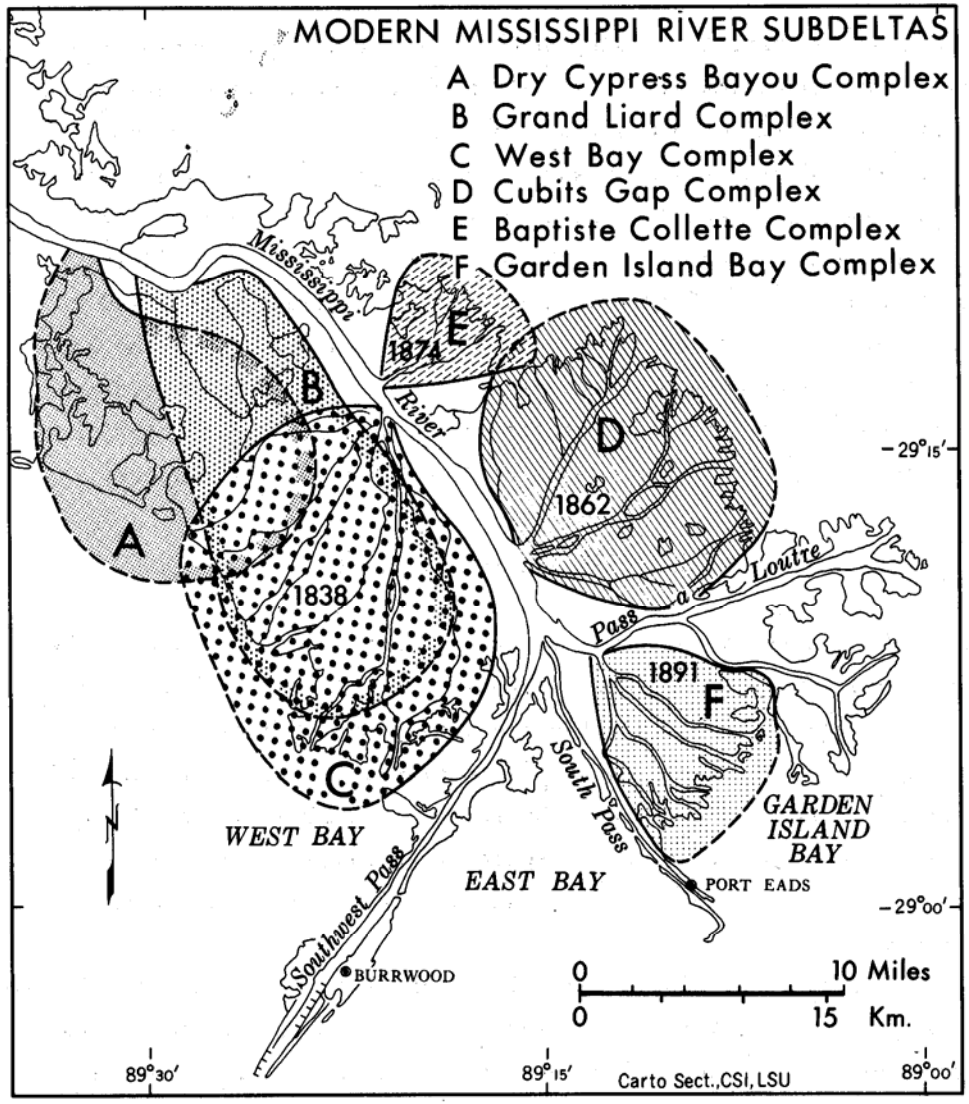


Figure 18. Six subdeltas of the modern Mississippi Balize Delta recognized from maps and sediment analysis. Dates indicate year of crevasse opening (Dry Cypress Bayou and Grand Liard subdeltas not included in this study)

Source: Wells report, 1984

Louisiana's Coastline in the Year 2040

Source: CWPPRA

Major Causes Of Wetland Loss

Barrier Island Degradation

Subsidence

Storms

Sea Level Rise

Salt Water Intrusion

Sediment Reduction

Canals

Oil & Gas Development

Levee System

Economic and Ecological Significance of Louisiana's Coastal Resources

Importance of Coastal Louisiana to the Nation

- Home to 20% of US commercial fisheries
- Over 1 billion pounds caught annually
- Dockside value $291 million
- Recreation value $944 million

Importance of Coastal Louisiana to the Nation

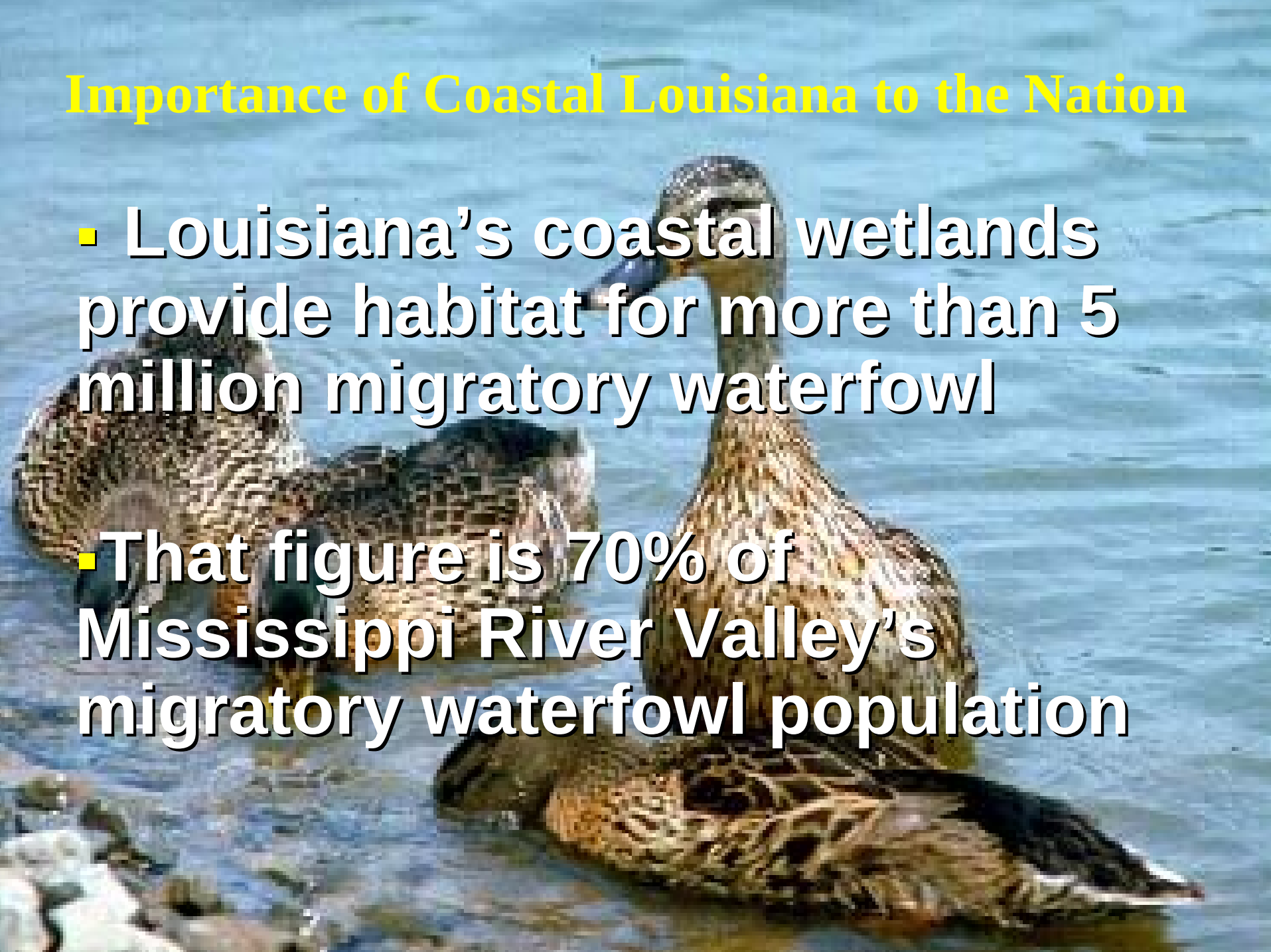
- Ports rank 1st in Nation by tonnage

- Port of New Orleans, Port of South Louisiana and Port of Baton Rouge combined are the largest port facility in the world

Importance of Coastal Louisiana to the Nation

- Louisiana Supplies U.S. with 27% of its crude oil
- Louisiana Provides 32% of domestic natural gas production
- LOOP facility is connected to 50% of refineries in U.S.

Importance of Coastal Louisiana to the Nation

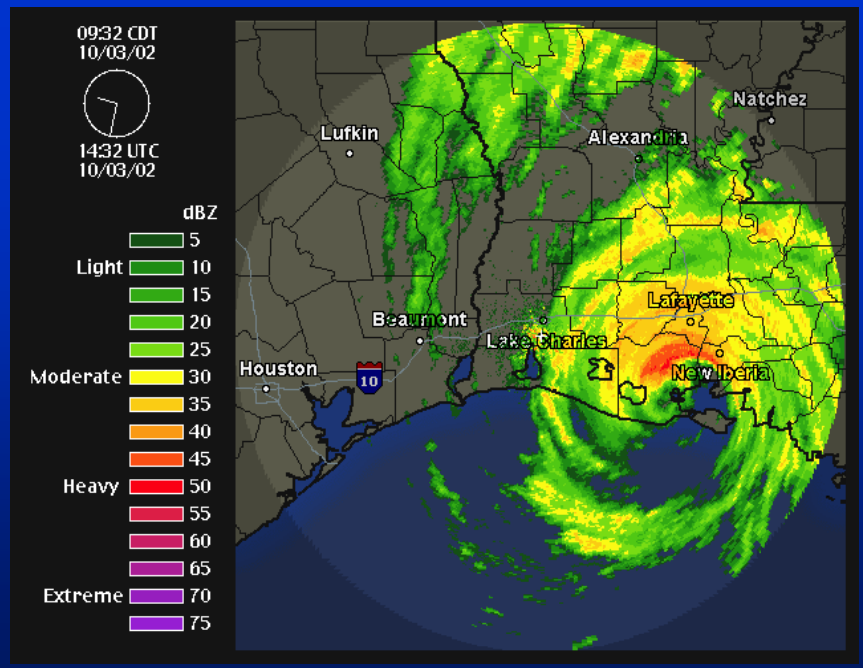


- Louisiana's coastal wetlands provide habitat for more than 5 million migratory waterfowl

- That figure is 70% of Mississippi River Valley's migratory waterfowl population

Importance of Coastal Louisiana to the Nation

Coastal marshes absorb hurricane storm surges



West Bay Sediment Diversion Project Background

West Bay Sediment Diversion (MR-03)

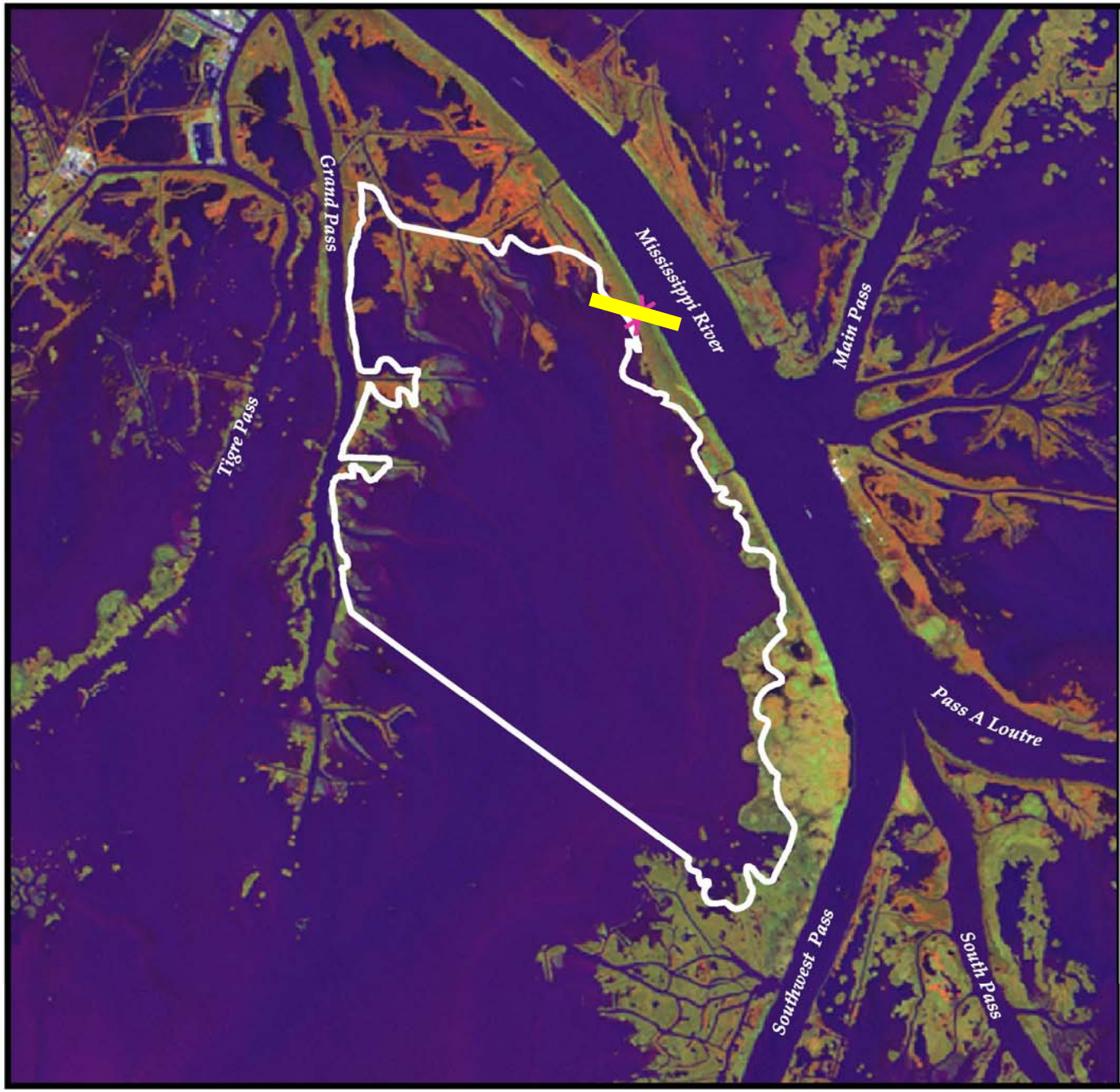

1947
Head of Passes
Reference

1950s


1989
Head of Passes
Reference

Project History

- Louisiana Coastal Area, Louisiana, Land Loss and Marsh Creation Feasibility Study, 1990
- Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA) first Priority Project List, 1992
- Cost Share Agreement executed Oct 2002



West Bay Sediment Diversion (MR-03)

Sediment Diversion *

Project Boundary

* denotes proposed features

DRAFT

1 0 1 2 Miles

1 0 1 2 Kilometers

Map Produced By:
U.S. Department of the Interior
U.S. Geological Survey
National Wetlands Research Center
Coastal Restoration Field Station

Background Imagery:
2002 Thematic Mapper Imagery

Map Date: March 27, 2003
Map ID: USGS-NWRC 2003-11-085
Data accurate as of: March 27, 2003

Project Features

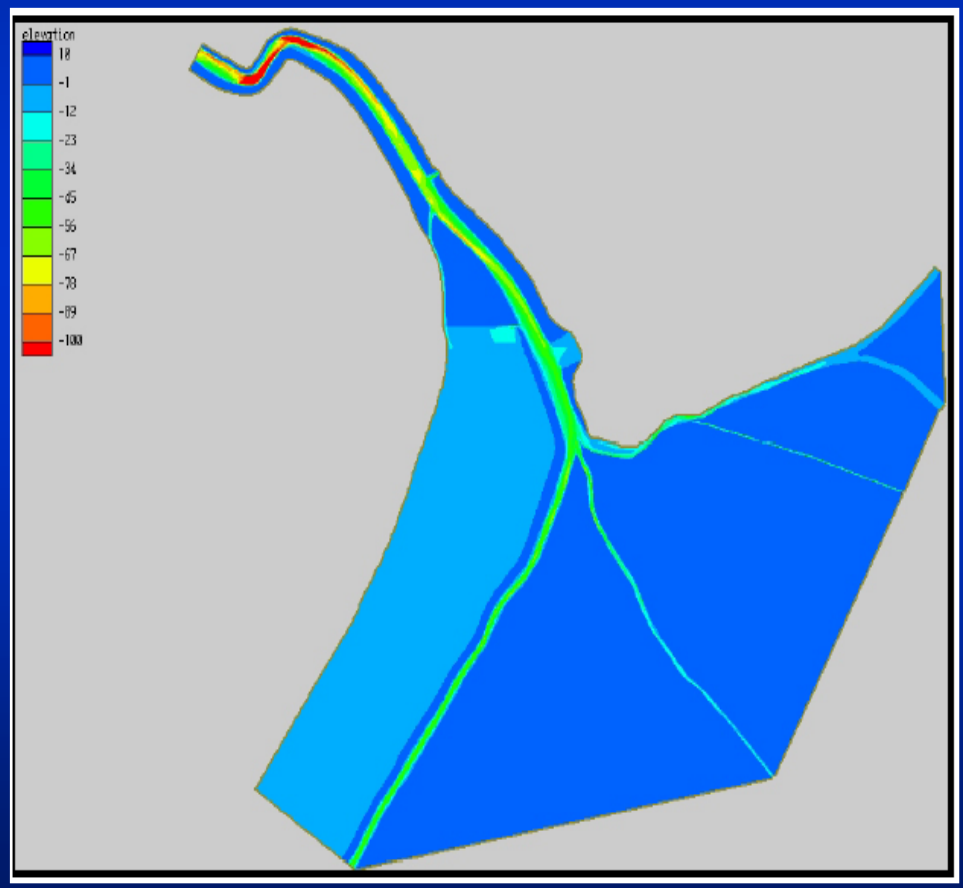
- Diversion Channel
- Two step construction plan
- Pilottown Anchorage area dredging
- O&M program

Engineering & Design Information

- Hydraulic Design and Modeling
- Soil Borings
- Surveys
- Plans and Specifications

Hydraulic Modeling Effects on Mississippi River

- Four model studies performed
  - HEC-6 (1988)
  - TABS (1994)
  - CH3D-SED (2000)
  - CH3D-SED (2001)

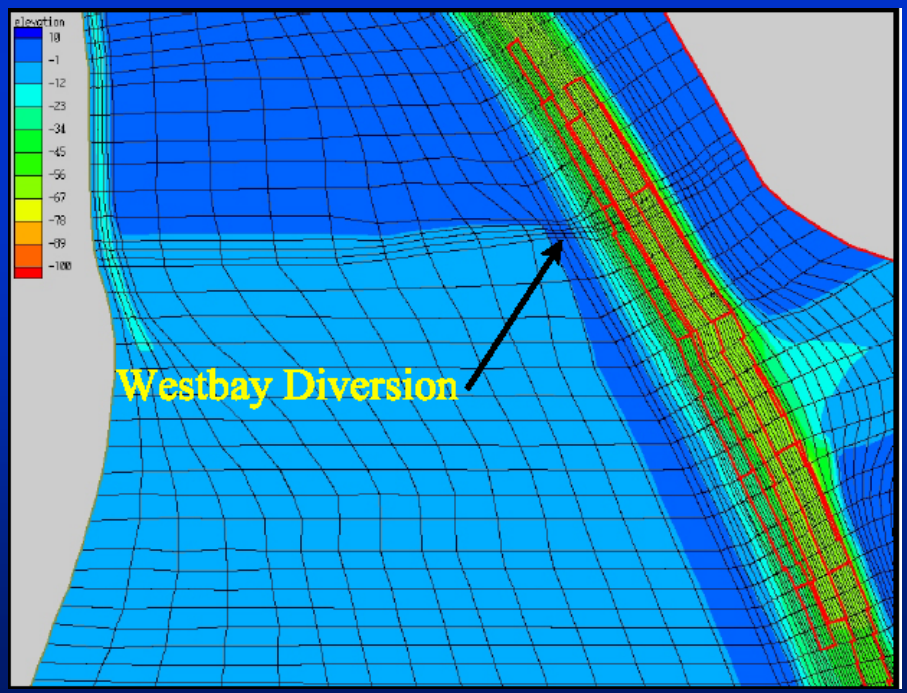


CH3D-SED Modeling (2000)

- 50,000 cfs diversion
- 5 flows modeled, peak river flow 1,300,000 cfs
- Increased dredging in the navigation channel by 200,000 cubic yards per year
- Increased shoaling in the anchorage area by 700,000-900,000 cubic yards per year

CH3D-SED Modeling (2001)

- Purpose – assess the effects of the angle of diversion on sediment diverted



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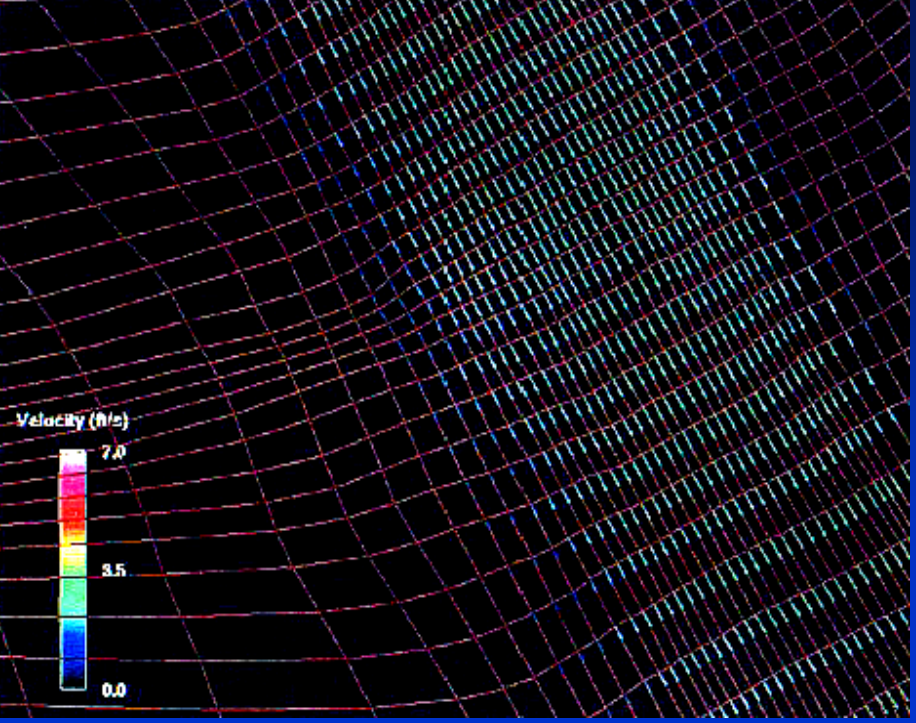
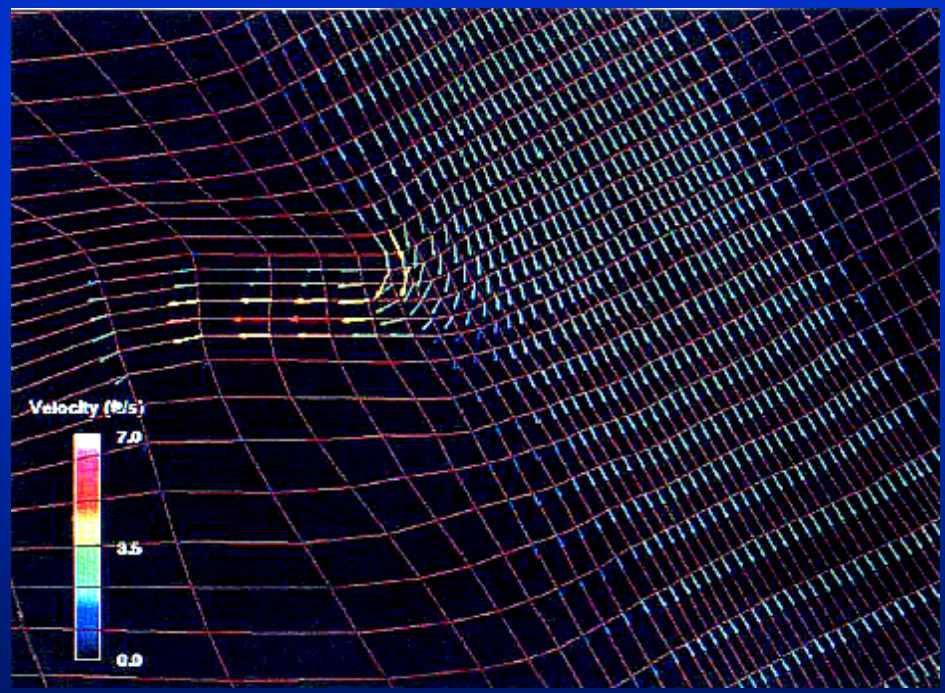
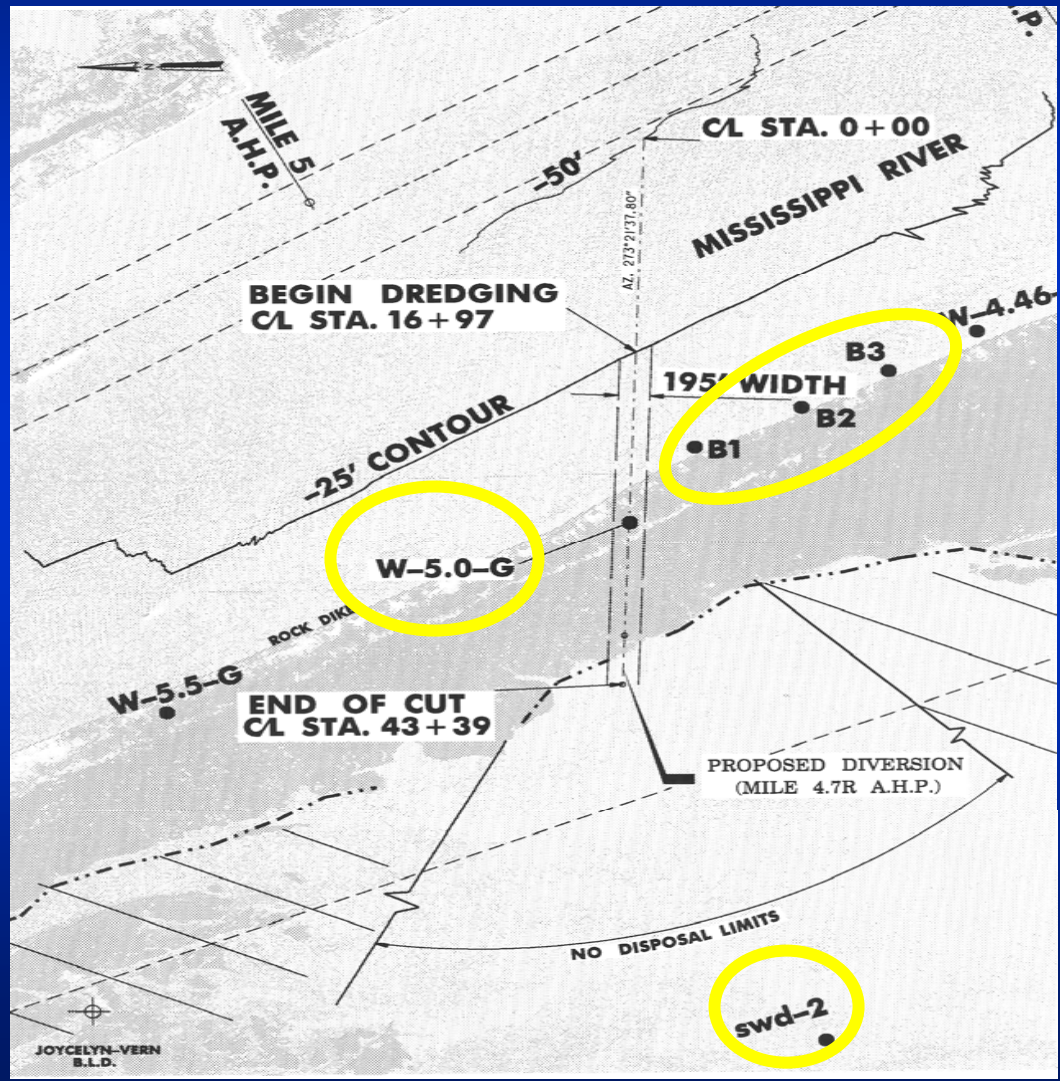
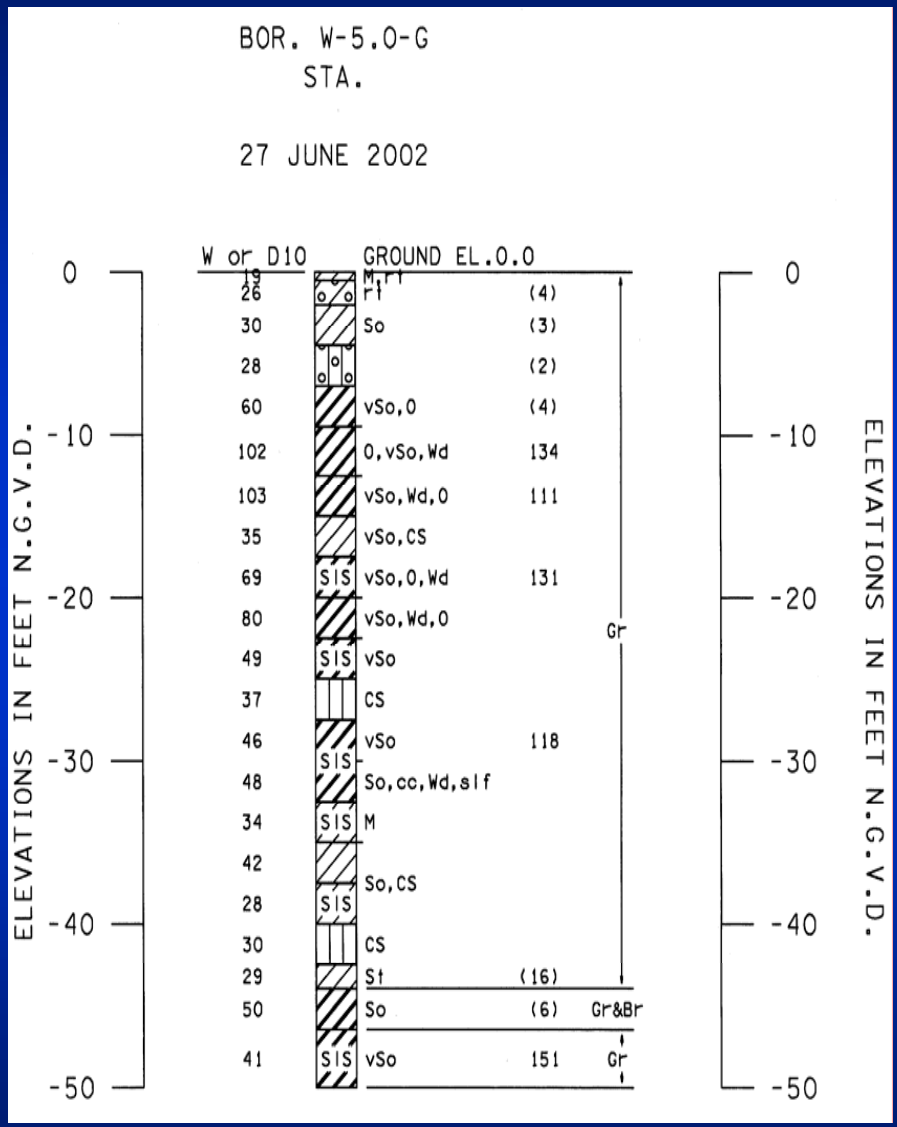




Existing Condition – 500,000 Cubic Feet Per Second

Geotechnical Boring Locations Map

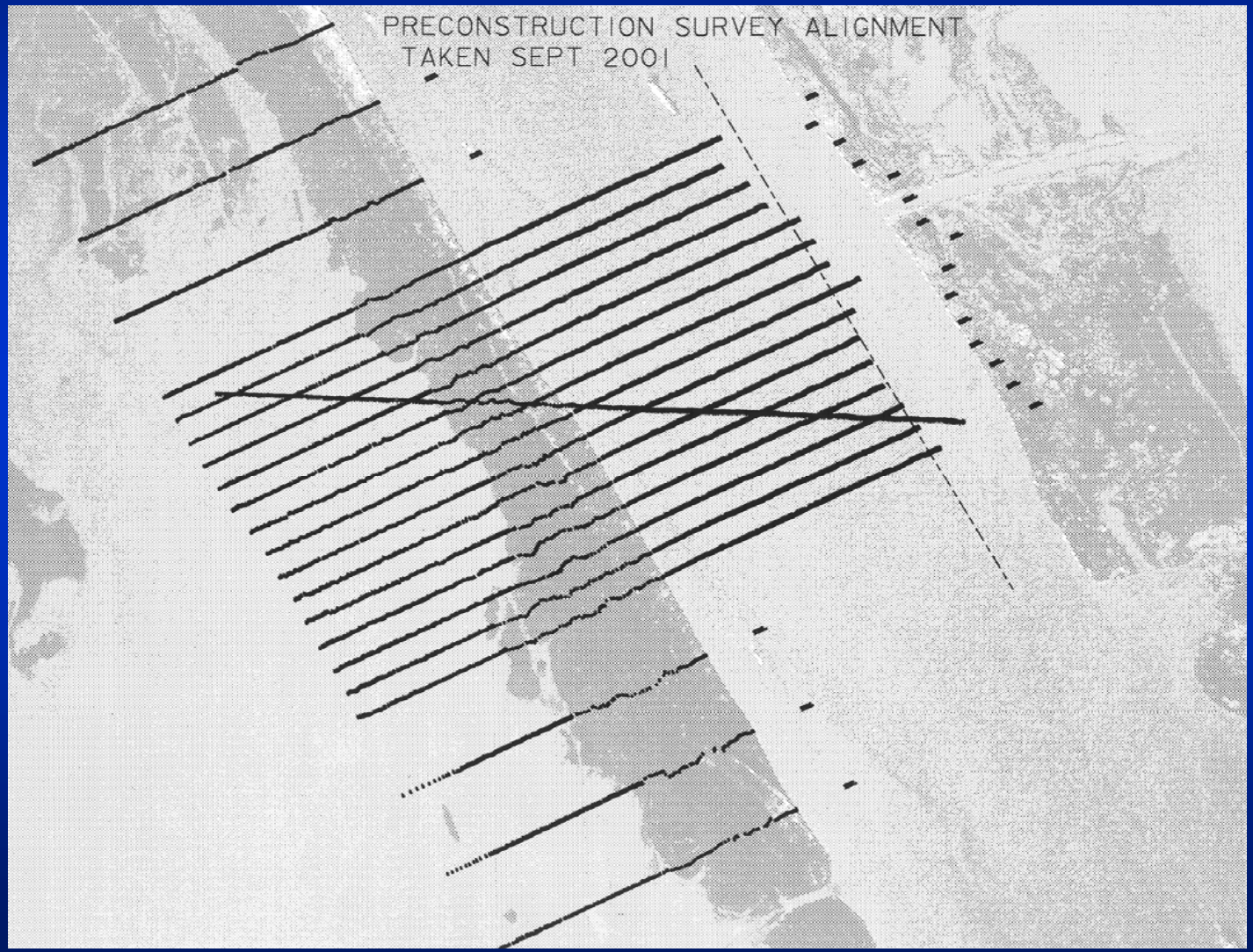




W-5.0-G

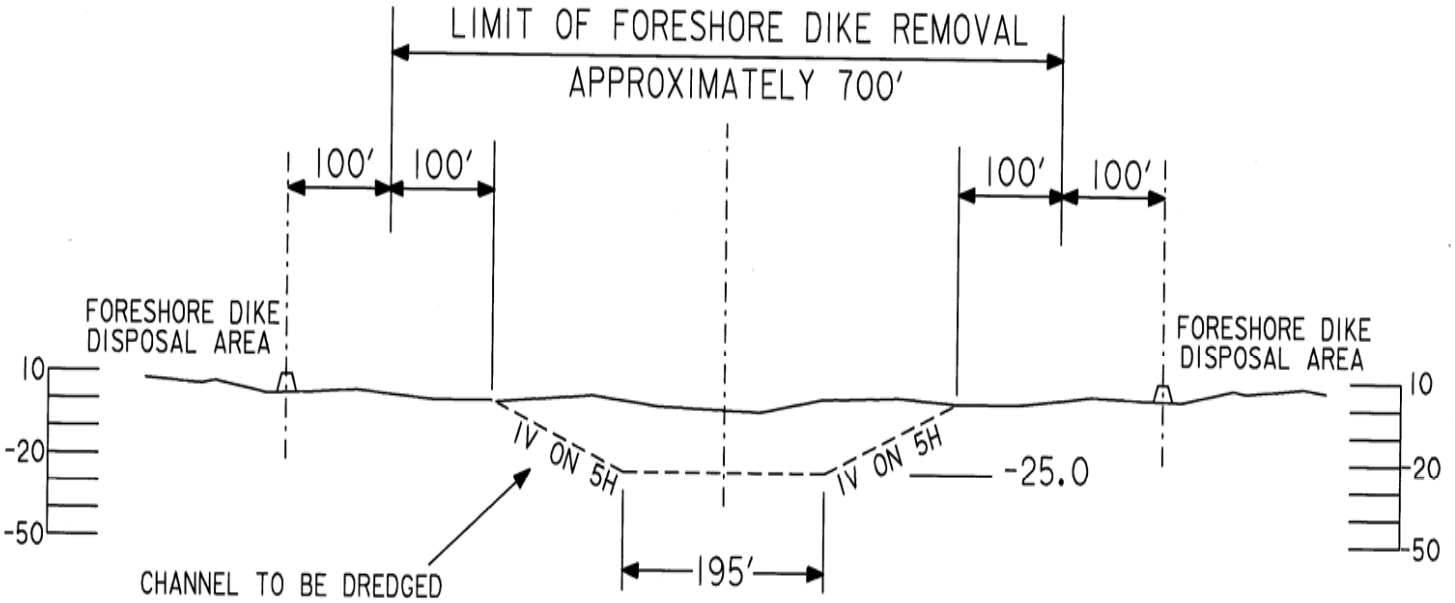
- Located where diversion channel is to be constructed

Survey Locations



View of Riverbank at Site of Cut

Diversion Channel Cross-Section



**CHANNEL TOP WIDTH APPROXIMATELY 475'.

20,000 CFS DIVERSION
THEORETICAL SECTION
(NTS)

Oil Pipeline Relocation

- Chevron-Texaco relocated an 8” oil pipeline that runs parallel to the river
- Pipeline was directional drilled to a new depth of –150 ft to allow diverted water to pass safely
- Completed May 2003

Dredge California

Pre-Construction

Clearing for Construction

Construction Dredging

Completed Construction

Building Wetlands


Marsh creation site
December 2003


Marsh creation site
March 2004


Marsh creation site
November 2005

Future Actions

- Monitor project performance
- Enlarge to 50,000 cfs flow
- Maintenance dredge channel and anchorage
- Manage outfall in the bay

Lessons Learned for Project Managers

- Long-term planning
- Multiple teams and partners
- Coordination is key
- Expect the unexpected
- Apply lessons to future projects

Summary

- First of its kind large-scale river diversion
- Designed to divert sediment to build wetlands (previous diversions were freshwater only)
- Project enjoys widespread support and involved extensive coordination for NEPA compliance and design review
- Will provide valuable design, construction, and monitoring information critical to future coastal restoration plans

ADDITIONAL INFORMATION

WWW.LACOAST.GOV

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U.S. Army Corps of Engineers

Coastal Restoration Branch

504-862-2310