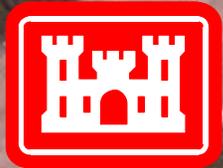


MISSISSIPPI RIVER GULF OUTLET STUDIES



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

April 6, 2004

TOPICS

- **OVERVIEW AND BACKGROUND**
- **CURRENT OPERATIONS AND MAINTENANCE**
- **NAVIGATION**
- **FLOOD CONTROL**
- **ECOSYSTEM RESTORATION**

OVERVIEW AND BACKGROUND

*Peter J. Rowan
Colonel, U.S. Army
District Engineer*



LAKE PONTCHARTRAIN

Cement Plant and Michoud
Assembly Facility

Cold Storage

Container Terminal

MIGO

IHNC Lock

LAKE BORGNE

New Orleans

MISSISSIPPI RIVER

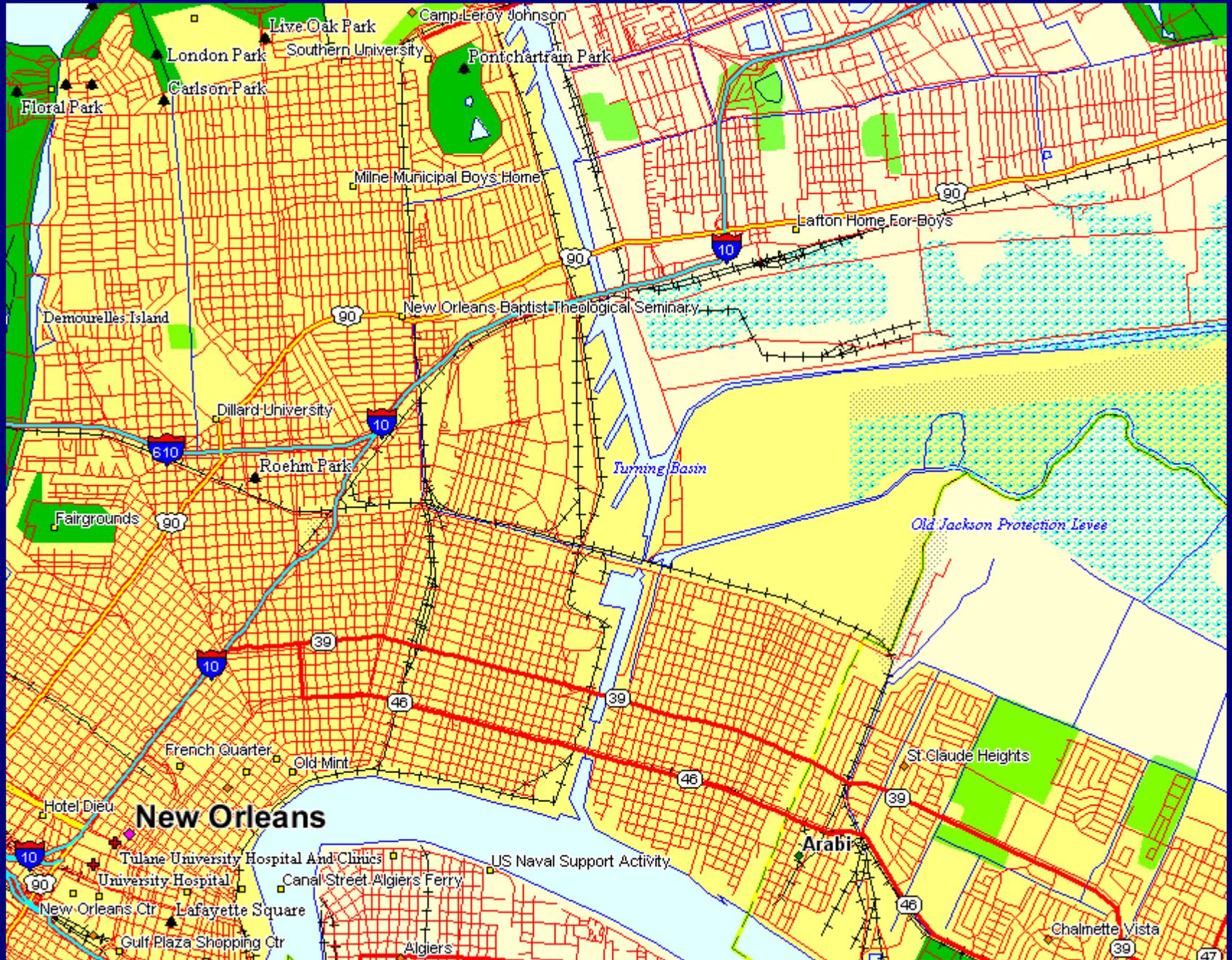
MIGO

Harvey Lock

Algiers Lock

- 76 mile 2-way traffic channel
- 500 foot wide 36' depth
- Completed 1968
- Initiated re-evaluation study 1999
- Operations & Maintenance \$13M annually

Rail lines in vicinity of MRGO



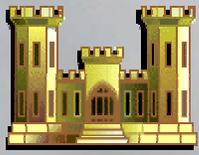
Port Facilities





***OPERATIONS
&
MAINTENANCE
(O&M)***

***Edmond J. Russo, Jr., P.E.
Operations Manager***



O&M Program Agenda

- Project orientation
- O&M authorizations and practices
- O&M Project Delivery Team (PDT)
- Vessel usage trends
- Bank erosion trends
- Channel maintenance plans and costs
- Dredging program
- Bank protection program
- O&M Results



New Orleans

Lake Borgne

Mississippi River-Gulf Outlet, LA

36' x 500'

Channel

Jetties

Breton Sound

Mississippi

River

38' x 600'

Channel

Gulf of Mexico





O&M Authorizations and Practices

Authorizations					
Mile reach	Bottom elev and width	Adv maint	Over depth	Template and LOS*	
				Historical	Current target
66 to 23	36' x 500'	4'	1'	40' x 500' 2 way	39' x 450' 1 way
23 to 0	36' x 500'	6'	2'	42' x 500' 2 way	41' x 450' 1 way
0 to -9	38' x 600'	2'	2'	40' x 600' 2 way	40' x 600' 1 way

* LOS = Level of Service, 1 or 2 way ship traffic

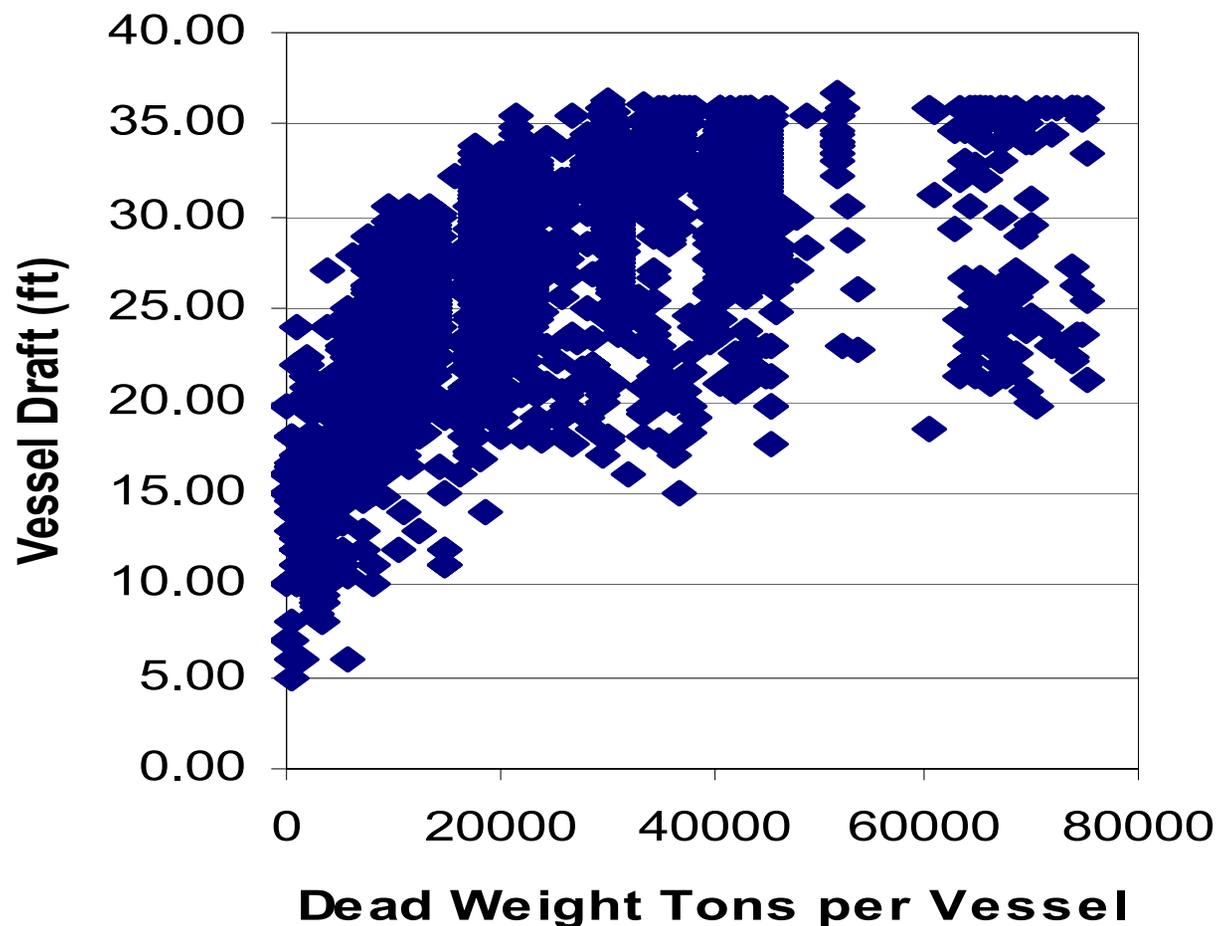


O&M Project Delivery Team (PDT)

- **Customers**
 - Port
 - Shipping industry
 - Pilots
- **Partners**
 - Port – Assuring agency for ROE / ROW
 - State – Sec 204 beneficial use projects
- **Stakeholders**
 - General public
 - Elected officials
 - Land owners
 - State and federal resource agencies
- **USACE interdisciplinary planning team**
 - New Orleans District
 - Vicksburg District
 - Memphis District
 - HQ and MVD



Vessel Usage Trends

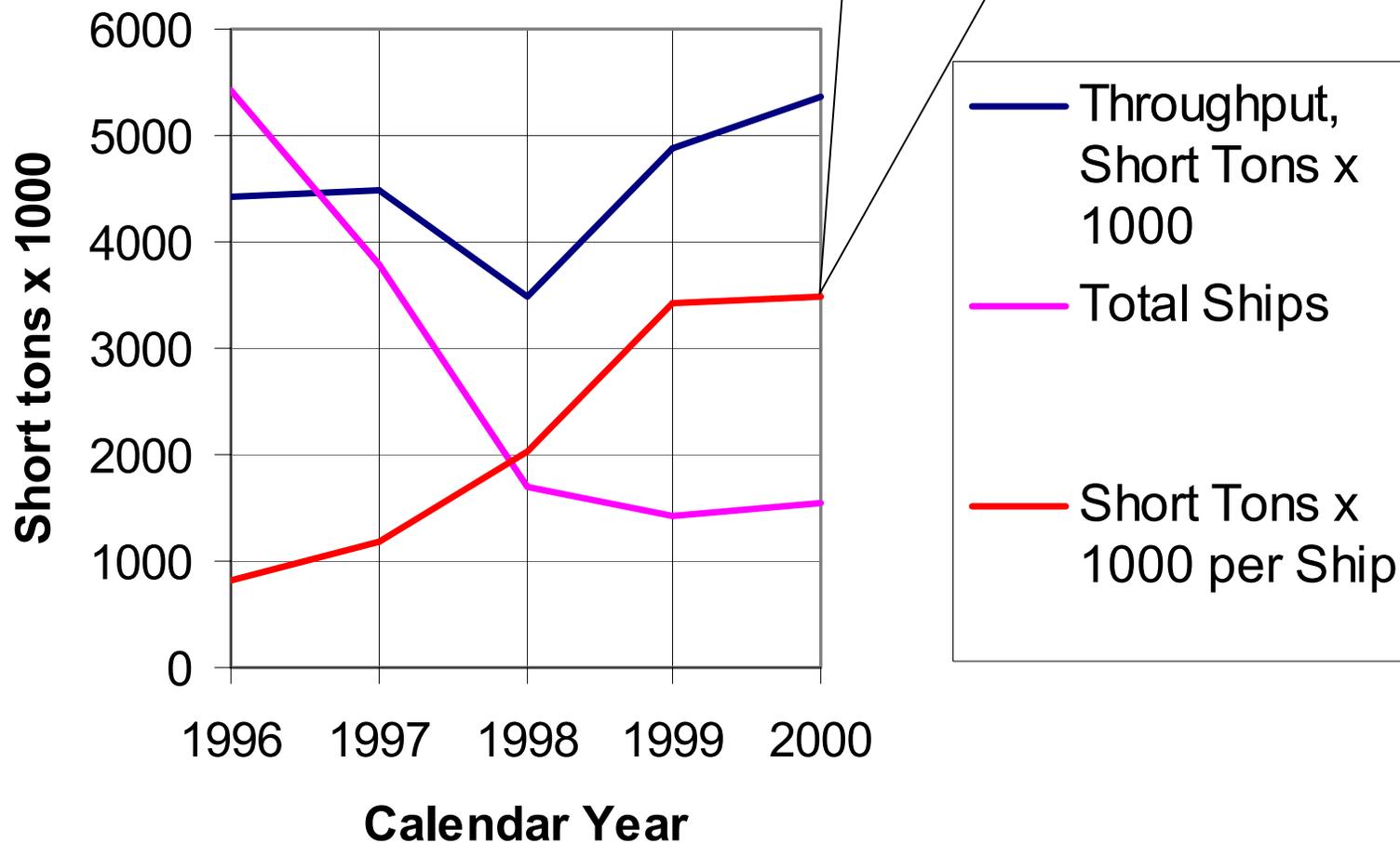


- Period: 2 JAN 1998 to 30 JUN 2002
- 2.68 vessel transits / day during sample period shows maximum draft ships using channel at ~36 ft



Vessel Usage Trends

Larger ships result in less trips for cargo moved





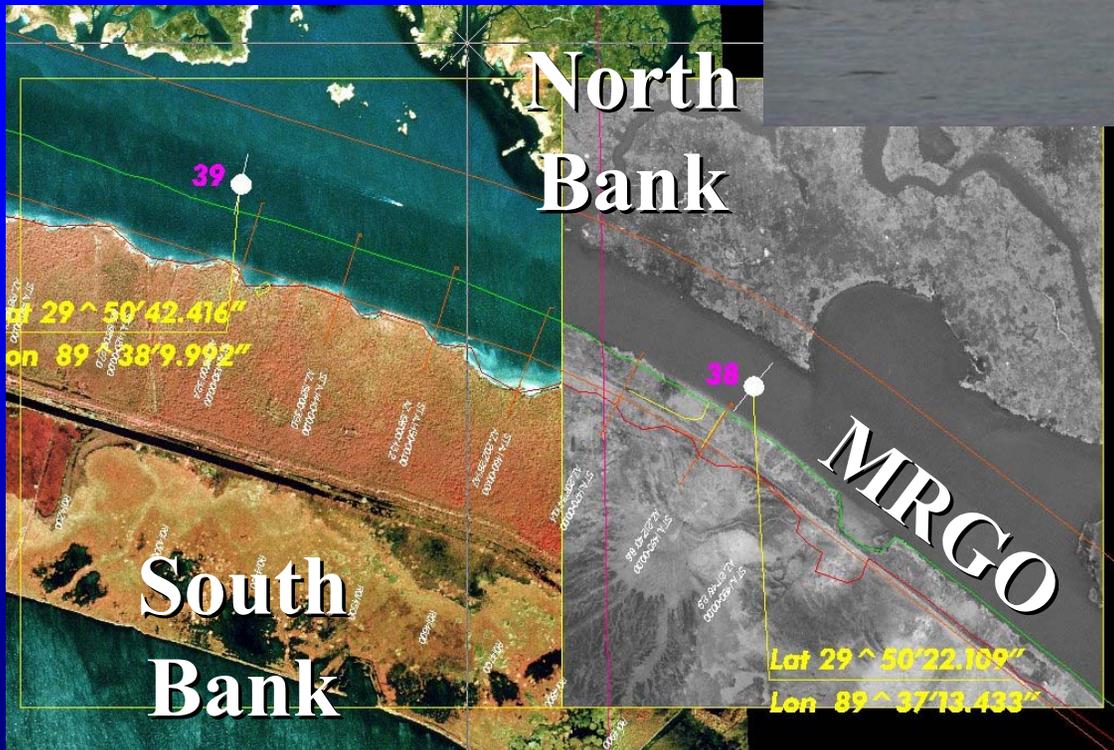
MRGO Initial Channel Construction Progress Circa 1959



**Original
Feature:
Unprotected
Banklines**



Ship Waves and Bank Erosion

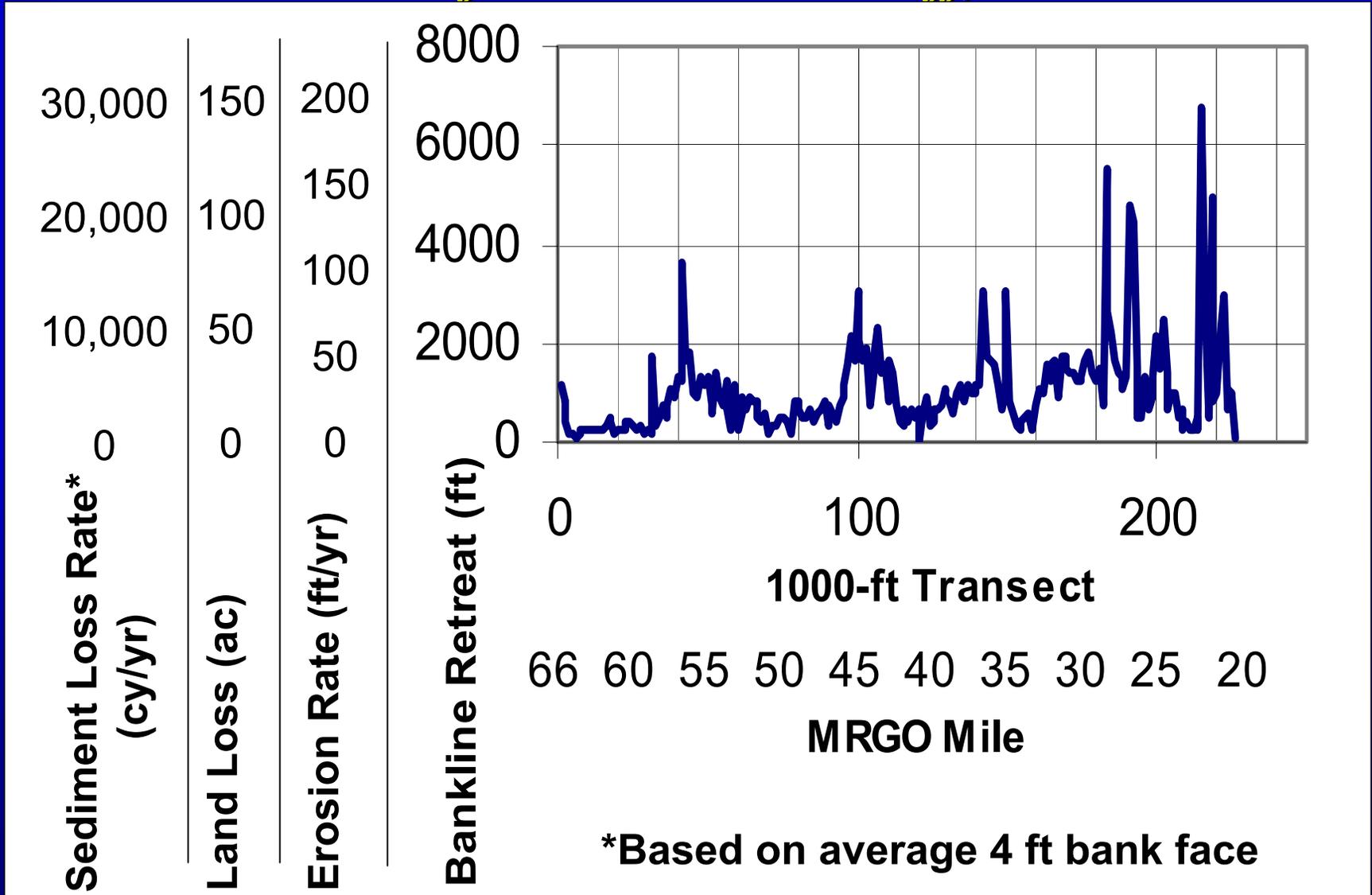


**Ship waves
Range from ~4-6
ft in height**



North Bank Erosion Trends 1964-1996

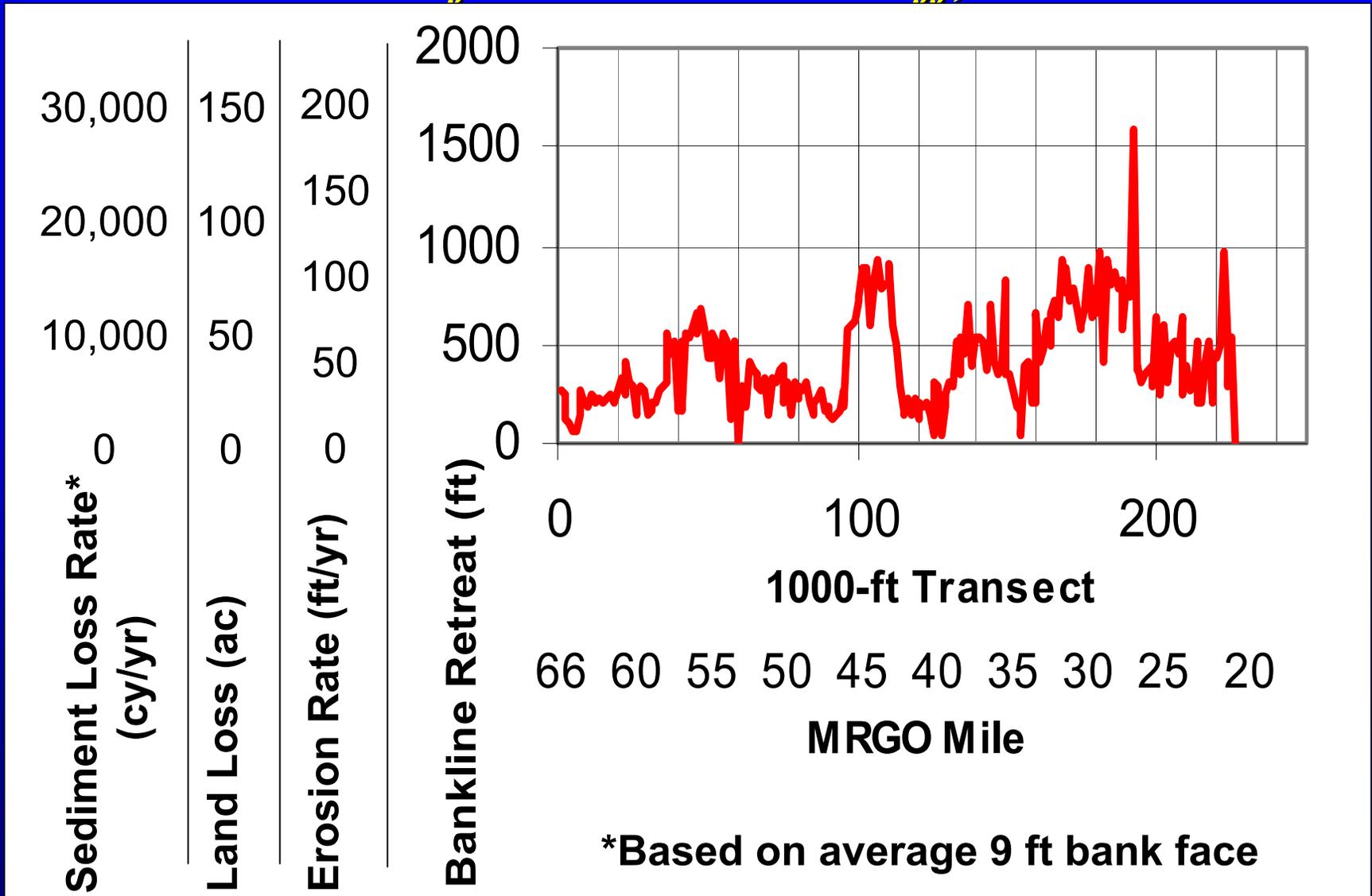
after Britsch and Ratcliff, 2001





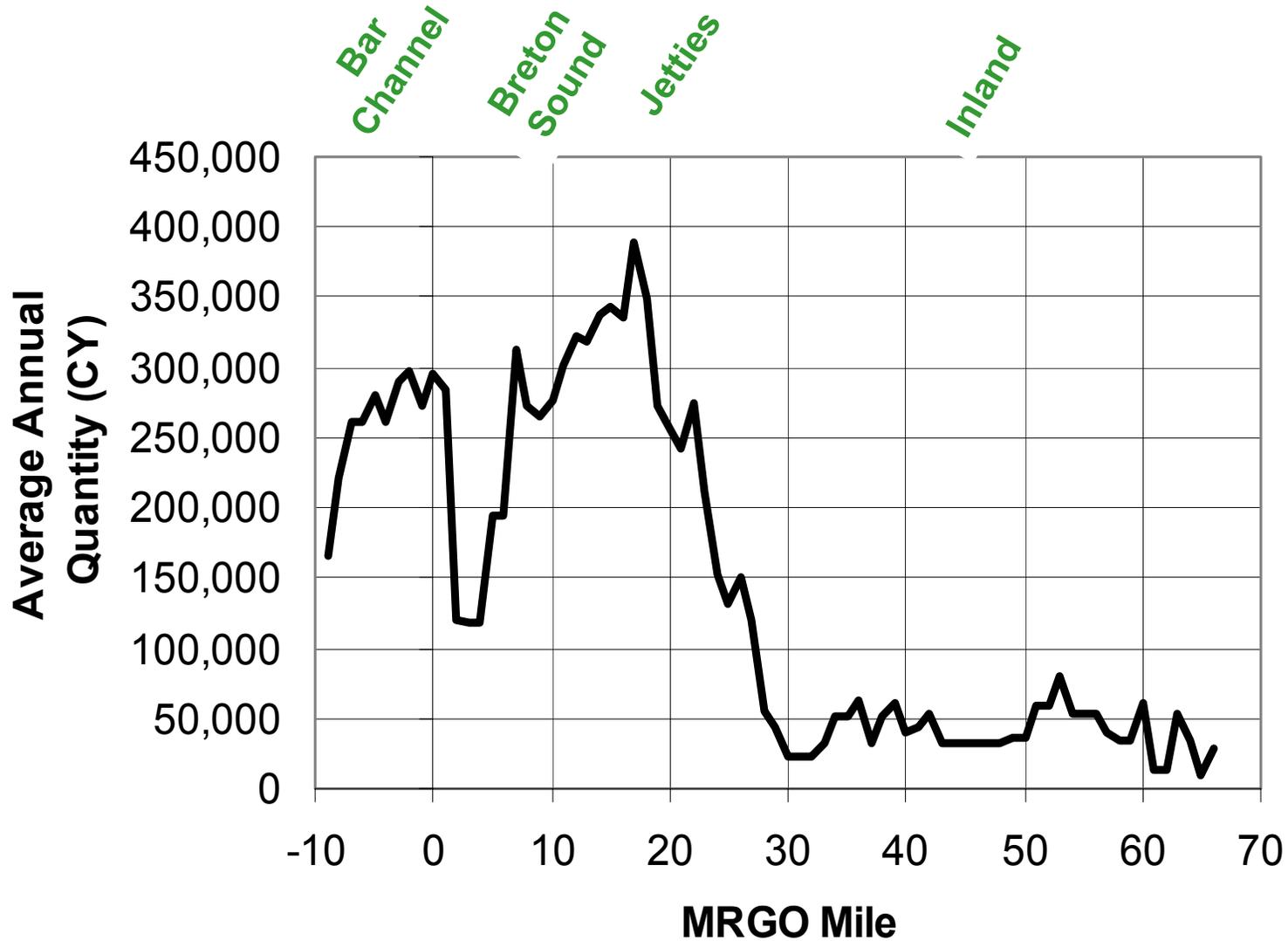
South Bank Erosion Trends 1964-1996

after Britsch and Ratcliff, 2001



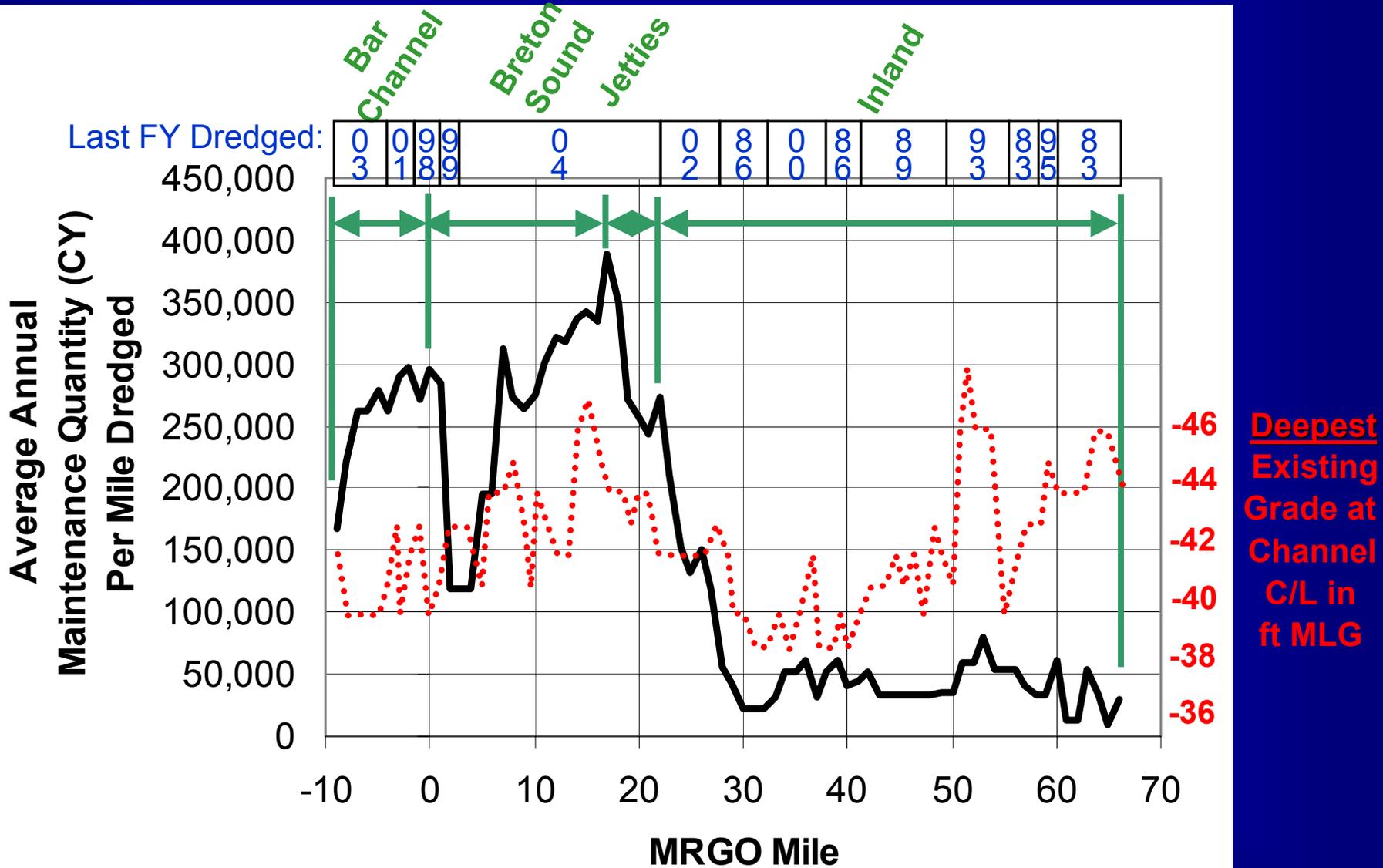


Channel Maintenance Trends 1966-2002



MRGO Channel Maintenance Trends

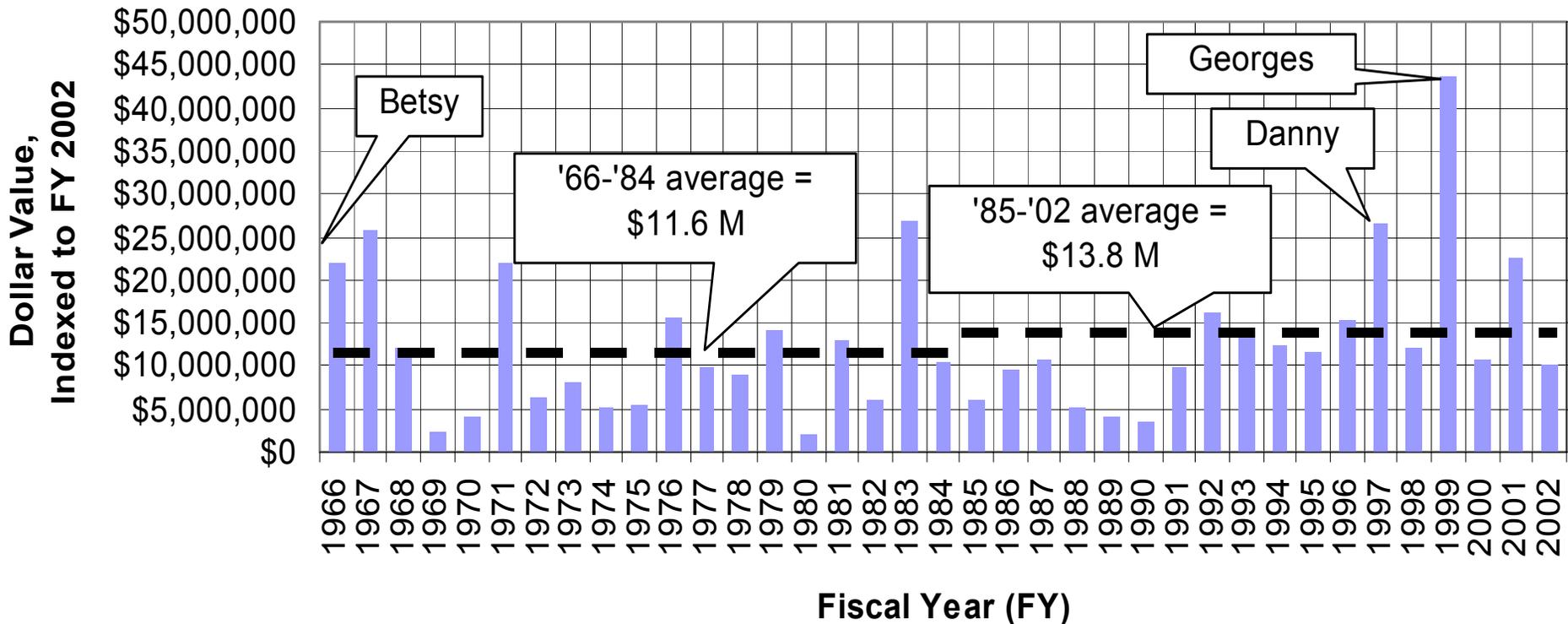
MAR 04





MRGO O&M Costs Indexed to FY 02 Dollars

- Major storms impacting area
 - 1915 hurricane
 - 1947 hurricane
 - 1965 – Hurricane Betsy
 - 1998 – Hurricane Georges
- Long term O&M average cost history includes storm years





Most probable future O&M Project Plans and Costs

- **Reduced dimensions dredging – 1 way traffic need**
- **Upland disposal / open water disposal / wetland creation / bank protection**
- **PDT scoping and plan formulation**
 - Tradeoff traditional channel side rock retention plans for longer pumping distances to shallow open water pockets along channel corridor
 - Led to lower cost beneficial use plans than past
- **\$12.5 M/yr estimated**
 - \$10.2 M/yr channel maintenance
 - \$2.3 M/yr beneficial use / bank protection



O&M Dredging Program





*Wetland Creation using
Channel Maintenance
Dredging Materials*

*Lake Borgne,
Louisiana*

Mississippi River – Gulf Outlet

*~1000 acres created
since 1985*

Breton Island Restoration Project in Connection with MRGO Channel Maintenance





Results of O&M Dredging Program *(FY 02 dollars)*

- **1985-2002**
 - **~1000 acres of wetlands created / barrier island restored**
 - **\$2.2 M/yr average cost**
 - **\$37.4 M total cost during period**
 - **\$37,400 per acre created / restored**

O&M Bank Protection Program



Mi.
60

Mi.
55

Mi.
50

Mi.
45

Mi.
40

Mi.
35

Mi.
30

Mi.
25

Mi.
20

FS = foreshore protection
 DMR = dredged materials retention
 ACM = articulated conc. mattress

Lake Borgne

Shell Beach

Hopedale

N.T.S.

Legend:

	<u>Compl.</u>	<u>Ongoing</u>	<u>Sched.</u>	<u>Prop.*</u>
O&M FS/DMR Rock				
Hurr. Prot. FS Rock				
CWPPRA FS Rock				
ACM				
Jetties				

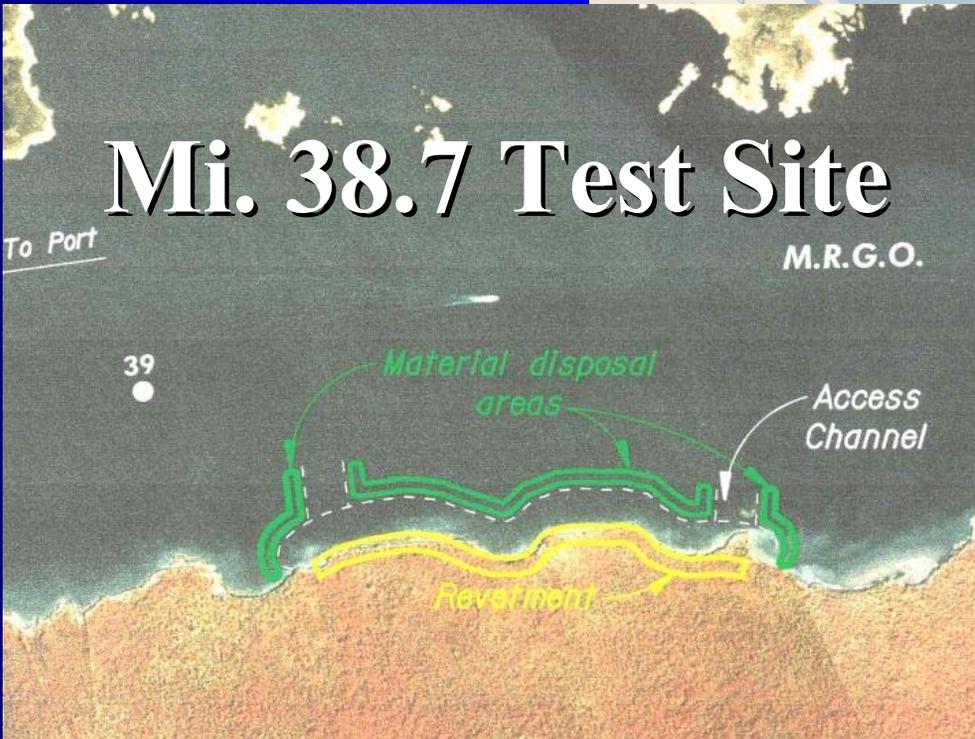
* Under analysis to advance

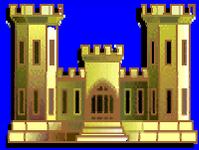


Results of O&M Foreshore Rock Protection Program (FY 02 dollars)

- **Completed work**
 - **Initial construction lifts**
 - 8 miles constructed
 - \$10.7 M value to date
 - **Maintenance lifts**
 - 12 miles in maintenance lifts completed
 - Multiple lifts for some reaches
 - \$2.8 M value to date
 - **Value of completed work = \$13.5 M**

Articulated Concrete Mattress (ACM) Bank Stabilization Program





O&M Program Summary

- **Sensitive to existing project problems and needs**
 - **Environmental**
 - **Economic**
 - **Social**
 - **Recreational**
- **Striking a balance in O&M to sustain project**
 - **Reduced channel maintenance dimensions for levels of service required**
 - **Beneficial use of dredged materials and bank protection**
- **Operating on protocols to manage budget at target cap**
 - **Bank protection in average O&M years**
 - **Funding focused on O&M in storm years**



NAVIGATION

Beth Wiggins

Chief, Project Management East



MRGO

GUIDANCE

- **Directed in the FY 05 President's Budget to:**
 - **Complete Re-evaluation Study for Navigation**
 - **100% Federal cost**
 - **Complete with funds available**
 - **Initiate Ecosystem Restoration Study**
 - **\$50K develop scope of study and identify non-Federal Sponsor**
 - **\$175K initiate cost shared feasibility studies**



MRGO Regional Economic Impact

Preliminary Results

- **\$2.3 Billion - Impact to State Economy**
- **\$1.1 Billion - Impact to Local Economy**
- **\$386 Million - Statewide Earnings**
- **17,000 - Statewide jobs**



MRGO Re-evaluation Study

Navigation Alternatives

- **Channel remains open to deep draft (O&M includes some bank protection and beneficial use)**
- **Modify channel – 12, 16 or 20 ft depth by Natural Shoaling**
 - **Barge traffic requires 12 ft depth only**
 - **Shoaling will be greatest at barrier bar channel entrance**



MRGO Re-evaluation Study

Economic Evaluation

➤ **Assumptions:**

- **No action to close MRGO to deep draft traffic until IHNC deep-draft lock constructed (2017)**
- **5 - 5/8 % Discount Rate**
- **Partial closure achieved by shoaling**



MRGO Re-evaluation Study

Economic Evaluation

- **Preliminary economic analysis shows that the MRGO:**
 - **Is strongly justified for deep-draft traffic if there is no viable deep-draft alternative**
 - **Is marginally justified for deep-draft traffic if there is a viable deep-draft alternative**
 - **Is not justified as a federal project for shallow-draft traffic only**



FLOOD CONTROL

Beth Wiggins

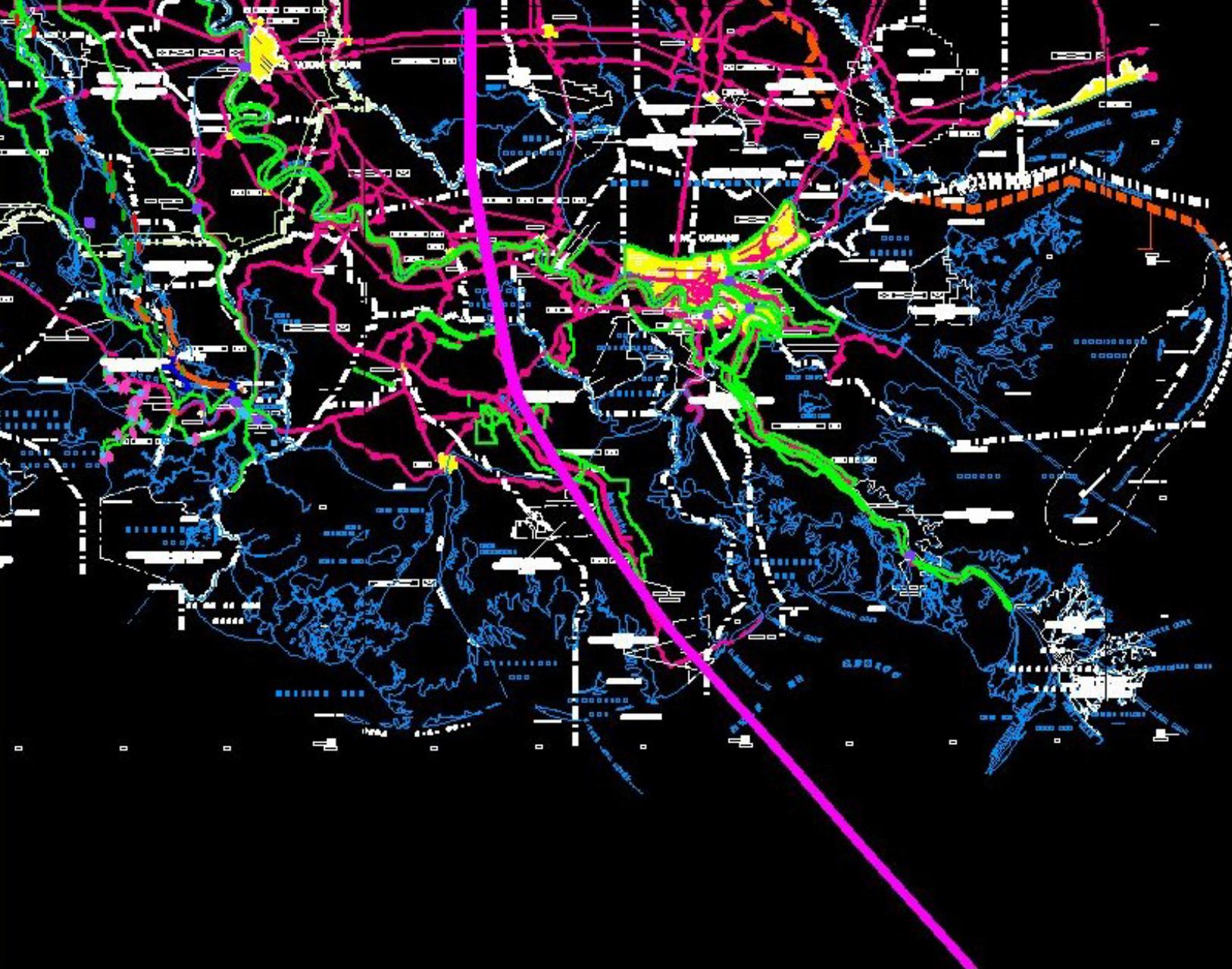
Chief, Project Management East



MRGO Re-evaluation Study

Effects of Hurricane Storm Surge

- **Nine storm scenarios: combination of three forward speeds (Slow, Medium and Fast) and three intensities (Strong, Moderate, Weak)**
- **Same track was used for all storm scenarios**
- **Track selected to produce maximum winds parallel to axis of MRGO while minimizing east winds across Mississippi Sound**
- **In addition, a model run was made using the track of Hurricane Betsy**



Model Storm Track



MRGO Re-evaluation Study

Effects of Hurricane Storm Surge

- **Two model runs for each storm scenario**
 - **with MRGO open**
 - **with MRGO closed**



MRGO Re-evaluation Study

Effects of Hurricane Storm Surge

➤ **Conclusions:**

- **The largest difference between the Open and Closed MRGO was less than .6 feet**
- **Model conclusion is that the open MRGO has a minimal effect on storm surge elevations**



ECOSYSTEM RESTORATION

*Gregory Miller
Project Manager
Coastal Restoration Branch*



MRGO Ecosystem Restoration

- **Environmental impact assessment in Re-evaluation Study**
- **CWPPRA**
- **CAP**
- **LCA**
- **FY05 Study**



MRGO Re-evaluation Study

Environmental Impacts

- **Most significant environmental effects occurred in the first 20 years after MRGO constructed**
 - 2,500 acres loss due to construction
 - 4,220 acres loss due to bank erosion from 1968 – 1987
- **Continuing environmental impacts result from bank erosion – avg 15 ft/year**



MRGO Re-evaluation Study

Environmental Impacts

- **EIS analysis in progress**
 - **Analyzing environmental impacts of operating MRGO for deep-draft traffic**
 - **Analyzing environmental impacts of operating MRGO for shallow-draft traffic**



BREAUX ACT PROJECTS

***Gregory Miller
Project Manager
Coastal Restoration Branch***



MRGO - Coastal Wetlands Planning, Protection and Restoration Act

STUDY AREA BREAUX ACT PROJECTS





MRGO Ecosystem Restoration

STUDY AREA BREAUX ACT PROJECTS

- Four projects located along channel
 - PED - Two shoreline protection projects along Lake Borgne and MRGO est. cost \$45 million benefiting 495 acres
 - Constructed - Two hydrologic restoration projects in area cost \$2.6 million benefiting 889 acres
- Total cost \$47.6 million protecting 1,384 acres
 - Average \$34,393 per acre benefited
- Shoreline protection using rock dikes is very expensive (\$1 million to \$3.5 million per mile)
 - Rock dike average cost \$90,909 per acre benefited



CONTINUING AUTHORITIES PROGRAM

*Gregory Miller
Project Manager
Coastal Restoration Branch*



Corps of Engineers

Continuing Authorities Program

- Nine standing authorizations from Congress for USACE to work with local governments on small projects
- Project types include flood control, bank protection, ecosystem restoration, beneficial use of dredged material and others



Corps of Engineers

Continuing Authorities Program

- CAP projects constructed in St. Bernard in the past few years include:
 - Breton Island Restoration
 - Beneficial use marsh creation
- Projects being planned include:
 - Additional beneficial use/marsh creation
 - Wing jetty
- LA Dept of Natural Resources is the local sponsor helping to fund these efforts



*LOUISIANA
COASTAL AREA
STUDY*

*Gregory Miller
Project Manager
Coastal Restoration Branch*



MRGO Ecosystem Restoration ***LCA COORDINATION***

- During LCA public meetings in 2003 USACE and LDNR heard from the public that MRGO needed to be addressed in the LCA Comprehensive Study
- MRGO Ecosystem Restoration is incorporated in alternative plans of LA Coastal Area Study (LCA)
- New start MRGO Ecosystem Restoration feasibility study will offer detailed options to include in the LCA initiative

Coastwide Restoration Plan



-  Rebuild historic reef
-  Existing navigation channel
-  Proposed navigation channel
-  MRGO study
-  Freshwater diversion
-  Marsh creation
-  Salinity control influence
-  Freshwater influence
-  Barrier island and shoreline restoration
-  Louisiana coastal area





*ECOSYSTEM
RESTORATION
STUDY*



MRGO Ecosystem Restoration FEDERAL FUNDING

- FY05 budget includes study directions and funding
- FY05 federal funds \$225k
- FY05 federal funds schedule
 - \$50k for PMP development and \$175k for feasibility
- Local cost share 50% (estimate \$175k)
- Total study cost estimated <\$550k pending PMP development



**From data supplied by the USGS,
since 1956, habitat conversion or
land loss due to natural causes
and the MRGO:**

Habitat Conversion – 19,500 acres

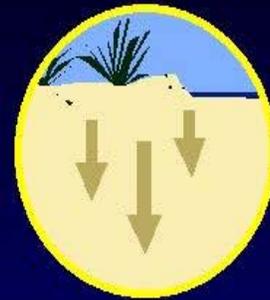
Land Loss – 17,600 acres

Major Causes Of Wetland Loss

Barrier
Island
Degradation



Subsidence



Storms



Sea Level
Rise



Salt Water
Intrusion



Sediment
Reduction



Canals

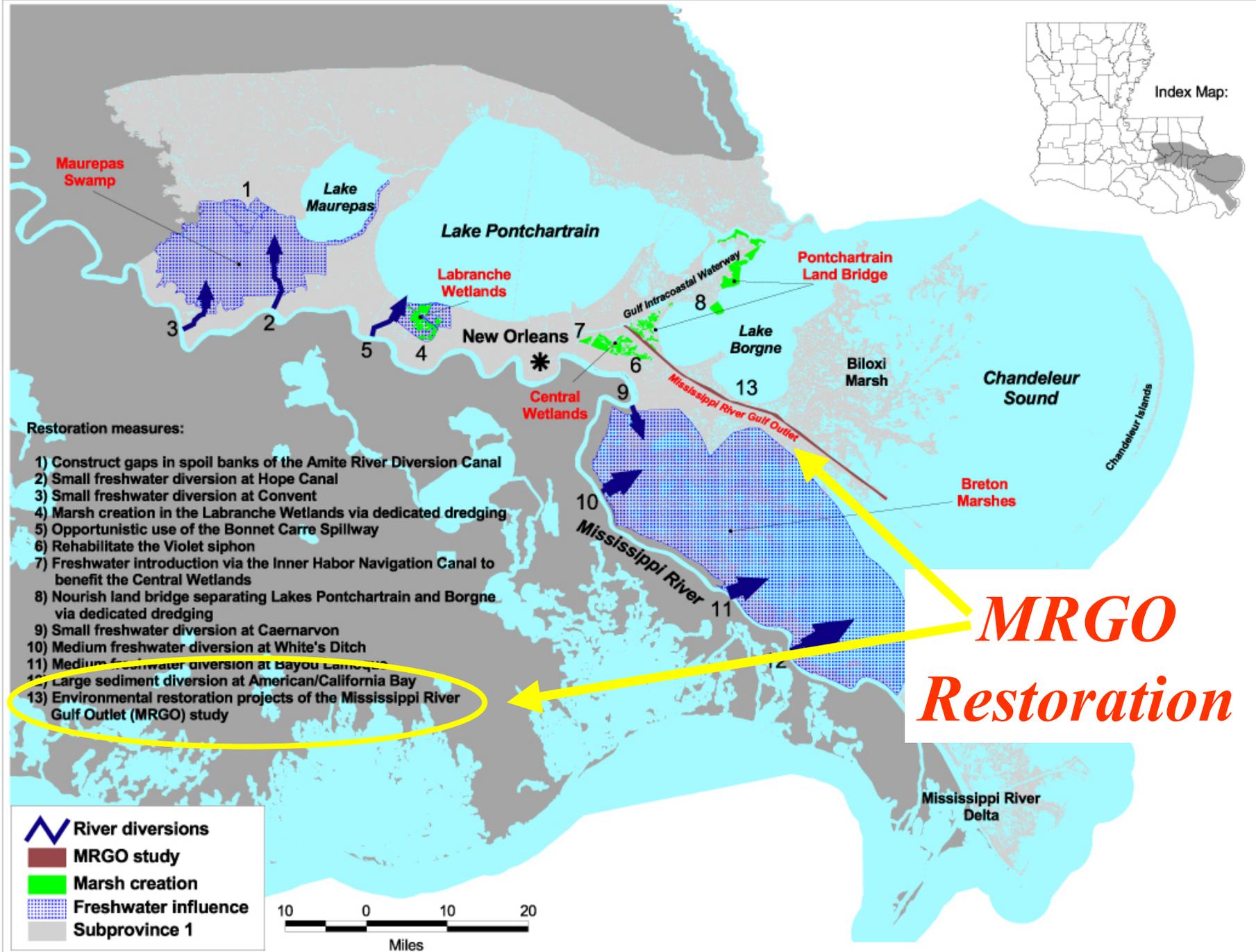


Oil & Gas
Development



Levee
System





Restoration measures:

- 1) Construct gaps in spoil banks of the Amite River Diversion Canal
- 2) Small freshwater diversion at Hope Canal
- 3) Small freshwater diversion at Convent
- 4) Marsh creation in the Labranche Wetlands via dedicated dredging
- 5) Opportunistic use of the Bonnet Carre Spillway
- 6) Rehabilitate the Violet siphon
- 7) Freshwater introduction via the Inner Harbor Navigation Canal to benefit the Central Wetlands
- 8) Nourish land bridge separating Lakes Pontchartrain and Borgne via dedicated dredging
- 9) Small freshwater diversion at Caernarvon
- 10) Medium freshwater diversion at White's Ditch
- 11) Medium freshwater diversion at Bayou Lafourche
- 12) Large sediment diversion at American/California Bay
- 13) Environmental restoration projects of the Mississippi River Gulf Outlet (MRGO) study

 River diversions
 MRGO study
 Marsh creation
 Freshwater influence
 Subprovince 1



MRGO
Restoration



MRGO Ecosystem Restoration BACKGROUND

- Some environmental measures included in the MRGO Re-evaluation Study may be examined in the FY05 new start Ecosystem Restoration study
 - Marsh creation
 - Bank stabilization
 - Rebuilding of natural ridges
 - Constriction of breeches
 - Diversion of Mississippi River water



This presentation is available on
the internet at:

<ftp://ftp.usace.army.mil/Incoming/MVN/MRGO%20Study/>

Additional Information

www.mvn.usace.army.mil

- John Saia (504) 862-2204
- Beth Wiggins (504) 862-2778
- Ed Diehl (504) 862-1876
- Edmond Russo (504) 862-1496
- Gregory Miller (504) 862-2310