

Re-Establishment of In-Bay Placement Mobile Harbor

Nathan D. Lovelace P.E.
Operations Division
U.S. Army Corps of Engineers
Mobile District
June 22, 2016

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NATURAL PROGRESSION



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- Introduction to Mobile Harbor
- Problem Statement
- Establishment of IWG
- In-Bay Placement
- Impact to Navigation
- Culture Shift

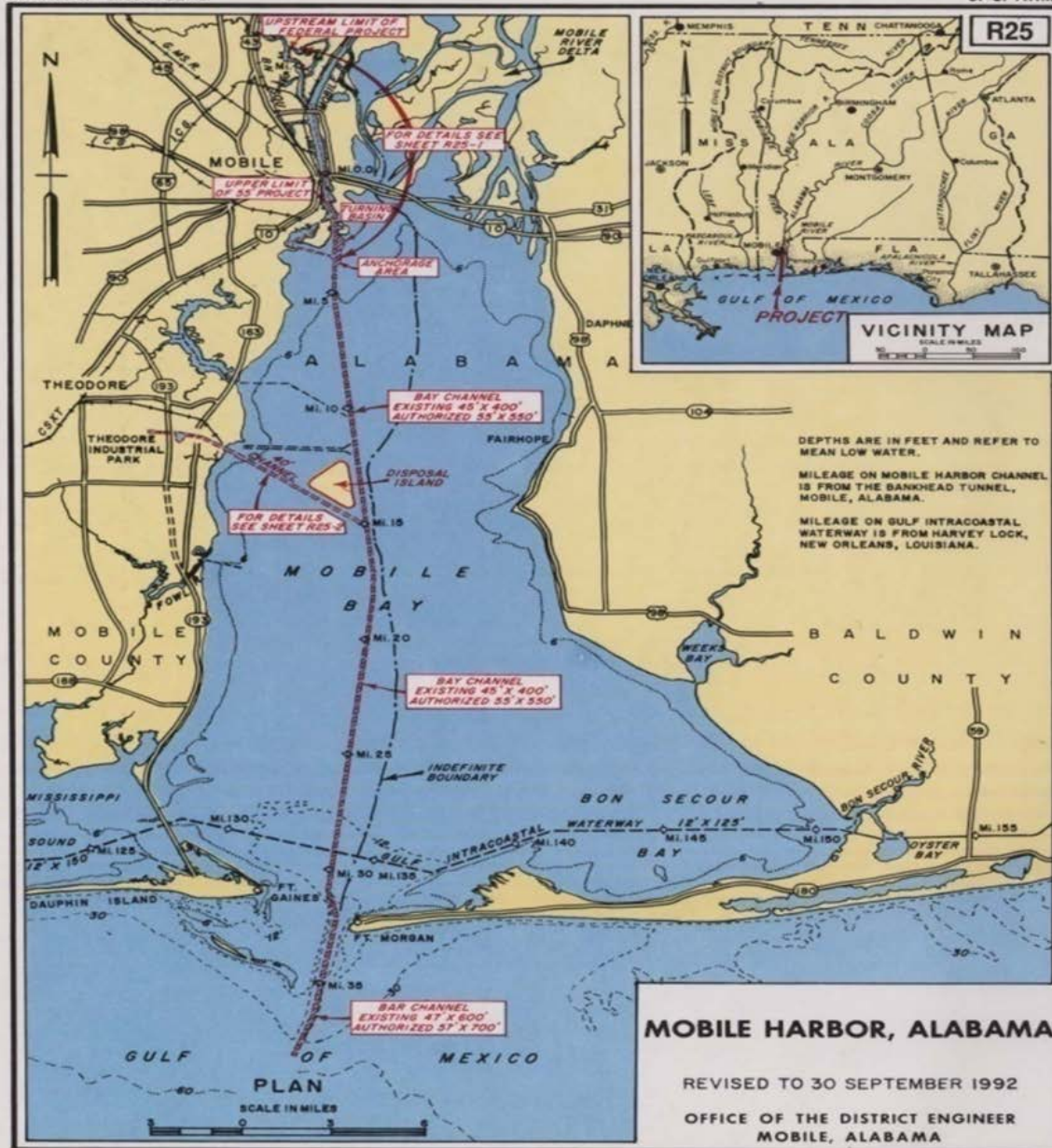


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Mobile Harbor



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- Ranked in the top 10 Leading U.S. Port
- 65 Million Tons Domestic/Foreign
- 40 Miles of Main Channel
 - ▶ 4.5 Miles to -40 ft
 - ▶ 35.5 Mile to -45 ft
- Fed by the 4th Largest Watershed in U.S.
- Annual Shoaling Rate Approx 6.5 MCY
 - ▶ 1.2 MCY River
 - ▶ 4 MCY Bay
 - ▶ 1 MCY Theodore
 - ▶ 0.3 MCY Bar



Problem Statement



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- Lack of disposal areas within the Bay system
- Backlog of maintenance material leading to depth/width restrictions
- WRDA 1986
 - ▶ Authorization for widening and deepening
 - ▶ Dredged material from Mobile Channel shall be disposed of in open water in the Gulf of Mexico
- WRDA 1996
 - ▶ May consider alternatives to disposal of dredged material in the Gulf of Mexico, including environmental acceptable alternatives for beneficial uses of dredged material and environmental restoration



Establishment of the IWG



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- Built on existing RSM relationships and principles
- Presented the watershed study/sediment budget
- Challenged the team to look at the evidence and decide for themselves **“Is it smart to continue removing 4 MCY from the Bay and hauling it to the Ocean?”**
- IWG initiated several studies/demo projects to better understand the capabilities of fine grain sediments
 - ▶ Filling of Brookley Hole using channel material
 - ▶ Burlap Tubes demo for potential use in large BU site



Mobile Bay Interagency Working Group (IWG)



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- Alabama State Port Authority (ASPA)
- USACE, Mobile District
- USACE, Engineering Research and Development Center (ERDC)
- Alabama Dept. of Conservation and Natural Resources (ADCNR), State Lands Division
- ADCNR, Marine Resources Division (MRD)
- ADCNR, Wildlife and Freshwater Fisheries Division (WAFF)
- Alabama Dept. of Environmental Management (ADEM)
- Geological Survey of Alabama (GSA)
- U.S. Fish and Wildlife Service (FWS)
- National Marine Fisheries Service (NMFS), Habitat Conservation Division
- Mobile Bay National Estuary Program (NEP)
- Environmental Protection Agency (EPA)
- Dauphin Island Sea Lab (DISL)
- The Nature Conservancy (TNC)
- Mobile County Environmental Department
- Mobile Bay Keeper

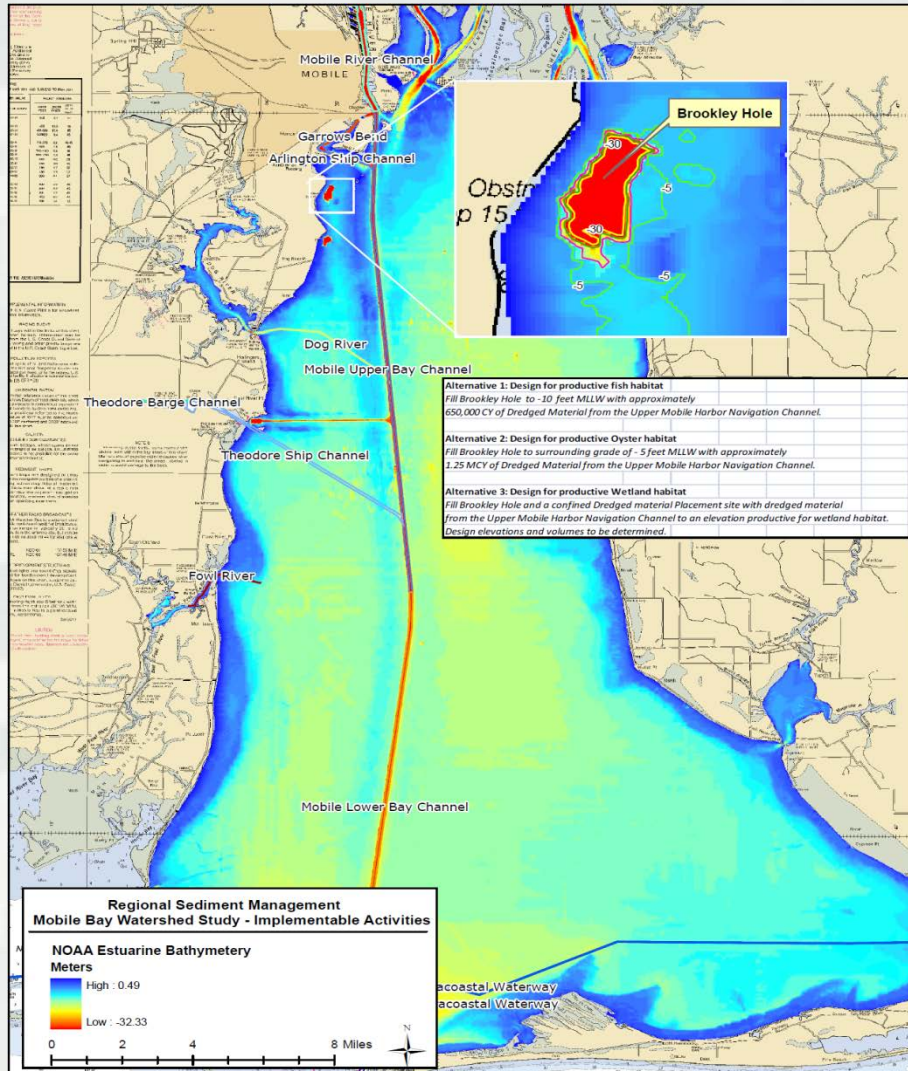
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BU of Dredged Material to Fill Brookley Hole



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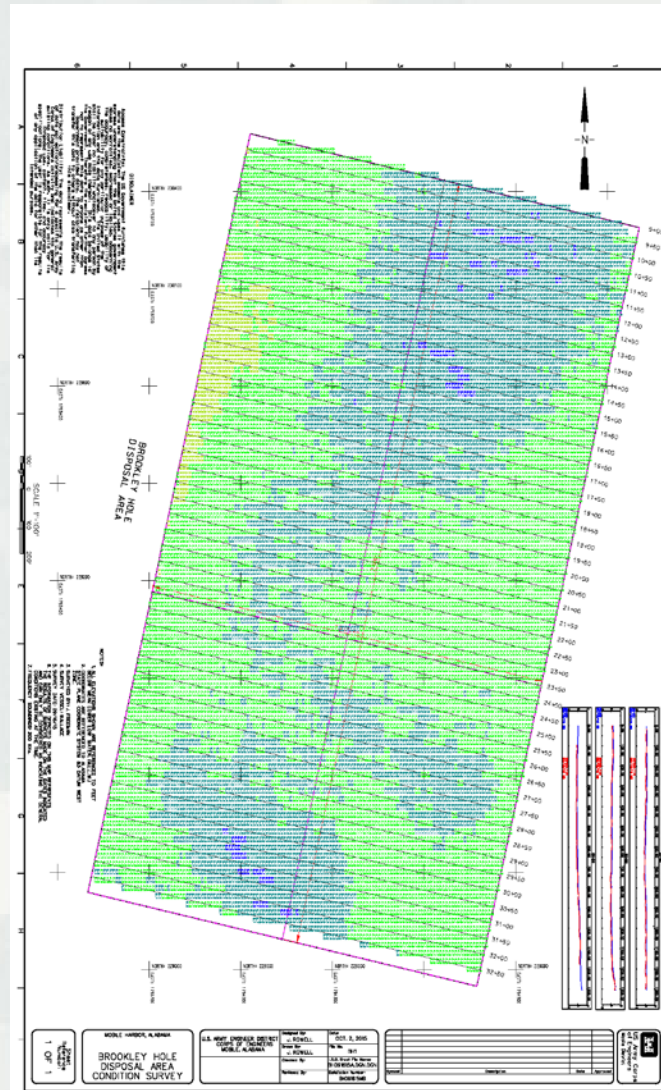
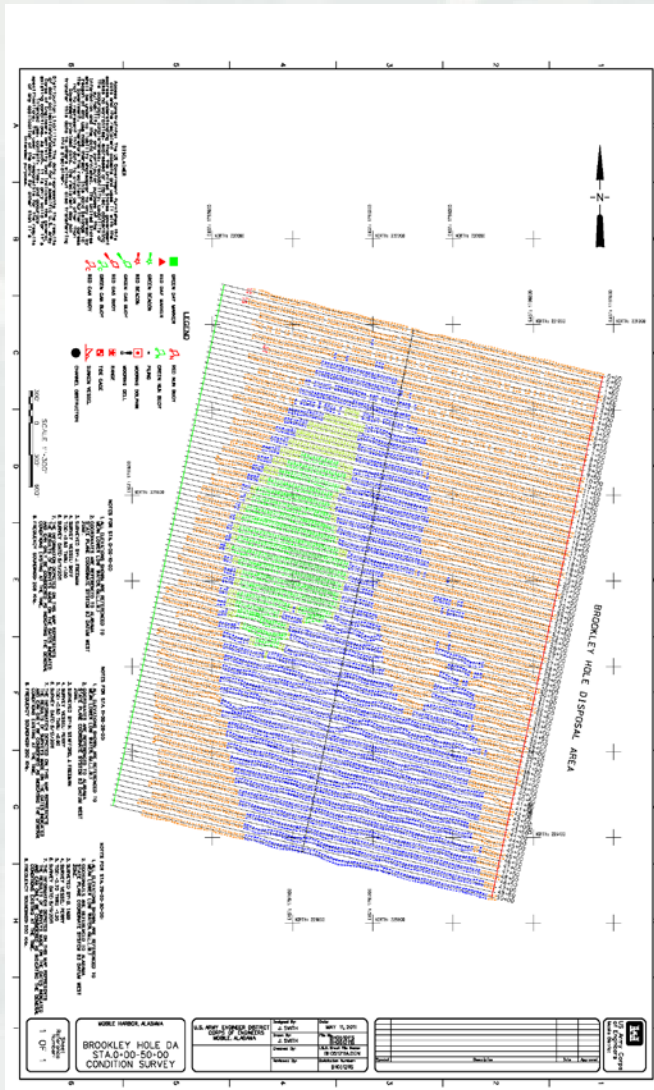
- Recommendation to pursue permitting processes to implement BU action
- Fill Options
 - Fill to some level of productivity
 - Fill to surrounding grade through successive dredging cycles
 - Combination of emergent feature w/ marsh vegetation grading into shallow submerged environment
- 1.2 MCY of initial fill from upper Mobile Bay Channel
- Monitoring results used to determine desired level of restoration
- Initial fill completed September 2012
- Leveraging other research programs (DOER)
 - Conducted baseline characterizations
 - Continued post-fill monitoring



BU of Dredged Material to Brookley Hole



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Establishment of the IWG



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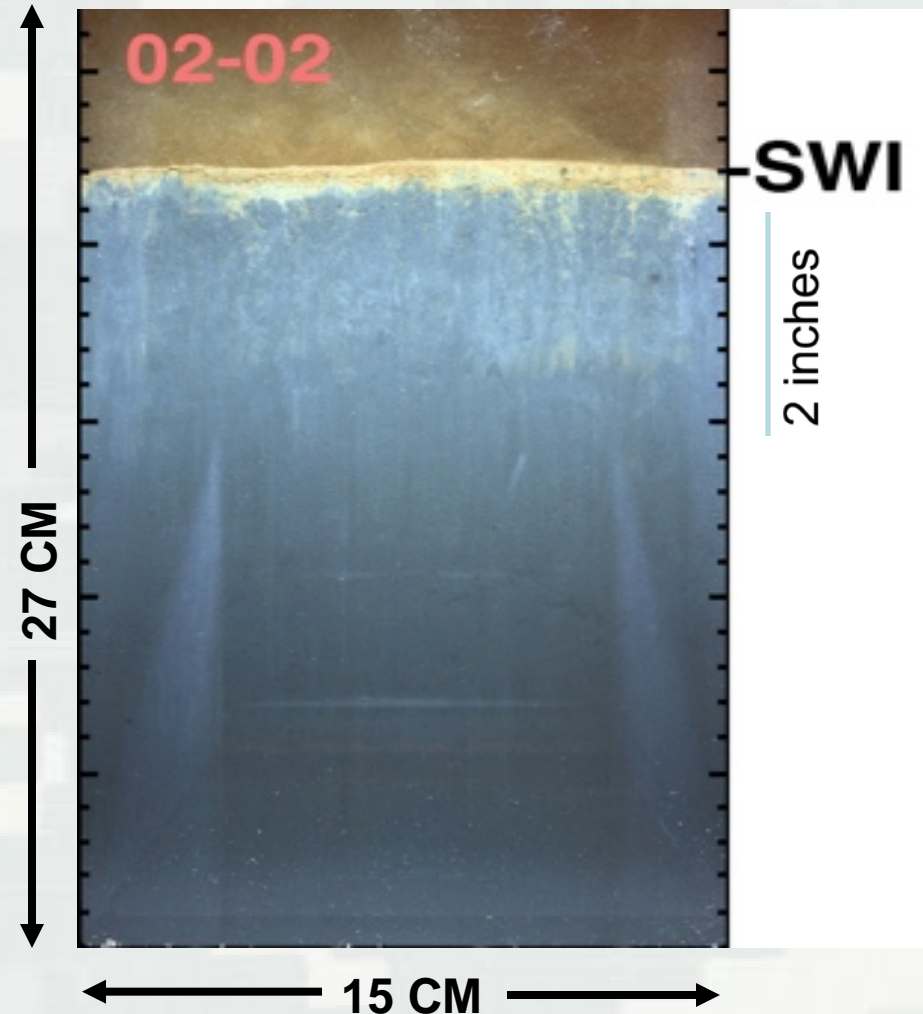
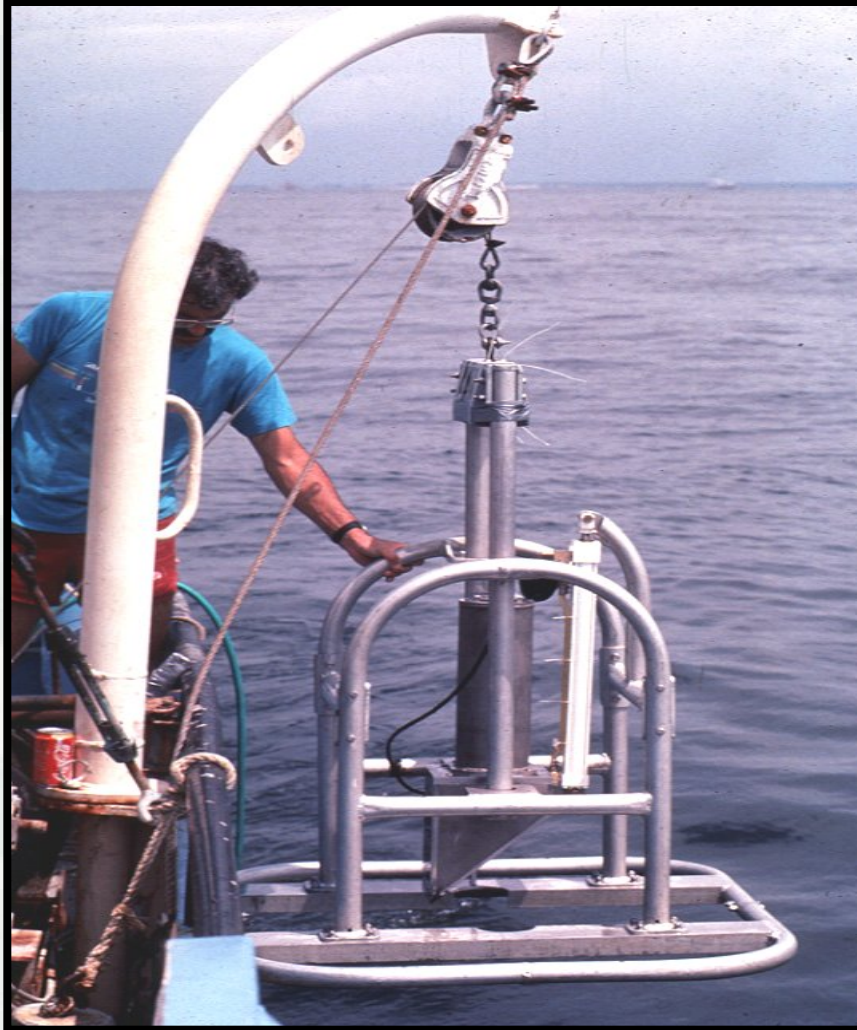
- IWG agreed to consider In-Bay placement with the Corps commitment to a thin-layer demo and constant pursuit of other BU opportunities (i.e. large BU site)
- Corps spent ~\$1M to model thin-layer demo
 - ▶ Sediment Profiling – SedFlume – Push Cores
- Results were amazingly informative and positive
- IWG had successfully fostered the efforts that would ultimately prevent approx. 2-3 MCY annually from leaving the Mobile Bay system.
- IWG team established their identity by shifting the culture of managing fine grain channel material.



Sediment Profiling Imagery



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OLDER DREDGED MATERIAL SPI IMAGED 09/26/2012



02-09

Oxygenated
Surface Layer
Reworked by
Currents or
Wave action

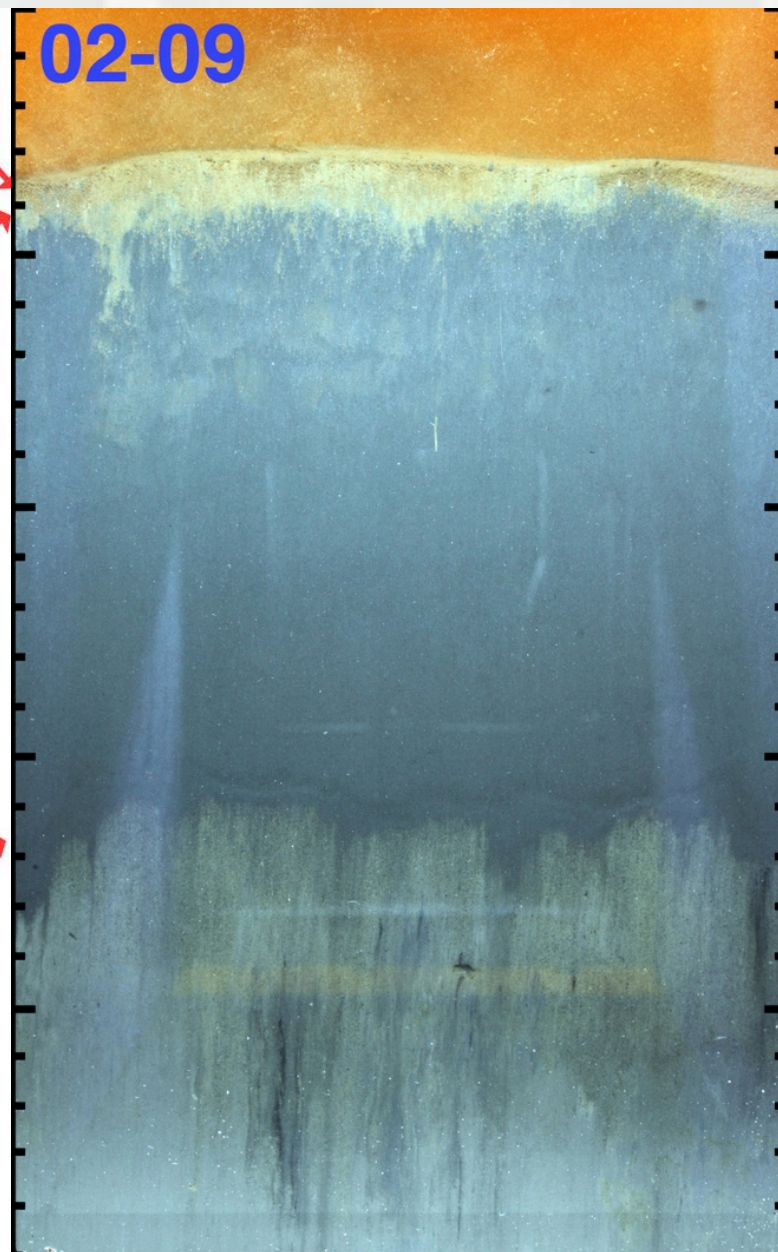
2 inches

Buried
Native Bed

Sediment-water
Interface

Dredged
Material
Layer

Scale in cm

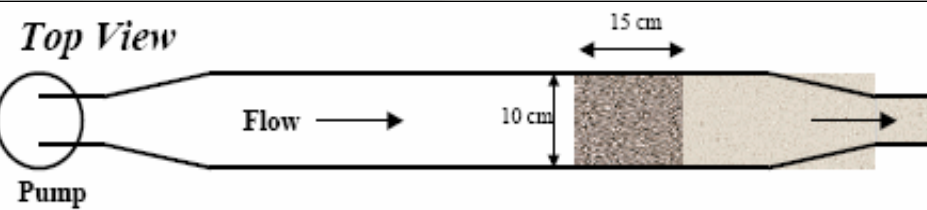




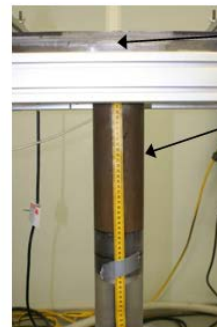
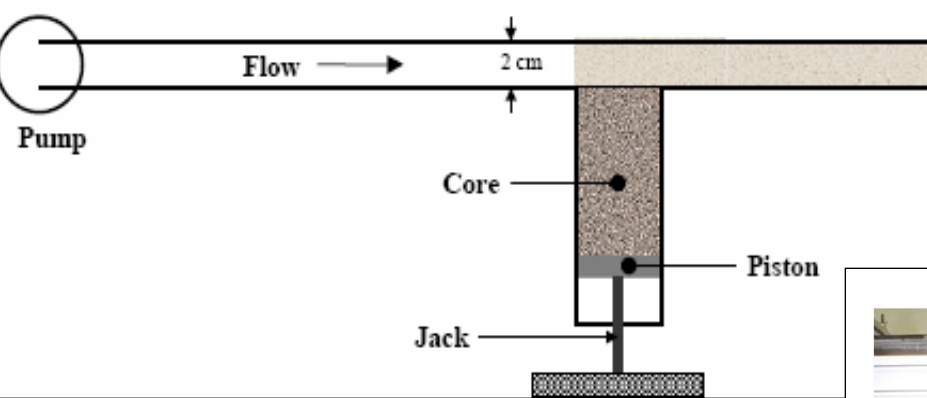
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SEDFLUME

Top View

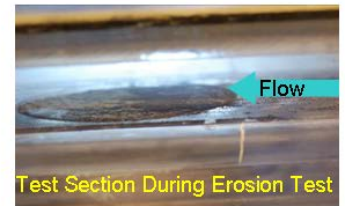


Side View



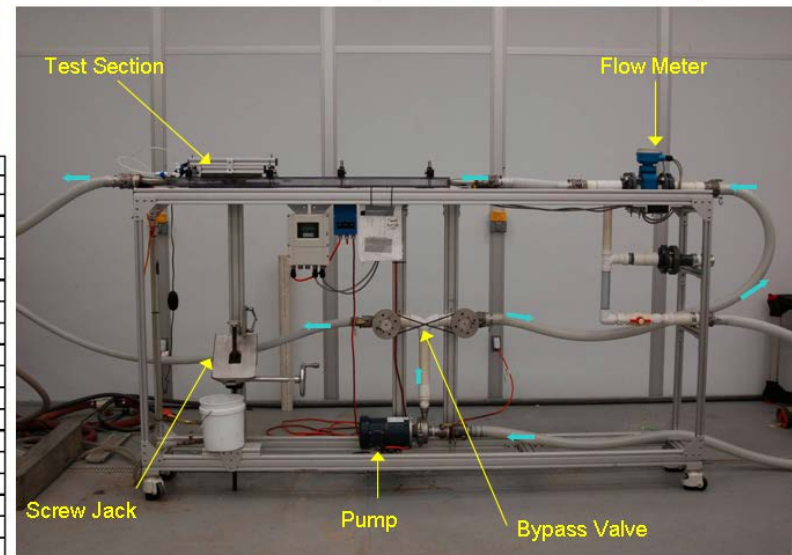
Test Section

Core



Test Section During Erosion Test

Shear stress τ (Pa)	Flow Rate (GPM)
0.1	6.1
0.2	9.1
0.4	13.5
0.6	17.0
0.8	20.1
1.2	25.3
1.6	29.8
2.4	37.4
3.2	44.0
4	49.9
5	56.6
6.4	65.0
8	73.7
10	83.5
12	92.5
13	96.7
14	100.8



Test Section

Flow Meter

Screw Jack

Pump

Bypass Valve

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Modeling Conclusions



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- Approximately 35% of the sediment that erodes from the designated disposal areas is transported and deposits in the navigation channel.
- The remaining 65% is widely dispersed throughout the bay by wind-, river-, and tide-driven currents.
- The dredge material placed in thin-layers is less erodible (~ 45%) than native sediment.
- Sediment becomes remobilized into Bay's natural sediment system (Not transported along the bottom)



In-Bay Placement



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- June 30, 2014 Received CZM and WQC for thin-layer placement in Mobile Bay
- In-Bay placement fulfilled WRDA 96 standards “*environmental acceptable alternatives for beneficial uses of dredged material and environmental restoration*”

LAURENCE R. LEFLEUR
Director

Alabama Department of Environmental Management
adem.alabama.gov
1400 Guleaux Blvd. 36130-2400 • Post Office Box 301463
Montgomery, Alabama 36130-1463
(334) 271-7700 • FAX (334) 271-7950

ROBERT J. BENTLEY
Governor

June 30, 2014

Mr. Curtis Flakes
U.S. Army Corps of Engineers
P. O. Box 2288
Mobile, AL 36628-0001

RE: State of Alabama: Coastal Consistency Decision
Facility: Mobile Harbor Federal Navigation Project, Mobile County, Alabama
Mobile District U.S. Army Corps of Engineers (USACE) Permit Number: FPLA-MH01-10
Alabama Department of Environmental Management (ADEM) Tracking Code: 2012-167-COEP-CZM-M2

Dear Mr. Flakes:

By way of Joint Public Notice No. FP14-MH01-10 (20 May 2014) and your letter of 23 June 2014, the ADEM received the USACE's consistency determination for the second modification to FP11-MH01-06 (April 10, 2012). The ADEM understands that the modification would expand the open bay thin-layer disposal option from an emergency storm related action only to also include long-term open bay thin-layer disposal as an alternative option. Forwarding this option is expected to add an environmentally acceptable alternative for managing maintenance dredged material within the Mobile Bay navigational channel.

Pursuant to 15 CFR § 930, et al. review of the information submitted in accordance with the rule.

Future modifications of this feed

This certification does not constitute any injury to persons, local laws or regulations, and it is not construed as an acquiescence to the matter.

Contact the Mobile-Coastal office with this matter.

Sincerely,

STEVEN O. JORDAN, Chief
Field Operations Division

SOJ/sb/cap File: CZCERT

Enclosure(s): Modification No.

E-copy: Larry Person, U.S. Army Corps of Engineers
Michael Nelson, U.S. Army Corps of Engineers
Rosemary Hall, USEPA Region IV, Atlanta
Josh Russell, USACE, Daphne
Mark Thompson, MWRP-M2, Panama City
Carl Ferraro, ADCNR

Birmingham Branch
135 Nelson Road
Birmingham, AL 35209-4702
(205) 942-4168
(205) 941-5853 FAX

Des Moines
2715
(205) 942-4168
(205) 941-5853 FAX

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June 30, 2014

Mr. Curtis Flakes
U.S. Army Corps of Engineers
P. O. Box 2288
Mobile, AL 36628-0001

RE: State of Alabama: Clean Water Act (CWA) § 401(a) Water Quality Certification
Facility: Mobile Harbor Federal Navigation Project, Mobile County, Alabama
Mobile District U.S. Army Corps of Engineers (USACE) Permit Number: FPLA-MH01-10
Alabama Department of Environmental Management (ADEM) Tracking Code: 2012-167-COEP-WQC-M2

Dear Mr. Flakes:

By way of Joint Public Notice No. FP14-MH01-10 (20 May 2014), the ADEM received the USACE's request for CWA § 401(a) Water Quality Certification for the second modification to FP11-MH01-06 (April 10, 2012). The ADEM understands that the proposed modification would expand the open bay thin-layer disposal option from an emergency storm related action only to also include long-term open bay thin-layer disposal as an alternative option. Forwarding this option is expected to add an environmentally acceptable alternative for managing maintenance dredged material within the Mobile Bay navigational channel.

This letter grants certification that the activities associated with this requested modification will not violate applicable water quality standards established under Section 303 of the Clean Water Act and (32-22-9(g), Code of Alabama (1975) provided there remains strict adherence to the conditions listed in the original ADEM issued certification. CWA § 401 (a) water quality certification will terminate coincidentally with the expiration of FP14-MH01-10.

Contact the Mobile-Coastal office anytime with questions. Always include the ADEM tracking code above when corresponding on this matter.

Sincerely,

STEVEN O. JORDAN, Chief
Field Operations Division

SOJ/sb/cap File: WQC/2532

E-copy: Larry Person, U.S. Army Corps of Engineers
Michael Nelson, U.S. Army Corps of Engineers
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Josh Russell, USACE, Daphne
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Carl Ferraro, ADCNR, Spanish Fort

Birmingham Branch
135 Nelson Road
Birmingham, AL 35209-4702
(205) 942-4168
(205) 941-5853 FAX

Des Moines Branch
2715 Nelson Road, S.E.
Des Moines, AL 36025-1313
(205) 942-4168
(205) 941-5853 FAX

Mobile Branch
2715 Nelson Road, Suite B
Mobile, AL 36688
(205) 942-4168
(205) 941-5853 FAX

Mobile-Coastal
2024 Spanish Street, Suite B
Mobile, AL 36688
(205) 942-4168
(205) 941-5853 FAX

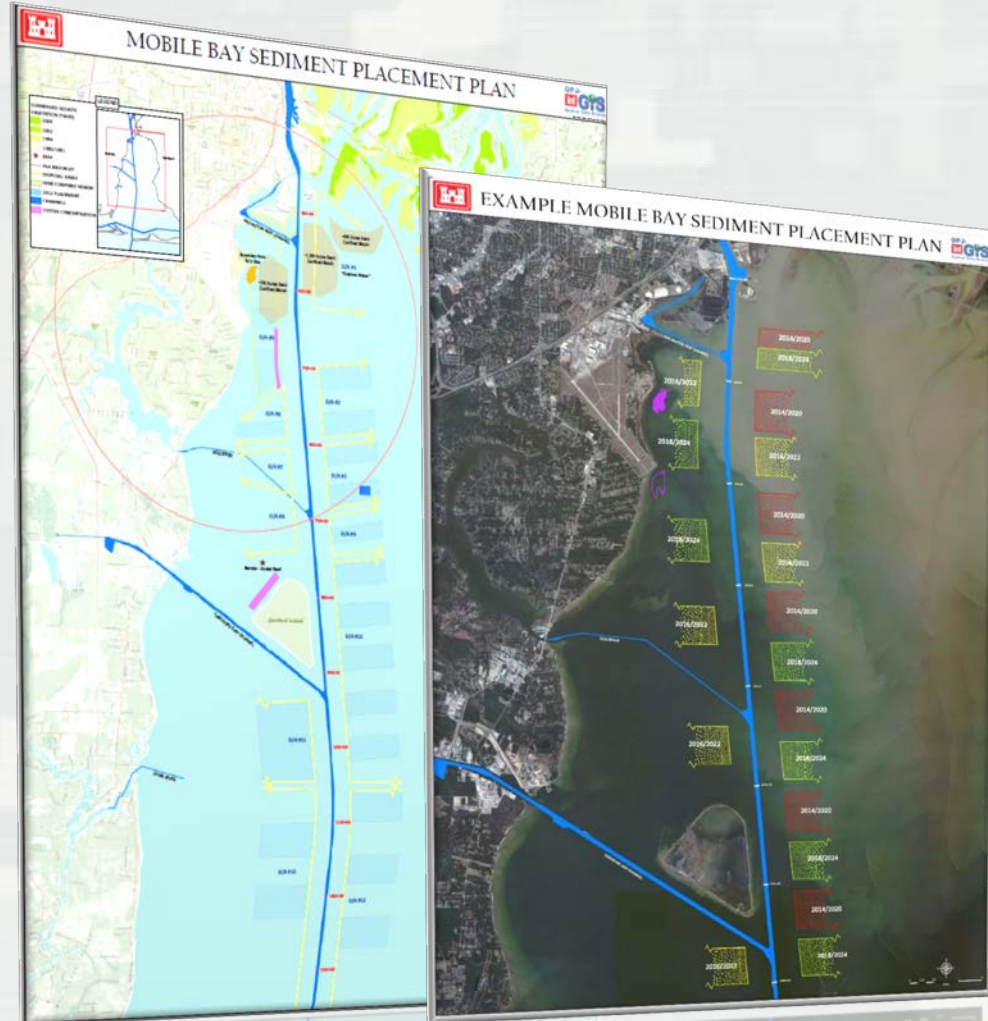


In-Bay Placement



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- Alternating Site Use
- GPS Tracking System
- Material Placement on a 6 year cycle





Placement Barge



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Impact to Navigation



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- \$5-7/CY prior thin-layer permit
- \$2-3/CY with thin-layer permit
- Reduced budget request approx. \$6M/YR
- Gain flexibility to shop the dredge market
- Greater channel reliability
- Consistent customer relations



Culture Shift



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- **IWG proved that inherited perspectives need to be replaced with scientific facts**
- **Saving dredging dollars doesn't always come at the expense of environmental stewardship**



Keeping Our Commitments



- Submitted BU Site to RESTORE Federal Council
 - ▶ Bucket 2 Funded Priority List -- \$2.5M
- RSM study to explore filling of Oyster Holes in Bay

