



U.S. ARMY

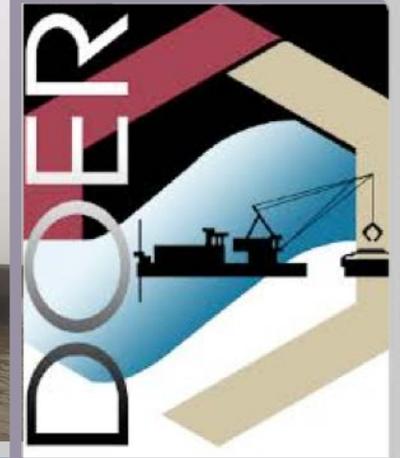
Optimizing Beneficial Use with Seasonal Plant Emergence

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¹US Army Engineer Research and Development Center

²Wetland and Aquatic Research Center, USGS

Western Dredging Association
2018 Gulf Coast Chapter Meeting
New Orleans, LA

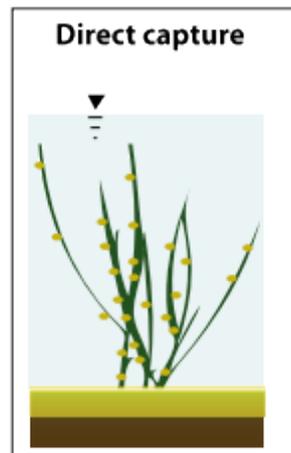


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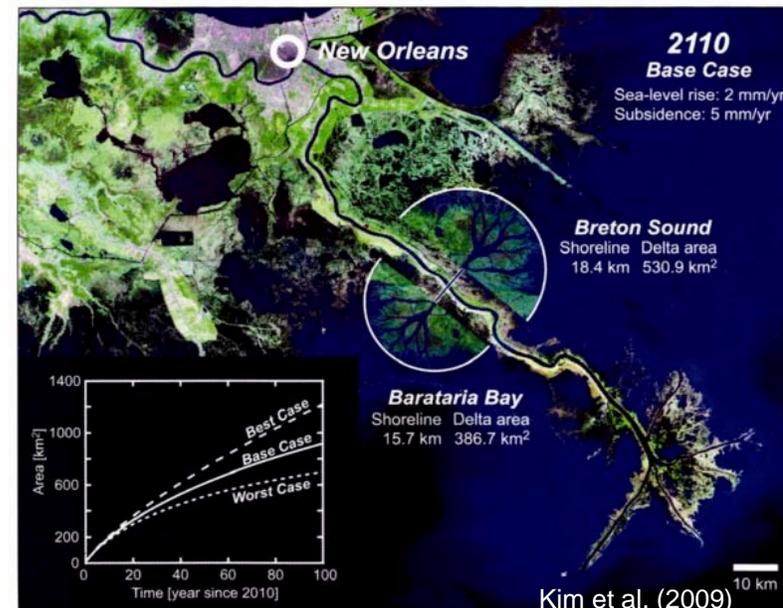
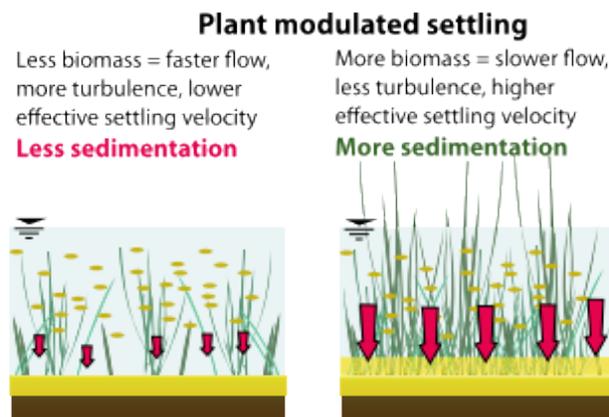


The Problem

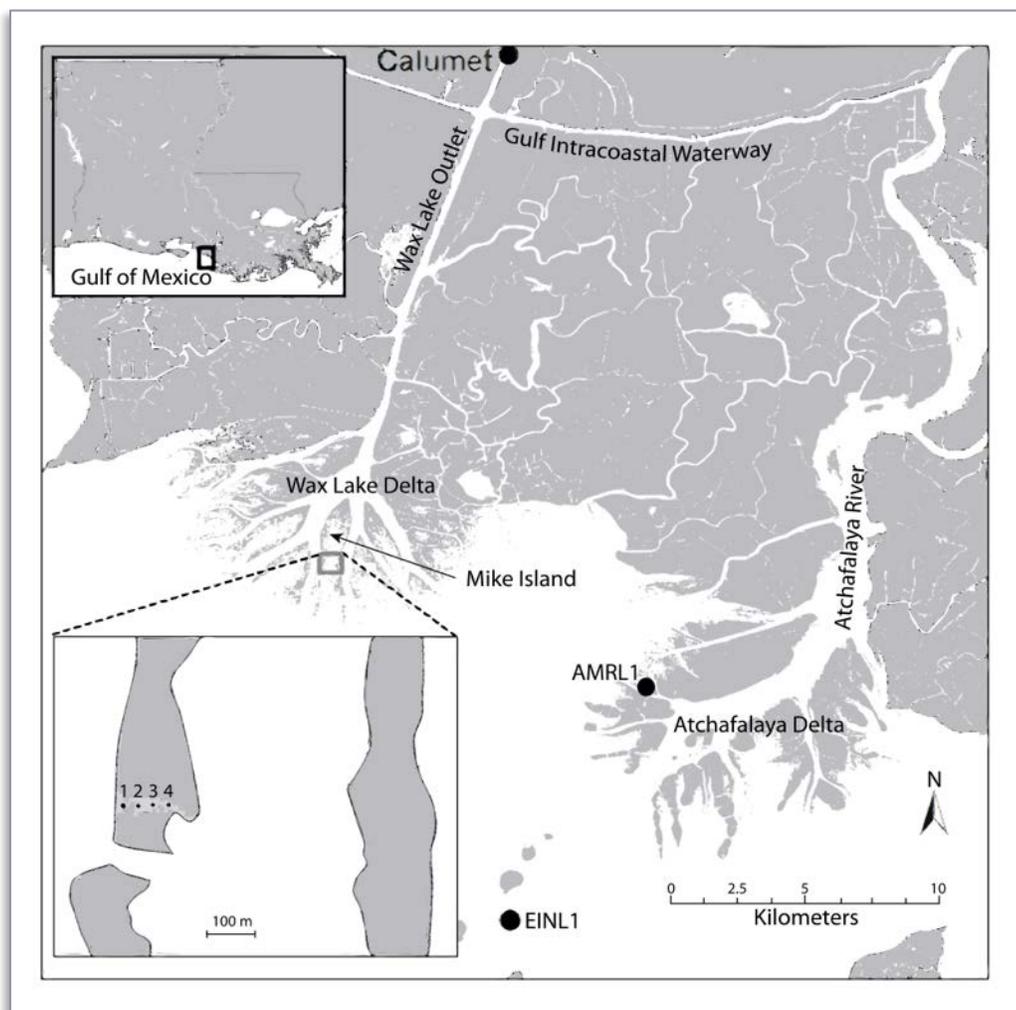
- Beneficial use of dredged material (BUDM) is expanding both in adoption and scale
- The role of vegetation is an important variable in BUDM operations
- Different aspects of vegetation processes require different research approaches to better define processes and improve practice



Fagherazzi et al. (2012)



Study Setting: Wax Lake, Louisiana



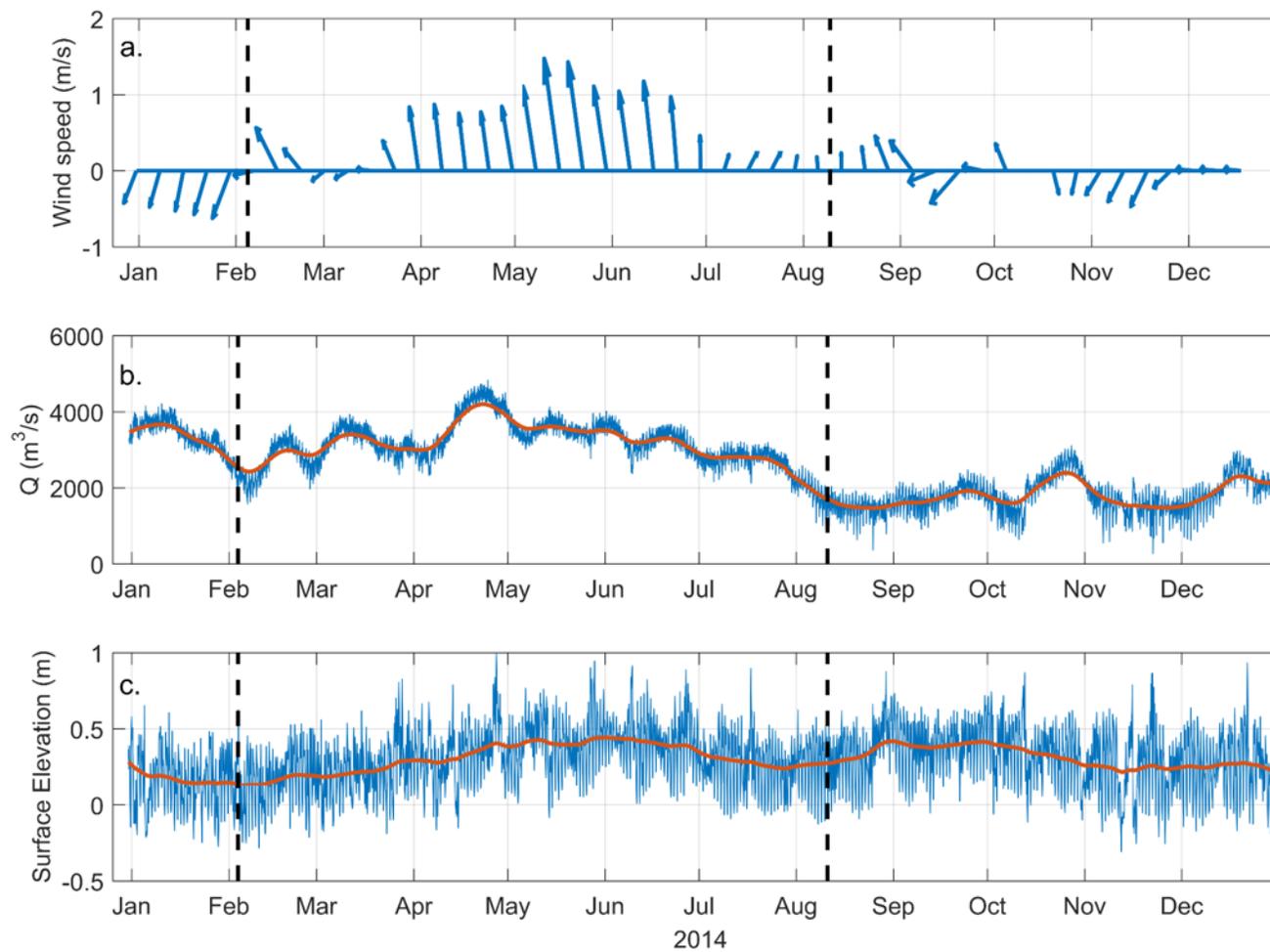
Instrumented platforms on Mike Island

Calumet – discharge
 AMRL1 – water level
 EINL1 – wind

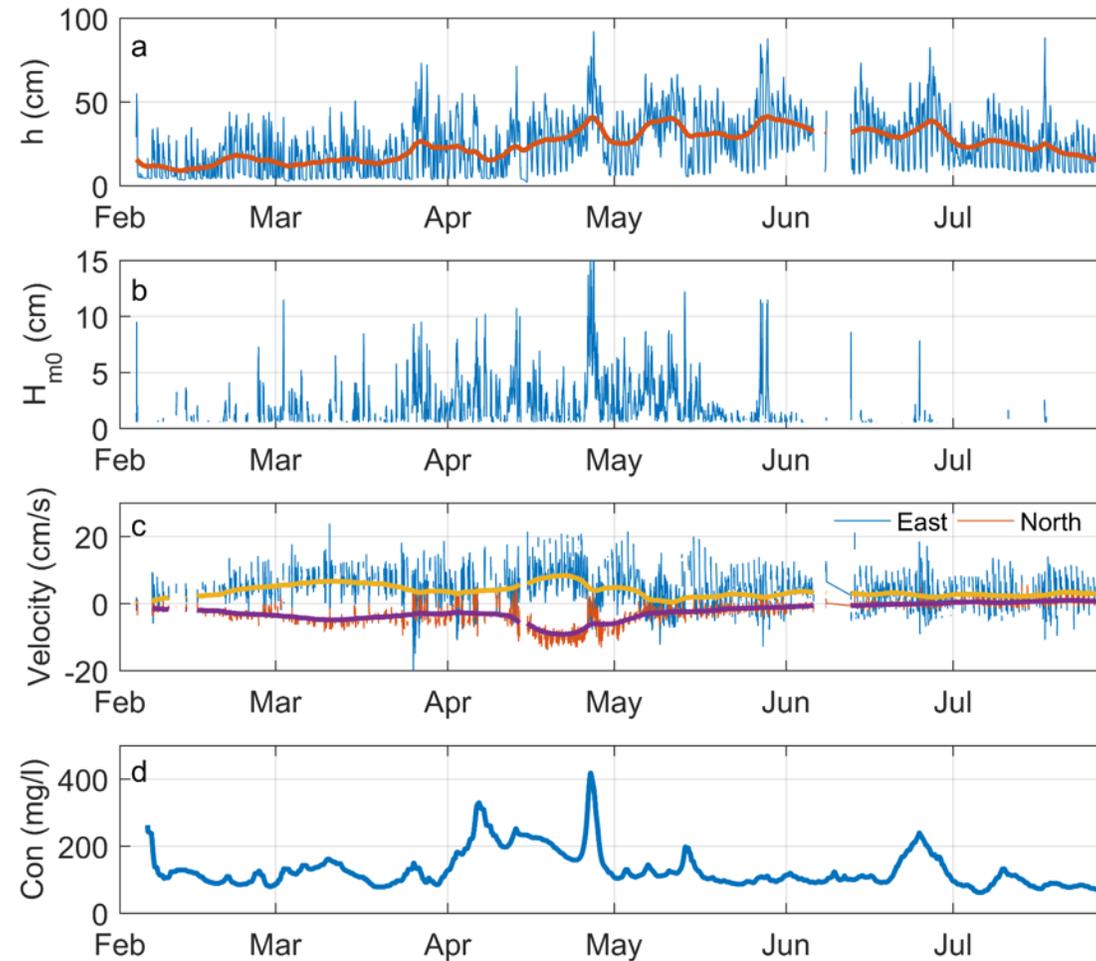
Data Collection



Regional Conditions: Hydrodynamics



Site Conditions: Sediment- and hydro-dynamics



Regional Setting: Vegetation

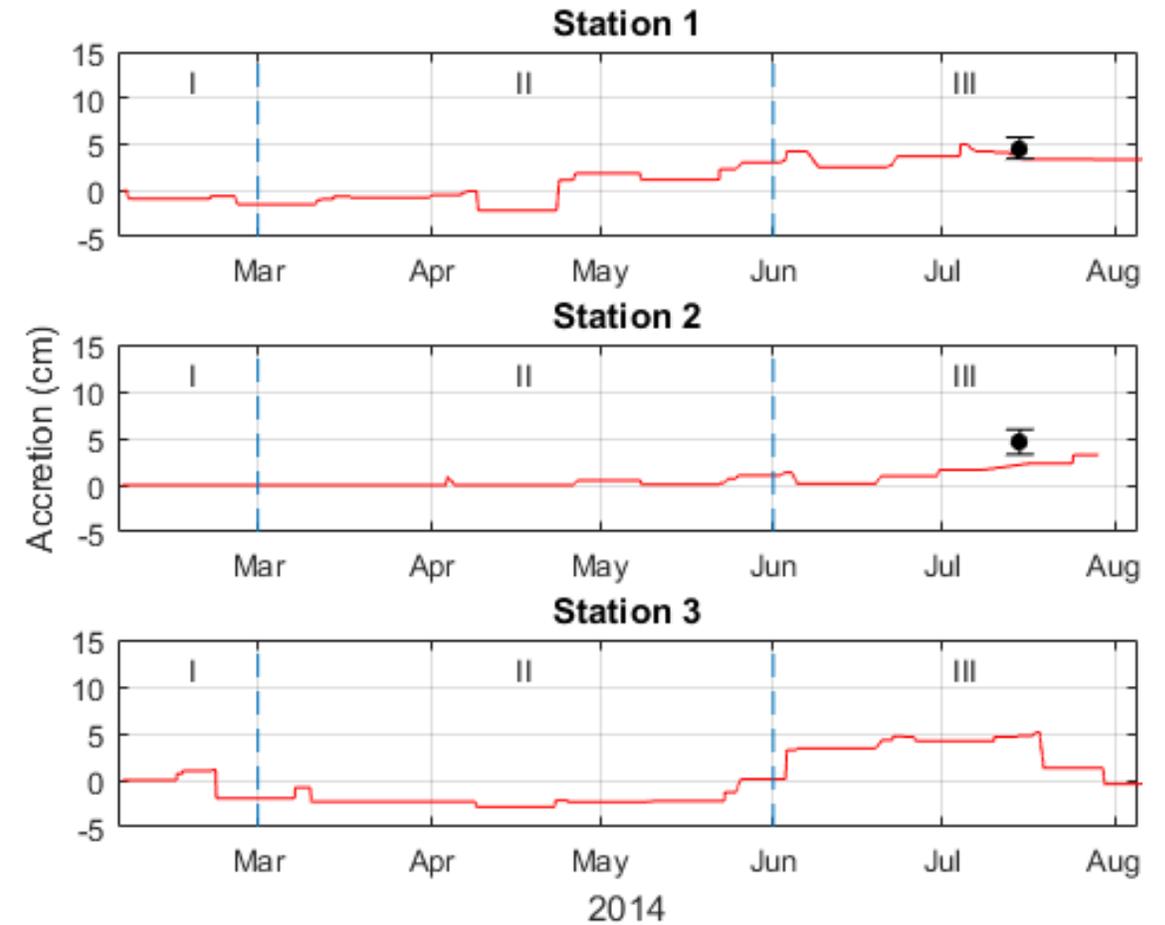


- The emergence of American lotus (*Nelumbo lutea*) in late spring forms a dense canopy over the island reducing wave and current energy increasing the potential for sediment deposition.

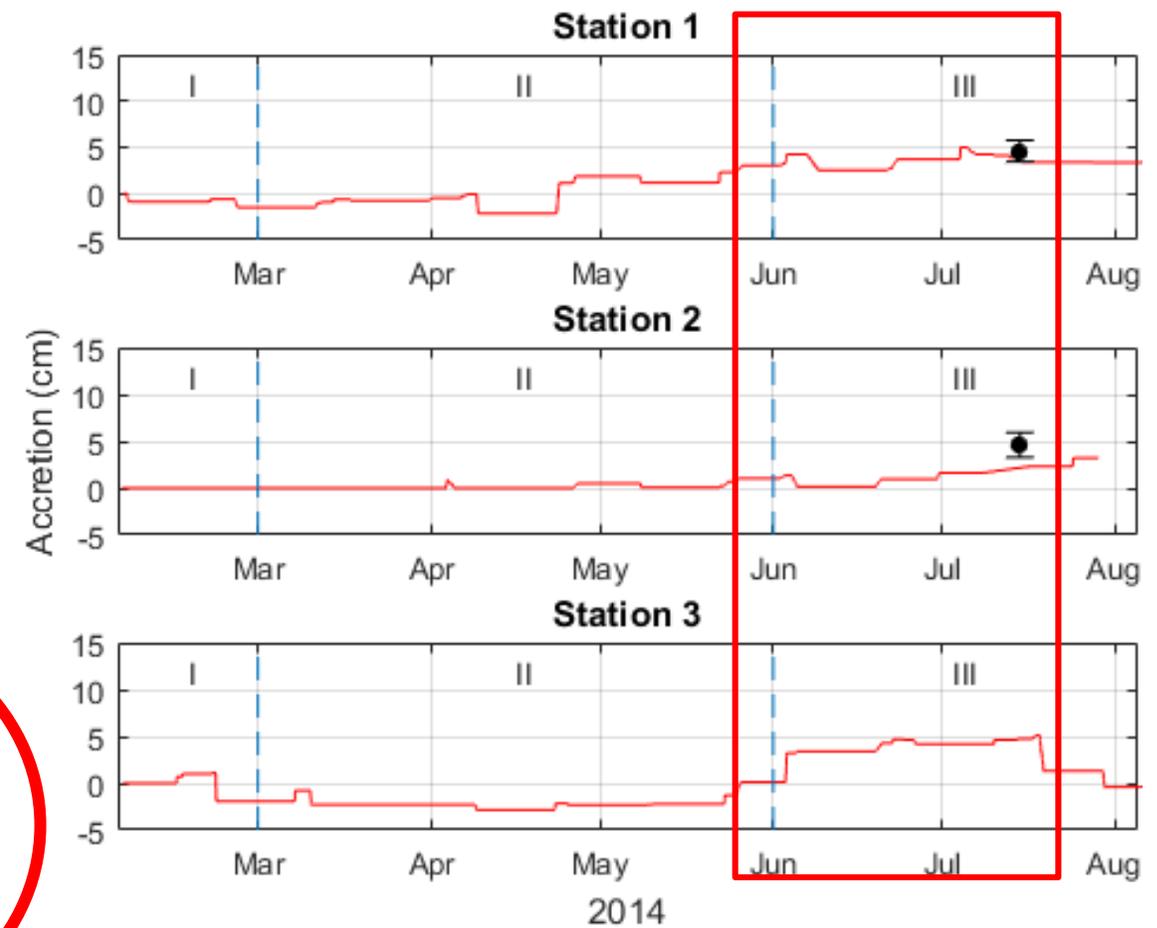
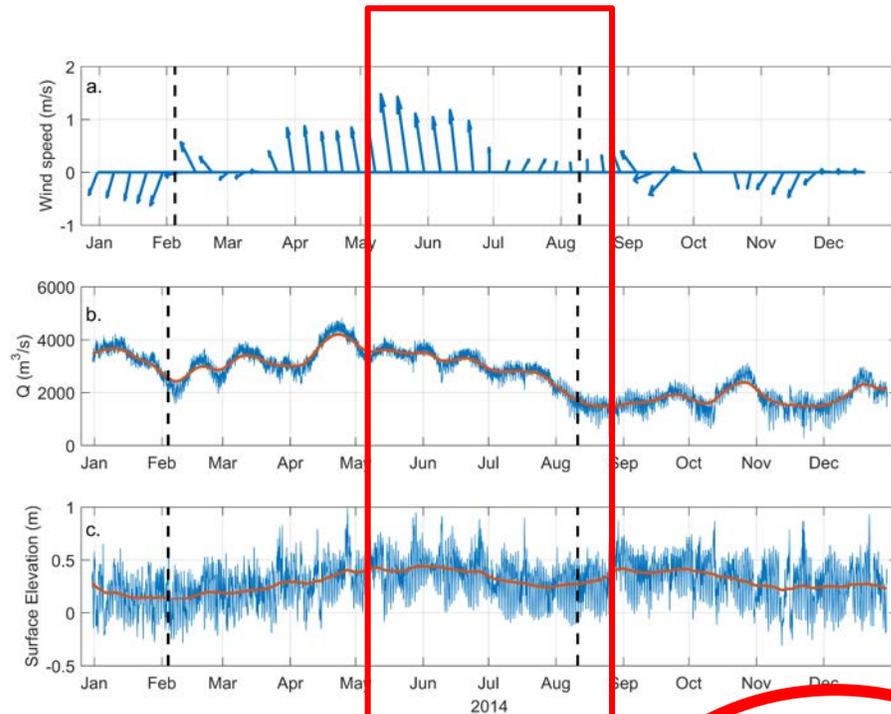
Vegetation



Sediment deposition



Vegetation and sediment deposition



Conclusions

- sediment retention = river discharge + tides + wave resuspension + **vegetation capture**
- The stage and type of vegetation in emergent wetlands has implications for the retention of sediment, e.g. more sediment flux might not yield greater deposition due to reduced trapping



Wax Lake Technical Report

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Coastal and Hydraulics Laboratory



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Sediment Dynamics in a Vegetated Tidally Influenced Intertributary Island: Wax Lake, Louisiana

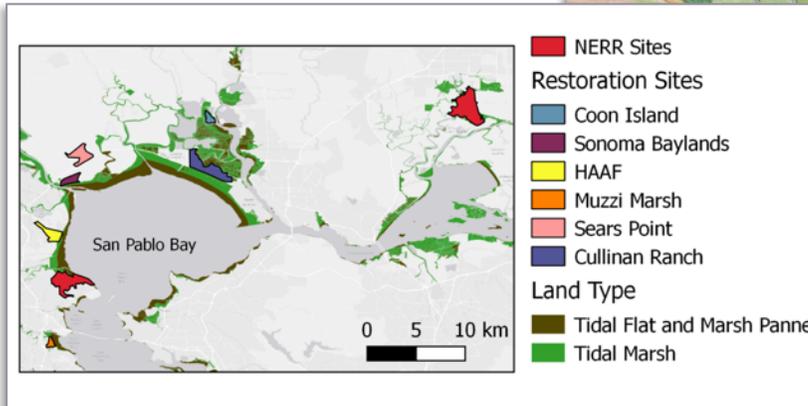
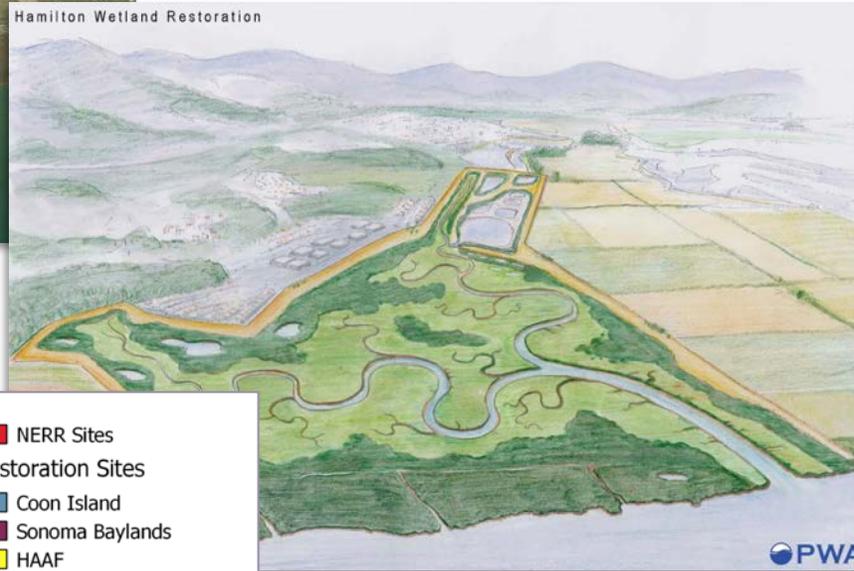
Richard Styles, Duncan Bryant, Joe Gailani, Jarrell Smith,
Brandon M. Boyd, and Greg Snedden

July 2017



Approved for public release; distribution is unlimited.

Sediment Accretion in Thin Layer Placement Marshes



Brandon Boyd, Joe Gailani

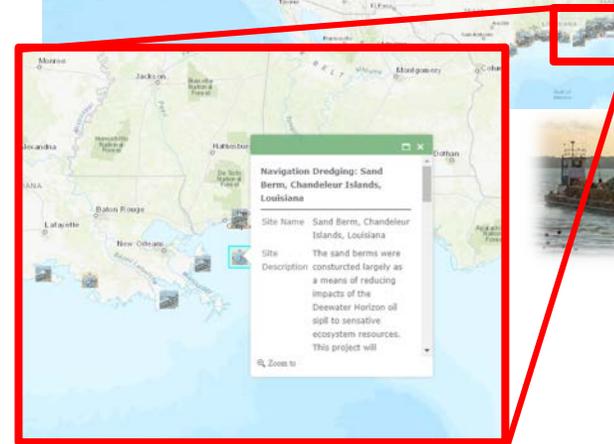
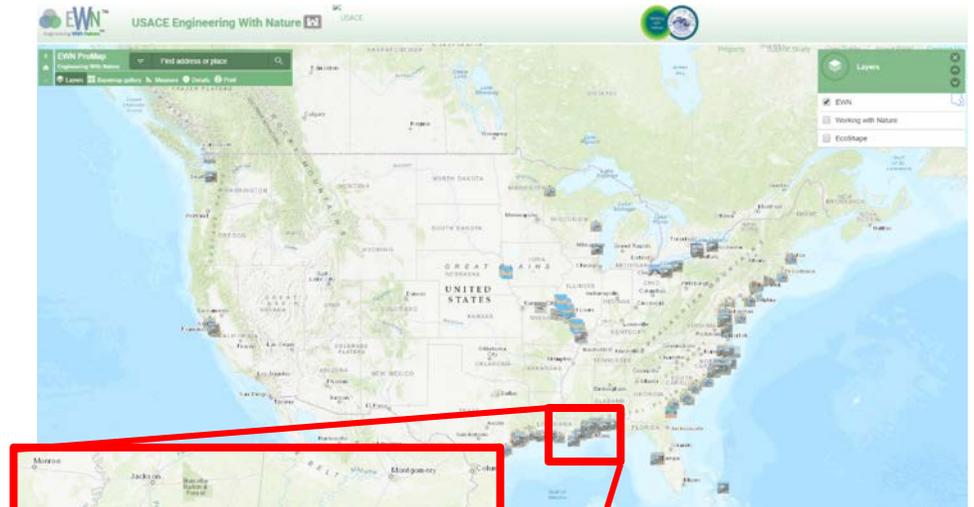
Synthesizing USACE Beneficial Use of Dredge Material (BUDM) Efforts into EWN ProMap

Knowledge Gap & Needs:

- BUDM activities have greatly expanded across USACE.
- Documentation of USACE-BUDM efforts are deficient.
- Difficult to evaluate breadth and evolution of USACE-BUDM efforts and synthesize data to inform project planning and development.

Capabilities being developed:

- Centralized and user-friendly repository (integrated within EWN ProMap) of USACE-BUDM project information that will serve to inform dredging operations and sediment management programs.



James C. Nifong, Safra Altman, Brandon Boyd

US Army Corps of Engineers • Engineer Research and Development Center

Thank you!

The screenshot shows the website for the Coastal & Hydraulics Laboratory. The main heading is "RADIONUCLIDE TRACER AND GEOCHRONOLOGY LABORATORY". Below this, there is a section titled "What we do" which describes the use of radionuclides in sediment dating. A prominent image shows a mushroom cloud from a nuclear test, with the caption "Photo of the 1962 by Mike hydrogen bomb test. These types of test injected nuclear fallout into the atmosphere that was subsequently deposited around the world. The record of this fallout is preserved in soils and sediments and can be used to determine age." To the right, there is a section for "Current and past projects" featuring a photo of "HAMILTON WETLANDS". The bottom of the page lists "Genova Spectroscopy System" and "Expertise".

<https://chl.erdc.dren.mil/radlab>

The screenshot shows the Engineering With Nature (EWN) website. The header includes the EWN logo and navigation links for "EWN Initiative", "Proving Grounds", "Projects", "Resources", and "NNBF". The main content area features a large image of a wetland restoration project with the caption "Marsh mounds via stormwater, Sears Point Wetland Restoration, USA (Photo by Sonoma Land Trust)". To the right, there is an "EWN News" section with several articles dated from October 2018, including "Baltimore District strives to restore Chesapeake Bay island, marshes (PDF)" and "Engineering With Nature, An Atlas will be released October 2018 (PDF)". Below the news section, there is a "What is Engineering With Nature?" section with a brief description of the program. The bottom of the page has a navigation bar with icons for home, menu, and social media.

<https://ewn.el.erdc.dren.mil/>

The screenshot shows the website for "Dredging Operations and Environmental Research" at the U.S. Army Corps of Engineers. The header includes "DOER Program", "Projects", and "Resources". The main content area features a large image of a wetland with the caption "Focus Area: Environmental Resource Management. To develop measures that adequately protect environmental resources while allowing dredging operations to proceed." Below this, there are sections for "Connect" and "Discover". The "Connect" section lists the "Program Manager" (Todd S. Bridges, Ph.D., Senior Scientist, Environmental Laboratory, Engineer Research and Development Center) and the "Assistant Program Manager" (J. Daniel Ferral, Research Biologist, Environmental Laboratory, Engineer Research and Development Center). The "Discover" section lists "Focus Area Leaders" including "Dredged Material Management" (Tim Welp, Research Hydraulic Engineer, Coastal Hydraulics Laboratory) and "Operations Technology" (Joe Gallant, Ph.D., Research Hydraulic Engineer, Coastal Hydraulics Laboratory). The bottom of the page has a navigation bar with icons for home, menu, and social media.

<https://doer.el.erdc.dren.mil/>

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