



National Conference on Ecosystem Restoration

Building connections from the local to the landscape scale



KEEPING UP WITH THE TIDE - RESTORATION DESIGN CONSIDERATIONS IN THE SOFT SOILS OF COASTAL LOUISIANA

National Conference on Ecosystem Restoration 2018



HDR Engineering, Inc.

Overview

- The Issue
- Project Challenges
- Example Projects / Lessons Learned



Entrance of Joseph Harbor at Rockefeller Wildlife Refuge in Cameron Parish

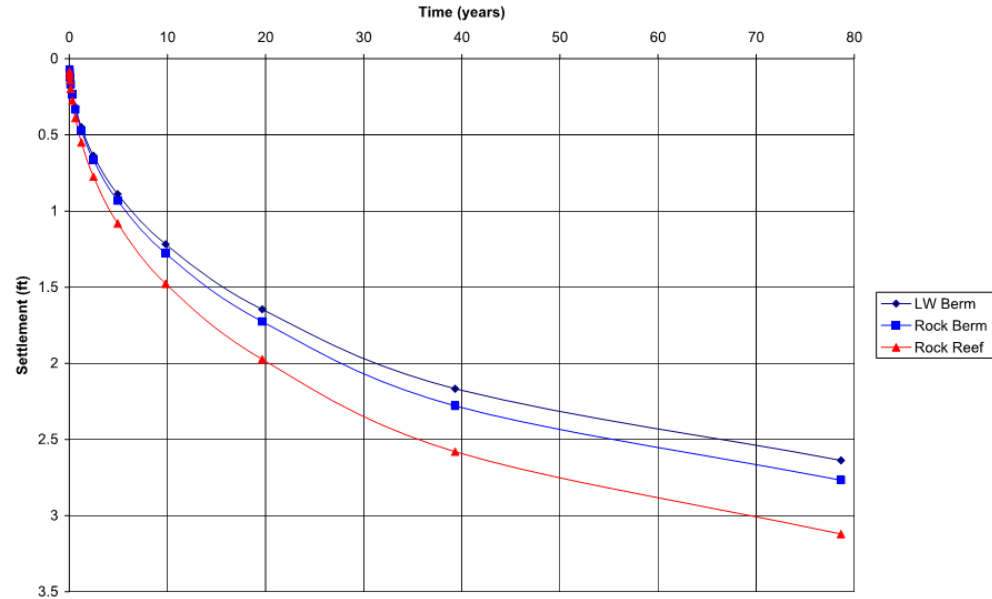
The Issue

- Loss of Land... wetlands, habitat, recreation
- Soft soils = no foundation
- Engineer feasible solutions within the environmental and site constraints



Project Challenges

- Foundation and Settlement Design
- Project Life (projects continue to sink...)
- Continually Changing Site Conditions
- Project Accessibility – Shallow Water Access



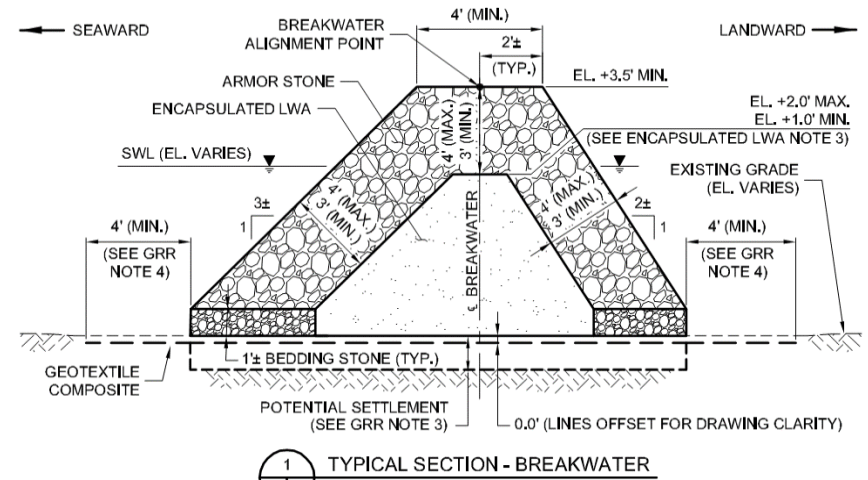
Biloxi Marsh Shoreline Protection (PO-72)

- Exposure to large waves across Lake Borgne
- Extremely soft organic soils
- 10 ft of yearly shoreline loss with areas up to 50 ft per year
- 4 miles of shoreline protection



Biloxi Marsh Shoreline Protection (PO-72)

- Highly organic soft soils and high wave energy – limited options for shoreline protection
- Challenged with maintaining elevation without adding weight
- Lightweight aggregate core breakwater



Biloxi Marsh Shoreline Protection (PO-72)

- High rates of erosion
- Design surveys outdated
 - Design survey in 2009
 - Construction in 2013
- Design layout updated with construction surveys



Rockefeller Refuge Marsh Restoration

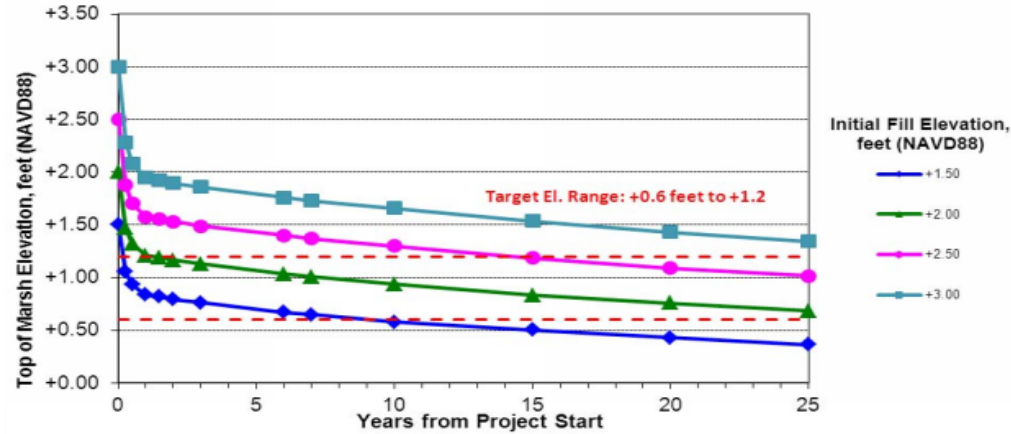
- State Refuge mitigation bank
- Restore 170+ acres of marsh at 3 sites
- Soft clay soils
- Material dredged from historic oil field canals



Rockefeller Refuge Marsh Restoration

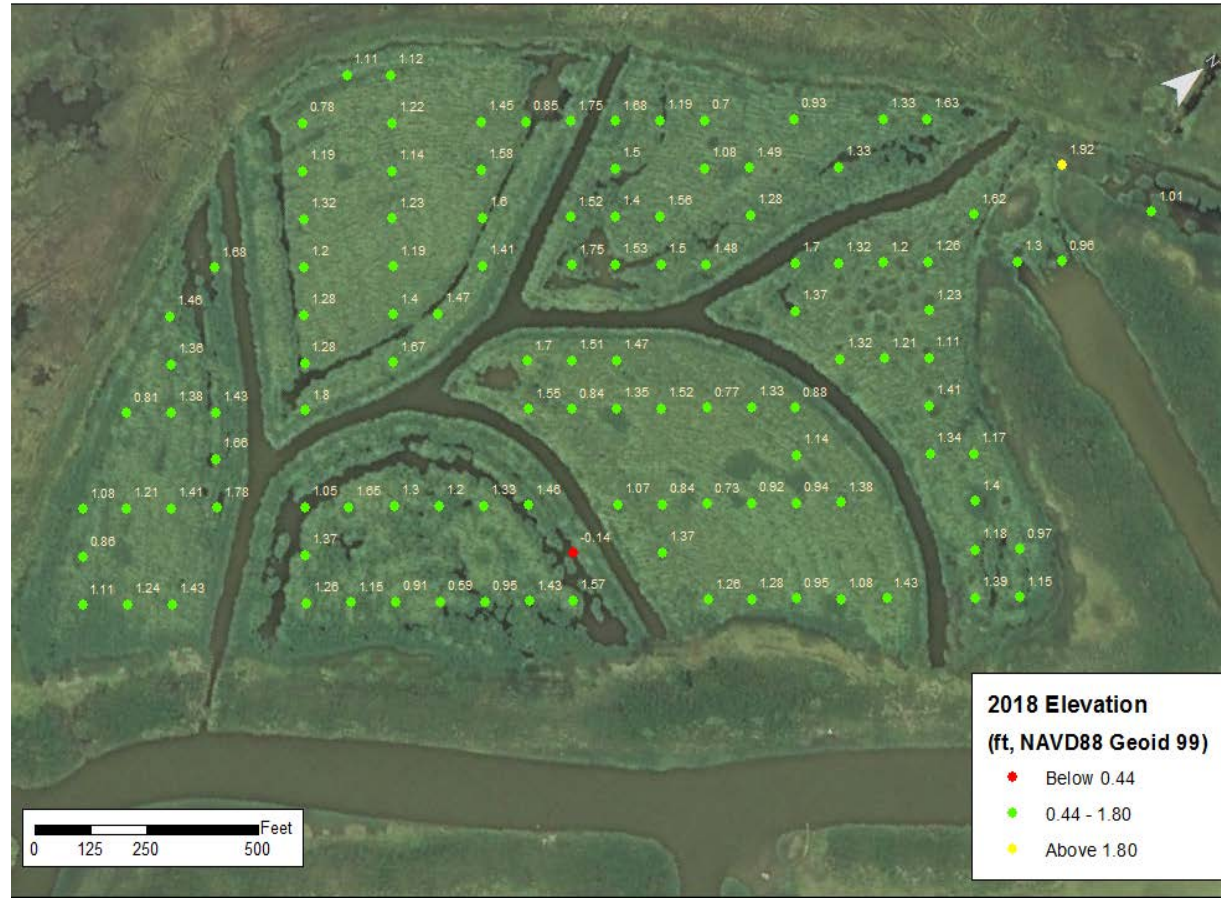
- Mitigation bank success criteria
 - Short and Long Term criteria
- Elevation continues to drop over time
- Considerations for subsidence and sea level rise

Estimated Marsh Settlement Over Time (South Area)



Rockefeller Refuge Marsh Restoration

- Post construction monitoring
- Required for mitigation bank
- Provides valuable data on actual conditions



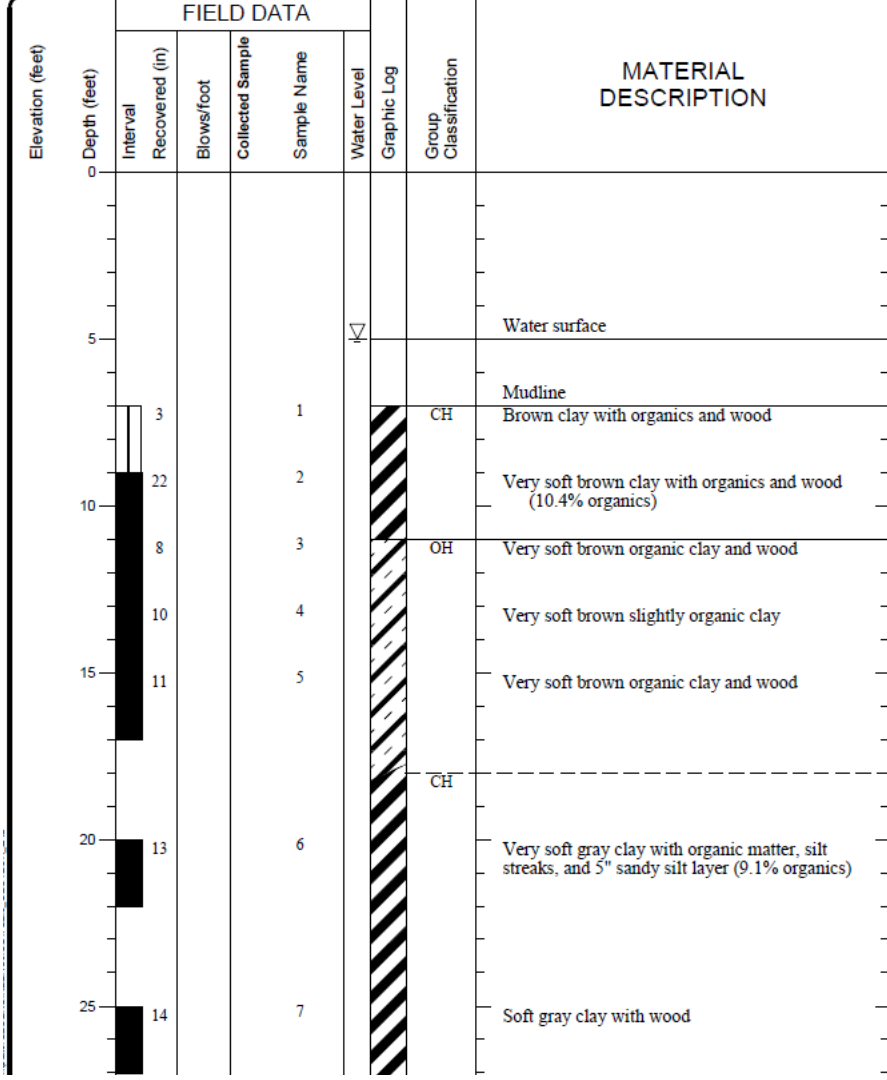
Tangipahoa Parish Shoreline Protection

- 3 miles shoreline protection
- Exposed shoreline across Lake Pontchartrain
- Soft organic soils
- Relic cypress stumps and roots



Tangipahoa Parish Shoreline Protection

- Design for settlement and stability based on soil boring data
- Relic root structure beneath the breakwater



Tangipahoa Parish Shoreline Protection

- Relic stumps and shallow water
- Difficulties for access during construction
- Access channels
- Contractor's option to reuse/sell woody material



Tangipahoa Parish Shoreline Protection

- Breakwater layout based on soft soil conditions and relic stumps
- Breakwater layout
 - Depth considerations
 - Avoided stumps (mostly...)



Tangipahoa Parish Shoreline Protection



Thank You! Questions?

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