Regional Sediment Management And Engineering With Nature

ERDC
Engineer Research and Development Center

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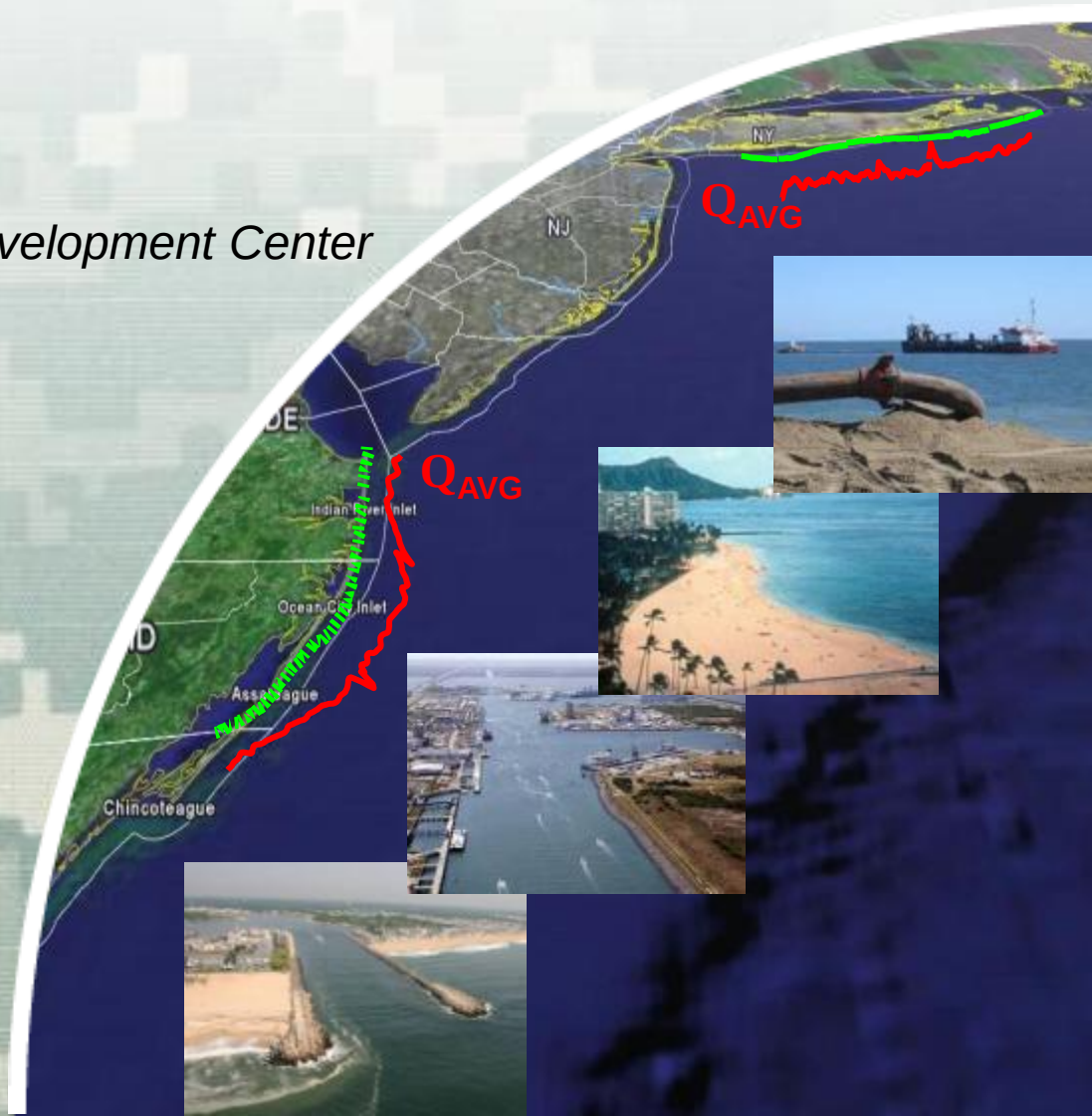
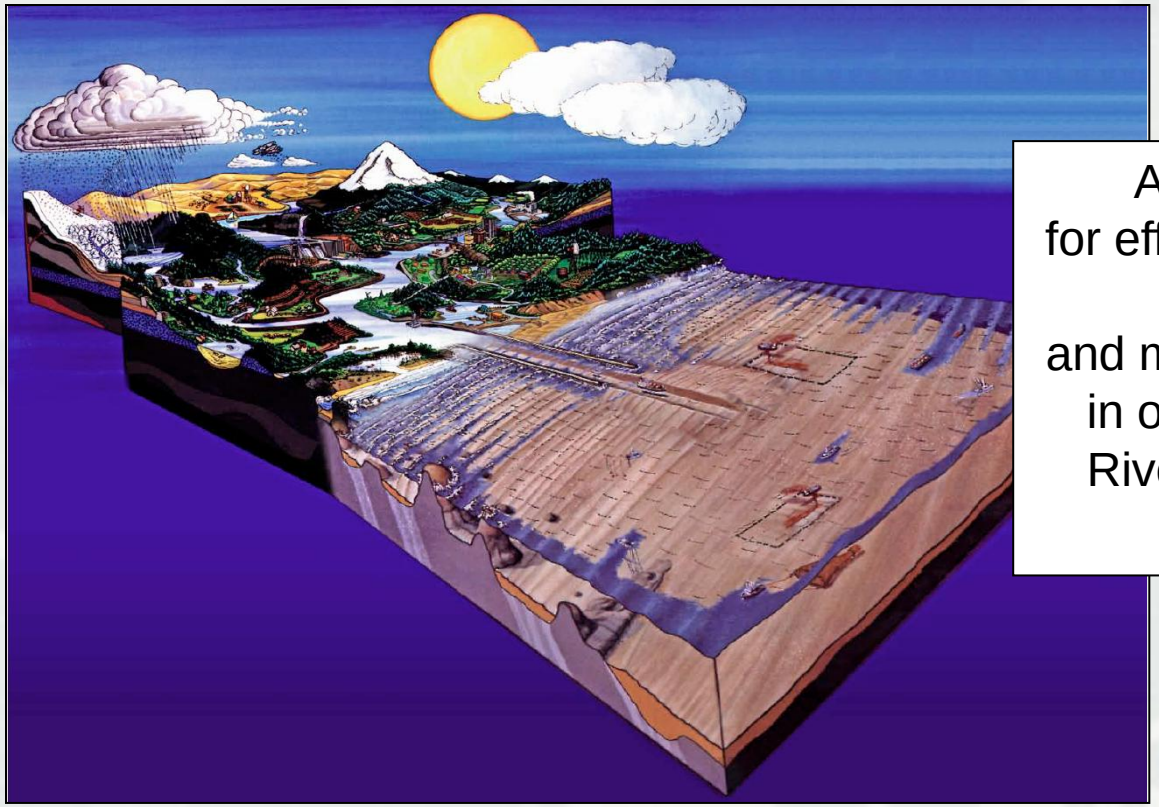
Engineering With Nature
Buffalo District
Collaborative Meeting

Buffalo, NY
1-3 December 2014



US Army Corps of Engineers
BUILDING STRONG®

Regional Sediment Management



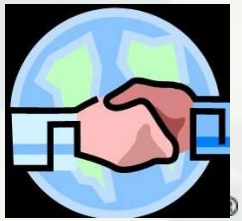
A systems approach
for efficient and effective use
of sediments
and management of projects
in our Coastal, Estuarine,
Riverine, and Watershed
environments

RSM = Sustainable Solutions for…..

Navigation/ Dredging	Flood Risk Management	Environmental Restoration

RSM Operating Principles:

- Recognize sediments as a regional resource; prioritize use
- Link and leverage across multiple projects, business lines, authorities
- Improve operational efficiencies & natural exchange of sediments
- Economically viable, environmentally sustainable solutions
- Local sediment actions which benefit the region, consider regional impacts
- Enhance technical knowledge/tools for regional approaches
- Share information and data
- Communicate and collaborate – USACE, Stakeholders, Partners



RSM Program

Regional Approaches

Coordination

Technology Data Gaps

Integrate Across Projects and Authorities

Operations & Maintenance

Continuing Authorities Program

Dredge Material Mgmt Plans

Feasibility Studies

Other

Construction

USACE RSM Participation (2000-2014)

CODS/CFDC

NCDB

MCNP

WOTS

7 Division, 25 Districts (20 Coastal/5 Inland), ERDC, IWR

Understand Region
- Sediment Budget
- Beach Morphology
- Landcover Type
- Coastal/Inland Processes

Holistic/Systems Approach

Identify Gaps/Improve Knowledge

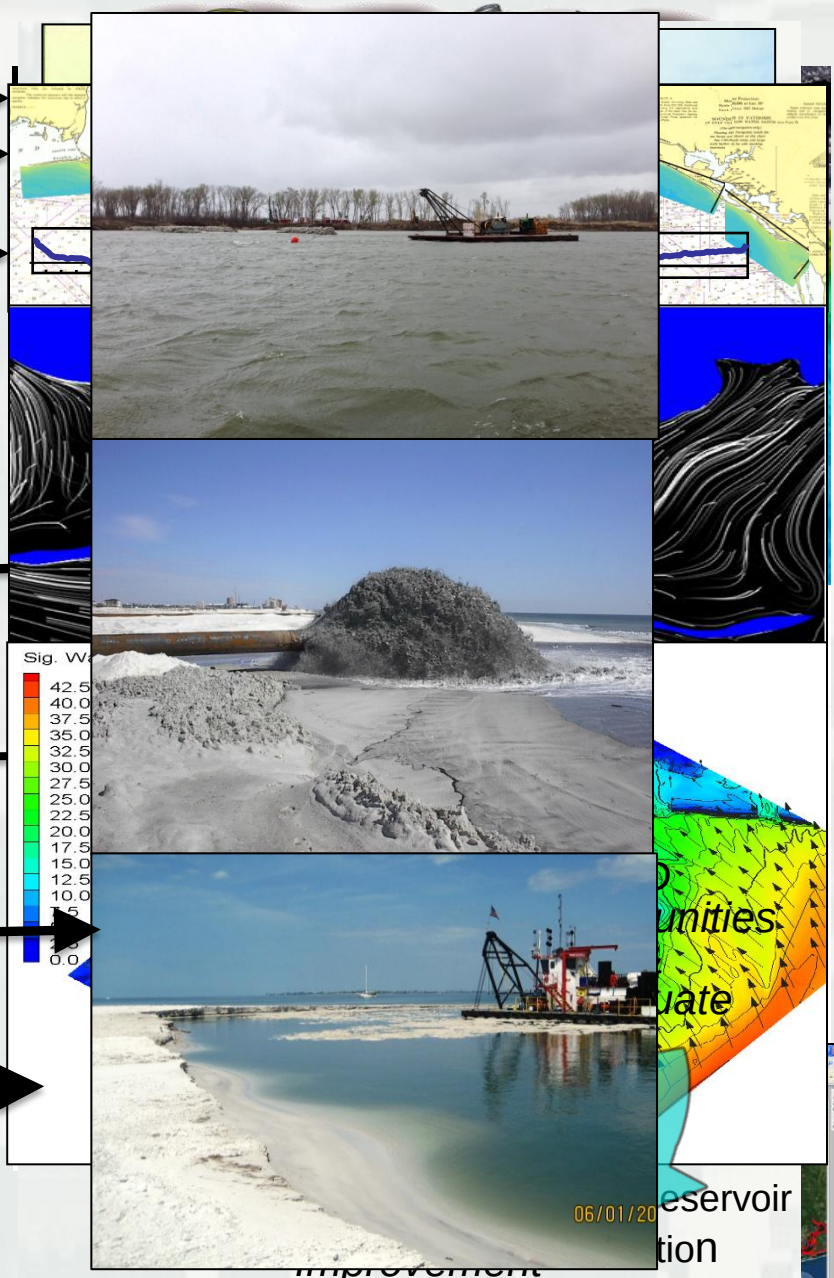
Data Management/Regional Tools
Collaborative w/Partners

Identify/Evaluate Opportunities to Optimize Use of Sediments Across Multiple Projects
Innovative, Efficient/cost effective, Science-based

Take Action: Construct Pilot Projects
Collaborative w/Partners

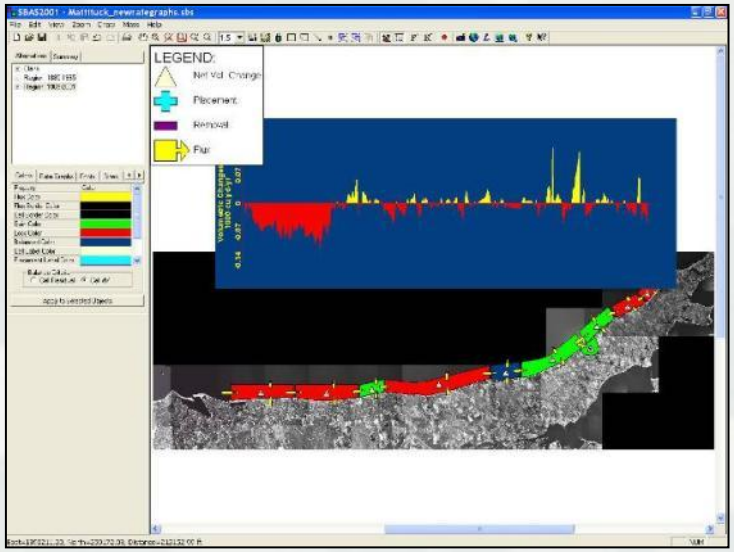
Monitor: Evaluate Performance
Adaptive Management

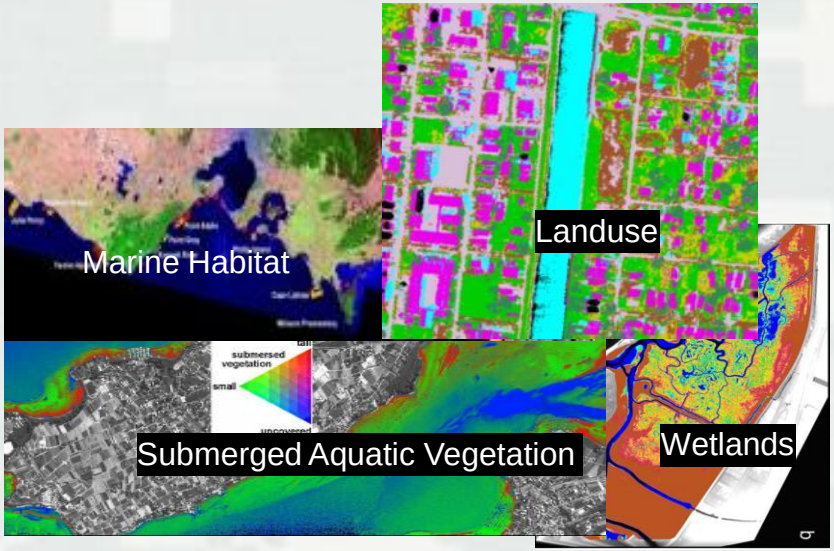
Incorporate Standard Practice
Sustainable



RSM Long-Term Goal
Link with Engineering With Nature

Bridge Regional Sediment Processes
with
Regional Environmental/Ecosystem Processes



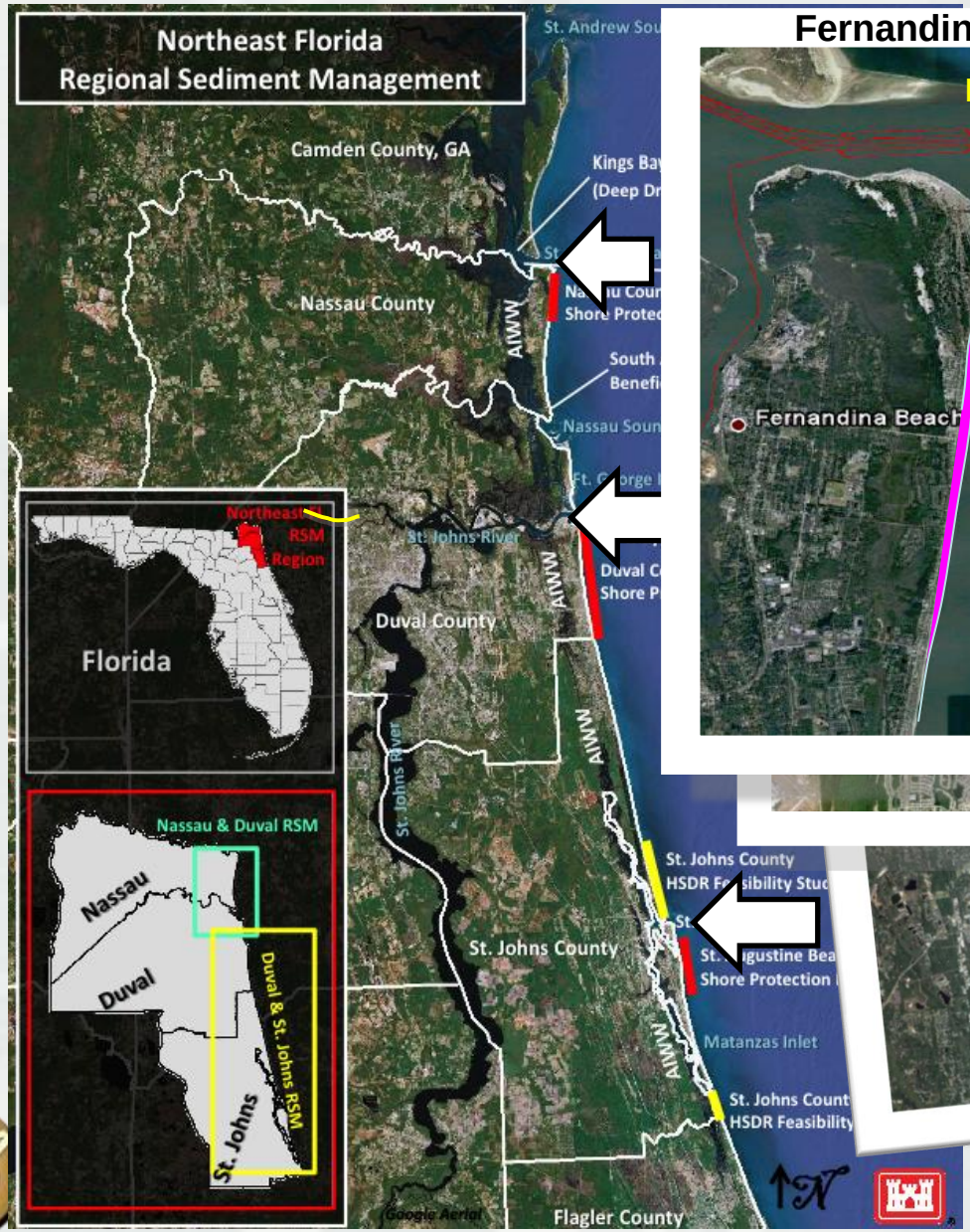


Sediment/Engineering

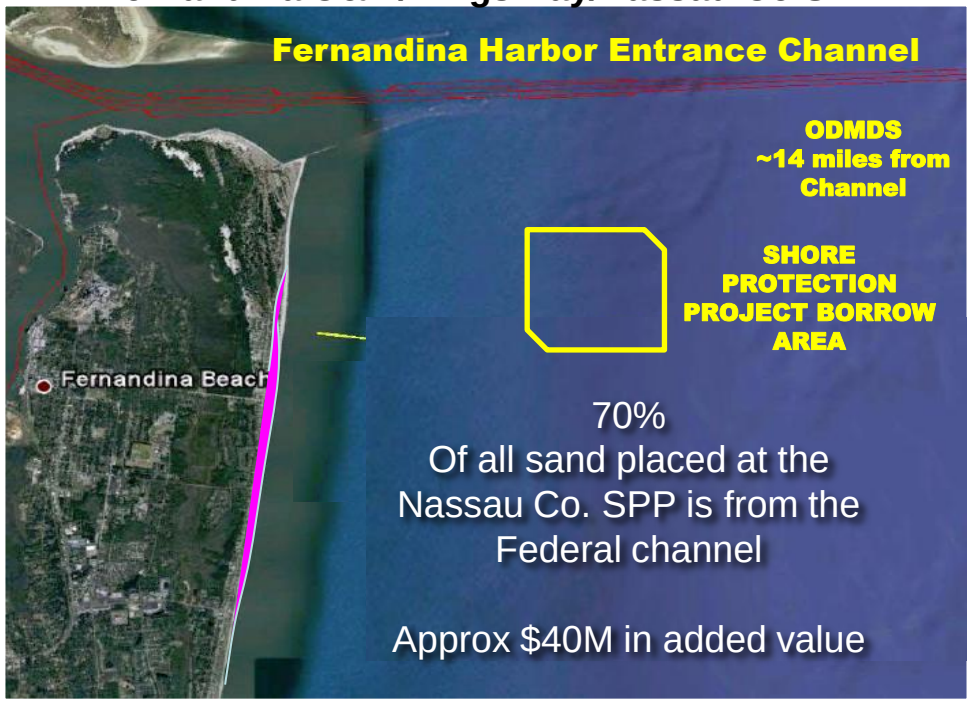
Environmental/Ecosystem

Jacksonville District Integrated Dredging Program

Jacksonville District - St Johns, Duval, Nassau Counties



Fernandina O&M/Kings Bay/Nassau Co SPP



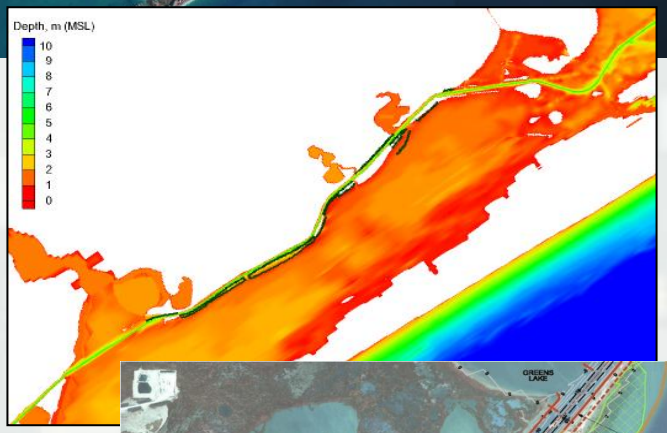
Galveston, Gulf Intracoastal Waterway RSM

Challenges

- PA's along GIWW are eroding on the channel and bay sides due to currents, wind generated waves and ship wakes
- Once breached, material is deposited into GIWW
- Once they become submergent, they become potentially unavailable

Objectives

- Determine/Confirm Erosion of barrier islands
- Identify causes of erosion and erosion rates (sediment budget)
- Design/Evaluate methods to decrease erosion
- Integrate alternative into O&M



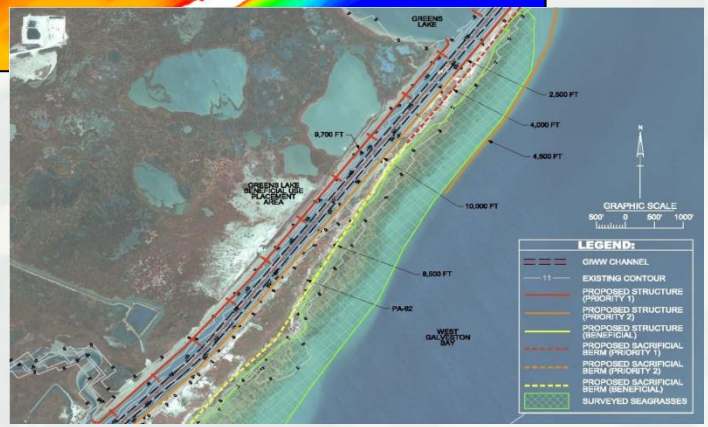
Opportunities to take action

Implement construction by phase: PA 62 through PA 64 - Phase 1, North of Greens Lake & PA 65 to Chocolate Bay - Phase 2.

Address each individual reach according to its designated priority - How rapid is channel shoaling and shoreline erosion?

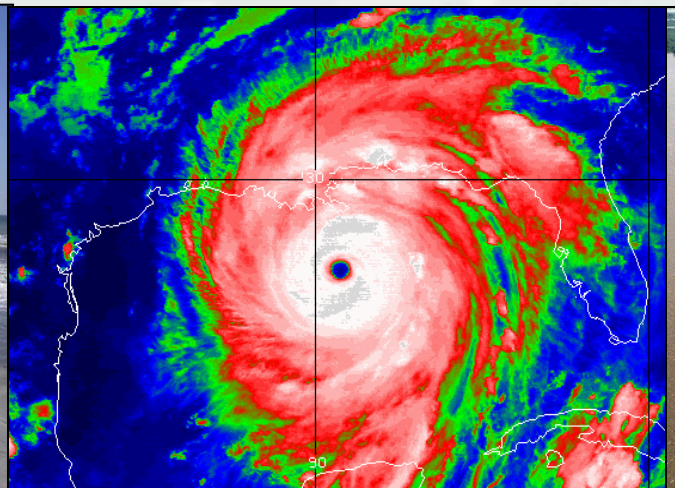
Recommend rip rap revetment on the channel side of the barrier islands based on cost, but ACB is more practical for this reach.

Recommend <u>a combination of oyster castles, rip rap revetment, and sacrificial berms on the Bay side</u>.



Why RSM is Important & Supports EWN

- Improve utilization of sediments - local & regional
- Link multiple projects & authorities, leverage funding, reduce timelines
- Increase benefits while reducing/maintaining costs
- Share data, tools, and capabilities
- Improve partnerships and collaboration
- Pilot Projects/Adaptive Management - Improve channel availability, shoreline erosion/flood portection, environmental habitat



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RSM Technical Notes, Reports, Manuals, Conference Papers

Tools and Data

Sediment Budget Analysis System (SBAS)
CE-Dredge-RSM Dredging Manager & Viewer
Models and Databases
Etc…