

Sustaining the MTS through RSM & EWN

Ms. Linda Lillycrop

USACE RSM Program Manager
Engineer Research and Development Center
Coastal and Hydraulics Laboratory

Dr. Todd Bridges

Senior Research Scientist
EWN Program Manager
Engineer Research and Development Center
Environmental Laboratory

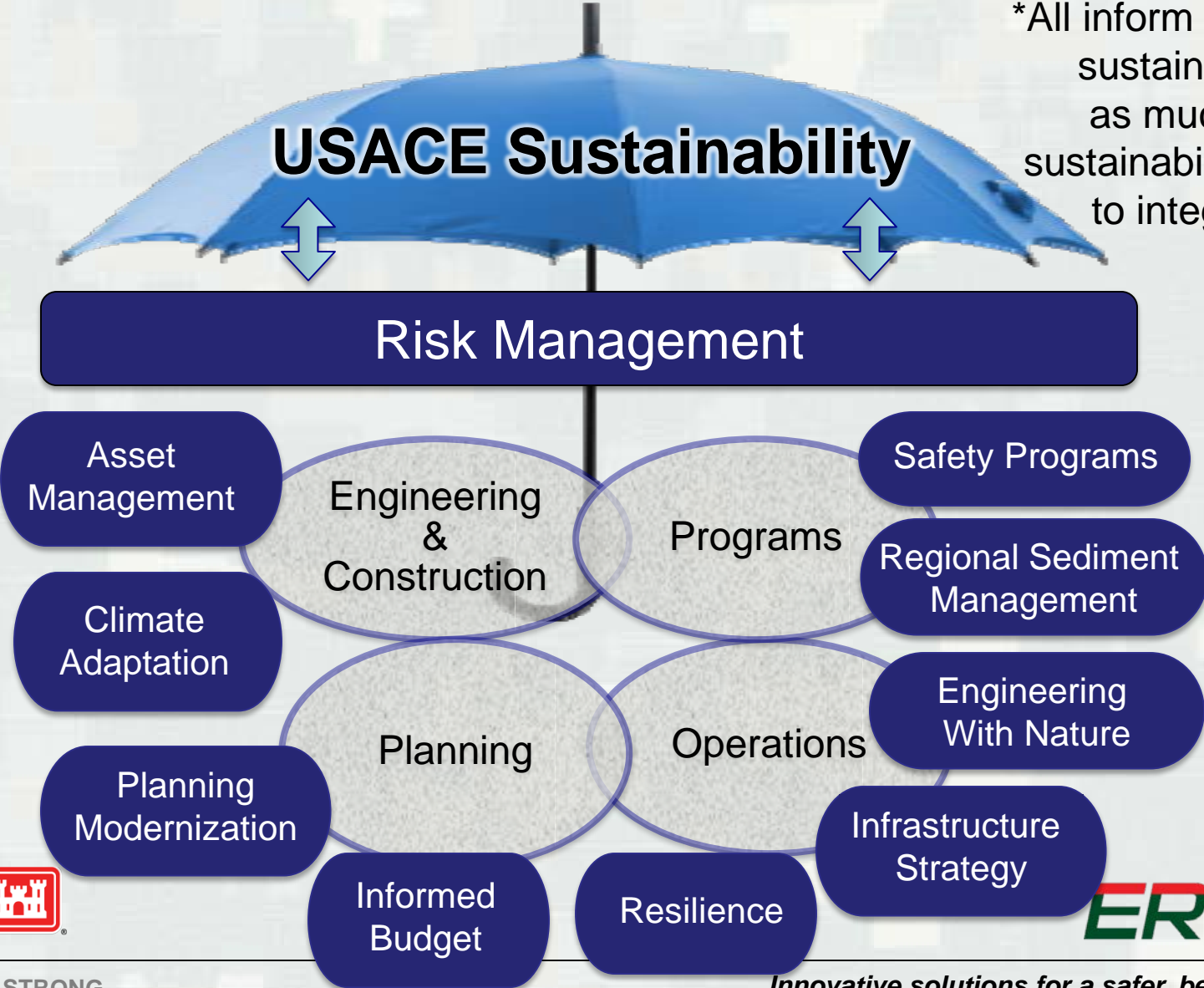
4th Biennial TRB-CMTS R&D Conference
June 22, 2016
Washington, DC



US Army Corps of Engineers
BUILDING STRONG



New Era of Water Resource Management



*All inform long term sustainability as much as sustainability helps to integrate



Corps Navigation Mission

....Each year the Corps moves
200 Million cu yd of sediment



...At a cost of more than
\$700 Million per year



ERDC

Regional Sediment Management...

...a systems approach to deliberately manage sediments in a manner that maximizes natural and economic efficiencies to contribute to sustainable water resource projects, environments, and communities = Healthy Systems.

- O&M, FRM, Ecosystem, Emergency Mgmt:
 - Short and long-term sustainable, resilient solutions
 - Coastal and Inland
- Recognizes sediment as a valuable regional resource
- Work across multiple projects, authorities, business lines
- Tools and technologies for regional approaches
- Relationship building, decision making, implementation



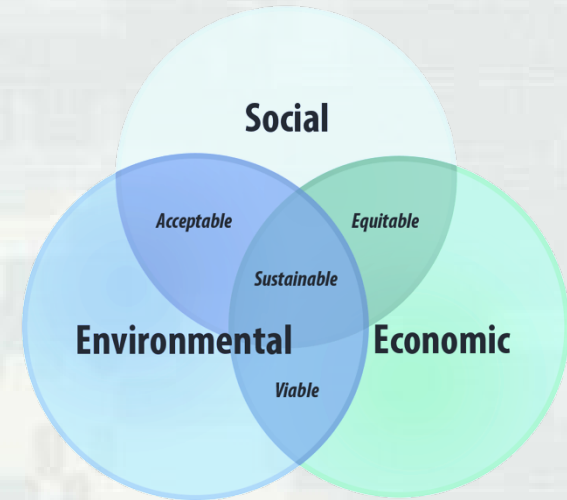
ERDC

Engineering With Nature...

...the intentional alignment of natural and engineering processes to efficiently and sustainably deliver economic, environmental and social benefits through collaborative processes.

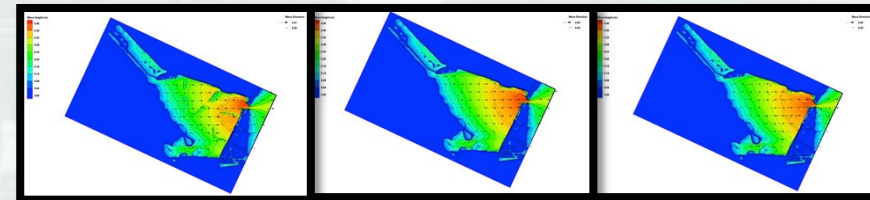
Key Elements:

- Science and engineering that produces operational efficiencies
- Using natural process to maximum benefit
- Broaden and extend the benefits provided by projects
- Science-based collaborative processes to organize and focus interests, stakeholders, and partners



Hamilton Wetland, San Pablo Bay

- Beneficial use of dredged material to restore army air field to wetlands
- Dredged material placed directly to contour wetland
- ERDC monitoring of new wetland:
 - Quantify waves
 - Other physical processes
 - Accretion
- ERDC modeling:
 - Wave generation and dissipation
 - Testing different shapes for barriers
- Plants will volunteer in tidal areas as sufficient accretion occurs



Linear Berms (As-Built)

No Berms (Control)

Mounds (ala Sears Pt.)



Coastal NJ, Philadelphia District



December 2014



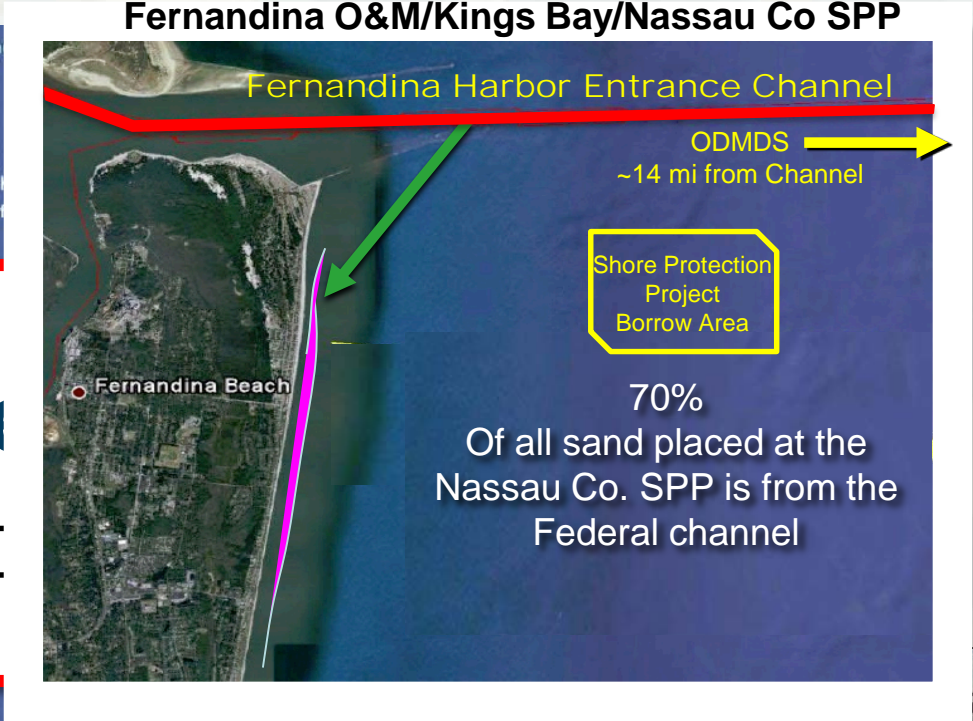
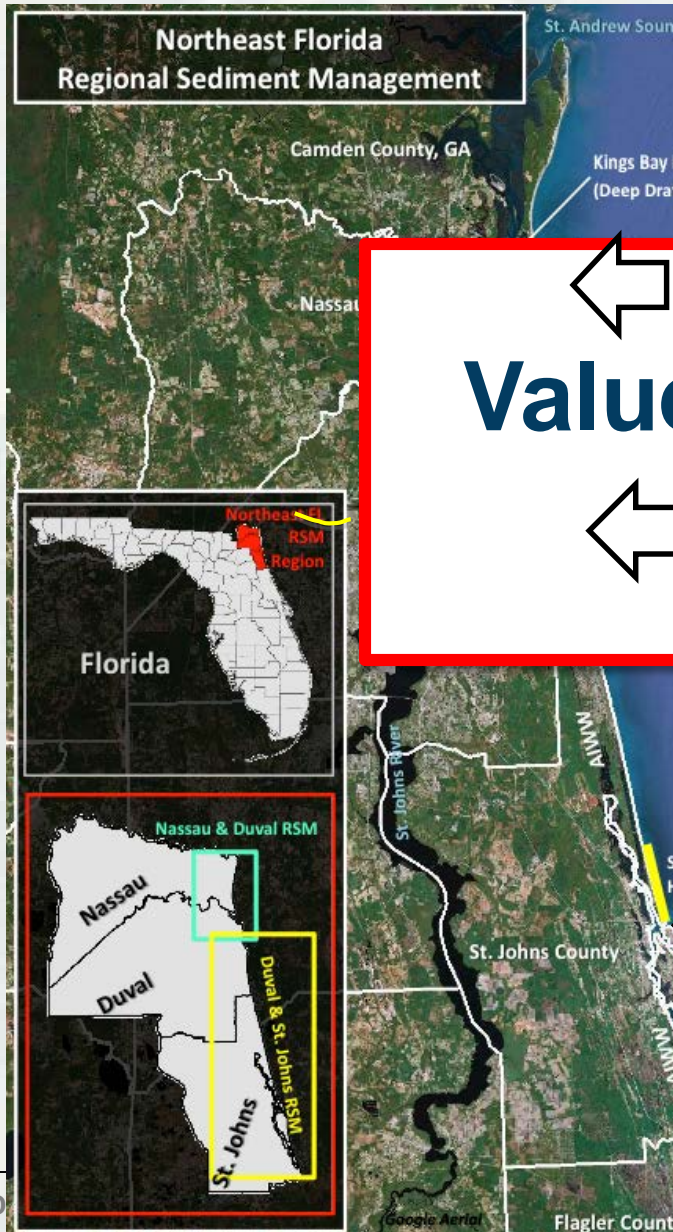
Stone Harbor



Avalon



Jacksonville District - St Johns, Duval, Nassau Counties



Shore Protection Project

Shoaling Area - O&M



BUILD

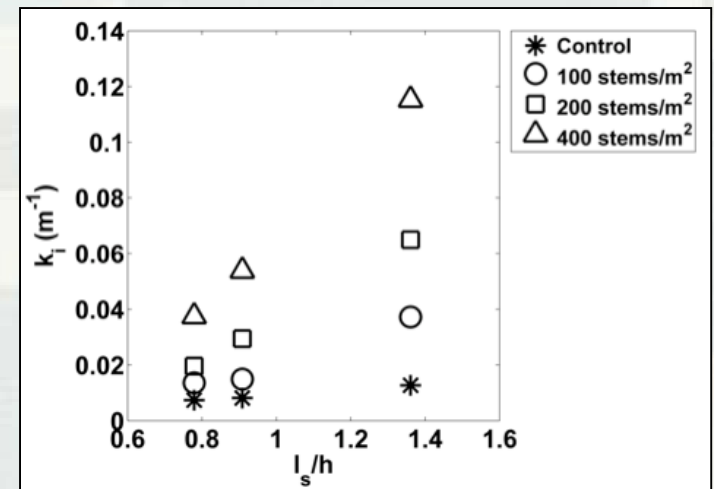


Innovative solutions for a safer, better world

R&D Example: Wave Dissipation by Vegetation

What are the engineering benefits of wetlands with respect to waves?

- Flume studies
 - Complemented by examination of sediment processes & field studies
- Wave attenuation:
 - increases with stem density
 - increases w/submergence ratio
 - slight increase with incident wave height
- Results used to enhance STWAVE nearshore wave model



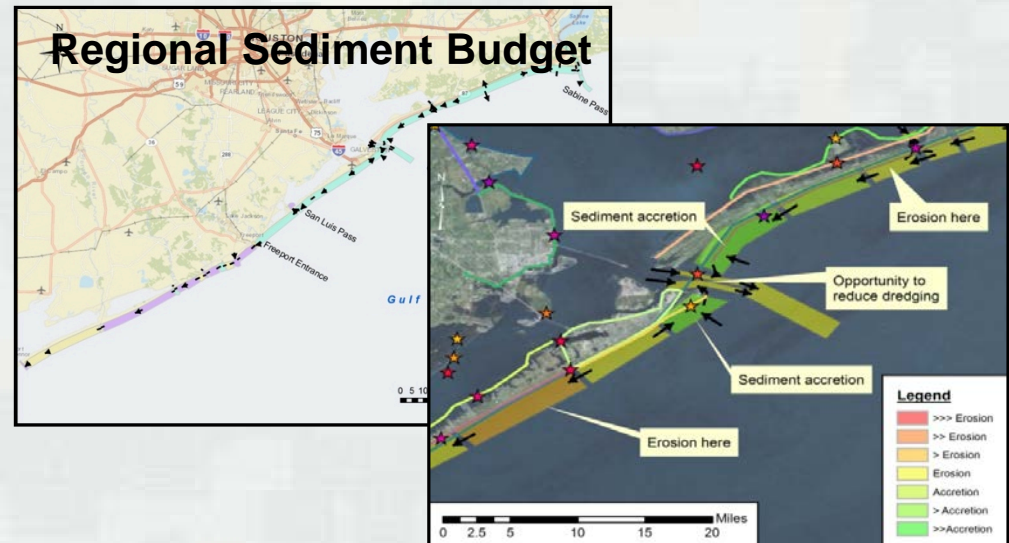
Tools

Understand System – ID/Evaluate Opportunities

Sediment Budget Analysis System

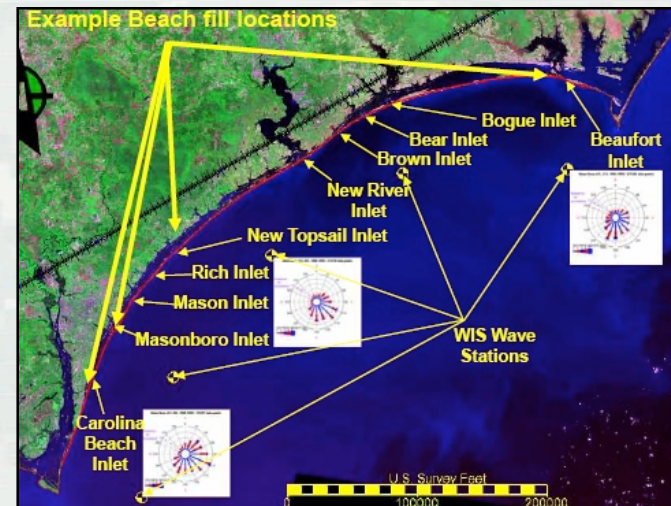
Regional/Local Sediment Budgets

- Sediment sources and sinks
- Sediment transport patterns
- Share information
- Decision Making



GenCade Numerical Model

- Regional shoreline response to actions
- Multiple interacting projects
- Multiple sources & sinks
- Regional trends
- Navigation channel maintenance
- Evaluate regional strategies



Science, Engineering, Technology Research Targets

- Fundamental processes
 - ▶ Sediment transport through and around NNBF
 - ▶ Long-term engineering/environmental performance of features
 - ▶ Environmental Services provided by engineered features and structures
 - ▶ Processes contributing to system-scale resilience
- Modeling systems that support broad-scale application
 - ▶ Planners, stakeholders and decision-makers
 - ▶ Engineering design
 - ▶ Operations and maintenance
- Reliable, cost-efficient monitoring technologies
 - ▶ Measuring system evolution
 - ▶ Infrastructure/feature performance
- Demonstration/pilot projects to innovate, evaluate, and learn at relevant field scales
 - ▶ Facilitate necessary collaboration
 - ▶ Evolve organizational culture and practice
 - ▶ Produce credible evidence of success
 - ▶ Fuel the “power of the story”



ERDC

Concluding Thoughts

- Address technical and business processes to maximize success
- Communicate concepts and successes of advancing technologies and practice
- Accelerate progress through collaboration



ERDC



BOEM
BUREAU OF OCEAN ENERGY MANAGEMENT



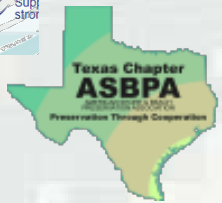
EWN



Preserving our coastal economy
asbpa
and ecology since 1926



USGS
science for a changing world



Thank You!

rsm.usace.army.mil

Linda.S.Lilycrop@usace.army.mil



engineeringwithnature.org

Todd.S.Bridges@usace.army.mil



IOOS
INTEGRATED OCEAN OBSERVING SYSTEM

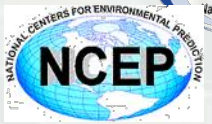
ADEM



NAVSYS
Navigation Systems Research Program



JALBTCX



ERDC