USACE Regional Sediment Management

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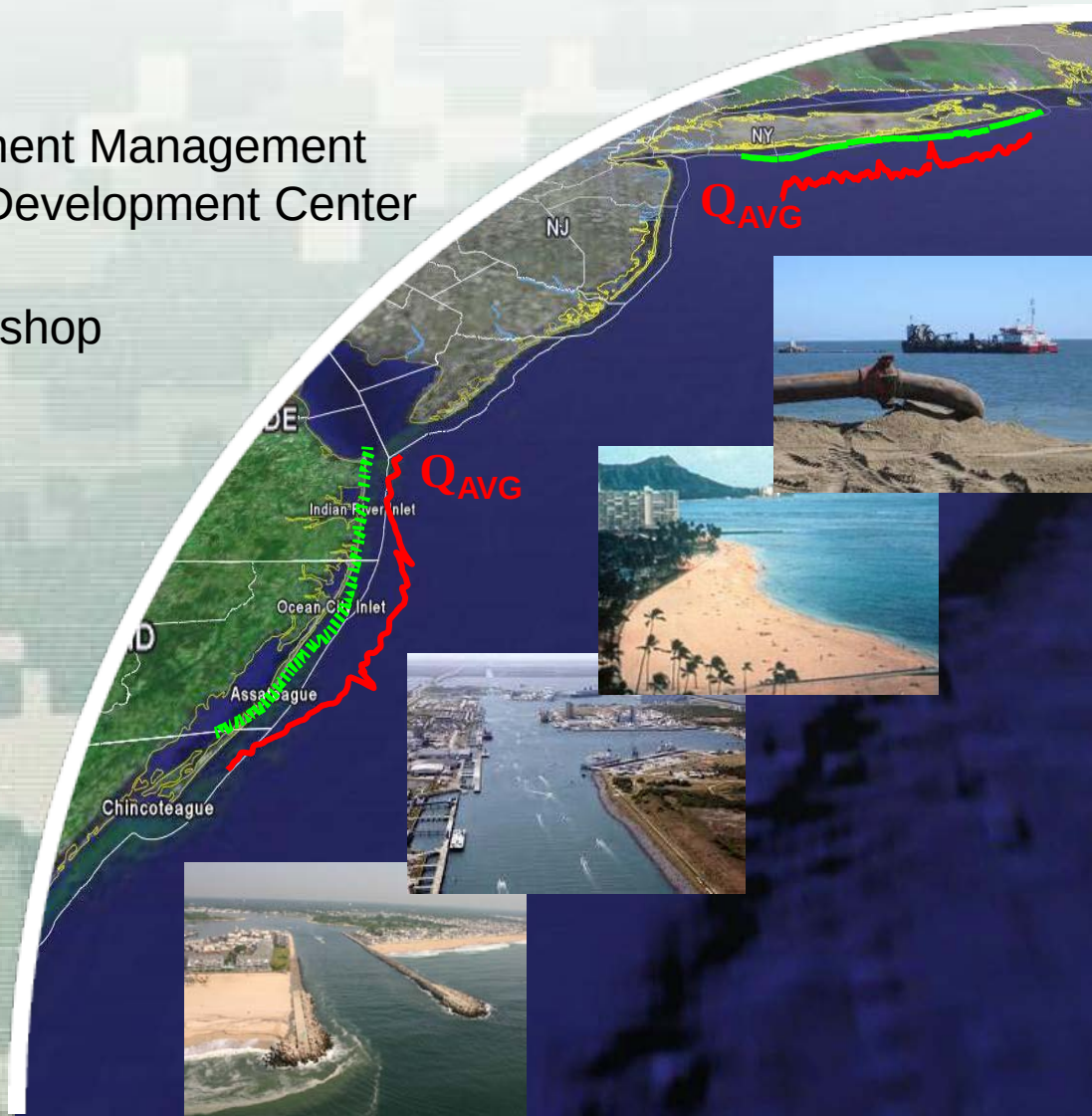
US Army Engineer Research and Development Center

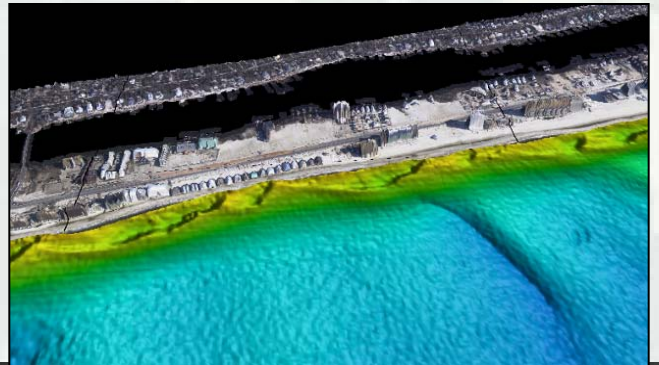
Building/Working with Nature Workshop
18-19 January 2011
Mobile, AL



US Army Corps of Engineers
BUILDING STRONG®

Outline

- **Regional Sediment Management**
  - What it is in the Corps
  - Why it is important
- **Case Studies**
- **Summary**

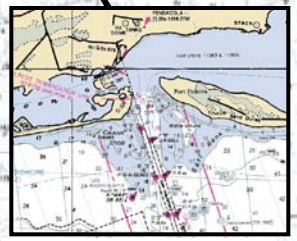


Why RSM?

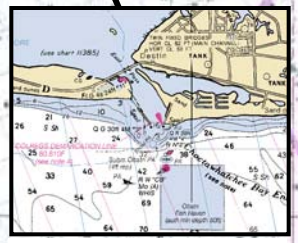
Local projects to regional focus
Including other Federal, State, and Local projects

DAUPHIN ISLAND

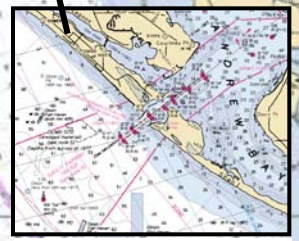
PERDIDO PASS



PENSACOLA PASS



EAST PASS



PANAMA CITY

Why RSM?

…..Each year the Corps moves
250-300 Million cu yd of sediment

…At a cost of more than
$700 Million per year

Regional Sediment Management

- Coastal Engineering Research Board Initiative (1996 -1998)
- RSM Demonstration (1999)
- Mobile District (1999-2002)
- Additional Districts (2002 – present)

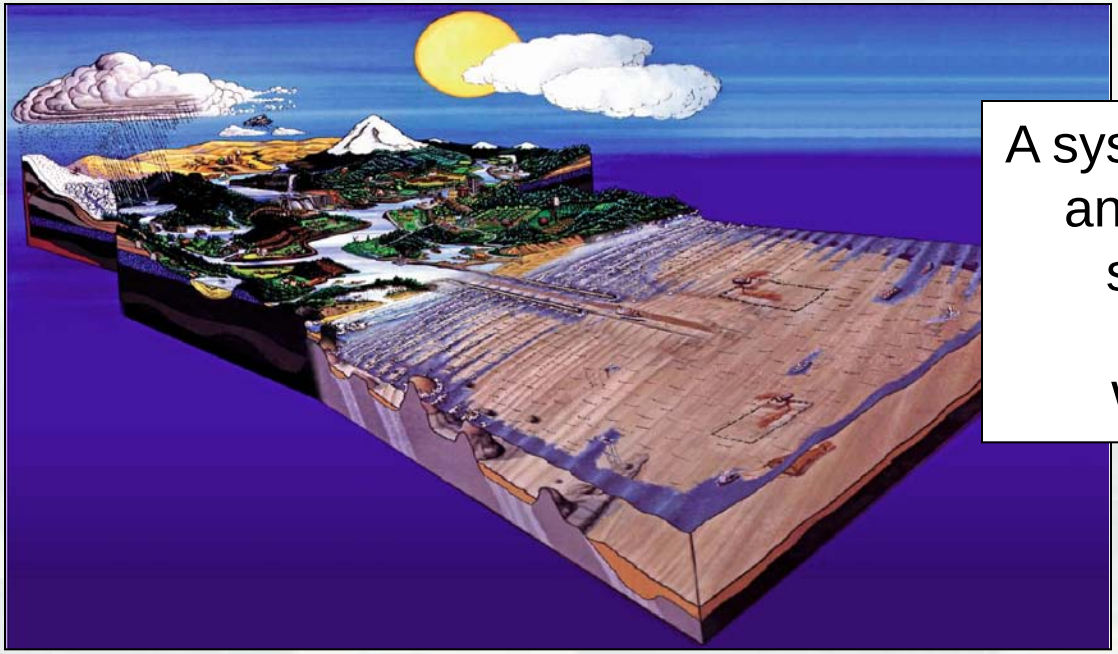
Charge from CERB:

"*RSM Demo Projects WILL…*"

- **Contain Specific Problem to Solve**
- **Generate Initial Outcomes Quickly**
- **Involve Multiple Agencies**
- **Develop Stakeholder Support**

RSM Solution

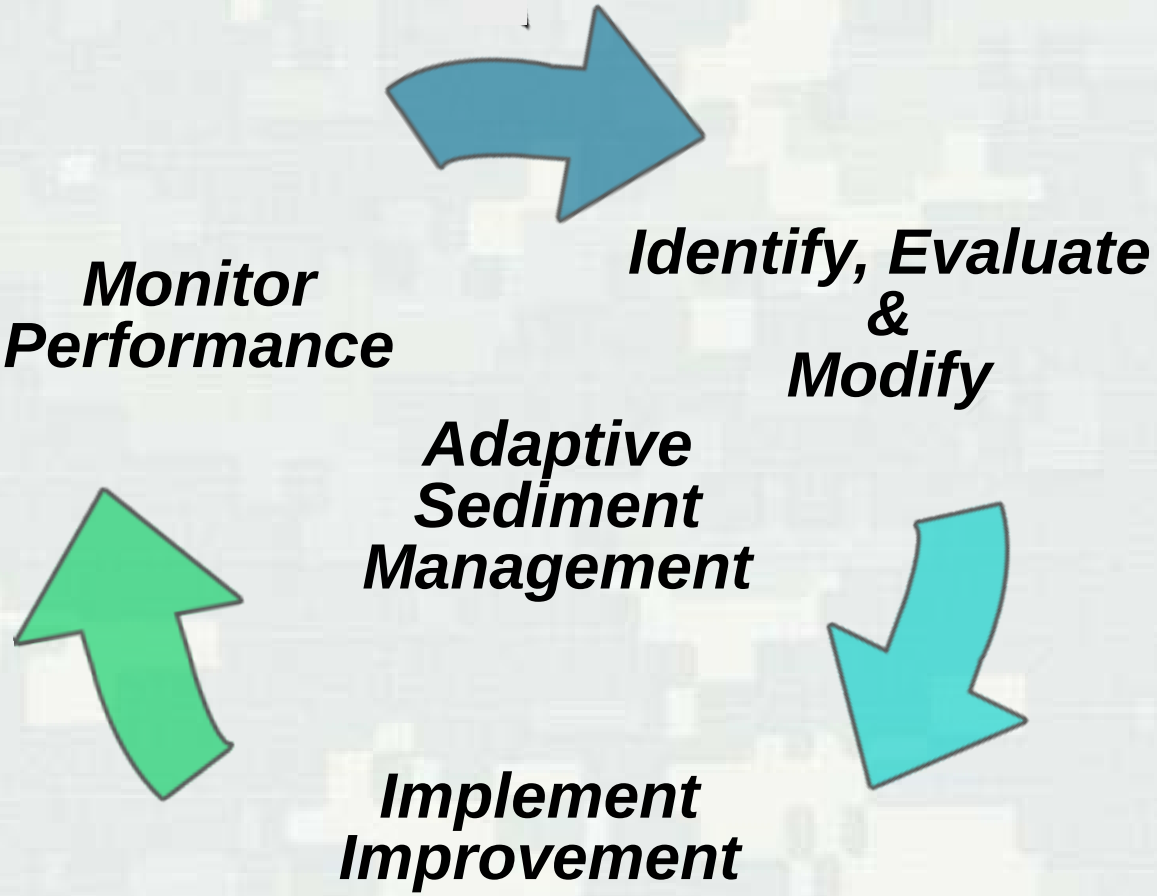
Regional Sediment Management is…



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

- Manage local projects and sediments within the regional context
- Consider sediments as a regional resource
- Support sustainable solutions for navigation and dredging, flood and storm damage reduction, and ecosystem restoration
- Communicate and collaborate – USACE, Stakeholders, and Partners

Regional Sediment Management Approach

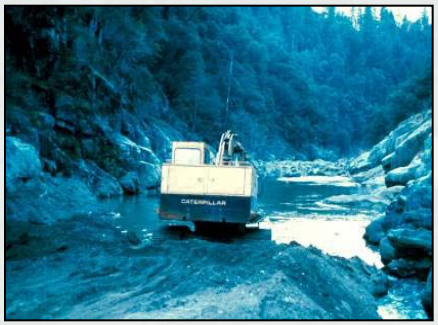


RSM Strategies

Reduce Offshore Placement

Nearshore/Beach Placement

Bypass
Optimize Placement



Reduce Sediments at the Source

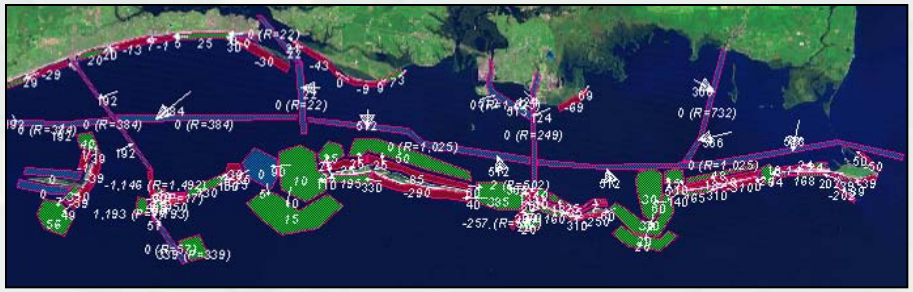
Utilize Upland Material

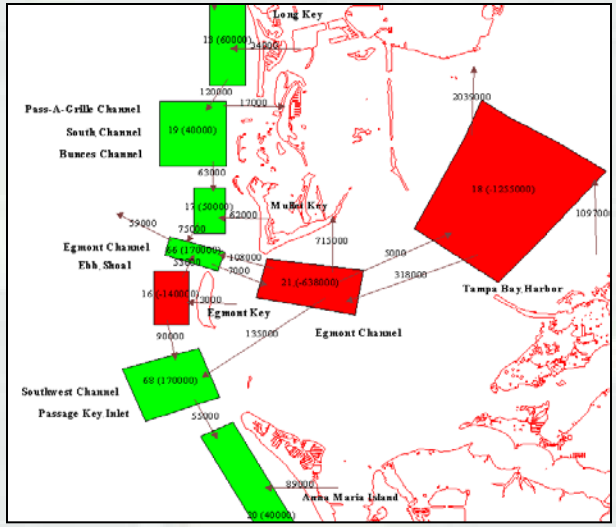
Ecosystem Habitat

Why RSM is Important to Civil Works:

- Regional vs project approaches
- Practice ‘Adaptive Management’
- Improve channel availability
- Reduce dredging requirements
- Storm damage reduction
- Address sand resource issues
- Environmental stewardship
- Reduce costs while increasing benefits
- Improve partnerships and collaboration

Regional Sediment Budgets



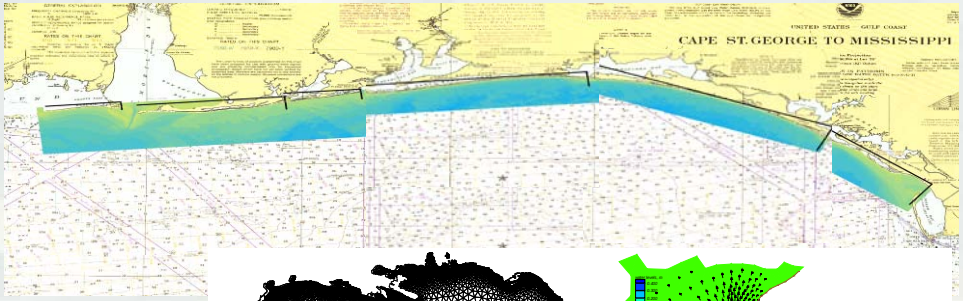


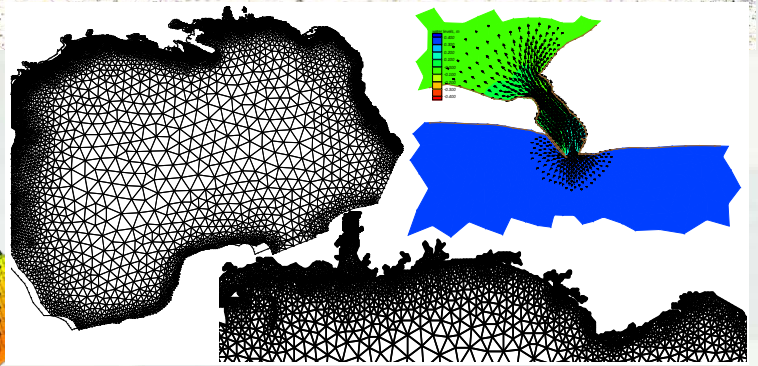
Models:

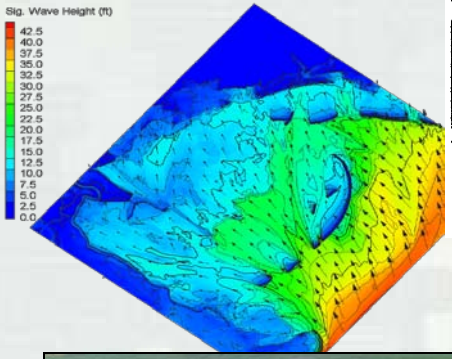
Waves, Circulation, Water levels, Sediment Transport, Shoreline Change

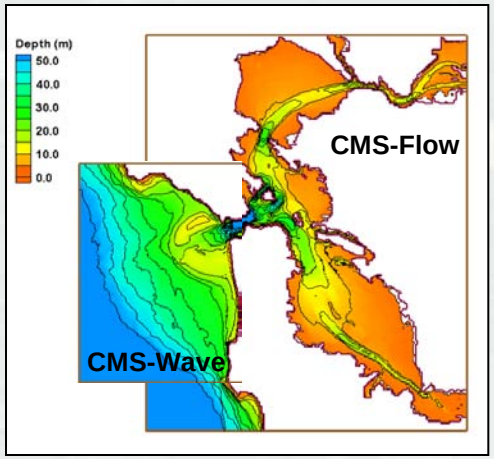
Complex to Adaptive Management

- Regional processes and trends
- Sediment sources & sinks
- Multiple interacting projects
- Connect beaches & inlets
- Navigation channel maintenance
- Evaluate local/regional Strategies



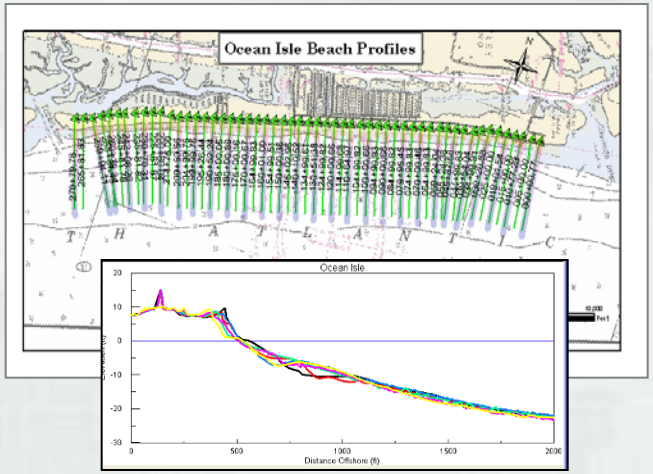


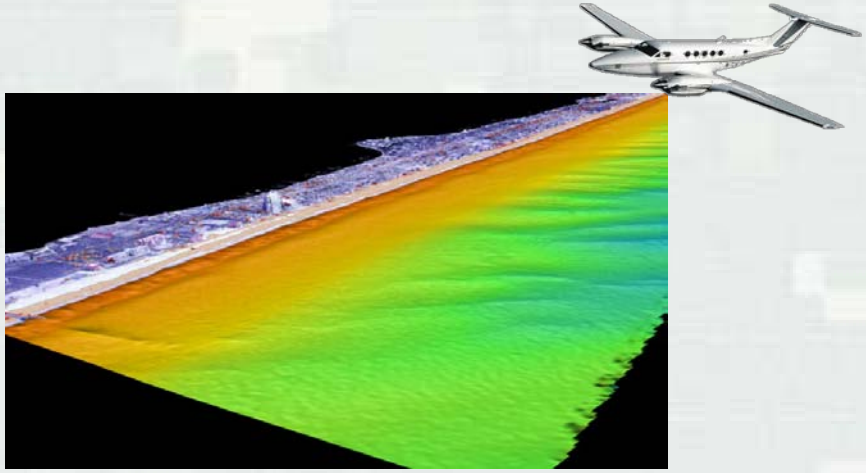


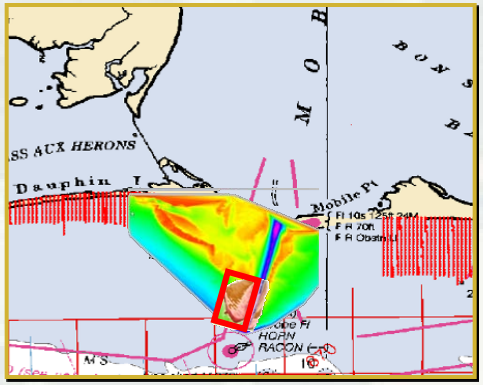


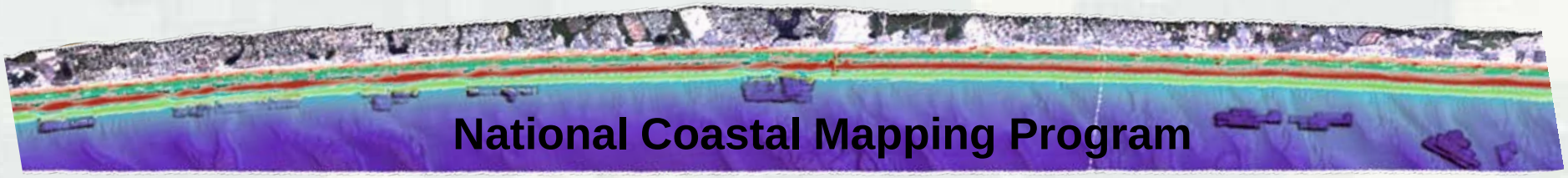
Mapping Data - Bathymetry/Topography/Shoreline/Imagery

Regional/Long-Term/Pre-Post-Storm



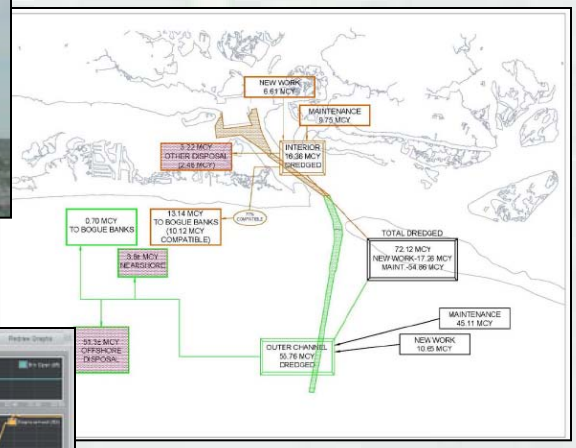


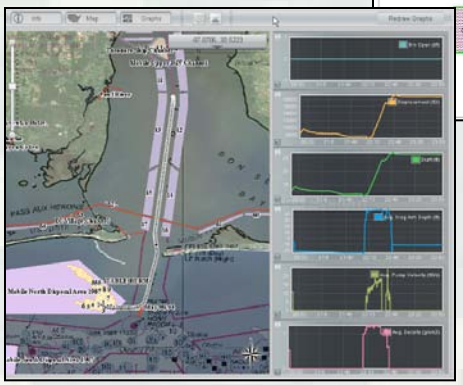




National Coastal Mapping Program

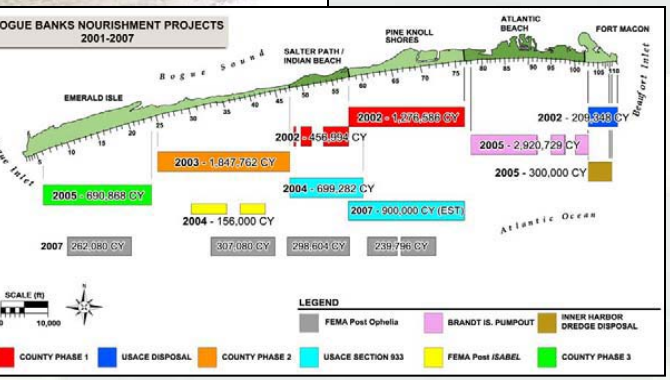
Dredging information:



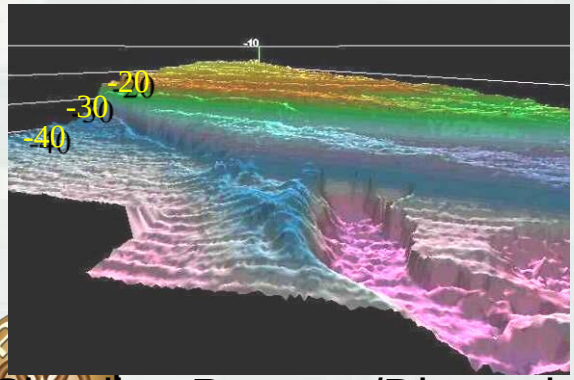


Navigation Channels
Borrow Areas

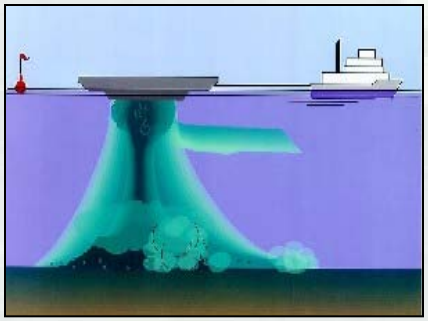
Beach
Nourishment



FATE Models



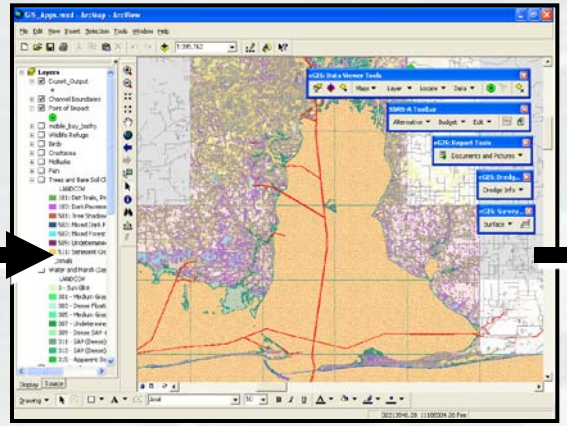
Shoaling Patterns/Dispersion

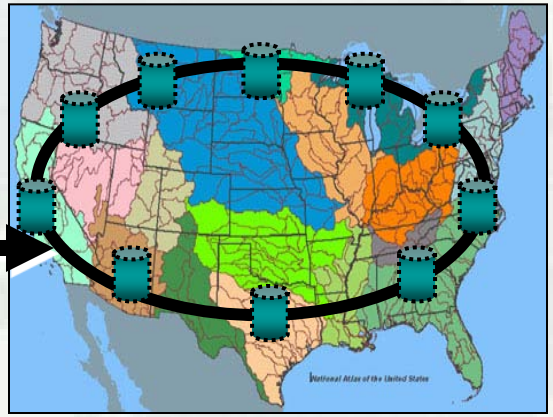


Sediment
Characteristics

eGIS/eCoastal: Data Management & GIS

- Data management, visualization, & analysis
- Regional sediment budgets
- Facilitate sharing data & tools
- Protect our investments
- Retain Institutional knowledge





RSM Across the USACE

Collaboration Fed/State/Local
All Districts

RSM PgMP, PMP, District Guidance
NAE, NAN, NAP, NAO, NAB, SAW, SAJ, SAM, MVN, SWG, SPL, NAP, NWP, NWS, NWO, POH

RSM Strategies/Alternatives
NAE, NAN, NAP, NAO, NAB, SAW, SAC, SAJ, SAM, MVN, SWG, SPL, SPN, NWP, LRB, POH, NWO

Sediment Budgets/Regional Modeling
NAE, NAN, NAP, NAO, NAB, SAW, SAC, SAJ, SAM, MVN, SWG, SPL, SPN, NWP, LRB, POH, NWO

Model/Tool Develop/tech transfer
NAE, NAN, SAW, SAJ, SAM, MVN, SPN, POH, NWP

Monitoring/Data collection
NAE, NAN, NAO, SAW, SAJ, SAM, SWG, NWP

Data Management/eGIS
All Coastal, expanding inland

CDF Mining/Capacity
SAM, POH

River Sand for Coast
SAJ, SAM

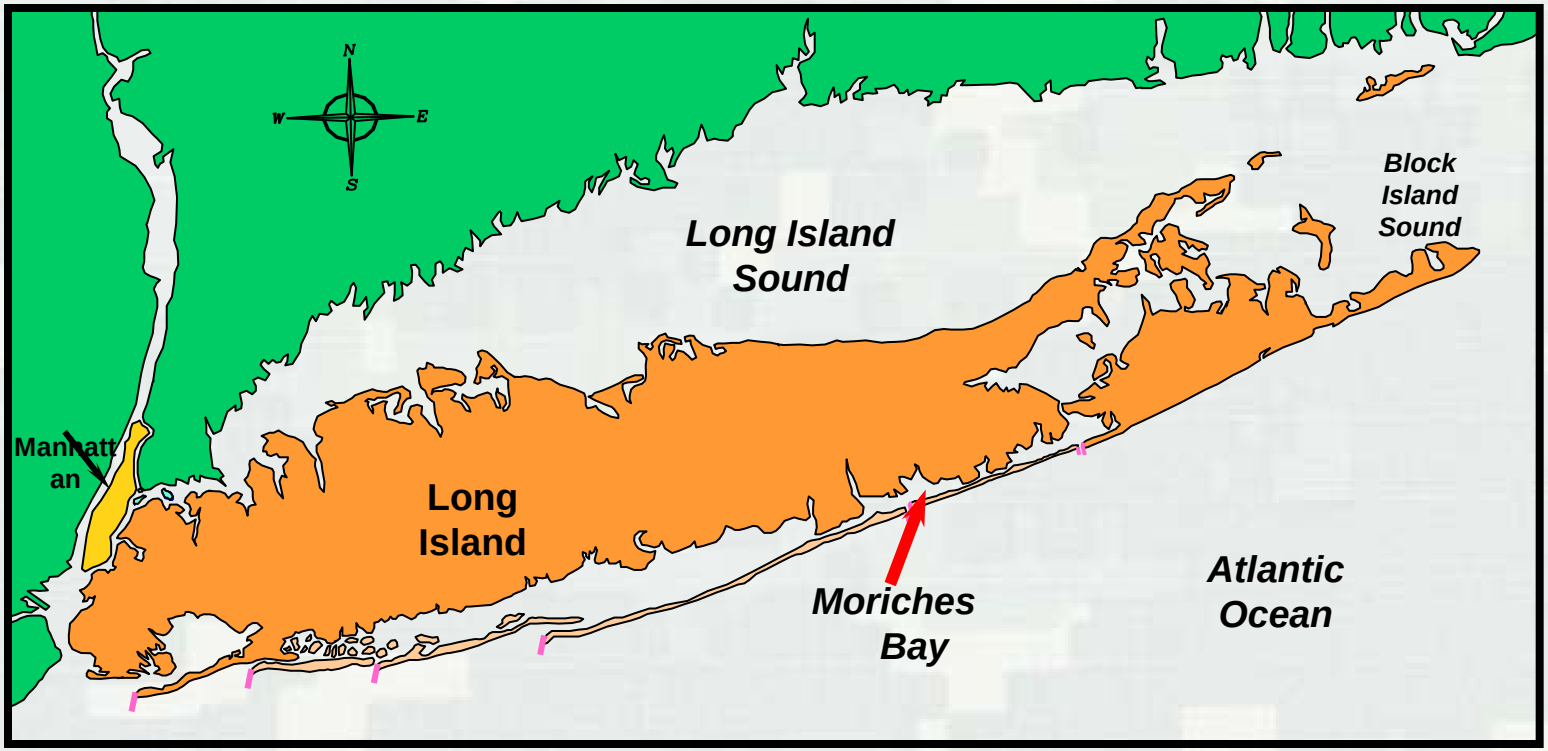
Sand Bypassing-Reduce Offshore Nearshore placement
NAN, NAP, SAJ, SAM, NWP, SPL

Habitat Restoration
NAN, NAP, SAJ, SAM

Watershed
NAP - Darby Cobbs, Delaware Estuary
SAM - Mobile Bay Watershed
SPL - Santa Ana River
NWS - Howard Hansen Dam
NWO - Upper MO River
NWK - MO River at Kansas City

Long Island ICWW, Moriches Bay

Alternate Disposal Area, Endangered Shorebird Habitat



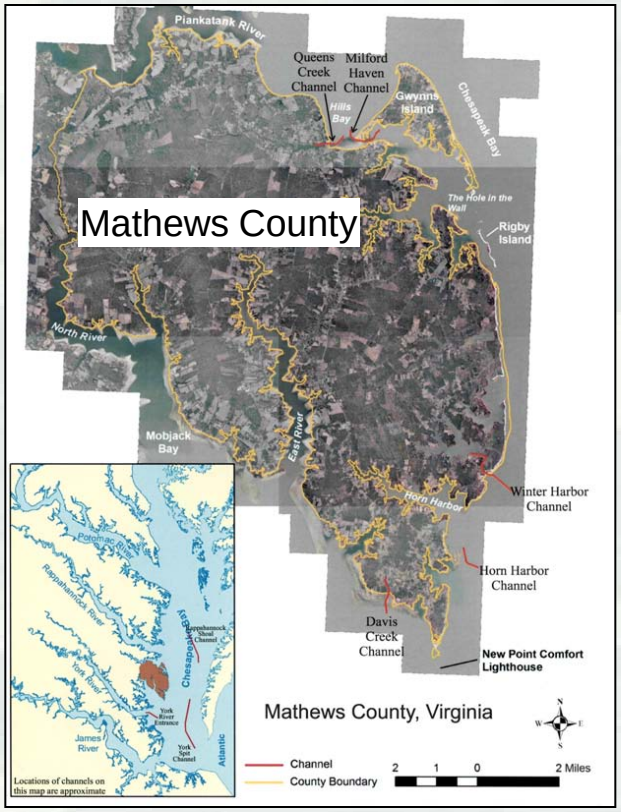
NAO Mathews County, VA RSM

RSM Region:

- Western Shore Chesapeake Bay (200-mi shoreline)
- Highly eroding shorelines
- Disposal sites reaching capacity

Goals:

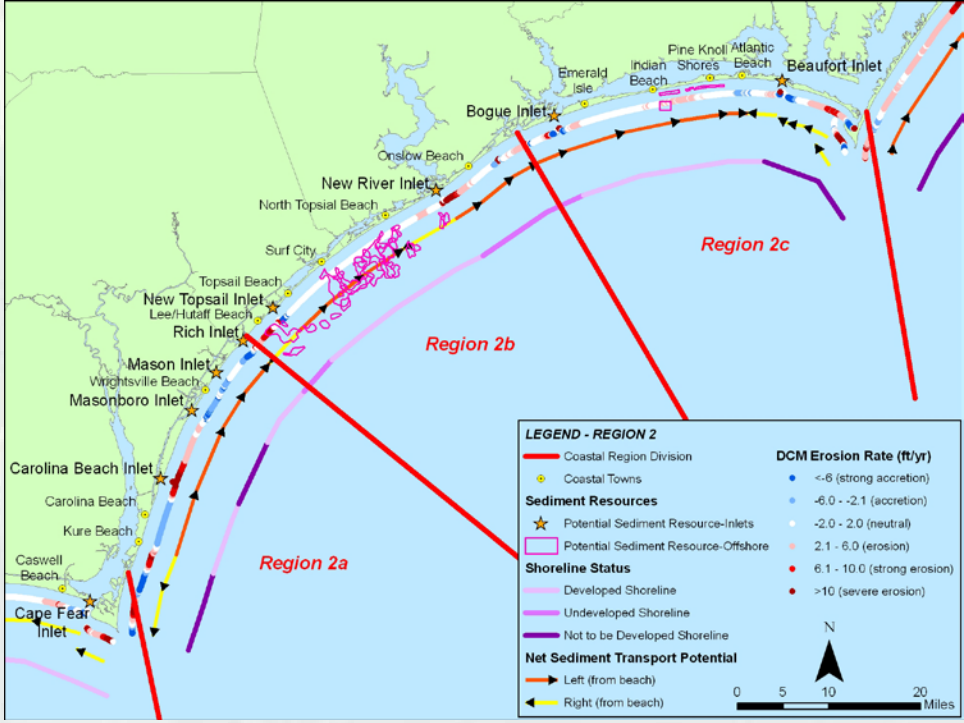
- Manage 6 federal navigation channels under single RSM plan
- Identify uses disposal site material
- Identify new disposal sites
- Extend maintenance cycles
- Reduce long-term O&M dredging costs per project
- Reduce shoreline erosion
- Collaborate w/stakeholders on regional approaches
- Achieve regional, cross-mission benefits



Find solution or abandon maintenance of Federal Projects

SAW North Carolina RSM

- 328-mi shoreline
- 2 Deep-Draft Harbors
- 10 Shallow Draft Channels
- 1 Jettied Inlet
- 2 By-Passing Operations
- 3 Capes
- 19 Inlets
- 4 Constructed Storm Damage Reduction Projects
- Developed/Non-Developed



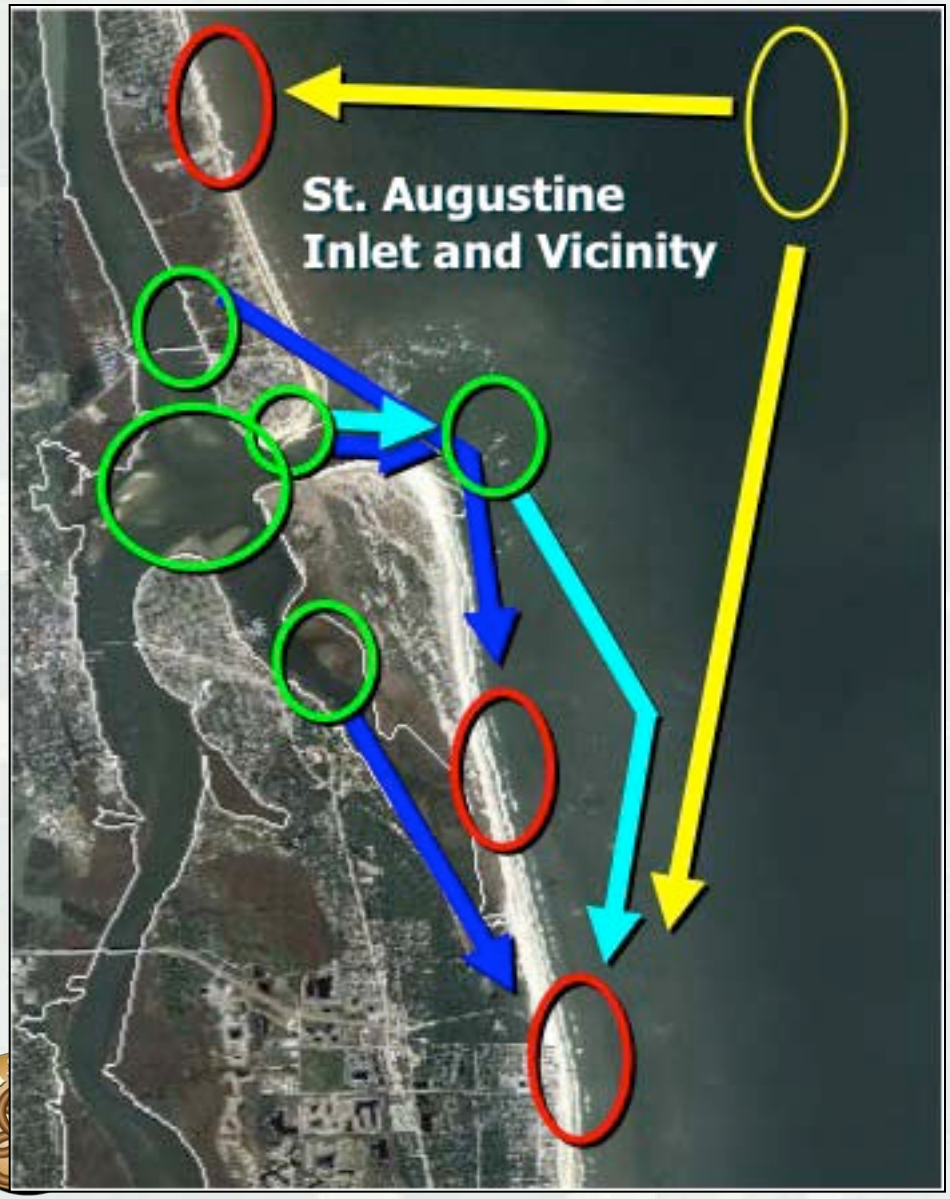
Goals

- Collaborate: NC Beach and Inlet Management Plan
- eCoastal - Accessible/Standardized Georeferenced Data
- NC Sediment Budgets - Understanding of regional system

- Mgmt sediment resources at federal projects and beaches
- Informed Dredging decisions
- Impacts dredging/disposal on adjacent projects
- Improve sand bypassing Wilmington Harbor, Masonboro Inlet
- Assist Morehead City DMMP

St. Augustine Inlet, FL and Vicinity

Combining multiple projects (CG, O&M), sand bypassing, shoreline erosion



- erosional area
- shoaling area
- offshore borrow area
- inlet bypassing
- beneficial use
- beach nourishment

Perdido Pass, AL

Shoreline Erosion, Littoral System Resource, Sand Bypassing, Nearshore Placement, Reduce Rehandling

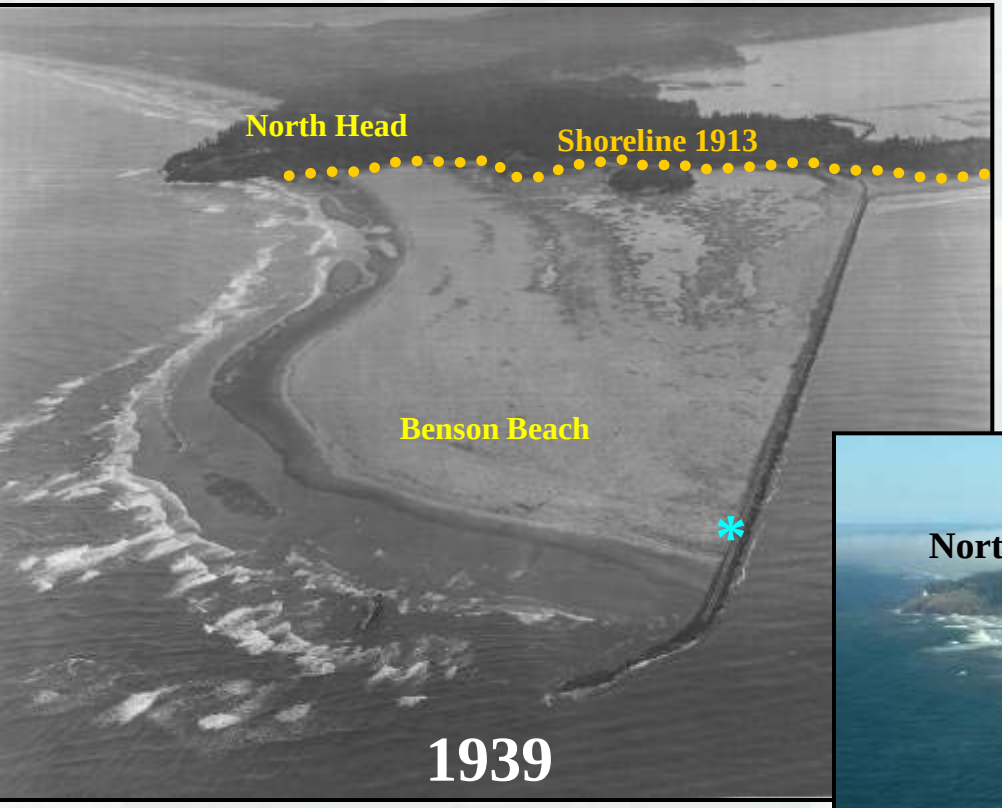
Shoaling Area

Placement Area

SPD-California and RSM

Beach Quality Materials Dredged from 13 Coastal Harbors are placed on Downdrift Shorelines

Mouth of Columbia River, Benson Beach



RSM Summary

- Manage local projects in Regional Context
- Understand local/regional processes, sediment sources and sinks
- Seek solutions which maximize use/minimize costs
- Leverage and supplement resources
- Take Action: “Adaptive Management”