Regional Sediment Management Program and RSM-U

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RSM-U
Reservoir Sediment Management Workshop
15-18 August 2017

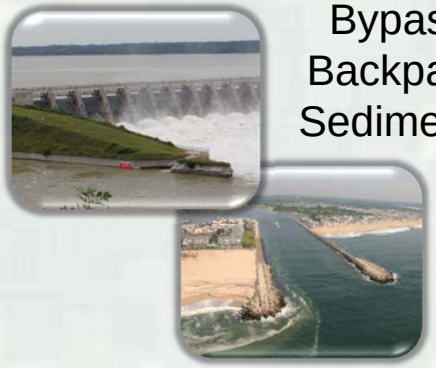
Regional Sediment Management

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

- Navigation, Flood Risk Mgmt, Environmental, Emergency Mgmt
  - Economic & environmentally sustainable solutions
  - Coastal and Inland
- Recognize sediments as a valuable regional resource
- Work across multiple projects, authorities, business lines
- Tools and technologies for regional approaches
- Relationship building for decision making & implementation

RSM Goals and Strategies

Reduce Offshore/CDF Disposal

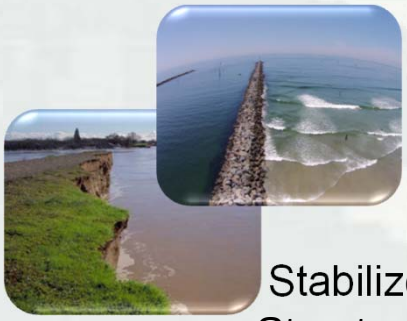


Bypass Backpass Sediments

Reduce Erosion

Save Capacity

- Keep sediments in the system
- Mimic natural sediment processes
- Reduce unwanted sedimentation
- Environmental enhancement
- Maintain & protect infrastructure



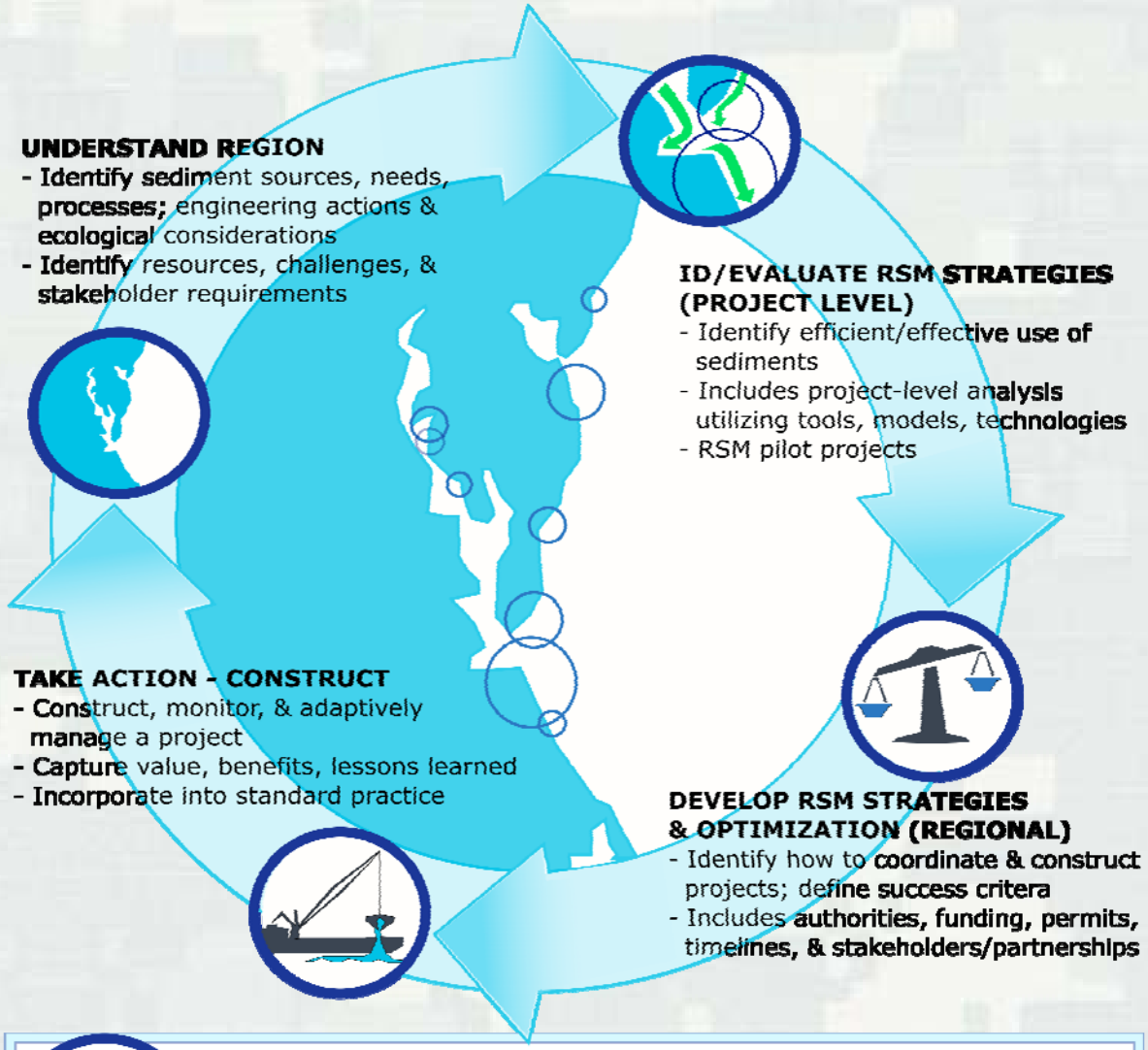
Stabilize Structures

Reduce Channel Shoaling

Reduce Runoff

Ecosystem Habitat Restoration

RSM Process


UNDERSTAND REGION
- Identify sediment sources, needs, processes; engineering actions & ecological considerations
- Identify resources, challenges, & stakeholder requirements
ID/EVALUATE RSM STRATEGIES (PROJECT LEVEL)
- Identify efficient/effective use of sediments
- Includes project-level analysis utilizing tools, models, technologies
- RSM pilot projects
DEVELOP RSM STRATEGIES & OPTIMIZATION (REGIONAL)
- Identify how to coordinate & construct projects; define success critera
- Includes authorities, funding, permits, timelines, & stakeholders/partnerships
TAKE ACTION - CONSTRUCT
- Construct, monitor, & adaptively manage a project
- Capture value, benefits, lessons learned
- Incorporate into standard practice
COMMUNICATION, COLLABORATION, COORDINATION
- interagency, stakeholders, partners, resource agencies

RSM Participation (2000-2017)

28 Districts

20 Coastal

8 Inland

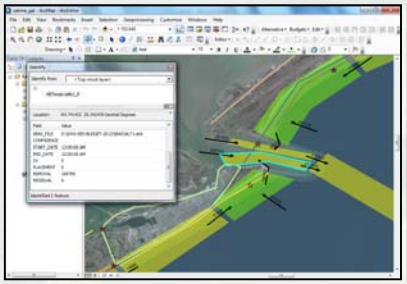
7 Coastal/Inland

ERDC, IWR-

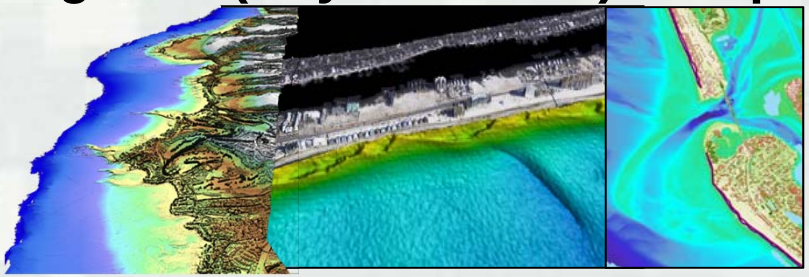
**Tools, Technologies for RSM Approaches

Regional Sediment Budgets

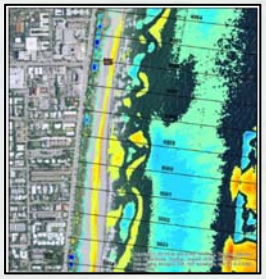
Sediment Budget Analysis System
Web-based SBAS Viewer



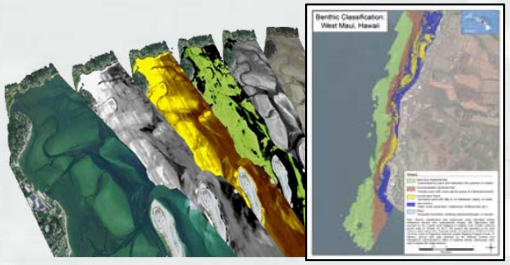
Regional (Beyond Local) Comprehensive Surveys



Morphology/Landcover/Imagery

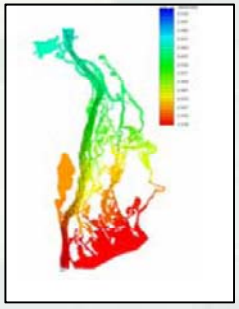


Volumes

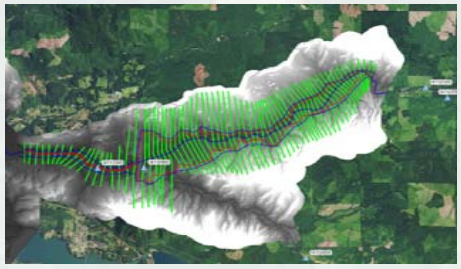


SAV & Benthic Classification

Regional/Project Scale Model Applications

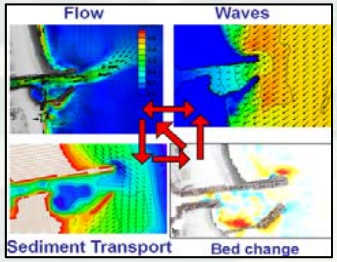


ADH

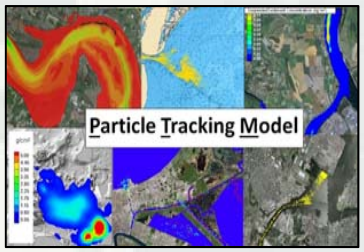


HEC-RAS

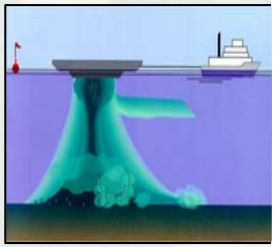
GenCADE



CMS

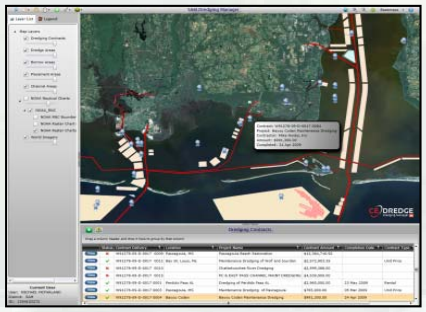
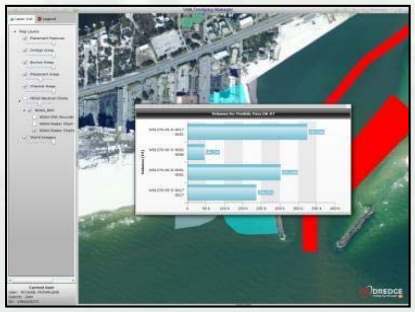
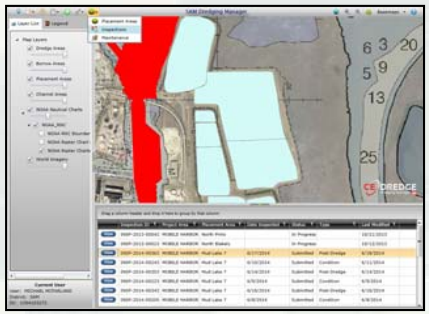


PTM

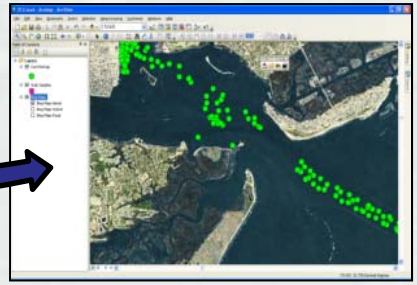
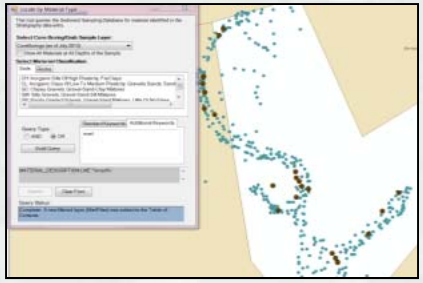


STFATE
LTFATE

Dredging Histories/Placement Area Management (CE-Dredge)

Sediment Data: Sediment Analysis Geo-App (SAGA)


R&D for Sediment Placement

Thin-layer placement

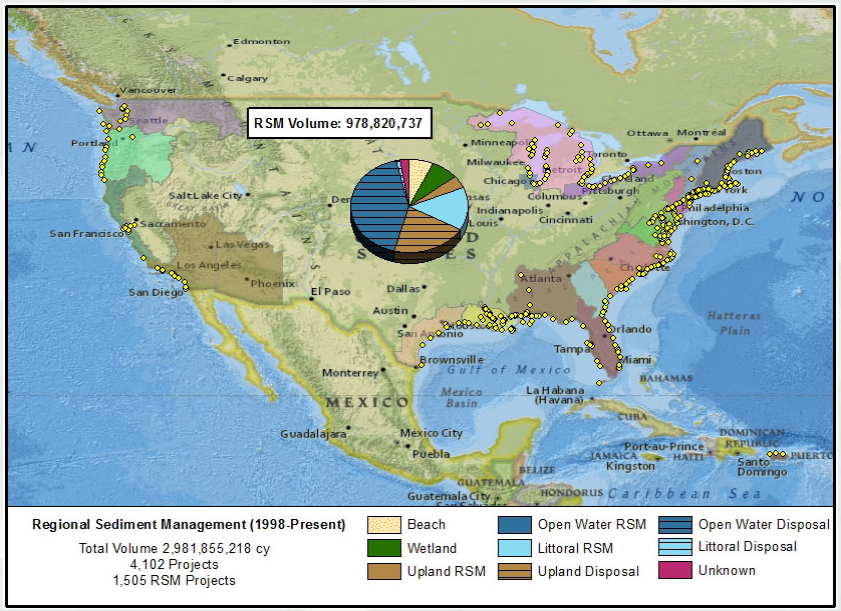
Loss of Fines

Nearshore Berms

Reservoir Flushing Bypassing

Historical Navigation Sediment Utilization: *Inland FY17

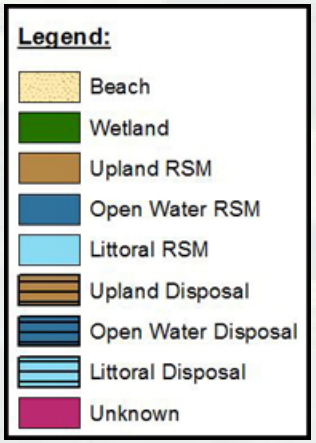
Where, when, volume of sediments placed beneficially? Where can we improve?

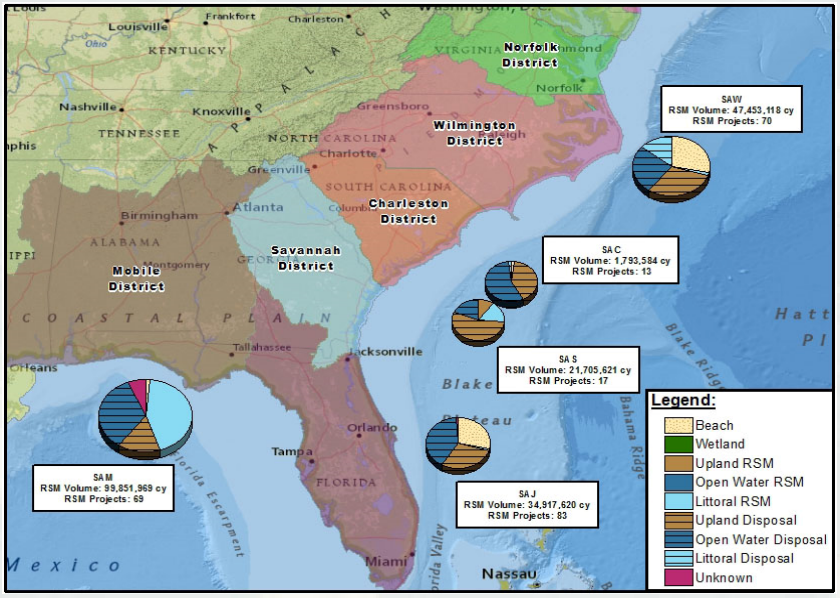


District Data 1998-2014

Coastal Navigation Projects

- 3 Bcy
- 36% placed beneficially
- 9 Mcy/yr placed on beaches
- 5 Mcy/yr Unknown





Mobile District: Mobile Bay RSM Strategy

POCs Larry Parson, Nate Lovelace, Elizabeth Godsey

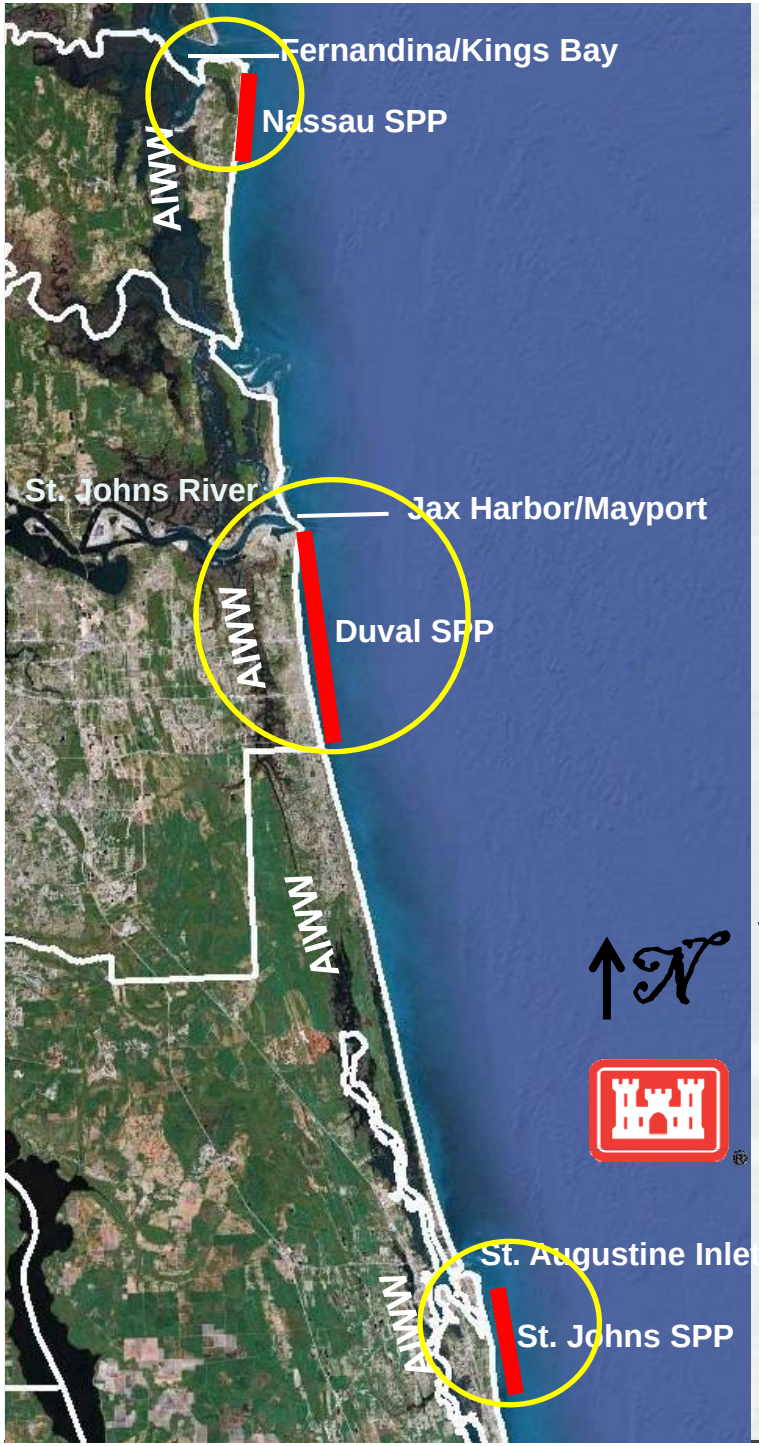
- WRDA86: Place all dredged sediments in ODMDS
- Tripled maintenance costs

- 2007 Mobile Bay Basin Interagency Working Group

- 2012 Emergency conditions – Upper Bay
- Thin-layer placement demo SAM-ERDC
- 2014 Approval Long-Term in-bay placement
- Placed $1M cy cost savings $4M

RSM Strategies

- ✓ Continue TLP
- ✓ Biodegradable containment structures
- ✓ Fill dredge and oyster holes
- 1000-acre emergent marsh



Quantifying the Benefits

11 yrs

Fernandina/Kings Bay Navigation Channel → Nassau County Shore Protection Project

$45M Sediment Value

30 yrs

Jacksonville Harbor Navigation Channel → Duval County Shore Protection Project

$31M Sediment Value

SPP $4M for Nav

14 yrs

St Augustine Inlet/IWW Navigation Channel → St Johns County Shore Protection Project

$4M Sediment Value

SPP $13M for Nav

$97M Total Value

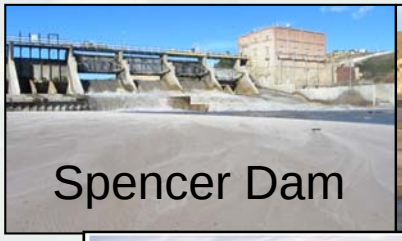
Reservoir Sediment Management

NWO, NWP, NWK, HEC

POCs Paul Boyd, John Shelley, Chris Nygaard, Jarod Norton, Stanford Gibson

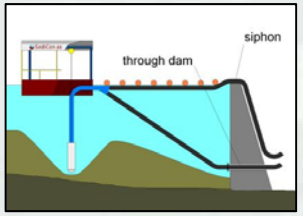
Reservoir Flushing

- Monitor reservoir flushing events
- HEC-RAS – Reduce uncertainty, New features
  - evaluate TMDLs
  - automate operational alternatives.
- Inform future reservoir flushing events
- Provide tools to manage downstream effects



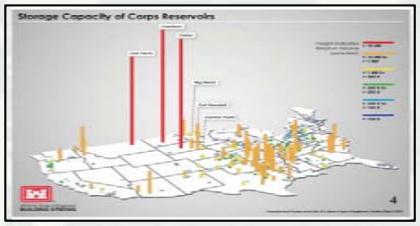
Evaluate Low-cost Reservoir By-Passing

- ID Methods & solutions
- Coordinate Pilots



Inventory of Corps Reservoir Sediment Management Activities

- Inform future conditions, actions, regional impacts, benefits
- Reservoir Sedimentation Information (RSI) Data Portal



Reservoir Sediment Management Workshops

USACE, Other Agencies, State, Private

3 Workshops

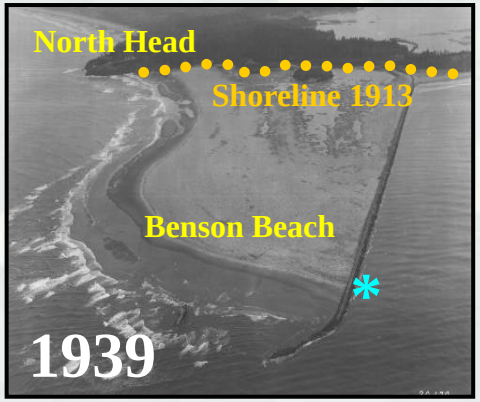
RSM-U Aug 2017

NWP, Mouth of the Columbia River RSM

POC, Jarod Norton

Challenge

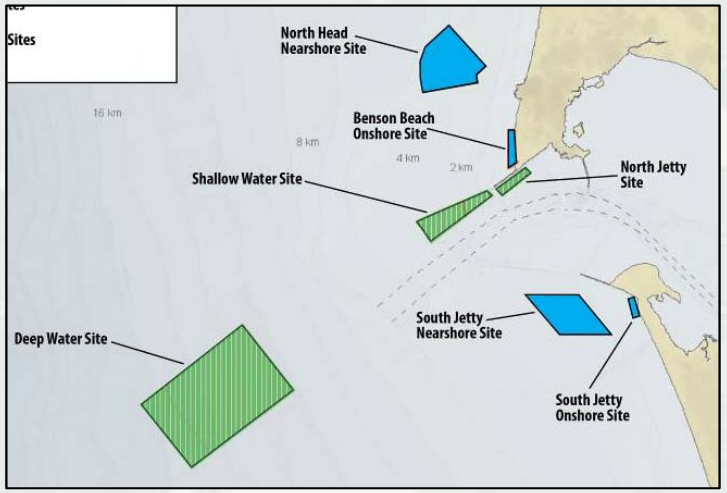
- Shoreline erosion
- North Jetty deterioration
- Wasting sediment to Deep Water Site
- Protect benthic habitat



Goal

Develop/Implement NWP RSM Strategy

- Keep sediment in the littoral cell (BU)
- Obtain new nearshore sites
- Protect South Jetty Root
- Lower Maintenance Costs/Cycle Time
- Increased BU/Habitat for Benthics
- Stak



NWP, Lower Columbia River RSM Strategy

POC, Jarod Norton

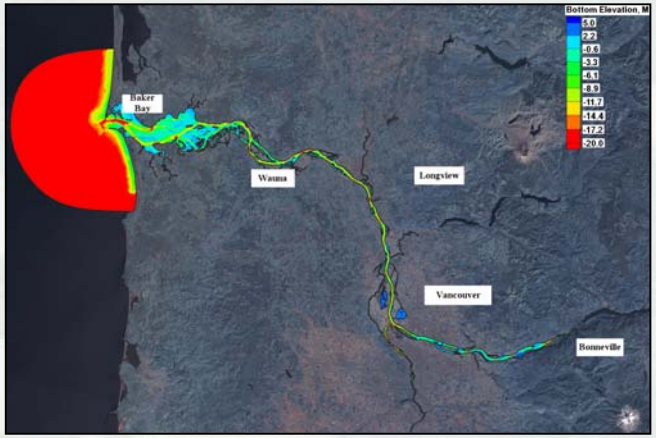
Challenge

- Annual shoaling, draft restrictions
- Dredge 6-8 Mcy/yr
- Limited funding & dredge plant availability
- Upland/in-water placement sites reaching capacity
- Need to proactively manage O&M maintenance
- Prevent wasting and/or rehandle dredged material

Goals

Sustainable long-term RSM Strategy

- Optimize Beneficial Use
- Prevent re-shoaling
- Ensuring reliable navigation Channel



MVR, Sedimentation Impacts at the Confluence of the Sangamon and Illinois Rivers

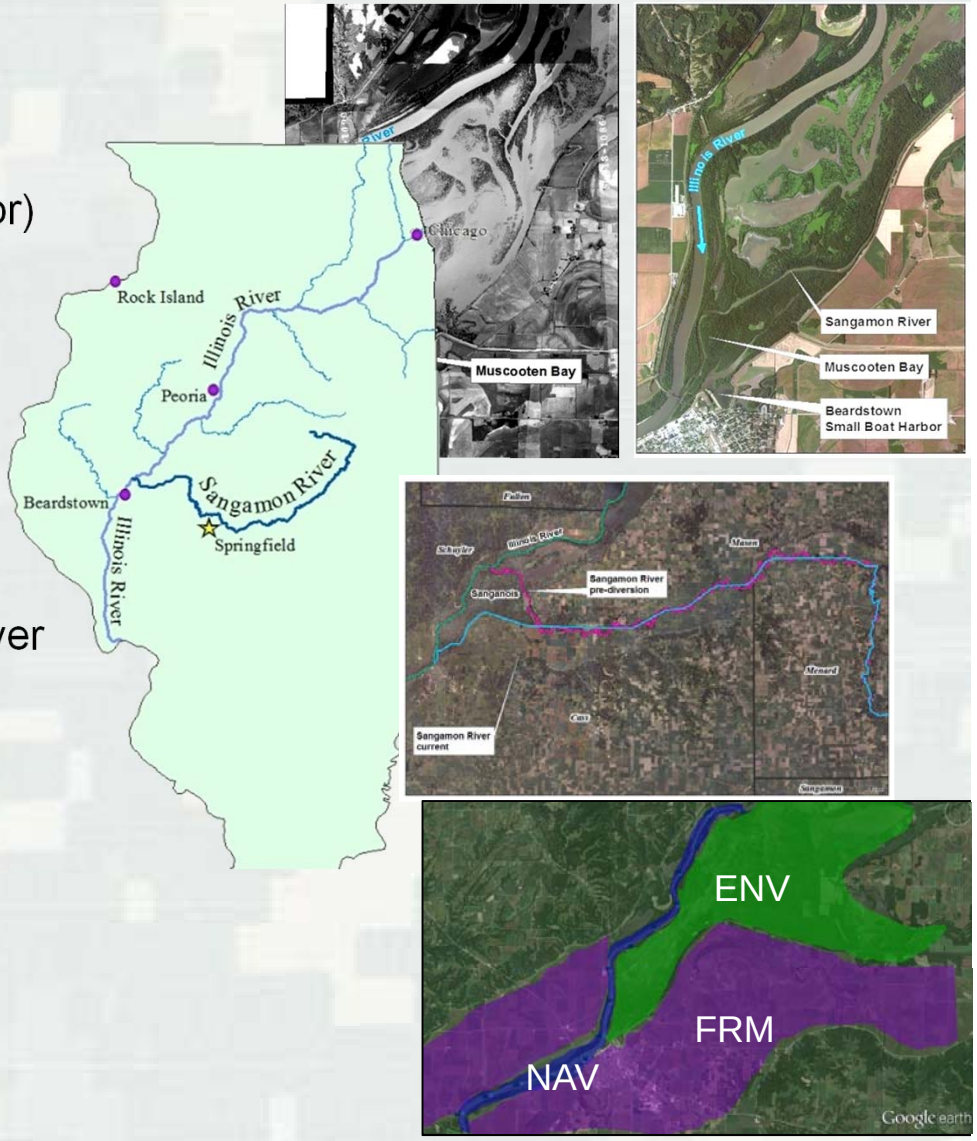
POC Nicole Manasco

Challenge

- Most expensive dredging location in MVR
- Backwater areas of Illinois river filled in with sediment (affecting Federal Small Boart Harbor)
- Lack of data, Lack of regional/political will
- Massive sand stockpiles to offload

Goals

- HEC-RAS Model to understand system
- Understand consequences of channelization and land use on Sangamon River
- ID opportunities for sediment delivery to ILriver
- Stakeholder collaboration (Nav, FRM, ENV)
- Develop beneficial use strategies for sediment
  - IDOT use of sand for new bridge
  - Partnership for soil manufacturing
  - Increase topographic diversity



NWO, Evaluating Projected Impacts/Benefits of Increased Sediment Load to the Lower MO and MS Rivers

POC Paul Boyd

Will increasing sediment supply to MO river below Gavins Point Dam result in changing degradation of MO River?

Would increased sediment load provide benefits to the MS River?

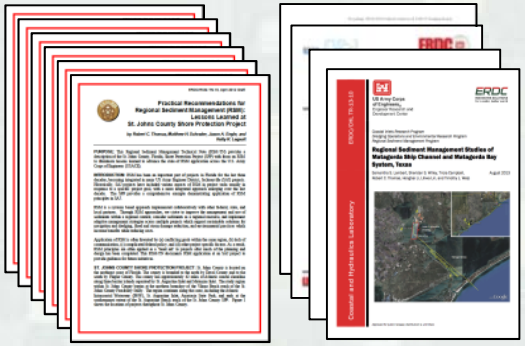
Quantifying downstream benefits could allow USACE to consider cost of moving sediment as investment

Approach

- Use HEC-RAS model to estimate maximum sediment load without causing aggradation
- Estimated load will be attenuated moving downstream and bed changes assessed

RSM.USACE.ARMY.MIL

RSM Technical Notes, Reports Manuals, Conference Papers



USACE Bi-Monthly Call/Webinars

District Stakeholder Workshops

Technical Webinars with Districts
**R&D Programs*
DOTS
WOTS

RSM University

USACE/Stakeholder Outreach, Education & Training

11-12 April, Thin-Layer-Placement:
Regulatory & Permitting Meeting
Jacksonville, FL

15-17 Aug, Reservoir Sediment Mgmt
for Managers, Regulators, Operators
Lakewood, CO

2018

Reservoir Sediment Mgmt
Engineering Workshop:
Assessment & Numerical Modeling

RSM on Inland Systems

Tools for RSM:
Overview and Training

Professional Development Hours (PDH)

ERDC
Engineer Research and Development Center

THE COASTAL & HYDRAULICS LABORATORY
presents this certificate to
NAME
for attending
Regional Sediment Management University
Reservoir Sediment Management Workshop

Lakewood, CO
15 -17 August 2017

Linda S. Lillycrop
RSM Program Manager

PDH Hours = 21.0

Marianne H. Floyd
CHL Training Coordinator

RSM-U Training Certificate

Certificate of Completion

This certifies that

_____

Has successfully completed the

_____

This ____ Day of _____ ____

_____
Signature

What are the impacts/value to the Corps?

Relationship Building:

- ✓ Across the USACE
- ✓ Stakeholder/Resource Agency Communication and Participation

More Efficient Systems

- ✓ Reduced lifecycle costs, increased value of sediments
- ✓ Leveraging across projects and business lines
- ✓ More project execution (Do more with less i.e. low use)

Utilizing Sediment Resources for Healthy Systems

- ✓ More Sustainable and Resilient
  - Coastal and Riverine Systems
  - Ecosystem and Aquatic Habitats

Recovery Operations

- ✓ Teams and Relationships Established
- ✓ RSM Strategies for Managing Sediments
- ✓ Data, Tools, Models Available

Tools and Technologies for Regional Approaches

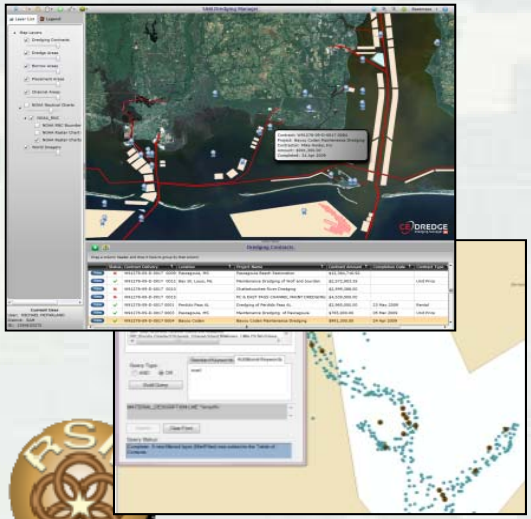
- ✓ Enhanced tools, models, technologies to manage sediments
- ✓ Improved data storage, access, visualization, analysis

Regional Sediment Management = Resilient Healthy Systems

Regional Sediment Budgets
Local Actions=Regional Benefits

ODMDS
Regional Strategies

Improved Relationships



Data Management and Access

Riverine & Reservoir Mgmt

FY17 Regional Sediment Management Program

LRC: Evaluation of Nearshore Placement in Southern Lake Michigan (con't)
LRE: Understanding and Maintaining the Lake Michigan Sand Supply
MVN: Maintenance of Hopper Dredge Disposal Area (HDDA)
MVR: Upper Pool 11 Sediment Transport
NAO: James River Federal Navigation Channel (cont)
NWK: In-reservoir/downstream channel effects low-cost sediment bypass Tuttle Creek Lake
NWO: Comprehensive Inventory of USACE Reservoir Sediment Management Activities
NWP: Lower Columbia River - RSM Strategy (con't)
NWS: Bypass/nearshore placement: Skagit Bay downdrift of Swinomish Nav Ch (con't)
POH: BU Opportunities & Lessons Learned Haleiwa & Kikiaola Harbors
SAJ: Incorporation of RSM into SMART Planning
SAM: Pascagoula Harbor DA10 littoral Zone Placement Sand Transport Study (MsCIP & CIRP)
SAM/SAJ: Turbidity Compliance FL (con't)
SAW: Carolina Beach Inlet Complex Sediment Budget and RSM strategy (con't)
SWG: GIWW-Bolivar Flare: Shoaling Reduction & BU Maint Dredge Material (RSM & CIRP)
CHL: Advancing Nearshore Berm Research, Guidance, and Tool Development (RSM & CIRP)
CHL/SAJ: Improve CMS to Improve BU Activities via Inclusion of Alongshore Variable Sand Thickness, San Juan Harbor/Condado, PR - CIRP, FRF, UPR, PRDNR
CHL/RCX: Sediment Sorting during Dredging/Placement Process: Implications for Resource Mgmt & Environmental Impacts (RSM & BOEM)
RCX: Quantifying Ecosystem Value of RSM
RSM University Workshops