

FY21 RSM IPR – NAP – A Systems Approach to Beneficially Use Fine and Coarse-grained Dredged Material at the Confluence of the Delaware and Salem Rivers in New Jersey



A.Renaud, M.Chasten

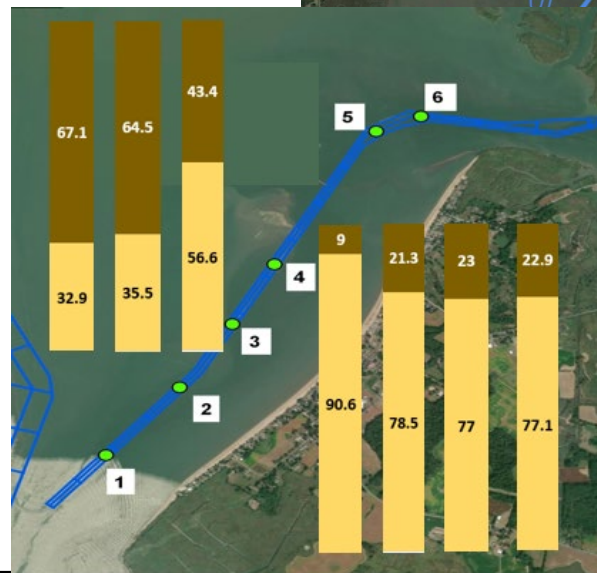
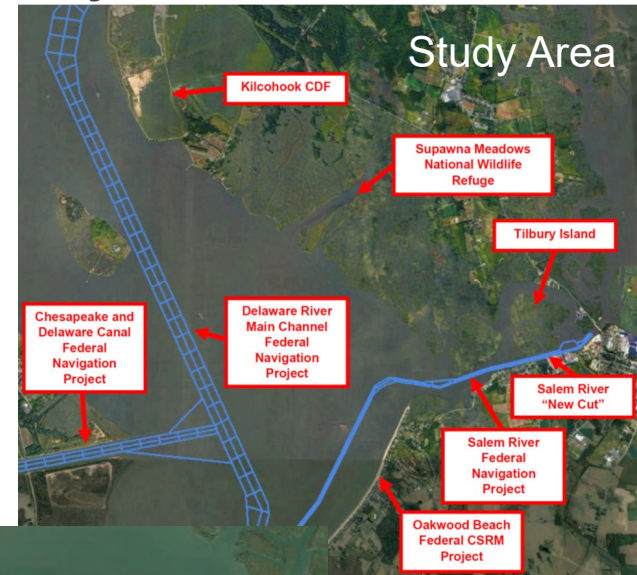
BLUF: NAP dredges ~1 MCY/yr from federal channels within 5 miles of Salem River, NJ that could be beneficially used rather than being placed in confined disposal facilities (CDFs) that remove sediment from the system with no economic or environmental benefits to the nation. Lessons learned here could redefine the federal standard in this region and champion utilization of sediment across the region & district.

Challenge/Objectives

- Continued evaluation of constructability options and techniques to place material
- Characterize Hydrodynamics of Study Area/Placement Sites
- Optimize/Prioritize Placement of Material sites
- Hand Baton to O&M on Specs & Design Development and Change corporate thinking on base “Federal Standard”

Approach – Year 2

- Collect & process hydraulic data
- Model hydraulic forces on sediment
- Characterize sediment
- Forecast fine material consolidation behavior and elevation change



Sediment Type for Shoaling along lower Salem River Along Oakwood Beach – % Fines in Brown, % Sand in Tan

FY21 RSM IPR – NAP – A Systems Approach to Beneficially Use Fine and Coarse-grained Dredged Material at the Confluence of the Delaware and Salem Rivers in New Jersey



District/Other USACE PDT Members

ERDC: S.Bailey + team, D.Perkey, J.Gailani

NAP Ops: M.Chasten, J.Gray, AJ Mottola

NAP E&C: R.Hampson

NAP Planning: J.Gebert, A.Leary, A.Renaud

Stakeholders/ Partners

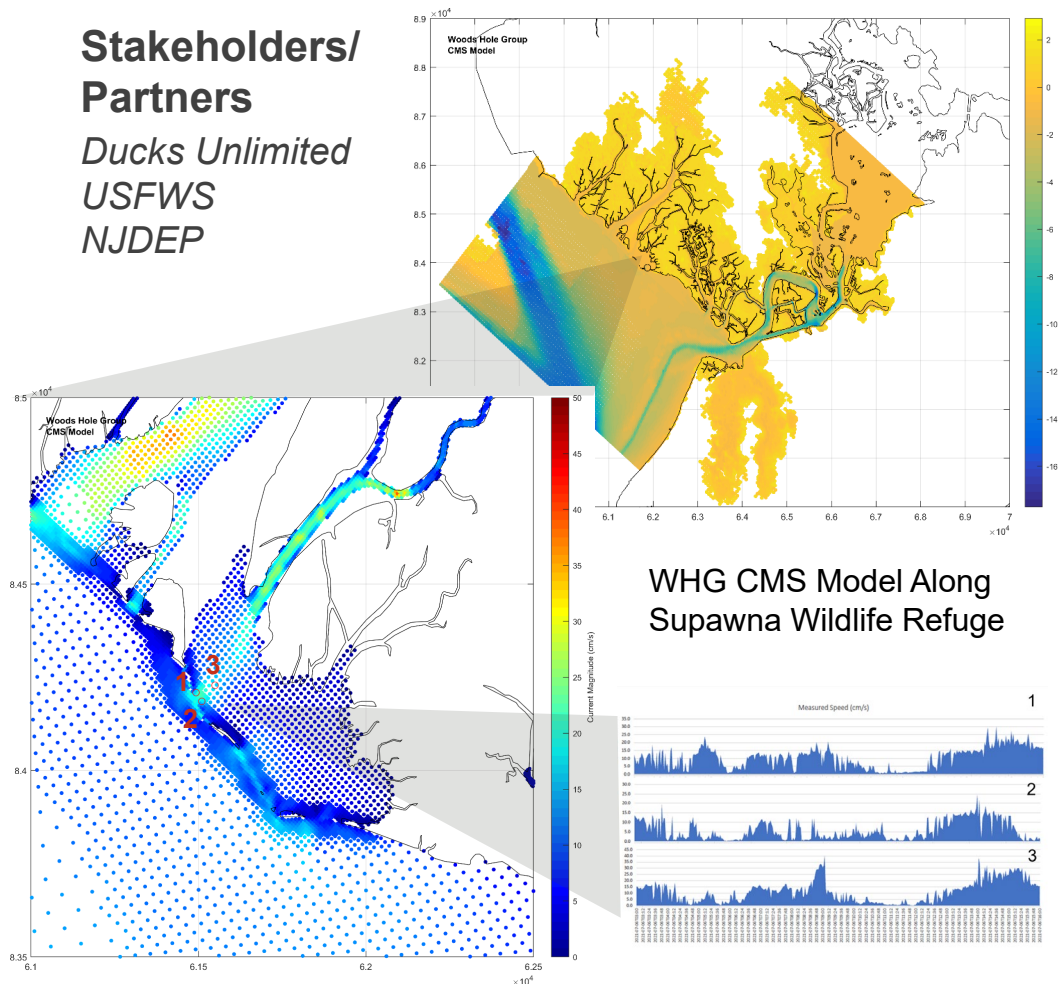
Ducks Unlimited

USFWS

NJDEP

Leveraging/Collaborative Opportunities

- Leveraged efforts of DU and USFWS to rehabilitate Supawna NWF and generally make use of sediment.
- Leverage existing hydrodynamic analyses of the region, incl. WHG CMS model
- Nearshore Berm placement limits with Gov't Dredge Murden
- USACE ERDC EL/CHL and Seven Mile Island Innovation Laboratory for leveraging lessons learned for use of fine-grained dredged material to build natural infrastructure



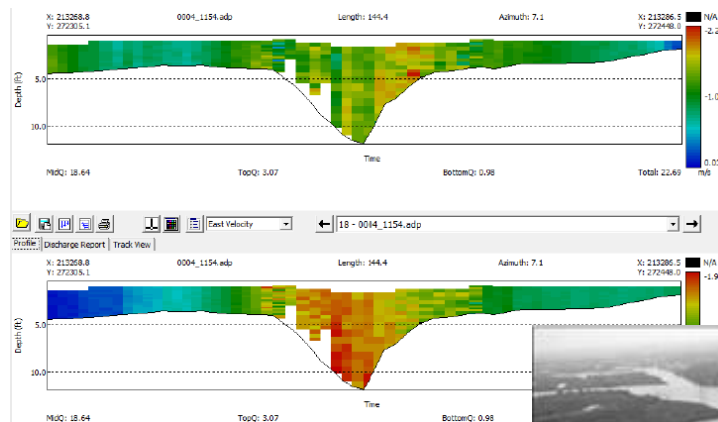
Ground Truthing of Model with Current Data

FY21 RSM IPR – NAP – A Systems Approach to Beneficially Use Fine and Coarse-grained Dredged Material at the Confluence of the Delaware and Salem Rivers in New Jersey



Accomplishments/Deliverables

- Overall - Refined feasibility of potential marsh and tidal channel restoration using RSM strategies in manner consistent with federal standard
- Current and additional hydro- measurements at Goose Pond and Tilbury Island Sites in order to leverage and verify existing CMS Model for Hydraulic Characterization
- Prioritization of Candidate Placement Sites
- Preliminary Feasibility Planning for Sand Removal/ Placement Along Oakwood Beach
- Sediment for Consolidation Modeling of Fine Grain Material from Lower Salem to determine fate and evolution of material
- MOU Developed with USFWS and Support of Stakeholder for Utilization of Sediment Currency
- Draft Preliminary Assessments/Special Report Characterizing Sites/Summarizing Process, Findings and Lessons Learned



Velocity Profile from Placement Candidate Site at Tilbury Island



Historic Maintenance Dredging Along Salem River



Column Settlement Testing

FY21 RSM IPR – NAP – A Systems Approach to Beneficially Use Fine and Coarse-grained Dredged Material at the Confluence of the Delaware and Salem Rivers in New Jersey



Challenges

- Revolving Personnel
- Data Collection Equipment/Timing & Downstream Ripple Effects
- FedEx
- Innovative Option Appeared Less Successful
- Level of Official Partnership



Responses

- Continued data/literature review and outreach
- Leveraging previous CMS Model
- Risk-informed approach to most achievable outcomes with Fed. Standard in Mind
- Project Scope Modification & Evolution

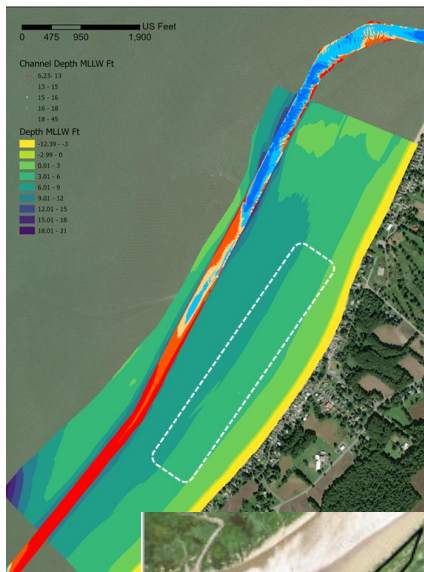
Path to Construction

- Permitting for Gov't Dredge placement at Oakwood Beach (Winter FY22)
- Final Sed Consolidation Analysis
- Signed MOU for Supawna
- E&C Plans/Specs Development Considering RSM Alts alongside Killcohook Base plan
- Full funding

Lessons Learned

- Phased Systems Approach Can Support Progress in Some Areas When Others Stall
- Prioritization Factors for Alternatives
- Benefits of Focusing on Partner Priority Sites, including existing data & coordinated monitoring

FY21 RSM IPR – NAP – A Systems Approach to Beneficially Use Fine and Coarse-grained Dredged Material at the Confluence of the Delaware and Salem Rivers in New Jersey



Salem River Shoaling Along Oakwood Beach & Potential Placement



Estimated Placement

- BU of Delaware River, Salem River, and C&D Canal DM keeps sediment in the system and out of CDFs, extends lifecycle of existing storage options, reduces long-term land acquisition and management costs
 - **Sediment Use at Multiple Scale/Types**
 - ▶ Est. 5 to 10,000 CY Sand Removal and Placement towards Oakwood Beach
 - ▶ Est. 33 to 128K CY at Goose Pond Placement Site
- Decrease the dredged material pumping distance by >2 miles by placing the material at Supawna Meadows, or nearshore to Oakwood Beach instead of in the Killcohook CDF
- Potential defining of roadmap for almost 1 MCY/yr to be beneficially used in restoring eroded wetlands (multiple thousand acres) and tidal channels (multiple miles)
- Increasing acceptance of RSM as SOP within USACE and Stakeholders through continued implementation of lessons learned at SMILL and by developing appreciation and acceptance of sediment as a currency
- Improves working relationship with Federal & State environmental agencies & NGOs – “give and take” = compromise