



**US Army Corps  
of Engineers.**  
Engineer Research and  
Development Center

# National Regional Sediment Management Program Philadelphia District (NAP):



## Utilizing High Velocity Tidal Channels for the Beneficial Use of Dredged Material and Marsh Restoration in the Delaware River Estuary

### Description

In the vicinity of the Salem River in New Jersey there are three Federal navigation projects located directly adjacent to large wetlands which have been incrementally incised and eroded by high velocity tidal channels which are expanding laterally. This effort will investigate the potential to close those channels and allow them to be reestablished as tidal wetlands through the strategic placement of dredged material from Federal navigation projects.

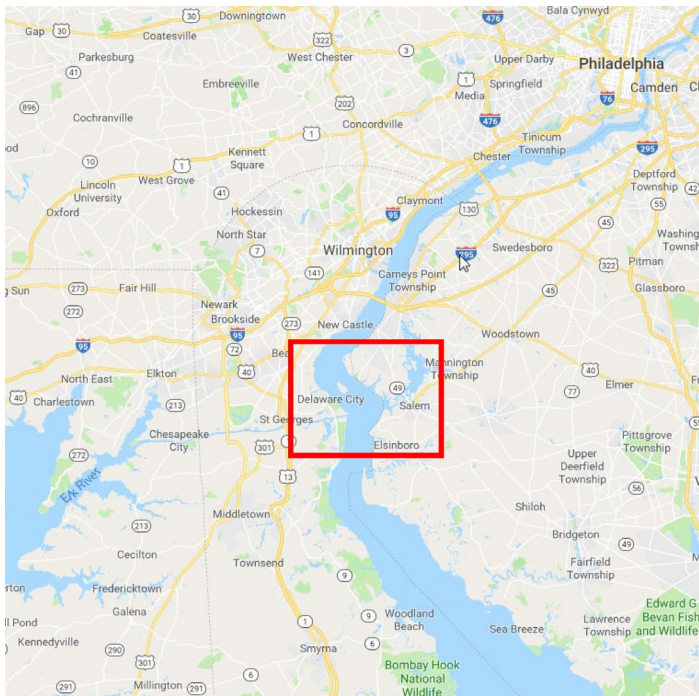


Figure 1 – Location of RSM Initiative

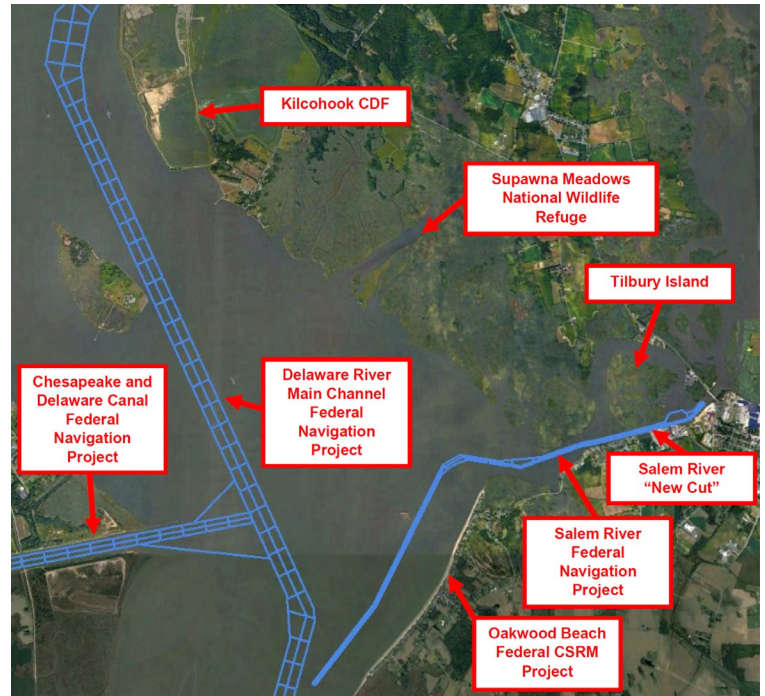


Figure 2 – Details of Initiative Focus Area

### Issue/Challenge To Address

Tilbury Island is a tidal wetland that was formed in 1929 when the Federal Salem River project dredged the “New Cut” channel through a marsh peninsula at a bend in the river. Since that time, Tilbury Island has been eroding from both the exterior and interior due to increased tidal flow and incision by high velocity tidal channels. The marshes of the adjacent U.S. Fish and Wildlife Service (USFWS) National Wildlife Refuge (Supawna Meadows) are also eroding due to the fluvial and tidal action within numerous creeks. The degradation of coastal wetlands within the Delaware River Estuary has been documented to be rapidly occurring. A 2012 report by the Partnership of the Delaware Estuary estimated that between 1996 and 2006, the rate of loss was approximately one acre per day, with the expectation of that rate increasing due to climate change and sea level rise.

NAP Operations Division typically dredges the Salem River project every 7 years, but this cycle is based on the historic frequency of appropriations, rather than the needs of the project due to shoaling rates. The two most critical navigation shoaling points that are dredged produce approximately 100,000 CY of silt and 100,000 CY of sand each dredging cycle. Material from both of these areas is pumped via pipeline to the Killcohook CDF (approximately 4 miles north) for upland disposal.



## Utilizing High Velocity Tidal Channels for the Beneficial Use of Dredged Material and Marsh Restoration in the Delaware River Estuary

In its simplest form, the Salem River/Tilbury Island/Supawna Meadows complex offers a perfect opportunity to employ RSM principles and practices. The navigation project can only afford to dredge relatively small amounts of material and pump it a long distance to a CDF due to funding and geographic constraints. Adjacent to the navigation project (approximately 1.5 miles away), there are several eroded marsh areas that could benefit by receiving dredged material resources. If technologies could be developed or upgraded to allow the confinement and consolidation of the dredge material in the dynamic, tidal channel environment, there would be significant opportunities for improving efficiencies for the navigation project (pump more material due to closer placement site) as well as opportunities for environmental uplift in the restored marshes.

### Successes Lessons Learned

Lessons learned will be documented throughout this investigation.

### Projected Benefits Cost Savings Value Added

This initiative has potential to add significant efficiencies to the USACE Navigation business line in both the short and long term. For the Salem River project alone there is potential to decrease the dredge pumping distance by over two miles by taking the material to Tilbury Island or Supawna Meadows instead of the CDF. Money saved by the decreased pump distance could then be reinvested to dredge the project more efficiently. Material from the Delaware Main Channel and the C&D Canal could also be pumped a shorter distance for restoration purposes. All material diverted from the CDFs would increase their capacities, reducing the need/cost of alternate CDFs

### Expected Products

- Bathymetric surveys and existing data collection.
- Sediment budgets and shoaling rate analyses for Federal navigation projects
- Modeling of sediment placement scenarios
- Stakeholder collaboration workshop
- Technical note

### Stakeholders/Users

Stakeholders include USFWS (NJ Field Office and Supawna Meadows), NJ Department of Environmental Protection, NJ Department of Transportation, Ducks Unlimited, and the Tilbury Island landowners.

### Leveraging Opportunities

There are at least four Federal projects that could benefit from a holistic approach to leverage RSM opportunities in the Salem County Region across the Navigation, CSRM, and Ecosystem Restoration Business Lines (the three navigation projects and the adjacent Oakwood Beach CSRM project). There are also Federal (USFWS), non-Federal (NJDEP), and NGO (Ducks Unlimited/Landowner) stakeholders that have been implementing or studying marsh restoration efforts in the Salem River/Supawna system since 2004.

### Points of Contact

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### Participating Partners

NAP intends to leverage efforts ongoing in the Seven Mile Island Living Laboratory (SMILL) recently initiated by USACE, NJDEP and The Wetlands Institute. We also intend to utilize USACE technical expertise from ERDC, as well as lessons learned from the Barneget Inlet Section 1122 project.