

Keeping it in the System: Beneficial Use of Dredged Sediment to Increase Resiliency



WHAT

Photo: USFWS

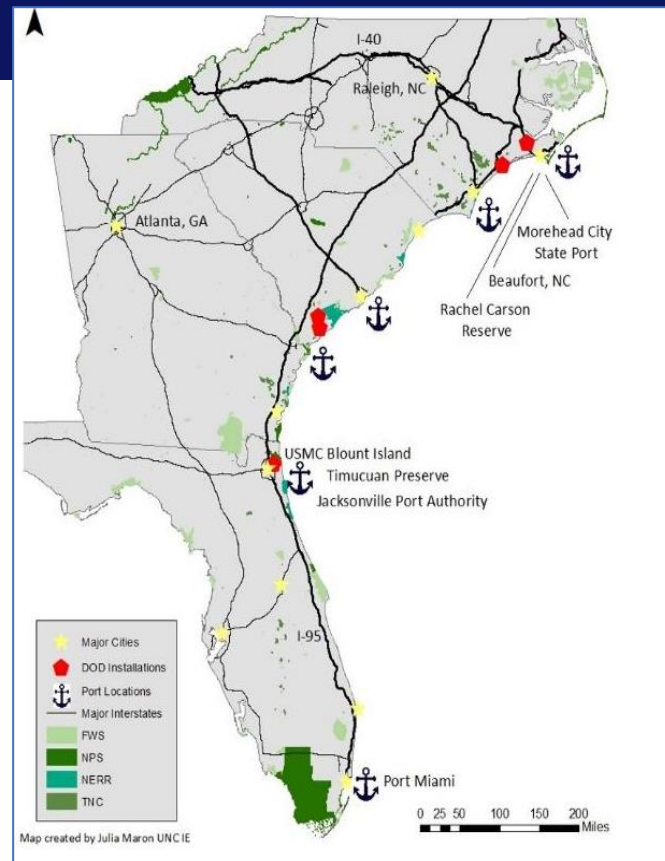
Coastal marshes provide numerous societal services including habitat provision, improvement of water quality, and protection of built infrastructure from storms. Intertidal marshes grow vertically by trapping sediments carried in tidal waters and an adequate sediment supply is critical for marshes to increase elevation at a rate commensurate with local relative sea level rise (SLR). **Marshes will need more sediment to keep up with accelerated SLR.** Dredging of navigation channels exacerbates the problem because in most cases, dredged sediments are removed from the estuarine system and disposed in either upland or offshore open-water sites. There is increasing recognition of the value of keeping dredged sediments in their local system and using them to create or enhance **Natural and Nature Based Features (NNBF)**, such as **thin-layer placement** to salt marshes. Also termed beneficial use, this strategy of repurposing dredged sediments within the estuarine ecosystem can be an effective way to build marsh resilience to storms, SLR, and erosion, thereby protecting the services they provide. **We will develop a framework and process for matching dredging needs with opportunities for beneficial use.**

WHERE

Working on a watershed scale at two different study sites in Beaufort, North Carolina and Jacksonville, Florida project partners include state and federal resource managers. These areas are representative of marsh and sediment management challenges all along southeastern coastal communities subject to SLR.



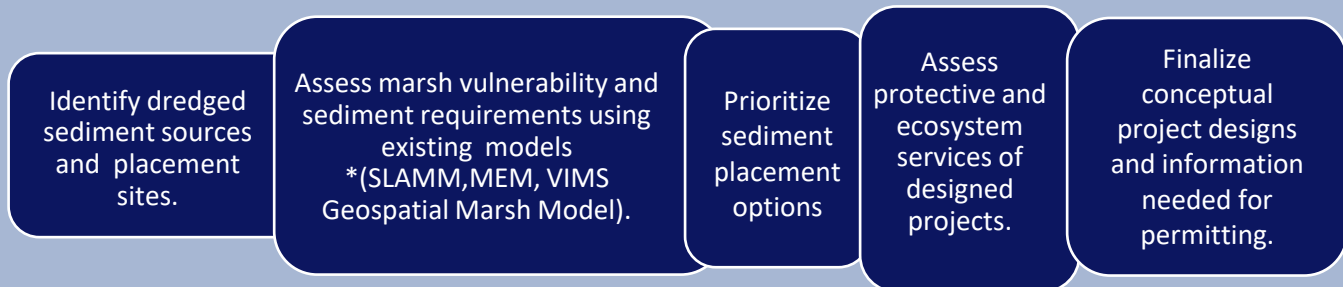
Photo: NC Coastal Federation



HOW

This project will develop and demonstrate a comprehensive approach for maximizing the beneficial reuse of dredged sediments within their watershed of origin, that is, keeping the sediment in the system. In particular, the focus is on thin-layer placement of dredged sediments to marshes vulnerable to SLR, and where appropriate, co-placement of living shorelines. Opportunities will be identified, and the process facilitated to synchronize maintenance dredging activities with NNBF restoration/creation projects. Engagement with local and regional stakeholders, and the regulatory community, is critical to identifying NNBF projects. Developing a framework for this process will facilitate beneficial reuse of dredged sediments into long-term planning for marsh resilience.

Lessons learned from stakeholder meetings, model assessment, design team, and regulatory feedback over the three years of executing this project will be captured and shared with broader coastal communities of managers and scientists. Framework and guidance packages that describe the steps required to develop and design beneficial reuse of dredged sediments will be created. Uniting disparate stakeholders around the common theme of sediment will be the focus of end of project workshops and webinars.



Steps guiding the design of beneficial use projects.

PROJECT TEAM

Susan Cohen

UNC Chapel Hill Institute for the Environment
susanac@email.unc.edu

Carolyn Currin, Jenny Davis

NOAA National Centers for Coastal Ocean Science
carolynbeaufort@gmail.com, jenny.davis@noaa.gov

Brian Harris, Brain McFall

USACE Research & Development Center
brian.c.mcfall@erdc.dren.mil, Brian.D.Harris@erdc.dren.mil

Sam Whitin, Kathryn Cerny-Chipman

EA Engineering, Science and Technology
swhitin@eaest.com, kcchipman@eaest.com

STAKEHOLDERS AND PARTNERS

Florida

- National Park Service
Timucuan Ecological and Historic Preserve
Southeast Coast Inventory and Monitoring Network
- JAXPORT
- Marine Corps Support Facility Blount Island Command

North Carolina

- N.C. Coastal Reserve and National Estuarine Research Reserve
- North Carolina Sentinel Site Cooperative
- Town of Beaufort
- Port of Morehead City

*SLAMM <http://www.warrenpinnacle.com/prof/SLAMM/>
Marsh Equilibrium Model <https://esajournals.onlinelibrary.wiley.com/doi/10.1002/ecs2.1582>
VIMS Geospatial Marsh Model <https://www.serdp-estcp.org/content/download/47287/451159/file/RC-2245%20Final%20Report.pdf>

Funding for this project is provided in full by NOAA, National Centers for Coastal Ocean Science, The Effects of Sea Level Rise Program.

