REBUILDING HEALTHY MARSHES:

SCOTCH BONNET ENHANCEMENT PROJECT 1-YEAR UPDATE

OVERVIEW:

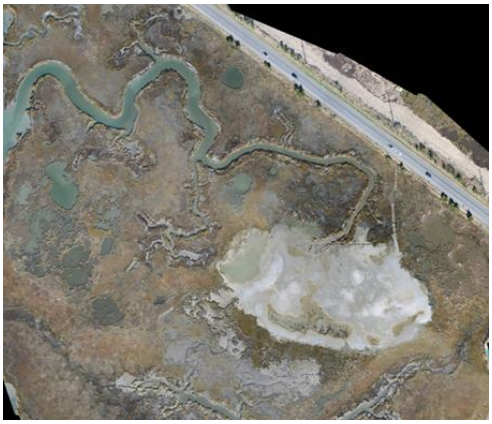
As spring rolls into the marshes, we are excited to provide an update on the marsh rehabilitation project at Scotch Bonnet Island in the marshes adjacent to The Wetlands Institute. Our goal was to save Scotch Bonnet Island from drowning. The project partners, The Wetlands Institute (TWI), U.S. Army Corps of Engineers (USACE), and NJDEP Fish and Wildlife, are pleased to provide an update following the first year of recovery. The project, completed in the fall of 2024, is progressing well on a trajectory of revitalization.

SITE DESCRIPTION AND PROJECT NEED:

This beneficial use project used clean sediment dredged from the NJ Intracoastal Waterway federal channel to maintain safe navigation and increase the elevation of low marsh areas that have fallen below the elevation range for healthy marshes. Marshes are at their healthiest when they are nourished by tidal waters. However, when they are inundated too often and too deeply, they begin to deteriorate and drown. Our research has shown that many marshes in New Jersey are being stressed by rapidly rising seas and are at a tipping point. Since the 1950s, the Scotch Bonnet Island marshes have lost more than 30% of their area to marsh drowning, and formerly lush expanses of marsh grass are increasingly converting to mud flats and open water.

The goal of the project is to restore lost marsh by reestablishing suitable levels of tidal flooding so that it has the appropriate balance with life-giving tides. Lifting the marsh elevation with dredged material will ensure that area tidal marshes are healthy and vibrant for decades to come, helping to provide storm and flooding protection to our communities.

PROJECT DETAILS:



Prior to revitalization, the 86-acre marsh island was at an elevation that was almost entirely at or below stable low marsh elevation with the marsh platform increasingly dissected by rapidly expanding tidal channels and pool formation and expansion and eroding tidal channels exporting sediments and contributing to shallowing of adjacent waterways.

Work began with USACE navigation channel maintenance operations to clear two critical shoals in the vicinity of Nummy Island. Dredged material was tested and confirmed to be free of contaminants and consisted of a sediment mixture of find sand and mud that creates favorable substrate for marsh rehabilitation. The dredged sediment slurry was pumped nearly two miles through a floating pipeline and sprayed onto a section of marsh managed by NJDEP as part of the Cape May Coastal Wetlands Wildlife Management Area, just south of Stone Harbor Boulevard at Scotch Bonnet Island and adjacent to TWI.

The construction phase of the project lasted for two months between October and December 2024. Biodegradable coir logs were used to direct flows into lower lying areas and prevent sediments from being lost to non-target areas. An expanding, erosional tidal channel that was dissecting the marsh area was blocked by two experimental weir structures that were designed to force the dredged material in discharge waters to settle out but to also allow tidal flooding to naturally distribute sediments across the target areas of marsh platform.

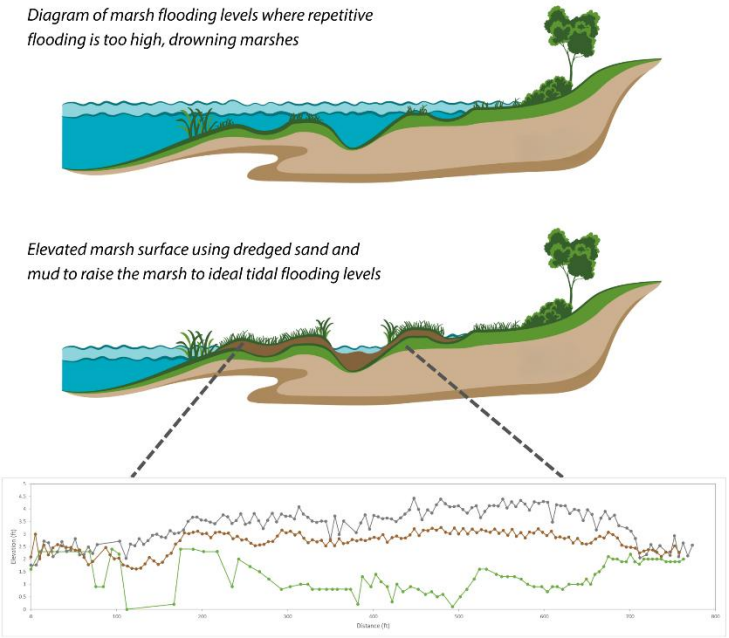
The project successfully placed 14,000 cubic yards of sand and mud over 5.5 acres. Construction target elevations were 1-1.5' higher than the planned ecological elevations to allow for dewatering and consolidation of the underlying marsh sediments resulting from the weight of the placed sediments and dewatering. Sediment thickness was up to 3' in places successfully meeting elevation targets. After one year of site evolution, marsh elevations have decreased approximately 1' and tidal channels are stable. By early spring 2025, a few months after construction, marsh grasses from natural seed dispersal had begun to grow on the marsh surface beginning site colonization and marsh elevations are within the range for continued grass growth.

MONITORING AND ASSESSMENT

Wildlife usage of the marsh was immediate including during the sediment placement phase with the higher elevation serving as an important refuge for birds during high water events. Monitoring of site usage documented 32 bird species utilizing the placement area including notable numbers of migratory shorebirds and species of special interest.

Ongoing monitoring and research by USACE, ERDC, The Wetlands Institute and University of Pennsylvania will continue to inform restoration best practices for the use of nature-based solutions.

For more information, visit wetlandsinstitute.org/scotchbonnet. A timelapse video of the construction project is at youtu.be/E_MdOmeQFRk.



Graph showing original marsh surface (green), marsh surface when material was placed (grey), and restored marsh surface with new grass colonizing (brown)1 year after placement.