



Seven Mile Island Innovation Laboratory Overview & Purpose

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Overview

In Spring 2019, the U.S. Army Corps of Engineers Philadelphia District (USACE-NAP) partnered with the State of New Jersey, The Wetlands Institute (TWI), and the USACE Engineer Research and Development Center (ERDC) to launch the Seven Mile Island Living Laboratory. The initiative is designed to advance and improve dredging and marsh restoration techniques in coastal New Jersey through innovative research, collaboration, knowledge sharing and practical application. In December, it was upgraded to Innovation Lab (SMIIL) to reflect the scale of the program.

SMIIL is based on an international concept pioneered by a Dutch organization who uses a “Living Lab for Mud” to test and demonstrate environmental and societal benefits.

Seven Mile Island, New Jersey was chosen to host an Innovation Lab due to the presence of existing and historic dredged material placement sites, confined disposal facilities, federal and state channels including the New Jersey Intracoastal Waterway (NJIWW), extensive tidal marshes, a mixture of sandy and muddy sediments and, a rich historic dataset to build upon. SMIIL goals focus on maintaining safe navigation channels while retaining dredged sediment in the system to benefit natural ecosystems and coastal communities.

SMIIL efforts will enhance the science and engineering that supports dredging and placement practices in the region, the State and nationally. Regional Sediment Management (RSM) and Engineering with Nature (EWN) principles and practices serve as a strong foundation for SMIIL and will be utilized to develop innovative solutions for sediment management needs within the region.

The SMIIL encompasses ~24 square miles of tidal marshes, coastal lagoons, tidal channels and bays between the Cape May County mainland and the barrier island communities of Stone Harbor and Avalon, NJ. The NJIWW, a federal channel maintained by the USACE-NAP, bisects the SMIIL.



Above: Aerial Imagery of Seven Mile Innovation Laboratory Area on the New Jersey Coast

Below: SMIIL team visits an historic placement site to evaluate resulting marsh resilience



The Wetlands Institute sits at the center of the laboratory's significant area of publically managed lands (Cape May Wetlands Wildlife Management Area) and provides an ideal base of operations. In addition to SMILL's significant ecological value, the location allows collaborators to build upon recent beneficial use placement of NJIWW dredged material and post-construction monitoring efforts, a history of sediment placement and field research, and a well-established field station with over 50 years of relevant research.

A SMILL Working Group includes members representing a diverse group of natural resource managers, scientists, engineers, practitioners, communication specialists and regulatory officials from government, academia and non-profit organizations. The Working Group provides a collaborative forum where members offer ideas, experience and perspectives to advance SMILL goals and enhance the acceptability of innovative practices. Several of the SMILL's Working Group members have already partnered on projects involving dredging, habitat creation and marsh restoration in the area. Efforts will build on past successes and partnerships through the implementation of strategic, innovative, cost-effective sediment management practices based on sound science and system-based solutions.

Initial Progress

In April 2019, more than 40 members of the Working Group met at TWI to further refine the short and long-term objectives for the SMILL and develop strategies to accomplish these goals. Given the potential for research within the SMILL to support missions ranging from navigation to conservation to coastal risk reduction and system resilience, the group considered a variety of initial actions that could be implemented and tested.

Moving Forward

USACE and TWI will be leading field data collection. USACE began collecting sediment and hydrodynamic data in fall 2019. System hydrodynamics, sediment properties and mobility will be utilized for project selection, design and modeling sediment placement effectiveness here and elsewhere. TWI has been collecting avian site usage data at a potential placement site. Data will be used to inform baseline conditions and initial designs, develop placement strategies that strive to mimic natural processes, coordinate with resource agencies, and construct several placements by early 2021. Monitoring data will be collected throughout all activities. We will evaluate adaptive management strategies and inform policy to benefit long-term sustainable practices and coastal resilience in the region. The USACE, State of New Jersey and The Wetland Institute, as the lead partners in the SMILL, will coordinate frequently and inform the larger Working Group of progress, results and future plans. Updates on SMILL activities will also be shared periodically on USACE and partner websites.



Above: USACE researcher takes a sediment sample from the NJ Intracoastal Waterway Channel

Below: New sediment management techniques like strategic placement along degraded marshes near the NJIWW channel are being considered

