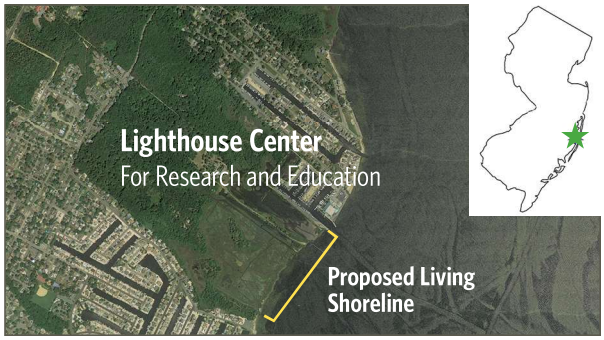
LIVING SHORELINE CASE STUDY

The marsh experience 2 forms of energy degradation; undercutting of the marsh edge & top-down surface erosion. © Bill Shadel/TNC

Lighthouse Center Shoreline Stabilization Project

The primary goal of the hybrid living shoreline—the first phase in the overall restoration plan—is to reduce the rate of shoreline and marsh loss caused by wave energy and allow the beach to re-establish itself.



The Lighthouse Center for Natural Resource Education is on the western shoreline of Barnegat Bay nearly opposite Barnegat Inlet. It is an environmental education and research center situated on one of the last undeveloped bay-front. The 194-acre site includes a suite of coastal habitats including maritime forest, mudflats, lagoons, fields, salt marshes, and a small artesian spring. The site receives significant public use, with thousands of visitors each year including schools, community groups, and researchers.

Over the past 50 years, the Lighthouse Center's marsh and shoreline have suffered extensive degradation, predominantly from historic mosquito-management, farming, sea-level rise, chronic boat wakes, and severe storms. Recently, the rate of shoreline loss has increased to an average of 4 feet per year. The degraded marsh and shoreline have made the Lighthouse Center's facilities more vulnerable to coastal flooding. After suffering significant damage during Hurricane Sandy, the Foundation recognized the need to restore the shoreline and marsh and convened experts to develop a restoration plan.

Overview

Living Shoreline Type
Breakwater

Project Location
Waretown, NJ

Lead Organization
Natural Resource Education Foundation of New Jersey (the Foundation)

Point of Contact
Pola Galie, Operations Manager, Lighthouse Center for Natural Resource Education, pgalie@nrefnj.org

Land Owner
New Jersey Department of Environmental Protection, Division of Fish and Wildlife

Project Funders
Natural Resource Education Foundation of New Jersey, The Nature Conservancy

Project Team
Natural Resource Education Foundation of New Jersey, Sovereign Consulting, Ocean County Soil Conservation District, Academy of Natural Sciences of Drexel University, Barnegat Bay Partnership.

Waretown, NJ: Lighthouse Center Shoreline Stabilization Project

3.5-ft.-highWADs being installed to create a breakwater at the Seagrass Plantation Restoration Site in Delaware © Douglas Janiec

Project Description

The primary goal of the hybrid living shoreline the first phase in the overall restoration plan—is to reduce the rate of shoreline and marsh loss caused by wave energy and allow the beach to re-establish itself. Once this is done, the next phases—restoration of the marsh edge and platform—are more feasible.

Experts from academic institutions, non-profit conservation organizations, consulting firms, and other stakeholders provided insight and developed a conceptual restoration plan for the property including a living shoreline, marsh restoration, and hydrological improvements. The first step was to design and implement a living shoreline to protect and restore 1,600 feet of natural shoreline. To assess the current condition of the site, the Foundation employed Sovereign Consulting—a firm experienced in nature-based coastal restoration—and partnered with Drexel University. With the site assessment completed, a design was created for a living shoreline that would reduce wave energy before it reached the marsh and allow sediment to accrete passively along the shoreline.

Living Shoreline Features

Wave Attenuation Devices (WADs®)

The design calls for WADs along the 1,600-foot shoreline. WADs® are hollow concrete structures specially designed to dampen wave energy and create accretion landward. The structures allow wildlife passage and the natural exchange of water and sediment in the shorezone, and their holes provide refuge for smaller fish. As large as they are, their weight is distributed over a wide base, resulting in less pressure on the bottom than a person's foot.

Shorter, 3.5-ft.-high WADs® will be installed parallel to the northern shoreline where the elevation is higher. Taller, 7-ft.-high WADs® will be installed parallel to the southern shoreline where the elevation is lower. To properly size and place the WAD® units, Sovereign modeled potential significant flooding for existing and proposed site conditions.

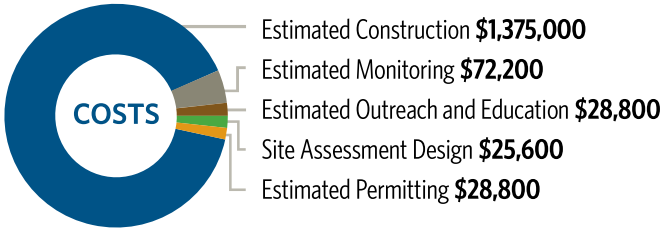
Project Status

The Foundation is actively seeking funds for permitting and installation of the hybrid living shoreline. As of July 2019, the design is complete, and the necessary permits have been identified but permit applications have not yet been prepared or submitted.

Costs

Note: Below are cost estimates to build a 1,600-foot WAD® breakwater along the entire shoreline and to restore 0.2-acres of marsh, which are Phase 1 of a larger restoration plan.

Estimated Total Project Cost $1,530,400



The Nature Conservancy
New Jersey

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CRF
CLIMATE RESILIENCE FUND

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