

OCSCD Staff Participate in Living Shoreline Project at the Lighthouse Center for Natural Resource Education



OCSCD Staff Members from left to right: Sean Yeats, Kristin Adams, Jessica Pinto & Rachel Hammack

Last month, Ocean County Soil Conservation District Staff, including Jessica Pinto, Kristin Adams, Sean Yeats and Rachel Hammack, participated in marsh grass plantings as part of a living shoreline project installation at the Lighthouse Center (LHC) for Natural Resource Education Foundation of NJ (NREFNJ) located in Waretown (Ocean Township). The LHC is an environmental education and research center located in Ocean Township, Ocean County, and is situated on one of the last undeveloped bayfront tracts in Barnegat Bay. Through a lease agreement with the NJDEP's Division of Fish and Wildlife, the LHC is operated by the Natural Resource Education Foundation of New Jersey (NREFNJ), a non-profit 501(c)(3) corporation.



Left: Bags of recycled oyster shells; Right: Wave Attenuation Devices (WADs) arranged on the bay front.

The LHC encompasses 194 acres of diverse coastal habitats, which have suffered extensive degradation over the past 50 years, predominantly due to historic mosquito control practices, sea level rise, significant climatic events such as Hurricane Sandy, and chronic boat wake action. Along portions of the shoreline, the rate of shoreline loss since 1995 has averaged over 4 feet per year, and in recent years up to 6 feet per year. Shoreline degradation has also increased the LHC's vulnerability to severe storm events. NREF's Living Shoreline Technical Team (composed of experts from numerous conservation agencies and organizations www.lighthousecenternj.org) received funding from The Nature Conservancy (TNC) for the design phase and then subsequently, the permitting stage (<https://coastalres.wpengine.com/wp-content/uploads/2019/11/Case-Study-Lighthouse-Center.pdf>) Phase 1 of the living shoreline design was funded through the 319h Program (funding from the Clean Water Act) administered by the NJDEP. This project, entitled: *Lighthouse Center Enhancement & Rejuvenation Program: Phase 1 Shoreline Stabilization and Rejuvenation* Grantee: Natural Resource Education Foundation of New Jersey Funding amount: \$300,000.



Kristin Adams (left) , Rachel Hammack (middle) and Jessica Pinto (middle & right) plant *Spartina alterniflora* plugs in clusters.

This grant funded the implementation of portion of the living shoreline design along the northern 400+ feet of the living shoreline project on the LHC property (a.k.a. Phase 1). Phase 1 of the project will restore, enhance and increase resilience of the shoreline profile, including:

- Re-establishing salt marsh habitats along the LHC waterfront;
- Protect and enhance brackish impoundment from coastal storms and storm surge;
- Enhance water quality by promoting ecosystem services furnished by filter feeding bivalves and stands of bayfront vegetation;
- Protect and reestablish habitats of migratory birds, fish and near-shore marine species (e.g., horseshoe crabs and terrapins); and
- Provides outreach, education, and public involvement for nature-based approaches to coastal resilience and enhancement of the Barnegat Bay.



Top Left: *Spartina alterniflora* plugs planted in a cluster; Top Right: Danielle McCullough (USFWS) and Kristin Adams (OCSCD) plant *Spartina alterniflora* plugs; Bottom Left: planted *Spartina patens* plugs



The project was designed and implemented by Sovereign Consulting, Inc., led by Douglas Janiec, Senior Restoration Ecologist. The design has two general energy dampening system layouts. One located along the existing flats has a shell bag revetment to hold the peat toe by establishing a narrow oyster reef, small wave attenuation devices for storm protection, and more than 50-foot wide reestablished marsh system acting as a final soft armoring of the system. The other system consists of slightly larger wave attenuation structures located subtidally to dampen energy and accrete sediments landward to recreate the eroded beach.

These hybrid living shoreline approaches represent a nature-based solution to protect, stabilize, and provide resilience to the coastline. Hybrid living shoreline projects can vary greatly depending on the location, tidal changes, fetch, wave energy and erosion at each specific site. Rather than a hard shoreline structure such as bulkheads that can prevent natural marsh migration, marshes that are part of a living shoreline can trap sediment from tidal waters and allow them to grow in elevation as sea level rises. Living shorelines are more resilient against storms than bulkheads, and can also improve water quality, provide fish habitat and increase biodiversity both above and below the water surface. The living shoreline project at the Lighthouse Center encompassed multiple techniques each with their own material and purpose that will work cohesively to protect the shoreline as a system. The first step in the process was to install the initial shell bag toe, planting protection, and end plugs of an unwanted man-made ditch. Second, Wave Attenuation Devices (WADs) were trucked in from Mississippi and arranged strategically to dissipate (or dampen) oncoming wave energy to stop nearshore erosion and restore the shoreline. Third, sand was brought in to complete the ditch plug. Fourth, goose deterrent fencing was installed in preparation of the plantings. Fifth, approximately 7,000 plants were installed.



Top Left: *Spartina alterniflora* plugs ready to be transplanted; Top Right: Dave Volz (Sovereign) plants *Spartina alterniflora* plugs; Bottom Left: Douglas Janiec (Sovereign) explains the project; Bottom Right: completed living shoreline project during a coastal storm event



Two different grasses were selected for marsh restoration, the first of which is *Spartina patens*, or saltmeadow cordgrass, also referred to as salt hay, which is used to create high marsh habitat. This habitat is located above the mean high-water mark and is typically only inundated during periods of extreme high tides associated with coastal storm surge. The second type of grass used in the marsh restoration is *Spartina alterniflora*, or smooth cordgrass, which is used to create low marsh habitat. Low marsh areas are those occurring closest to water, are usually flooded at every high tide and exposed during low tide. Three different methods were used to plant *Spartina alterniflora*, linear plantings of rows roughly 12" apart, clusters of 10 plants with 4' spacing and clusters of 5 plants with 2' spacing. *Spartina patens* was all planted in rows roughly 12" apart. Depending on the substrate, either a garden trowel was used to dig the holes, or an auger on the end of a battery-operated drill. (Photos and text by Kristin Adams, PSM, Ocean County Soil Conservation District, with assistance from Douglas Janiec, Sovereign Consulting, Inc.)