Living Shorelines

Beaches & Oceans
Project Profiles

Dune Restoration

Stratford Point, CT

A large scale lead remediation on Connecticut's Stratford Point in 2000-01 had stripped the shore's intertidal zone of its native peat substrate and coastal plantlife. The following decade of unabated wave action, capped

by hurricane Irene had left the shoreline badly eroded. Landowners worked with the Connecticut Audubon Society, specialty contractor All Habitat Services, LLC, and CEC Connecticut to restore the 900-ft coastal dune system. The team modified Filtrexx Bank Stabilization system, filling 12" SoilSoxx® with a compost and sand mixture reinforced with geotextile. The SoilSoxx were covered with a thick layer of sand and planted with 38,000 American Beach Grass plantings to form an artificial coastal dune system extending the length of the north shore. The entire structure is designed to match the height of the existing bluff. The Soxx are invisible from view, but provide stability to the entire system.

According to All Habitat, "During Hurricane Sandy, the dune aided in prevention of major erosion of the shoreline and other inland areas. Although the storm washed away the dune's sand and vegetation, the base of our dune remained intact and the shoreline relatively unaffected. Our dune remains a key part of the ecosystem protection and restoration at Stratford Point."

filtrexx®
SUSTAINABLE TECHNOLOGIES

877-542-7699
info@filtrexx.com | filtrexx.com

Living Shorelines

Beaches & Oceans
Project Profiles

Dune Restoration
Old Saybrook, CT

In 2010, dunes along the Katharine Hepburn former estate historic landmark were renovated using dredged material from the salt marsh nearby. The area was subject to concern due to a thin amount of beach dune between the ocean and the salt marsh behind Old Saybrook. These areas are common along the East coast, and often concerns for breaching of the dunes during surge events leads to restoration efforts to prevent loose sands in dunes from moving.

The project was coordinated by having mobile equipment on site (Filtrexx FX Machine and a track loader) and being able to use local dredge materials to fill the 12" Filtrexx SoilSoxx®. The dredge was a suitable combination of sand and organic matter depositions, allowing for it to

be used as a growing media for salt tolerant plant species. The dredge material had previously been excavated and left on site to naturally dewater over time. When used, it was at normal atmospheric conditions, in various piles around the targeted job site. Small bobcat loaders were used to move the dredge and prepare the area to place the filled Soxx. The FX Machine was able to fill several hundred feet of soxx per run. Each layer of Soxx were wrapped in a lightweight reinforcement geogrid to keep the layers from moving upon tidal impact. The successive layers were filled and stair stepped back to an approximate 3:1 slope. Each layer of lightweight geogrid extended several feet back into the slope, buried from the successive layers on top of them. Once the Soxx were filled and the new face of the dune restored, they were planted with a variety of salt tolerant species of plugs, which immediately began to grow and thrive.

filtrexx®
SUSTAINABLE TECHNOLOGIES

877-542-7699
info@filtrexx.com | filtrexx.com

Living Shorelines

Beaches & Oceans
Project Profiles

Dune Scarp Prevention

Georgetown County, SC

Dune scarp prevention is a new practice and design consideration among beach dune restoration and preservation efforts. Loose sand that accumulates within sand dunes is mixed with vegetation, and ideally, becomes large mounds, however there are still difficulties in holding together loose sand during tidal surge events. Full moons, large tides, storms, and hurricanes cause surge events, especially if at high tide, that often cause irreparable damage to dunes that have taken years to accumulate. When dunes begin to erode from the ocean side, the edge of the dune becomes scalloped out and is scarped with each tidal event. Each wave that continues to pound loose sand loosens the non reinforced dune, dislodges vegetation, and erodes the face of the dune. The scarp is normally nearly vertical because the sand continues to fall into the surf when the toe of the dune is washed away with each subsequent wave. As this process continues, the dune scarp becomes more and more into the center of the dune, and greater amounts of sand are washed away with each successive wave and tidal event.

Before

By utilizing a design concept of preventing this scarp from worsening, Filtrexx placed a SoilSoxx® at the toe of the escarpment along the face of the dune. This location is where the waves meet the dune, upon high tide. The Soxx were filled with native beach sand on location. Care was taken to ensure the mesh openings were small enough to encapsulate and contain the fine sands of the South Carolina beaches. Various sand conditions exist and if the sand is able to rinse out of the Soxx, limited protection would be provided. Filtrexx has over a dozen different selections of mesh to fit the needs of various grain sizes of sands for beach dune scarp prevention. Once the Soxx were filled, they were covered with a light layer of sand to blend in with the rest of the dune structure.

Installation

The next tide event brought even higher tides. Within one full tide, the Soxx not only prevented dune scarps from further progressing, but they assisted in sand deposition next to the toe of the dune, and eventually buried the Soxx in the dune toe, thereby further preserving the dune for future events. During the next low tide, another Soxx was filled directly on top of the first Soxx. **Continued...**

filtrexx®
SUSTAINABLE TECHNOLOGIES

877-542-7699
info@filtrexx.com | filtrexx.com

Living Shorelines

Beaches & Oceans
Project Profiles

Continued... It was clear that the beach had gained significant height in a storm surge and sand accumulation was happening. The installation of the Soxx prevented dune scarp during these events, and led to protection of the dune into the following year. Nearly one year later, during a similar storm event, the toe of the dune began eroding away (below). As the toe of the dune began to regress further and further into the dune structure, eventually the original Soxx from one year earlier were unearthed, and then continued to provide protection against further dune scarp. Note, the vegetation that had grown partially into the Soxx over one year had more success in resisting erosion from tidal events than those plants without Soxx.

After storm surge (1 year)

The minimum size of Soxx to be considered for dune scarp protection should be 12" in diameter, filled with native beach sand, and filled to a continuous length of at least 25 feet. If possible, continuous lengths of several hundred feet will be less likely to move during severe storm events. The use of lightweight geogrid wraps can also be considered, during the dune construction process, and this practice allows dune scarp prevention to be part of a future preventative planning process for responsible dune managmenet.

filtrexx®
SUSTAINABLE TECHNOLOGIES

877-542-7699
info@filtrexx.com | filtrexx.com

Living Shorelines

Beaches & Oceans
Project Profiles

Bank Stabilization

Dewey Beach, DE

The Town of Dewey Beach, in Sussex County, Delaware experienced drainage problems along Bayard Avenue, resulting in flooding of the street and associated parking areas and yards. The untreated stormwater generated by the impervious surface contributed to pollution loadings, with a negative impact on the water quality of Rehoboth Bay. After a thorough review of conceptual alternatives for addressing drainage, flooding and water quality problems along Bayard Avenue, the town announced engineering specifications aimed at mitigating the flooding.

Envirotech Environmental Consulting, Inc. was retained, in conjunction with ECI Engineering Planning Surveying, to create a Green Technology BMP for low impact development and coastal watershed management. The plan included road grading, additional catch basins, a berm with an outfall structure pumping station, and a drainage swale. The berm was created over an existing bulkhead, and stabilized with Filtrexx® Compost Storm Water Blanket™ with Lockdown™ Netting and native vegetation. Outfall pipes convey water into this dissipation area. The existing non-functioning pipes located within the wetland were removed and a stream channel was created in their place. They created a drainage swale and stabilized it using Filtrexx Bank Stabilization made with 24" Soxx™. The effect was 100% performance. Zero flooding has occurred within the watershed since construction was completed in April 2011 (except for flooding caused by a pump failure in 2012). The system even withstood the impact of Hurricane Irene in August 2011.

filtrexx®
SUSTAINABLE TECHNOLOGIES

877-542-7699
info@filtrexx.com | filtrexx.com