

# Bio-engineered Coastal Bank Stabilization Bayswater Seaside LLC properties in New Seabury Mashpee, MA

## Project Characteristics

- *Bio-engineering/Soft Solution*
- *Environmental Permitting*
- *Construction Oversight*
- *Innovative/Experimental Design*

Woods Hole Group was contracted to design, permit and oversee construction of a large bio-engineered coastal bank stabilization project at Bayswater Seaside LLC properties in the ocean front community of New Seabury, Mashpee, MA.

Three waterfront parcels in this development have experienced long-term erosion rates of approximately one to two feet per year (1845-1994), but recent storms and end-effects from nearby revetments have exacerbated the erosion rate to approximately 10 feet per year over the past decade. Property owners have been nourishing the beach and steep coastal bank since the 1980s, but recent nourishments of 20,000 cubic yards annually along the 250-foot shoreline made apparent the need for a more sustainable and cost-effective solution.

Due to regulatory restriction prohibiting a traditional “hard” coastal engineering structure on the undeveloped parcels, an innovative and effective bio-engineered solution was designed to protect the toe and upper portions of the bank. The bio-engineered design was accepted by the Town and Massachusetts DEP as an appropriate “soft” solution design, and thus was permissible for the site for erosion protection in accordance with the State and Local Wetland Regulations.



High energy wave impacts were a complicating factor at the site that factored into the design. Most soft solutions have been found effective in low impact sites, but the nature of this site demanded a more robust solution to withstand wave and debris forces at the site.

The measures implemented to prevent scour and bank slumping included installation of eight (8) terraced biodegradable sand-filled coir envelopes at the toe of the bank, stabilized by 12-inch piles, stacking of four (4) coir fiber rolls above the sand envelopes, annual beach nourishment, and restoration of the coastal bank with high-density plantings of Cape American beach grass (*Ammophila breviligulata*).

The project was successfully constructed during the winter and spring of 2011, and is the largest project of its kind to have been permitted and built on Cape Cod to date.