

# Great Kills Harbor—Evaluation of an Offshore Breakwater System

Staten Island, New York



*Coastal green infrastructure is investigated as an approach to repair damage caused by Superstorm Sandy and enhance future resilience.*

Staten Island's Great Kills Harbor is nestled within the 580-acre Great Kills Park, part of the Gateway National Recreation Area. Once a soft shoreline with extensive subtidal flats and shoals, the Harbor historically fostered a thriving ecology which offered both wildlife habitat and coastal protection. Over time, portions of the shoreline were hardened,

and the Harbor is now home to six marinas and a number of commercial and residential areas. Though its habitat and protective value have diminished, it remains an ecological and recreational haven within New York City.

In 2012, the Harbor suffered severe damage from wave action and shoreline erosion during Superstorm

Sandy. With retreat not a viable strategy for the community, the New York State Department of Environmental Conservation and the New England Interstate Water Pollution Control Commission launched a study to determine the best way to improve the Harbor's resilience in the face of future storms.

As the ecological consultant on a team led by Ocean and Coastal Consultants/COWI and SCAPE, Biohabitats played a key role in evaluating strategies to strengthen the Harbor's resilience while maintaining its ecological and recreational value. Biohabitats modified the Evaluation of Planned Wetlands methodology to assess the site's nearshore, upland, and coastal wetland ecology. This included an evaluation of existing habitat and site

attributes, as well as potential future storm conditions under rising sea levels. The team also provided insight into natural infrastructure alternatives and potential ecological impacts and benefits of the breakwater structures. All findings were presented to stakeholders and included as part of a final project summary report.

The summary report is now being used to guide future planning and shoreline adaptation, promote resilience, and help demonstrate how a "coastal green infrastructure" alternative to more traditional approaches can reduce coastal risk in New York City. It will also inform other shoreline protection studies being implemented by New York City and State, the U.S. Army Corps of Engineers, and the U.S. Department of Housing and Urban Development.

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