

COASTAL IMPACTS OF THE NORTHEASTER OF 12 DECEMBER, 1992

H. Bokuniewicz and K. Sakson
Marine Sciences Research Center
State University of New York
Stony Brook, NY 11794-5000

A northeaster began to develop along the Long Island shoreline on 10 December, 1992. Very unusually high storm tides and severe wave conditions were battering the coast through 12 December and the situation did not moderate until 14 December, 1992. The intensity and duration of this storm, coupled with the fact that it occurred near a time of spring tides, made this one of the most important storms in at least 30 years. Its effects were also aggravated because the Long Island beaches were generally at a relatively low elevation following the Halloween Storm of 1991 and subsequent events.

Extremely severe erosion resulted from the superposition of storm waves with offshore wave heights of twenty feet on storm tides that completely submerged the beach. At West Walk in Saltaire, the scarp cut into the dune was over six feet high and had a base estimated to be 7.5 feet above the National Geodetic Vertical Datum (NGVD). In Montauk, NY, the storm surge was measured to be 5.45 feet above the NGVD. The maximum surge height seemed to increase to the west. At the Battery in New York City, it was measured to be 7.68 feet which corresponds to a northeaster with a recurrence interval of 50 or 60 years or a hurricane with a 20-year return period. The storm surges during this northeaster rivaled or exceeded the maximum water levels at many locations in the region caused by hurricanes.

A preliminary calculation of the return period of extreme water levels near western Fire Island has been done by the U.S. Army Corps of Engineers' Waterways Experiment Station; water elevation of 7.5 feet would be expected to be seen about once in 20 years during a hurricane but only once in 80 years due to a northeaster.

In addition to the breach at Westhampton Beach, washovers occurred on Fire Island. Debris lines at one location (Old Inlet) indicated a water level about five feet above mean sea level, high enough to submerge the island at this point. Along Fire Island, about 16% of the dune line is less than 50 feet wide and about 60% suffered measurable losses (relative to a 1981-base vegetation line). Although the erosional scarp was relatively straight, gentle variations in the trend of the dune crest resulted in erosional losses that were not uniform. Losses exceeded 100 feet in several locations while very little recession was measured in other areas.