



New Jersey: State of the Beach Report

May 2003

Starting in the summer of 1998 and continuing through the summer of 2002, the New Jersey Coast experienced a prolonged period of relatively calm weather and a mild wave climate. This time period was devoid of any significant coastal storm events including offshore hurricane activity. This period of quiet weather came to an abrupt end during the last week of August 2002 when the first of **24 coastal storm events** occurred. Between late September 2002 and January 3rd, 2003 the coast was exposed to a storm with wave heights in excess of 5 feet once every 5 to 10 days. This storm activity subsided during the month of January but re-emerged with the **President's Day Blizzard of February 16th and 17th**. The most significant storm of the winter season, the President's Day storm generated wave heights greater than 11 feet and a 2-foot storm surge along the coast. Five additional storms have occurred since February 17th, the most recent of which occurred between April 7th and 12th with wave heights in excess of 8 feet along the coast.



The 2002 – 2003 winter was the **most active winter storm season since the 1997-1998 winter**. This increased activity may be attributed to the change in the global storm patterns associated with El Niño events in the tropical eastern Pacific Ocean. A pooling of warmer than usual surface water in the eastern Pacific shifts the polar jet stream over the United States, increasing the frequency of east coast storms. The last major El Niño event occurred between 1997 and 1998, corresponding with the last active winter storm season.

Three of the 24 storm events, including the President's Day storm, **elevated the ocean water level to + 7.0 feet mean lower low water (MLLW)**. Based on historic water level observations, storms that generate an ocean stage elevation of 7 ft MLLW occur on average once every two years. Based on water stage alone, the winter of 2002 – 2003 would be considered an extremely mild storm season. **However, long-term beach monitoring in New Jersey has shown that a sequence of small coastal storms can have a cumulative impact equal to or exceeding one significant storm event.**

Data collected through the New Jersey Beach Profiling Network by the staff of the Coastal Research Center at Richard Stockton College of New Jersey indicate that the beaches in New Jersey had benefited from the prolonged calm weather period prior to the fall of 2002. Most beaches had a significant beach berm (flat section of dry beach above the mean high water line) and healthy dune system. **The sequence of 15 storms between Labor Day and January 3rd 2003 removed the beach berm along most un-nourished beaches and deposited the sand in the offshore bar system.**

Observations made in early February by researchers in the New Jersey Coastal Protection Technical Assistance Service (CPTAS) at Stevens Institute of Technology revealed that a moderate amount of sand had returned to the dry beach from the offshore bars during the calm wave period in January. Post storm surveys of the New Jersey coast taken by CPTAS staff immediately after the February 16 – 17 President's Day Storm indicated extensive beach erosion and the removal of the seaward toe of most coastal dunes along the State's un-nourished beaches. In contrast, beaches with active beach nourishment projects suffered mild erosion and in most cases still had a sizable beach berm seaward of the dune line.



The beaches along the New Jersey coast are presently in a mildly eroded state typical of early spring conditions. Sand eroded from the beach berm and in some cases the dune toe is present in the offshore bar system and should begin to move back onto the beach during the calmer wave conditions prevalent during the late spring and summer months. Beach goers can expect their favorite beaches to be slightly narrower than usually at the beginning of the summer season but should see them get progressively wider as we go through July and August. Surfers and fishermen will find ideal recreational conditions during the early summer as the wide offshore bars will create good surf and deep gullies inshore of the bar.

Since December 2002, the current El Niño episode has weakened significantly, typical of the decaying phase of the eastern Pacific warm water anomaly. It is anticipated that global atmosphere and ocean conditions will return to average conditions during the summer of 2003. Dr. William Gray, noted hurricane forecaster, foresees slightly above normal Atlantic hurricane activity in 2003 in response to the decay of the El Niño episode. **Generally, active hurricane seasons are beneficial to the Jersey shore as tropical storms that pass well east of the New Jersey coast (east of Bermuda) generate a large long period swell that is extremely efficient in helping to build up beaches.**



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