



State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION

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Governor

Natural & Historic Resources  
Office of Engineering & Construction

MARK N. MAURIELLO  
Acting Commissioner

MEMORANDUM

TO: David Rosenblatt, Administrator, Office of Engineering and Construction  
*Benjamin Keiser*

FROM: Benjamin Keiser, Manager, Bureau of Coastal Engineering

DATE: October 19, 2009

SUBJECT: Coastal Storm Survey & Damage Assessment  
Storm Activity Impact - October 15<sup>th</sup> through 18<sup>th</sup>, 2009

SUMMARY:

A relatively calm time period from mid-September through mid-October allowed the New Jersey coastline to recover from the increased storm activity that occurred during the end of the summer. This period allowed beach berm widths and elevations to recover and provide some level of protection to dunes, properties, and infrastructure landward of the beach. The calm period ended along the New Jersey coast as two storm systems created a long period of persistent onshore winds, abnormally high tides, high seas and rough surf; this activity began on Thursday, October 15<sup>th</sup>, 2009 and did not subside until Sunday, October 18<sup>th</sup>, 2009.

A strong coastal low pressure system developed off of the Carolinas on Thursday October 15<sup>th</sup> and tracked northeast off the New England coast and through the Canadian Maritimes through Friday; the pressure gradient related to this system created strong northeasterly winds and high seas, increasing the tidal levels higher than normal. The moderate northeasterly winds persisted through Saturday, when a second low pressure system intensified off of the Delmarva coast; the effects of this second storm lasted through late Sunday, October 18<sup>th</sup>, 2009. The long duration of moderate to strong northeasterly winds and the astronomically high tides related the new moon on October 18<sup>th</sup> allowed water levels to increase and stay elevated for much of the period.

Off of the New Jersey coast, sustained winds of 38 miles per hour with gusts as high as 50 miles per hour occurred. In addition, the largest nearshore sea heights were measured as high as 16 feet; this resulted in surf heights ranging from 5 to 8 feet, with some areas along the New Jersey coastline experiencing even higher surf heights. The strong onshore winds, large surf heights, and increased water levels created varying degrees of erosion along the New Jersey coastline.

The Bureau of Coastal Engineering conducted a survey of the New Jersey coastline on Monday, October 19, 2009, the results of which are included as part of this report. As this report was being compiled, surf heights continued to be in the 2- to 4-foot range with north-northwest winds ranging from 5 to 15 miles per hour; this is forecast to subside by Tuesday, October 20, 2009. A detailed summary listed by municipality from north to south follows this report.

Note: Wind data courtesy of the National Oceanic & Atmospheric Administration's National Data Buoy Center  
Wave heights courtesy of Steven's Institute's Davidson Lab NJ Coastal Monitoring Network  
Surge data courtesy of the National Oceanic & Atmospheric Administration's Meteorological Data Laboratory.

PERTH AMBOY	No erosion noted.
SOUTH AMBOY	No erosion noted.
OLD BRIDGE	1' - 2' sloped erosion for 2,500' near Lawrence Ave.
CLIFFWOOD BEACH	No erosion noted
KEYPORT	No erosion noted.
UNION BEACH	1 ½' - 2' vertical cut by 50' for 1,200' at the municipal beach.
KEANSBURG	1' sloped erosion throughout the municipality. 6' vertical cut in dune by 2' wide for 200' along pier at Point Comfort.
BAYSHORE FLOODGATE	1' sloped erosion throughout municipality. 2' vertical cut in dune by 3' wide for 500' in length on east side of floodgate.
PORT MONMOUTH	2' vertical cut in dune by 2' wide for 500' in length near Spy House.
BELFORD	No erosion noted.
LEONARDO	No erosion noted.
ATLANTIC HIGHLANDS	No erosion noted.
HIGHLANDS	No erosion noted.
SEA BRIGHT	6' - 8' vertical cut in the dune from the municipal beach to the southern limit of municipality. 4' high by 50' wide sloped erosion from the municipal beach to the southern limit of municipality. 1' - 2' sloped erosion by 20' wide from municipal beach to north end of municipality.
MONMOUTH BEACH	2' - 4' foot flat erosion throughout municipality.
LONG BRANCH	1 1/2' - 2' high x 45' wide vertical cut for 500' along beach near Brighton Ave. 1' - 1 ½' foot flat erosion by 20' throughout municipality.
ELBERON	3' - 4' foot flat erosion throughout municipality.
ALLENHURST	3' - 4' foot flat erosion throughout municipality.
DEAL	3' - 4' foot flat erosion throughout municipality.
LOCH ARBOUR	3' - 4' foot flat erosion throughout municipality.

ASBURY PARK	6'- 8' high by 60'- 90' wide sloped erosion entire length of municipality.
OCEAN GROVE	5'- 6' high by 60'- 90' wide sloped erosion entire length of municipality.
BRADLEY BEACH	5'- 6' high by 60'- 90' wide sloped erosion entire length of municipality.
AVON BY THE SEA	3'- 5' high by 50'- 70' wide sloped erosion entire length of municipality.
BELMAR	5'- 6' high by 40'- 70' wide sloped erosion entire length of municipality.
SPRING LAKE	3'- 5' high by 30'- 50' wide sloped erosion entire length of municipality. Erosion back to toe of dune at New Jersey Ave. No damage to dune system. Sand on boardwalk.
SEA GIRT	3'- 5' high by 40'- 60' wide sloped erosion entire length of municipality. 1' - 2' vertical cut 2' wide to dune at National Guard camp.
MANASQUAN	5'- 6' high by 30'- 60' wide sloped erosion from Inlet to Brielle Ave. 3'-4' high by 40'-50' wide sloped erosion from Brielle Ave to Ocean Ave.
POINT PLEASANT	8'- 9' high by 50'- 70' wide sloped erosion with 3' - 5' vertical cuts interspersed throughout entire length of municipality.
BAYHEAD	3'- 5' high by 20'- 30' wide sloped erosion entire length of municipality. 5'- 8' high by 2'- 3' wide cut to dune system throughout municipality.
MANTOLOKING	3'- 5' high by 20'- 30' wide sloped erosion entire length of municipality. 5'- 8' high by 2'- 3' wide cut to dune system throughout municipality.
LAVALLETTE	5'- 6' high by 30'- 50' wide sloped erosion entire length of municipality. Erosion back to toe of dune throughout municipality.
BRICKTOWN	3'- 5' high by 30'- 40' wide sloped erosion entire length of municipality. 1'- 2' high by 2' wide cut to dune system in various section along municipality.
ORTLEY BEACH	5'- 6' high by 20'- 30' wide sloped erosion entire length of municipality. 6'- 8' high by 2'- 3' wide cut to dune throughout municipality.
SEASIDE HEIGHTS	5'- 6' high by 50'- 60' wide sloped erosion entire length of municipality except for the south side of the pier, where 100' wide section of beach loss was reported.
SEASIDE PARK	5'- 6' high by 40'- 70' wide sloped erosion entire length of municipality.

ISLAND BEACH STATE PARK	3'- 4' high by 30'(access road) - 90' (near inlet) wide sloped erosion entire length of municipality. 9'- 10' vertical cut 3'- 4' wide dune cut for 60' length near Fisherman's Walkway.
BARNEGAT LIGHT	4'- 5' sloped erosion 100' wide for the entire length of municipality.
LOVELADIES	4'- 5' sloped erosion 100' wide for the entire length of municipality. 10' high by 15' wide by 5,000' long dune cut in southern end of municipality.
HARVEY CEDARS	4'- 5' sloped erosion 100' wide for the entire length of municipality. 13' high x 20' wide x 7,000' long vertical cut in dune reported from 80 <sup>th</sup> St. to Bergen Ave.
NORTH BEACH	4'- 5' sloped erosion 100' wide for the entire length of municipality. 10' high by 15' wide dune cut for length of municipality.
SURF CITY	4'- 5' sloped erosion 100' wide for the entire length of municipality. 600' of sand fence down at 18 <sup>th</sup> St. 4' high by 10' wide by 600' long at 18 <sup>th</sup> St.
SHIP BOTTOM	4'- 5' sloped erosion 100' wide for the entire length of municipality. No dune erosion noted.
LONG BEACH TOWNSHIP	4'- 5' sloped erosion 100' wide for the entire length of municipality. Dune cut 8' high by 10' wide by 6000' total in various sections along the municipality along the south sides of each groin (300' per groin average). Several sections of dune fence down.
BRANT BEACH	4'- 5' sloped erosion 100' wide for the entire length of municipality. 8' high by 10' wide by 1,500' dune cut from 45 <sup>th</sup> - 52 <sup>nd</sup> St. Several sections of dune fence down.
BEACH HAVEN	4'- 5' sloped erosion 100' wide for the entire length of municipality. 8' high by 10' wide dune cut 300' - 500' long along south side of each groin throughout municipality. Minor washover at Merivale Ave. (structure remains protected)
HOLGATE	4'- 5' sloped erosion 100' wide for the entire length of municipality. 8' high by 10' wide dune cut 300' - 500' long along south side of each groin throughout municipality. 4' high by 30' wide dune cut along 800' of the Holgate Natural Area. Access road has been washed out along the toe of dune.
BRIGANTINE	2' vertical cut, 40' wide by 800' in length in the Brigantine Refuge area. 2' - 3' sloped erosion from the Refuge to Lagoon Ave.
ATLANTIC CITY	1 ½' - 2' sloped erosion from Albany to Kentucky Ave. 2'- 3' vertical cut from New Jersey Ave. to the Inlet with various sections of dune fence undermined.

VENTNOR	2'-6' vertical cut into dune system under the boardwalk Baltimore to New Haven. From Cambridge Ave. to North End of Ventnor 1' - 3' vertical cut.
MARGATE	2 foot flat erosion throughout municipality.
LONGPORT	2 foot flat erosion throughout municipality.
OCEAN CITY	8'-14' cut in dune from Pennyland Ave. north to the Bridge. Geotubes are exposed along Surf Ave. with sand in road. Public works currently cleaning roadway. Sand fence down in various sections.
STRATHMERE	1' - 1 ½' sloped erosion 20' wide in the Natural Area. 1' - 2' sloped erosion by 150' wide from Natural Area to Hawthorne Ave. Debris on beach.
WHALE BEACH	1 ½' - 2' sloped erosion by 100' wide throughout municipality.
SEA ISLE CITY	1' - 2' sloped erosion 150' wide from 1 <sup>st</sup> to 15 <sup>th</sup> St. 1' - 2' sloped erosion 50' wide from 15 <sup>th</sup> to 40 <sup>th</sup> St. 2' sloped erosion 100' wide from 40 <sup>th</sup> to 52 <sup>nd</sup> St. 3' - 5' vertical cut 10' - 15' wide along the dune from 30 <sup>th</sup> - 37 <sup>th</sup> St. 1 ½' - 2 ½' sloped erosion 65' wide from 52 <sup>nd</sup> - 93 <sup>rd</sup> St. 2' - 6' vertical cut 10' - 12' wide along the dune from 55 <sup>th</sup> - 93 <sup>rd</sup> St.
AVALON	Overwashing of seawall at Ocean Drive near Townsend Inlet Bridge causing 20' of road shoulder to collapse on west side of roadway. Minor tidal flooding during high tide near Ocean Drive. 2' - 3' sloped erosion, 55' wide from 11 <sup>th</sup> to 26 <sup>th</sup> St. Forebeach flooding reported. Vertical cut 10' - 12' wide by 2' - 10' high in dune from 11 <sup>th</sup> St. to 26 <sup>th</sup> St. Debris on beach at 26 <sup>th</sup> St. 1' - 2' sloped erosion, 70' wide from 26 <sup>th</sup> to 80 <sup>th</sup> St. Sand fence and split rail fencing down along beach.
STONE HARBOR	2' - 2 ½' sloped erosion, 65' wide entire length of municipality. 4' - 6' wide x 2' - 3' high dune cut from 96 <sup>th</sup> St to 97 <sup>th</sup> St. 5' - 10' wide x 6' - 10' high dune cut from 100 <sup>th</sup> St to 115 <sup>th</sup> St. Sand fence and split rail fence down.
NORTH WILDWOOD	2' - 2 ½' sloped erosion, 150' wide entire length of municipality. Tidal flooding has intruded the inlet beach pond. 5' high by 8' wide dune cut 100' long at the inlet beach.
WILDWOOD CREST	2' - 2 ½' sloped erosion, 100' wide entire length of municipality. Forebeach flooding reported.

WILDWOOD	2' - 2 ½' sloped erosion, 150' wide entire length of municipality. Forebeach flooding reported.
CAPE MAY CITY	1' - 1 ½' foot sloping cut, 35' wide entire length of municipality. 10' high by 6' wide dune cut for 300' at Wilmington Ave. Sand fence down.
CAPE MAY POINT BOROUGH	1' - 1 ½' foot sloping cut, 15' wide entire length of municipality and the State Park.
DELAWARE BAY	Minor tidal flooding at Reeds beach. Windblown sand on street. Public works out to clean streets.