



State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION

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MEMORANDUM

TO: David Rosenblatt, Assistant Commissioner

FROM: Chris Constantino for William Dixon, Director 

DATE: June 2, 2021

SUBJECT: Initial Coastal Storm Survey & Damage Assessment
Atlantic Ocean, Delaware Bay and Raritan Bay shorelines
May 28 – May 30, 2021 - Nor'easter

Since Winter Storm Orlena (January 31st through February 2nd, 2021), New Jersey has experienced very few periods of elevated seas and surf. As a result, both natural and man-made recovery efforts were very productive, resulting in increased beach width and height as well as reestablishment of previously eroded portions of dune. Even the 'hot spot' locations which typically are more susceptible to erosion fared well since February. Despite that, these areas continued to be more closely monitored by the Division of Coastal Engineering (DCE) and the respective municipalities. Consistent with the last several Coastal Storm Survey & Damage Assessments, local beach maintenance efforts as well as recently completed periodic nourishment projects in Cape May County, Atlantic County and Monmouth County dampened the impacts and alleviated some of the pressure at several traditional 'hot spot' locations. As a result of these efforts and the reduced severity of the storm, the impacts due to the May 28th through May 30th nor'easter were not as dramatic with much of the eroded sand being shifted in the nearby intertidal and subtidal areas in the form of sandbars. This was very evident at almost all oceanfront survey locations.

Short- to medium-period seas, generated by moderate to strong east-northeast and northeast winds, on Friday, May 28th began to impact the coast of New Jersey. On Saturday, May 29th and Sunday, May 30th, the winds were mostly northeasterly and eventually become west-northwesterly on Monday, May 31st as the storm pulled away. Seas generally began to transition into a predominantly medium period swell Saturday, May 29th through Monday, May 31st. Surf heights ranged from 4 to 8 feet Friday through Sunday with the greatest surf heights generally observed around jetties, groins, inlets, and piers. By Monday, surf heights ranged from 1 to 3 feet, with much calmer sea conditions observed.

Buoys off the New Jersey coast recorded sustained winds over 40 mph with gusts over 50 mph. Gusts at inland reporting stations were recorded at nearly 50 mph during the peak of the event. Sea heights at nearby buoys peaked at 13 feet. Oceanfront tides reached minor flood stage levels for 3 consecutive high tide cycles from May 28th through May 29th for much of New Jersey; some back bay locations reached moderate flood stage during the period. These elevated tidal levels were a product of the recent astronomical tide phase and the prolonged period of strong onshore winds.



Staff from DCE conducted ‘hot spot’ visual pre-storm surveys from Wednesday, May 26th through Friday, May 28th. A full post-storm assessment was conducted on Tuesday, June 1st; the results of this assessment are contained in this report. During the compilation of this report, the surf conditions were around 1-foot with westerly winds generally under 15 mph. A detailed summary listed by municipality from north to south is enclosed.

Of the 81 sites were surveyed, 70 were determined to have minor beach or dune erosion, 11 had moderate beach or dune erosion and 0 had major beach or dune erosion. Criteria for determining damage levels are listed at the end of this summary.

Please note that the storm damage assessments found herein were conducted in a rapid time interval with pre-storm and post-storm observations made immediately before and after the event in question. Please note that the changes documented in this report are from this event; pre-existing conditions (i.e. scarps in dunes prior to the event) and what caused these conditions are not always reported herein. It is often the Division’s experience that much of the material eroded from the “dry” beach area has not been lost, but rather redistributed within the beach profile system, such as creation or enlargement of offshore sand bars. Our expectation is that much of material will return to the “dry” beach in time following the storm; this time frame may vary based on several contributing factors such as storm frequency and duration.

*** Damage Levels:**

Major erosion – consists of significant or total beach berm loss and/or significant erosion and scarping of the dunes.

Moderate erosion – consists of significant scarping and/or significant sloped erosion of beach berm and/or minor erosion of the dunes.

Minor erosion – consists of redistribution of sand within the beach profile or loss of sand without significant scarping or significant sloped erosion.

LOCATION	INSPECTION NOTES	DAMAGE LEVEL*
PERTH AMBOY	Minor sloped erosion. No major incidents or damage observed or reported.	Minor
SOUTH AMBOY	Minor sloped erosion. No major incidents or damage observed or reported.	Minor
OLD BRIDGE	Up to 30' of sloped erosion, 1'-2' in height. Various sections of vertical dune scarps, up to 3' high and 5' wide. Some wave runup/tide to the upper beach. No other major incidents or damage observed or reported	Minor
ABERDEEN	No major incidents or damage observed or reported. No major incidents or damage observed or reported.	Minor
ABERDEEN CLIFFWOOD BEACH	Up to 20' of sloped erosion, 1' to 2' in height. Various sections of vertical dunes scarps, up to 2' in height. Wave runup/tide to the upper beach. Substantial over wash reported along Lakeshore Dr. and Ocean Blvd.	Minor
KEYPORT	Minor sloped erosion and redistribution of sand. Some wave runup/tide to the upper beach. No major incidents or damage observed or reported.	Minor
UNION BEACH	Up to 50' of sloped erosion, 1'- 2' in height. Some wave runup/tide to the upper beach.	Minor
KEANSBURG – BAYSHORE FLOODGATE	Minor sloped erosion and redistribution of sand. No major incidents or damage observed or reported. Gate was closed consistent with the Operations Manual.	Minor
KEANSBURG	Floodgate Facility to Point Comfort: Up to 50' of sloped erosion, 1' – 2' in height. Various sections of pre-existing vertical beach scarps, up to 5' in height. Point Comfort to Ideal Beach: Up to 50' of sloped erosion, 1'- 2' in height. Various sections of pre-existing vertical beach scarps, up to 5' in height. Wave runup/tide to the upper beach. Ideal Beach to Pews Creek: Up to 20' of sloped erosion, 1'- 2' in height. Wave runup/tide to the upper beach.	Minor
MIDDLETOWN	Pews Creek Pump Station: Gate was closed consistent with the Operations Manual.	Minor
	Port Monmouth: Minor sloped erosion and redistribution of sand. Wave runup/tide to the upper beach. No major incidents or damage observed or reported.	Minor
	Belford: Scarping along the dike at the ferry terminal; up to 6' high. County repairing at time of inspection. No major incidents or damage observed or reported.	Minor
	Leonardo: Minor sloped erosion and redistribution of sand. Some wave runup/tide to the upper beach. No major incidents or damage observed or reported.	Minor
ATLANTIC HIGHLANDS	Minor sloped erosion and redistribution of sand. Storm debris on upper portions of the beach. No major incidents or damage observed or reported.	Minor
HIGHLANDS	Minor sloped erosion and redistribution of sand. No major incidents or damage observed or reported.	Minor
SEA BRIGHT	Minor sloped erosion. Some wave runup/tide to the upper beach. No major incidents or damage observed or reported.	Minor

MONMOUTH BEACH	Riverview Road to Beach Rd.: Minor sloped erosion. Some wave runup/tide to the upper beach. No major incidents or damage observed or reported.	Minor
	Beach Rd. to South end of Borough: Minor sloped erosion. Some wave runup/tide to the upper beach. No major incidents or damage observed or reported.	Minor
LONG BRANCH	Seven Presidents to Seaview Ave.: Minor sloped erosion. Some wave runup/tide to the upper beach. No major incidents or damage observed or reported.	Minor
	Seaview Ave. to Cottage Pl.: Minor sloped erosion. Some wave runup/tide to the upper beach. No major incidents or damage observed or reported.	Minor
	Cottage Pl. to Pullman Ave.: Minor sloped erosion. Some wave runup/tide to the upper beach. No major incidents or damage observed or reported.	Minor
DEAL	Minor sloped erosion and redistribution of sand. Some wave runup/tide to the upper beach. No major incidents or damage observed or reported.	Minor
ALLENHURST	Minor sloped erosion and redistribution of sand. No major incidents or damage observed or reported.	Minor
LOCH ARBOUR	Minor sloped erosion and redistribution of sand. Wave runup/tide to the upper beach. No major incidents or damage observed or reported.	Minor
ASBURY PARK	Minor sloped erosion and redistribution of sand. No major incidents or damage observed or reported.	Minor
NEPTUNE OCEAN GROVE	Minor sloped erosion and redistribution of sand. No major incidents or damage observed or reported.	Minor
BRADLEY BEACH	Minor sloped erosion and redistribution of sand. No major incidents or damage observed or reported.	Minor
AVON	Minor sloped erosion and redistribution of sand. No major incidents or damage observed or reported.	Minor
BELMAR	Minor sloped erosion and redistribution of sand. No major incidents or damage observed or reported.	Minor
SPRING LAKE	Minor sloped erosion and redistribution of sand. No major incidents or damage observed or reported.	Minor
SEA GIRT	Minor sloped erosion and redistribution of sand. No major incidents or damage observed or reported.	Minor
MANASQUAN	Minor sloped erosion and redistribution of sand. No major incidents or damage observed or reported.	Minor
POINT PLEASANT BEACH	Minor sloped erosion and redistribution of sand. Some wave runup/tide to the upper beach/dunes. Some wave runup/tide to the upper beach/dunes.	Minor
BAY HEAD	Minor to moderate sloped erosion and redistribution of sand. Some wave runup/tide to the upper beach/dunes. Some sand fence and accessways were damaged, mostly between Harris St. and Mount St.	Moderate
MANTOLOKING	Minor to moderate sloped erosion and redistribution of sand. Some wave runup/tide to the upper beach/dunes. ADA crossover damage and additional fence damage near Downer St.	Minor
BRICK	Minor sloped erosion and redistribution of sand. Some wave runup/tide to the upper beach/dunes.	Minor
TOMS RIVER NORMANDY BEACH through MONTEREY BEACH	Minor sloped erosion (moderate sloped erosion in Normandy Beach section). Wave runup/tide to the upper beach/dune. Crossovers and low, narrow beach damaged in Normandy Beach.	Minor

LAVALLETTE	Minor sloped erosion and redistribution of sand. Some wave runup/tide to the upper beach.	Minor
TOMS RIVER ORTLEY BEACH	Moderate sloped erosion. Wave runup/tide to the upper beach/dune. Several crossovers damaged and closed by Township.	Moderate
SEASIDE HEIGHTS	Minor sloped erosion and redistribution of sand. Some wave runup/tide to the upper beach.	Minor
SEASIDE PARK	Minor sloped erosion and redistribution of sand. Some wave runup/tide to the upper beach/dunes.	Minor
BERKELEY TWP. S. SEASIDE PARK	Minor sloped erosion and redistribution of sand. Some wave runup/tide to the upper beach/dunes.	Minor
ISLAND BEACH STATE PARK	Minor sloped erosion and redistribution of sand. Some wave runup/tide to the upper beach/dunes. Wind-blown sand reported at several locations.	Minor
BARNEGAT LIGHT	No major incidents or damage observed or reported.	Minor
LONG BEACH TWP. LOVELADIES	Moderate sloped erosion. Wave runup/tide to the upper beach/dune. Several crossovers damaged and being repaired by Township.	Moderate
HARVEY CEDARS	Up to 30' of sloped erosion, 2' – 3' in height. Wave runup/tide to the upper beach/dune. Several crossovers damaged and being repaired by Borough.	Moderate
LONG BEACH TWP. NORTH BEACH	Minor sloped erosion and redistribution of sand. Some wave runup/tide to the upper beach/dunes.	Minor
SURF CITY	Minor sloped erosion and redistribution of sand. Some wave runup/tide to the upper beach/dunes.	Minor
SHIP BOTTOM	Minor sloped erosion and redistribution of sand. Some wave runup/tide to the upper beach/dunes.	Minor
LONG BEACH TWP. BRANT BEACH through N. BEACH HAVEN	Minor sloped erosion and redistribution of sand. Some wave runup/tide to the upper beach/dunes.	Minor
BEACH HAVEN	Up to 20' of sloped erosion, 2' – 3' in height. Wave runup/tide to the upper beach/dune. Approx. 3,500 linear feet of vertical dune scarping up to 8' in height, up to 12' deep mostly between Norwood Ave. and Holyoke Ave, and between Jeffries Ave. and Leeward Ave. Some accretion and redistribution of sand noted at a few locations.	Moderate
LONG BEACH TWP. HOLGATE	Up to 30' of sloped erosion, 2' – 3' in height in some areas. Wave runup/tide to the upper beach/dune. Approx. 2,100 linear feet of vertical dune scarping up to 10' in height, up to 30' deep between Harding Ave. and Tebco Terrace. Some accretion and redistribution of sand noted at a few locations.	Moderate
BRIGANTINE	Minor sloped erosion and redistribution of sand. Small beach in front of promenade. Some wave runup/tide to the upper beach/dunes/revetment.	Minor
ATLANTIC CITY	<u>Inlet Seawall and Terminal Jetty area:</u> No incidents or damage observed or reported. Evidence of splash over near Flagship Resort	Minor
	<u>Inlet Jetty to Ventnor Border:</u> Minor sloped erosion and redistribution of sand. Some wave runup/tide to the upper beach/dunes.	Minor
VENTNOR	Minor sloped erosion and redistribution of sand with several stretches of vertical beach scarping, up to 2' in height. Some wave runup/tide to the upper beach/dunes.	Minor

MARGATE	Minor sloped erosion and redistribution of sand. Some wave runup/tide to the upper beach/dunes.	Minor
LONGPORT	Minor sloped erosion and redistribution of sand. Some wave runup/tide to the upper beach/dunes.	Minor
OCEAN CITY	Minor sloped erosion and redistribution of sand. (moderate sloped erosion from Brighton Pl. to 6 th St.) Vicinity of 5 th St. continues to experience erosion; near vertical erosion into to dune between 5 th St. and 6 th St. Some wave runup/tide to the upper beach/dunes throughout City.	Moderate
UPPER TWP. STRATHMERE	Up to 15' of sloped erosion, 1' – 2' in height. Some wave runup/tide to the upper beach/dunes. Evidence of redistribution of sand.	Minor
SEA ISLE CITY	Up to 30' of sloped erosion, 1' – 2' in height. (more notable between JFK Blvd. and 32 nd St.). Some wave runup/tide to the upper beach/dunes. Evidence of redistribution of sand.	Minor
AVALON	Up to 25' of sloped erosion, 1' – 2' in height. (vertical beach scarping, up to 2' in height, near 13 th St. and 14 th St.). Some wave runup/tide to the upper beach/dunes. Evidence of redistribution of sand.	Minor
STONE HARBOR	Up to 20' of sloped erosion, 1' - 2' feet in height and redistribution of sand. Some wave runup/tide to the upper beach/dunes.	Minor
NORTH WILDWOOD	Hereford Inlet & Surf Ave: Up to 20' of sloped erosion, 1'- 2' feet in height from New York Ave. through Surf Ave. No additional damage immediately reported to the seawall. USACE seawall repair ongoing in Anglesea section of inlet.	Minor
	2nd Ave. to 15th Ave.: Up to 75' of sloped erosion, 2' - 4' in height. (most notable between 3 rd Ave. and 7 th Ave. and between 13 th Ave. and 15 th Ave.) Wave runup/tide to the upper beach/dune/bulkhead/seawall. City's sand backpassing operation impacted. 15th Ave. to Wildwood border: Up to 40' of sloped erosion, 2'- 3' in height. Wave runup/tide to the upper beach. City's sand backpassing operation impacted.	Moderate
WILDWOOD CITY	Up to 30' of sloped erosion, 1' in height and redistribution of sand. Some wave runup/tide to the upper beach. No evidence of significant ponding on the upper beach. Leaming Ave. outfall pipe construction continues.	Minor
WILDWOOD CREST	Up to 30' of sloped erosion, 1' in height and redistribution of sand. Some wave runup/tide to the upper beach. No evidence of significant ponding on the upper beach.	Minor
LOWER TWP. DIAMOND BEACH	Up to 20' of sloped erosion, 1' in height and redistribution of sand. Some wave runup/tide to the upper beach.	Minor
CAPE MAY CITY	Minor sloped erosion and redistribution of sand. Wave runup/tide to the upper beach. No impacts to the dunes.	Minor
LOWER TWP./WEST CAPE MAY	Minor sloped erosion and redistribution of sand. Wave runup/tide to the upper beach. No impacts to the dunes.	Minor

CAPE MAY POINT	Minor sloped erosion and redistribution of sand. Wave runup/tide to the upper beach. No impacts to the dunes.	Minor
LOWER DELAWARE BAY	<u>North Cape May/Villas:</u> Minor sloped erosion and redistribution of sand. Wave runup/tide to the upper beach and dunes. Some minor loss to vegetation at several locations.	Minor
	<u>Del Haven/Pierces Point/Reeds Beach:</u> Minor sloped erosion and redistribution of sand. Wave runup/tide to the upper beach, to the vegetation line and to the bulkhead at several locations.	Minor
DELAWARE BAY/RIVER	<u>East Point:</u> Sloped erosion and redistribution of sand near lighthouse site and Lighthouse Rd. Wave runup/tide to the upper beach and dune.	Minor
	<u>Heislerville Dike:</u> Scour holes increasing in size and minor/moderate settlement on side slopes of dike. No major incidents or damage reported.	Moderate
	<u>Bivalve (Commercial):</u> No major incidents or damage reported. Gabion structures near Marine Police remain in disrepair.	Minor
	<u>Fortescue:</u> Up to 40' of sloped erosion and redistribution of sand. Tide to the upper beach at several locations.	Minor
	<u>Gandy's Beach:</u> Minor sloped erosion and redistribution of sand.	Minor
	<u>Lawrence Twp. - (Bay Point):</u> No major incidents or damage reported.	Minor
	<u>Fairfield Twp. (Sea Breeze):</u> Moderate sloped erosion. Wave runup/tide to the upper beach with undermining of pavement on Seabreeze road.	Moderate
<u>Oakwood Beach:</u> Minor sloped erosion and redistribution of sand. Tide to the upper beach and fences at several locations. Southern end of USACE project experienced more notable moderate erosion.	Moderate	