



State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION

Climate and Flood Resilience

Division of Coastal Engineering

1510 Hooper Ave., Suite 140

Toms River, N. J. 08753

Telephone: 732-255-0767

Fax: 732-255-0774

PHILIP D. MURPHY

Governor

SHEILA Y. OLIVER

Lt. Governor

CATHERINE R. McCABE

Commissioner

MEMORANDUM

TO: David Rosenblatt, Assistant Commissioner

FROM:  Chris Constantino for William Dixon, Director

DATE: December 21, 2020

SUBJECT: Initial Coastal Storm Survey & Damage Assessment
Atlantic Ocean, Delaware Bay and Raritan Bay shorelines
December 16, 2020 Nor'easter ("Winter Storm Gail")

SUMMARY:

After a historic 2020 Atlantic hurricane season, the region has transitioned towards the winter season with several periods of small to moderate wave events yet impacts to most beaches were minimal and short-lived. This was due to calm weather conditions in between the episodes of elevated surf. Despite this, the Division of Coastal Engineering's (DCE) focus continues to be on the 'hot spot' locations which haven't fared as well. DCE and the respective municipalities continue to monitor those areas closely and keep in close communication with each other regarding the status of these locations. Consistent with the last several Coastal Storm Survey & Damage Assessments, ongoing and recently completed periodic nourishment projects in Cape May County, Atlantic County and Monmouth County alleviated some of the pressure at several traditional 'hot spot' locations.

Short- to medium-period seas, generated by moderate to strong east-northeast and northeast winds, increased through Wednesday December 16th and early Thursday December 17th. Winds subsided as they rotated around out of the north-northwest and northwest through the day on Thursday December 17th. Seas generally began to transition into a predominantly medium-period swell through the day Thursday December 17th and into Friday December 18th. Surf heights between late December 16th and December 17th ranged from 6 to 9 feet with greater heights observed around jetties, groins, inlets, and piers.

Buoys off the New Jersey coast recorded sustained winds over 40 mph with gusts near 60 mph. Gusts at inland reporting stations were recorded 60 mph during the peak of the event. Sea heights peaked at nearby buoys at 24 feet. Tides reached near flood and/or minor flood stage levels for 3 of the 4 high tide cycles on December 16th and December 17th for much of New Jersey's while several locations reached moderate flood stage for 1 of those 3 high tides. The elevated tidal levels reached were a result of the astronomical tide phase and the period of strong onshore winds.

Staff from DCE conducted a town-by-town visual pre-storm survey on Tuesday December 15th and Wednesday December 16th, with the post-storm survey being conducted on Friday December 18th. The results of this assessment are contained in this report. During the compilation of this report, the surf conditions around the state ranged from 2 to 4 feet with winds generally under 20 mph. A detailed summary listed by municipality from north to south is enclosed.

Of the 79 areas surveyed, 70 were determined to have minor beach or dune erosion, 5 had moderate beach or dune erosion and 4 had major beach or dune erosion. Criteria for determining damage levels are listed at the end of this report.

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 reported.	Minor
SOUTH AMBOY	Minor sloped erosion. No major incidents or damage reported.	Minor
OLD BRIDGE	Up to 10' of sloped erosion, 1' in height. Various sections of vertical dunes scarps, up to 2' in height. 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.	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. Some wave runup/tide to the upper beach. Some overwash reported. No other major incidents or damage observed or reported.	Moderate
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. Some wave runup/tide to the upper beach. 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' - 3' in height. Various sections of vertical beach scarps, up to 3' in height. Some wave runup/tide to the upper beach. Point Comfort to Ideal Beach: Up to 20' of sloped erosion, 1' - 3' in height. Various sections of vertical beach scarps, up to 3' in height. Some wave runup/tide to the upper beach. Ideal Beach to Pews Creek: Up to 20' of sloped erosion, 1' - 2' in height. Some wave runup/tide to the upper beach.	Minor
MIDDLETOWN	Port Monmouth: Up to 20' of sloped erosion and redistribution of sand. Some wave runup/tide to the upper beach. No major incidents or damage observed or reported.	Minor
	Belford: Additional scarping along the dike at the ferry terminal; 1' – 2' wide, up to 10' high. 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. 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	Up to 100' of sloped erosion, 2'– 4' in height, with 2'- 3' vertical beach scarps. Some wave runup/tide to the upper beach.	Minor
MONMOUTH BEACH	Riverview Road to Cottage Rd.: Up to 40' of sloped erosion, 2'– 4' in height, with 2'- 4' vertical beach scarps. Some wave runup/tide to the upper beach.	Minor

	Cottage Rd. to South end of Borough: Up to 70' of sloped erosion, 2'– 4' in height, with 2'- 5' vertical beach scarps. Some wave runup/tide to the upper beach.	Minor
LONG BRANCH	Seven Presidents to Seaview Ave.: Up to 70' of sloped erosion, 2'-4' in height. Some wave runup/tide to the upper beach.	Minor
	Seaview Ave. to Cottage Pl.: Up to 95' of sloped erosion, 2'- 4' in height, with vertical beach scarps up to 3'. Some wave runup/tide to the upper beach.	Minor
	Cottage Pl. to Pullman Ave.: Up to 75' of sloped erosion, 2'- 4' in height, with vertical beach scarps up to 3'. Some wave runup/tide to the upper beach.	Moderate
DEAL	Up to 30' of sloped erosion. Some wave runup/tide to the upper beach. No major incidents or damage observed or reported. Some ponding on the beach.	Minor
ALLENHURST	Up to 30' of sloped erosion. Some wave runup/tide to the upper beach. No major incidents or damage observed or reported.	Minor
LOCH ARBOUR	Minor sloped erosion and redistribution of sand. Some wave runup/tide to the upper beach. No major incidents or damage observed or reported.	Minor
ASBURY PARK	Up to 50' of sloped erosion. Some wave runup/tide to the upper beach. No major incidents or damage observed or reported. Wind-blown sand on nearby streets.	Minor
NEPTUNE OCEAN GROVE	Up to 50' of sloped erosion. Some wave runup/tide to the upper beach. No major incidents or damage observed or reported. Wind-blown sand on boardwalk and nearby streets.	Minor
BRADLEY BEACH	Up to 60' of sloped erosion. Some wave runup/tide to the upper beach. No major incidents or damage observed or reported. Wind-blown sand on nearby streets.	Minor
AVON	Up to 50' of sloped erosion. Some wave runup/tide to the upper beach. No major incidents or damage observed or reported. Wind-blown sand on nearby streets.	Minor
BELMAR	Up to 50' of sloped erosion. Some wave runup/tide to the upper beach. No major incidents or damage observed or reported. Wind-blown sand on boardwalk.	Minor
SPRING LAKE	Up to 50' of sloped erosion. Some wave runup/tide to the upper beach. No major incidents or damage observed or reported. Wind-blown sand on boardwalk.	Minor
SEA GIRT	Up to 50' of sloped erosion. Some wave runup/tide to the upper beach. No major incidents or damage observed or reported. Wind-blown sand on nearby streets.	Minor
MANASQUAN	Up to 50' of sloped erosion. Some wave runup/tide to the upper beach. No major incidents or damage observed or reported. Wind-blown sand on promenade and nearby streets/parking lots.	Minor
POINT PLEASANT BEACH	Up to 150' of sloped erosion (up to 80 feet south of New York Ave. and up to 150' north of New York Ave.), 3' – 6' in height. Some wave runup/tide to the	Minor

	upper beach/dune. Some fence/crossover damage at New York Ave.	
BAY HEAD	Up to 75' of sloped erosion, 4' – 8' in height. Significant additional vertical dune scarp (10' to 12' high) and total loss of beach from Karge St. south through south of Chadwick St. Substantial dune fence and crossover damage from North St. south through Johnson St. Some wave runup/tide to the upper beach/dune throughout.	Major
MANTOLOKING	Up to 80' of sloped erosion, 3' – 6' in height. Some wave runup/tide to the upper beach/dune. Some fence damage at Downer St.	Minor
BRICK	Up to 70' of sloped erosion, 3' – 6' in height. Some wave runup/tide to the upper beach/dune.	Minor
TOMS RIVER NORMANDY BEACH through MONTEREY BEACH	Up to 90' of sloped erosion, 3' – 6' in height. Some wave runup/tide to the upper beach/dune.	Minor
LAVALLETTE	Up to 65' of sloped erosion, 3' – 6' in height. Some wave runup/tide to the upper beach/dune.	Minor
TOMS RIVER ORTLEY BEACH	Up to 65' of sloped erosion, 4' – 6' in height. Some wave runup/tide to the upper beach/dune. Vertical dune scarping up to 5' in height and dune fence/crossover damage from 4th Ave. south through 9th Ave.	Major
SEASIDE HEIGHTS	Up to 125' of sloped erosion, 3' – 6' in height. Some wave runup/tide to the upper beach/dune.	Minor
SEASIDE PARK	Up to 85' of sloped erosion, 3' – 6' in height. Some wave runup/tide to the upper beach/dune.	Minor
BERKELEY TWP. S. SEASIDE PARK	Up to 45' of sloped erosion, 3' – 6' in height. Some wave runup/tide to the upper beach/dune.	Minor
ISLAND BEACH STATE PARK	Reports of wave runup/tide to the upper beach. Wind-blown sand reported at several locations. No major incidents or damage reported to DCE.	Minor
BARNEGAT LIGHT	Up to 70' of sloped erosion, 3' – 5' in height. Some wave runup/tide to the upper beach/dune.	Minor
LONG BEACH TWP. LOVELADIES	Up to 70' of sloped erosion, 3' – 4' in height. Some wave runup/tide to the upper beach/dune.	Minor
HARVEY CEDARS	Up to 70' of sloped erosion, 3' – 4' in height. Some wave runup/tide to the upper beach/dune. Approx. 3,000 linear-foot vertical dune scarp up to 4' in height, up to 6' deep between Cumberland Ave. and 69 th St.	Moderate
LONG BEACH TWP. NORTH BEACH	Up to 70' of sloped erosion, 3' – 4' in height. Some wave runup/tide to the upper beach/dune.	Minor
SURF CITY	Up to 70' of sloped erosion, 3' – 4' in height. Some wave runup/tide to the upper beach/dune.	Minor
SHIP BOTTOM	Up to 70' of sloped erosion, 3' – 4' in height. Wave runup/tide to the upper beach/dune.	Minor
LONG BEACH TWP. BRANT BEACH through N. BEACH HAVEN	Up to 70' of sloped erosion, 3' – 4' in height. Wave runup/tide to the upper beach/dune.	Minor
BEACH HAVEN	Up to 70' of sloped erosion, 3' – 4' in height. Wave runup/tide to the upper beach/dune. Approx. 2,000 linear-foot vertical dune scarp up to 12' in height, up to 25' deep between Holyoke Ave. and Berkeley Ave.	Major

LONG BEACH TWP. HOLGATE	Up to 70' of sloped erosion, 3' – 6' in height. Wave runup/tide to the upper beach/dune. Approx. 2,500 linear-foot vertical dune scarp up to 12' in height, up to 20' deep between Washington Ave. and Holgate Ave.	Major
BRIGANTINE	Up to 35' of sloped erosion, 1' to 3' in height. Some ponding located on the upper beach. Some wave runup/tide to the upper beach/dunes/revetment. Little dry beach in front of promenade	Minor
ATLANTIC CITY	<u>Inlet Seawall and Terminal Jetty area:</u> No incidents or damage observed or reported.	Minor
	<u>Inlet Jetty to Steel Pier:</u> Up to 30' of sloped erosion, 1' to 3' in height. Some wave runup/tide to the upper beach/dunes, with some additional vertical dune scarps up to 10' deep and up to 6' in height between Steel Pier and Victoria Ave. Beachfill ongoing north of Vermont Ave. <u>Steel Pier to St. James Pl.:</u> Up to 40' of sloped erosion, 2' to 3' in height. Some wave runup/tide to the upper beach/dunes. Damage to Margaritaville Beach Bar and Hard Rock Beach Bar. <u>St. James Pl. to Ventnor Border:</u> Up to 30' of sloped erosion, 1' to 2' in height. Some wave runup/tide to the upper beach/dunes.	Moderate
VENTNOR	Up to 20' of sloped erosion, 1' to 2' in height. Some wave runup/tide to the upper beach/dunes. Beachfill recently completed south of the fishing pier.	Minor
MARGATE	Up to 20' of sloped erosion, 1' to 2' in height. Some wave runup/tide to the upper beach/dunes.	Minor
LONGPORT	Up to 25' of sloped erosion, 2' to 3' in height. Some wave runup/tide to the upper beach/dunes. Beachfill recently completed.	Minor
OCEAN CITY	Up to 30' of sloped erosion, 1' – 3' in height south of Music Pier and 3' to 4' north of Music Pier. Some wave runup/tide to the upper beach. Some beach scarping north of Music Pier.	Minor
UPPER TWP. STRATHMERE	Up to 40' of sloped erosion, 1' – 2' in height. (larger of the range in Whale Beach) Some wave runup/tide to the upper beach/dunes. Evidence of ponding on the upper beach.	Minor
SEA ISLE CITY	Up to 60' of sloped erosion, 2' – 3' in height. (larger of the range in between 33 rd St. and 57 th St.). Some wave runup/tide to the upper beach. Evidence of ponding on the upper beach.	Minor
AVALON	Up to 35' of sloped erosion, 2' – 3' in height. (larger of the range in between 10 th St. and 16 th St.). Some wave runup/tide to the upper beach/dunes.	Minor
STONE HARBOR	Up to 35' of sloped erosion, 2' - 3' feet in height. 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 35' of sloped erosion, 2'- 3' in height. Some wave runup/tide to the upper beach/dunes. Additional vertical dune scarps up to 12' deep and up to 6' in height between 13 th Ave. and 15 th Ave.	Moderate
	15th Ave. to Wildwood border: Up to 40' of sloped erosion, 1'- 2' in height.	
WILDWOOD CITY	Up to 45' of sloped erosion, 2'- 3' in height. Evidence of ponding on upper beach. Some wave runup/tide to the upper beach.	Minor
WILDWOOD CREST	Up to 45' of sloped erosion, 2'- 3' in height. Evidence of ponding on upper beach. Some wave runup/tide to the upper beach.	Minor
LOWER TWP. DIAMOND BEACH	Up to 35' of sloped erosion, 1'- 2' in height. Some wave runup/tide to the upper beach	Minor
CAPE MAY CITY	Up to 15' of sloped erosion, 1'- 2' in height. Some wave runup/tide to the upper beach/dunes.	Minor
LOWER TWP. WEST CAPE MAY	Minor sloped erosion and redistribution of sand. Some wave runup/tide to the upper beach. No major incidents or damage observed or reported.	Minor
CAPE MAY POINT	Up to 15' of sloped erosion, 1'- 2' in height. Some wave runup/tide to the upper beach/dunes.	Minor
LOWER DELAWARE BAY	North Cape May/Villas: Minor sloped erosion and redistribution of sand. Wave runup/tide to the upper beach, dunes and to the vegetation line at several locations.	Minor
	Del Haven/Pierces Point/Reeds Beach: Minor sloped erosion and redistribution of sand. Some wave runup/tide to the upper beach, to the vegetation line and to the bulkhead at several locations. Some evidence of overwash at Reed's Beach.	Minor
DELAWARE BAY/RIVER	East Point: Minor sloped erosion and redistribution of sand near lighthouse site and East Point Rd./Bay Ave.	Minor
	Heislerville: No major incidents or damage reported. Some minor settlement. Additional work still required – from past events.	Minor
	Bivalve (Commercial): No major incidents or damage reported. Gabion structures near Marine Police remain in disrepair. Some sand and gravel added to supplement the settlement.	Minor
	Fortescue: Minor sloped erosion and redistribution of sand. Tide to the upper beach at several locations. Pre-existing large vertical dune scarps still present.	Minor
	Gandy's Beach: Minor sloped erosion and redistribution of sand. Tide to the upper beach and landward of the concrete binblocks at several locations.	Minor
	Lawrence Twp. - (Bay Point): No major incidents or damage reported.	Minor

	<p>Fairfield Twp. (Sea Breeze): Minor redistribution of sand. No major incidents or damage reported. DCE construction ongoing at the location.</p>	<p>Minor</p>
	<p>Oakwood Beach: Minor sloped erosion and redistribution of sand. Tide to the upper beach and fences at several locations. Erosion continues at the southern end.</p>	<p>Minor</p>