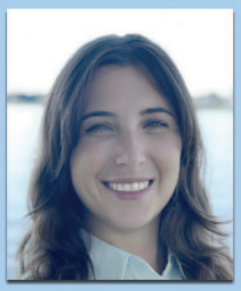
20th Annual State of the Shore Media Event

Thursday, May 26, 2022
Asbury Park



SAMANTHA KREISLER
Communications Specialist
New Jersey Sea Grant Consortium

As the days grow longer and sun shines brighter, New Jerseyans once again emerge from their annual winter slumbers to trade in their boots for flip flops and head to the coast. Leaving the dark cold days of winter behind, beachgoers look forward to another season of fun on the Jersey shore.

Luckily, our beaches are ready for the summer crowds after a relatively mild season. Our sandy shores are in good condition after this winter's low offshore wave activity, minimal erosion, and continued statewide efforts to protect our coastal communities.

This summer is projected to be both hotter and wetter than usual due to weak La Niña conditions. This year's State of the Shore Report will further explain and expand upon the causes of these conditions and more, but the bottom line is: pack an umbrella with your sunscreen and sunnies.

On another note, this upcoming October 2022 will mark the tenth anniversary of Superstorm Sandy. The eerie similarities from this season's State of the Shore Report to that of 2012 may seem ominous, but New Jersey has since taken numerous strides to improve the resilience of its coastal communities. Nevertheless, as we reflect on the changes our state has made and lessons learned in the past decade, it is vital to be mindful of the power the ocean and nature have over our coastline.

Above all, NJSGC wishes everyone a safe and wonderful summer at the beach.

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NOAA

20th Annual State of the Shore Report

DR. JON K. MILLER
Coastal Processes Specialist
New Jersey Sea Grant Consortium
Extension Program
Research Associate Professor
Stevens Institute of Technology

and

AUDREY FANNING
Graduate Research Assistant
Stevens Institute of Technology

DR. JON K. MILLER

Overall, New Jersey's beaches are in relatively good condition heading into the Summer 2022 season. A series of relatively mild winters in a row, in combination with renewed efforts to protect New Jersey's beachfront communities after Superstorm Sandy have contributed to these favorable conditions. As we come up on the 10-year anniversary of Sandy, it is instructive to look back at the 2012 State of the Shore Report. The opinion offered in that report is ominously similar to the one offered this year.

> *The remainder of the winter was extremely quiet with only one other storm of note, and as a result, New Jersey's beaches made it through the winter largely unscathed, and in ideal shape heading into the spring and summer.*

The devastating impacts of Sandy, after what was a similarly mild 2011-2012 winter season serve as a reminder of the awesome power of mother nature. In the decade since Sandy, New Jersey has taken a number of steps to improve the resilience of its coastal communities, including buying out damaged properties, elevating homes and businesses, embracing living shorelines and other natural infrastructure, and most importantly developing a statewide coastal resilience strategy. Beaches and dunes remain a critical element in that strategy, serving as the first line of defense against coastal storms. Now more than ever, it is important that the state remain committed to maintaining and enhancing this vital natural infrastructure through programs such as the Shore Protection Fund.

Coastal Flooding

In terms of coastal flooding, this winter was relatively uneventful. As shown in Figure 1 at right, coastal water levels as measured by the National Oceanic and Atmospheric Administration (NOAA) tide gauge at Atlantic City only reached the moderate flood threshold defined by the National Weather Service (NWS) twice between September 1st and April 30th. The first instance was during a prolonged low-level storm (Izzy) in early January that occurred coincident with a spring tide (period of higher-than-normal astronomical tide). The combination of high astronomical tides and a moderate storm surge caused water levels to peak at just over 7.15 ft above Mean Lower Low Water (MLLW). The second instance was during the Nor'easter that occurred just a few weeks ago in mid-April. That storm event was relatively short lived, but generated a storm surge in excess of 2.5 ft. Similar to the early January storm, the April Nor'easter occurred during a spring tide, which amplified its effect and pushed the observed water level above 7.2 ft MLLW.

In addition to these larger coastal flooding events, a series of smaller storms resulted in water levels that exceeded the NWS minor flood threshold. The most notable of these occurred early on in the winter season. In early October, a weak, but slow-moving storm system, generated a relatively small storm surge that lasted for several days. Although the magnitude of the event was not significant, high tide flooding persisted over several days, creating a nuisance for coastal residents and businesses. The largest storm of the year as measured by surge (excess water above the astronomical predicted tide) occurred during a late October storm. This second October storm started late on the 26th and persisted through the end of the month. At its peak, a storm surge of 3.6 ft was measured. Fortunately, the storm occurred during

a neap tide, when water levels were about a foot lower than normal. Even still, the storm was powerful enough to generate minor coastal flooding for three consecutive days. The importance of timing was emphasized, when a little more than a week later in early November a much smaller storm once again pushed water levels above the minor flood threshold. During this storm, the recorded water level was several inches higher than the preceding storm, despite having a storm surge that was nearly a foot and a half less. The difference was that the smaller November storm occurred during a spring tide which amplified its effect. For perspective, had the larger, late October storm occurred one week later, water levels would have approached or exceeded the major flood threshold.

Coastal Erosion

While coastal erosion is more common during periods of coastal flooding, there are additional factors that determine the amount of erosion that occurs during a storm. The three factors that are most commonly associated with erosion are, elevated water levels (flooding), elevated wave heights, and storm duration. Elevated water levels allow erosive storm waves to reach the normally dry upland portions of the beach, while the storm duration regulates how much time the waves spend attacking the beach. Fortunately, this past winter was extremely mild in terms of offshore wave activity, limiting the amount of coastal erosion experienced by New Jersey's beaches. Wave heights measured off the southern and northern New Jersey coast by NOAA's National Data Buoy Center (NDBC) are shown in Figures 2 and 3, respectively. Although there is no specific wave height that defines a storm, 10 ft serves as a useful boundary between the more typical winter conditions and those associated with less frequent storm events. During the first half of the winter, only a handful of storms generated waves in excess of 10 ft. Of the ones that did, the two associated with the previously mentioned October coastal flooding events were most primed to generate significant erosion due to the extended period of elevated water levels and wave heights. Both however, resulted in minimal erosion for different reasons. During the mid-October storm, the relatively small storm surge reduced the overall erosional impact, while during the late October storm, it was the asynchronous timing of the peak surge, maximum wave heights, and astronomical high tides that limited the erosion.

The largest waves of the season were measured during Winter Storm Izzy in mid-January. Waves more than 18.5 ft were measured at buoy 44025 off the coast of Long Branch, while waves in excess of 17 ft were measured at buoy 44009 off the coast of Cape May. This storm also generated the second largest storm

Figure 1: Winter 2021-22 water levels measured at Atlantic City

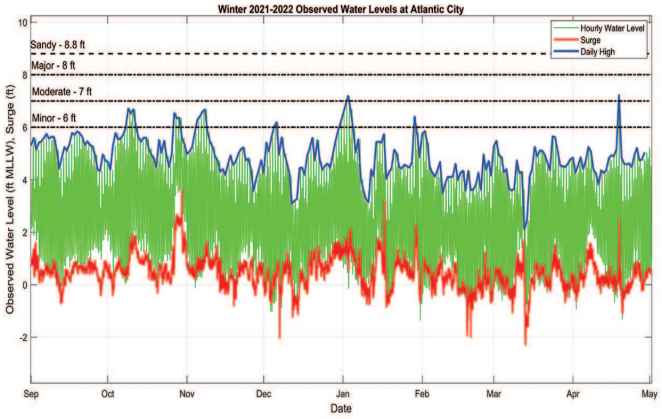


Figure 2: Winter 2021-22 wave heights measured off Cape May

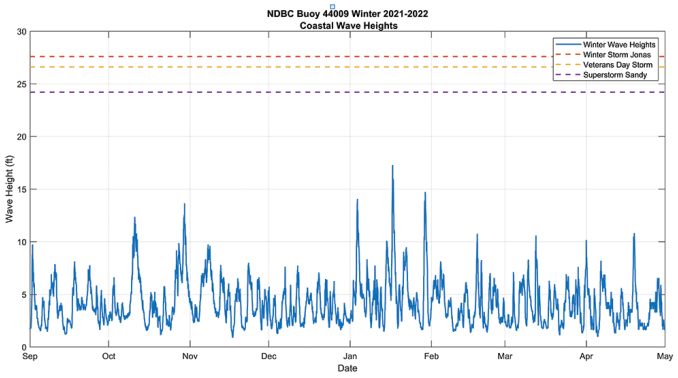
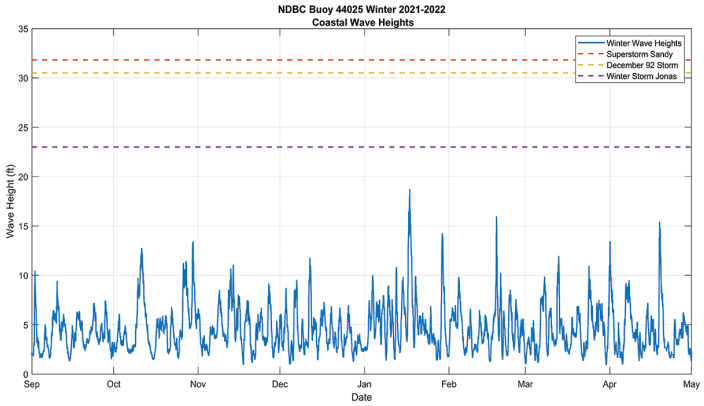


Figure 3: Winter 2021-22 wave heights measured off Long Branch



surge of the season (3.2 ft); however, since the storm passed quickly during a period of lower-than-normal tides, the total water level measured during the storm remained relatively low limiting the erosional impacts of the storm. Two other storms which generated waves greater than 15 ft were also recorded by buoy 44025. A storm in mid-February generated waves of nearly 16 ft; however, there was minimal storm surge associated with the event, and therefore limited erosion. Although the waves were slightly smaller (~15.5 ft) during the mid-April Nor'easter, it had a more significant erosional impact due to the length of the storm, and higher water levels. Current beach conditions are largely the result of this storm (and the subsequent Mother's Day weekend Nor'easter) and although some may appear narrow in spots, storms of this magnitude typically move sediment from the dry beach to sandbars that eventually work their way back onshore during the late spring/early summer.

Tropical Outlook

This summer is projected to be an active hurricane season, as leading models from Colorado State University, Pennsylvania State University, the University of Arizona, Accuweather, and the Weather Channel all predict a higher-than-average number of storms. While none of the models are predicting a repeat of the 2020 season during which a record 30 named storms occurred, conditions are ripe for another lively season. The latest forecast from Colorado State's Tropical Meteorology Project calls for an active Atlantic-basin hurricane season, as current weak La Niña conditions are likely to transition to neutral ENSO conditions by late summer/fall. La Niña conditions in the Pacific influence hurricane activity in the Atlantic by lowering wind shear in the upper atmosphere, making it easier for tropical disturbances to intensify into hurricanes. The current warmer-than-average water temperatures across the Caribbean and sub-tropical Atlantic also factor into this year's prediction, as these conditions provide the fuel for intensifying developing storms. The net result is a seasonal forecast, which calls for an above average number of tropical storms, with a projected 19 named storms, 9 hurricanes, and 4 major hurricanes, with a 47% chance that one of those major hurricanes makes landfall along the east coast. For comparison, the 2012 (Sandy) early season forecast only called for 10 named storms including 4 hurricanes and 2 major hurricanes. Perhaps more relevant locally, the forecasted probability of a hurricane impacting New Jersey during the 2022 hurricane season is 11%, which is slightly higher than the long-term average of 7%. The likelihood of a major hurricane impacting the state, however, remains low, at approximately 1%. As is typical, the odds of impact are slightly higher in the southern part (Cape May, Atlantic, and Ocean Counties) of the state as compared to the northern part. New Jersey residents would be wise to remember, however, that it only takes a single storm to create catastrophic impacts. Hurricane Ida is the most recent example. Although originally a major hurricane, Ida weakened to a tropical depression by the time it reached New Jersey, yet the storm still caused tens of billions of dollars of damage and tragically several deaths. New Jersey residents are urged to heed the advice of the National Weather Service and State and local officials when a storm is approaching. Information on hurricane preparedness can be found on the NJ Office of Emergency Management website at: http://www.ready.nj.gov/plan-prepare/hurricanes.shtml.

Current Conditions

Overall, New Jersey enters this summer season with its beaches in good shape. The past four winter storm seasons have been relatively mild and the combination of this beneficial weather pattern along with continued efforts by federal, state, and local governments to bolster the State's beach through beach nourishment have contributed to the overall healthy state of New Jersey's beaches. As we come up on the 10th anniversary of Superstorm Sandy it is important that New Jersey continue to build on the progress made over the past decade in becoming more resilient. As we move towards an uncertain future impacted by climate change, it is certain that natural landscape features including beaches and dunes, maritime forests and coastal wetlands will all continue to play a critical role in achieving balance and resilience within the natural/built system.

New Jersey Sea Grant Consortium
22 Magruder Road Fort Hancock, NJ 07732
732-872-1300
njseagrant.org

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Cover photo - Benita Battaglia - Stockton Beach - Cape May