

Hurricane *Dorian* - Preliminary Assessment for Bogue Banks Oceanfront (9/6/19)

Summary Points:

- (1) **No significant dune erosion** along the entire ~25 mile long Bogue Banks oceanfront. Most sand fencing and posts at the base of the dune were not damaged as well.

Before and after photo SLIDESHOW – [CLICK HERE](#)

- (2) The Post-*Florence* Beach Nourishment Project ([Phase I](#)) was completed just over 4 months ago, which included a dune feature and placed 945,446 cubic yards of sand along eastern Emerald Isle and Indian Beach/Salter Path (5.2 miles). Additionally, +350,000 sea oats were planted along the dune crest (flat top of dune) and the dune slope – **there was very little damage to the dune plants** from *Dorian*.

BEFORE



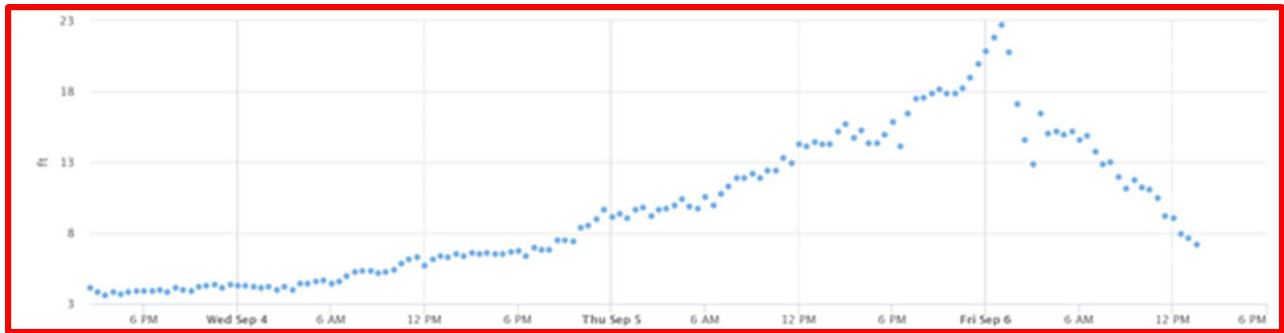
AFTER



- (3) **Sand may have been deposited at the intersection of the dune and berm; giving a visual appearance that the beach gained sand.** We will conduct a survey measuring the entire beach profile (subaerial and underwater) to ascertain changes in beach shape and volume.
- (4) ***Dorian* had a similar track, forward motion, and intensity as hurricane Matthew (2016) traveling in the west to east direction across Onslow Bay. And accordingly had a similar impact along the beaches.**

Offshore Waves, Storm Tide – The nearest wave buoy is located roughly 40 miles due south of Beaufort Inlet ([LEJ3](#)) and recorded a wave height of 23 feet on early Friday morning (9/6/19) as *Dorian* swept south of Bogue Banks (image below). The maximum wave height for the last

hurricane significantly impacting Bogue Banks was 28 feet (*Florence* 2018). *Florence*'s duration in Onslow Bay was much longer and the approach was from a different angle.



Storm surge is the wall of water being pushed by a hurricane in the northeast quadrant, while **storm tide** includes the additive or subtractive impacts of the tide. The magnitude of storm surge is predicated on numerous factors such as; storm intensity, forward speed, angle of approach, and slope of the continental shelf. The storm surge plus wave action drives peak erosion during hurricanes - at the present it is unclear what the actual storm surge and/or storm tide was for Bogue Banks. During large, short-term storm events; the U.S. Geologic Survey collects additional data (such as high-water marks and additional sensor deployments) to help document high-water events. The high water levels along the oceanfront and soundfront will be measured/surveyed and made available via <https://stn.wim.usgs.gov/FEV/#2019HurricaneDorian>. The high water mark measured along the oceanfront will represent the storm tide. The storm tide for *Florence* in 2018 along Bogue Banks was generally +9.5 feet NAVD 88, and it is reasonable to assume the storm tide for *Dorian* was a few feet less.

Surveying – Later this week, *Geodynamics, LLC* will mobilize and begin surveying 122 transects along Bogue Banks (spaced roughly 1,000 feet apart), which is part of one of the most comprehensive, annually surveyed beach monitoring networks in the U.S. The last survey was conducted in the Spring of 2019 prior to the hurricane season and will serve as our pre-storm survey. In addition to gaining a better understanding of how much sand was lost/eroded or gained during *Dorian*, we will be able to place this event in a greater long term context and utilize these data for the Phase II Post-*Florence* Beach Nourishment Project planned for this upcoming winter along the shorelines of west Atlantic Beach, Pine Knoll Shores, the State-area of Salter Path and a portion of western Emerald Isle including the Town's western regional access.

The Shore Protection Office has also contracted a licensed FAA drone operator to take video of the entire oceanfront of Bogue Banks and we will be conducting the drone flight this weekend. For the most part, the video will be taken from a perspective of ~45 feet above land and will be available soon at the Shore Protection Office's [YouTube Channel](#).

Photos

[All Pre Storm Photos](#)

[All Post Storm Photos](#)

[SIDE BY SIDE Before and After Slideshow](#)