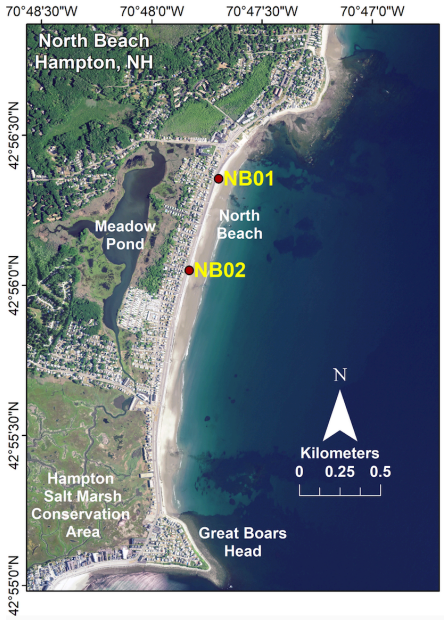
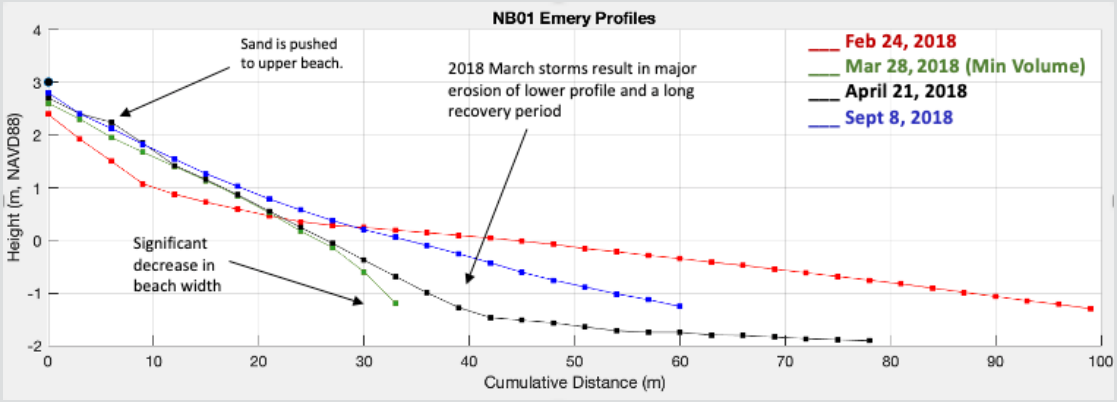
NH Volunteer Beach Profiling Report 2020

North Beach, Hampton, NH

North Beach 01

Beach profiling station NB01 has a low overall elevation, leaving it especially vulnerable to storm events resulting in erosion. The dunes that were historically located along North Beach have been replaced by residential homes, businesses, and large cement seawalls which extend nearly the entire length of the beach, reducing a major sand source. Sand dunes hold and maintain high volumes of sand which serve as natural protection against storms and erosion. Our data depict large ranges in beach elevation and volume, which suggests erosion is a significant problem at NB01.



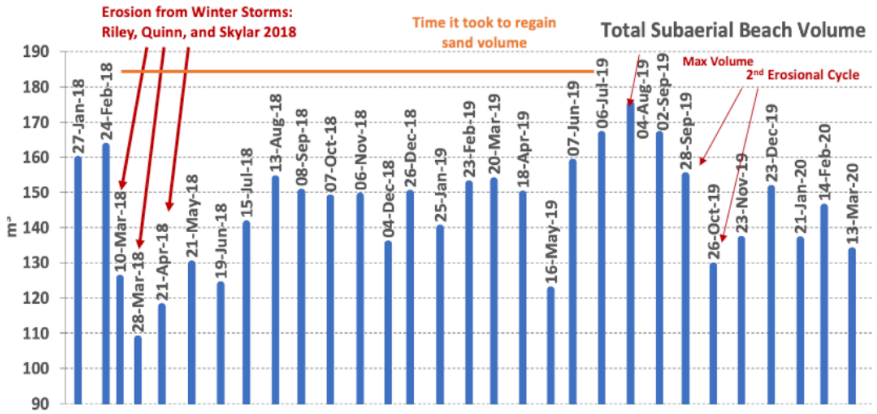


Storm effects and recovery

The figure to the left shows a beach elevation profile that extends from the seawall to the low tide line at profiling station NB01. Each color represents a significant profile date. The February 2018 (red) data depicts pre-storm beach conditions. The March 2018 (green) data depicts impacts of Nor' easters Riley, Quinn, and Skylar (March 1-14) indicated by the large loss of beach width and rapid elevation decline. The April 2018 (black) data depicts the beach beginning to recover with the return of the low tide terrace (lower beach). The September 2018 (blue) data displays the beach continuing to recover with the mid beach elevation increasing over a meter.

Changes in sand volume at NB01

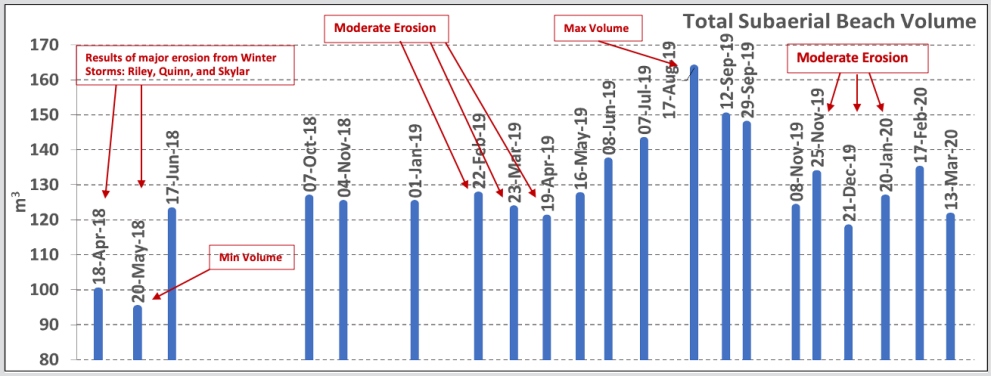
In the figure below/right, each blue column represents the estimated volume of sand along a 1-meter-wide swath of the intertidal section of the beach transect for each given date. Generally, the data depicts seasonal gains and losses. In March 2018, a large volume of sand eroded from the beach due to a series of nor'easters. It took the beach nearly a year to fully regain sand volume from those storm events. A second cycle of erosion occurred in September-October 2019 where NB01 lost sand volume, but then quickly regained it by December 2019. When the beach holds lower volumes of sand, the coast is more vulnerable to storm impacts such as flooding. High volumes of sand on the beach can help combat storm damages.



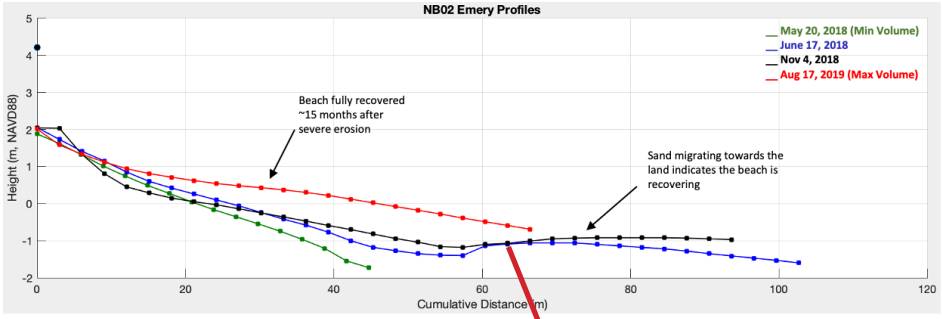
North Beach 02

Similar to profiling station NB01, station NB02 is very dynamic with ongoing losses and gains of elevation and movement of sediment. The overall elevation of North Beach is low, so even when it is healthy and gaining sediment, it remains highly vulnerable to the erosional effects of storms. Like NB01, small decreases in elevation can result in large increases in flooding.

Changes in sand volume at NB02



NB02 was significantly eroded during the March 2018 nor'easters. Gaps in the data exist for 2018 limiting our understanding of the recovery process. Moderate erosion continued in early 2019. The beach recovered and reached its maximum elevation and volume in August 2019, followed by consistent losses through December 2019. The continued erosion at North Beach, which lowers the overall volume of sand, makes it vulnerable to storms in the future.



Storm effects and recovery

NB01 and NB02 both follow similar impact and recovery patterns from the March 2018 storms. The beach profile at NB02 shown above from May 2018 (green) is extremely short due to the late winter 2018 nor'easters.

NB02 reached maximum volume in August 2019.

WHAT'S NEXT?

North Beach management options

- Construct living shorelines, or nature-based approaches to shoreline stabilization
- Nourish the beach with sand, potentially sourced from dredging projects
- Allow seaweed deposited by tides to remain to aid in building sand on the beach
- Conduct outreach on the importance of beaches and dunes in protecting the coast
- Explore the ecological history of the area to understand what landforms previously existed

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