



# 2022 Buxton Beach Renourishment

Project Update — July 15, 2022

Issue No. 1

*For updates and additional information, visit [MoreBeachToLove.com](http://MoreBeachToLove.com).*

## Construction Progress

The Buxton beach renourishment project officially commenced on **Thursday, June 30, 2022**. As of Friday, July 15, the contractor, Great Lakes Dredge & Dock Company (GLDD), has placed approximately 300,000 cubic yards (cy) of sand along the Buxton oceanfront, equivalent to 25% of the total project volume. Approximately 2,500 feet (ft) of the beach from Tower Circle to the ocean groin field near the original location of the Cape Hatteras Lighthouse has received nourishment sand. Pumping is currently proceeding north.



Photo taken on July 14, 2022.



Prior to the dredge's arrival, GLDD mobilized land-based equipment (dozers, front-end loaders, dump trucks, office shacks, fuel tanks, lighting plants, shore pipes, etc.) to the staging area located at the Buxton Beach Access parking lot. With construction going on, most of the equipment has been moved to and stored in the active construction zone.

GLDD chose to start the project with America's largest hopper dredge, the *Ellis Island*, after she had worked in Avon for 11 days

before coming down to Buxton. The dredge's first load was delivered in Buxton on the afternoon of June 30 near Cape Court. Before the dredge's arrival, a submerged pipeline had already been installed on the beach in that locality. Pumping proceeded south for the following 11 days, and construction reached the southernmost boundary of the Buxton project on Monday, July 11. Sand ramps over the shore pipes were built every 200 to 300 ft along the complete sections. The public used these ramps when crossing the shore pipes.

Photo taken on July 4, 2022.



Pumping approaching the southernmost project boundary on Monday morning, July 11, 2022.



After the southern section of the project area was completed, shore pipes were removed, and the newly nourished beach was graded and completely opened to the public on the morning of Tuesday, July 12. That afternoon, nourishment operations returned to the area near the subline landing point, and the pumping direction moved north toward the northern limit of the Village of Buxton.

**Construction started proceeding north toward the National Seashore. [Photo July 12, 2022]**



## Project History – 2017-2018 Initial Nourishment

Buxton's first beach nourishment project was completed between June 21, 2017, and February 27, 2018, along the same stretch of oceanfront as the 2022 renourishment project. The primary purpose of the 2017–2018 project was to provide a wider beach and buffer storm waves along this critically eroding section of Hatteras Island. It was designed to reduce the frequency of storm damage to N.C. Highway 12 and the existing community infrastructure. Approximately 2.6 million cubic yards of beach-quality sand was excavated from an offshore borrow area and placed along the 2.9-mile stretch of shoreline.



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Summer dredging was permitted for beach nourishment projects in the Outer Banks because of inclement wave conditions in the winter months. The contractor, Weeks Marine, elected to use a cutterhead dredge to start the nourishment on June 21, 2017. Construction lagged primarily due to rough sea conditions that frequently curtailed operations and led to mechanical breakdowns. Four named hurricanes (*Irma*, *Jose*, *Katia*, and *Maria*) impacted the project area in September 2017, producing wave heights significantly higher than the required safe operating conditions for a cutterhead dredge. The contractor started using a hopper dredge to continue the project in October 2017. Despite the intermittent work schedule, construction moved forward. As of December 22, 2017, nourishment in front of the narrow isthmus of N.C. Highway 12 was completed, and a highly vulnerable section of the road was protected.

**Pumping in front of the Village of Buxton on November 27, 2017.**



Buxton 2017-2018 ©SE

Despite all the delays, the 2017–2018 project was completed without sea turtle takes or other environmental incidents. Collaborations among the owner (Dare County), regulatory agencies (U.S. Army Corps of Engineers, National Park Service, and North Carolina Department of Environmental Quality), and the contractor remained excellent during construction. The Buxton project holds implications for other work in the Outer Banks. If summer dredging had not been permitted, the duration of construction could have been longer, and the road may have breached again during the subsequent hurricanes and storms.



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After project completion, the newly nourished beach withstood a series of nor'easters in March 2018. It also endured Hurricane *Florence* in September 2018, Hurricane *Dorian* in September 2019, and other winter storms without much interruption to N.C. Highway 12 traffic or damage to the Buxton oceanfront properties. However, nourishment sand was lost outside of the project area after each weather event since project completion, and Buxton returned to pre-nourishment conditions before the 2022 renourishment project was implemented. Some sand bags were exposed due to erosion, and property owners installed new sand bags as a temporary shoreline protection measure. The loss of dry beach made N.C. Highway 12 vulnerable to flooding and breaching once again.

**Orthophotography mosaic generated on March 25, 2022 during low tide showing little dry-sand beach and exposed sand bags on the oceanfront.**



## 2022 Renourishment to Protect N.C. Highway 12

Following the completion of the 2017–2018 initial nourishment, the Buxton project area became eligible for Federal Emergency Management Association (FEMA) post-storm beach restoration funding following declared disasters. To qualify for this assistance, FEMA requires Dare County (as the project owner) to establish a maintenance program involving periodic renourishment with imported sand to preserve the original design of an engineered beach. While the county was planning the maintenance renourishment, Hurricanes *Florence* and *Dorian* impacted the Outer Banks in September 2018 and September 2019 (respectively). Post-storm surveys confirm that approximately half a million cubic yards of sand was lost due to the storms, equivalent to ~20% of the volume placed during the 2017–2018 project.

Dare County decided to combine the county's maintenance project with FEMA's post-storm restoration project to achieve cost savings. The North Carolina Coastal Area Management Act (CAMA) and National Park Service (NPS) permits were issued by November 2021 in time for the construction bid opening. The U.S. Army Corps of Engineers permit was granted before the county's construction fund was secured in February 2022.



The 2022 renourishment is similar to the 2017–2018 nourishment in its construction method, construction window, and potential environmental impact but smaller in scale (ie – 1.2 million cubic yards in 2022 versus 2.6 million cubic yards in 2017). A significant difference between the two projects is the dune construction. No dune was constructed in 2017. The county is integrating an initial dune along the oceanfront to provide storm protection along this highly eroding area. The plan aims to establish uniform standards for Buxton to enhance dune growth and coastal resiliency. The typical dune crest elevation is at +13 ft NAVD (ie – about 13 ft above mean sea level and 6 ft above the normal dry beach) with a typical width of 20 ft. If a property is located seaward of the designed dune line, no dune is allowed to be built based on the CAMA permit condition. In addition, no nourishment sand can be placed under a house, and GLDD requires a 10-ft "no work buffer" around a property to protect the structure. Therefore, after nourishment, temporary ponds may occur under some properties where the natural ground level is a few feet lower than the constructed dry-sand beach. These ponds are expected to fill in naturally with sand and dry out as the water drains over the next few months.

Another main difference between the projects is the coverage of exposed sand bags. During the 2017–2018 project, the nourishment contractor was prohibited from using nourishment sand to cover sand bags based on CAMA's rules and regulations. If sand bags were exposed and situated within the fill template, homeowners had to truck in sand to cover those bags before nourishment. In light of the higher-than-normal frequent occurrence of storms and the accelerating erosion over the recent years, Dare County coordinated with the state and federal agencies and obtained permission to use nourishment sand to cover exposed sand bags in the 2022 renourishment project. This solution will significantly alleviate the potential expense that oceanfront homeowners may need to spend to cover their sand bags. It will also maintain the sand quality along the entire beach profile from the dune to the underwater portion of the project.



## Job Site Safety

Job site safety is GLDD's top priority. The general public is required to stay away from the active construction zone and keep off the shore pipes that are stored on the beach.

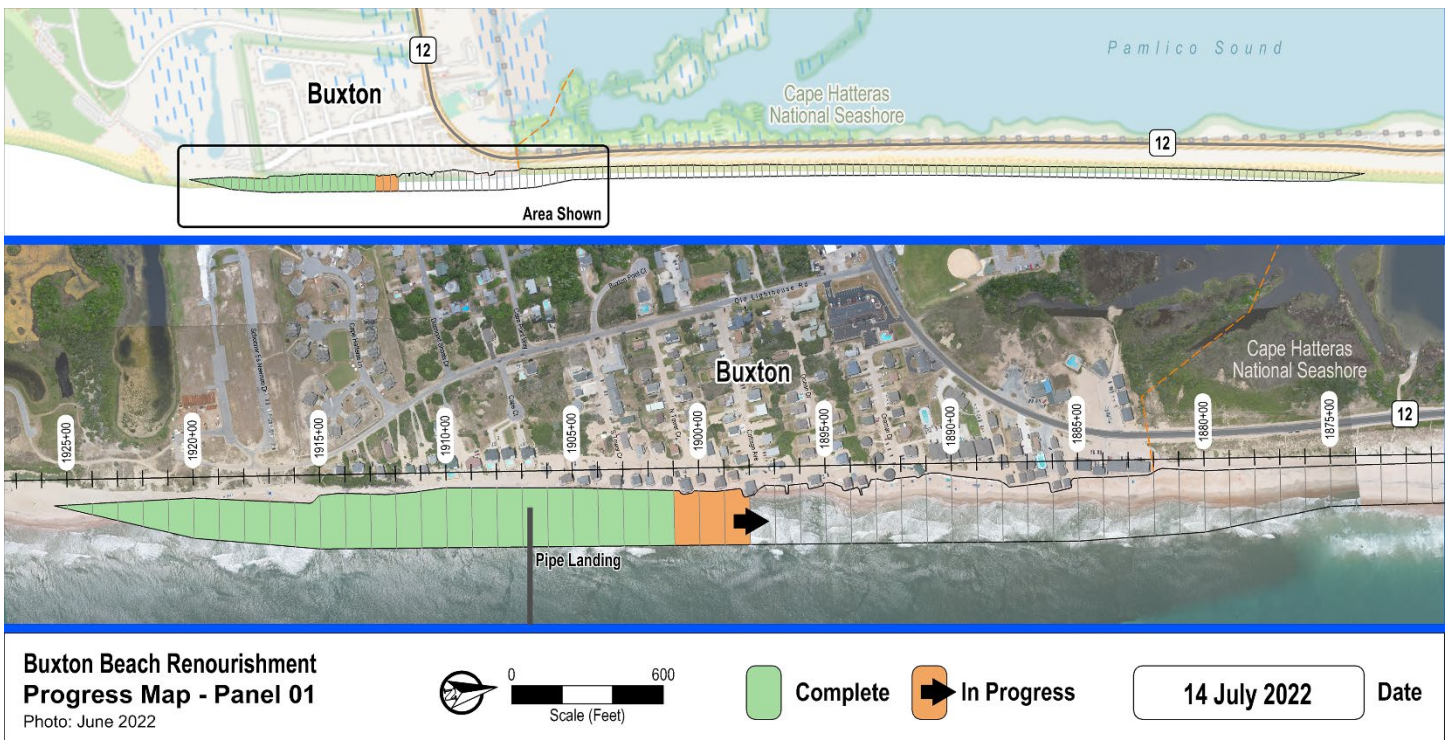


People can enjoy watching construction activities from a safe distance. [Photo July 4, 2022]



## Construction Schedule and Progress Map

The dredge currently on site is the *Ellis Island*, and it is scheduled to work in Buxton until reaching the pumping limit from the subline landing point near Tower Circle. The second hopper dredge, the *Liberty Island*, is expected to arrive at the Buxton job site by late next week after completing her work in Avon. GLDD currently anticipates completing the project by the end of August 2022.



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