Nags Head Geophysical Survey

geodynamics
AN NV5 COMPANY

Project Highlights

- HRG Survey conducted over the 2021-22 field seasons to secure a sand borrow site on behalf of the Town of Nags Heads for future beach nourishment needs.
- Innomar Med-100 parametric and SB-0512i (CHIRP) SBP data were integrated with previously collected vibracores to discern paleo-channel features and the extent of the base, surficial sand unit.
- HRG survey activities conducted aboard the *R/V Chinook* (Geodynamics) and *R/V Shearwater* (Duke University) - the latter enabling 24-hour operations.

Project Location

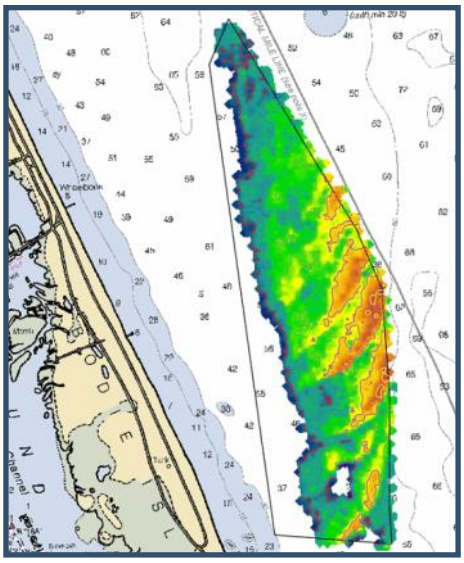
Nags Head, N.C.

Client

Town of Nags Head / Moffatt & Nichol

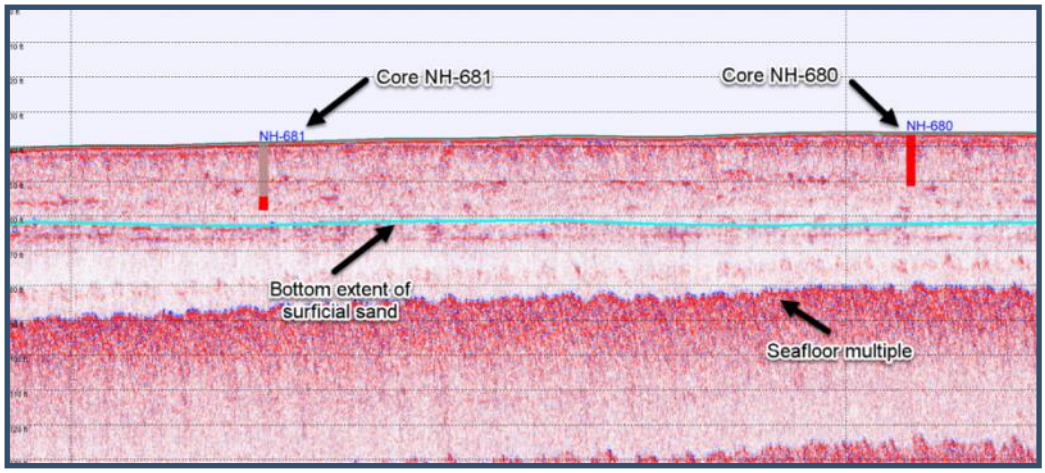
Project Description

Geodynamics was retained by Moffatt & Nichol to conduct a nearshore survey to help secure sand resources for the Town of Nags Head's future beach re-nourishment efforts. A High Resolution Geophysical (HRG) suite including multibeam echosounder sonar (MBES), side-scan sonar (SSS), magnetometer (MAG), and parametric sub-bottom profiling (SBP) technology was employed over the course of two field seasons to survey a +7 sq NM borrow site area in accordance with the State's regulations for beachfill projects (15A NCAC 07H .0312). HRG survey activities were conducted aboard Geodynamics' *R/V Chinook* and Duke University's *R/V Shearwater*.



Isopach map of the surficial basal sand unit quantified in the borrow area.

Vibracores previously collected within the borrow area were integrated into the SBP analysis, which enabled a clear "base sand" horizon to be identified and subtracted from the depicted seafloor. The X, Y depth points of the horizon were subsequently gridded at a 5 ft resolution to model the extents of the basal sand unit. An extensive network of paleo channels were also identified in the northern portion of the survey area.



Example of interpreted base horizon of surficial sand (Edgetech 512 processed data).