

III. SURVEY DATA COLLECTION

Beach profile surveys were conducted along the Town's shoreline by APTIM (formerly CPE-NC) in September 2013, May 2015, December 2017, June 2018, and May 2019. All surveys consist of a total of 38 profile transects with a spacing of roughly 1,000 feet along the Town's oceanfront beach (Figure 2). Survey data were collected along transects listed in Table 1. Coordinates shown in Table 1 are referenced to the North Carolina State Plane coordinate system in feet NAD83 and the profile azimuth refers to degrees referenced to true north. Transects listed in Table 1 are shown graphically in Appendix A – 2019 Town of Duck Topographic and Hydrographic Survey Report. Appendix A also includes detailed survey methodology, monument information, profile plots, profile digital photography, and field book notes.

The profile surveys used in this analysis were collected in September 2013, May 2015, December 2017, June 2018, and May 2019. The surveys extended landward until a structure was encountered or to a range 50 feet beyond the landward toe of dune, whichever was more seaward. Elevation measurements were also taken seaward along the profile to at least the -30-foot NAVD contour. Upland data collection included all grade breaks and changes in topography to provide a representative description of the conditions at the time of the work. The maximum spacing between data records along individual profiles was 25 feet. The upland survey extended into wading depths sufficiently to allow the offshore portion to overlap the upland portion by a minimum of 50 feet. More detailed information on survey data acquisition is available in Appendix A.

In May 2019, APTIM also conducted an initial nearshore shore parallel bathymetric survey between baseline station D-8 (south end of Blue Heron Lane) to baseline station D-19 (the northern boundary of the USACE FRF property). The reason for this bathymetric survey was based on surveys conducted offshore of the Kitty Hawk and Kill Devil Hills projects between December 2017 and October 2018 that identified deep depressions or troughs and shore oblique sandbars offshore of the project area. These features were not captured by the 1,000-foot spaced profile lines. Therefore, the purpose of the nearshore bathymetric survey for Duck was to determine whether features similar to those observed offshore of the Kitty Hawk and Kill Devil Hills projects were present in the vicinity of the Town of Duck beach nourishment project area. The total length of the survey area is 10,400 ft. (approximately 2.0 miles). Survey data were collected from approximately the -10 ft. contour out to approximately 3,000 ft. offshore with a survey line spacing at 200 ft. intervals and parallel to the shore.

Table 1. Profile Survey Baseline and Azimuth

Profile⁽¹⁾	Easting	Northing	Azimuth
PI-17	2950657.3	920098.9	70
PI-18	2951026.0	919175.4	70
D-01	2951387.5	918267.7	70
D-02	2951733.8	917384.4	70
D-03	2952103.0	916429.4	70
D-04	2952464.0	915495.3	70
D-05	2952849.3	914598.0	70
D-06	2953224.4	913696.9	70
D-07	2953607.3	912798.8	70
D-08	2953983.0	911897.9	70
D-09	2954356.7	910994.8	70
D-10	2954759.1	910066.7	70
D-11	2955158.1	909133.1	70
D-12	2955461.4	908412.5	70
D-13	2955874.3	907478.4	70
D-14	2956252.1	906578.3	70
D-15	2956628.6	905677.8	70
D-16	2956978.7	904767.7	70
D-17	2957333.7	903863.9	70
D-18	2957718.8	902886.5	70
D-19	2957932.5	902331.0	70
D-20	2958139.7	901760.7	70
D-21	2958472.1	900958.7	70
D-22	2958754.0	900228.8	70
D-23	2958992.7	899515.6	70
D-24	2959267.2	898739.8	70
D-25	2959601.7	897824.3	70
D-26	2959928.6	896902.3	70
D-27	2960250.6	895981.9	70
D-28	2960604.1	895073.0	70
D-29	2960963.6	894166.2	70
D-30	2961317.7	893257.6	70
D-31	2961676.7	892350.7	70
D-32	2962078.1	891379.4	70
D-33	2962439.4	890553.2	70
D-34	2962839.6	889616.1	70
SS-01	2963230.4	888697.7	70
SS-02	29636419.0	887775.8	70

⁽¹⁾ PI-Pine Island transects; D-Duck transects; SS-Southern Shores transects