



Figure 1. Project Location Map.

III. SURVEY DATA COLLECTION

Beach profile surveys were conducted along the Town's approximately 5.9 mile ocean shoreline in November 2011, September 2013, May 2015, and December 2017. These surveys were conducted to monitor the condition of the beach, analyze the vulnerability of existing development and infrastructure with respect to potential damages associated with long-term shoreline recession and impacts from coastal storms, and evaluate the performance of a beach fill completed in June 2017 along a portion of the Town's shoreline. Additionally, the database of beach profiles is used to calculate short and long-term volume and shoreline change rates and will assist in identifying patterns of volumetric and shoreline change along the Town's shoreline. The surveys consist of a total of 34 profiles with a spacing of roughly 1,000 feet. In addition, two profiles were surveyed both north and south of the Town limits to evaluate adjacent trends that might impact project formulation should these areas be included in future erosion mitigation plans. In all, a total of 38 profiles, encompassing 35,000 feet of shoreline, were surveyed as part of this project. 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 Figure 2 through Figure 5. The 2017 Town of Duck Beach Profile Survey Report is provided as Appendix A.

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/-197+12	2962839.6	889616.1	70
SS-01/-187+14	2963230.4	888697.7	70
SS-02/-177+13	2963619.0	887775.8	70

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



Figure 2. Profile Survey Baseline and Azimuth PI-17 to D-7



Figure 3. Profile Survey Baseline and Azimuth D-8 to D-17



Figure 4. Profile Survey Baseline and Azimuth D-18 to D-28



Figure 5. Profile Survey Baseline and Azimuth D-29 to SS-02

The profile surveys conducted by Aptim Coastal Planning & Engineering of North Carolina, Inc. (APTIM – formerly CPE-NC) in September 2013, May 2015, and December 2017, 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.