TOWN OF DUCK
2023 SHORELINE & VOLUME CHANGE
MONITORING REPORT

I. INTRODUCTION

The Town of Duck has implemented a long-term beach management program to sustain the beaches that support a significant portion of their local economy, maintain the tax base of the Town, retain existing recreational resources, and protect existing natural resources. In order to accomplish these stated goals, the Town is taking steps to maintain and monitor its oceanfront beach and dune to a configuration that provides a reasonable level of storm damage reduction to public and private development and mitigates long-term erosion impacts.

As part of the long-term shoreline management program, the Town of Duck, in cooperation with Dare County, constructed a large beach nourishment project in 2017 that placed approximately 1.26 million cy of sand along approximately 1.6 miles of the Town's shoreline. This area, referred to as the Central Reach project, extends from near station D-10 in the north, which is located near 128 Skimmer Way, to station D-19 in the south, which is located at the south property line of 137 Spindrift Lane (northern boundary of the USACE FRF property). The beach fill design for 2017 project in the Town of Duck included a 20-foot wide dune at elevation +20.0 feet NAVD88 fronted by a variable width berm at elevation +6.0 feet NAVD88. In 2023, the Town completed its first renourishment project of the Central Reach project. Approximately 576,800 cy were placed along the same area as the 2017 project. The beach fill design for the 2023 Central Reach project included a variable width berm at elevation +6.0 feet NAVD88 and a 10-foot wide dune that varied in elevation between +14.0 and +19.0 feet NAVD88 along the southern 1 mile of the Project Area.

The Town has implemented a beach monitoring program to track both the performance of the Central Reach beach fill project and the overall health of the beach along the entire Town. This monitoring report describes shoreline changes and volume changes measured along the Town's oceanfront shoreline. The monitoring report also includes the results of an updated storm damage vulnerability analysis using the latest May 2023 beach profile conditions.

II. PROJECT LOCATION

The Town of Duck is located on the Outer Banks of North Carolina roughly 27 miles south-southeast of the North Carolina and Virginia border. The Town encompasses 5.5 square miles extending along 5.9 miles of Atlantic Ocean shoreline from the Dare County and Currituck County line south-southeast to the Town of Southern Shores. The USACE Field Research Facility (FRF) is located within the Town limits between station D-19 and D-23 and is approximately 2.3 miles north of the southern limit and 3.6 miles south of the northern limit. A Location Map is provided in Figure 1. This location map also shows the limits of the Duck nourishment project (Central Reach), built along a 1.6-mile section of the Town's oceanfront shoreline.

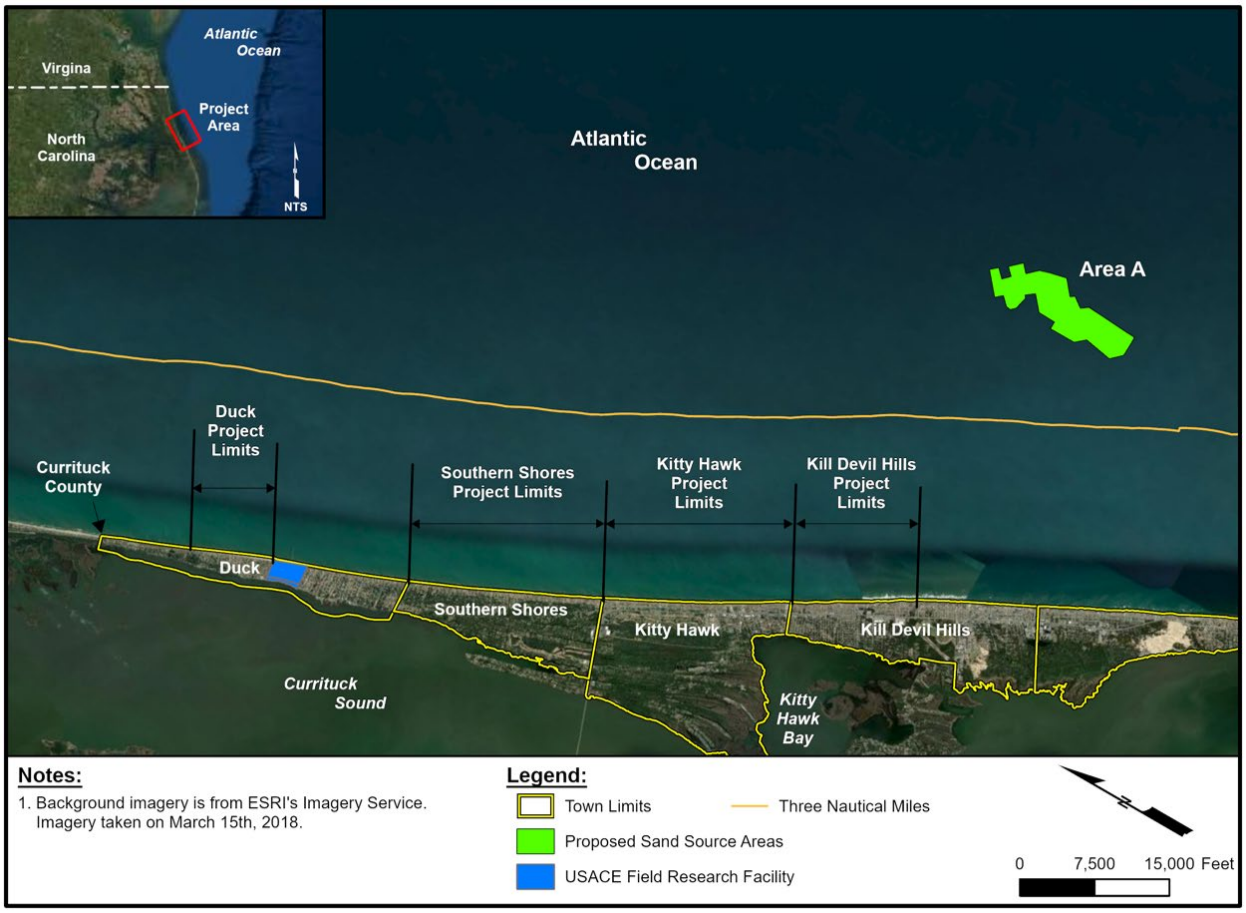

Figure 1. Project Location Map

For the purpose of monitoring, the oceanfront beach of Duck was separated into three areas: namely, the Central Reach Project Area, the North Monitoring Area, and the South Monitoring Area. These areas are depicted on Figure 2. The Central Reach Project Area includes the beach between the northern FRF property line, located near station D-19, through station D-10, which is near the northern end of Skimmer Way. The section referred to as the North Monitoring Area extends from station D-10 (northern end of Skimmer Way) north to the Duck town limits (station D-01). The area designated as the South Monitoring Area extends from station D-19 south to D-34 (located near the Duck town boundary with the Town of Southern Shores) and includes the shoreline along the USACE FRF property. Figure 2 also depicts the monitoring stations where the beach profile surveys were conducted.

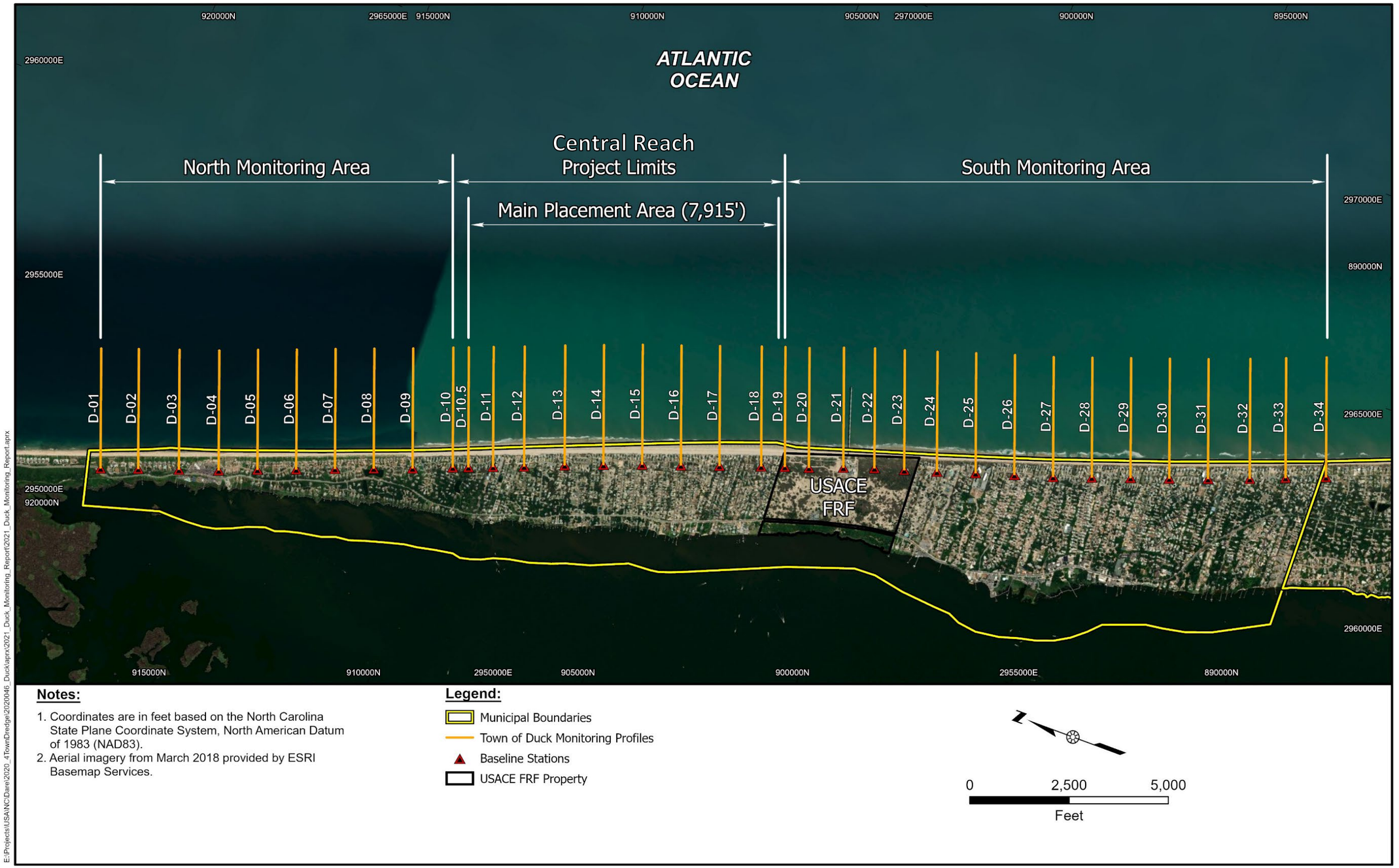

Figure 2. Detailed Project Area Map showing the North Monitoring Area, Central Reach Project Area, South Monitoring Area, and the location of the Monitoring Stations