

**Appendix D: Marine Archeology Study, Moored Buoys for Scientific Data Collection,
North Carolina, Outer Continental Shelf**



**MARITIME ARCHAEOLOGY DESKTOP STUDY
WOODS HOLE OCEANOGRAPHIC INSTITUTION
MOORED BUOYS FOR SCIENTIFIC DATA COLLECTION
NORTH CAROLINA, OUTER CONTINENTAL SHELF**

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In September 2022, SEARCH completed a desktop analysis in support of a research project the Woods Hole Oceanographic Institution (WHOI) proposed for the deployment of 10 moored buoys for scientific data collection. The project area is in federal waters between 24 and 80 kilometers (km) (13 and 43 nautical miles [nm]) off Nags Head, North Carolina (**Figure 1**). The buoys will be moored by simple anchors measuring approximately 3.5 meters (m) (12 feet [ft]) in diameter. A high-resolution geophysical survey will be conducted in 2023 to microsite the locations prior to installation.

Tetra Tech, Inc., contracted SEARCH to evaluate the proposed buoy locations to identify known, reported, and potential submerged archaeological resources in the vicinity of the project area. This pre-survey review provides WHOI an archaeological study area encompassing 1.6 km (1 mi) of the proposed buoy locations. The results will assist WHOI planning under the United States Army Corps of Engineers *Nationwide Permit 5 Scientific Measurement Devices* permitting process. SEARCH reviewed numerous databases to locate any documented submerged cultural resources in the study area. These databases include:

- Bureau of Ocean Energy Management (BOEM) Archaeological Resource Information Database;
- Global GIS Data Services, LLC, Global Maritime Wrecks Database (GMWD);
- National Oceanic and Atmospheric Administration (NOAA) Automated Wreck and Obstruction Information System (AWOIS);
- NOAA Electronic Navigation Charts Database (ENC);
- 2006 NOAA Aids to Navigation (NavAids) and the 2007 US Coast Guard (USCG) Hazards to Navigation database;
- Secondary sources relative to shipwrecks off the North Carolina coast.

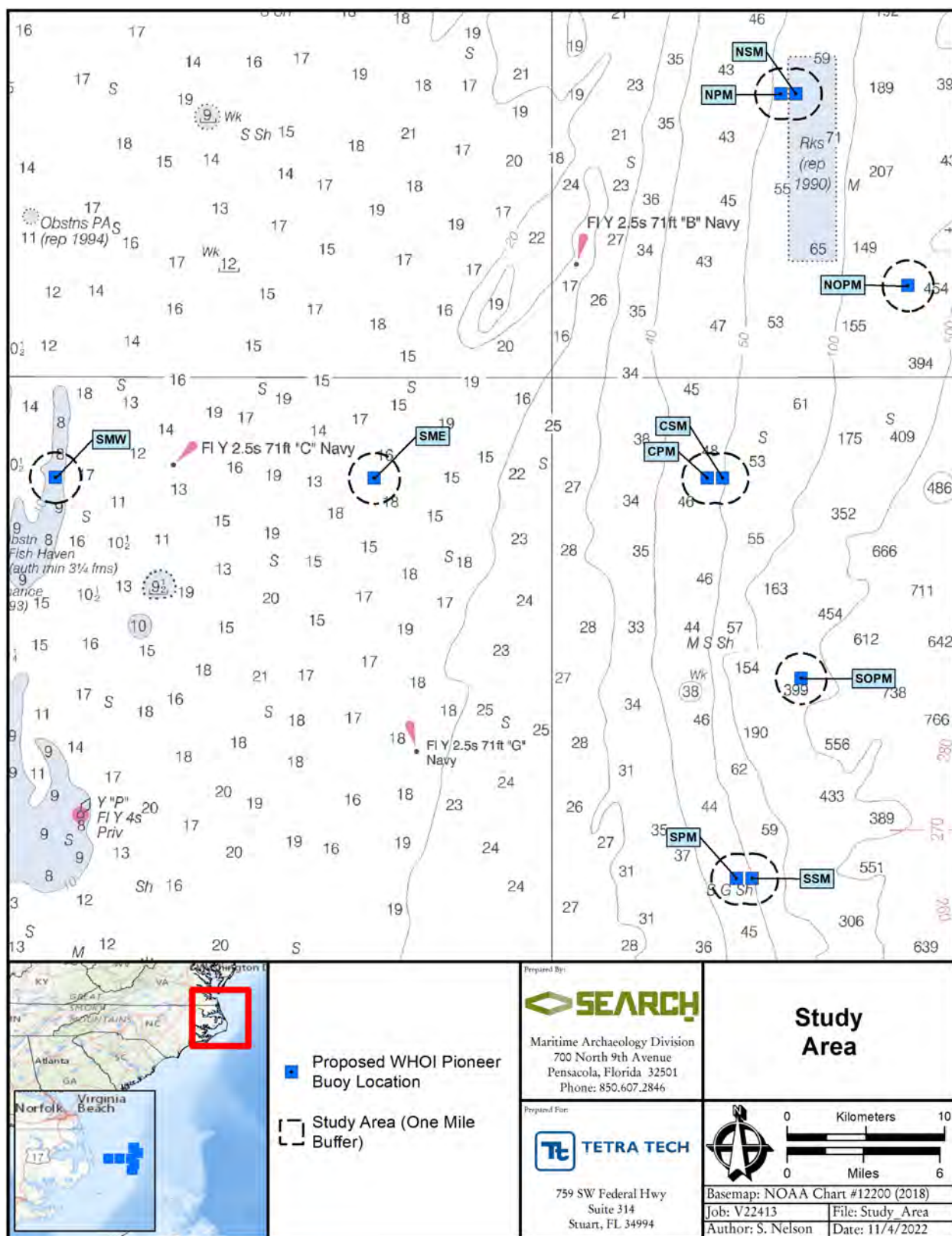


Figure 1. The proposed WHOI buoy locations.

ENVIRONMENTAL CONTEXT

To determine the likelihood of encountering archaeological sites in a particular region, archaeologists apply the knowledge that precontact peoples utilized specific landscape characteristics. Utilized landscapes include floodplains adjacent to river systems, due to their proximity to fresh water, and areas of higher elevation, which are ideal vantage points with dry soils. Evaluating the submerged coastal plains for these landscape features includes a review of regional climate, crustal geophysical shifts, sea-level changes, and shoreline migration. This analysis is essential for creating predictive models for human use of the offshore landscape (Merwin 2010).

The coastal plain of northeastern North Carolina is composed of surficial Quaternary sediments consisting of sand, clay, and gravel in a variety of fluvial and lacustrine environments overlaying a pre-Cambrian igneous basement. These deposits originate from the Eastern Slate Belt, which comprises the middle of the state, primarily metamorphic rocks with some igneous intrusions (Brown 1985). The easternmost of these belts are lower-grade metamorphic rock consisting of Greenschist facies with chlorite and biotite. Intermediate between the metamorphic belt and the coastal sediment plain are the Yorktown and Duplin Formations, which consist of fossiliferous clays interbedded with fine-grained, bluish-gray sand. The western margin of the Atlantic coastal sediment plain is known as the “Fall Line,” which is the boundary where the crystalline metamorphic rocks abut the younger sedimentary strata (Spangler 1950). Much of what is known about the stratigraphy of northeastern North Carolina is from initial oil exploration drilling by the Esso Standard Oil Company between 1945 and 1947.

The underlying basement dips from the Fall Line eastward to the coast and is directly overlain by undefined Lower Cretaceous sediments followed by the Upper Cretaceous Tuscaloosa Formation, which consists of gravelly sands and dark lignitic clays. The Eutaw Formation overlies this layer, consisting of variably colored sands and clay shales with lignite, pyrite, and glauconite. The Eocene is represented by glauconitic, clayey sands with shell limestones and coquinas and is well-dated due to the presence of foraminifera. However, the Oligocene was not represented in any drilled cores, likely because this period was an erosional environment offshore. The Miocene deposits are like those of the Eocene but with frequent phosphate nodules. These formations are overlain by Pleistocene and modern sediments (Spangler 1950).

The geological system of northern North Carolina’s Coastal Plain, from Cape Lookout to the Virginia border, consists of basal sediments of Pliocene age (about 5.3 to 1.8 million years in age) and surficial sediment deposits of Quaternary age (fewer than 1.8 million years in age) (Riggs et al. 1992). The proposed buoy locations are at the eastern edge of the Albemarle Shelf, a depositional basin characterized as an embayment on the central to southeast coast of the United States (Brown et al. 1972) (**Figure 2**). The basin is confined by the Norfolk Arch to the north and the Cape Lookout high on the northern flank of the Mid-Carolina Platform to the

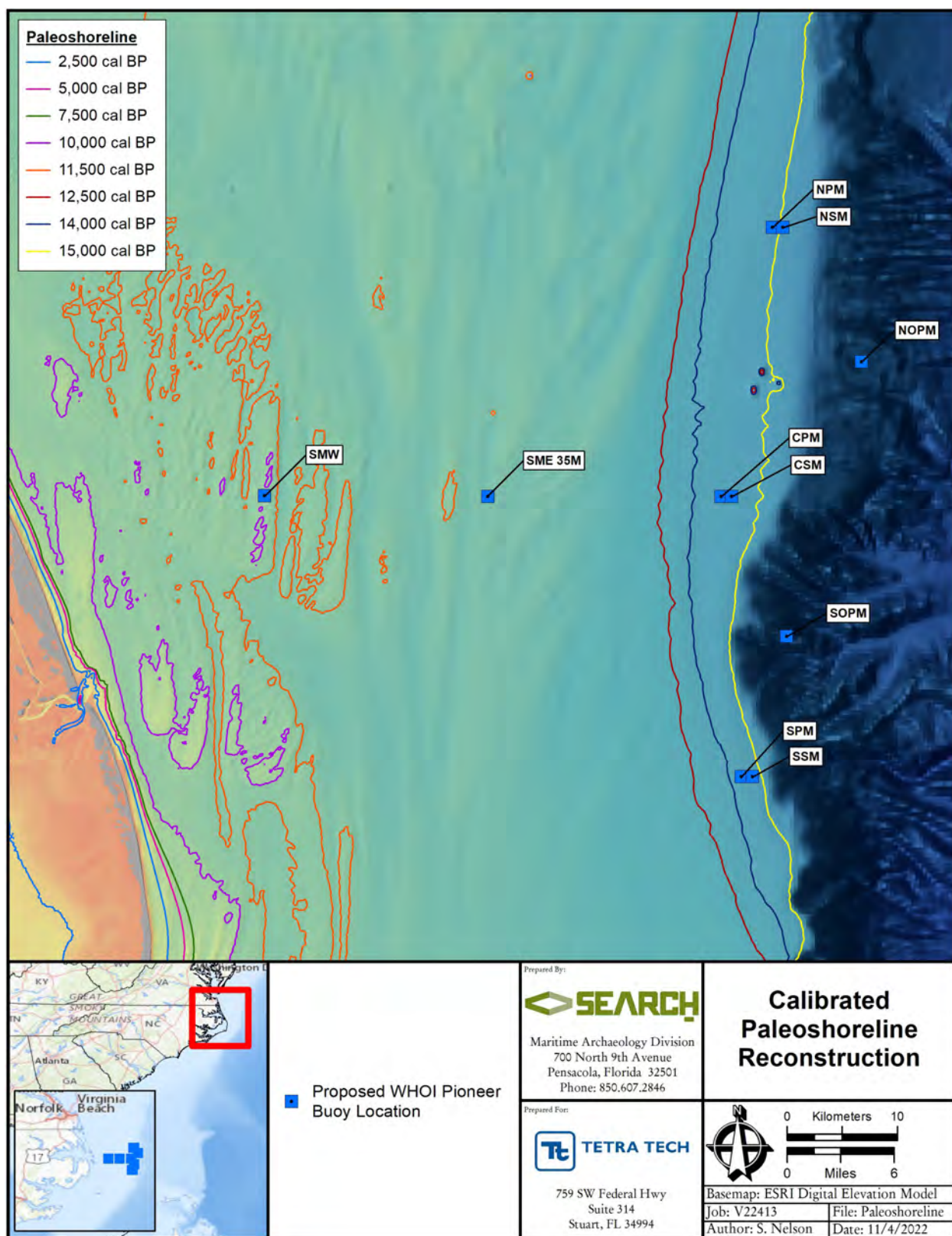


Figure 2. Paleoshoreline migration of the North Carolina Outer Continental Shelf.

south (Ward and Strickland 1985). The Pliocene sedimentary units are composed of several southward protruding sedimentary sequences, whereas the Quaternary deposits are mostly remnant beach features and paleo-channel fill from several fluctuations in sea levels during the past 1.8 million years (Riggs et al. 1992). Sediments that make up the Outer Banks, the formations on the offshore continental shelf and barrier islands east of terrestrial North Carolina, were supplied from three sources: paleo-fluvial channels, shoal complexes, and sand-rich Pleistocene sedimentary deposits (Thieler et al. 2014).

The overlying Quaternary sediments primarily consist of muds and slightly indurated muddy sand, sand, and peat that thicken northward to fill the subsiding Albemarle Embayment. The Quaternary deposits can be 70 to 90 m (229 to 295 ft) thick near major river drainages such as the Roanoke and Pamlico Rivers and Outer Banks barrier islands (Culver et al. 2011; Riggs et al. 1995). The northern embayment is dissected by a large fluvial drainage system incised during the last glacial maximum (LGM), around 24,000 calendar years before present (cal BP). A major paleo-fluvial valley, the Paleo-Roanoke River Valley, bisected the continental shelf and extended eastward from the region around Kitty Hawk, across the continental shelf, and toward the buoy locations. This now-submerged and -buried paleo-river valley was the sole Appalachian-sourced river drainage in the area (Thieler et al. 2014). The paleo-river valley is approximately 8 to 9 km (4.9 to 5.6 mi) wide and is incised to a depth of 57.3 m (188 ft) below sea level (Thieler et al. 2014). The Late Pleistocene to Holocene sediments associated with the LGM fill the paleo-Roanoke River valley (Mallinson et al. 2005; Sager and Riggs 1998). The more-recent late Pleistocene/early Holocene sediments are approximately 15 m (49 ft) thick (Culver et al. 2011) and tend to thin to less than 1.1 m (3.6 ft) below 12.8 m (42 ft) of water depth (Rice et al. 1998). The formation of the estuaries and barrier island system of North Carolina west of the project area began as early as 6000 cal BP as the rate of sea-level rise decreased and sea level approached present-day levels (Kopp et al. 2015; Mallinson et al. 2018).

During the LGM, approximately 24,000 cal BP, 5% of the Earth's water was locked within ice sheets in the northern and southern hemispheres. This caused the lowering of global sea levels by roughly 134.1 m (440 ft) (Lambeck et al. 2014). The reintroduction of fresh water into the oceans radically changed global sea levels and littoral (nearshore) landscapes. During the last 20,000 years, approximately 15–20 million km² (5.8–7.7 million mi²) of coastal landscape has been submerged worldwide, roughly the area of South America (Faure et al. 2002). The introduction of fresh water into the oceans also had global climatic ramifications. Oscillations in climate, coupled with sea-level rise, radically changed the landscape and ecosystem. Arid conditions severely affected freshwater supplies during the climatic shifts, making sources of water such as springs, streams, and rivers focal points for human occupation during those periods (Thulman 2009). The water shortage lowered water tables within the region, limiting major water sources to the springs and deeply incised river valleys, such as the Paleo-Roanoke River (Faure et al. 2002).

The paleoenvironment and paleoecology for North Carolina's Coastal Plain from roughly 14,000 cal BP to present-day climate conditions established roughly 3,000 cal BP, has been

reconstructed utilizing pollen analysis of sediment cores extracted from throughout the region. From the LGM to the end of the Younger Dryas, (23,000–11,600 cal BP), Coastal Plain forests were filled with cold weather fir (*Abies*), spruce (*Picea*), pine (*Pinus*), alder (*Alnus*), and a gradually increasing population of oak (*Quercus*) trees (Canuel et al. 2017; Spencer et al. 2017). The assemblage of pollen taxa indicate that the Late Pleistocene climate was much cooler and drier than present-day conditions (Sirkin et al. 1977). There also was an abundance of sedges (*Cyperaceae*) and grasses (*Poaceae*) on which megafauna such as mastodon (*Mammot*) and horse (*Equus* sp.) would have grazed upon (Eshelman et al. 2018). Evidence at sites across the Americas indicate that Paleoindian peoples frequently utilized mastodon and horse as a part of their subsistence strategy (Halligan et al. 2016; Waguespack and Surovell 2003; Waters et al. 2015).

By 14,000 cal BP, all but one of the buoy locations would have been inundated (**Figure 2**). During the Younger Dryas (12,900–11,600 cal BP) period, there was a marked increase in spruce and pine as climatic conditions became increasingly colder and drier (Carlson 2010). Sea levels were 60 to 65 m (197 to 213 ft) below present-day sea levels (Lambeck et al. 2014). The paleo-Atlantic coastline would have been approximately 39 km (24 mi) west of the easternmost project buoy. During this period, many of the megafauna, including mammoths and mastodons, became extinct (Perrotti 2018). The archaeological record also reflects major cultural changes that may have been a response to sudden climatic changes, as Clovis technology quickly spread throughout North America then abruptly disappeared (Waters and Stafford 2007). This abrupt climatic period was followed by warming temperatures and the replacement of spruce and fir by pine and hemlock by 9000 cal BP (Canuel et al. 2017). By this time, sea levels had rapidly increased to 18 m (59 ft) below modern levels (Engelhart et al. 2012). By 10,000 cal BP, the westernmost buoy location was inundated by sea level rise after the Younger Dryas.

From 9000 to 6000 cal BP, sedimentary and pollen data from lake sites in the southeastern United States indicate that the early to middle Holocene was significantly wetter than previously suggested (Grimm et al. 1993). Sea levels also had increased to 7.9 m (26 ft) below present-day levels (Engelhart et al. 2012). This period is characterized by high pollen percentages of tupelo (*Nyssa*) and oak (*Quercus*), but low percentages of pine (*Pinus*). Forests throughout the Southeast would have resembled those of swampy areas in present-day northern Florida. Additionally, 15 large flooding events were detected within sediment samples from the Little River in the upper North Carolina Coastal Plains. This rise in major floods increased fivefold as, on average, five floods were detected per 1,000 years compared to only six large flood events occurring since 6100 cal BP (one flood/1,000 years) (Goman and Leigh 2004). The increase in flooding events is associated with changes in atmospheric circulation related to shifts in the position of the Bermuda High, sea surface temperatures, and El Niño activity. The increase in tropical storms resulted in a greater than average precipitation for the surrounding region than is the case today (Goman and Leigh 2004). By 3500 cal BP, forests shifted to drier, deciduous forests, including oaks and members of the blueberry family, such as arrowwood (*Viburnum*) (Canuel et al. 2017), and sea levels had increased to present-day levels, submerging the study area (Engelhart et al. 2012).

In summary, the palynology data show changes across the Terminal Pleistocene/Early Holocene boundary from cooler and dryer climate species to a shift toward warmer and wetter species. All but one buoy location were fully inundated by sea-level rise by 14,000 cal BP. The westernmost buoy location was inundated by 10,000 cal BP. From 9000 to 6100 cal BP, temperatures ameliorated, and conditions were wetter than at present, with an increase in species such as tupelo, oak, cypress, and sedges. There is an abundance of charcoal in the sediments around 6000 cal BP when modern forest ecosystems emerged with drier climate conditions. The period of colonization is marked by a significant increase in ragweed (*Ambrosia*). Sediment cores collected from Jug Bay in the Chesapeake area span 1,500 years and show changes in trees and wetland taxa during the Medieval Warm period (approximately AD 950–1250). During that time, pollen of walnut (*Juglans*), a tree which grows in wet habitats, decreased dramatically while pollen of dry taxa, such as oak and holly (*Ilex*), increased. Similarly, there are large decreases in seeds of wetland plants such as wild rice (*Zizania*) and pickerelweed (*Pontederia*). The initial slow increase in ragweed is accompanied by a rapid increase in pollen of the high marsh arrowhead (*Sagittaria*), suggesting drier conditions probably due to sediment infilling of the marsh (Canuel et al. 2017).

NATIVE AMERICAN CULTURAL HISTORY

There are no confirmed precontact archaeology sites within the study area; however, the known presence of Native Americans populations in North America before 13,000 cal BP offers the potential for undiscovered sites to exist. The traditional model for the peopling of the New World argues that Asian populations migrated to North America over the Bering land bridge that linked Siberia and Alaska. These peoples then travelled to southern North America via an ice-free corridor between the Laurentide and Cordilleran ice sheets just before 13,000 cal BP (Fiedel 2000; Waters and Stafford 2014). However, archaeologists continue to identify sites that show clear evidence for human presence in the Americas by 14,000 to 15,000 cal BP (Dillehay et al. 2008; Halligan et al. 2016; Jenkins et al. 2012; Waters et al. 2015). More recently, evidence of humans living on the continent as early as 23,000 cal BP has been presented (Bennett et al. 2021). Human occupation of the Americas prior to circa (ca.) 13,000 cal BP requires alternative models for entry because the ice-free corridor remained closed prior to 13,400 cal BP (Heintzman et al. 2016). An alternative hypothesis for pre-13,000 cal BP migration routes includes populations traveling along the Pacific and Atlantic coasts using boats and following exposed shorelines (Anderson and Gillam 2000; Braje et al. 2017; Bradley and Stanford 2004; Faught 2008; Fladmark 1979). If humans were in the Americas during the LGM by 23,000 cal BP, then other possible routes of entry are available, including over land during the last interglacial period. In the Atlantic, sites that could be associated with coastal migration or oceanic boat use before ca. 4000 cal BP would now be inundated due to increases in global sea levels since the LGM.

The North Carolina–Virginia shoreline is estimated to have migrated across the buoy locations between 15,000 and 10,000 cal BP (see **Figure 2**). The submersion of the buoy locations by

approximately 10,000 years ago excludes Mid to Late Archaic-, Woodland-, and Contact-period occupation sites from being established on the associated paleolandscape (Engelhart et al. 2011). The following discussion highlights the precontact chronology for the buoy locations, including Paleoindian and Early Archaic period settlements and possible maritime use by later Archaic, Woodland, and Contact period populations.

Paleoindian Period (>14,500–10,000 cal BP)

Anderson (1995) has identified three Paleoindian periods: Early or Pre-Clovis (pre-15,000–13,250 cal BP); Middle Paleoindian (13,250–12,850 cal BP); and Late Paleoindian/Early Archaic (12,600–10,700 cal BP). The Paleoindian period is characterized by a distinctive set of fluted projectile points, including Clovis, Simpson, Suwannee, and Dalton Hardaway varieties. Paleoindian groups were mobile hunter-gatherers, likely organized in small bands or extended families. Most models suggest Paleoindian peoples were skilled hunters of big-game animals and utilized species such as mastodon and horse as part of their subsistence strategy (Halligan et al. 2016; Waguespack and Surovell 2003; Waters et al. 2015). Multiple sites and isolates in the region support this hypothesis for Paleoindian land use, mobility, and organization (Forman 2003; Lowery 2008; McAvoy and McAvoy 1997; Stanford et al. 2014).

The Cactus Hill site along the Nottoway River in Virginia and the Topper site on the terrace above the Savannah River in South Carolina are two potential examples of pre-Clovis sites regionally located near the buoy locations (Goodyear 2005; McAvoy et al. 2000; Miller 2010). These sites include Middle Paleoindian fluted Clovis points, lithic debitage, fire-cracked rocks, bone, charcoal, and pottery eroded along shorelines and in buried contexts. Lithic debitage and bifacial tools at Cactus Hill are present below the Clovis materials indicative of a pre-Clovis occupation (McAvoy et al. 2000). Broken chert material below the Clovis artifacts at Topper have been used to argue for a pre-Clovis occupation there (Goodyear 2005). Despite the presence of these artifacts, a pre-Clovis occupation at these sites is not commonly accepted. Most archaeologists attribute the pre-Clovis artifact ages and stratigraphic locations to relocation, poor dating contexts, and natural processes (Haynes 2015). Further offshore, a potential isolated Paleoindian biface was found. The Cinmar Isolated Find was located approximately 109.4 km (68 mi) off Virginia near the continental shelf break and approximately 63 km (39.1 mi) north of the northern buoy locations. Archaeologists associated the find with the Paleo-Susquehanna River (Lothrop et al. 2016). The biface and a mastodon skull were discovered by scallop fishermen in the 1970s. The mastodon skeleton was later directly dated to 27,000 cal BP (Stanford et al. 2014). The age of the remains and the loose contextual association with the mastodon skull have made this discovery highly disputed (Boulanger and Eren 2015; Eren et al. 2015; Haynes 2015). Yet, as there is building evidence for human presence in North America and the southeast by 15,000-14,000 cal BP (Halligan et al. 2016; Waters et al. 2018) it is likely that old sites are preserved on Virginia and North Carolina's continental shelves (Stanford et al. 2014).

Middle Paleoindian projectile point variants in the North Carolina Coastal Plain include Clovis points, Hardaway blade, and Hardaway-Dalton. Late Paleoindian variants include Hardaway side

notched. Some archaeologists view the Hardaway complex as a manifestation of the Early Archaic period, suggesting that the Hardaway types are the result of synchronic tool modification as opposed to diachronic change. However, most archaeologists agree that the other tools found in association with Hardaway Complex points, such as side- and end-scrapers, are very similar to Paleoindian tool assemblages (Ward and Davis 1999:42). As such, the Hardaway Complex could be a transitional Late Paleoindian/Early Archaic assemblage.

Settlement models derived from data recovered in the Piedmont suggest a Paleoindian settlement system focused on high-quality lithic material (Gardner 1977). This model, however, may not be applicable to the lithic-deprived Coastal Plain. Reid and Simpson (1998:33) suggest that a settlement model proposed by Dent (1995) for the Chesapeake region, which includes the Coastal Plain of Virginia, Maryland, and Delaware, is more applicable to the Coastal Plain of North Carolina. The model proposes two site types: regional residential bases and resource extraction locations, reminiscent of Binford's (1980) foraging system. The residential bases served as the "hub of subsistence activities," while the resource extraction locations functioned as lithic procurement sites (Binford 1980:9).

Archaic Period (ca. 10,000–3000 cal BP)

Following the Paleoindian period, climate at the beginning of the Holocene became warmer but remained dry. This period is marked by an increase in population, sedentism, and a change in the environment. Climatic change resulted in the boreal forests occupied by Paleoindian peoples to be replaced with northern hardwoods. Technologically, the early Holocene was the beginning of the Early Archaic period (10,000–8500 cal BP). Little is known about Early Archaic subsistence. Based on the recovery of bone and antler tools, white-tailed deer appear to have been an important species, both for tools and diet (Reid and Simpson 1988). Based on the location of sites within different environmental niches, additional terrestrial and aquatic fauna, such as small mammals and fish, and available floral resources, such as nuts and seeds, are suggested dietary staples (Daniel 2001).

Early Archaic Period (10,000 to 8000 cal BP)

Early Archaic (10,000–8000 cal BP) sites, like Paleoindian sites, are typically identified by the presence of diagnostic projectile points. As noted, some archaeologists view the Hardaway complex as a transitional Late Paleoindian/Early Archaic lithic assemblage, a viewpoint that is open to debate (Ward and Davis 1999). However, there are a series of points, based on definitive stratigraphic context in the Piedmont, categorized as Early Archaic. These include Palmer Corner Notched and Kirk Corner Notched types. Other tools include end-scrapers, side-scrapers, blades, and drills along with various bone and antler tools (Reid and Simpson 1998:34). This general tool assemblage is also found at archaeological sites on the Coastal Plain (Phelps 1983:22).

Early Archaic sites are small with a settlement pattern indicating residential shifts between floodplain and upland ecosystems (Steponaitis 1986:371). Daniel (1998:194) suggests that this

movement was most likely predicated on the availability of knappable stone as opposed to a drainage basin adaptation proposed by Anderson and Hanson (1988). However, Phelps (1983:24) suggests that Early Archaic site location in the lithic-poor Coastal Plain was based on stream accessibility.

Middle Archaic Period (8000 to 5000 cal BP)

The Middle Archaic (8000–5000 cal BP) is marked by the appearance of the Stanly Stemmed projectile point along with Morrow Mountain Stemmed and Guilford Lanceolate points (Ward and Davis 1999:73). Tool use also expanded to include atlatl weights, grooved axes, and notched pebbles. Middle Archaic settlement and subsistence patterns were very similar to the previous Early Archaic as groups continued to utilize local resources in the upland terraces and floodplains they occupied.

Numerous sites from the Middle Archaic period have been found along the eroded shorelines and ploughed fields of the region (Lowery 1999). These sites supported larger populations with increased regional dependency for materials and often bear evidence of the reuse of cemeteries, suggesting that the Middle Archaic was a time of higher territoriality and restricted mobility. During the Middle Archaic, modern coastal waterways and estuaries became inundated. Shellfish resources were available to the Middle Archaic cultures living throughout the Coastal Plain (Cronin 2000), although the archaeological procurement settings for shellfish and marine resources are now, for the most part, inundated and difficult to access. The use of marine resources also points to marine adaptations that may include the use of boats.

Late Archaic Period (5700 to 3200 cal BP)

The Late Archaic period is marked by a series of climatic changes from warm and wet conditions to warm and dry conditions to wet and cold conditions. At this time, sea levels increased to approximately 4 m (13.1 ft) lower than present conditions. Given this sea-level history, some Late Archaic sites surrounding the Coastal Plains may be buried below tidal marsh deposits in inundated upland settings (Lowery 2008).

Continued growth in population, regional differentiation, increased technological specialization, increased sedentism, the establishment of trade networks, and the intensified use of the forest and aquatic resources define the Late Archaic period (5700–3200 cal BP). Numerous Late Archaic sites along the Coastal Plain indicate the existence of long-distance trade and cultural influence from peoples living outside of the region. Artifacts, including ground slate knives, points, stone gouges, fishhooks, and old copper cultural items, were found at multiple sites throughout the region, indicating contact with eastern and western Great Lakes cultures (Lowery 2008).

Some of the earliest pottery and steatite vessels are from the Later Archaic. Fiber-tempered clay ceramics were produced at this time, predating steatite vessels in some areas (Sassaman 1993:180). The earliest expression of fiber-tempered ceramics in the Coastal Plain is the

Stallings series (Ward and Davis 1999:76). Exterior surface treatments included punctations, incising, and finger pinching. Stallings pottery is found throughout the southern Coastal Plain but is rare north of the Neuse River, leading Phelps (1983:26) to subdivide the Coastal Plain into north and south subregions. The Thom's Creek series, which is like the Stallings series in terms of exterior surface treatments, is a sand-tempered ceramic and associated with the Late Archaic. Late Archaic groups, however, did not abandon lithic technology. In the North Carolina Coastal Plain, the broad-bladed, broad-stemmed Savannah River type is the diagnostic projectile point of the period. Late Archaic groups also continued to use atlatl weights and grooved axes seen during the Middle Archaic.

During this period, settlements seem to shift from upland terraces and riverine valleys to estuaries and the mouths of major rivers (Ward and Davis 1999:75). In South Carolina, Georgia, and Florida, large coastal shell rings and shell sheet middens have been associated with the Late Archaic. These types of sites are rare along the North Carolina coast (Reid and Simpson 1998:39). Late Archaic sites in this area are reminiscent of earlier site types, including large, residential base camps and smaller resource extraction locations. The increased use of coastal locations also suggests a potential increase in boat use and on-water activities during the period.

Woodland and Contact Period (3200 cal BP–European Contact)

Woodland Period (3200 to 300 cal BP)

The Woodland period (3500–300 cal BP) is characterized by the widespread introduction of ceramics, the onset of maize cultivation, and the emergence of sedentary lifestyles and complex societies. There also was a continued population increase throughout the Coastal Plain region. The climate generally approached present-day conditions, which allowed subsistence resources to become more reliable as sea levels reached near-current levels. The cultural regionalization, typically reflected in ceramic assemblages, lead to a division of the Coastal Plain into northern and southern subregions. The northern Coastal Plain extends from the Neuse River north to the Virginia state line.

Early Woodland Period (3200 to 2400 cal BP)

The Early Woodland period (3200–2400 cal BP) is typically marked by pottery's common usage and subsequent common archaeological occurrence. Early minority pottery types in the Coastal Plain represent a southeastern tradition and include the fiber-tempered Stallings wares and sand-tempered Thom's Creek series. More common wares recovered throughout the Coastal Plain reflect a Middle Atlantic influence as evidenced by the frequent recovery of sand-tempered, cord-marked, and fabric-impressed ceramic sherds (Phelps 1983).

In the northern Coast and Coastal Plain, the Early Woodland period is known as the Deep Creek phase and is identified by the recovery of Deep Creek ceramics. The series was named for a small tributary of the Tar River where the complex was first recognized at the Parker site

(31ED29) (Phelps 1983:29). The Deep Creek series contains medium to coarse sand tempering with, in order of frequency, cord-marked, net-impressed, fabric-impressed, simple-stamped, and plain surfaces.

The Hamp's Landing series, a limestone- or marl-tempered ceramic, also has been associated with Early Woodland contexts (Hargrove and Eastman 1997:92). Surfaces are typically plain, simple stamped, fabric impressed, or cord marked. Associated lithic tools are somewhat limited and include the Gypsy point, thought to be a derivation of the Savannah River type, and the Roanoke triangular point (Phelps 1983:29).

Little is known about Early Woodland settlement patterns on the Coastal Plain; however, Phelps (1983:32) speculates that it was like that of the Late Archaic period. Reid and Simpson (1998:41) suggest that the Woodland settlement pattern proposed by Gardner (1982) in the Virginia Coastal Plain may be applicable to the southern Coastal Plain of North Carolina. The settlement model included two site types: large base camps and smaller resource extraction camps. The largest known sites are in transition zones between fresh and salt water (Stewart 1992), while smaller sites along streams were occupied seasonally.

Middle Woodland Period (2400 to 1200 cal BP)

The Middle Woodland (2400–1200 cal BP) period is known as the Mount Pleasant phase in the north. Mount Pleasant ceramics are tempered with medium sand and include “an occasional large particle of quartz sand” (South 1976:18) or “larger clastic inclusions” (Phelps 1983:32). Surfaces are cord marked, fabric impressed, or net impressed. Hanover ceramics, also associated with Middle Woodland contexts throughout the Coastal Plain, are tempered with crushed sherds or lumps of fired clay. Exterior surfaces also were cord marked and fabric impressed. Roanoke points, biface blades, abraders, celts, shell pendants, and gorgets have been associated with the Mount Pleasant phase in the northern Coastal Plain (Phelps 1983:33). North of the Virginia border, during the Middle Woodland period after 1700 cal BP, Mockley ware became the dominant Coastal Plain ware (Stewart 1992). Mockley ceramics are characterized by a poorly paddled paste, 20 to 30% of which is composed of unburned, crushed shell, usually oyster.

Settlement patterns during the Middle Woodland have been described as “dispersed,” marked by “a relatively high rate of residential mobility...” (Herbert 2002:302). Loftfield (1976) notes a shift from upland areas to bottomland sites, perhaps in response to increased plant cultivation, and estuaries for resource procurement. The number of shell midden sites also increases during this period. In the north, subsistence reflects a greater dependence on estuarine resources than in previous periods. Phelps (1983:33) suggests that small camps in the estuaries were used as shellfish-collecting stations, with hunting and fishing relegated to minor activities. Despite these activities, heavy and continuous warm-season fishing and clamming were documented at the Addington site in Virginia Beach (Whyte 1988). Deposits at this site date approximately from 1800 to 400 cal BP.

Late Woodland Period (1200 to 300 cal BP)

By the Late Woodland, agriculture had developed into a major subsistence activity, ushering in significant changes in precontact settlement patterns. The growing human population inhabited larger, more sedentary villages, participated in a new range of activities, and developed complex forms of sociocultural interaction (Turner 1992). The Late Woodland/Contact period (1200—300 cal BP) is divided into the Colington phase along the northern Tidewater and the Cashie phase within the interior of North Carolina's northern Coastal Plain and associated with historically documented Algonquian-speaking and Iroquois-speaking tribes, respectively. Colington-phase sites along the northern coast are identified primarily by the recovery of shell-tempered ceramics. In order of popularity, surface treatments are fabric impressed, simple stamped, plain, and incised. Additional artifacts include small triangular points, abraders, celts, bone pins and awls, fishhooks, shell hoes and picks, freshwater pearls, and shell beads (Ward and Davis 1999:211).

Settlements have been identified archaeologically and historically; however, settlement patterns remain problematic. Post molds associated with two Colington-phase longhouses and a palisade were uncovered in 1985 at the Amity Site (31HY43) east of Lake Mattamuskeet in Hyde County, North Carolina. The use of longhouses is supported in a historic context from accounts of European explorers and with the help of drawings by John White in 1585. White's drawings provide a very different view of village organization. The village of Pomeiock on the north side of the Pamlico Sound is a palisaded, circular settlement with numerous longhouses in the interior, while Secoton on the south side of the Pamlico River appears to be more of an elongated village with nucleated and dispersed sets of longhouses (Ward and Davis 1999:214–215).

White's drawings also show the use of charnel houses (mortuary vaults). Mass graves or ossuaries appear to have been a major part of the Algonquian burial complex; however, semi-flexed and bundle pit burials have been associated with Colington ceramics in Dare County, suggesting alternate burial practices (Ward and Davis 1999:216). Evidence for subsistence is also provided in the historic record. White's drawings of the village of Secoton show fields of corn in various stages of maturity (Ward and Davis 1999:215). In addition, Colington-phase site locations suggest the continued use of riverine, upland, and estuarine environments.

The Cashie phase is associated with the Iroquois-speaking Tuscarora in the northern, inner Coastal Plain. Most of the information on the Cashie phase comes from excavations at the Jordan's Landing site (31BR7) in Bertie County, North Carolina. Cashie ceramics are tempered with small pebbles that typically extrude through the interior and exterior surfaces. Surface treatments are fabric impressed, simple stamped, incised, and plain. Additional artifacts include numerous bone tools such as awls and perforators, shell beads, and small Roanoke and Clarksville triangular points.

Cashie burial practices were different than those along the coast. Cashie ossuaries typically contain two to five individuals, as opposed to the large number of individuals found in

Colington and White Oak ossuaries. Phelps (1983:43) suggests that the small number may reflect a sociopolitical organization focused at the village level. Based on the archaeological and historical record, Phelps (1983:43) defines the settlement pattern as small villages, farmsteads, and specialized camp sites. Subsistence data include hickory nuts, various species of mammals, turtles, turkey, mussels, and domesticates such as maize and beans (Phelps 1983:46). However, as of 1983, no complete Cashie structures had been identified (Phelps 1983:47).

Many Algonquian groups in the north were united under the rule of Chief Powhatan of the Chesapeake Bay region. By the beginning of the seventeenth century, the Powhatan chiefdom encompassed most of the Coastal Plain of Virginia and had a population of possibly 13,000 people. The first well-documented contact between Europeans and the Native American groups of the lower Chesapeake Bay occurred in 1570 (Strickland et al. 2016; Turner 1992).

POSTCONTACT CONTEXT

This section provides a maritime historic context of the proposed WHOI buoy project on the Outer Continental Shelf (OCS) off North Carolina. This context emphasizes the key events, people, places, and activities that have affected the maritime history of this region, from the period of European settlement in the early seventeenth century to present.

Contact Period

Bodie Island, a member of North Carolina's ever-evolving string of barrier islands known collectively as the Outer Banks, was first explored by Europeans during the mid-sixteenth century. In 1524, King Francis I of France commissioned Giovanni de Verrazano to discover the elusive Northwest Passage. Verrazano and his crew of the carrack *La Dauphine* departed Portugal on January 17, 1524. Following an arduous transatlantic crossing, the crew of *La Dauphine* made landfall on March 21 at a site dubbed "Selva di Lauri" (Forest of Laurels) in the locale of present-day Cape Fear, North Carolina. Verrazano initially turned south for approximately 225 mi before turning north to follow the Atlantic Coast to Newfoundland. On March 25, *La Dauphine* landed a party of 25 men to replenish the ship's dwindling supply of fresh water. Upon seeing an expansive body of water bordering the island's western shore, Verrazano determined that he was standing on the isthmus that divided the Atlantic Ocean from the long sought after "Oriental Sea" (Stick 1958:13). According to historians, Verrazano had in fact made landfall on North Carolina's Outer Banks within the vicinity of present-day Cape Lookout and Cape Hatteras. Thus, the Oriental Sea was in fact present-day Pamlico Sound. Verrazano would continue north, passing by the remaining islands of the Outer Banks before eventually reaching Newfoundland. Running low on supplies, Verrazano ordered his ship's helm turned east and back to European waters. He and the crew of *La Dauphine* returned to Dieppe, France, on July 8. Though his written observations would prove vital to subsequent explorers, his inaccuracy would haunt Europe for more than 150 years as many a resource would be spent endeavoring to find Verrazano's sea (Stick 1958:11–21).

Except for shipwrecked sailors in 1559 and 1564, the region of the Outer Banks remained devoid of foreign invaders in the succeeding years of 1524 (Stick 1958:14). That narrative was ended, however, in late summer 1566 with the arrival of the packet boat *La Trinidad* carrying two Dominican friars, 15 soldiers, and one baptized Virginia Native American named Don Luís. The expedition was the brainchild of Pedro Menéndez de Avilés, Spanish Governor of Florida, to further extend Spain's colonial reach into the Baya a de Santa Maria (present-day Chesapeake Bay). The proposal called for returning Don Luís, a native chieftain, to his homeland within the Chesapeake Bay region. Upon his safe return, it was expected that Luís would assume his place among his people and "champion the cause of Spain and Catholicism" (Vigneras 1969:403). The expedition sailed from San Mateo, Florida, on August 2 and arrived in present-day Chincoteague Bay on the August 14. However, strong winds forced *La Trindad* out to sea, and they did not reach the coast again for another 10 days. Unbeknownst to the Spanish, they were considerably further south than their initial landfall. The expedition entered what they believed to be a river but was in fact present-day Currituck Sound. The newly found "river" and its opposite banks were claimed for the King of Spain and dubbed San Bartolmé (Saint Bartholomew). The Spanish would spend the next three days exploring the river's banks, even going so far as venture seven leagues inland before Don Luís concluded the region was not the land of his people. *La Trindad* was provisioned and turned north before a hurricane forced the expedition to set sail for Spain. *La Trindad* arrived in Cádiz, Spain on October 23, 1566 (Vigneras 1969:398–414).

Despite continued Spanish interest in region, it was the English in 1584 that arrived with serious intentions to settle a permanent colony. On July 4, two English barks, *Bark Raleigh* and *Dorothy*, arrived under the combined command of Captain Phillip Amadas (*Bark Raleigh*) and Captain Arthur Barlowe (*Dorothy*). This expedition was seen as a preliminary step to exercising the power granted to Sir Walter Raleigh by Queen Elizabeth I on March 25, 1584 (Stick 1958:14). Under the proceeding Royal Charter of 1584, Raleigh was authorized to explore and establish dominion over any "remote, heathen and barbarous lands, countries and territories, not actually possessed of any Christian Prince or inhabited by Christian People [*sic*]" (Lillian Goldman Law Library 2008). The charter was not only viewed as potentially profitable entity for the budding British Empire, but also as a check to the growing Spanish presence in the New World. For Amadas and Barlowe's part, their collective mission was to explore the region and provide a detailed assessment regarding the area's potential for future colonization within the proceeding seven years (the length of the royal charter) (Stick 1958:14).

Upon sighting the coast on July 2, presumably within the vicinity of present-day Core Banks, the ships turned north and followed the shore approximately 120 mi. Two days later, the vessels reached a navigable inlet near present-day Jean Guite Creek, just north of present-day Kitty Hawk (Stick 1958:14). Upon navigating the treacherous inlet, the ships "cast anker about three harquebuz-shot within the havens mouth on the left hand of the same...and took possession of the land, in the right of the Queenes most excellent Majestie [*sic*]" (Barlowe 1584:2). After approximately six weeks of exploration and trade with local Native American tribes, the two vessels returned to Plymouth, England, in September 1584.

Upon reading the expedition's proceeding report, Raleigh decided to finance a second expedition to the North Carolina coast. Led by Raleigh's cousin, Sir Richard Grenville, the members of the expedition included approximately 600 men, 300 of which were soldiers, and various tradesmen, including carpenters, smiths, cooks, shoemakers, and at least one minister. Their collective mission was to establish a permanent settlement on the lands previously explored by Captains Amadas and Barlowe. On April 9, 1585, five vessels, including the refitted galleass *Tiger*, flyboat *Roebuck*, ship *Red Lion*, ship *Elizabeth*, and bark *Dorothy*, slipped their moorings at Plymouth, England, and arrived off present-day Ocracoke Island on June 26. Despite reaching their destination with most ships intact, the expedition experienced difficulties from the onset. Grenville's flagship, *Tiger*, had too deep a draft to navigate the narrow inlet leading to Pamlico Sound and subsequently ran aground on June 29. To further frustrate matters, much of the ship's cargo was destroyed in the crew's efforts to refloat the vessel, thus a years' worth of food was cut to roughly 20 days of rations. Following exploration of the county to the south and the west, Grenville and his party received permission from local Native American leaders to establish a settlement on the northern portion of present-day Roanoke Island (Stick 1958:16–17).

On August 25, Grenville departed the island with roughly 500 men aboard the *Tiger* and *Roebuck* with the intention of returning to England for additional men and much-needed supplies. He left command of the settlement and its 107 inhabitants to Sir Ralph Lane, who saw to the completion of a small fortification consisting of primitive lodgings within an earthen perimeter wall. Despite the colonists' perseverance, dwindling supplies and poor relations with local tribes plagued the colony for remainder of its short existence. On June 8, 1586, Sir Francis Drake arrived off the coast of the Outer Banks with an assorted fleet of 23 vessels following a successful cruise against Spanish shipping in the Spanish West Indies and Florida. Drake was prepared to offer assistance to the colony with whatever supplies and manpower the colonists required; but a three-day hurricane scattered the fleet and ultimately lead to Lane's decision to abandon his position on Roanoke Island. Lane and the remaining colonists boarded the *Bark Bonner* on June 19 and arrived in Plymouth, England, in July 1586. Ironically, a relief ship outfitted by Raleigh, and "fraighted with all maner of things [*sic*]," arrived off the coast of the Outer Banks in late June (Stick 1958:18). Upon finding Lane's fort abandoned, the ship was quickly repaired for England "with all the aforesaid provisions" (Stick 1958:18). Following in close succession, Sir Richard Grenville arrived with six ships boasting 200 colonists and supplies; however, he too found Lane's settlement abandoned. Unwilling to give up England's hard-fought position, he left 15 men behind with two years' worth of provisions (Stick 1958:19).

The following spring, Sir Walter Raleigh made a final attempt to capitalize on the Royal Charter of 1584. On May 8, 1585, the ship *Lyon* and her two consorts, a 20-ton flyboat and a 30-ton pinnace, departed Plymouth, England, with 150 colonists under the command of the artist John White. The small fleet arrived off the Outer Banks on July 22 with the intention of collecting the 15 men left behind by Sir Richard Grenville the previous summer and continuing to the Chesapeake Bay in the hopes of establishing the "Cittee of Raleigh [*sic*]" (Stick 1958:19). However, upon reaching the northern tip of Roanoke Island, White and his fellow colonists found Lane's fort demolished. Among the ruins lay the bare bones of a man believed to be one

of the 15 men left behind by Grenville. Following much debate, White reluctantly ordered his colonists to establish themselves in the remnants of Lane's fort with the resolve to make their stay permanent. Despite rebuilt homes and improved relations with local tribes, the colony required additional manpower and supplies if it were to survive as intended by Raleigh. The colonists elected then-Governor James White to return to England to "encourage and accelerate plans to resupply and reinforce the colony" (Evans 2006). White departed the colony on the *Lyon* on August 27, 1587 (Stick 1958:20).

Three years would pass before White returned to the northern tip of Roanoke Island. He returned not as the leader of a relief expedition, but as a passenger onboard the ship *Hopewell*, the flagship of privateering fleet under the command of John Watts. On August 18, 1590, White, Watts, and their fellow privateers found the colony all but abandoned. Further examination of the immediate area turned up no trace of the 117 inhabitants save the word "CROATOAN" carved into a post that once made up the fort's outer fence and the letters "C-R-O" carved into a nearby tree (Figure 3). Designs to conduct an extensive search of the area were abandoned following the approach of severe storms, which forced Watt's weather-beaten ships to return to England for repairs. The fleet arrived in Plymouth, England, on October 24, 1587. To this day the fate of the so called "Lost Colony," remains a mystery (Stick 1958:21).



Figure 3. An 1876 sketch of John White returning to the Roanoke Colony after a three-year absence to find the colony mysteriously deserted (Bryant and Gay 1876).

Colonial Period

In the aftermath of the Lost Colony, King James I of England chartered the Virginia Company of London in 1606 and tasked investors with establishing a permanent settlement in North America. As a result, the Jamestown settlement was established on the northern bank of the present-day James River on May 14, 1607 (Rouse 1972). The physical boundaries of the settlement began to expand as early as 1611 as colonists (those newly arrived and preexisting) sought healthier places to settle and potentially prosper. Further fuel was added to the fire of those desiring to relocate following John Rolfe's successful cultivation of tobacco in 1612 (Salmon 2010). Suddenly, colonists were not only in need of land, but land that contained well-drained soil with good aeration, essential characteristics for tobacco cultivation. In the proceeding years, colonial expansion slowly began to spread south and east of Jamestown. By 1653, colonists reached the banks of the present-day Albemarle and Currituck Sounds. Known as the Albemarle region, this remote area of land and water was the stuff of legend prior to the mid-seventeenth century. Early explorers and hunters to the region returned to the Virginia settlements boasting of the country's "glories and riches" (Connor 1919:23). An early visitor to the region named John Pory reported the region was "very fruitful and pleasant county, yield[ing] two harvests in a year"

(Connor 1919:23). Another visitor named Edward Bland declared “tobacco will grow larger and more in quantity than in Virginia” (Connor 1919:23).

To instill order over competing territorial claims within the Albemarle region, King Charles II of England granted the Carolina Charter of 1663 to eight of his most loyal supporters. Known as the Lords Proprietors, this group of men gained board authority over the land between the Virginia Colony and Spanish Florida. On September 8, 1663, the Lords Proprietors issued the new colony’s first land grant. The recipient was Sir John Colleton, a member of the Lords Proprietors, and the property deeded to him was an island known today as Colington Island. There, Colleton built a plantation that is widely considered the “first permanent settlement in the Banks area” (Stick 1958:22). In the proceeding years, the plantation would attempt to “grow tobacco, cultivate grapes and start a winery, and raise hogs.” However, it appears none of the ventures took serious hold, largely due to the island’s lack of soil development and instability. Colleton’s experience, however, did not stop other like-minded individuals from following suit, and by the early 1720s, the entire Outer Banks was in private hands, though most of the population was composed of individuals and families of “modest circumstances, who either squatted on the large holdings or secured grants for small tracts of their own” (Stick 1958:23). Overall, island residences primarily relied on marine life, including fish, and water flow for sustenance and more than likely maintained a small garden for supplemental means (Stick 1958:22–25).

While the soil was unfavorable to support large-scale crop cultivation, the islands offered its diverse population other means to turn a profit. Dead whales routinely washed ashore, and from them, inhabitants extracted oil and bone. These humble beginnings turned into full-fledged industry following the influx of New England whalers to the region as early as 1715 (Stick 1958:24, 33). With them came the introduction of offshore whaling techniques, and by 1730, the Kingdom of Great Britain was importing on average roughly 656 imperial gallons of whale oil from Carolina (Reeves and Mitchell 1988:4). Additionally, the region’s remoteness and inaccessibility to outsiders provided “excellent natural grazing lands without requiring fencing,” thus stock raising quickly became an important occupation for early inhabitants. While this livelihood proved profitable, the introduction of animals such as “cattle, horses, hogs, and sheep” further contributed to the Outer Banks instability, thus accelerating the island’s erosion via wind and water (Stick 1958:33).

In addition to providing natural boundaries for livestock, the islands’ seemingly impassable barriers provided inhabitants with yet another occupation, though this one was potentially more lucrative albeit sporadic. Wrecking became synonymous with the Outer Banks in the years leading up the eighteenth century. This unsavory characteristic became a national reputation following the incident of the HMS *Hardy* in 1696. A swift frigate of the Royal Navy, *Hardy* was allegedly driven ashore between Roanoke Inlet and Currituck Inlet and looted by locals, “who got some of her guns ashore and shot into her sides and disabled her from getting off” (Stick 1958:23). Pirates, those known and otherwise, also took advantage of the region’s natural asylum. In the waning years of the “Golden Age of Piracy” (roughly 1713 to 1718), notorious sea rogues such as John “Calico Jack” Rackham and Edward “Blackbeard” (Figure 4)

each utilized the Outer Banks as a rendezvous from which to terrorize coastal shipping lanes. Practicing hit-and-run tactics, these raiders and their crews relied on captured merchantmen such as sloops and schooners to ply their trade. These sleek, shallow drafted vessels came equipped with ample cargo space and were easily modified to carry heavy armament, which the pirates used to deadly effect (Konstam 1999:7–77). The problem became so significant and far-reaching that Virginia Governor Alexander Spotswood was forced to intervene without the knowledge of North Carolina Governor Charles Eden. On November 17, 1718, Spotswood sent the provisional sloops *Ranger* and *Jane*, under the command of Lieutenant Robert Maynard and manned by Royal Navy sailors, to the Outer Banks. At dawn on November 22, Maynard engaged Blackbeard and the crew of the sloop *Adventure* off Ocracoke Island. The ensuing action resulted in the death of Blackbeard, whose severed head was suspended from the bowsprit of *Ranger* as a grisly trophy of Maynard's victory. The engagement, commonly referred to as the Battle of Ocracoke Inlet, ended both the "most notorious pirate of them all" and the golden age of piracy (Rankin 1994:55–61).



Figure 4. An eighteenth-century portrait of Captain Edward Teach, also known as Blackbeard. The ship in the background is believed to be his flagship *Queen Anne's Revenge* (Nicholls 1726–1765).

Albemarle policymakers, free from the burden of the pirate menace, were eager to establish permanent communities on the Outer Banks to facilitate greater regional commerce. However, many of the proposed settlements, such as the Town of Carteret on Roanoke Island in 1723 and the town of Portsmouth on Ocracoke Island in 1734, failed to physically materialize until the 1750s, if at all. Though these locations were hardly the foundation for a town, scanty accommodations were made to station experienced maritime pilots to assist incoming vessels to commercial hubs such as Edenton and Bath Town (Stick 1958:40–43).

While policymakers were busy laying the groundwork for anticipated communities, opportunistic individuals, both near and far, were buying up what remained of the available land on the Outer Banks. One of the more notable land grants was deeded to a resident of nearby Alligator River, Matthew Midget. In 1722, Midget purchased all 1,900 acres of Bodie Island, which at the time was a 9.5 mi strip of land bracketed by Roanoke Inlet to the north and Chickinacommock Inlet to the south. Later that year, Midget and his family moved to the island and established one of the first permanent settlements near the site of the Lost Colony in more

than a century. Midget died at his residence on Bodie Island in 1734, but he left behind four sons to carry on his family name and ensure the survival of his investment for later years f(Stick 1958:277).

Further colonization of the Outer Banks stopped temporarily when war between the empires of Britain and Spain came to the area in the spring of 1741. Known collectively as the War of Jenkins' Ear (1739–1748), Spanish privateers arrived due the conflict, including a “large, high stern black sloop” in late April 1741 (Stick 1958:35). By early May, the Spanish vessels had “captured a total of six vessels, including two registered at Edenton” (Stick 1958:35). The Spanish would continue periodic raids of the Outer Banks and harassing English shipping along the coast until the cession of hostilities in 1748. Their final raid culminated in the burning of Brunswick Town on the western bank of the Cape Fear River, just south of present-day Wilmington, North Carolina (Stick 1958:37). Though the damage from the conflict was relatively minimal on the Outer Banks, North Carolina Governor Arthur Dobbs pushed forward plans to establish fortifications at Beaufort and Ocracoke Inlets. Fort Dobbs at Beaufort Inlet was never completed and thus was never garrisoned. Fort Granville at Ocracoke Inlet was completed in 1756 and garrisoned the following year. Though the fort was abandoned less than 10 years later, its garrison's need for local amenities and accommodations paved the way for the development of nearby towns Portsmouth and Pilot Town (also known as Ocracoke Village). These two villages were the largest communities on the Outer Banks on the eve of the American Revolution in 1775 (Stick 1958:35–43).

Revolutionary War

In the aftermath of the French and Indian War (1754–1763), the Kingdom of Great Britain made repeated attempts to levy taxes against its 13 American colonies to alleviate the heavy debt incurred during the conflict's campaigns. These policies coupled with the colony's overall attitude and various responses toward them resulted in the outbreak of war on Lexington green on April 19, 1775. At the commencement of hostilities, Britain's Royal Navy boasted approximately 150 ships and was considered to be the superior maritime fighting force in the world (Clodfelter 2017). Playing the role of David to the Royal Navy's Goliath was the newly created Continental Navy, which did not possess a single vessel at the outbreak of war. Thus, the Continental Navy was forced to purchase armed merchantmen while simultaneously launching frigates inferior in both design and armament to those of its adversary (Holland 2000).

As a result of the Royal Navy's overwhelming nautical superiority, the British Admiralty predictably responded with “a naval blockade—designed not only to cut off the colonies from Europe and the Caribbean but also to sever intercolonial commerce” (Davis and Engerman 2006:59). However, in the roughly eight and a half years of war, the Royal Navy could never fully accomplish either facet of its assignment. For one, the British commanders, which include the likes of Lord Richard Howe, never seemed to have enough ships to cover the entirety of the American coast. In fact, the largest contingent of vessels attached to the North American station at one time was 90 ships of various types. While this amount appears adequate to

institute a formidable blockade, the actual number of ships at sea never equaled the number of ships available on paper. This discrepancy was largely due to the reality that wooden ships are forever in a state of decay, thus requiring constant repairs. The issue regarding a lack of ships on station was further compounded on March 18, 1775. On that date, the Continental Congress approved the commissioning of privateers and provincial naval vessels to harass British vessels. During the war, some 2,000 vessels were granted letters of mark and reprisal (Daughan 2016:37–43). It is estimated that American ships captured approximately 3,100 British merchantmen (Daughan 2016:37–43).

The colony of North Carolina, particularly the Albemarle region, quite possibly proved to be the greatest thorn in the side of the Royal Navy. As a whole, North Carolina was notorious for its liberal policies regarding privateering. Sailors of privateers fitting out in the colony were authorized to keep “one half of the goods taken from merchant ships” (Feyerabend 2019:5). In the event a privateering crew captured a British vessel, they could “split the bounty among themselves, minus a fee” (Feyerabend 2019:5). In addition to these appealing incentives, crews based in the Albemarle region had yet another reason to put to sea early and often: the Outer Banks, long cursed as a physical barrier responsible for stunting the development of a region, now acted as a natural seawall against opposing forces. This increased the odds of successful privateering activities against the brute strength of the Royal Navy. For the duration of the war, the ports of the Albemarle, Currituck, and Pamlico sounds remained open for commerce. Much-needed supplies and war material poured through the narrow inlets of the Outer Banks. Allied vessels running in and out of Ocracoke Inlet were considered the best hope for getting supplies to Washington’s beleaguered army at Valley Forge during the winter of 1777 (Stick 1958:45).

Despite their precarious situation, the British did what they could to stifle American trade and discourage support for the patriotic cause among the Outer Banks’ inhabitants. From 1775 to 1782, Royal Navy ships routinely took station off the various inlets of the Outer Banks, capturing numerous merchant craft in the process. In addition to the ships offshore, Royal Marines conducted frequent raids of the Outer Banks’ settlements. Most of these activities involved livestock looting, much to the chagrin of the livestock’s owners, but resistance was often met with violence and destruction of property. In response to these affronts, the North Carolina Provincial Congress recommended “six companies be stationed along the seacoast between Virginia and South Carolina” (Delaney 1959:4). By the end of 1776, five companies of provincial troops were sent to the Outer Banks and stationed at strategic locations: “one between Currituck and Roanoke Inlet, one at Ocracoke Inlet, one between Ocracoke and White Oaken Inlet, one between Bogue Inlet and new River Inlet, and the last to be stationed between New River and Deep Inlet” (Delaney 1959:4). In addition to the troops ashore, two row galleys were pledged to the defense of the Outer Banks by Virginia’s General Assembly. Only one galley, the *Caswell*, was completed and sent to Ocracoke Inlet, where it served until it sank due to poor maintenance in 1780. The final defensive measure employed on the Outer Banks was the construction Fort Hancock at Cape Lookout in 1778. Erected using earth and logs, Fort Hancock boasted at least six cannons and included “barracks, powder house, and well” (Stick 1958:59). The fortification, however, never saw significant action, and its garrison was removed by the end of 1781. By that time, the British had met a disastrous defeat at the hands

of American and French forces at Yorktown, Virginia. This long sought-after Allied victory effectively brought the British war effort in the 13 American colonies to a close (Grant 2008:171).

Figure 5 is a 1776 map of the North Carolina coast created by B. Romans of London, England. As described above, the waters off the coast of the Outer Banks was anything but quiet during the years of the American Revolution. During this time, Allied privateers and Royal Navy warships and auxiliary vessels would continuously traverse the project area. Despite leading raids and establishing a loose blockade, the British never completely closed the Outer Banks to the American war effort.

War of 1812

In the immediate aftermath of the Revolutionary War, approximately 1,000 people lived in the Outer Banks. While the islands remained scantily developed even by eighteenth-century standards, the foundations for present-day villages such as Kitty Hawk were very much in place in 1783. As for regional occupations, little had changed over the last century. Piloting remained the staple source of income for most inhabitants of Portsmouth and Ocracoke Village. Elsewhere on the Outer Banks, locals attached several occupational titles to themselves, including farmer, planter, stockmen, mariner, and whaler. Except for the pilot title, most residents assumed all occupational titles. Residents “raised garden stuff for the table, owned stock which grazed on the open Banks range, caught their own fish, dug their own oysters, and clams, put up their own houses, built and sailed their own boats” (Stick 1958:73). Even the old occupation of wrecking found its way into the late eighteenth century when locals became instant beachcombers upon learning an ill-fated ship was pounded to pieces on the island’s ocean side (Stick 1958:72–73).

In the waning years of the eighteenth century, the world around the Outer Banks once again descended into a state of war. In 1792, the French Revolutionary Wars commenced, and with them came a disruption in global trade as belligerent European nations attempted to disrupt each other’s supply chain. At the onset of hostilities, the United States remained neutral, but this policy soon drew the ire of both sides, and restrictions were placed on American maritime commerce (Lipsey 2000). By 1812, belligerent nations repeatedly violated the rights of US ships and sailors, even those of the American Navy (reestablished in 1794). America’s desire to protect its maritime prerogatives coupled with its western territorial expansion led to a declaration of war on the United Kingdom on June 18, 1812 (Springer 2017). Once again, America found itself badly outmatched in the maritime theater of war. Britain’s Royal Navy had approximately 800 warships in commission on the eve of hostilities, whereas the recently revived United States Navy had just 16 commissioned warships (Black 2008). What the US Navy lacked in quantity, however, it more than made up for in quality. Six of the warships were Joshua Humphreys’ famed six frigates: USS *United States*, USS *Constellation*, USS *Constitution*, USS *Chesapeake*, USS *Congress*, and USS *President*. Their unique construction and heavy armament allowed them to overpower the inferior frigates of the Royal Navy in ship-to-ship action. This disparity allowed the US Navy to enjoy relative success in the war’s first year (Toll 2008). American privateers, revived by act of Congress on June 26, 1812, also contributed

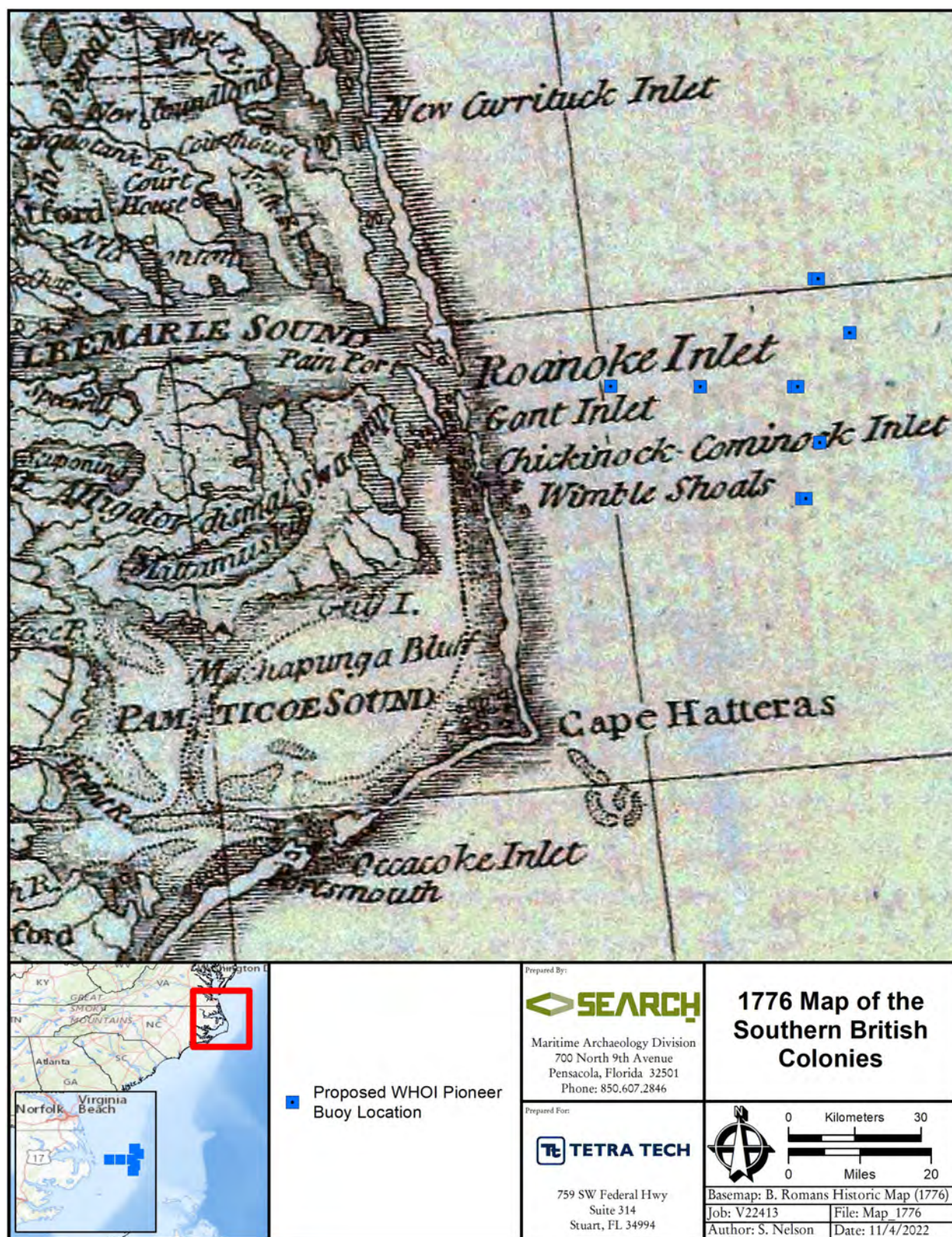


Figure 5. A 1776 historical map of North Carolina's barrier islands (Office of Coast Survey, NOAA 1776).

to these early blows to British morale (Leiner 2014). Bloodied but hardly beaten, the British Admiralty responded to these affronts by instituting a blockade of the American coast, specifically its major ports from Boston to New Orleans and the Chesapeake Bay (Toll 2008). Unlike their previous attempt, the British blockade during the War of 1812 was bolstered by significantly more ships; the North American Station alone was composed of 135 vessels by 1814 (Grodzinski 2014). Further aided by seasoned commanders of the Napoleonic Wars and substantial resources from the home islands, the British sealed the vaunted American frigates in their ports and brought maritime commerce to a screeching halt. Exports from the United States dropped from \$45 million in 1811 to just \$7 million in 1814 (Black 2008). It was during this strangle hold by the Royal Navy that American privateers once again took center stage and engaged in an all-too-familiar style of guerrilla naval warfare. While the exact damage done by American privateers is unknown, historians generally agree the number of British merchantmen captured during the war lies anywhere from 1,200 to 2,000 vessels (Leiner 2014).

Like the American Revolutionary War, the Outer Banks became an epicenter for privateering activity. The ports of the Albemarle region assumed critical importance as entry points from which supplies could be funneled to besieged American ground forces. One of the more impactful American privateer captains to operate out of the Outer Banks was Otway Burns. A native of Swansboro, North Carolina, Burns and his crew of the Baltimore clipper ship *Snap Dragon* operated chiefly out of Ocracoke and Beaufort Inlets (**Figure 6**). From 1812 to 1814, Burns made three separate cruises, resulting in the capture of 42 British ships and their cargo, the latter of which was valued at more than \$4 million dollars (Tucker 2012). As for the blockading vessels of the Royal Navy, they managed to capture approximately 1,500 American vessels during roughly three years of war, including the notorious *Snap Dragon* in June 1814 (Grodzinski 2014; 1812privateers.org 2020). For all their nautical might and strategy, the British were never able to stomp out the privateering trade, particularly out of the Banks. Strikingly, the only notable attack on North Carolina's barrier islands by British amphibious forces occurred on July 12, 1813. At dawn, residents of Portsmouth and Ocracoke woke to the sight of 19 barges loaded with Royal marines heading for shore. Fortunately for the residents, little if any damage was done to the communities, though the invading marines captured "hundreds of cattle and sheep" (Stick 1958:84).



Figure 6. The luck of the notorious *Snap Dragon* finally ran out following an engagement with HMS Martin on June 30, 1814 (North Carolina Department of Natural and Cultural Resources 2020).

Antebellum Period

The hotly contested conflict came to end with the signing of the Treaty of Ghent on February 17, 1815. As a result, residents of the Outer Banks turned their attention to the region's worsening navigational issues and how to mitigate them. In the immediate years of the American Revolution, it became apparent that Roanoke Inlet was shoaling up at an alarming rate and would soon be impassable by vessels, even those of the shallowest draft. In 1787, the North Carolina General Assembly planned to build a canal in Roanoke Inlet's place and even went so far to incorporate The Raleigh Canal Company to "improve the navigation of the Albemarle Sound" (Stick 1958:75). However, the project never materialized, and by 1811, Roanoke Inlet was completely closed to seafaring traffic. The project was revitalized by English engineer Hamilton Fulton in 1820, but the State of North Carolina and the federal government were unprepared to bear the brunt of the estimated \$2 to 3 million price tag. Subsequent government surveys (six in all) were performed in the area to ease public pressure and possibly find an agreeable alternative, but none could be found and the project collapsed. The situation for ports in the Albemarle region was made worse with the closure of Currituck Inlet in 1828, leaving Ocracoke Inlet as the region's single lifeline to the Atlantic. The closure of Currituck Inlet also came at a time when maritime commerce was reaching new heights. Thus, it was a common sight to see anywhere from "thirty to sixty vessels anchored in the roads at one time" (Stick 1958:88). Most of these vessels were sailing ships, but steamships or steamers were also becoming a common sight amongst the maritime world's rank and file. By 1840, the dual communities of Portsmouth and Ocracoke Village had grown extensively because of the increased burden put on the inlet. That same year, a post office, the first of the Outer Banks, was established in each of the towns, and a hospital would follow in six years later (Stick 1958:88–89). On September 7, 1846, a hurricane aptly named the "Gale of 1846" slammed into the North Carolina coast. Upon emerging from their place of shelter, inhabitants found two inlets had been cut through Bodie Island and Cape Hatteras Banks, respectively. The inlet on Cape Hatteras Banks assumed the name Hatteras Inlet and opened following the successful passage of the schooner *Asher C. Havens* on February 5, 1847. Meanwhile, the inlet on Bodie Island was given the name Oregon Inlet in June 1848 after the steamship *SS Oregon* became the first vessel to cross its narrows (Stick 1958:280; 297).

The hazards associated with the inlets of the Outer Banks were not the only concern shared by state and federal officials. Every year, the oceanic coastline of North Carolina's barrier islands was littered with the remains of ill-fated vessels of every size and shape. Furthermore, unless navigational aids were optimized, the issue was guaranteed to only get worse as coastal traffic increased year in and year out. Prior to the opening of Oregon Inlet in 1846, the Outer Banks was home to three lighthouses at Cape Hatteras, Ocracoke Inlet, and Cape Lookout. However, it was evident among policymakers that they needed to do more because the number of lives and property lost along the coast, particularly at Diamond Shoals, continued to reach staggering heights. As early as 1837, Congress appropriated approximately \$5,000 for the construction of a new lighthouse on Pea Island to work in tandem with Cape Hatteras Lighthouse. However, the proposal was ill-received by local residents due to the site's location, and construction was delayed until the mid-1840s. The creation of Oregon Inlet in 1846 caused further delays.

Subsequently, the inlet's potential to become a new artery for maritime commerce entering Albemarle and Pamlico Sounds created the opportunity to compromise on the proposed lighthouse's location. On March 3, 1847, Congress appropriated \$12,000 for the construction of a lighthouse on the southern tip of Oregon Inlet. The 56.5 ft structure known as Bodie Island Lighthouse was officially opened in the spring of 1848. However, the foundation on which the structure was built was of poor quality, so the tower began to lean as early as 1850. The Bodie Island lighthouse was declared unfit for service, prompting demolition in favor of new lighthouse in 1857. The second Bodie Island Lighthouse, also south of Oregon Inlet, was operational on July 1, 1859, at an appropriated cost of \$25,000 (Stick 1958:73–106, 277–279, 302).

A final noteworthy addition to the safety of regional and national maritime traffic came out of the Outer Banks area in the wake of the Calypso Hurricane of 1837. The newly built passenger steamship *SS Home*, bound for Charleston, South Carolina, was heavily damaged because of the hurricane (**Figure 7**). With the steamship's condition growing worse by the minute, Captain Carleton White ordered the *Home* run aground on a reef roughly "a quart of a mile offshore," just north of the safety of Ocracoke Inlet. The vessel carried 135 passengers and crew onboard, but only three lifeboats and two life preservers. All three lifeboats



Figure 7. A mid-nineteenth-century lithograph of the sinking of the steam packet *SS Home*. This tragic episode contributed to Congress's decision to pass the Steamboat Act of 1838 (Currier 1837).

were either smashed or capsized upon launching, and the two life preservers were taken by two men who quickly jumped overboard. The *Home* was pounded to pieces by the relentless surf, and approximately 90 people died, including women and children. The needlessness of the catastrophe garnered the attention of national headlines, increasing the pressure on Congress to intervene on behalf of the American public (Stick 1958:110–116). The result was the passage of the "Steamboat Act" in 1838, which required "all commercial vessels to carry enough life preservers for all passengers" (Neely 2019:106).

Civil War

On the morning of April 12, 1861, a 25-centimeter (10-inch) mortar battery from Fort Johnson opened the bombardment of Fort Sumter in Charleston Harbor and consequently touched off four years of bloodshed (Page 1994). On May 20, 1861, the State of North Carolina ratified the Provisional Constitution of the Confederate States of America, thus dissolving its union with the United States. Despite earning the distinction as the final state to join the Confederacy, North Carolina prepared better than most prior to succession. Local militia assumed control of the

Cape Fear River Fort Caswell and Fort Johnston immediately following secession (Moore 1999). Meanwhile, provisional troops occupied Fort Macon, a formidable third-system fortification located on Bogue Banks and responsible for guarding Beaufort Inlet. In addition to assuming control of the fortifications, Governor John Ellis authorized the creation of the North Carolina Navy, which consisted of the side-wheel steamer *Winslow* (2-guns) and the gunboats *Ellis* (2-guns), *Beaufort* (1-gun), and *Raleigh* (1-gun). Turned over to the Confederate States Navy in the wake of secession, these four warships were charged with overseeing the defense of the Albemarle region's sounds and tributaries. The CSS *Winslow* also served as a coastal raider and captured sixteen prizes in six weeks during the summer of 1861. Additional privateers and locally and foreign-owned blockade runners were also operating out of the Albemarle region.

Confederate officials were aware the latter two would eventually draw the ire of the United States Navy, and no one expected the former North Carolina Navy to defend the sounds against a fleet, much less a frigate. Thus, a series of earthen fortifications were hastily constructed at the inlets of the Outer Banks. By early August 1861, Fort Oregon stood on the south bank of Oregon Inlet, while Fort Morgan (also known as Fort Ocracoke) was positioned on Beacon Island inside Ocracoke Inlet. Concurrently, Hatteras Inlet, "the only inlet at the time...which could admit large ocean-going vessels," (Stick 1958:119) was guarded by two forts on its east bank, Fort Hatteras and Fort Clark (Kaufmann and Kaufmann 2004:251). Despite an initial lack of supplies and manpower, Fort Oregon and Fort Morgan were each garrisoned by a small detachment of provisional troops, while Forts Hatteras and Fort Clark received roughly 580 Confederate regulars under the command of Colonel William F. Martin. The forts at Hatteras Inlet received an additional commanding officer, Captain Samuel Barron, commander of coastal defenses of Virginia and North Carolina (Page 1994:58–59).

The first and last test of the fortifications on the Outer Banks came on August 28, 1861. At dawn, Confederate lookouts at Fort Clark spotted a newly arrived federal fleet under the command of Commodore Silas H. Stringham. The naval force comprised the USS *Minnesota* (44-guns), USS *Wabash* (46-guns), USS *Susquehanna* (15-guns), USS *Pawnee* (10-guns), USS *Monticello* (3-guns), USS *Cumberland* (24-guns), and revenue cutter *Harriet Lane* (6-guns). The warships were further supported by the steam tug USS *Fanny Cadwalader* (1-gun) and chartered steamers *Adelaide* and *George Peabody* (Page 1994:59–60). All told, the fleet boasted 149 guns. Their shore-based advisories at Fort Hatteras and Fort Clark mounted just 19, one of which, a 10-inch rifled cannon, had no ammunition. In addition to the Stringham's fleet, the federal government also sent General Benjamin F. Butler and a land force of approximately 880 federal troops and artillery (Kaufmann and Kaufmann 2004:251–252).

Following a 25-minute bombardment, the Confederates were persuaded to abandon Fort Clark, which became the possession of Butler's shore detachment roughly an hour later (**Figure 8**). Fort Hatteras survived the inevitable iron hailstorm until roughly 11 a.m. the following day. By that time, Barron hauled down the Confederate insignia in favor of the white flag of surrender. The price of victory was relatively light for federal forces; they suffered just three wounded men. By comparison, the fort's defenders were not so fortunate. Confederate casualties comprised roughly four men dead, 20 wounded, and 678 captured. On August 30, Butler and

Stringham received orders from Washington, D.C., to permanently occupy the forts at Hatteras Inlet, a reversal of the original plan which called for inlet to be obstructed and the forts destroyed. While the battle itself was comparatively anticlimactic, its repercussions reverberated for the remainder of war. Washington's decision to occupy Fort Hatteras and Fort Clark convinced Confederates forces to abandon Fort Oregon and Fort Morgan and thus



Figure 8. An 1861 drawing of bombardment of Fort Hatteras and Fort Clark. Federal troops under the command of Colonel Max Weber can be seen landing in the foreground (Waud 1861).

control of their respective inlets for fear of suffering a similar fate (Page 1994:60–63). Furthermore, the federal Navy now had a base of operations from which to reprovision their ships and extend their reach of attack. The biggest blow, however, was absorbed by the Confederacy's maritime supply line. In the words of Union Admiral Dixon D. Porter, "It was a death-blow to blockade running in that vicinity, and ultimately proved one of the most important events of the war" (Page 1994:63).

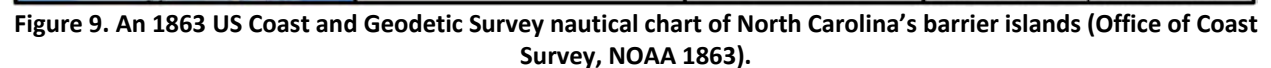
Fueled by the thought of these scenarios coming to fruition, Confederate Colonel Ambrose R. Wright organized the remaining rebel forces in the area on Roanoke Island. Supported by ships of the former North Carolina Navy under the command of Commodore William F. Lynch, Colonel Wright moved to counter the federal offensive by fortifying the island, thus controlling access to the Albemarle Sound. Hampered with inadequate manpower, supplies, and just 34 pieces of artillery, one of which was a souvenir from the Mexican War, Confederate engineers chose to concentrate their efforts on the island's northwestern shore. There, they constructed three earthen fortifications. The southernmost position, named Fort Barlow, was at Pork Point and boasted 9-guns. Roughly 1,000 yards to the north along the coast sat the four-gun battery Fort Blanchard. Anchoring the line of defenses was Fort Huger at Weir Point, mounting 12-guns. The final defensive position, Fort Forest, was positioned on the mainland, across Croatan Sound from Fort Huger. Unlike the Roanoke defenses, Fort Forest comprised "two canal boats that had been beached...and armed with seven cannons" (Page 1994:65). The remaining two cannon were deployed in a battery constructed at Ballast Point overlooking the Roanoke Sound, its only line of defense (Page 1994:65–66).

Cognizant a Confederate stronghold on Roanoke Island could prove particularly troublesome to offensive operations against Richmond, Union Major General George B. McClellan dispatched Brigadier General Ambrose E. Burnside to the Outer Banks. Supported by the North Atlantic

Blockading Squadron under the command of Rear Admiral Louis M. Goldsborough, Burnside's orders were "to capture and fortify Roanoke Island" before moving on to Beaufort Inlet and Fort Macon (Page 1994:65). Eager to bolster Union moral with a decisive victory, Burnside spent the remaining months of 1861 assembling a force of 15,000 men and gathering a diverse collection of 20 shallow-drafted ships, including former passenger steamers, tugs, and "even a couple of garbage scows" (Page 1994:65).

Burnside's expedition arrived off the coast of Hatteras Inlet on January 13, 1862. Upon arrival, however, the armada was battered by storms and forced to take shelter inside Hatteras Inlet, further delaying operations until the following month. In the interim, the roughly 5,000 Confederate defenders of Roanoke Island experienced difficulties of their own. Recently appointed Brigadier General Henry A. Wise took ill, and command of the island's defenses fell to Colonel Henry M. Shaw of the 8th North Carolina Battalion (Page 1994:65–66). Forewarned of the federal armada en route to his location, Shaw added to his defenses by "driving piles and sink ships to obstruct the channel" between Fort Forrest and Fort Barlow (Page 1994:66). On the morning of February 7, Burnside's motley assortment of watercraft led by the former New York ferry turned gunboat USS *Southfield* entered Croatan Sound. There, they found Lynch's equally diverse fleet composed of nine vessels, including two aging side-wheel steamers, six screw-steamers, and an armed schooner. In total, Lynch's fleet could bring 9-guns to bear, while the federal gunboats could muster 40-guns. As the odds would suggest, the impending two-day battle did not begin or end well for the Confederate defenders. At 11:30 a.m., federal gunboats simultaneously engaged Fort Barlow and the vessels of Lynch's hapless fleet, silencing both by mid-afternoon. Their success allowed federal ground forces to reach the shore of Roanoke Island unopposed. By midnight, roughly 10,000 federal troops under the command of Brigadier General John G. Foster were encamped on the island's southern tip. The following day, Foster and his men advanced north, rolling up Shaw's 3,000 Confederates in the process. By nightfall on February 8, with his back to the Albemarle Sound, Shaw surrendered the remainder of his force to prevent further bloodshed. Federal casualties included 41 killed and 227 wounded, while the Confederates suffered 24 killed, 68 wounded, and 2,500 captured. Burnside's forces would remain in the vicinity Roanoke Island for roughly a month before capturing New Bern on March 15, 1862. Forty-two days later, Fort Macon would surrender following a devastating 30-day siege. The fort's capitulation ensured the last free inlet of the Outer Banks was closed, and with it, the war for the Albemarle Region and its barrier islands (Page 1994:66-77; Stern 1962:68–69).

The Civil War coastline of the Outer Banks is depicted in **Figure 9**. Though the region had been essentially knocked out of the conflict by 1863, its offshore waters remained turbulent with the bow waves of passing vessels. Most of these ships were vessel types belonging to the federal Navy, including wind-powered and steam-driven warships, ironclads, and troop transports. Occasionally, foreign and Confederate-owned blockade runners traversed the area, though by this time, many avoided the region completely and instead made for Confederate-held ports such as Wilmington and Charleston.



Reconstruction to the Early Twentieth Century

Because the Outer Banks was knocked out early in the war and devoid of large-scale infrastructure worth destroying to prevent its use by enemy forces (save for aids to navigation), the Outer Banks' road to recovery was considerably brighter than the rest of the war-torn South. Prior to the Civil War, the barrier island's lighthouses were notorious for contributing little to the actual act of maritime navigation. In 1852, soon-to-be Admiral and Civil War veteran Lieutenant David D. Porter referred to the Outer Banks lighthouses as "the worst in the world," while Lieutenant H. J. Hartstene argued the lighthouses "if not improved...should be dispensed with, as a navigator is apt to run ashore looking for them" (Stick 1958:168). As fate would have it, the process of alleviating these criticisms and others like them began during the nation's four years of civil war.

On two known occasions, Confederate raiding parties landed on the barrier islands with the intent to blow up the Outer Banks lighthouses to ensure they could no longer aid the activities of the federal Navy. The Confederates succeeded in destroying the Bodie Island Lighthouse in 1862, but their second attempt in 1864 at Cape Hatteras and Lookout yielded no such results because both lighthouses remained standing. By 1870, Cape Lookout Lighthouse was fully repaired and received a new first order Fresnel lens, while Cape Hatteras Lighthouse was torn down in favor of the modern-day 198 ft tower. The new Cape Hatteras Lighthouse also received a new first order Fresnel lens, and at the time of its completion, it was the tallest brick lighthouse in the world. As for Bodie Island, its third and final lighthouse was completed in October 1872. Using material left over from the completed Cape Hatteras Lighthouse, the tower measured 156 ft tall and cost approximately \$140,000 in US Government appropriated funds. Like Cape Hatteras and Lookout, Bodie Island Lighthouse received a first order Fresnel lens with an accepted range of 18 nm. To further prolong the life of the structure, engineers built the lighthouse on Oregon Inlet's north bank to avoid eventual complications with the south migrating inlet. The final addition to the Outer Banks coastal lighthouses was the 162 ft Currituck Beach Lighthouse in the community of Corolla, completed in December 1875 (Stick 1958:168–169).

In addition to lighthouses, the federal government also invested heavily in the region's ability "to protect life and property from shipwrecks" along the coast (Oppermann 2005:4). Under the supervision of the US Department of Treasury, seven US Life-Saving Stations were completed by December 1874 at "Jones's Hill, Caffrey's Inlet, Kitty Hawk Beach, Nag's Head, Bodie's Island, Chicamiconico, and Little Kinnakeet" (**Figure 10**; Stick 1958:169). Designed to house a crew of six surfmen four months out of the year (December through March), these early structures were minimalist and among the earliest examples of life-saving station standardization. The station's first floor housed the crew's surfboat and a common room/kitchen combination, while the second floor served as the crew's living quarters and storage room (Oppermann 2005:6). The presence of the Life-Saving Service contributed to a noticeable decline in the loss of life and property along the Outer Banks; however, by the winter of 1877 to 1878, it was clear more needed to be done. The tipping point came with the loss of 188 lives because of the wreck of the USS *Huron* and SS *Metropolis* on the North Banks in November 1877 and January 1878,

respectively. In June, Congress authorized the construction 11 additional lifesaving stations, all of which were operational by the winter of 1878 to 1879. Located at Deal's Island, Old Currituck Inlet, Poyner's Hill, Paul Gamie's Hill, Kill Devil hills, Tommy's Hummock, Pea Island, Cedar Hummock, Big Kinnakeet, Creeds Hill, and Hatteras, these new stations were constructed in the image of the 1874 stations, but they were larger and included more amenities, including office space, bathrooms, and an observation tower. In the succeeding years, additional resources and procedures arrived in the form of a seventh surfman at each station, year-round employment for all crewmembers, and the establishment and coordination of a beach patrols. By 1883, North Carolina was home to 29 life-saving stations. Only four were in an area outside of the Outer Banks (Stick 1958:172–173).



Figure 10. An early twentieth-century photograph of Bodie Island Life-saving Station. The site's VIP quarters can be seen in the background (Library of Congress).

Several of the navigational aids and life-saving stations are apparent in an 1879 United States Coast and Geodetic Survey (U.S.C.&G.S.) chart (**Figure 11**). In an era devoid of modern technology, these structures proved critical to the safe passage of ships and minimal loss of life along the North Carolina coast. Despite the best efforts of their keepers and crews, maritime disasters still occurred offshore, as was the case for the schooner *Veto* in 1885. According to *The Meriden Daily Republican*, the vessel was en route to Boston before floundering in gale off Bodie Island on March 21. Fortunately for Captain J. L. Springer and his crew of six, the schooner *Genevieve* was nearby and provided assistance, and there was no loss of life (*The Meriden Daily Republican*, 27 March 1885:3).

The flow of Congressional funding did not stop with aids to navigation and search and rescue. A US Weather Bureau Station was established at the lighthouse keeper's quarters at Cape Hatteras in 1874, followed by additional stations at Kitty Hawk (1875), Cape Lookout (1876), Portsmouth (1876), Beaufort Inlet (1878), and Wash Woods (1878). Post offices were also widely established up and down the barrier islands. In 1865, the only post offices in the Outer Banks region could be found at the villages of Portsmouth, Ocracoke, and Hatteras, respectively. However, by 1939 the region was home to 23 post offices, all of which were within the boundaries of the Outer Bank's hamlets. Inevitably, the process of selecting a name to appear on the new post office led to a flurry of name changes for many historic Outer Banks communities to avoid duplicates and complications. Chicamacomico, for example, became the present-day community of Rodanthe in 1874, while Whales Head became present-day Corolla in 1895. Like the lighthouses, life-saving stations, and weather stations, the establishment of US

Post Offices brought much-needed employment to the Outer Banks (Stick 1958:174–175). Prior to this time, most inhabitants still relied on the trades of their ancestors for survival, most notably maritime trades, including “boatmen, mariners, pilots, and fishermen” (Stick 1958:212). However, these trades were largely seasonal and thus had to be paired with other ventures, such as raising livestock. The advent of full-time employment opportunities associated with the establishment of government-funded facilities at long last provided the residences of the Outer Banks with steady source of income. This economic foundation proved vital to the region’s subsistence during the economic downturns of the early twentieth century (Stick 1958:175).

The Outer Banks, particularly the communities of Kitty Hawk and Kill Devil Hills, were thrust into the national spotlight with the successful flight of the Wright brothers’ heavier-than-air aircraft, also known as the *Wright Flyer*, on December 17, 1903 (Stick 1958:195–211). The Outer Banks received further attention during the final months of the Great World War, but this attention stemmed from a place of concern rather than national pride. World War I, universally dubbed “the war to end all wars,” had consumed the great powers of Europe and Asia since July 1914. Though a thinly veiled source of war material for the Allies, the United States remained neutral until joining the fray on the side of England and France in April 1917 (MacMillan 2014). The war came to the American coast, specifically the waters off the Outer Banks, the following spring. In May 1918, a succession of three German U-boats, beginning with *U-151*, followed by *U-140*, and ending with *U-117*, “sank a total of 10 vessels off North Carolina alone” (NOAA 2017). Their victims included the British steamships *Harpathian*, *Pinar Del Rio*, *Vindeggen*, and *Mirlo*; Norwegian steamships *Vinland* and *Hendrik Lund* and bark *Nordhav*; and the American steamship *Mera*, schooner *Stanely M. Seaman*, and US Lighthouse Services Light Vessel *LV-71* (NOAA 2017).

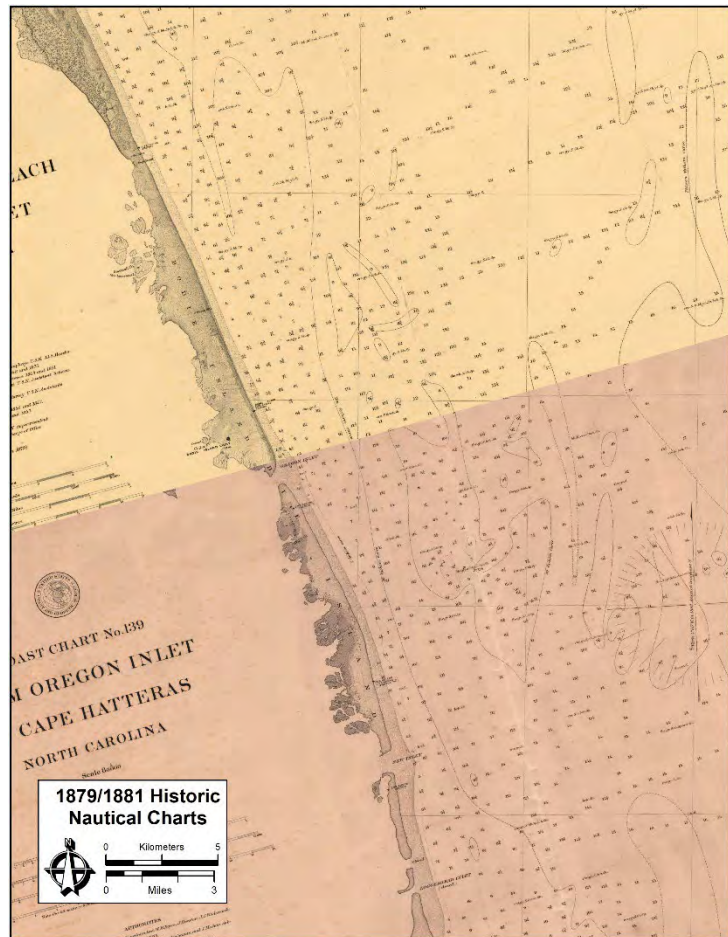


Figure 11. An 1879 United States Coast and Geodetic Survey nautical chart of North Carolina’s barrier islands (Office of Coast Survey, NOAA 1879).

World War II and Post War Years

The end of the war came with Imperial Germany's acceptance of formal surrender on November 11, 1918. Almost immediately, residents of the Outer Banks region turned their attention from the threat of a foreign enemy to two seemingly unrelenting domestic forces, one of an environmental nature the other financial. Decades of open stock raising and subsequent failure to replace vegetation left the Outer Banks little more than bald beaches stuck in a state of rapid erosion by merciless tides, wind, and weather. As for the economy, tried and true trades of the past, such as stock raising, fishing, and whaling, were on the decline or near extinction due to poor resource management. The shoaling of the Outer Banks's various inlets due to erosion allowed for only vessels of the shallowest draft to enter. Thus, maritime traffic entering North Carolina's sounds via the Atlantic Ocean was brought to little more than a trickle, leaving little work for experienced pilots. The sharp decline of shipwrecks along the coast put life-saving operations, now under the direction of the US Coast Guard, at risk of downsizing (Stick 1958:242–243).

In addition to sand, the barrier islands were also bleeding their population as younger generations sought a livelihood elsewhere. In the latter half of the 1920s, regional policymakers under the direction of Wash F. Baum, Dare County Board of Commissioners, created a plan to stem the bleeding. Baum believed the solution to the woes of the Outer Banks was to increase the region's accessibility via roads and bridges connecting the barrier islands together and to the mainland. This in turn would allow the communities of the Outer Banks to take advantage of the nation's budding tourism industry, which had already given new life to once-struggling beach communities such as Atlantic City, New Jersey, and Virginia Beach, Virginia. By the eve of World War II, and in the face of the Great Depression, the Outer Banks was connected to the mainland by two bridges over Roanoke Sound and Currituck Sound, respectively. Furthermore, an 18 mi stretch of asphalt highway ran from the beaches of Kitty Hawk to Nags Head (Stick 1958:243–246). In addition to the "finest beaches...seen anywhere," local advocates and policymakers saw to the construction of the Wright Brothers National Memorial at Kill Devil Hill in 1932 and improvements to the Fort Raleigh National Historic Site in 1937 (Stick 1958:243–250). Three years later, conservation efforts and erosion control measures, debated upon and agreed to circa 1937, began to take shape. According to a National Park Service report dated July 1940, "southward from the Virginia State Line extendin[ing] got Hatteras Inlet a great barrier dune has been built for the protection of the Banks form the ocean...In all, one hundred and fifteen miles of barrier dune has been constructed." The report also states, "a total of 141,841,821 square feet of grassing has been planted...2,552,359 seedlings and shrubs were set out" (Stick 1958:250). By 1941, attendance at the historic sites were reaching an "all-time high," whilst Outer Banks communities, specifically Kitty Hawk and Nags Head, recently furnished new hotels and summer cottages were "doing big business" (Stick 1958:251). That same year, North Carolina officials, backed by funds from multimillionaire philanthropist Paul Mellon, received authorization to establish a national seashore on the battier islands (Vaughn and Cortner 2013:27). Large swaths of land, including those comprising the famed Cape Hatteras, were donated to the project. However, the Japanese attack on Pearl Harbor on December 7, 1941, brought all feelings and projects of good will to a screeching halt.

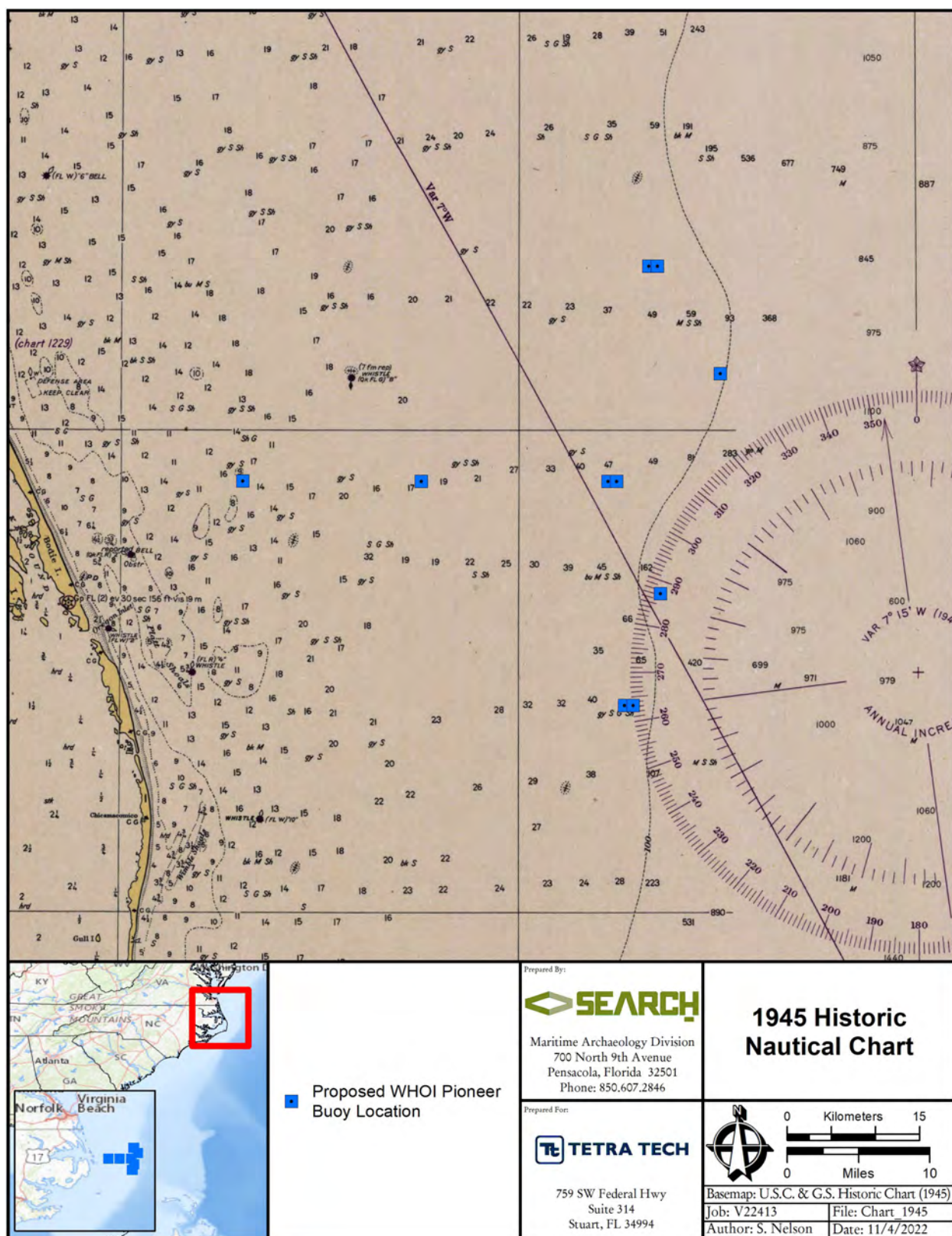
The Outer Banks, like the rest of America, was plunged back into a state of war the following day. Dozens of able-bodied Outer Banks residents, including “more than a hundred” members of the Midgett family (ancestors of Bodie Island’s 1722 owner Matthew Midget), rushed to the nearest recruiting station to join all branches of the military (Stick 1958:251). By January of 1942, U-boats, now under the employ of Nazi Germany, reemerged from the watery depths to wreak havoc on the Outer Banks coast, which was soon to be known as “Torpedo Alley.” Despite prior proof of U-boat capabilities during World War I, the American coast began the war devoid of resources dedicated to sub-hunting and merchant ship escort duties (NOAA 2017). As a result, the barrier island’s saw the loss of more than 250 vessels in 1942, including the steam tankers *Olympic* (5,300-tons) and *China Arrow* (Figure 12; 8,400-tons). The latter vessels were lost in vicinity of Bodie Island in January and February, respectively. Ever-mounting merchant ship losses compelled American war planners to train their focus on U-boat countermeasures along the Outer Banks. By 1943, the U-boat terror was relatively under control and would remain so for the duration of the war. Residents of the Banks were will-versed in executing “black outs,” a common coastal community practice of shutting off all the lights to avoid silhouetting Allied ships at sea. More direct measures included a coastal convoy system, long-range aircraft patrols, and an influx of anti-submarine vessels (Hickam, Jr. 2014; National Park Service 2016). The final German U-boat to be sunk off the Outer Banks was *U-548* in April 1945 (Branch and Barefoot 2006).



Figure 12. A photograph taken of the ill-fated steam tanker *China Arrow* in December 1941. The vessel was torpedoed and sunk off by Bodie Island by *U-103* less than three months later (The Mariners’ Museum and Park).

Figure 13 shows the project area against the backdrop of a 1945 U.S.C.&G.S. nautical chart. By this time, the U-boat threat was largely under control, though enemy incursions did occur, most notably *U-548* in the second to last month of the war. Allied merchantmen including steam tanks and freighters represented most maritime traffic passing by the Outer Banks. As mentioned above, these vessels typically traversed the shipping lanes under the cover of American aviators or under the escort of US Navy destroyers and US Coast Guard cutters. In the war’s aftermath, the coastal waters of North Carolina remained turbulent with the wake of fleeing merchantmen moving up and down the American coast. That trend remains to this day.

The post-war years saw the Outer Banks become a hub of activity because the tourism industry was fully embraced as the region’s primary economic staple. As early as the summer of 1946,



land prices steadily began to climb, and real estate developers, eager to acquire land at the lowest price, pounced as soon as lots become available. By 1952, “new hotels, motels, restaurants, stores, and cottages were open for business” up down the Outer Banks, with the greatest concentration at Nags Head, Kill Devil Hills, and Kitty Hawk (Stick 1958:251). In June of that same year, the present-day Cape Hatteras National Seashore, considered a dead project in the immediate aftermath of the Second World War, became a reality. Thus, calls were amplified to increase automobile access to Cape Hatteras and beyond. By 1960, it was possible for tourists to travel from Nags Head to Ocracoke Village via a system of free highways and ferries. Today, tourism continues to be the industry on which the islands north of Ocracoke Inlet rely on to sustain their way of life. The same cannot be said of the lower Outer Banks composed of the islands of Portsmouth, Core Banks, and Shackleford Banks. These islands remain isolated, devoid of human life, and at the mercy of the wind, weather, and tides (Stick 1958:251–253).

POTENTIAL FOR SUBMERGED CULTURAL RESOURCES

SEARCH assessed the precontact through postcontact contexts to determine the potential for submerged archaeological resources to be within the area of potential effects (APE). The APE is the area of buoy impacts, while the project study area encompasses a 1.6 km (1 mi) radius around each buoy. The study area permits a broader context for analysis when assessing potential impacts to archaeological resources. Based on the precontact occupation of the once-exposed OCS, the historic maritime context of the area, and the small footprint of any one of the 10 buoys being deployed, SEARCH expects a low to moderate potential for precontact and postcontact submerged archaeological resources at any one buoy location, but a moderate to high potential for the entire project study area.

Low water levels during the late Pleistocene and evidence for human presence in the Americas by 15,000 to 14,000 cal BP support a moderate to high potential for submerged precontact deposits. While the research area is far offshore and was inundated between 14,000 and 10,000 cal BP, the importance of nearshore and coastal resources to human subsistence provides high potential for resource use. Additionally, the presence of potential stream systems near and through the buoy locations add potential for landscape use and site preservation.

The preservation potential for submerged archaeological resources on North Carolina’s OCS varies and is highly dependent on the duration of exposure and unique resource composition. Marine transgression and seafloor sedimentation are the main environmental factors affecting preservation (TRC Environmental Corporation 2012). A low sedimentation rate along the continental margin within the last 10,000 years has created a seafloor that is highly exposed to erosional forces associated with marine transgression and bottom currents (Goff et al. 2005; Rice et al. 1998). For example, Native American dugout wooden canoes, used for fishing and open water transportation, are not likely to exist intact on the seafloor. This is because exposed wood tends to deteriorate in marine environments with high erosional force. The best chance of survival for such submerged cultural resources exists if the resources were buried within marine sediment. Burial is possible in instances of quick, large-scale flooding that produces rapid sediment accumulation (Uchupi et al. 2001).

For similar reasons, archaeologists expect a progressively higher preservation potential for historic submerged cultural resources because shipbuilding started to utilize materials with a lower susceptibility for deterioration in maritime environments. European exploration along the Outer Banks region in the mid-sixteenth century brought the first maritime transportation—sailing vessels. Increased maritime activity in the region during the seventeenth and eighteenth centuries included larger ocean-going ships and coastal traders. These larger wooden vessels are also likely to deteriorate; however, metal components, such as iron fastenings, may exist on or beneath the seafloor.

The introduction of steam vessels in the region in the nineteenth century presents a much higher preservation potential. Though the wooden hull of steam vessels is likely to deteriorate, any iron machinery may exist individually or as complex concentrations of components. The use of iron and steel in hull construction soon followed steam technology in the nineteenth century. Whether propelled by sail or steam, a vessel with an iron or steel hull is more likely to remain intact on the seafloor. The twentieth-century workboat is another category of shipwreck that should be expected to have high preservation potential. An iron or steel vessel propelled with a steam or gasoline engine would also likely survive relatively intact on the seafloor. The modern recreational vessel, although not considered a submerged cultural resource, could be another vessel type documented in the vicinity of the cable route. Vessels made of fiberglass utilizing modern aluminum marine motors will likely exist on the seafloor due to the recent deposition and durability of fiberglass and aluminum.

PREVIOUSLY RECORDED ARCHAEOLOGICAL SITES AND SURVEYS

SEARCH conducted a review of previous maritime archaeological investigations to determine whether submerged archaeological resources have been documented within or adjacent to the APE. The proposed APE is approximately 24 km (13 nm) from the shoreline of North Carolina at its closest point. This is outside state waters. Nevertheless, SEARCH archaeologists consulted North Carolina's Underwater Archaeology Branch, Office of State Archaeology, Department of Historic and Cultural Resources (NC DNCR). The NC DNCR did not have any additional information on previously recorded sites or surveys within the study area. Review of databases (GMWD, NOAA AWOIS, ENC, NavAids, and BOEM) within 1.6 km (1.0 mi) of the APE did not reveal any shipwrecks in the study area. **Figure 14** shows shipwrecks reported in the vicinity of the study area, and **Table 1** lists these wrecks.

It is important to note that positional accuracy for historic shipwrecks is typically tentative at best. Historic shipwrecks are generally plotted based on contemporary records, maps, or oral histories. Many shipwreck databases provide a range of positional accuracy or an accuracy reliability scale. It must be assumed, therefore, that the databases do not constitute an exhaustive list of reported shipwrecks potentially within the 1.6 km (1.0 mi) buffer zone around the proposed buoy positions, nor can it be assumed that every shipwreck truly resides where it is depicted.

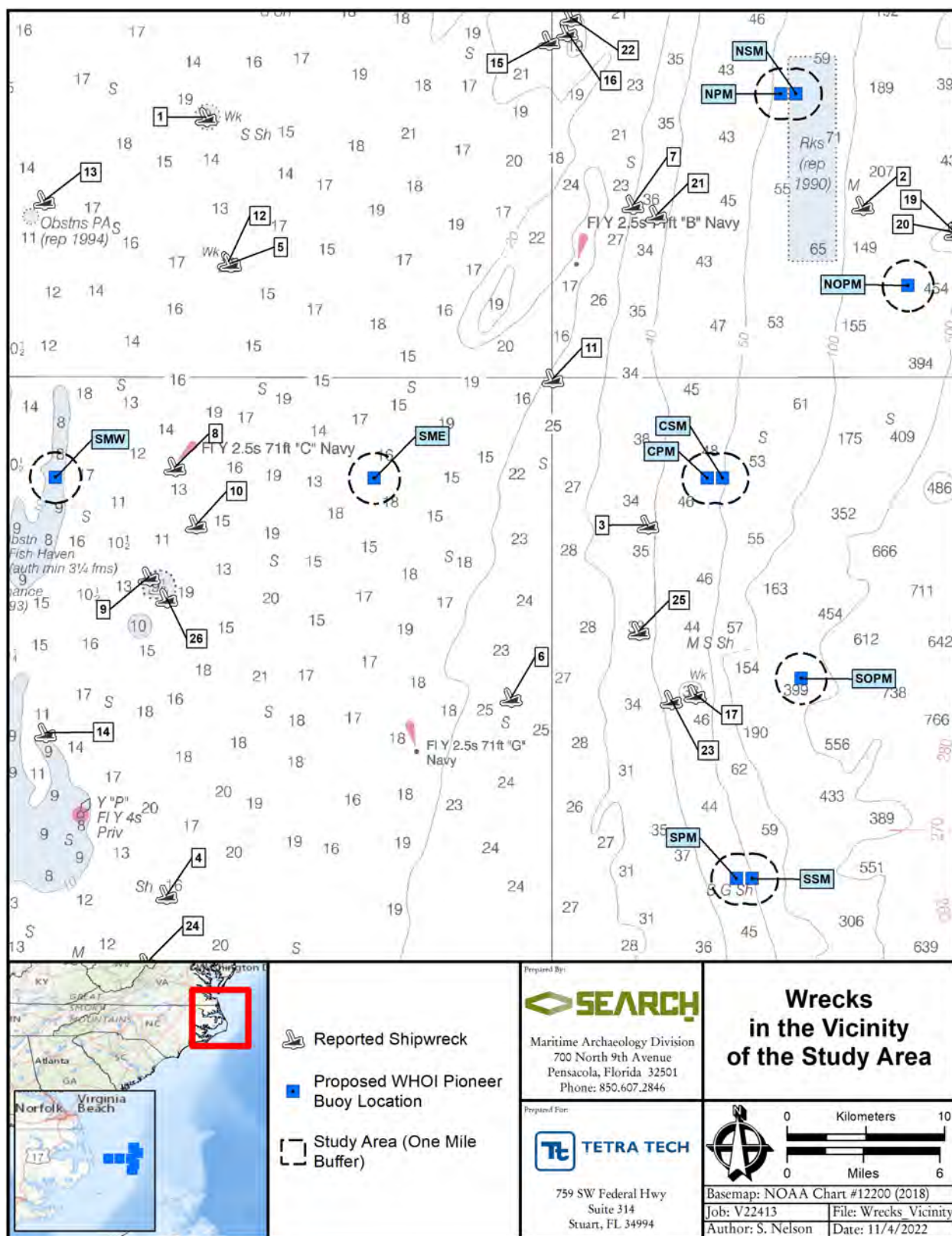


Figure 14. Wrecks in the vicinity of the study area.

Table 1. Wrecks in the Vicinity of the Study Area.

Map ID	Vessel Name	Year Lost	Source
1	Byron D. Benson (B.D. Benson)	1942	BOEM (6001, 8593); AWOIS (717); GMWD (22269, 39118, 259670); ENC (7261, 8221)
2	Cape Charles Wreck	Unknown	BOEM (4427)
3	China Arrow	1942	BOEM (2108)
4	City of Atlanta	1942	BOEM (14281)
5	Norvana	1942	BOEM (10192); GMWD (39117); ENC (4656)
6	P.T. Barnum	1906	BOEM (311)
7	Russian Trawler	Unknown	BOEM (948)
8	Tower	Unknown	BOEM (4425)
9	U-85	1942	BOEM (10318, 15968); AWOIS (700); GMWD (22468)
10	U-85 (second location)	1942	BOEM (14773)
11	Veto	1885	BOEM (5701)
12	York	1942	BOEM (8590); AWOIS (713); GMWD (22467); ENC (7579)
13	Unidentified	Unknown	BOEM (3122)
14	Unidentified	Unknown	BOEM (3180)
15	Unidentified	Unknown	BOEM (8594, 4428); AWOIS (719); GMWD (259671)
16	Unknown (150)	Unknown	BOEM (971, 4429)
17	Unknown	Unknown	BOEM (8587); AWOIS (698); GMWD (39204, 259512); ENC (4662)
18	Unknown	Unknown	BOEM (8591); AWOIS (714); GMWD (39378, 259668); ENC (5056)
19	Unknown	1918	BOEM (8852); GMWD (19966)
20	Unknown	1968	BOEM (9211); GMWD (20820); ENC (8360)
21	Unknown	Unknown	BOEM (8592); AWOIS (715); GMWD (259669)
22	Unknown	Unknown	BOEM (8595); AWOIS (721); GMWD (259672)
23	Unknown	Unknown	BOEM (9021); GMWD (23076)
24	Unknown	Unknown	GMWD (38487); ENC (1056, 6575, 7922)
25	Unknown	Unknown	ENC (7583)
26	Unknown	Unknown	ENC (8506)

Throughout history and up to the present day, the waters off northern North Carolina have been a crossroads of maritime traffic. Maritime accidents and shipwrecking events have included numerous vessels operating in the surrounding waterways, sailing vessels along the Outer Banks, cargo vessels moving goods and fuel out of and into Chesapeake Bay and north and south along the Atlantic seacoast, war time losses, and other maritime casualties. The strong weather events common in the Atlantic make maritime commerce hazardous. There exists the potential for yet undocumented archaeological resources to be revealed in a future survey.

CONCLUSION AND RECOMMENDATIONS

SEARCH conducted the current desktop analysis on behalf of Tetra Tech, Inc., to determine existing and potential submerged cultural resources within the proposed project area within US federal waters. This analysis, utilizing geological, precontact, and postcontact background research and a review of archaeological sites and shipwreck databases, indicates a moderate to high potential for submerged cultural resources to exist in the vicinity of the proposed buoy locations. Although SEARCH did not identify any documented archaeological sites, reported shipwrecks, or maritime obstructions within 1.6 km (1.0 mi) of the proposed buoys, a future high-resolution geophysical survey could locate archaeological sites. This analysis is intended for submittal to WHOI and will assist with planning of the 2023 remote-sensing survey and buoy placement.

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