APPENDIX F – CULTURAL RESOURCES

US ARMY CORPS OF ENGINEERS

US DEPARTMENT OF INTERIOR
NATIONAL PARK SERVICE

CAPE HATTERAS NATIONAL SEASHORE
NORTH CAROLINA

ENVIRONMENTAL ASSESSMENT

BEACH RESTORATION TO PROTECT NC HIGHWAY 12
CLEAN WATER ACT 404 AND NPS SPECIAL USE PERMITS
AT BUXTON, DARE COUNTY, NORTH CAROLINA

SEPTEMBER 2015

Report Title:

A Phase I Remote-Sensing Archaeological Survey Of
A Proposed Borrow Site off Buxton, Dare County, North Carolina

(Extract from the 1590 Theodor de Bry Map produced for Sir Walter Raleigh)

Submitted to:

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6 May 2015

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6 May 2015

Abstract

Coastal Science and Engineering (CS&E) of Columbia, South Carolina is working with the Dare County Board of Commissioners to identify and permit a sand source for the beach restoration project on Hatteras Island where erosion threatens Highway 12. The proposed project is intended to widen the oceanfront beach and provide an erosion buffer to reduce chronic highway damage and maintain county infrastructure. The primary borrow source has been identified as a shoal located 1.5 miles offshore of the Cape Hatteras Lighthouse. In order to determine any effect on potentially significant submerged cultural resources, CS&E contracted with Tidewater Atlantic Research (TAR) of Washington, North Carolina to conduct a submerged cultural resource remote-sensing survey of the proposed borrow site. Work performed by TAR consisted of a background literature survey, historical research and cartographical investigation. Field investigations focused on the remote-sensing survey. Remote-sensing survey operations were carried out on 23-24 December 2014 and 1-2 January 2015. Analysis of the magnetic and acoustic data from the borrow site identified a total of 123 magnetic anomalies. With the exception of a cluster of 10 anomalies buffered for avoidance, all of the anomalies have signatures similar to those produced by deteriorated small pipe, old cable or deteriorated wire. Historical research suggests that the source of the anomalies could be associated with telegraph or post-World War II acoustic transducers. None of the signatures are suggestive of complex vessel remains. Six acoustic target images were identified within the borrow site. Only one of those documents a long linear object exposed on the bottom surface that resembles cable, wire or small diameter pipe. Two others appear to represent concreted cable or wire and a cluster of small rectangular objects. Examination of the sub-bottom profiler records identified no evidence of shell middens, paleo-channel confluences or lagoon complexes considered to be associated with prehistoric habitation. While a cluster of 10 of the anomalies with a potential association with shipwreck remains are recommended for avoidance, identification of material generating the remaining magnetic and three acoustic signatures suggestive of cable, wire of pipe is recommended for two reasons. Firstly, investigation of the material will identify it and document a representative sample for the historical record. Secondly, identification will facilitate determining if the subject anomalies represent a hazard for dredge operations and/or an undesirable material for beach restoration.

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Introduction

Coastal Science and Engineering (CS&E) of Columbia, South Carolina is working with the Dare County Board of Commissioners to identify and permit a sand source for the beach restoration project on Hatteras Island where erosion threatens Highway12. The primary borrow source has been identified as a shoal located 1.5 miles offshore of the Cape Hatteras Lighthouse. In order to determine any effect on potentially significant submerged cultural resources, CS&E contracted with Tidewater Atlantic Research (TAR) of Washington, North Carolina to conduct a submerged cultural resource remote-sensing survey of the proposed borrow site.

The remote-sensing investigation conducted by TAR archaeologists was designed to provide accurate and reliable identification, assessment and documentation of submerged cultural resources in the study area. The assessment methodology was developed to comply with the criteria of the National Historic Preservation Act of 1966 (Public Law 89-665), the National Environmental Policy Act of 1969 (Public Law 91-190), Executive Order 11593, the Advisory Council on Historic Preservation Procedures for the protection of historic and cultural properties (36 CFR Part 800), the updated guidelines described in the Archaeological and Historic Preservation Act (54 U.S.C. 3000101 et seq.), "Abandoned Shipwreck Law" (North Carolina General Statute [NCGS] 121, article 3) and the North Carolina Archaeological Resources Protection Act (NCGS 70, article 2). The results of the investigation were designed to furnish CS&E with the archaeological data required to comply with North Carolina and Federal submerged cultural resource legislation and regulations.

Work performed by TAR personnel consisted of a background literature survey, historical research and cartographical investigation. Field investigations focused on the remote-sensing survey. Remote-sensing survey operations were carried out in two phases due to the continuation of early winter adverse weather conditions. The first suitable weather window occurred on 23-24 December 2014 and the second suitable weather window occurred on 1-2 January 2015. To reliably identify anomalies associated with submerged cultural resources, survey equipment included both magnetic and acoustic remote sensing employing a cesium magnetometer, sidescan sonar, and sub-bottom profiler. Navigation and data collection was accomplished using differential global positioning and computer survey software.

Analysis of the magnetic and acoustic data from the borrow site identified a total of 123 magnetic anomalies. With the exception of a cluster of 10 anomalies buffered for avoidance, all of the anomalies have signatures similar to those produced by deteriorated small pipe, old cable or deteriorated wire. Historical research suggests that the source of the anomalies could be associated with telegraph or post-World War II acoustic transducers.

None of the 113 remaining magnetic signatures are suggestive of complex vessel remains. Six acoustic target images were identified within the borrow site. Three of those document objects exposed on the bottom surface resemble cable, wire or small diameter pipe and short rectangular objects. Examination of the sub-bottom profiler records identified no evidence of shell middens, paleo-channel confluences or lagoon complexes considered to be associated with prehistoric habitation.

While 113 of the anomalies are not recommended for avoidance, identification of material generating the magnetic and acoustic signatures suggestive of cable, wire of pipe is recommended for two reasons. Firstly, investigation of the material will identify it and document a representative sample for the historical record. Secondly, identification will facilitate determining if it represents a hazard for dredge operations and/or an undesirable material for beach restoration.

Project Personnel

TAR project field personnel included principal archaeological investigator Gordon P. Watts, Jr. and archaeologist/remote-sensing operator Gregory O. Stratton. Senior historian Robin Arnold carried out the historical and literature research. Dr. Watts analyzed the remote-sensing data. Dr. Watts and Ms. Arnold prepared this report.

Project Location

The survey site under investigation lies in the Atlantic Ocean 1.5 miles offshore of the Cape Hatteras Lighthouse in Dare County, North Carolina (Figure 1). The proposed borrow area, including a 200-foot buffer, is a rectangle 8,500 feet in north-northeast to south-southwest length and 2,320 feet in east-southeast to west-northwest width (Figure 2).

The survey area encompasses a total of 452.7 acres and .71 square statute miles. North Carolina State Plane, NAD 83, U.S. Survey Foot geographical coordinates for the survey area are shown in Table 1.

POINT	X COORDINATE	Y COORDINATE
1	3048897.68	566343.07
2	3050869.15	565158.52
3	3046491.34	557872.58
4	3044519.89	559057.11

Table 1. North Carolina state plane coordinates for survey area.

To ensure sufficient data would be available to locate any potentially significant magnetic anomalies and sonar targets in the project area, remote-sensing data were collected along parallel lanes spaced on 50-foot intervals (Figure 3). The area surveyed also included a

200-foot buffer zone so that those targets located along the periphery of the borrow area could be identified and the impact from dredging assessed.

Survey Weather Conditions

First Phase (December 2014)

During the first day of fieldwork conducted on Tuesday, 23 December 2014, the temperature ranged from 45 degrees to 55.9 degrees with an average of 50 degrees. Wind speed ranged from six mph (NE) to 8.1 mph with maximum gusts reaching 16 mph. The visibility reached six miles with events of dense fog and some rain causing mist, overcast and mostly cloudy conditions. The sea level pressure registered at 30.03 inches.

During the second day of fieldwork conducted on Wednesday, 24 December 2014, the temperature ranged from 58 degrees to 66 degrees with an average of 62 degrees. Wind speed ranged from 12 mph (SSW) to 25 mph with maximum gusts reaching 40 mph. The visibility reached three miles with events of slight rain, overcast and mostly cloudy conditions. The sea level pressure registered at 29.88 inches.

Second Phase (January 2015)

During the first day of fieldwork conducted on Thursday, 1 January 2015, the temperature ranged from 39 degrees to 50 degrees with an average of 46 degrees. Wind speed ranged from eight mph (WNW) to 17 mph with maximum gusts reaching 24 mph. The visibility reached 10 miles with no events of precipitation or fog. For most of the day, conditions were clear. The sea level pressure registered at 30.3 inches.

During the second day of fieldwork conducted on Friday, 2 January 2015, the temperature ranged from 50 degrees to 53 degrees with an average of 50 degrees. Wind speed ranged from six mph (NW) to 13 mph with maximum gusts reaching 20 mph. The visibility reached 10 miles with no events of fog, mist or rain. For most of the day, the conditions were overcast or mostly cloudy. The sea level pressure registered at 30.32 inches.

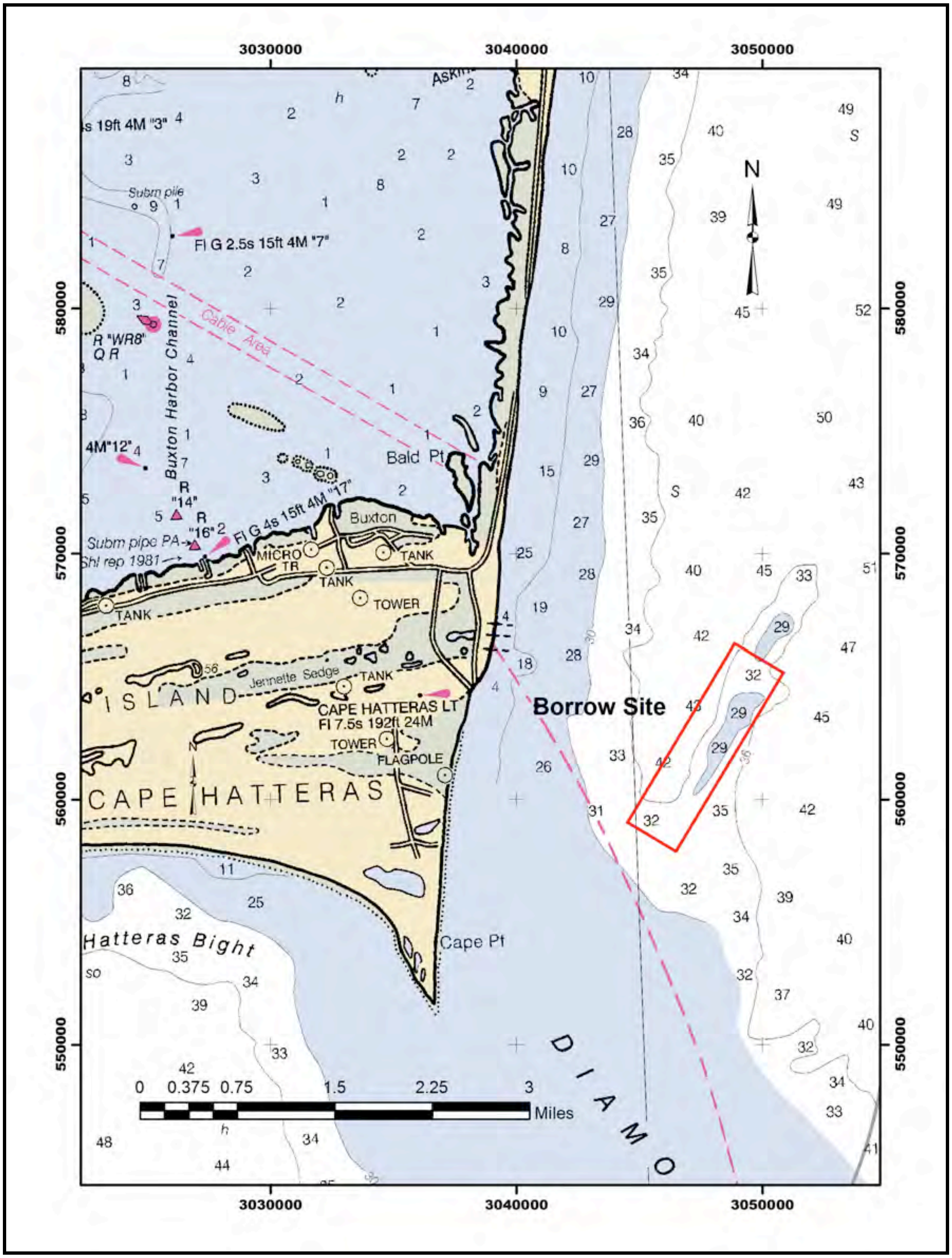

Figure 1. Project location extracted from NOAA Chart 11555.

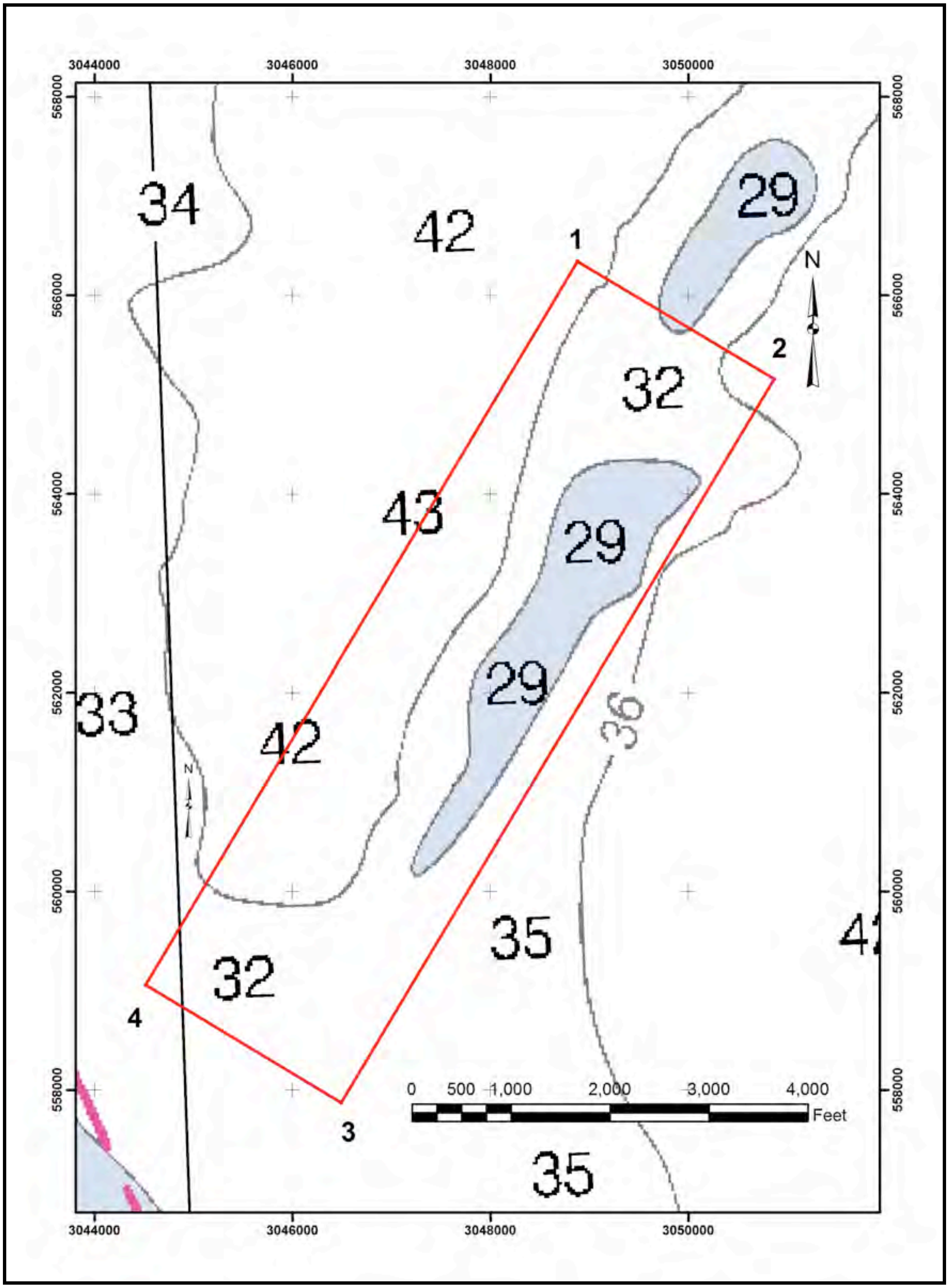

Figure 2. Survey area border coordinate points.

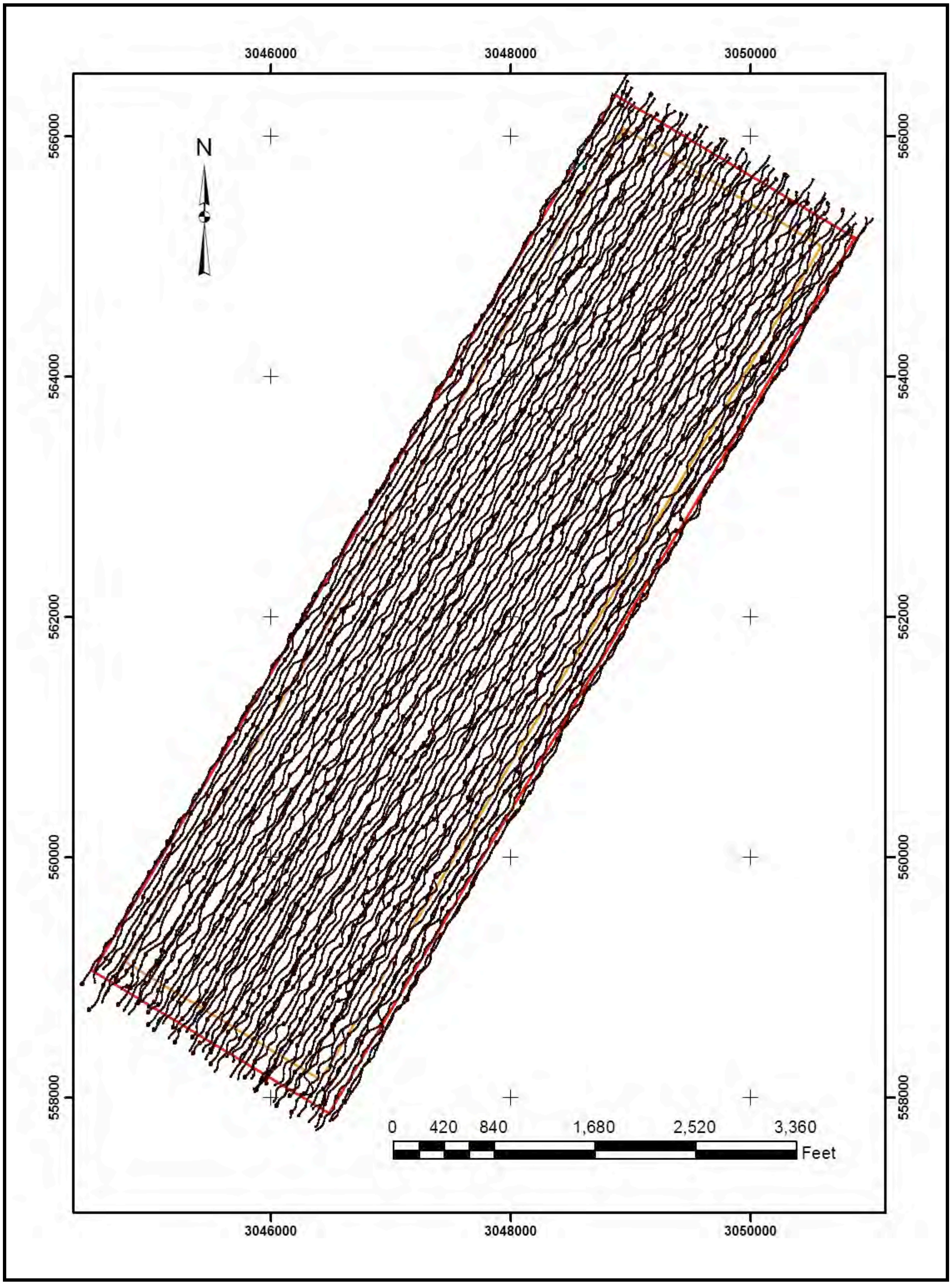

Figure 3. As-run tracklines covering the Buxton borrow site.

Research Methodology

Literature and Historical Research

In conjunction with the conduct of North Carolina Outer Banks remote-sensing surveys, TAR historians previously examined the shipwreck inventories of the former Mariners Museum Library in Newport News, Virginia [now housed at Christopher Newport University], the North Carolina Division of Archives and History (NCDAH) in Raleigh, the Program in Maritime History and Underwater Research at East Carolina University (ECU) in Greenville, North Carolina, and the David Stick Collection at the Outer Banks History Center (OBHC) at Manteo, North Carolina.

At the North Carolina Kure Beach Underwater Archaeology Branch (UAB) facility, files were previously surveyed for prehistoric and historic submerged archaeological sites in the study area. In respect to the current Dare County project, the principal investigator consulted the “Bibliography of North Carolina Underwater Archaeology” compiled by UAB staff (Brooks, Merriman and Wilde-Ramsing 1996), and conferred on three occasions with the UAB director to discuss the Section 106 requirements for the remote-sensing project and to ascertain if any newly discovered submerged cultural resources have been added to that agency’s shipwreck inventory (John Morris, elec. comm., 13 November 2014; John Morris, pers. comm., 27 February 2015; John Morris, elec. comm., 3 March 2015).

The literature and archival investigation focused on a survey of primary and secondary source materials associated with the historical development of the North Carolina Outer Banks. The TAR historian focused on documented activities such as exploration, colonization, agriculture, industry, trade, shipbuilding, commerce, warfare, transportation, and fishing. These historical activities are contributing factors in the loss of vessels in the project area. In examining each of these factors, special attention was committed to maritime activities associated with navigation along Hatteras Island.

Preliminary wreck-specific information was collected from sources that include: *Encyclopedia of American Shipwrecks* (Berman 1972), *Merchant Steam Vessels of the United States 1790–1868* (Mitchell 1975), and supplements nos. 1-3 (Mitchell 1978, 1982, 1984), *Shipwrecks in the Americas* (Marx 1983), *Naval Documents of the American Revolution* (U.S. Department of the Navy, 11 vols., 1964-2005), *The Naval War of 1812* (Dudley, 2 vols., 1985, 1992), *Shipwrecks of the Civil War* (Shomette 1973), *Official Records of the Union and Confederate Navies in the War of the Rebellion* (National Historical Society, series I & II, 31 vols., 1987), *National Political Manual* (1868), *Military and Naval Service of the United States Coast Survey* (U. S. Department of Commerce 1916), *Graveyard of the Atlantic* (Stick 1952), *Shipwrecks of North Carolina*: *from the Diamond Shoals North* (Gentile 1993), *Shipwrecks: Diving the Graveyard of the Atlantic* (Farb 1992), and *Shipwrecks of the Outer Banks* (Duffus 2007).

Additional shipwreck information was generated by gratis or premium Internet databases that include: the Automatic Wreck and Obstruction Information System (AWOIS) sponsored by NOAA, NewspaperArchive.com, Newspapers.com, *The New York Times*, Eastern North Carolina Digital Library, JSTOR, Questia, Academia, Accessible Archives, Fold3, and Genealogy Bank.

Technical reports provided another source of background and local shipwreck information. David Phelps' "The Archaeology of Colington Island" serves as an excellent example of a report on the region’s prehistory. Timothy Thompson and William Gardner's “A Cultural Resources and Impact Area Assessment of the Pea Island National Wildlife Refuge, Dare County, North Carolina” also contributed to an understanding of prehistoric site potential in the region. Wilson Angley's "An Historic Overview of Oregon Inlet" provided a local historical background and critical shipwreck data. James Delgado's excellent "A Preliminary Assessment of Environmentally Exposed Shipwreck Remains, Cape Hatteras, North Carolina" provided historical insight and shipwreck specific data. Dames and Moore's "Report on a Remote Sensing Survey of Oregon Inlet, North Carolina" provided confirmation that unidentified remote-sensing targets have been located north of the project area. Another credible source consulted for contemporary wreck-specific data for the region included “East Carolina Nearshore Expedition: The Shipwrecks” (National Oceanic & Atmospheric Administration [NOAA] 2012).

Cartographic Research

TAR historians previously examined relevant cartographic records preserved in The National Archives (Washington, DC, Suitland, Maryland [MD], and College Park, MD); the North Carolina Department of Archives and History (NCDAH) [Raleigh NC]; the UAB (Kure Beach NC); the Outer Banks History Center (Manteo NC); the University of North Carolina at Chapel Hill; Duke University (Durham NC); the USACE library (Wilmington, NC); the Duke Marine Laboratory (Beaufort NC); and the Joyner Library (East Carolina University (Greenville NC). In addition to the large collection of North Carolina maps [originals and reproductions] located at TAR, numerous Internet sources of scholarly map collections were consulted during the current research phase including the American Memory Map Collection (Library of Congress), the David Rumsey Historical Map Collection and Old Maps Online.

National Register of Historic Places Listing

During the conduct of archival research and Section 106 compliance activities, the National Register of Historic Places (NRHP) database was queried on several occasions. The database was last queried on 29 March 2015 to check potential relevant updates. As of this date, 27 resources were listed for Dare County, North Carolina. Of this number, three shipwrecks were listed that are in the vicinity of the project area; the *E. M. Clark*

(Hatteras), the *Empire Gem* (Hatteras), and the USS *Monitor* (Hatteras) (National Park Service n.d.a.)

North Carolina State Historic Preservation Office Listing

During the conduct of archival research and Section 106 compliance activities, the North Carolina Listings in the National Register of Historic Places was queried on several occasions. The state database was last queried on 29 March 2015 to check potential relevant updates. As of this date, 29 resources were listed for Dare County, North Carolina. Of this number, three shipwrecks were listed that are in the vicinity of the project area; the *E. M. Clark* (Hatteras), the *Empire Gem* (Hatteras), and the USS *Monitor* (Off Hatteras) (North Carolina State Historic Preservation Office 2015).

Remote-Sensing Survey

In order to reliably identify submerged cultural resources, TAR archaeologists conducted a systematic remote-sensing survey of the proposed project site. Survey activities were conducted from the 25-foot survey vessel *Tidewater Surveyor* (Figure 4). In order to fulfill the requirements for survey activities in North Carolina, magnetic and acoustic remote-sensing equipment were employed. This combination of remote sensing represents the state of the art in submerged cultural resource location technology and offers the most reliable and cost-effective method to locate and identify potentially significant targets. Data collection was controlled using a differential global positioning system (DGPS). DGPS produces the highly accurate coordinates necessary to support a sophisticated navigation program and assures reliable target location.

Figure 4. Twenty-five foot Parker survey vessel, the *Tidewater Surveyor*.

An EG&G GEOMETRICS G-881 marine cesium magnetometer, capable of plus or minus 0.001 gamma resolution, was employed to collect magnetic data in the survey area (Figure 5). To produce the most comprehensive magnetic record, data was collected at 10 samples per second. The magnetometer sensor was towed just below the water surface at a speed of approximately four to five knots. Magnetic data were recorded as a data file associated with the computer navigation system. Data from the survey were contour plotted using QUICKSURF computer software to facilitate anomaly location and definition of target signature characteristics. All magnetic data were correlated with the acoustic remote-sensing records.

A 445/900 kHz KLEIN SYSTEM 3900 digital sidescan sonar (interfaced with SONARPRO SONAR PROCESSING SYSTEM) was employed to collect acoustic data in the survey area (Figure 6). The sidescan sonar transducer was deployed and maintained between five and seven feet below the water surface. Acoustic data were collected using a range scale of 50 meters to provide a minimum of 200% coverage and high target signature definition. Acoustic data were recorded as a digital file with SONARPRO and tied to the magnetic and positioning data by the computer navigation system.

Figure 5. Deploying EG&G GEOMETRICS G-881 cesium vapor magnetometer.

Figure 6. Deploying the KLEIN 3900 digital sidescan sonar.

Acoustic sub-bottom data was collected using an EDGETECH 3100P Portable sub-bottom profiler with an SB-216S tow vehicle (Figure 7). The SB-216S provides three frequency spectrums between 2 and 15kHz with a pulse length of 20 msec. Penetration in coarse and calcareous sand is factory rated at 6 meters with between 2 and 10cm of vertical resolution. During the survey the sub-bottom transducer was deployed and maintained between three to five feet below the water surface. To facilitate target identification, sub-bottom sonar records were electronically tied to DGPS coordinates and recorded as a digital file using EDGETECH's DISCOVER software.

A TRIMBLE AgGPS was used to control navigation and data collection in the survey area. That system has an accuracy of plus or minus three feet, and can be used to generate highly accurate coordinates for the computer navigation system on the survey vessel. The DGPS was employed in conjunction with an onboard COMPAQ laptop loaded with HYPACK navigation and data collection software (Figure 8). Positioning data generated by the navigation system were tied to magnetometer records by regular annotations to facilitate target location and anomaly analysis. All data is related to the North Carolina State Plane Coordinate System, NAD 83.

Figure 7. Deploying the EDGETECH sub-bottom 216S tow vehicle.

Figure 8. Monitoring computer navigation system located at vessel helm.

Data Analysis

To ensure reliable target identification and assessment, analysis of the magnetic and acoustic data was carried out as it was generated. Using QUICKSURF® contouring software, magnetic data generated during the survey were contour plotted at 5-gamma intervals for analysis and accurate location of magnetic anomalies. The magnetic data were examined for anomalies, which were then isolated and analyzed in accordance with intensity, duration, areal extent and signature characteristics. Sonar records were analyzed to identify targets on the basis of configuration, areal extent, target intensity and contrast with background, elevation and shadow image, and were also reviewed for possible association with identified magnetic anomalies.

Data generated by the remote-sensing equipment were developed to support an assessment of each magnetic and acoustic signature. Analysis of each target signature included consideration of magnetic and sonar signature characteristics previously demonstrated to be reliable indicators of historically significant submerged cultural resources. Assessment of each target includes avoidance options and possible adjustments to avoid potential cultural resources. Where avoidance is not possible the assessment includes recommendations for additional investigation to determine the exact nature of the cultural material generating the signature and its potential NRHP significance. Historical evidence was developed into a background context and an inventory of shipwreck sites that identified possible correlations with magnetic targets (Attachment A). A magnetic contour map of the survey area was produced to aid in the analysis of each target.

Cultural Development

Prehistoric Background

Modern archaeological research in North Carolina can be linked to the development of an archaeology program that commenced at the University of North Carolina at Chapel Hill in the 1930s. A few general works published in the 1940s and early 1950s summarized the available ethnographic and ethnohistoric data for the Coastal Plain (Phelps 1983:8). The first extensive archaeological survey of the Tidewater region was undertaken in 1954-1955. William Haag carried out this work in response to the development of the Cape Hatteras National Seashore (Haag 1958). Haag surveyed a considerable amount of coastline from the Neuse estuary northward to the Virginia border and recorded 81 sites, the majority of which were on Hatteras, Roanoke, Bodie, and Colington islands, the lower Currituck peninsula, and along the shores of the Pamlico estuary (Phelps 1983:9).

Archaeological research increased during the 1970s when regional programs were developed at universities and schools within North Carolina. Archaeological surveys were done at the Cape Hatteras National Seashore (Thompson 1977), the Pea Island National Wildlife Refuge (Thompson and Gardner 1979), Colington Island (Phelps 1981), and Roanoke Island (Phelps 1984). The cultural sequence of the Coastal Plain, first presented by Haag and South, is continually being refined through archaeological studies. An overview of the cultural sequence for the North Carolina Coastal Plain is discussed below.

The Cultural Sequence

Archaeologists have divided human occupation in the eastern United States into four temporal periods: Paleo-Indian, Archaic, Woodland, and Historic. Each temporal division is distinguished by the climate, technology, and subsistence patterns characteristic of the period. The Coastal Plain physiographic province can also be divided into two cultural-spatial units, the North Coastal and South Coastal regions, based upon cultural differences that seem to begin near the end of the Late Archaic period (Phelps 1983: 16).

The Paleo-Indian Period (12,000 - 8000 B.C.)

The Paleo-Indian period of eastern North Carolina is the earliest and most obscure of the cultural divisions. The adaptive subsistence of humans during this period is generally associated with specialized hunting and gathering, or big game hunting during the end of the Wisconsin glaciation when its retreat brought about climatic and environmental changes (Willey 1966: 37-38). Evidence of this period is almost entirely limited to the surface distribution of fluted, Clovis, or finely worked Cumberland, Quad, Dalton, and Hardaway projectile points. By 1983 less than 50 Paleo-Indian fluted points had been recorded at sites in Bertie, Carteret, Edgecombe, Hertford, Nash, and Pitt counties (Phelps 1983: 18). Fluted points have been recorded in private collections for Beaufort, Craven, and Gates counties.

For the most part, Paleo-Indian sites have been recorded in the uplands where the present conditions do not favor the preservation of early sites. Agricultural disturbance, erosion, and lack of appreciable soil accretion are factors that limit the preservation of Paleo-Indian sites. These sites lack the stratification needed for comparative analysis and dating. Paleo-Indian sites found in the Tidewater region would have been located on the Inner Coastal Plain at the time of their occupation. With the retreat of the last glaciers the sea level rose to near its present level, inundating coastal sites.

Settlement patterns of Paleo-Indian short-term-activity sites or longer-utilized base camps seem to be associated with access to lithic materials for tool manufacture, such as quartz, quartzite, slate, rhyolite, chert, and jasper which were brought down from the mountains and Piedmont areas by rivers (Phelps 1983: 21). Other factors that influenced site location included access to water, habitats favorable to game, and sunlight exposure (Thompson and Gardner 1979: 23). The environment of the Coastal Plain during the Paleo-Indian period was one of broad river valleys with braided stream channels around numerous sandbars, freshwater marshes along the stream edges, and a boreal pine-spruce forest on the interstream uplands (Whitehead 1972: 313). The retreat of the Wisconsin glaciation brought about changes in the environment and the disappearance of the megafauna, which gave way to a new subsistence strategy.

The Archaic Period (8,000 - 1,000 B.C.)

The change in climate following the glaciation must have produced a favorable environment for human subsistence, since numerous Archaic sites can be found in the Coastal Plain. The density of Archaic sites within the Coastal Plain is higher than for any other prehistoric period. These locations can be found in all microenvironments from saline estuary shores to stream margins and their tributary systems as well as pocosins and floodplain swamps (Phelps 1983: 24). Each of these environments produced a diverse and abundant food source that helped contribute to a slight rise in human population. There is also a strong relationship between site location and accessibility to streams.

Surveys that have documented Archaic sites in the Coastal Plain indicate that the majority of sites represent short-term-activity localities evenly distributed along streams. Fewer base camps that may indicate seasonal utilization of available resources appear to be found near the confluence of major streams. All sites, however, are found in the Inner Coastal Plain. Stratified Archaic sites are scarce, but probably do exist in select undisturbed areas within the Inner Coastal Plain. Archaic sites are missing from the Tidewater area as a result of the environmental change that has occurred over the last several thousand years. Those sites that were located on the coast have been obliterated, buried, or inundated like sites of the earlier period.

During the Archaic period a wider range of habitats were utilized for subsistence, and thus likely a wider range of plants and animals. A transition in climate brought pines, hemlock, birch, and northern hardwoods, such as beech and maple, replacing the earlier boreal forests. Diversity in faunal and plant types would also accompany these habitat changes (Phelps 1983: 23). Hunting strategies adapted to the diversification in faunal species with changes in lithic point styles. Spear points such as the Kirk corner-notched, which were gradually replaced by the Kirk stemmed type, are associated with hunting during the Early Archaic period. Other lithic tools, such as scrapers, blades and drills used for the processing of bone and hides are also identifiable to the Archaic period.

A warmer and drier period during the Middle Archaic, referred to as the hypsithermal, distinguishes this subperiod from the previous one. During this time the pine-birch-hemlock forests of the Coastal Plain were being replaced by oak and hickory hardwoods. The numbers of sites increase slightly from the Early to Middle Archaic. Lithic point types experience a transition from the Kirk stemmed to Stanly stemmed points. New point types such as Morrow Mountain, Guilford, and Halifax that appear are believed to represent introduction and possible trade with other areas. Polished stone and semilunar spearthrower weights also appear for the first time.

The Late Archaic is represented by less diversification with the Savannah River point style being prevalent. The Savannah River phase is generally associated with a higher degree of sedentism believed to be a result of improved subsistence adaptation. The appearance of steatite vessels for cooking and storage, as well as fiber-tempered ceramic wares seem to support this belief. A distinction between the North Coastal Plain and the South Coastal Plain can be based on the ceramic distribution of this ware (Phelps 1983: 26). Site diversity appears to remain relatively stable into the Late Archaic, but some localities show a noticeable reduction of Late Archaic site density along smaller tributary streams (Phelps 1983: 25).

The Woodland Period (1,000 B.C. - 1650 A.D.)

The Early Woodland period is marked by further development of the increased diversification in subsistence and use of ceramics that began to appear during the Late Archaic period. However, little is known about settlement patterns or subsistence on the Coastal Plain during this transition. Settlement patterns are believed to be continuous with the preceding Archaic. It is thought that cultigens are also introduced during this period, but their immediate effect is not readily seen in the archaeological record. At a few of the sites with Early Woodland components in the Northern Coastal region, Stallings fiber-tempered ceramics are replaced with Thom's Creek sand-tempered ceramics, showing an introduction of new traits. Thom's Creek ceramics are eventually followed by the Deptford series (Caldwell and Waring 1939). Lithic projectile points are of the small stemmed variety, considered transitional from the older Savannah River type (Phelps 1975: 68), and are now classified as Gypsy points (Oliver 1981).

In the South Coastal region New River is the named phase during the Early Woodland period. There is a similarity between the South Coastal New River phase and the Deep Creek phase for the North Coast, but the New River phase is believed to carry on characteristics found only in the Southeast.

The Middle Woodland period is better understood than the preceding period. Phase names for this period are Mount Pleasant for the North Coastal region, and Cape Fear for the South Coastal region. During the Mount Pleasant phase there is a change in settlement patterns. Small sites along the smaller tributary streams decrease in number, while there is an increase in the number of sites along major streams and estuaries (Phelps 1983: 33). Sites found on Colington and Roanoke Islands indicate seasonal subsistence that relied primarily on shellfish collection. Inland riverine sites have the same pattern but reflect adaptations to shellfish and other species of the riverine environment (Phelps 1983: 33).

Sedentary villages represent the largest single settlement type of the period. This shift in pattern from hunting and gathering camps is generally associated to an increased dependence on domesticated plants, including maize. Ceramics of the Mount Pleasant series are tempered with sand and inclusions of small pebbles with varying surface finishes of fabric-impressions, cord-marking and net-impressing, simple-smoothing to produce a plain type, and incising of plain surfaces (Phelps 1983: 32). Lithic projectile points of the small variety of the triangular Roanoke type are associated with the Mount Pleasant phase. Other artifacts known to occur in Mount Pleasant assemblages are blades (bifaces), sandstone abraders, shell pendants or gorgets, polished stone gorgets, celts, and mats woven of marsh grass (Phelps 1983: 33). Burial patterns found on the Inner Coastal Plain and on Roanoke Island at the Tillet site include both primary inhumation and cremation.

During the Middle Woodland period the Cape Fear phase of the South Coastal region is less known. Ceramic types are similar to those of the North Coastal region. The distinguishing trait seems to be the manner of burial. Found in the South Coastal region is an extensive distribution of low sand burial mounds unique to the region. The high frequency of secondary cremation, platform pipes, and other objects in the mounds, and the fact that at least some of the mounds seem to be placed away from their contemporaneous habitation sites, points to southern influence during this period (Phelps 1983: 35).

The two local phases of the Late Woodland period for the North Coastal region are the Colington phase for the Algonkian culture of the Tidewater zone, and the Cashie phase for territory occupied by the Tuscarora and northern Iroquoian Meherrin and Nottaway in the interior Coastal Plain. The settlement pattern during the Late Woodland was relatively dispersed with site locations found along the sounds, estuaries, major rivers, and their tributaries. Most of the sites that occur on the mainland are found adjacent to streams or other bodies of water on high banks and ridges of sandy loams. Types of sites include capital villages (chiefdoms), villages, seasonal villages, and camps for specialized activities, as well as farmsteads likely occupied by extended families (Phelps 1983: 39-40).

Except for the camps that appear to be directly related to seasonal gathering of shellfish, fishing, and perhaps collecting, all seasonal and larger villages are located where agriculture, hunting, gathering, and fishing could all be accomplished within the site catchment area (Phelps 1983: 40). Shellfish collecting and fishing camps have been found on Colington Island and major villages, except maybe for Hatteras Island, occur on the Inner Coastal Plain. Hatteras Island is one of the few barrier islands with sufficient area at its present south end to support the subsistence needs of a large population (Phelps 1983: 40). One chiefdom was located on the Outer Banks on Hatteras Island, with most sites reported by Haag destroyed through modern development. Limited evidence does remain at the Hatteras Village site (Phelps 1983: 40).

Subsistence during this period relied upon gathering and hunting to support some agriculture. Exploitation of a wide range of habitats provided the needed food sources. Maize, hickory nuts, faunal remains of bears, deer, and a wide variety of animals; alligators, terrapins, and turtles; fish, and both marine and riverine shellfish have been found at excavated sites of this period (Phelps 1983: 40). By the end of the Late Woodland period, cultigens of squash, beans and sunflower would have been grown as eventually noted by explorers.

Colington ceramics of the Tidewater region are shell-tempered and divided into types based on surface decoration. In order of frequency are fabric-impressed, simple-stamped, plain, and incised. Shell tempering is either marine (oyster) or freshwater (mussel), depending upon the site location. Cashie ceramics associated with the Inner Coastal region are grit or pebble-tempered with the same surface treatments as those noted for Colington ware. Projectile points of the North Coastal region include the small variety of Roanoke triangular type with some occurrence of the smaller, equilateral triangular Clarksville points (Phelps 1983: 36-39).

Bifacial blades of various shapes, polished stone celts, gorgets, sandstone abraders, and milling stones are part of the lithic assemblage. Shell hoes, ladles and shell beads are also found. Bone artifacts include antler flakers, fish hooks, awls and punches of various shapes, bone pins, and a panther mask. Ceramic pipes with bowls attached to stems either horizontally or at an angle are also well known (Phelps 1983: 39).

Burial patterns during the Colington phase are those of Algonkian and Iroquoian ossuaries. Five ossuaries have been located and excavated within the Tidewater zone, with one located on Hatteras Island. The smallest contained 38 individuals and the largest contained 58 persons. The individuals ranged from newborn to the elderly and included both males and females. Few artifacts accompany the burials (Phelps 1983: 42). Cashie burials of the Inland Coastal region are also ossuaries. Unlike the Colington ossuaries, Cashie burials usually contain two to five individuals deposited as secondary bundle burials and may represent family rather than community interments (Phelps 1983: 46). Bone awls are sometimes included with a few individuals and shell beads are always found. A difference in the quantity of the shell beads included with the burial may indicate differing levels of social status or rank.

The Colington phase ended with the expansion of the European colonial frontier southward from Virginia into North Carolina. The Cashie phase, contemporary with Colington from A.D. 800, remained intact until A.D. 1715 when reservations were established for the Tuscarora and Meherrin after the Tuscarora War (Phelps 1983: 43). The Colington and Cashie phases of the North Carolina region are local variants of the same basic cultural tradition, but the South Coastal Plain has been presumed to be Siouian territory since the beginning of the Woodland period (Snow 1978: 60-61).

The Southern Coastal phase of the Late Woodland is known as Oak Island and continues into the modern Waccamaw culture. The Southern Coastal region is less well defined than the north. The local phase in the narrow Tidewater zone appears to have been similar to the Colington phase, but probably represents acculturation of south coast groups to north coast patterns (Phelps 1983: 48).

Historical Background

Exploration and Colonization (A.D. 1524 - 1776)

Documented exploration along the present-day North Carolina Outer Banks commenced some 485 years ago. In 1524, Florentine pilot Giovanni da Verrazano sailed from the Cape Fear region northwards to Old Currituck Inlet. Verrazano was justifiably cautious, and stayed so far from the shore that he was unable to discern individual features and inlets in the area (Cumming 1988:4-7). The following year, Spanish pilot Pedro de Quejo sailed along the Outer Banks and entered two inlets north of Cape Hatteras and a third to the south of this promontory. The names and exact locations of these historic inlets are unknown (Hoffman 1987:3-4). Later that year, Portuguese pilot Estevan Gomez sailed as far as 40 degrees north along the Atlantic Coast of North America (Dunbar 1958:7).

By 1542, Spanish treasure ships regularly passed within 50 to 75 miles of Cape Hatteras and the Outer Banks before heading east towards the Azores [972 miles due west of Lisbon] (Cumming 1988: 24). Spanish pilot Angel de Vilfane searched for the Jordan River [South Carolina] circa 1561, and sailed north along the North Carolina coast until a storm off Cape Hatteras sank one of his ships and forced him to head southeast (Hoffman 1987:8). The intensity of sixteenth-century storms off the Outer Banks is confirmed by the number of ships that were lost off the North Carolina coast in the early years of exploration. Ships were reported lost near Cape Hatteras in 1528, 1545, 1551, 1553, 1559, 1561, and 1564 (Cumming 1988:44).

The first Europeans to consider permanent settlement in present day North Carolina were Englishmen. When Philip Amadas and Arthur Barlowe arrived with Ralph Lane in 1585, they found a thriving native Algonquian population that subsisted by hunting, fishing and cultivation of a variety of foods. These English soon established a reliance on the native population for subsistence. When the Indians of Roanoke Island tired of this one-sided arrangement the former group destroyed fish weirs constructed for the English colonists and withdrew from Roanoke Island (Corbitt 1953:55).

At the time of the historic Roanoke voyages (1584-1590), there were two known inlets, Port Fernando [Hatorask Inlet] and Port Lane [closed before 1657] just north of present day Oregon Inlet. These inlets were in close proximity to one another, however, Port Fernando was considered superior and was used by English vessels to establish and supply the settlement on Roanoke Island. That inlet also served as a base for important reconnaissance operations. A slipway was built just inside the inlet to facilitate these activities (Quinn 1955:78). In 1585, Sir Richard Grenville (1542-1591) established a colony on Roanoke Island, and returned in 1586.

Popular tradition relates that Tennyson's poem "The Revenge" is based on the nobleman-adventurer's adventures. Grenville's ship *Tiger* is assumed to be one of the earliest shipwrecks recorded in North Carolina. A contemporary painting thought to be Her Majesty's *Tiger* flying the standards of Saint George was produced by John White in Puerto Rico during Grenville's expedition (Hulton 1984:9; Plate 3; Figure 9).

Shortly thereafter, Grenville returned to England for supplies leaving Ralph Lane in command of the colony. On 9 June 1586, Sir Francis Drake visited the settlement on his return from the Caribbean. Upon his arrival he determined Port Fernando to be an inadequate harbor for his fleet. His vessels, therefore, were anchored well offshore. On 13 June, disaster struck when a storm hit the Outer Banks. In the ensuing chaos several of Drake's smaller vessels were wrecked. The Colonists were disillusioned about the settlement and all but a small force decided to abandon the Roanoke Island and returned to England with Drake (Quinn 1955:passim).

A second attempt to establish a colony on Roanoke Island was made in the following year. The expedition, led by John White, also utilized Port Fernando as a base of operations. After a few months White returned to England. King Philip of Spain's 1588 attempt to invade England prevented White's return to the colony until 1590 (Figure 10). Upon his arrival, the governor found that the colonists had abandoned the settlement and disappeared. Over time, due to the mystery, the unfortunate settlement became known as the "Lost Colony." During White's futile attempts to locate the colony, Port Fernando was still used to access the sound.

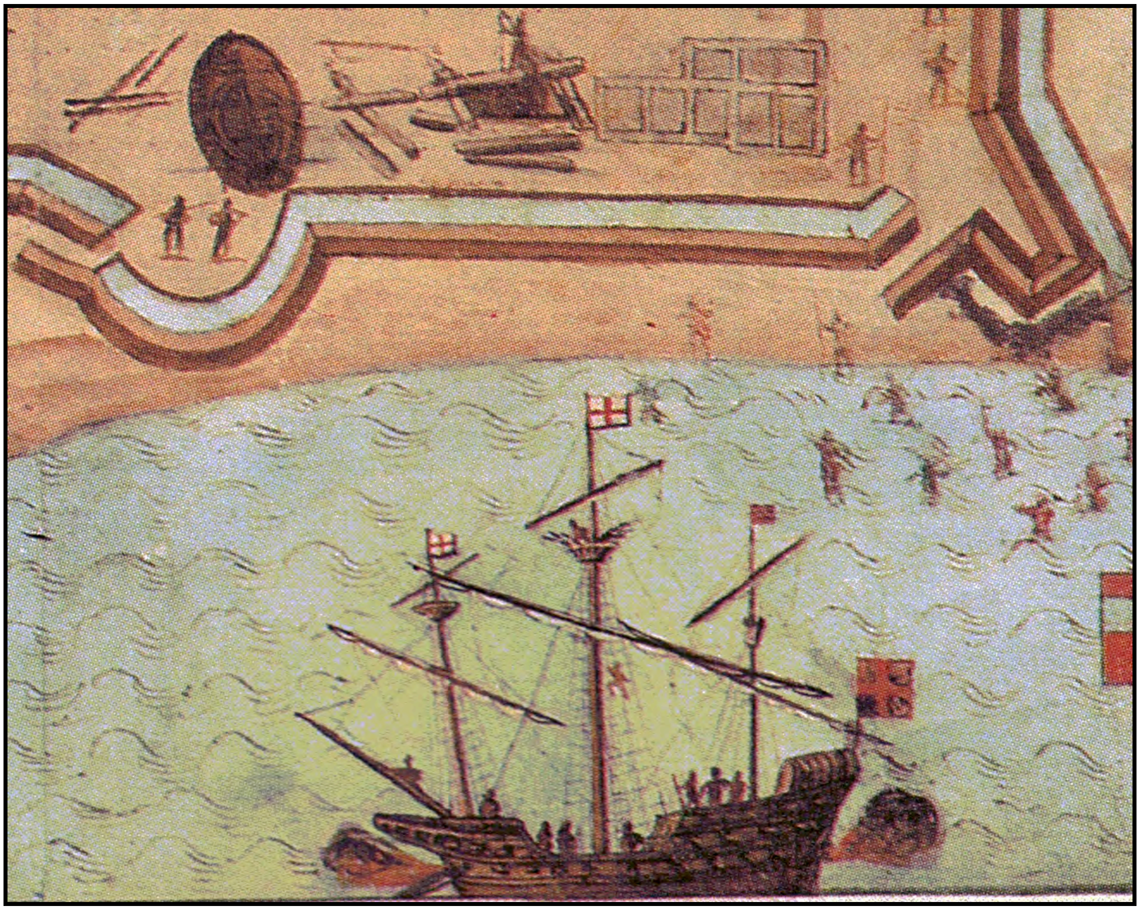

Figure 9. John White painting that may depict Her Majesty's *Tiger* (Hulton 1984:Plate 3).

On 17 August 1590, White sent out two small boats from his larger ships anchored off shore. One of these small vessels capsized while trying to cross the inlet bar, killing seven men. Ultimately, bad weather forced White to abandon his attempts to locate the colonists (Quinn 1955:252-255, 468-506, 553-560). English colonization efforts subsequently shifted to the Chesapeake Bay area where a successful settlement was established at Jamestown in 1607.

One of the advantages of Roanoke Island was the relative security afforded by the barrier islands (Figure 11). It would be difficult for the Spanish to find and destroy the settlement. Although the Spanish suspected that the English had been trying to establish a colony for some time, they did not send an expedition until 1588. The expedition's leader, Captain Vincente Gonzalez, believed that the repudiated English settlement was somewhere on Chesapeake Bay. Failing to find any evidence of an English colony in that area, Gonzalez sailed back to Florida. It was during this return voyage that the Spanish captain happened to discover the English slipway in Port Fernando. He remained unconvinced, however, that there could be any settlement nearby so he continued on his voyage without further reconnaissance (Quinn 1955: 773-812).

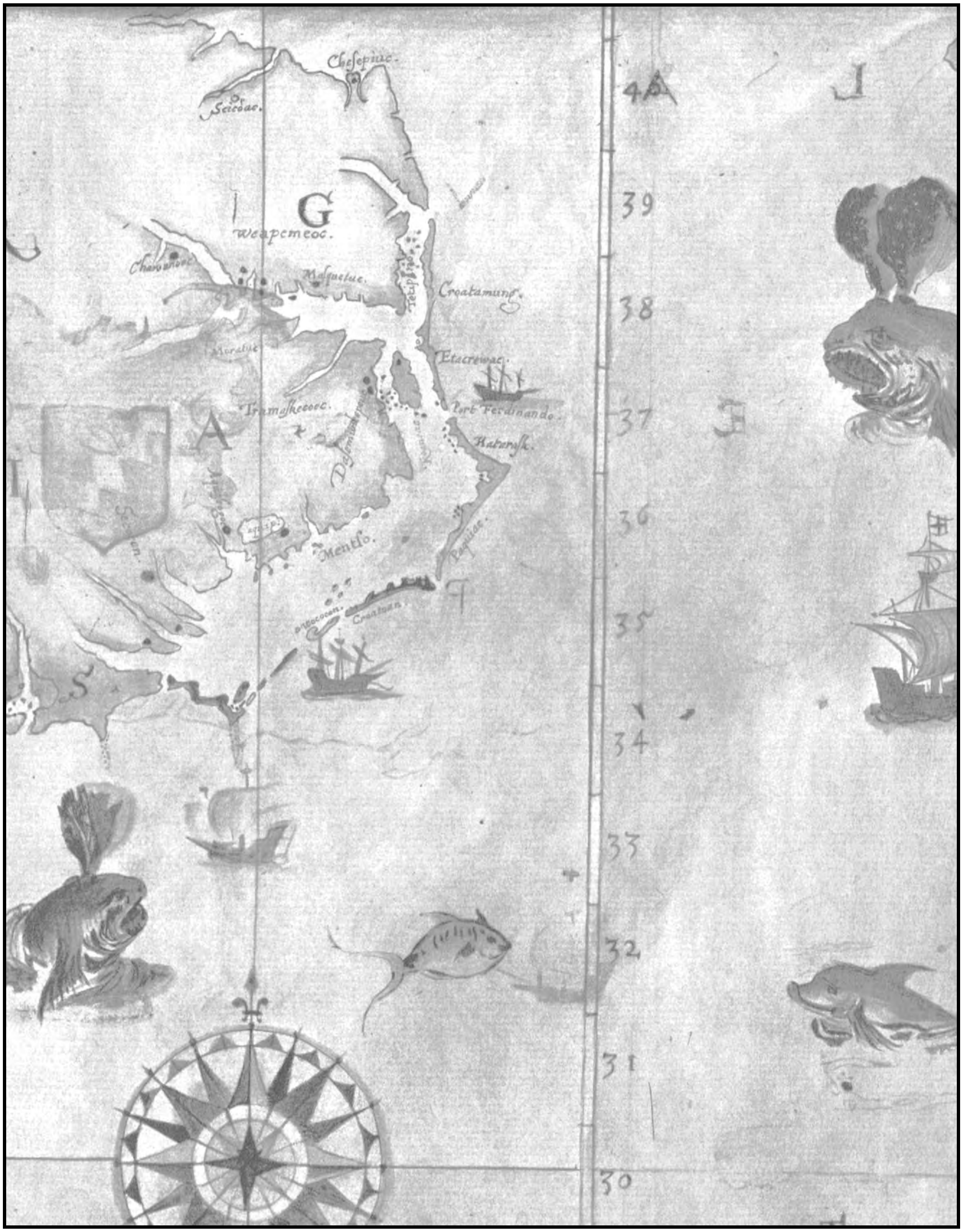

Figure 10. John White map dated 1585.

Figure 11. White-DeBry map dated 1590.

Roanoke Island was a focus of attention of explorers and settlers in the years that followed the historic Roanoke Voyages. The Claes Visscher panorama produced in 1616 illustrates the variety of English and other European vessels of the time (Figure 12), which may have reconnoitered the modern Dare County coast. In 1620 Marmaduke Rayner made a venture to Roanoke Island to explore (Dunbar 1958:16). Four years later, Francis Yardley, the governor of Virginia, noted in a letter that small sloops were trading in Carolina sounds with the local Indians for beaver skins. Later that year Yardley sponsored a group that visited Roanoke Island and bought land in eastern North Carolina from the local Indian tribes. These local Indian tribes died out or were absorbed by the close of the colonial period in eastern North Carolina (Dunbar 1958:16, 19).

Figure 12. Oceangoing ships depicted anchored and at sail in Thames River in Visscher's 1616 panorama (shown in: Noël Hume 1994:115).

In 1664, interest in the North Carolina Outer Banks resumed when Sir John Colleton established a plantation (Figure 13) on what is currently known as Colington Island. The nobleman planned to grow tobacco, which had been shown to be a successful cash crop in the Chesapeake Bay area, and prosper from the increased demand for tobacco in Europe. Tobacco proved to be a failure and the only financial gain from the plantation venture was derived from oil extracted from beached sea mammals some years later (Stick 1958:22).

Figure 13. Engraving of earthfast [or post-in-the-ground] dwelling that may represent Outer Banks construction of the mid-seventeenth century (Noël Hume 1994:315).

John Colleton's failure at growing tobacco on the Outer Banks was chiefly due to the instability of the ground surface and lack of soil development. The introduction of stock husbandry on the barrier islands further contributed to the deterioration of the ground cover and accelerated the natural processes of wind and water erosion. Figure 14 shows the area circa 1672; Colington Island, shown just to the right of Roanoke Island, is not named.

The lack of a suitable agricultural environment, combined with the hazards of navigating the barrier islands, limited the growth of the Outer Banks for several years. Those that attempted to make a living in the area managed their income from the sea. Fishing and shell fishing proved to be profitable, as well as salvaging or piloting of the vessels that dared enter the Outer Banks. Until the hardwood forests of the barrier islands were depleted, boat building also provided a source of income for some individuals living on the Outer Banks. However, the rapid loss of the forests further contributed to the destabilization of the sandy soil and produced migrating dunes which threatened some communities (Stick 1958:286).

In 1696, the *Hady*, a British ship, was driven ashore between Roanoke and Currituck inlets (Figure 14). The early trappers and fishermen camping along the Outer Banks pillaged the ship, transported some of her cannons ashore, and fired them into the vessel's side to ensure that the ship would never be refloated (Ashe 1908:149; Dunbar 1958: 20). The salvage and destruction of the *Hady* was not an extraordinary occurrence as wrecking developed as one of the earliest, albeit sporadic, occupations along the Outer Banks.

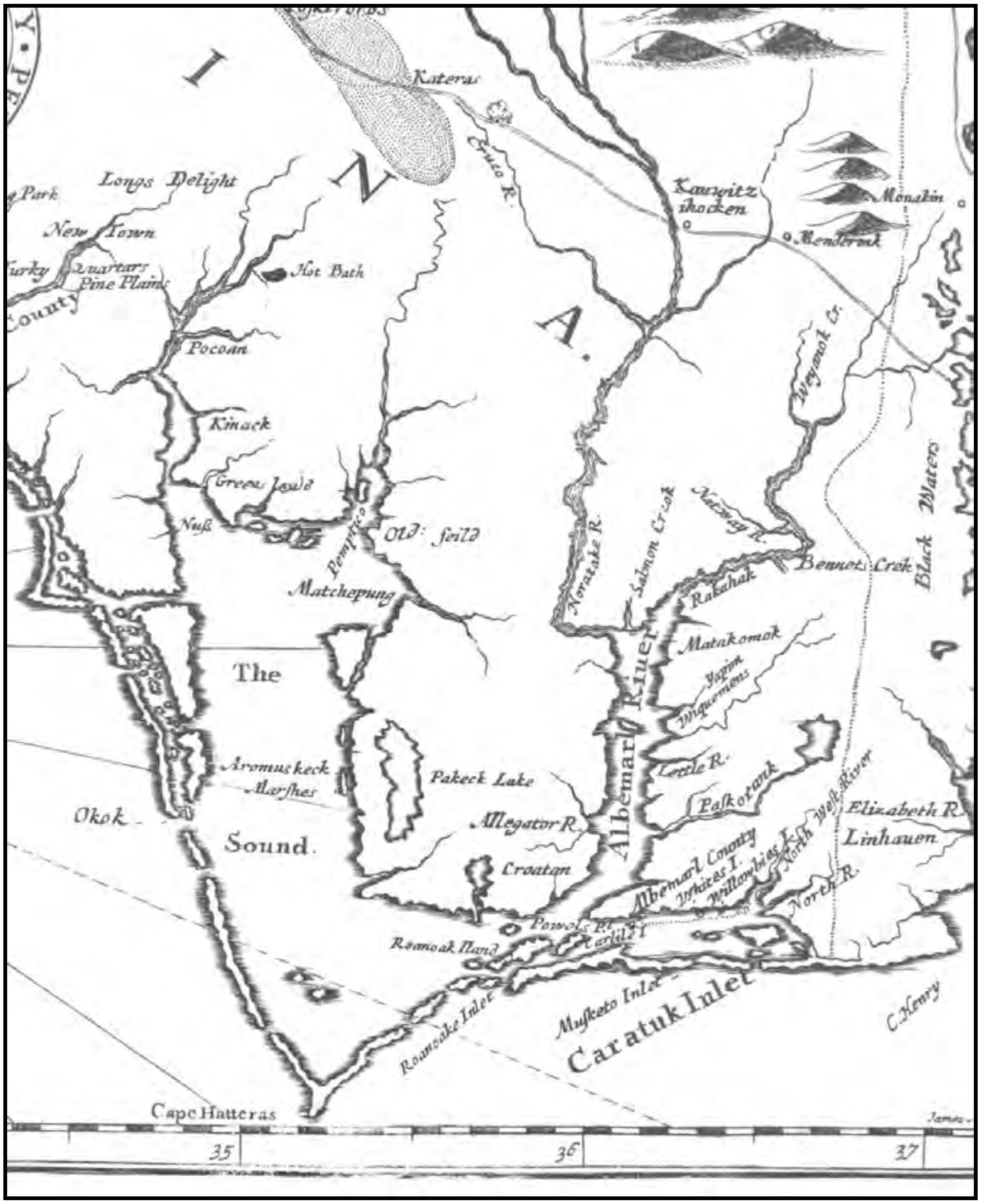

Figure 14. Ogilby map dated ca. 1672.

More than a century after the last Roanoke voyage the first permanent white settlement and residence near Oregon Inlet was established. Mathew Midget, who lived near the Alligator River, received title to Bodie Island in the 1720s. Upon his death in 1734 he left the island to his four sons (Stick 1958:78). It appears that Midget's descendants were still living on the island at the time that Oregon Inlet opened in 1846 (Angley 1985:4-5).

Bodie Island went by many names over a period of years, including Bodys Island, Bodies Island, Body Island, Micher Island, and Cow Island. The island was originally 9.5 miles long and contained about 1900 acres (Stick 1958:278). The name Bodie Island first appeared on maps in the early 1700s, and the 1709 John Lawson map identifies “Body I.”, where the famous surveyor-general searched for coneys [rabbits] (Figure 15).

Figure 15. John Lawson map dated 1709.

During the colonial period villages were established on *Haterask* Island on small wooded tracts on the sound side of the barrier island. Over time the English rendition for the Algonquian term, which translated to "there is less vegetation" was replaced with "Hatteras" (Powell 1968:216). On the islands of Roanoke and Colington, villages were also established within small wooded tracts that afforded protection from the harsh winter environment. There were also several villages located to the north of Roanoke Inlet (Dunbar 1958: 24). Although the shallow depth of Roanoke Inlet prevented it from being used by large vessels, navigation was sufficient to appoint a pilot in 1715. New Englanders frequently brought their vessels in through Roanoke Inlet and off-loaded their cargoes without payment of the required dues (Dunbar 1958: 21-23).

The Quidley family appears to have settled at The Cape [present-day Buxton] circa 1720 according to genealogist and descendant Dallas E. Quidley, Jr. In that year, the wife of Patrick Quidley (formerly of Virginia) gave birth to William Quidley (Quidley 2013). As an adult, the younger Quidley was identified as a captain and his progeny, including John Quidley, figured in the early history of the maritime community. One descendant of John Quidley born on Hatteras Island would serve as a surfman at Kinnekeet "riding a horse watching for sailing ships" and later as a lighthouse keeper (Quidley 2013).

The attention to vessels navigating along The Cape served several purposes for early eighteenth-century coastal families, whose lives and livelihoods depended on the goods being transported aboard the watercraft, as well as often having a familial connection to those on board. The Herman Moll map dated 1729 (Figure 16) illustrates the Sholes of Hatteras, which became popularly known as "Diamond Shoals" or "graveyard of the Atlantic". Renowned North Carolina historian William Powell (1968:142) described the treacherous series of three shoals that extend in a southeasterly direction from Cape Hatteras as such:

> Nearest the Cape is Hatteras Shoals; Inner Diamond Shoal is in the middle, and Outer Diamond Shoal extends fartherest [sic] into the Atlantic. The channel between Hatteras Shoals and Inner Diamond Shoal is Hatteras Slough: Diamond Slough is the channel between the two Diamond Shoals. At this point warm Gulf Stream waters collide with cold artic waters from the north causing a constant turbulence in the Atlantic.

Despite the obvious and constant dangers wrought by the Sholes of Hatteras, by the middle of the eighteenth century, a considerable trade had developed along the North Carolina coast. While Ocracoke was the dominant marine facility, Port Roanoke provided services important to the development of the Albemarle region. Port Roanoke has since developed into present-day Edenton. Commerce that left Port Roanoke travelled along three main routes according to 1772 customs records. Approximately two fifths of outbound cargoes were transported to the West Indies, one third went to the New England area, and one fifth was exported to the British Isles.

Figure 16. "Sholes of Hatteras" from Herman Moll Map, 1729 (Cumming 1998:Plate 50).

It bears note that during the subject period, and in fact to 1846, Hatteras Inlet was joined to Ocracoke Island as the fluctuating inlet had closed in 1760-70 (Powell 1968:217). Contemporary customs records indicate that of the incoming commerce one-half was from New England, one-fourth originated in the West Indies, and one-fifth was imported from the British Isles. At this date, eastern North Carolina residents were still not major consumers of goods. Of the incoming shipping, some 6,200 tons, which cleared Port Roanoke nearly one-fifth was ballast. A large proportion of the ships that passed through Port Roanoke were owned by merchants in the Albemarle area, as the 1772 custom records show that nearly one-third of the tonnage of ships that entered Port Roanoke were also registered there (Crittenden 1936: 70-71, 77-78, 105).

Revolutionary and Ante-Bellum Period 1776-1860

During the Revolutionary War, Roanoke and New Currituck inlets gained greater significance. Their shallow depths and constantly moving sand bars prevented strangers or the Enemy from safely navigating the waterways and afforded American coastal vessels safety within the sounds. Extracts from the 1770 Collett map show The Cape and "Occacock" Island (Figure 17) and three distinct inlets north of Hatteras (Figure 18), which depict the difficulties late-eighteenth-century mariners encountered as they sailed along the Outer Banks. Port Roanoke, although plagued by shallow and migrating channels, became a major North Carolina port that briefly rivaled Wilmington and the Cape Fear region (Crittenden 1936:42).

While British warships captured numerous vessels in or near the inlets of the Outer Banks, and even made sorties across the barrier islands into the sounds to harass small coastal vessels, the dangerous inlet provided a means of escape from pursuing warships and privateers. (Dunbar 1958:22; Crittenden 1936:122). The hostilities that led to the Revolutionary War did little damage to the commerce that passed through Port Roanoke, and custom records show that for the period 1774 to 1776 exports at Port Roanoke increased. In 1775, there were 40 percent more exports than in 1772. Growth continued so that by 1778 Port Roanoke cleared 15,000 tons in commerce that year alone (Crittenden 1936:119-120, 158).

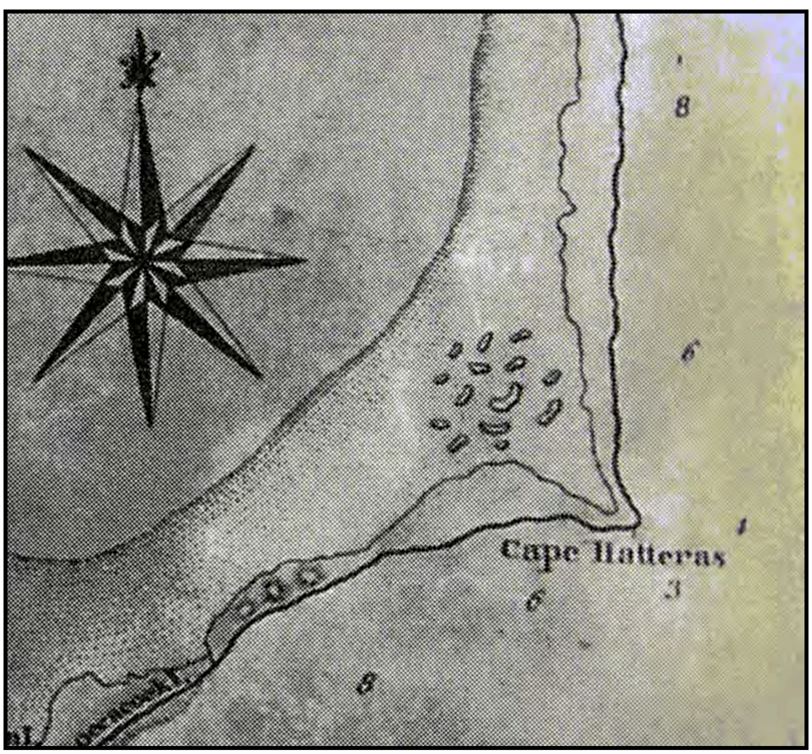

Figure 17. Cape Hatteras depicted in 1770 Collett Map (Cumming 1998:Plate 63).

Figure 18. The Collett map dated 1770 showing the inlets north of Hatteras.

Under the dynamic leadership of its secretary, Alexander Hamilton, the newly-formed U.S. Treasury Department sought and received the authority to construct a beacon on the headland of Cape Hatteras in 1794. According to Cape Hatteras Lighthouse authority Kevin Duffus (2003:17):

> [T]he proposed lighthouse was among the first commissioned by the nation warning mariners to avoid a specific navigational hazard. Previously, colonial lights had been established to guide vessels into port. Urgency was paramount…As the young nation's growth was being fueled by the cargoes of merchant vessels, an increasingly and disproportionate number of hulls were disgorging their wares on the dark and low-lying beaches along the Outer Banks.

After a lengthy exercise to master numerous obstacles, the U.S. government purchased four acres of land for $50 from a Currituck family [and estate] named Jennett. When the deed was finally conveyed to the Federal government, the "lighthouse had already been under construction for two seasons and its castle-like, octagonal stone rampart was by far the tallest manmade structure on the island" (Duffus 2003:19). Despite constantly combatting erosion due to storm surges and gales especially during the annual hurricane and northeaster cycles, the builders prevailed and the lighthouse was illuminated in October 1803 (Duffus 2003:19).

By 1808, a series of small islands developed in the sound immediately west of Roanoke Inlet, and navigation became especially hazardous. Trade through Port Roanoke finally ceased when the inlet closed in 1811. In 1828, Currituck Inlet to the north also closed, leaving the Albemarle region dependent upon facilities at Ocracoke, a considerable distance to the south. Figure 19 shows the coastline as of 1833. As part of a program to improve coastal navigation that was heavily supported by North Carolina legislator Archibald Murphy, construction of an inlet near Roanoke Island was proposed in 1816, 1820, 1829, 1840, and 1853. None of the proposals received necessary state-wide political support (Lefler 1965:199-205; Dunbar 1958:26).

In 1837, Congress did appropriate 5,000 dollars for building a new lighthouse on Pea Island, near New Inlet. Captain Charles W. Skinner upon inspecting the site for the Navy Board found it unsatisfactory and recommended that the lighthouse be built upon another site farther north on Bodie Island. This occasion seems to be the first printed use of "Pea Island," but the moniker may have been used before Roanoke Inlet closed in 1811 (Stick 1958:282). The MacRae-Brazier Map of 1833 clearly illustrated the closed status of Roanoke Inlet (Figure 19).

When plans for the lighthouse to be constructed on Pea Island north of Chicamacomico Inlet were revealed, the inhabitants of the area demanded that it be placed farther north on Bodie Island. The uproar they created kept anything from being decided until 1848. One factor complicating the decision was the opening of new inlets during a storm in the fall of 1846. On 7 September 1846, an intense storm drove water across the Outer Banks and created two relatively small inlets. An assistant superintendent with the United States Survey was stationed on Bodie Island when the storm occurred and observed that:

> On the morning of the September gale the sound waters were all piled up to the southeast, from the effects of the northeast blow of the previous days. The weather was clear, nearly calm, until about 11 a. m., when a sudden squall came up from the southwest, and the waters came upon the beach with such fury that Mr. Midgett, within three quarters of a mile of his house when the storm began, was unable to reach it until four in the afternoon. He sat upon his horse on a small sand knoll, for five hours, and witnessed the destruction of his property and (as he then supposed) of his family also, without the power to move a foot to their rescue, and, for two hours, expecting every moment to be swept to sea himself. The force of the water coming in so suddenly, and having a head of two or three feet, broke through the small portion of sea beach which had formed since the March gale, and created the inlets. They were insignificant at first-- not more than twenty feet wide-- and the northern one much the deepest and the widest. In the westerly winds which prevailed in September, the current from the sound gradually widened them; and then in the October gale, they came about as wide as they are now. The northern one has since been gradually filling, and is now a mere hole at the low water... [but the southern one] between high water marks, measured on the line, is 202 yards [wide and] between low water marks, 107 yards (C. O. Boutelle quoted in: Stick 1958: 279-280).

Although the northern inlet closed, the southern inlet continued to develop. It quickly became an important channel for vessels operating in both the Albemarle and Pamlico Sound (Angley 1985: 6). The inlet is said to have received its name from the steamboat *Oregon*, which was owned by merchant W. H. Willard, of Washington, North Carolina, when it passed through the inlet in June 1848 (*Free Press*, 8 July 1848 and Sharpe 1954: 104).

Figure 19. The MacRae-Brazier map dated 1833.

While Oregon Inlet provided the Albemarle region with a new Atlantic access, the shallow bar and shifting channels in the inlet made navigation difficult. Consequently, the elusive waterway was used principally by shallow draft vessels. Even navigation by small vessels was not without risk and the U.S. Coast Survey Chart of Bodies Island produced in 1849 identifies three wrecks in the inlet (Figure 20). Within a few years of its formation, navigation in Oregon Inlet came to the attention of the U.S. Army Corps of Engineers. Considerable local support developed for improving Oregon Inlet and several proposals were made in Congress to provide support. Other priorities prevailed, however, and it would be more that a century before improvements to the channel would be approved and funded.

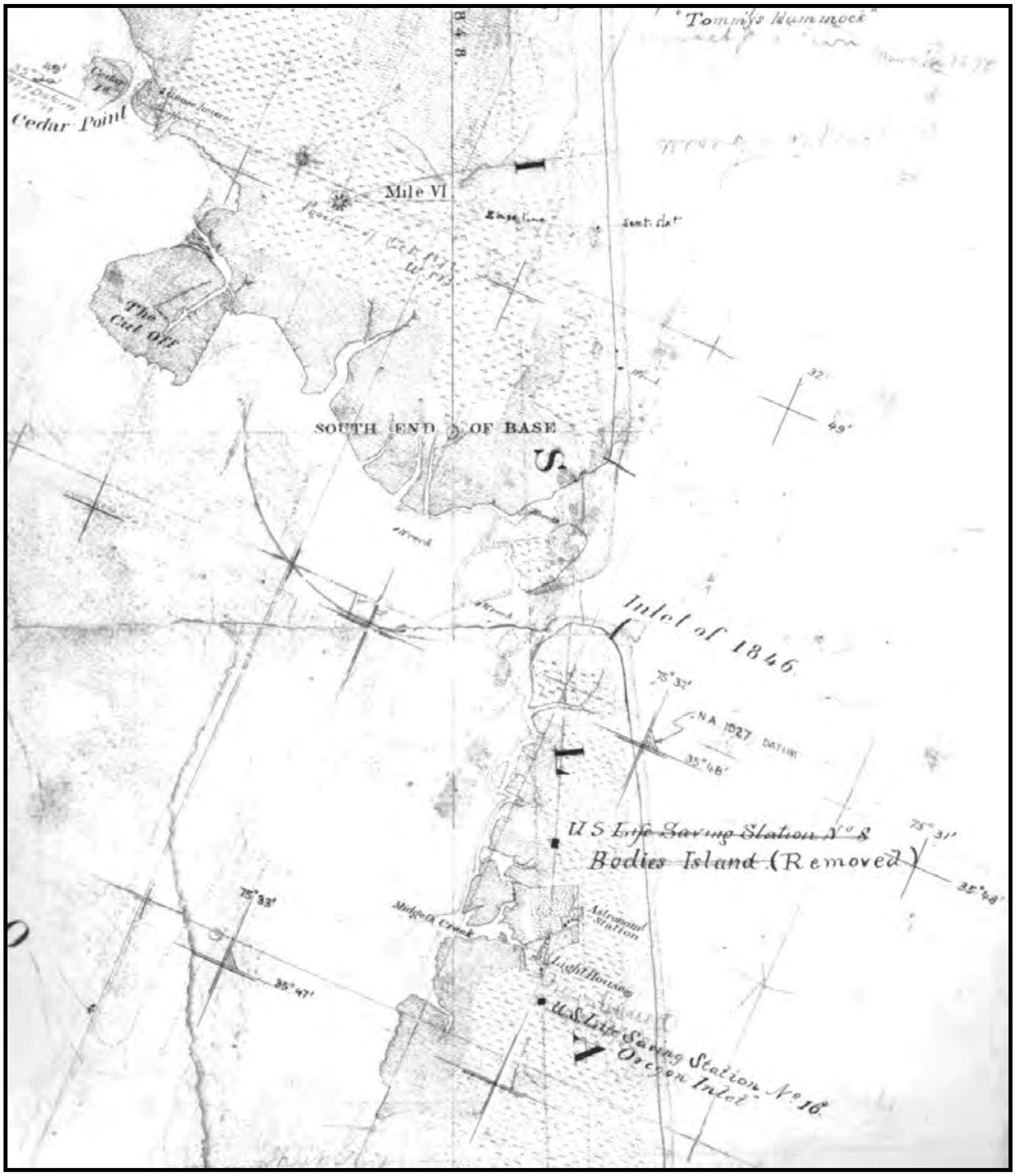

Figure 20. U.S. Coast Survey, topographic sheet, Bodies Island dated 1849.

While navigation in the inlet remained hazardous, Congress did approve the construction of a lighthouse near Oregon Inlet. The first Bodie Island Lighthouse was constructed south of the inlet during 1847-1848 (Republican, 5 May 1847, Angley 1985: 6-7). The lighthouse was 56.5 feet tall and its light had a range of 12 nautical miles (*North State Whig* 19 January 1848, *Free Press*, 8 July 1848). Unfortunately, it fell into disrepair shortly after its construction, and in 1857 an appropriation of 25,000 dollars was required for building a second structure and procuring a new lens. The second lighthouse began its operation on 1 July 1859 (*Times Daily* 18 July 1872; Stick 1958: 277-278).

The Bodie Island beacon was welcomed by those navigating North Carolina coastal waters, but it did not stop the loss of vessels in the Oregon Inlet vicinity. The same month that the second lighthouse began operations, the schooner *Spy* of Plymouth was wrecked on the beach three miles below the lighthouse (*Democratic Pioneer* 26 July 1859). The *Spy* carried a valuable cargo of pork, beef, fish, oils, paints, flour, sugar, bricks, gunney cloth, rope, shoes, hats, furniture, dry goods, doors, blinds, spirits, tobacco, butter, and cheese. Cargo salvaged from the wreck and rights to the vessel's remains were sold by Captain S. A. Baum, Commissioner of Wrecks, on 18 July 1859 (*Democratic Pioneer* 26 July 1859).

Civil War Period 1860-1865

During the Civil War, the Confederate States Government and the State of North Carolina initiated construction of a series of fortifications designed to provide for the defense of the Outer Banks of North Carolina, but both the plan and the resources to carry it out were limited. The result was a series of hastily constructed defenses that included Fort Oregon, located south of the inlet between the breakers and the Bodie Island lighthouse (Angley 1985:7).

North Carolina also began a buildup of naval forces to protect the sound and inlets. The "Mosquito Fleet" consisted of four vessels, the *Winslow, Ellis, Raleigh,* and *Beaufort*. The *Winslow*, under the command of Captain Thomas M. Crossan, was a side-wheel steamer armed with a single 32-pound gun. The other three vessels were small river boats such as the *Beaufort* which was 94 feet long, with a 17-foot beam, carried a compliment of 35 officers and men, and mounted one 32-pounder on its bow.

These three small river craft were sent to operate on the inland sounds and waterways, while the *Winslow* was ordered to Hatteras Inlet (Figure 21) to harass the enemy and capture coastal shipping. She was able to capture sixteen enemy vessels (Stick 1958:118). When the United States government received information that "pirates" were operating out of Oregon Inlet and that supplies were being run through the inlet, plans were devised to block the channel. The plan called for scuttling a number of stone-laden schooners. However, there is no historical evidence that the plan was ever implemented (Angley 1985:8).

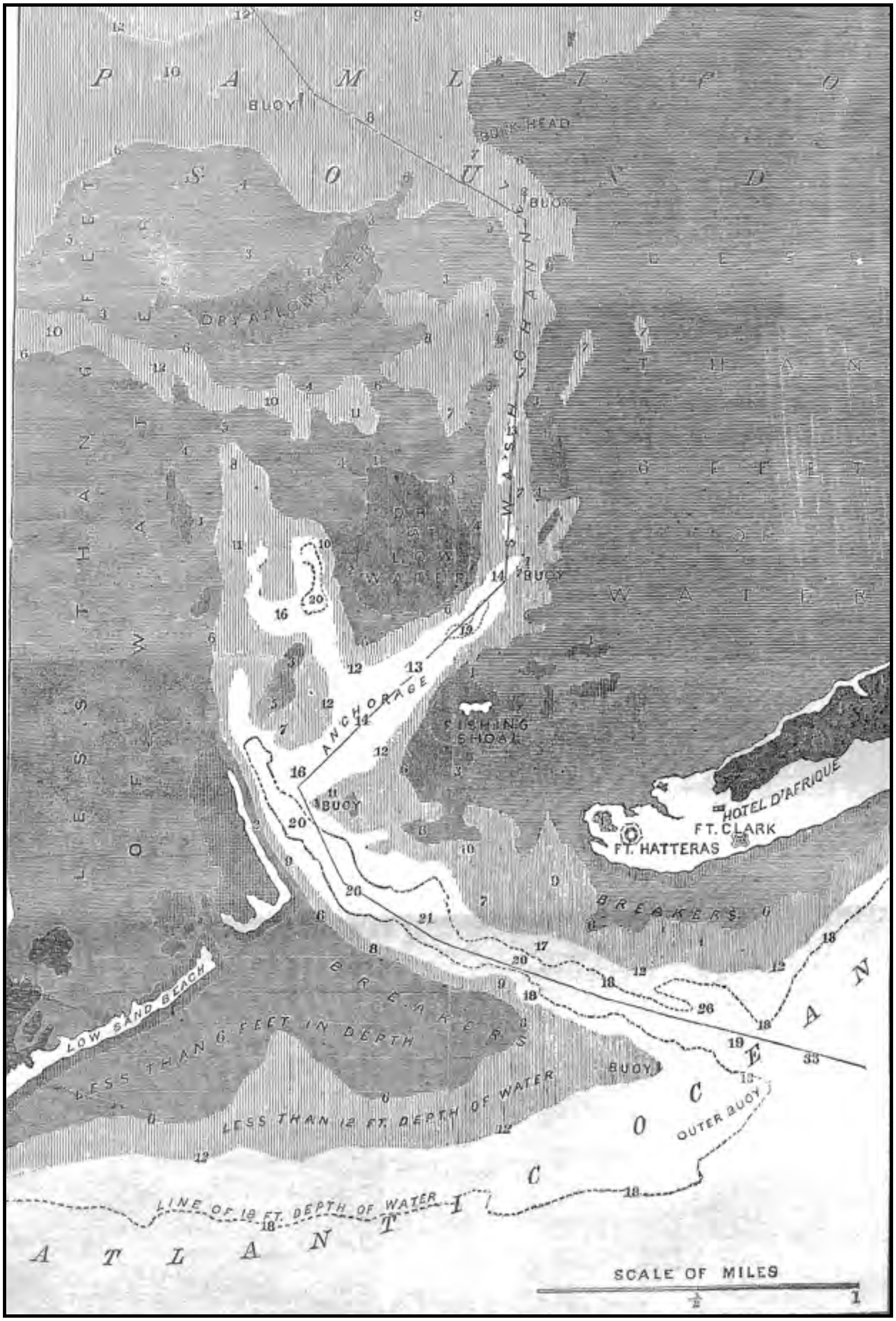

Figure 21. Contemporary chart depicting Hatteras Inlet details (*Harper's Weekly* 15 February 1862:103).

Instead, a joint Army and Navy force was dispatched to the North Carolina Outer Banks from Hampton Roads, Virginia, on 26 August 1861. The naval force, commanded by Commodore Silas H. Stringham, consisted of seven vessels mounting 143 guns. Stringham's fleet included the warships *Minnesota, Wabash, Susquehanna, Pawnee, Monticello, Harriet Lane,* and *Cumberland*. The land force, under the command of General Benjamin F. Butler, consisted of 880 men from the Ninth and Twentieth New York Volunteers, and detachments from the Union Coast Guard and Second U.S. Artillery. These troops were transported south on the tug *Fanny*, and the chartered steamers *Adelaide* and *George Peabody* (Stick 1958:120).

Figure 22. U.S. joint naval and army forces bombarding Hatteras Inlet fortifications in August 1861 published by *Currier & Ives* (Courtesy Library of Congress).

On arrival at Hatteras Inlet on 28 August, the warships began bombarding Fort Clarke. By the end of the day, it was under the control of Union officers. The next morning, the Federal force began shelling Fort Hatteras. After only a brief bombardment the Confederate garrison also surrendered (Figure 22). Upon learning of the attack on the forts, the Confederates sent a relieving force consisting of the Third Georgia Regiment from Norfolk onboard the steam tug *Junaluska*. The fall of both forts left the Confederate reinforcements without a practical mission and they landed on Roanoke Island on 30 August. After disembarking its troops the *Junaluska* went to Oregon Inlet and a council was held at Fort Oregon.

It was decided to evacuate the men and guns to Roanoke Island and join with other Confederate forces in resisting General Burnside. As they abandoned the fort, retreating Confederates destroyed the second Bodie Island Lighthouse (Stick 1958:129, 280). Meanwhile, supply lines were being established by the Federal force between Hatteras and Newport News, Virginia. In September, a detachment of men arrived to supplement those left to guard the Confederate forts. The Union gunboats *Ceres* and *Putnam* joined the three vessels that had been left by the original invading force, the *Pawnee, Monticello,* and *Fanny*. Fearing an attack, the commander of the Union detachments sent 600 men to the north end of Hatteras Island to set up a camp at Chicamacomico (Stick 1958: 130-131).

The Confederate force on Roanoke Island mounted a rifled naval thirty-two pounder on the bow of the side-wheel steamer *Curlew*. The vessel, under the command of Commodore Lynch and manned by recruits from the Third Georgia Infantry, set out with the *Junaluska* and *Raleigh* towards Chicamacomico.

Battle was initiated on 1 October 1861, when the small Confederate squadron met the Union steam tug *Fanny*. After only a 15-minute battle, the *Fanny* (Figure 23) was taken by Confederates, thus accomplishing their first capture of an armed ship during the Civil War (Stick 1958:132). On 5 October, two regiments of Confederate infantrymen were loaded onto the steamers *Curlew, Cotton Plant, Raleigh, Fanny, Empire,* and *Junaluska* and transported to a point about three miles off Chicamacomico in Pamlico Sound. The *Cotton Plant* was able to get about a mile closer in towards shore than the other vessels because of its shallower draft.

A company of artillery along with two 6-pound boat howitzers and two companies of infantry disembarked into the shallow water and waded towards the shoreline, firing at the Union troops stationed on the beach. The other vessels headed south in an attempt to land their troops behind the Union forces. Seeing that they might be encircled, the Federals rapidly retreated to Fort Hatteras. Their pursuit by Confederates has been called the “Chicamacomico Races” (Stick 1958:133-136).

Upon returning to Roanoke Island after the attack on Chicamacomico, Confederates set about fortifying their positions. Across Crotoan Sound, heavy pilings were sunk along with old sand-filled vessels. This strategy created a line of obstructions with only a few openings large enough to permit friendly vessel passage. An old canal boat was grounded opposite Redstone Point at the western end of the line of pilings and hulks. A battery of eight guns mounted upon the deck of the grounded hulk was called Fort Forrest.

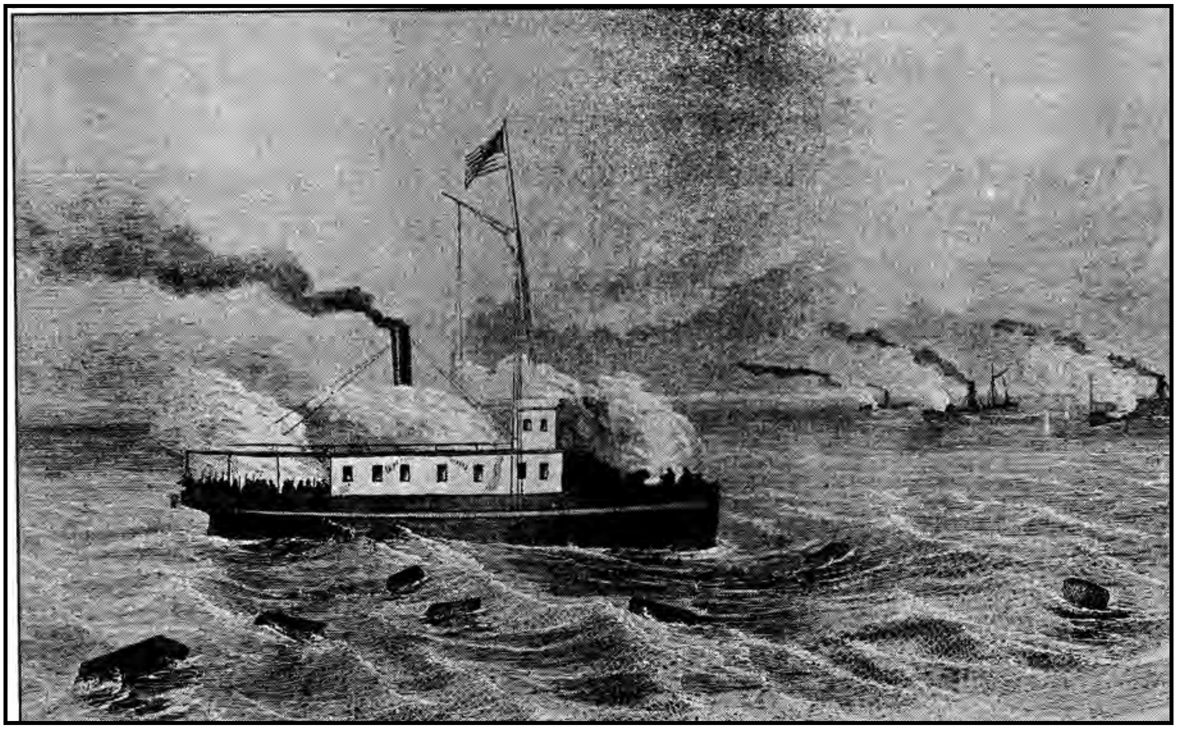

Figure 23. The US tugboat *Fanny* captured by Confederates (Carbone 2001:18).

On the eastern end at Roanoke Island, three forts were constructed. Fort Huger, which mounted twelve guns, was located at Weir Point, north of the piling line. Fort Blanchard, which had only four guns, was located a half-mile to the south of the line. Fort Bartow with eight guns was located on Pork Point near the line but invisible from the water (Stick 1958: 137).

On 11 January 1862, a flotilla of more than 80 Federal vessels, composed of sailing boats, North River barges, and large passenger steamers, sailed from Newport News and arrived off Hatteras Inlet on 13 January. Land forces were under the command of General Ambrose Burnside and U.S. Navy divisions were under the direction of Admiral Louis M. Goldsborough.

After arriving at the inlet, gales and storms prevented the Fleet from passing over the shallow sand bars and into the Pamlico Sound (Figure 24). The foul weather also caused the stranding and loss of five vessels; *City of New York*, *Grapeshot, Pocahontas, Louisiana,* and the *Zouave* (Figure 25; Figure 26).

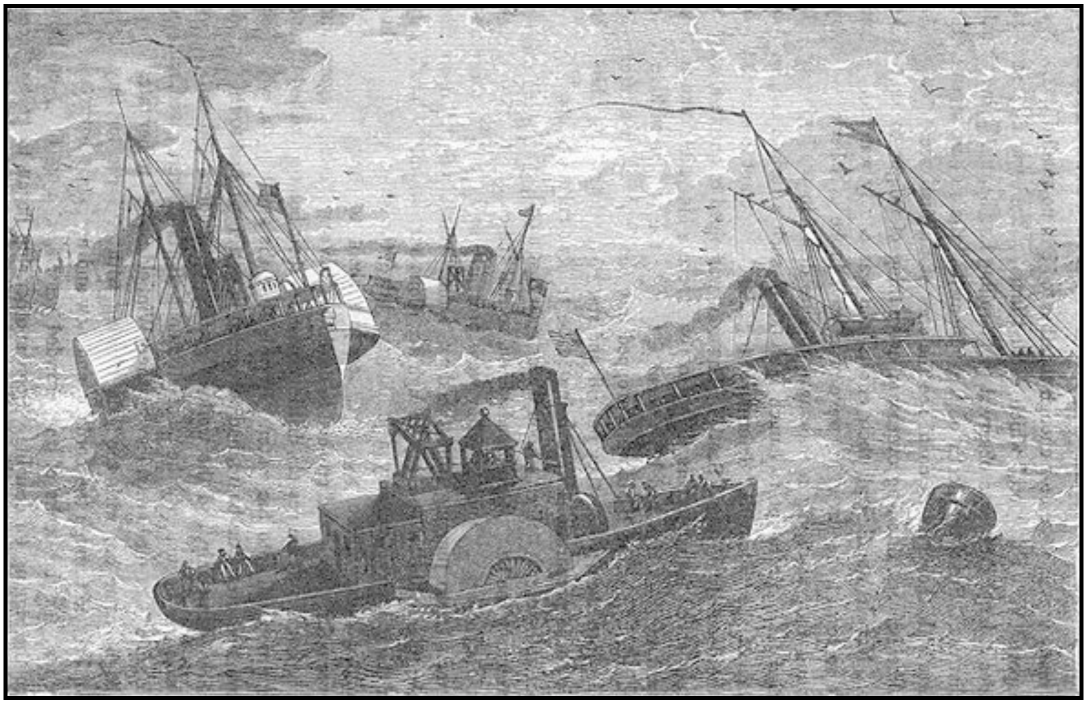

Figure 24. Federal vessels encountering foul weather off Hatteras Inlet.

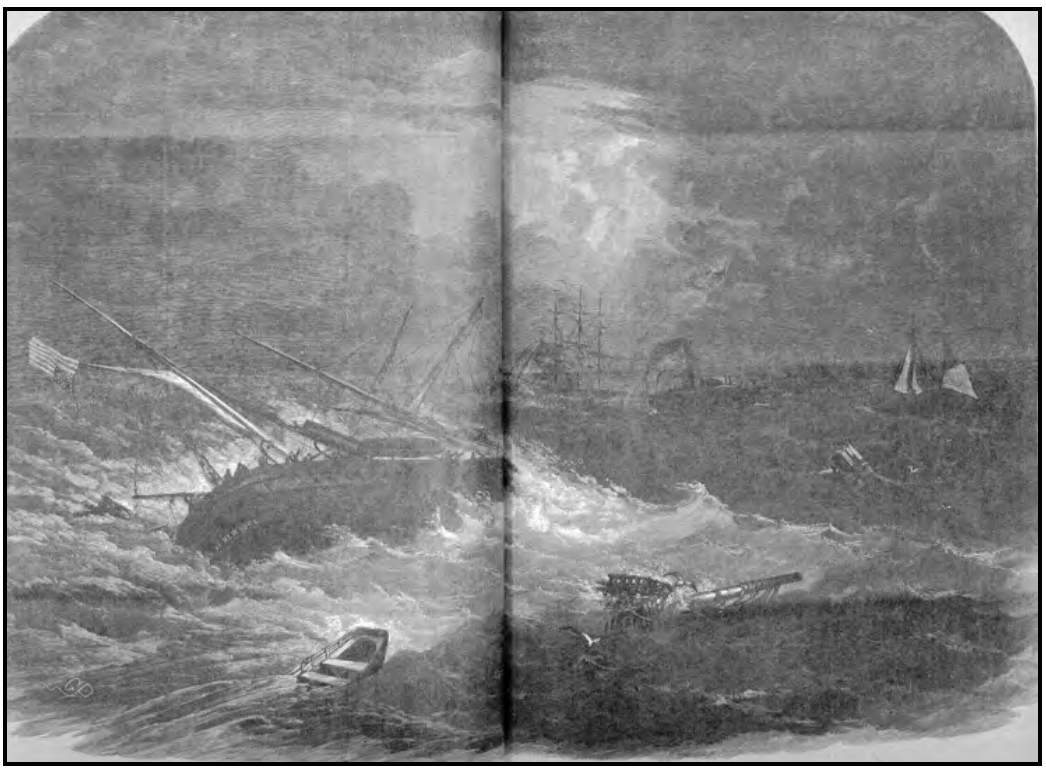

Figure 25. Loss of the *City of New York* at Hatteras Inlet (*Harper's Weekly* 15 February 1862:104-105).

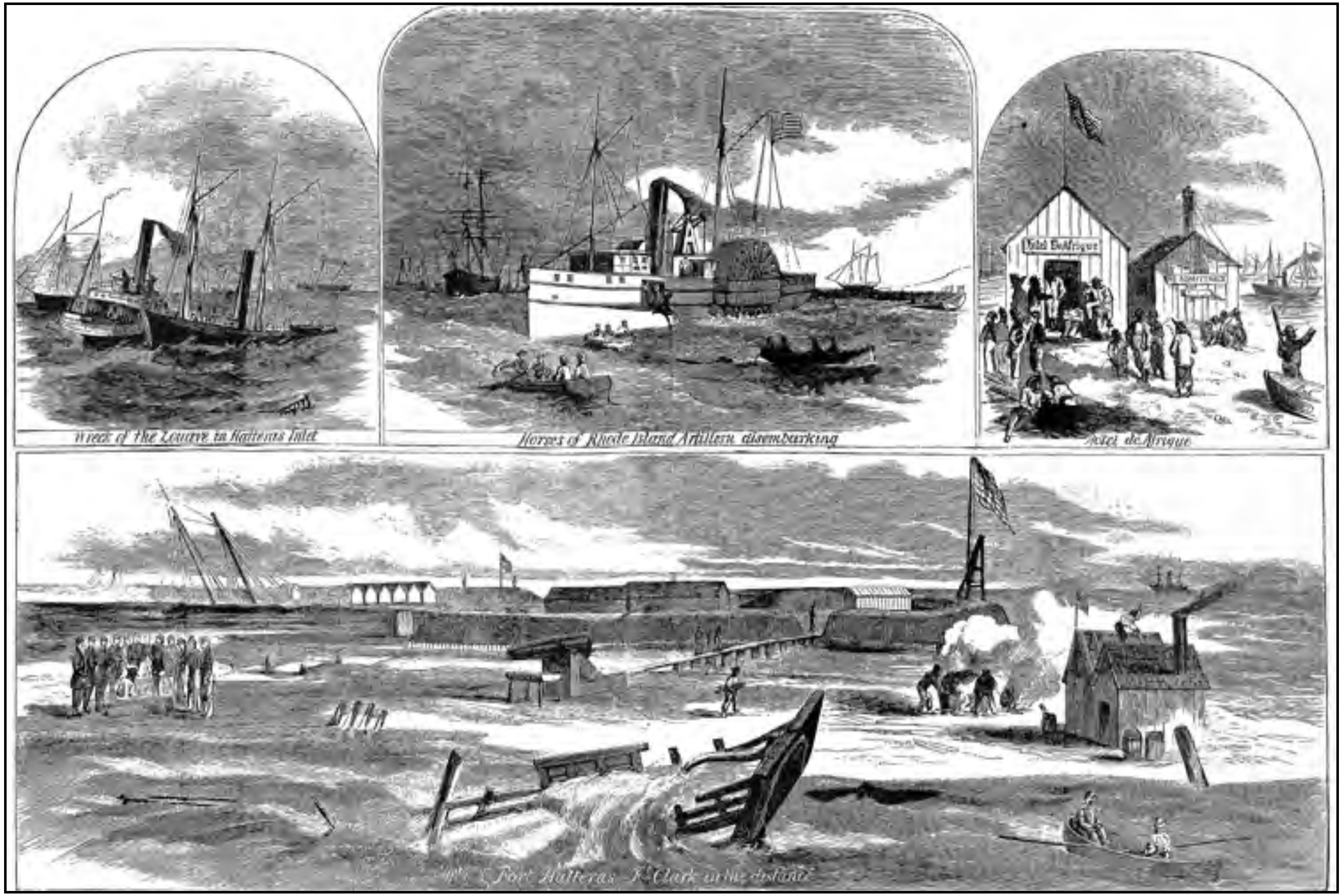

Figure 26. Contemporary montage showing wreck of the *Zouave* in Hatteras Inlet, Union transports and Hatteras Island scenes (*Harper's Weekly* 15 February 1862:101).

The *City of New York*, a 574-ton screw steamer transporting troops for the operation, foundered east of Hatteras Inlet on 13 January 1862 (Shomette 1973:36-37). The aging side-wheel steamer *Pocahonta*s was also lost (Figure 27) while engaged in transporting horses and equipment to support the invasion of North Carolina on Hatteras Island near Rodanthe on 18 January 1862 (Delgado 1984:62). Once within the sound, grounded Union vessels were easier to refloat and losses were almost eliminated. On 4 February, the remainder of the Union fleet was finally able to pass the bar and sail for Roanoke Island.

Figure 27. Shipwreck of the *Pocahontas* near Rodanthe on 13 January 1862 (*Leslie's Illustrated Newspaper* 15 March 1862:273).

Confederate defense of Roanoke Island had been given to General Henry A. Wise, but as he was suffering from pneumonia, command was transferred to Colonel H. M. Shaw. Under the command of Commodore Lynch, a fleet of nine vessels—*Black Warrior, Seabird, Appomattox, Ellis, Curlew, Forrest, Raleigh, Beaufort,* and *Fanny*—each with one 32-pounder, also guarded the island (Stick 1958: 141-142). Union forces arrived off Roanoke and began shelling the Confederate batteries and gunboats on 7 February. The Confederate gunboat *Curlew* was hit and ran aground in front of Fort Forrest, blocking the battery's line of fire. The *Forrest* was also struck by enemy fire and forced to withdraw.

By nightfall the Confederate fleet was out of ammunition and retreated up Albemarle Sound toward Elizabeth City (Stick 1958: 143). Union land troops continued to land at Ashby's Harbor until late in the night. The next morning the 7,500-man force began an attack on the Confederate defenses and by nightfall had captured the island with only light losses on each side (Stick 1958: 144-148).

The fall of Roanoke Island, on 8 February 1862, provided the United States with a base of operations that supported the closures of Albemarle and Pamlico sounds to Confederate commerce for the duration of the war. Along with the captures of Hatteras

Inlet and Fort Macon, "organized Confederate resistance" on the Outer Banks was generally suppressed (Stick 1958:152-153). A routine account by Master Woodward of the USS *Shawsheen* stationed at Hatteras Inlet on 5 April 1862 described the local maritime scene with a variety of watercraft as such:

> I proceeded to the inlet [Hatteras] with schooner *Napoleon* and towed her to sea without much trouble; the took lighter alongside the schooner *E. J. Raynor* to lighten her; supplied myself with coals from the *Charlotte Williams*, she being the deepest draft…gave orders to schooner *Neptune* to proceed to Roanoke island…these being all the coal schooners in the inlet for the Navy. Found the schooner *Charles H. Moller* with stores; gave him orders, after towing him over the swash…After lightening the *Raynor* up to 8 feet, towed him over the swash. Went to the steamer *Suwanee*, took 73 boxes of shell for 100 pounder Parrott guns, the boxes in bad condition, and one cask of packing; then took lighter up over the swash and put ammunition on board the *Raynor* again…Having done all as directed…I left the inlet for New Berne…Passed on the way here schooner *C. H. Moller*, bound here, and schooner *Palma*, bound out (National Historical Society, ser. 1, v. 7, 1987:202).

On the last day of December 1862, one of the more famous [modern perspective] Civil War Era shipwrecks occurred off Hatteras Island, when the USS *Monitor* foundered some 16 miles SSE of the Cape Hatteras Light in 225 feet of water (Figure 28). The ironclad steamer was being towed by the USS *Rhode Island*, in concert with the *Passaic* being towed by USS *State of Georgia*, when the Federal vessels encountered severe squalls (Berman 1973:148; Broadwater 2012:8-10). Owing to its historic status and the volume of public interest, the shipwreck site was "designated the first National Marine Sanctuary" on 30 January 1975 by the U.S. Department of Commerce secretary with approval by President Gerald Ford (Watts 1985:315).

At the time of the *Monitor*'s tragic demise, some 1200 individuals lived on Hatteras Island and of this number nearly half were housed west of the lighthouse (Figure 29: Figure 30). Approximately 100 slaves were included in the larger figure, and the majority of all residents were dispersed in just over 200 dwellings (Stick 1958:154). Only the contemporary village of Hatteras was known by its present-day name; Buxton was still simply called "The Cape" (Stick 1958:154).

Figure 28. Tragic loss of the USS *Monitor* off Cape Hatteras.

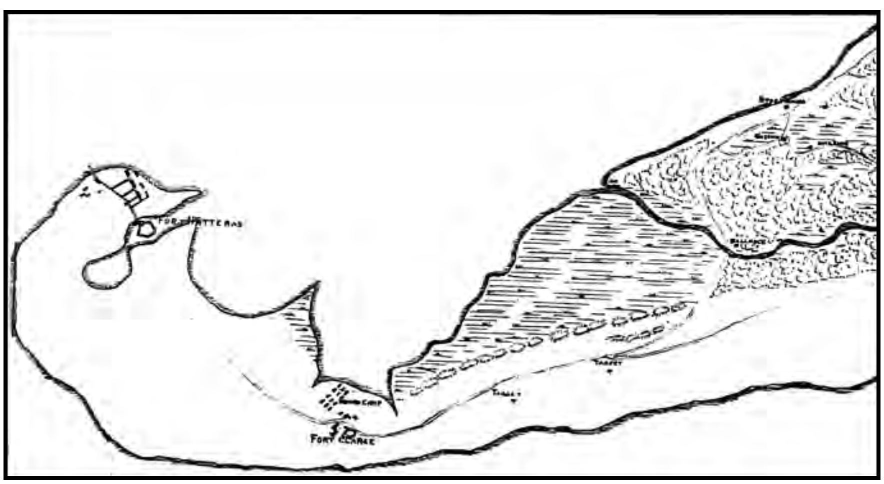

Figure 29. Map of Hatteras Island drawn 1864 by Union engineer (Courtesy National Archives Cartographic Section).

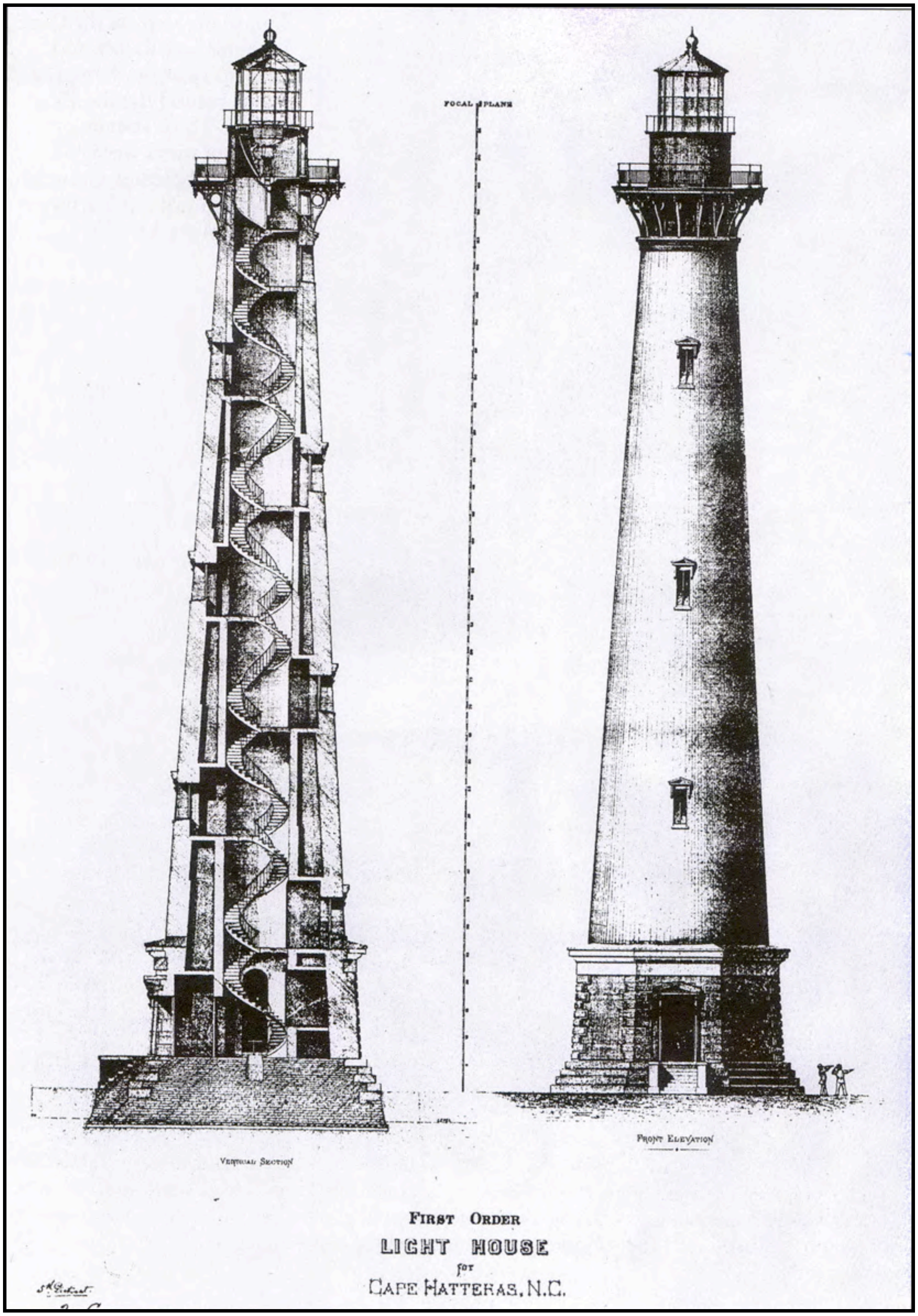

Figure 30. Architectural sketch of the Cape Hatteras lighthouse prepared in 1869 (Courtesy National Archives).

Following the Civil War proposals were also developed for improving navigation in Oregon Inlet, but government surveys carried out in 1873-1874 and again in 1882 determined that dredging the inlet as impractical. Several other improvements to navigation were initiated (U.S. Congress 1874:85). The new Hatteras Light had been constructed and was illuminated by 17 December 1870 (Duffus 2003:161-163). To provide a measure of safety for vessels navigating in the vicinity of Oregon Inlet, a third Bodie Island Lighthouse was built to replace the one destroyed by retreating Confederates. Constructed on a site purchased for $150 from John B. Etheridge in 1871-1872, that lighthouse ultimately cost $14,000 (U.S. Congress 1883:2). Work was completed on the 150-foot structure by 1 October 1872 (Stick 1958: 277-278). During construction of the new lighthouse five sailing vessels were wrecked off Bodie Island, confirming the need for a navigation aid in the area (*Times Daily* 18 July 1872).

From December 1873 to December 1874, the U.S. Lifesaving Service built seven new stations at Little Kinnakeet, Chicamacomico, Bodie Island, Kitty Hawk Beach, Nag's Head, Jones' Hill, and Caffrey's Inlet. Due to continued loss of life on the Outer Banks from vessel losses, the service built eleven more stations during the winter of 1878-1879. These were located at Tommy's Hummock (located north of Oregon Inlet and later renamed Bodie Island), Pea Island, Cedar Hummock, Big Kinnakeet, Creed's Hill, Hatteras, Deal's Island, Old Currituck Inlet, Poyner's Hill, Paul Gamiel's Hill, and Kill Devil Hills. Later in 1883, the service built a station at New Inlet (Stick 1958: 173). The Pea Island Life Station, which was opened in 1879, operated until 1946. For sixty-three years it operated as an all Negro-manned station (Sharpe 1954:103). The Coast Chart No. 139, Oregon Inlet to Cape Hatteras identifies the Bodie Island Lighthouse and U.S. Lifesaving Service stations in the project area.

In 1870, the Church brothers from Rhode Island opened a menhaden processing plant at Oregon Inlet (Dunbar 1958: 231). The plant was closed two years later because of hazardous navigation in the inlet, the limited supply of menhaden, and the lack of oil in the fish that were being caught in the sounds (Dunbar 1958: 149 and Angley 1985: 8-9). Only a year after the Church brothers closed their plant, the Corps of Engineers surveyed Oregon Inlet to assess the feasibility of improving navigation. Their plan was designed to improve access to the Oregon Inlet passage to Albemarle Sound and thus reduce by 120 miles the distance vessels arriving from northern ports would have to travel to ports in the sound. The survey determined that the advantages of the plan did not justify its projected cost. A particularly important consideration in the decision was the southward migration of the inlet (Angley 1985: 9; U. S. Congress 1874: 85).

Although nineteenth-century commercial fishing registered only nominal success in the Oregon Inlet vicinity, independent fishermen enjoyed success at Oregon Inlet and sport fishing became an important source of local income. By 1875, plentiful blue fish represented an important resource for both commercial and sport fisherman (Economist, 24 November 1875). Drum also became an important source of revenue for the area. Two years later that same Elizabeth City newspaper reported that "the sound near Oregon is alive with old drums and trolling furnishes sport and happiness to many an angler"

(*Economist* 6 June 1877). Herring also became an important resource and smoked herring brought two cents apiece in 1877 (*Economist* 9 May 1877). By 1891, Captain John Ward of Roanoke Island was offering "choice Oregon Inlet herrings" that were described as the "best in North Carolina" at $5.50 per thousand (*Economist* 5 May 1891).

By 1876, sizable ocean vessels were also using Oregon Inlet to gain access to the Albemarle. On 23 August 1876, the Elizabeth City *Economist* reported that six large vessels had navigated the inlet within the past month and the editor observed that "with proper help the water would be deepened all the way through" (*Economist* 23 August 1876). In April 1878, there was about 12 feet of water on the bar at Oregon Inlet and a schooner of 200 tons was reported to have crossed without incident (*Economist* 23 April 1878).

In 1882, the historic community [and its post office] called The Cape became officially known as Buxton in honor of Judge Ralph P. Buxton (Powell 1968:78). Buxton was born in Washington, North Carolina in 1826 and was educated at College Point, New York before joining the junior class of the University of North (Chapel Hill) in 1843. After graduation, Buxton read law under Raleigh, North Carolina judge John Bryan and subsequently obtained county and superior court licenses. The “warm and consistent Republican” practiced law in Fayetteville for many years, and also served as the town’s mayor. During Reconstruction, the Washington native was first appointed by Governor Holden to serve as a superior court judge. Buxton was described “as an ardent Whig and a great admirer of Henry Clay and Daniel Webster” (Dowd 1888:127-128).

In 1882, increased use prompted the Corps of Engineers to re-examined plans for improving navigation channels at Oregon Inlet. However, the constant migration south and volatile nature of the inlet environment still proved to be major stumbling blocks to cost-effective improvements. The inlet was found to have moved south and widened to about 500 yards since the previous survey. The channel had deepened, however, and vessels drawing 11 feet could pass though at high water while those drawing nine feet could pass when the tide was out. The Corps of Engineers also noted that on the sound side, Old House Channel ran away to the southwest and was both crooked and highly active. The channel over the bar was more constant but still liable to change in response to storm energy. The high-energy environment made any attempt at improving the inlet costly if not futile.

In 1897, the Oregon Inlet Coast Guard Station was built on the north end of Pea Island. The building was remodeled in 1933 and 1970 and was in use until December 1988. The station was evacuated due to the constant erosion on the north end of the island from the southward movement of Oregon Inlet. A modern Coast Guard facility was constructed at Oregon Inlet in 1990 on the west side of Highway 12 adjacent to the Oregon Inlet Fishing Center. Previously, the original station was listed on the NRHP as being the "oldest active Coast Guard Station in the State of North Carolina" (North Carolina Department of Transportation 1989:C-3).

A letter forwarded to the U.S. life-saving service superintendent in December 1895 confirms that the *Little Sampson* of Buxton was engaged in commercial fishing. On 13 October of that year the schooner sailed from Buxton "for Elizabeth City, North Carolina, with a cargo of fresh fish" (United States Life-Saving Service [USLSS] 1897:257). Later that day, the vessel "was driven ashore on a reef in consequence of a gale," however, due to the efforts of the Gull Shoal station, the *Little Sampson* was refloated a few days later (USLSS 1897:257). At the time of the mishap, the seven-ton schooner was under the command of Master Barnett and carried finfish valued at $120 (USLLS 1897:316-317).

Another contemporary and popular vessel plying late-nineteenth-century Dare County waters was the sharpie (Stick 1958:179; Figure 31). Contemporary records compiled by District Six station heads (Cape Henry to Cape Fear) identified Dare County vessels including the schooner *I. D. Jane* of Hatteras [Avon], the sloop *Little Inez* of Kinnakeet, the sailboat *Mary Caroline* of Roanoke Island, the sailboat *Rosette* of Roanoke Island, the schooner *Dorcas Jane* of Big Kinnakeet, and one unknown "Fish boat" of Hatteras. The outbound cargoes carried aboard these vessels appeared to be chiefly fish or oysters (Figure 32), and inbound cargoes brought to their homeports included corn and wood, and "General" merchandise (USLSS 1897:316-317).

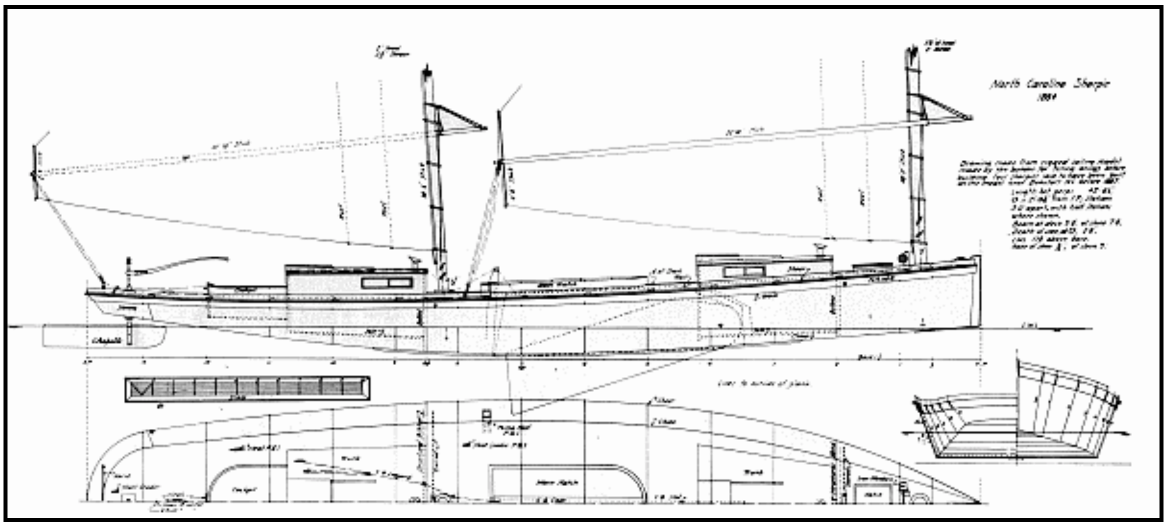

Figure 31. Drawing of North Carolina sharpie, 1891 (Chapelle 1961:143).

A highly visible vessel near Cape Hatteras seen at its official station was the Diamond Shoal lightship. This vessel served local watercraft, coastwise traders and foreign shipping in one of the most dangerous seaways in North America. Ironically, one of the lightships (Figure 33) survived the horrific effects of the San Ciriaco hurricane during August 1899, when the government-owned vessel was swept on the beach (Hairr 2001:72). Another would be destroyed some 19 years later by a German submarine stalking shipping along the Atlantic seaboard.

Figure 32. Hatteras oyster boat (b. 1889) owned by J. J. Davis of Buxton that sailed waters of Dare County for decades (Hairr 2001:81).

Figure 33. Diamond Shoals lightship beached after 1899 San Ciriaco hurricane (Hairr 2001:72).

Twentieth-Century Development

Although Dare County principally remained remote and underdeveloped in the years preceding The Great War, Gannon (1991:243) remarked that due to the brisk shipping passing along its barrier islands, "German U-boats worked the adjacent waters in 1918 destroying (by torpedo, mine, or driving aground) six tankers, a schooner, a bark, and the Diamond Shoals Lightship." These war losses are identified in Attachment A. In respect to military activities carried out in the vicinity of Cape Hatteras in the postwar period, a controversial bombing experiment was conducted by Brigadier General William Mitchell.

According to Branch (2006), Mitchell "had demonstrated in 1921 what many naval strategists considered impossible-that battleships could be destroyed from the air-when he used airplanes to sink an old surplus battleship" off the coast of Virginia. In September 1923, Mitchell:

> [S]et up the experiment off Cape Hatteras to determine if battleships could be sunk by high-level bombing and to measure the potential for aircraft being called into combat from long distances to intercept a hostile warship. The target vessels, which were to be scrapped under postwar naval limitation treaties, were the 14,949-ton *New Jersey* and *Virginia*, built between 1902 and 1906 at a cost of $6 million each and anchored 18 miles southeast of Cape Hatteras (Branch 2006).

The initial air attack was made by planes flying in from Langley Airfield in Virginia, some 175 miles to the north, while Mitchell's own planes flew out to the site from a make-shift airfield located on Hatteras Island. In the aftermath, the two vessels were successfully destroyed; the *Virginia* sank in 30 minutes, and the *New Jersey* disappeared in the ocean within minutes (Branch 2006). Due to his popularity with Hatteras Islanders, the airfield at Frisco was eventually named for "Billy" Mitchell (Hairr 2001:85).

The development of a lucrative fishing industry at Manteo increased pressure to improve navigation between that island and the Atlantic, which affected the region including Hatteras Island. In 1910 and 1911, dredging was begun to link Shallowbag Bay with Oregon Inlet. Proposed improvements called for a 6-foot-deep, 100-foot- wide channel across Shallowbag. Maintenance dredging of this channel was carried out in 1916, 1929, and 1934 (Angley 1985:12-13). The next step in the process of linking Manteo with Oregon Inlet was proposed in 1927. The Corps of Engineers investigated the feasibility of maintaining a 6-foot-deep, 150-foot-wide channel from Manteo through Roanoke Sound and into the main channel across the Pamlico Sound.

However, It was not until 1940/1941 that a channel of this nature was approved and work completed. It was approximately 13 miles long at the same depth as the 1927 proposal, but for economy the channel was dredged some 50 feet more narrow (Angley 1985:13). The improvements were designed to stimulate local commerce and improve navigation for the 5,000 to 15,000 vessels that navigated between Roanoke Island and Oregon Inlet (Angley 1985: 14). By 1940, local interest groups began to push for additional improvements to the channel from Manteo to Oregon Inlet and called for dredging and maintaining a channel through the inlet itself. They believed that this would "stimulate further growth in the fishing industry, increase salinity in the sounds, and provide a badly needed place of refuge for deep-sea trawlers fishing along the Outer Banks" (Angley 1985: 14).

Three years earlier the Elizabeth City *Daily Advance* reported that there were "100 boats occupied in the fishing industry around Oregon Inlet" and recorded that "President Roosevelt asked about fishing at Oregon Inlet" in conjunction with a visit to Roanoke Island in August 1937 (*Daily Advance* 23 June 1937). The newspaper went on to report the sport fishing for drum and channel bass at Oregon Inlet, "annually attracts thousands of sportsmen from northern cities as well as nearby towns" and each year brings approximately $100,000 into the economy of Dare County (*Daily Advance* 23 June 1937).

In *Operation Drumbeat*, Gannon (1991) provides an excellent overview of Germany's initial World War II Unterseeboot attacks along the vulnerable Outer Banks, which focused on the waters off Cape Hatteras. Specifically, the work sheds light on the remarkable albeit terrifying exploits of Reinhard Hardegen, commander of U-*123* as the Bremen-born former Naval airman carried out Operation Paukenschlag. The German High Command astutely recognized that the destruction of civilian maritime commerce making the critical turn at Cape Hatteras would cripple the United States military and its allies.

A dramatic photograph taken on 26 March 1942 shows the devastating torpedo attack on the *Dixie Arrow* off Cape Hatteras by U-*71* (Figure 34). This "Second Battle of the Atlantic" period was boldly called [in translation] "The Second Happy Time" or the "American shooting season" by many German submarine commanders. An additional image depicts the massive tanker in the previous month (Figure 35). At the time of its destruction, the 8046-ton *Dixie Arrow* was transporting 96,000 barrels of crude oil from Texas to New Jersey. War losses from this period are identified, when possible, in Attachment A.

Figure 34. U-*71* attacks *Dixie Arrow* off Cape Hatteras in March 1942 (U.S. Coast Guard [USCG] photo from McKay Collection).

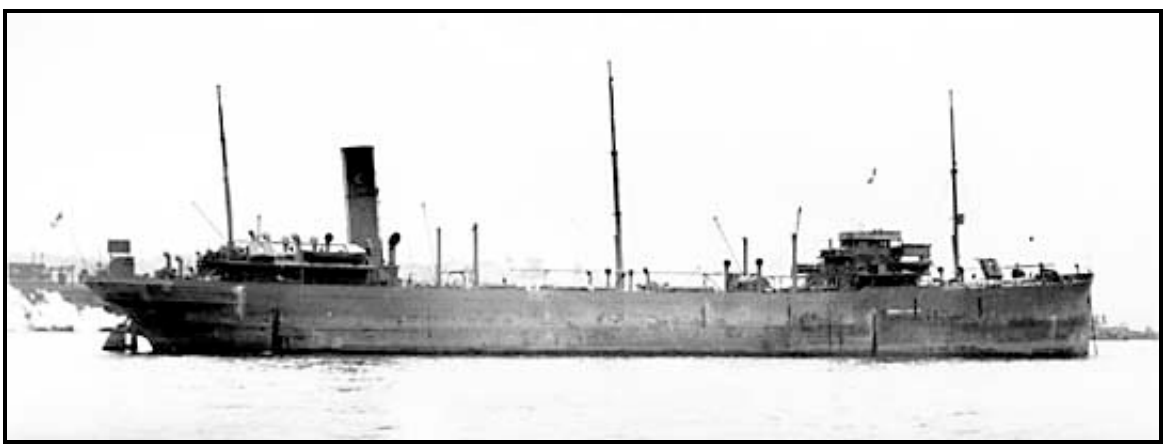

Figure 35. Image of *Dixie Arrow*, 11 February 1942 (USCG photo from McKay Collection).

In 1950, Congress gave approval for a 14-foot-by-400-foot channel across the ocean bar at Oregon Inlet and also authorized maintenance dredging of Old House Channel, Manteo-Oregon Inlet channel, and a channel from Manteo Oregon Inlet channel to Wanchese. A 200-foot-by- 600-foot basin was to be dredged at Manteo and a 200-foot-square harbor created at Wanchese (U. S. Army Corps of Engineers 1987). To stabilize the inlet channel and deter its southward migration, the Corps proposed the idea of building two rubble-mound jetties. The jetties would extend seaward from either shoulder of the inlet and stabilize the channel. After careful consideration this plan was not deemed economical (Angley 1985: 16).

By 1950, the Outer Banks' reputation as a recreational area was increasing rapidly. The town of Nags Head became a popular resort and that popularity provided support for rapid commercial development of the oceanfront. In addition, sport-fishing boats catering to the tourist joined the fishing fleets operating out of Oregon Inlet. Vessel traffic substantially increased the demand for improvements to navigation and political support for such projects. Over the next ten years the Corps worked to meet the channel specification outlined in 1950.

After the National Park Service opened the Cape Hatteras National Seashore in 1953, demands for ferry transportation across Oregon Inlet increased dramatically (Angley 1985: 17). By 1957, a 12-foot-deep channel was dredged across Oregon Inlet from the north ferry slip on Bodie Island to Pea Island. This channel was maintained over the course of the following two years by the hopper dredge *Barracuda*. The inlet remained hazardous however, and the ferry was frequently delayed by stranded fishing boats blocking the narrow channel (U. S. Army Corps of Engineers 1959; Angley 1985:16).

In response to these problems local residents began to lobby for an Oregon Inlet bridge. In August 1961, Herbert C. Bonner suggested to Congress that a bridge, financed by both state and federal revenue, be built across the inlet. Shortly after Bonner's petition was approved, specifications for the bridge were developed. According to Angley (1985:17), “the structure would be two and a half miles long, ...would curve westerly over the inlet, ...[and] would be twenty eight feet wide and elevated sixty-five feet above the water" Opening of the Bonner Bridge provided ready access to the Cape Hatteras National Seashore and increased the local attraction for tourists, which has become the basis of the modern economy of the northern Outer Banks.

Another important landmark was erected on Hatteras Island just before construction of the Bonner Bridge commenced. However, residents were not quite sure what the purpose of the new Federal facility was to be. As David Stick’s *The Outer Banks of North Carolina* went to press in April 1958, the author simply remarked of contemporary Cape Hatteras in this manner: “A U.S. Navy installation-its mission clouded in secrecy-has been built just north of the lighthouse. The old keeper’s quarters at the light has been converted into a Park Service museum of the sea” (288).

With respect to the mysterious complex that Stick referred to in early April 1958, the events taking place there were so “top secret” that members of the team were not allowed to even tell their spouses what activities were taking place at the Buxton site. According to the U.S. Navy (2008:16)

> Naval Facility (NAVFAC) Cape Hatteras was commissioned on January 11, 1956. It was located near Buxton, North Carolina, adjacent to the Cape Hatteras lighthouse. The island is a sandy spit,

> separated from the mainland by Pamlico Sound, known for its frequent and severe storms. The Diamond Shoals surrounding the island claimed more than 600 ships over the years, resulting in Hatteras being called the 'graveyard of the Atlantic'. Although considered relatively isolated, personnel enjoyed movies, bowling, surf and pier fishing, fresh water fishing and hunting. NAVFAC Cape Hatteras operated for over twenty six years and was decommissioned on June 30, 1982.

The highly-classified Cold War era data collection was officially called SOund SUrveillance System (SOSUS). With a view to expand the military program in real world environments, the U.S. Navy contracted with Bell Laboratories of Baltimore, Maryland "to undertake a program aimed at the manufacture and installation of equipment for long-range detection and classification" (U.S. Navy [USN] 2008:4). Early project names included "Caesar" and "Jezebel", the earliest testing took place off Turk Island, where the array was laid on the seafloor. Eventually, by 1952, several sites in the United States were chosen including Cape Hatteras (USN 2008:4).

In his account of 1958-era Buxton, Stick (1958:293) voiced nostalgia for the pre-highway days when sandy trails crisscrossed along the heavy woods between isolated cottages and other primitive buildings. On a more positive note, the Outer Banks historian and prolific author noted that:

> Since the completion of the Outer Banks highway and establishment of the Cape Hatteras National Seashore, a number of motels, restaurants, and other facilities for the tourist have been constructed at Buxton, particularly east of the woods and near the lighthouse (Figure 36). Quite a few Buxton residents own beach buggies, either stripped-down jeeps or older cars equipped with oversized tires, special racks for fishing rods, and boxes for carrying gear, picnic lunches, and the fish which are caught from the surf (Stick 1958:294).

Figure 36. Iconic image of Cape Hatteras Lighthouse (Hairr 2004:77).

Twenty-First Century

The Cape Hatteras Lighthouse was moved inland for approximately 2900 feet in 1999 due to the fact that the shoreline had come “dangerously close” to the historic structure. According to the U.S. Navy, the lighthouse is currently approximately 1500 feet from the seashore, which is the approximate distance as the date of construction. Unfortunately, 1400 feet of beach gained during the expensive lift and transfer engineering project of 1999 was lost during Hurricane Isabel. This destructive 2003 tropical storm “was particularly devastating for the area…and also split the two small towns of Frisco and Hatteras in half” (USN 2008:16). In addition, the storm surge essentially severed NC Highway 12 that provides a virtual lifeline from Nags Head to Hatteras Island. The small towns situated on Hatteras Island were “nearly demolished” during Hurricane Isabel’s deluge (USN 2008:16).

Contemporary Hatteras Island

Despite rapid develop in the post-World War II years, Hatteras Island remains largely undeveloped and the majority of this land is reserved for public activities “like fishing, water sports and observing nature” (USN 2008:15). The pristine beauty of the coast is defined by its “[n]aked sand dunes, wide beaches, thick maritime forest and vast marshlands” (USN 2008:15). The Cape Hatteras Lighthouse (b. 1870) is recognized by the NPS as the tallest beacon in the United States and is among those on the North Carolina coast that are still operational. Other local venues that attract visitors include the Chicamacomico Life-Saving Station (b. 1874), Cape Hatteras National Seashore, the Pea Island National Wildlife Refuge, the Frisco Native American Museum and the Graveyard of the Atlantic Museum.

Project Area Shipwrecks

Extant historical sources for the earliest periods of exploration and colonization are extremely limited and contain few geographically specific details. This was primarily a factor of the state-of-the-art of navigation. In later periods shipwreck references become more frequent, but until well into the twentieth century, location data was rarely accurate. This was because of the limitations of navigational accuracy and the methods of communicating and recording wreck-specific information. The loss of a vessel, cargo, and crew was more important than the precise location of the disaster. Those problems make exact correlation of historical shipwreck information with remote-sensing data difficult under most circumstances. However, a list of vessel losses (Attachment A) in the project vicinity provides a basis for preliminary vessel specific association with remote sensing targets.

The remains of vessels from Sir Francis Drake's fleet preserve evidence associated with the earliest English colony in the New World on Roanoke Island. Other sixteenth-century shipwreck sites have provided information about the Spanish conquest and colonization of the Americas. Vessels lost during the seventeenth century represent sources of data concerning the exploration and earliest permanent settlement along the North Carolina coast. Evidence of our colonial development and Revolutionary War survives in association with shipwreck sites of the eighteenth century. Nineteenth-century vessel remains document one of the most dynamic periods of United States maritime history, during which dramatic changes took place in the design and construction of ships. During the Civil War considerable maritime and naval activity took place along the North Carolina Outer Banks and many Union and Confederate vessels were sunk. Evidence of modern ship development and the ultimate decline of American maritime power survives in the remains of twentieth-century shipwrecks. Those include the last working sailing vessels as well as steamers, submarines, and warships.

The remains of vessels provide valuable opportunities to examine and reconstruct important aspects of our maritime heritage that frequently have not survived in the written historical record. Historic shipwrecks contain information concerning the design and construction of vessels that is not included in the written record. Well into the twentieth century, shipwrights continued to build vessels without benefit of plans or documentation. Although the displacement of shipwrights by engineers in the nineteenth and twentieth centuries brought increasing documentation, much of that evidence has not survived. This makes shipwrecks one of the most important sources of data concerning the evolution of vessel architecture and construction.

Ships and small vessels provided the most important element of trade and transportation system until late in the nineteenth century. They were the essential element of European exploration and development of the western hemisphere. Because of the instrumental role vessels played in that historical process, their remains contain an important record of the evolving material culture in the area. Artifacts associated with wrecks provide insight into shipboard life that permits the reconstruction of historic lifeways. Material carried as cargo reflects the development of the economic system that supported European development of North America. Cargo also reflects the development of technologies associated with virtually every aspect of life along the Atlantic seaboard.

Signature Analysis and Target Assessment

While no absolute criteria for identification of potentially significant magnetic and/or acoustic target signatures exist, available literature confirm that reliable analysis must be made on the basis of certain characteristics. Magnetic signatures must be assessed on the basis of three basic factors. The first factor is intensity and the second is duration. The third consideration is the nature of the signature; e.g., positive monopolar, negative monopolar, dipolar or multi-component. Unfortunately, shipwreck sites have been demonstrated to produce each signature type under certain circumstances. Some shipwreck signatures are more apparent than others.

Large vessels, whether constructed of iron or wood, produce magnetic signatures that can be reliably identified. Smaller vessels, or disarticulated vessel remains, are more difficult to identify. Their signatures are frequently difficult, if not impossible, to distinguish from single objects and/or modern debris. In fact, some small vessels produce little or no magnetic signature. Unless ordnance, ground tackle or cargo associated with the hull produces a detectable signature, some sites are impossible to identify magnetically. It is also difficult to magnetically distinguish some small wrecks from modern debris. As a consequence, magnetic targets must be subjectively assessed according to intensity, duration and signature characteristics. The final decision concerning potential significance must be made on the basis of anomaly attributes, historical patterns of navigation in the project area and a responsible balance between historical and economic priorities.

Acoustic signatures must also be assessed on the basis of several basic characteristics. Perhaps the most important factor in acoustic analysis is the configuration of the signature. As the acoustic record represents a reflection of specific target features, wreck signatures are often a highly detailed and accurate image of architectural and construction features. On sites with less structural integrity acoustic signatures often reflect more of a geometric pattern that can be identified as structural material.

Where hull remains are disarticulated the pattern can be little more than a texture on the bottom surface representing structure, ballast or shell hash associated with submerged deposits. Unfortunately, shipwreck sites have been demonstrated to produce a variety of signature characteristics under different circumstances. Like magnetic signatures, some acoustic shipwreck signatures are more apparent than others. Large vessels, whether iron or wood, can produce acoustic signatures that can be reliably identified.

Smaller vessels, or disarticulated vessel remains are inevitably more difficult. Their acoustic signatures are frequently difficult, if not impossible, to distinguish from concentrations of snags and/or modern debris. In fact, some small vessels produce little or no acoustic signature. As a consequence, acoustic targets must be subjectively assessed according to intensity of return over background, elevation above bottom and geometric image characteristics. The final decision concerning potential significance of less readily identifiable targets must be made on the basis of anomaly attributes, historical patterns of navigation in the project area and a responsible balance between historical and economic priorities.

Remote-Sensing Data Analysis

Data generated by the remote-sensing equipment was developed to support an assessment of each magnetic and acoustic signature. Analysis of each target signature included consideration of magnetic and sonar signature characteristics previously demonstrated to be reliable indicators of historically significant submerged cultural resources. Sub-bottom data was also assessed for relict channels and the potential for prehistoric resources. Assessment of each target included recommendations for additional investigation to determine the exact nature of the cultural material generating the signature and its potential NRHP significance.

A magnetic contour map of the survey area that illustrates the earth's magnetic background field and anomalies created by cultural material was produced to aid in the analysis of each target. To ensure reliable target identification and assessment, analysis of the magnetic and acoustic data was carried out as it was generated. Additional line-by-line signature analysis was carried out using HYPACK Single Beam Editor.

QUICKSURF contouring software was used to contour magnetic data generated during the survey at 5-gamma intervals to enhance assessment of the material generating each magnetic anomaly. Magnetic targets were isolated and analyzed in accordance with intensity, duration, areal extent and other signature characteristics. Sonogram signatures associated with magnetic targets were analyzed on the basis of configuration, areal extent, elevation, target intensity and contrast with background and shadow image.

Analysis of the Buxton Survey Data

Magnetic Data Analysis

Analysis of the magnetic data from the borrow site identified a total of 123 magnetic anomalies (Figure 37; Attachment B). With the exception of a cluster of 10 anomalies buffered for avoidance, all of the remaining anomalies have signatures similar to those produced by deteriorated small pipe, old cable or deteriorated wire (Figure 38).

Historical research suggests that the source of those anomalies could be electrical or telegraph cables or possibly SOSUS transducer arrays deployed by the U.S. Navy in the post-World War II Period. None of those signatures are suggestive of complex vessel remains. The 10 anomalies buffered and recommended for avoidance have a collective signature that could represent historical shipwreck remains (Figure 39).

Acoustic Data Analysis

Six acoustic target images were identified within the borrow site (Figure 40; Attachment C; Attachment D). One of those, SSS 001, documents a long linear object exposed on the bottom surface that resembles cable, wire or small diameter pipe. SSS 006, located nearby resembles a linear series of small rectangular objects that could be associated. Another target, SSS 002, appears to resemble partially buried and/or concreted cable, wire or small diameter pipe. The remainder of acoustic targets appears to represent geological bottom surface features with no associated magnetic anomaly.

Examination of the sub-bottom profiler records identified no evidence of shell middens, paleo-channel confluences or lagoon complexes considered to be associated with prehistoric habitation (Figure 41).

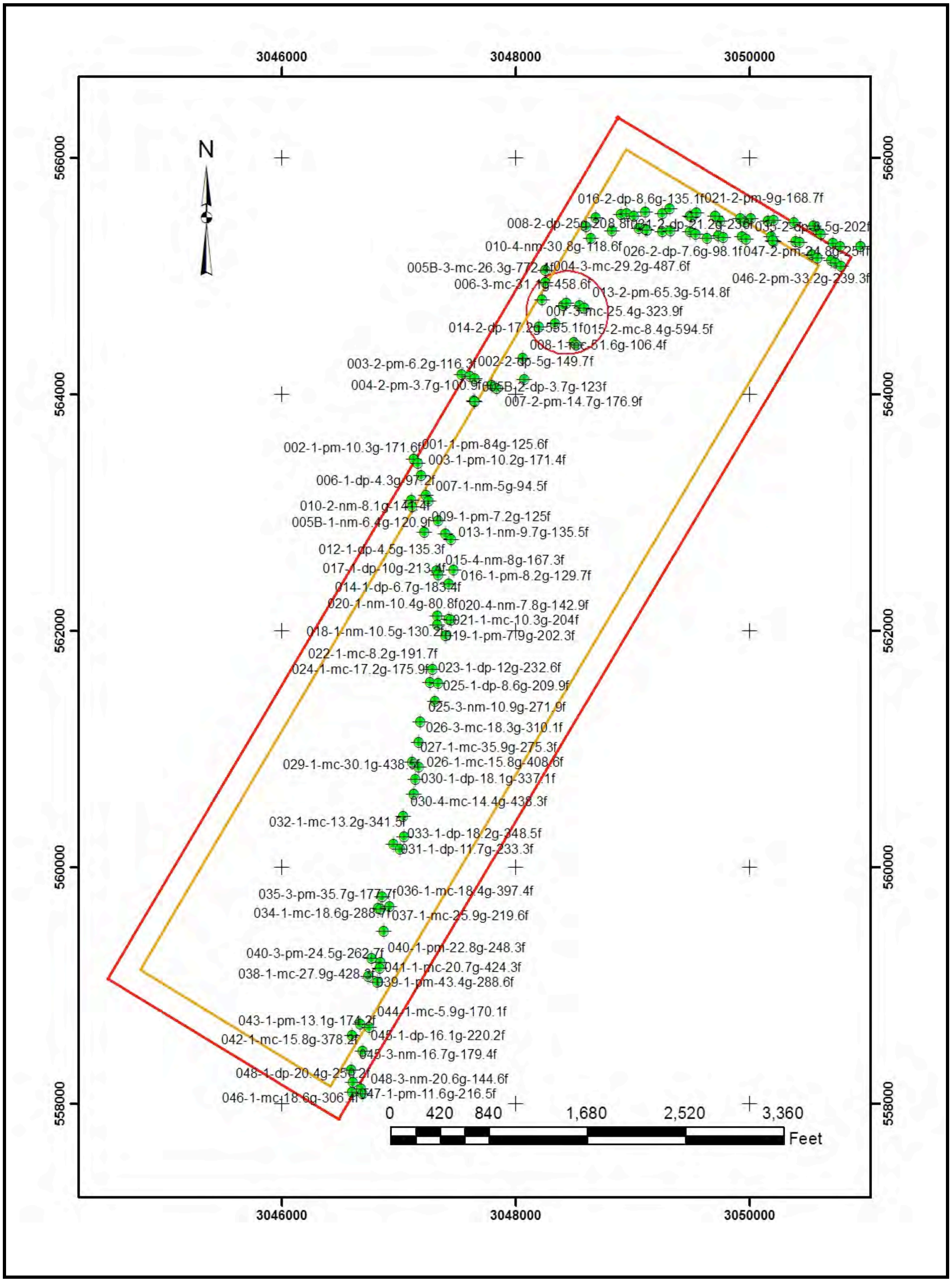

Figure 37. Magnetic anomalies identified in Buxton survey area.

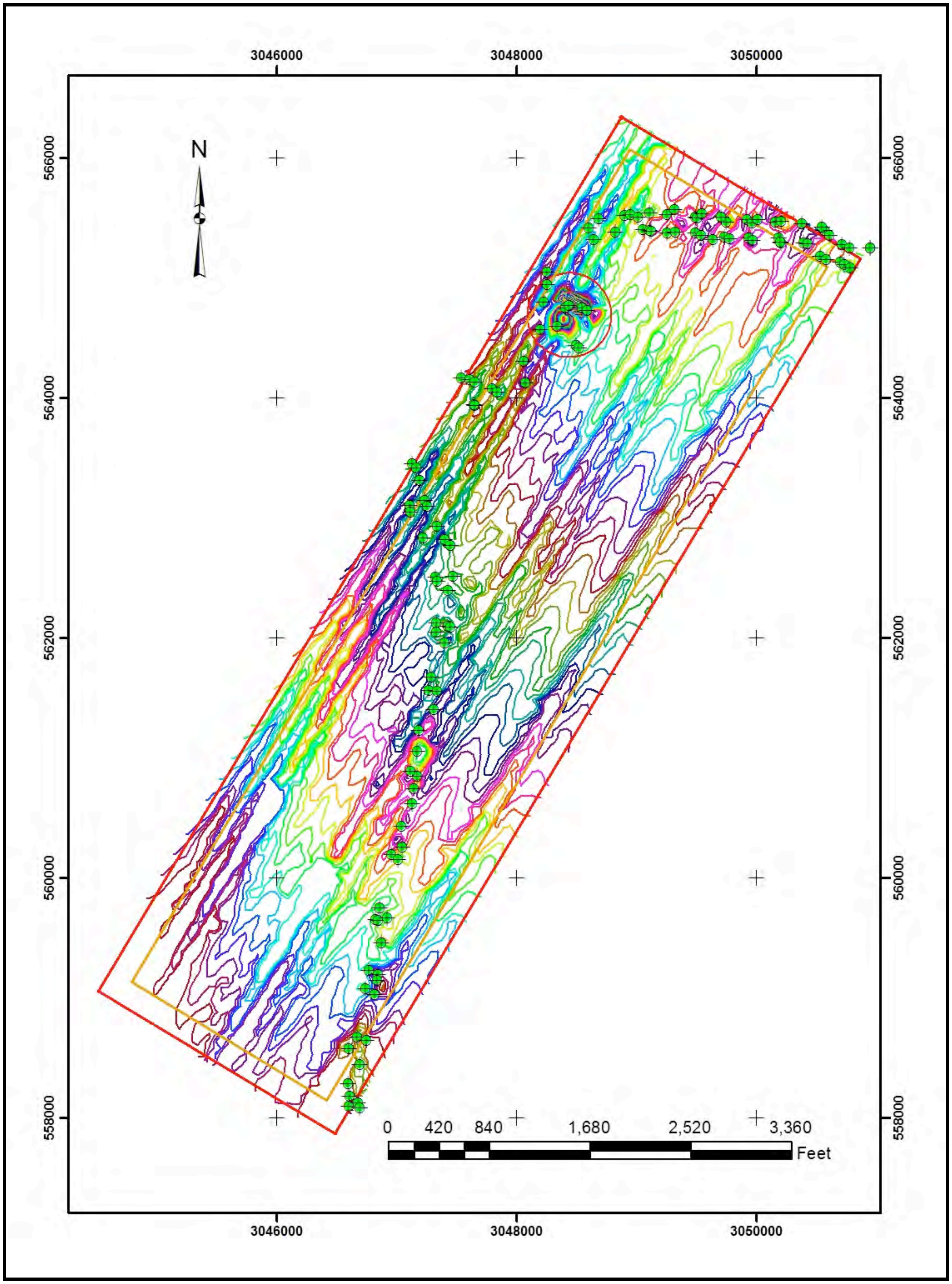

Figure 38. Magnetic contours and anomalies identified in the Buxton survey area.

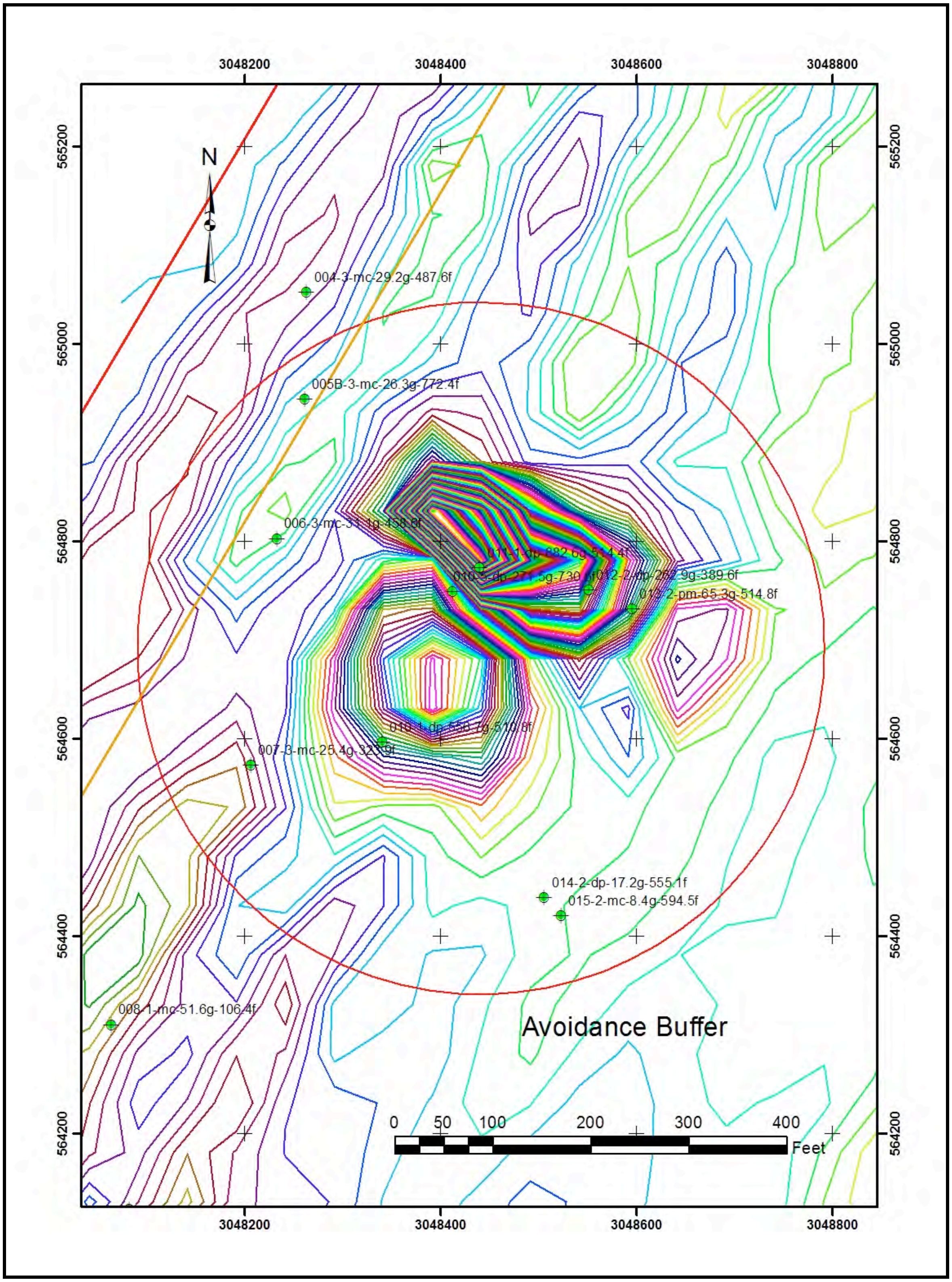

Figure 39. Buffered anomalies recommended for avoidance.

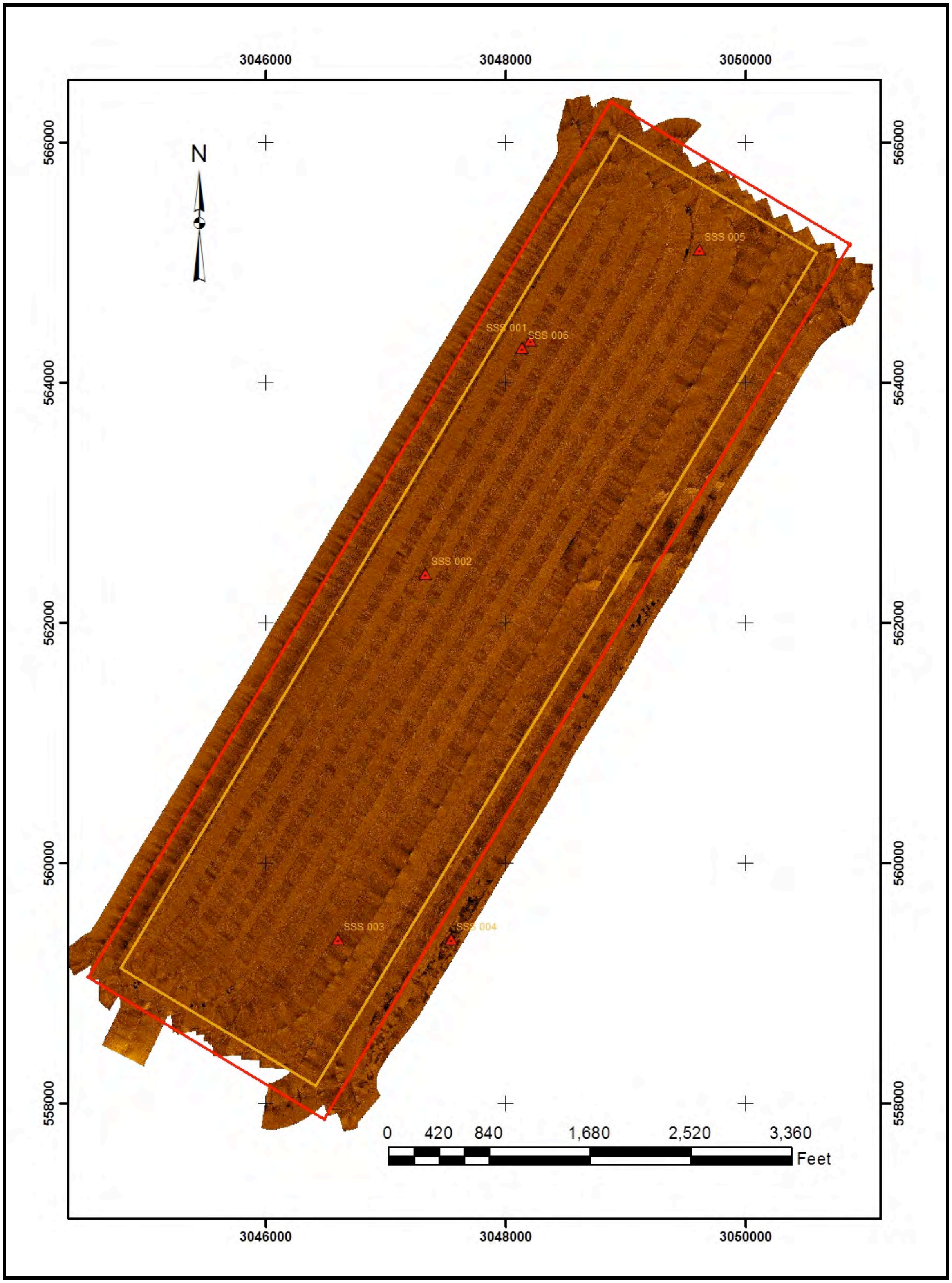

Figure 40. Sonar coverage mosaic showing acoustic target locations.

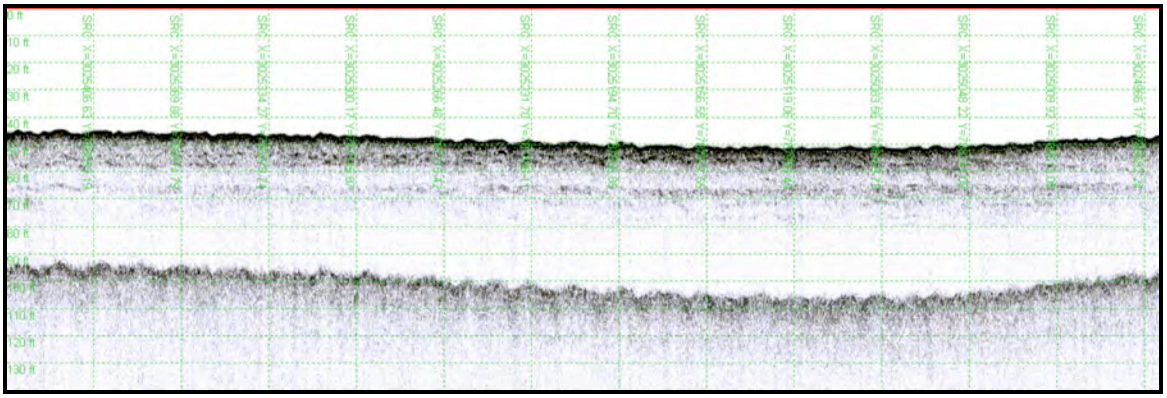

Figure 41. Sample of seismic image from the survey area.

Conclusions

The coastal waters off the Outer Banks of North Carolina have one of the highest documented concentrations of shipwrecks in the western Atlantic. The moniker "Graveyard of the Atlantic" is well earned. Hundreds of vessels have been reported lost off the Outer Banks and especially Cape Hatteras. Weather, currents, natural magnetic anomalies and shoals make navigation along the Outer Banks and off Cape Hatteras hazardous even today. For over 500 years, human error and warfare compounded dangers associated with the natural environment.

Although the project survey sites lie within the area of highest sensitivity for historic shipwrecks in North Carolina, no shipwreck remains have been included in the UAB site files at Kure Beach. The primary reason is no doubt a direct function of the fact that virtually no systematic survey work has been carried out in the Cape Hatteras vicinity. The closest systematic survey has been along the adjacent beaches and onshore waters in the Cape Hatteras National Seashore (Delgado 1984). The Delgado survey identified the remains of numerous vessels washed or run ashore during storms or conflict.

Data generated by this survey identified 123 magnetic anomalies and six acoustic targets in the project area. Historical research indicates that the source of 113 of those anomalies could be early electrical or telegraph cables or possibly SOSUS transducer arrays deployed by the United States Navy in the Post-WWII period.

From a historical/archaeological perspective documentation of the material and positive identification could contribute to one of the most highly secret clandestine operations on the Outer Banks. Focusing an investigation on the three potentially associated sonar signatures could facilitate identification and documentation.

While none of those signatures are suggestive of complex vessel remains, the 10 buffered anomalies recommended for avoidance have a collective signature that could represent historical shipwreck material. Additional investigation would be necessary to reliably identify material generating those signatures and assess any potential historical and archaeological significance.

Recommendations

Although the data generated by this survey does not definitively identify any historical shipwrecks, the cluster of ten anomalies that are recommended for avoidance have a complex collective signature that could be associated with shipwreck remains. For that reason the buffered area should be avoided. If avoidance is not an option at least three of the anomalies should be ground truthed to identify and assess the significance of material generating the signatures.

The remaining 113 anomalies and three acoustic images appear to be associated with deteriorated cable, wire or pipe. Historical data indicates that cable or wire in the area could possibly be associated with telegraph lines. Perhaps more likely, the anomalies could represent transducers or transducer cables associated with the post-WWII SOSUS acoustic submarine tracking facility developed at Buxton. In the event that those anomalies and acoustic targets cannot be avoided, diver investigation is recommended for several reasons. Firstly, investigation of the material will identify it and document a representative sample for the historical record. Secondly, identification will facilitate determining if subject material represents a hazard for dredge operations and/or would prove to be an undesirable material for beach restoration.

Unexpected Discovery Protocol

In the event that any project activities expose potential prehistoric or historic cultural material not identified during the remote-sensing survey, the dredge company under contract to Dare County should *immediately* shift operations away from the site and notify the respective Point of Contact (POC) for CS&E, the Dare County Commissioners' POC, the North Carolina SHPO (Raleigh) and the UAB (Kure Beach NC) head. Notification should address the exact location, where possible, the nature of material exposed by project activities, and options for immediate archaeological inspection and assessment of the site.

References Cited

Abbot, Willis J.
The Naval History of the United States. Vol. 2. Peter Fenelon Collier, New York, NY.

Angley, Wilson
1985 An Historic Overview of Oregon Inlet. Report on file at the Research Branch, North Carolina Division of Archives and History, Raleigh.

Ashe, Samuel A' Court
1908 *History of North Carolina, volume I, From 1584 to 1783*. Charles L. Van Noppen, Greensboro, NC.

Berman, Bruce D.
1972 *Encyclopedia of American Shipwrecks*. The Mariners Press, Boston, MA.

Broadwater, John D.
2012 USS Monitor: A Historic Ship Completes Its Final Voyage. National Marine Sanctuary Foundation, Washington, DC.

Brooks, Barbara Lynn, Ann M. Merriman, and Mark Wilde-Ramsing (compilers)
1996 Bibliography of North Carolina Underwater Archaeology. North Carolina Division of Archives and History, Underwater Archaeology Branch, Kure Beach.

Burgess, Robert H.
1978 *Coasting Schooner: The Four-Masted Albert F. Paul*. University Press of Virginia, Charlottesville.

Caldwell, Joseph R., and Waring, A.J., Jr.
1939 Pottery Type Descriptions. In: *Southeastern Archaeological Conference Newsletter*, 1(5):4-12.

Carbone, John S.
2001 The Civil War In Coastal North Carolina. North Carolina Division of Archives and History, Raleigh.

Chapelle, Howard I.
1961 *The Migrations of an American Boat Type*. Smithsonian Institution, Washington, DC.

Corbitt, David L. (editor)
1953 *Explorations, Descriptions and Attempted Settlements of Carolina, 1584-1590*. North Carolina Department of Archives and History, Raleigh.

Crittenden, Charles C.
1936 *The Commerce of North Carolina, 1763-1789*. Yale University Press, New Haven, NJ.

Cumming, William P.
1988 *Mapping the North Carolina Coast, Sixteenth-Century Cartography and the Roanoke Voyages*. Division of Archives and History, North Carolina Department of Cultural Resources, Raleigh.

1998 *The Southeast In Early Maps*. Third edition, revised & enlarged by Louis de Vorsey, Jr. The Fred Morrison Series in Southern Studies. The University of North Carolina Press, Chapel Hill.

Dames and Moore
1979 A Remote Sensing Survey of Oregon Inlet, North Carolina. Report to U. S. Army Engineer District, Wilmington, North Carolina, from Dames and Moore, Raleigh, NC.

Delgado, James P.
1984 A Preliminary Assessment of Environmentally Exposed Shipwreck Remains, Cape Hatteras National Seashore, North Carolina. Report to U.S. Department of the Interior, Washington, DC, National Park Service, Washington, DC, and East Carolina University, Greenville, NC.

Dowd, Jerome
1888 *Sketches Of Prominent Living North Carolinians*. Edwards & Broughton, Raleigh, NC.

Dudley, William S. (editor)
1985 *The Naval War of 1812: A Documentary History*. Vol. I. Naval Historical Center, Washington, DC.

1992 *The Naval War of 1812: A Documentary History*. Vol. 2. Naval Historical Center, Washington, DC.

Duffus, Kevin P.
2003 *The Lost Light: The Mystery Of The Missing Cape Hatteras Fresnel Lens*. Looking Glass Productions, Raleigh, NC.

2007 *Shipwrecks of the Outer Banks-An Illustrated Guide*. Looking Glass Productions, Raleigh, NC.

Dunbar, Gary S.
1958 *Historical Geography of the North Carolina Outer Banks*. Louisiana State University Press, Baton Rouge.

Farb, Roderick M.

1992 *Shipwrecks: Diving the Graveyard of the Atlantic*. Menasha Ridge Press, Birmingham, AL.

Gannon, Michael
1991 Operation Drumbeat: The Dramatic True Story Of Germany's First U-Boat Attacks Along The American Coast In World War II. Reprint of 1990 first edition. HarperCollins Publishers, New York.

Gentile, Gary
1993 *Shipwrecks of North Carolina*. Gary Gentile Productions, Philadelphia, PA.

Haag, William G.
1958 *The Archaeology of Coastal North Carolina*. Louisiana State University Coastal Studies Series 2. Louisiana State University, Baton Rouge.

Hairr, John
2001 *Outer Banks*. In: *Images of America* series. Arcadia Publishing Company, Charleston, SC.

Hall, Wesley K.
1999 A Phase I Upland and Underwater Archaeological Survey of the Dare County Beaches and Borrow Areas, North Carolina. Report to U.S. Army Corps of Engineers, Wilmington District, Wilmington, NC, from Mid-Atlantic Technology and Environmental Research, Castle Hayne, NC.

Hoffman, Paul E.
1987 *Spain and the Roanoke Voyages*. Division of Archives and History North Carolina Department of Cultural Resources, Raleigh.

Hudy, Paul M.
2009 Shipwrecks & Reefs: Diamond Shoals <http://www.nc-wreckdiving.com/LOCATIONS/HATTERAS.html>, last accessed 29 March 2015.

Hulton, Paul
1984 *America 1585: The Complete Drawings of John White*. Published jointly by The University of North Carolina, Chapel Hill, and British Museum Publications, London, England.

Lefler, Hugh Talmage
1965 *North Carolina History told by Contemporaries*. University of North Carolina Press, Chapel Hill.

Marx, Robert F.
1983 *Shipwrecks in the Americas*: *A complete guide to every major shipwreck in the Western Hemisphere*. Bonanza Books, New York, NY.

Mitchell, C. Bradford (editor)
1975 *Merchant Steam Vessels of the United States, 1790-1868*. "The Lytle-Holdcamper List" initially compiled by William Lytle and Forrest Holdcamper. Revised and edited by C. Bradford Mitchell. The Steamship Historical Society of America, Staten Island, NY.

1978 *Merchant Steam Vessels of the United States, 1790-1868*. "The Lytle-Holdcamper List" initially compiled by William Lytle and Forrest Holdcamper. Supplement Number 1. Prepared by C. Bradford Mitchell. The Steamship Historical Society of America, Staten Island, NY.

1982 *Merchant Steam Vessels of the United States, 1790-1868*. "The Lytle-Holdcamper List" initially compiled by William Lytle and Forrest Holdcamper. Supplement Number 2. Prepared by C. Bradford Mitchell. The Steamship Historical Society of America, Providence, RI.

1984 *Merchant Steam Vessels of the United States, 1790-1868*. "The Lytle-Holdcamper List" initially compiled by William Lytle and Forrest Holdcamper. Supplement Number 3. Prepared by C. Bradford Mitchell. The Steamship Historical Society of America, Providence, RI.

National Historical Society
1987 *Official Records of the Union and Confederate Navies in the War of the Rebellion*. Historical Times, Harrisburg, PA.

National Park Service
n.d.a. Dare County, North Carolina Search. National Register of Historic Places Database. National Park Service <http://www.nps.gov/nr/research/>, last accessed 29 March 2015.

n.d.b. Lost to the Perils of the Sea. Cape Hatteras: National Seashore, North Carolina. National Park Service <http://www.nps.gov>, last accessed 29 March 2015.

n.d.c. The Ghost Ship of the Outer Banks. Cape Hatteras: National Seashore, North Carolina. National Park Service <http://www.nps.gov>, last accessed 29 March 2015.

National Oceanic & Atmospheric Administration (NOAA)
2010 East Carolina Nearshore Expedition: The Shipwrecks. Sponsored by the National Oceanic & Atmospheric Administration, Silver Spring, MD. National Marine Sanctuaries <http://sanctuaries.noaa.gov/missions/2010ecu_nearshore/shipwrecks.html>, last accessed 31 March 2015.

Noël Hume, Ivor
1994 *The Virginia Adventure, Roanoke To James Towne: An Archaeological And Historical Odyssey*. Alfred A. Knopf, New York, NY.

North Carolina Division of Archives and History
1989 Memorandum [14 November] from David Brook, Deputy State Historic Preservation Officer to H. Franklin Vick, Planning and Research Branch, North Carolina Department of Transportation, Raleigh. North Carolina Division of Archives and History, Raleigh.

North Carolina Department of Transportation
1989 Environmental Assessment and Finding of No Significant Impact: Report on the Construction of a Terminal Groin and Revetment at Pea Island for Protection of the Herbert C. Bonner Bridge and North Carolina Highway 12, Dare County, North Carolina. North Carolina Department of Transportation, Raleigh.

North Carolina Humanities Council
n.d. Many Stories, One People. Programs. Road Scholars. "How Shipwrecks Shaped the Destiny of the Outer Banks." [Kevin P. Duffus]. North Carolina Humanities Council <http://nchumanities.org/programs/road-scholars/how-shipwrecks-shaped-destiny-outer-banks>, last accessed 29 March 2015.

North Carolina State Historic Preservation Office
2015 North Carolina Listings In The National Register Of Historic Places. "As of February 1, 2015." North Carolina State Historic Preservation Office <http://www.hpo.ncdcr.gov/NR-PDFs.html>, last accessed 29 March 2015.

Oliver, Billy L.
1981 The Piedmont Archaic: Reflections and Perspectives. Paper presented at the 37th Annual Southeastern Archaeological Conference, New Orleans, LA.

Phelps, David S.
1975 Test Excavations at the Parker Site (31Ed29) at Speed, Edgecombe County, North Carolina. In: *Archaeological Surveys of Four Watersheds in the North Carolina Coastal Plain,* pp. 106-137. North Carolina Archaeological Council Publication 16 (1981).

1981 The Archaeology of Colington Island. East Carolina University Archaeological Research Report No. 3. East Carolina University, Greenville, NC.

1983 Archaeology of the North Carolina Coast and Coastal Plain: Problems and Hypotheses. In: *The Prehistory of North Carolina*. Mark A. Mathis and Jeffrey J. Crow, eds. North Carolina Division of Archives and History, Raleigh.

1984 Archaeology of the Tillett Site: The First Fishing Community at Wanchese, Roanoke Island. East Carolina University Archaeological Research Report No. 6, Greenville, NC.

Powell, William S.
1968 *The North Carolina Gazetteer: A Dictionary Of Tar Heel Places*. The University of North Carolina Press, Chapel Hill.

Pullen, Drew
2001 *Portrait of the Past, The Civil War On Hatteras Island North Carolina: A Pictorial Tour*. Aerial Prospective, Mt. Holly, NJ.

Quidley, Jr., Dallas Edward
2013 *The Lighthouse Keeper's Son*. LifeRich Publishing, Bloomington, IN.

Quinn, David B. (editor)
1955 *The Roanoke Voyages, 1584-1590*. Hakluyt Society, London, England.

Sharpe, William
1954 *A New Geography of North Carolina*. Four vols. Sharpe Publishing Company, Raleigh, NC.

Shomette, Donald G.
1973 *Shipwrecks of the Civil War: the Encyclopedia of Union and Confederate Naval Losses*. Donic Ltd., Washington, DC.

Snow, Dean R.
1978 Late Prehistory of the East Coast. In*: Handbook of North American Indians*, vol. 15:357-361 (Northeast), edited by B. G. Trigger. Smithsonian Institution, Washington, DC.

Stick, David.
1952 *Graveyard of the Atlantic: Shipwrecks of the North Carolina Coast*. The University of North Carolina Press, Chapel Hill.

1958 *The Outer Banks of North Carolina*. The University of North Carolina Press, Chapel Hill.

1970 *Dare County: A History*. North Carolina State Department of Archives and History, Raleigh.

Thompson, Timothy A.
1977 Archaeological Resources at the Cape Hatteras National Seashore, A Management Study. North Carolina Division of Archives and History, Raleigh.

Thompson, Timothy A. and William M. Gardner

1979 A Cultural Resources and Impact Area Assessment of the Pea Island National Wildlife Refuge, Dare County, North Carolina. Thunderbird Research Corporation, Port Royal, Virginia.

U. S. Congress
1874 House Executive Document, No. 1, 43rd Congress, 2nd Session, U.S. Congress, Washington DC.

U. S. Congress
1883 Senate Executive Document, No. 1, 47rd Congress, 2nd Session, U.S. Senate, Washington D.C.

U.S. Department of Commerce
1916 Military and Naval Service of the United States Coast Survey. U.S. Department of Commerce, Washington DC.

U.S. Department of the Navy
1964-2005 *Naval Documents of the American Revolution*. U.S. Department of the Navy, Washington, DC.

U.S. Navy
2009 Naval Facility (NAVFAC) Station History. Updated 01 June 2008. U.S. Navy <http://www.navycthistory.com/NAVFACStations History.txt>, accessed 13 February 2015.

United States Life-Saving Service (USLSS)
1897 *Annual Report Of The Operations Of The United States Life-Saving Service For The Fiscal Year Ending June 30, 1896*. Treasury Department, Document No. 1926. United States Life-Saving Service, U.S. Treasury Department, Washington, DC.

Watts, Gordon P., Jr.
1985 Deep-Water Archaeological Investigation and Site Testing in the *Monitor* National Marine Sanctuary. In: *Journal of Field Archaeology* 12:315-332.

Whitehead, Donald R.
1972 Development and Environmental History of the Dismal Swamp. Ecological Monographs, Vol. 42:301-315.

Willey, Gordon R.
1966 An Introduction to American Archaeology, Volume I. Prentice-Hall, Inc., Englewood Cliffs.

Newspaper Sources

Daily Advance, Elizabeth City, North Carolina (NC)

Democratic Pioneer, Elizabeth City, NC.

Economist, Elizabeth City, NC.

Flake's Bulletin, Galveston, Texas

Free Press, Tarboro, NC.

North Carolina Times, New Bern, NC

North State Whig, Washington, NC.

Republican, New Bern, NC.

Times Daily, New Bern, NC.

Attachment A

(Outer Banks Shipwreck Inventory)

Attachment A: Outer Banks Shipwreck Inventory

VESSEL NAME	TYPE	ACTUAL OR APPROXIMATE LOSS DATE	ACTUAL OR APPROXIMATE SHIPWRECK LOCATION	REFERENCE
Tiger [or *Tyger*]	English ship	29 June 1585	Ocracoke Inlet	AK
Multiple Unknown		13 June 1586	Oregon Inlet	C
HMS *Hady*	Ship	1696	"was driven ashore upon the sands between the inlets of Roanoke and Currituck"	Q
HMS *Garland*	English warship	29 November 1710	"a little southward of Currituck Inlet"	K
Unknown	English ship	1728	"wrecked 6 miles seaward from Ocracoke Inlet"	K
Adriatick	English merchantman	1739	"wrecked at Cape Hatteras"	K
Hoylin	English merchantman	1741	"lost off Cape Hatteras"	K
Woolford	English merchantman	1741	"lost off Cape Hatteras"	K
George	American coastal trader	1743	"near Oregon Inlet"	CK
Katherine & Elizabeth	English merchantman	1744	"on Diamond Shoals"	K
Neptune	English merchantman	1744	"on Diamond Shoals"	K
Seven Unknown	English merchantmen	7/8 October 1749	"sank inside the [Ocracoke] bar"	K
Two Unknown	English merchantmen	7/8 October 1749	"wrecked 5 miles north of the inlet"	K
Unknown	Unknown	18 August 1750	Cape Hatteras	A
Nuestra Señora de la Soleda	Galleon of New Spain Flota	18 August 1750	"wrecked 10 leagues north of Ocracoke Inlet"	K
El Salvador	Merchant *nao* of New Spain Flota	18 August 1750	"wrecked 15 leagues north of Ocracoke Inlet"	K
Unknown	English merchantman	18 August 1750	"off Cape Hatteras"	K
(?)	(?)	18 August 1750	Currituck Inlet	A
Two Unknown	Schooners-merchantmen	1752	"wrecked on the Ocracoke Bar"	K
Union	American merchantman	January 1757	"lost at Cape Hatteras"	K
Virginia Packet	English packet boat	1757	"lost at Cape Hatteras"	K
Unknown	American schooner	1757	"lost at Cape Hatteras"	K
Friendship	English merchantman	1758	"lost at Cape Hatteras"	K
Peggy	English merchantman	1758	"lost at Cape Hatteras"	K
Princess Amelia	English merchantman	1758	"lost at Cape Hatteras"	K
Tyrrel	Brig	3 July 1759	Off Hatteras	A
Nancy	English merchantman	1760	"wrecked near Cape Hatteras"	K
Charming Betsey	Scottish merchantman	1760	"foundered off Cape Hatteras"	K
Shannon	Scottish merchantman	1764	"wrecked at Currituck Inlet"	K
Revenge	English merchantman	June 1765	"wrecked…two miles north of Currituck Inlet"	K
Good Intent	English slaver	1767	"lost off Cape Hatteras"	K
Charming Polly	English merchantman	1770	"totally lost off Cape Hatteras"	K
Lively	English merchantman	1771	"lost off Cape Hatteras"	K
Betsey	English merchantman	Before September 1772	"lost crossing… [Ocracoke] bar"	K
(14/15) Unknown	Large merchantmen	Early September 1772	"totally lost near the Ocracoke Inlet bar"	K
Charming Betsey	English merchantman	1774	"wrecked on Ocracoke Island"	K
Sally	English merchantman	1774	"lost on Cape Hatteras"	K

VESSEL NAME	TYPE	ACTUAL OR APPROXIMATE LOSS DATE	ACTUAL OR APPROXIMATE SHIPWRECK LOCATION	REFERENCE
Clementina	English merchantman	1775	"at Cape Hatteras"	K
Austin	English merchantman	1775	"lost off Cape Hatteras"	K
Aurora	English troop-transport	11 November 1777	"off Cape Hatteras"	K
Peggy	American merchantman	1783	"off Cape Hatteras"	K
(17) Unknown	Ships	23/24 July 1788	"wrecked at Ocracoke Inlet"	K
(?)	(?)	1778	Roanoke Inlet	A
Molly	English merchantman	1789	"wrecked at Cape Hatteras"	K
Pitt	English merchantman	1792	"lost on the Ocracoke Inlet bar"	K
Experiment	American merchantman	1792	"off Cape Hatteras"	K
(6) Unknown	Ships	2 August 1795	Ocracoke Inlet bar	K
Multiple Unknown	Spanish flota ships	2 August 1795	"off Cape Hatteras"	K
Betsey (Betsy)	American sloop	6 September 1797	"at Currituck Inlet"	AK
Industry	American merchantman	1798	"on Cape Hatteras"	K
Expectation	English merchantman	1802	"on Cape Hatteras"	K
Brunshill	English merchantman	1802	"on Cape Hatteras"	K
Lydia	English ship	1804	"on Cape Hatteras"	K
Molly	American merchantman	1804	"wrecked near Cape Hatteras"	K
Fortura	Portuguese merchantman	1805	"on Cape Hatteras"	K
Maria	French ship	1810	Cape Hatteras	K
Lively Lass	American ship	Late September 1810	"drifted onshore at Ocracoke Island'	K
Patriot	American pilot boat	January 1813	Nags Head	AK
#140	American gunboat	23 September 1814	Ocracoke Island	AK
(20+) Unknown	Ships	Early September 1815	"wrecked or sunk at Ocracoke Inlet and on Ocracoke Island"	K
Superior	American merchantman	3 October 1815	"near Cape Hatteras"	K
Sero	English merchantman	25 September 1815	"off Cape Hatteras"	K
Atlanta	American brig	8 November 1815	Diamond Shoals	K
Mary	Ship	15 April 1816	Currituck Beach	K
Eliza	American merchantman	1816	Ocracoke Island	K
Bolina	American merchantman	26 September 1816	"Boddy Island"	K
Mary & Francis	American ship	March 1817	"near Cape Hatteras'	K
Rosetta	Ship	4 March 1817	"lost…crossing the Ocracoke Inlet bar"	K
Emperor of Russia	Ship	18 March 1817	"near Currituck Inlet"	K
John Adams	American merchantman	19 May 1817	"on Cape Hatteras"	K
Voucher	Ship	19 November 1817	Chicamacomico	A
William Carlton	Ship/American merchantman	15 May 1818	Kill Devil Hills	AK
Georgia	English brig	15 July 1818	Currituck Inlet	AK
(2) Unknown	American merchantmen	3 October 1818	"wrecked near Cape Hatteras"	K
Revenue	Sloop	December 1818	Currituck Inlet	A
Revenge	American sloop	January 1819	Currituck Inlet	K
Phoenix	American schooner	13 May 1819	Cape Hatteras	K
Henry	American sloop	5 December 1819/January 1820	Ocracoke Island	AK

VESSEL NAME	TYPE	ACTUAL OR APPROXIMATE LOSS DATE	ACTUAL OR APPROXIMATE SHIPWRECK LOCATION	REFERENCE
Islington	Ship/American merchantman	16 March 1820	Cape Hatteras	AK
Horatio	American ship	2 April 1820	"on Diamond Shoals"	AK
Unknown	125-ton English merchantman	September 1821	"at Cape Hatteras"	K
Charles K. Mallory	American merchantman	10 September 1821	"on Cape Hatteras"	K
Martha	English merchantman	1821	Currituck Sands	K
Nereus	Ship	1 January 1822	"totally lost…on Cape Hatteras"	K
Enterprise	Schooner	27 October 1822	New Inlet	ACK
Peter Francisco	American ship	7 October 1823	"Bodies Island"	K
Caroline du Nord	French merchantman	19 January 1824	Ocracoke Inlet bar	K
Susan	American schooner	1 June 1824	Ocracoke Inlet bar	K
Emulous	American schooner	22 January 1825	Off Kitty Hawk	AE
Diomede	American schooner	23 January 1825	Kitty Hawk	AK
Washington	American ship	24 January 1825	Ocracoke Island	K
Nancy	American ship	21 February 1825	Ocracoke Inlet Bar	K
Horam	American merchantman	6 April 1825	Ocracoke Inlet Bar	K
(25+) Unknown	Ships	4 June 1825	"wrecked north of Ocracoke Inlet"	K
Harvest	Schooner	18 November 1825	Bodie Island	ACK
Victory	American schooner	December 1825	Kitty Hawk	AK
Louisa Matilda	Packet	24 August 1827	On Bodie Island	E
Cape Hatteras	Lightship	August 1827	Ocracoke	A
Belle	Packet	15 August 1836	On Bodie Island	EF
William Gibbons	Steamer	10 October 1836	New Inlet/Bodie Island	AE
Premium	Sloop	8 January 1837	Ocracoke	A
Victory	Schooner	6 February 1837	Bodie Island	A
Aurora	Schooner	June 1837	Ocracoke Bar	AF
Hunter	Schooner	19 August 1837	Kitty Hawk	AE
Alhambra	Schooner	26 August 1837	Bodie Island	AEF
Enterprise	Brig	9 October 1837	Bodie Island	A
Home	Steamer	9 October 1837	Ocracoke	A
Wave	Schooner	9 December 1837	Currituck Beach	A
Indus	Brig	18 December 1837	Hatteras Inlet	A
Horse	Schooner	31 January 1838	Currituck Beach	A
Milledgeville	Packet	30 August 1839	Chicamacomico	A
Mary	Schooner	22 December 1839	Ocracoke	A
William J. Watson	Schooner	15 November 1840	Bodie Island	A
Lambert Tree	Schooner	17 February 1841	Off OCracoke	A
Alonzo	Schooner	24 August 1841	Currituck Beach	AE
American Trader	Schooner	24 August 1841	Currituck Beach	AE
Heroine	Schooner	October 1841	Whales Head	A
Astoria	Bark	29 January 1842	Hatteras Inlet	AF
D. W. Hall	Brig	14 June 1842	Hatteras Inlet	A

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Trident	Schooner	14 June 1842	Bodie Island	AC
Pioneer	Brig	24 August 1842	Ocracoke	A
Congress	Ship	24 August 1842	Cape Hatteras	A
Kilgore	Brig	24 August 1842	On Currituck Beach	E
Leroy	Schooner	5 October 1842	Big Kinnakeet	A
Marion	Brig	4 November 1842	Bodie Island	AE
F. A. Tupper	Schooner	27 March 1843	Chicamacomico	A
William Taylor	Brig	20 October 1843	Bodie Island	CD
Driver	Schooner	17 January 1844	Cape Hatteras	A
Danube	Schooner	14 May 1844	Bodie Island	AE
McDonough	Schooner	13 June 1844	Kitty Hawk	A
Moon	Brig	8 May 1845	Nags Head	A
Victoria	Ship	23 October 1845	Currituck Beach	A
Ontario	Bark	1 December 1845	Diamond Shoals	A
Regulus	Schooner	5 January 1846	Hatteras Shoal	A
Comet	Schooner	7 January 1846	Ocracoke Inlet	A
C.C. Thorn	Schooner	2 June 1846	New Inlet	A
Howell (or Howard)	Ship	30 July 1846	Nags Head	A
Mary Anna	Schooner	8 September 1846	Off Hatteras	A
Antilla	Schooner	6 November 1846	Nags Head	AEF
Pennsylvania	Brig	24 September 1847	Diamond Shoals	A
R.W. Brown	Schooner	11 December 1848	New Inlet	AD
Evergreen	Schooner	9 January 1849	Currituck Beach	AE
J. P. Bickley	Schooner	March 1849	Cape Hatteras	A
Fanny Gray	Schooner	March 1849	Ocracoke	A
Margaret	Brig	24 July 1850	Diamond Shoals	A
Ocean	Brig	July 1850	Diamond Shoals	A
Racer	Schooner	July 1850	Diamond Shoals	A
Mary Ellen	Brig	July 1850	Diamond Shoals	A
Belle	Brig	July 1850	Diamond Shoals	AF
Franklin	Steamer	14 September 1850	Currituck	AE
Edward Wood	Schooner	23 November 1850	Currituck Inlet	A
America	Side-wheel steamer	29 January 1851	Off Cape Hatteras	F
Richard H. Wyatt	Schooner	31 January 1851	Off Hatteras	A
Jane	Schooner	June 1851	Hatteras	A
P.B. Savery	Schooner	11 August 1851	Chicamacomico	A
Magnolia	Schooner	3 December 1852	Chicamacomico	A
Mary Turcan	Brig	13 December 1852	Off Currituck	A
Mountaineer	Steamer	25 December 1852	Kitty Hawk	A
Henrietta Pierce	Schooner	16 January 1853	Kitty Hawk	AE
Augustus Moore	Schooner	15 April 1853	Kitty Hawk	AEF

VESSEL NAME	TYPE	ACTUAL OR APPROXIMATE LOSS DATE	ACTUAL OR APPROXIMATE SHIPWRECK LOCATION	REFERENCE
Bladen McLaughlin	Steamer	6 May 1853	Kitty Hawk	AEF
Albemarle	Brig	7 September 1853	Off Hatteras	AF
Rattler	Clipper	8 December 1853	Currituck Beach	A
Rio	Schooner	December 1853	Bodie Island	AC
Cassius	Schooner	12 February 1854	Off Hatteras	A
Oriline St. John	Bark	21 February 1854	Off Hatteras	A
Robert Walsh	(?)	8 March 1854	Off Hatteras	A
Mary Varney	Bark	5 April 1856	Off Hatteras	A
A. S. Willers	Schooner	September 1857	Off Cape Hatteras	AF
Baltic	Schooner	November 1857	Currituck Beach	AE
Atlanta	Steam side wheel	1 March 1858	Bodie Island, "Body Island"	EF
Amanda Coons	Brig	11 November 1858	Currituck Beach	AE
Agamenenon	Ship	25 March 1859	Currituck Beach	A
Mary	Schooner	26 October 1859	Ocracoke	A
Charles	Schooner	November 1859	Off Nags Head	AE
Lady Whidbee	Schooner	17 January 1860	New Inlet	A
Vera Cruz	Steamer	1860	Bodie Island	A
Black Squall	Brig	8 April 1861	Ocracroke	AF
B. T. Martin	Brig	24 July 1861	Chicamacomico	AF
York	Conf. privateer	9 August 1861	Cape Hatteras	A
Governor	Fed. transport	31 October 1861	Off Hatteras	A
Peerless	Fed. transport	31 October 1861	Off Hatteras	A
City of New York	Fed. transport	15 January 1862	Hatteras Inlet	A
R. B. Forbes	Fed. Steamer	25 February 1862	Curritcuck Banks	A
Oriental	Fed transport/Union Transport	8 May 1862	Bodie Island	ACE
Volant	Brig	September 1862	New Inlet	A
USS *Monitor*	Fed. gunboat/Ironclad steamer	30 December 1862	16 miles SSE of the Cape Hatteras Light in 225 feet of water	AFO
Bainbridge	Federal brig	21 August 1863	Off Hatteras	A
Vera Cruz	Steamer	12 April 1866	Bodie Island	E
Andrew Johnston	Steamer	5 October 1866	Currituck Inlet	A
King Fisher	Steamship	November 1866	"about six miles south of Hatteras"	I
George E. Maltby	Schooner	7 January 1867	Off Hatteras	A
Martha	Schooner	10 January 1867	Currituck Beach	AE
Alfred Thomas	Schooner	10 March 1867	Chicamacomico	AC
Flambeau	Steamer	March 1867	New Inlet	A
Quick	Brig	March 1867	Oregon Inlet	ABCD
Vesta	Schooner	April 1867	Hatteras Inlet	A
G. W. Carpenter	Schooner	April 1867	Creeds Hill	A
Daniel Chase	Schooner	4 November 1867	Bodie Island	A
Adamantine	Schooner	November 1867	Bodie Island/Inlet	AEF
Nevada	Steamer	4 June1868	Hatteras Shoal	AR

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Istria	Bark	June 1868	Diamond Shoals	A
Alliance	Steamer	4 March 1869	Off Hatteras Inlet	AF
Thames	Steamer	6 April 1869	Off Cape Hatteras	A
Ezra	Bark	September 1869	Bodie Island	AC
Eagle	Steamer	4 March 1870	Bodie Island	ACE
M. A. Forbes	Bark	May 1870	Currituck Beach	A
Key West	Steamer	October 1870	Cape Hatteras	A
Fairbanks	Steamer	9 December 1870	Hatteras Inlet	A
Kensington	Steamer	27 January 1871	Off Chicamacomico	A
William Muir	Brig	1 April 1871	Currituck Beach	A
Harriet N. Rogers	Schooner	15 January 1873	Bodie Island	ACE
Annie McFarland	Brig	30 January 1873	Currituck Beach	AE
Faugh-A-Ballagh	Brigantine	2 February 1873	Currituck Beach	A
William	Schooner	6 February 1873	Chicamacomico	A
Ariadne	Steamer/Steam screw	7 February 1873	Nags Head/Oregon Inlet	AF
Volunteer	Steamer	23 February 1873	Nags Head	A
R. B. Thompson	Schooner	3 July 1873	Off Cape Hatteras	A
Spellbourne	Schooner	October 1873	Off Cape Hatteras	A
Waltham	Brig	4 May 1874	Bodie Island	ABC
J. Means	Schooner	12 October 1874	Bodie Island	AE
Blaisdell	Schooner	May 1875	Off Cape Hatteras	AF
Mary H. Westcott	Schooner	25 June 1875	Oregon Inlet	BCD
Clara Davidson	Schooner	7 February 1876	Hatteras Inlet	A
Nuova Ottavia	Bark	1 March 1876	Currituck Beach	A
Lotta Lee	Schooner	March 1876	Hatteras Inlet	A
Harvest	Schooner	17 November 1875	Off Nags Head	E
S. S. Lewis	Wrecking Schooner	September 1876	Cape Hatteras	A
J.H. Lockwood	Schooner	20 November 1876	Chicamacomico	AE
America	Bark	24 December 1876	Chicamacomico	AEF
Iona	Schooner	9 April 1877	Chicamacomico	A
Benjamin W. Robinson	Schooner	10 April 1877	Chicamacomico	AF
Hattie L. Fuller	Schooner	13 April 1877	Oregon Inlet	ABCD
Western Star	Schooner	11 September 1877	Bodie Island	A
Huron	Steam screw	24 November 1877	Nags Head/"short distance offshore from Nags Head"	AEN
E. B. Wharton	Schooner	31 January 1878	Ocracoke	A
Metropolis	Steamer	31 January 1878	Curritcuck Beach	A
C. C. Overton	Brig	1 February 1878	Ocracoke	A
Success	Bark	15 January 1879	Bodie Inlet	AC
Ida B. Silsbee	Schooner	18 August 1879	Cape Hatteras	A
M&E Henderson	Schooner	30 November 1879	Pea Island	A
Whitney Long	Schooner	20 December 1879	Creeds Hill	A

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Benjamin Dickerson	Bark	18 October 1880	Off Cape Hatteras	AF
L & D Fisk	Schooner	23 November 1880	Diamond Shoals	A
A. B. Goodman	Schooner	4 April 1881	Creed Hill Station-Diamond Shoals	AF
Sandusky	Ship	28 August 1881	Off Hatteras	A
Thomas J. Lancaster	Schooner	5 October 1881	New Inlet	A
Resolute	Steamer	1881	Oregon Inlet	D
F. L. Carney	Bark	22 January 1882	Hatteras Inlet	A
Mary L. Vankirk	Schooner	5 February 1882	New Inlet	A
Unqua	Sloop	15 August 1882	Oregon Inlet	D
Edna Harwood	Schooner	31 November 1882	Off Hatteras	A
John Floyd	Schooner	14 December 1882	Diamond Shoals	A
Eugene	Schooner	22 January 1883	Ocracoke	A
Angela	Italian bark	4 March 1883	¼ m. E of northern end of Kitty Hawk Beach	EF
Luola Murchison	Schooner	3 October 1883	Kitty Hawk	AE
Florence	Schooner	5 January 1884	Chicamacomico	A
John N. Parker	Schooner	8 January 1884	Hatteras Inlet	A
Issac L. Clark	Schooner	17 December 1884	Diamond Shoals	A
Ephraim Williams	Barkentine	22 December 1884	Big Kinnakeet	A
A. F. Crockett	Schooner	17 February 1885	Ocracoke	AF
Ella May	Sloop	8 August 1885	Oregon Inlet	BCD
Ada F. Whitney	Schooner	22 September 1885	Poyners Hill	A
Thomas Sinnickson	Schooner	12 October 1885	Hatteras Inlet	A
Nellie Wadsworth	Schooner	6 December 1885	Hatteras Inlet	A
Jennie Beasley	Schooner	26 January 1886	Currituck Inlet	AE
Codorus	Bark	4 August 1886	Diamond Shoals	A
George S. Marts	Schooner	16 April 1887	Off Hatteras	A
Charles	Schooner	23 August 1887	Oregon Inlet	BCD
Samuel Welsh	Barkentine	25 February 1888	Whales Head	A
Rachel A. Collins	Schooner	12 March 1888	Off Hatteras	A
Annchen	Brigantine/Barge	17/18 July 1888	Creeds Hill/Off Cape Hatteras	AF
Lena Breed	Schooner	4 December 1888	Diamond Shoals	A
Walter S. Massey	Barkentine	18 January 1889	Diamond Shoals	A
Allie R. Chester	Schooner	20 January 1889	Outer edge of Diamond Shoals	AF
Josie Troop	Bark	22/23 February 1889	Chicamacomico	AE
Hattie Lollis	Schooner	7 April 1889	Nags Head	AE
Wolseley	Bark	11 April 1889	Big Kinnakeet	A
N. Boynton	Barge	17 April 1889	Poyners Hill	A
John Shay	Schooner	17 April 1889	Cape Hatteras	A
Viola W. Burton	Schooner	27 May 1889	Big Kinnakeet	A
Frank M. McGear	Schooner	23 October 1889	Whales Head	A
Francis E. Waters	American schooner	23 October 1889	Nags Head	AN

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Lizzie S. Haynes	Schooner	24 October 1889	Pea Island/Bodie Island*	ABCE*
Annie E. Blackman	Schooner	24 October 1889	New Inlet	A
Busiris	Schooner	24 October 1889	Poyners Hill	A
Pioneer	Steamer	1889	Ocracoke	A
Sue Williams	Schooner	22 March 1890	Chicamacomico	A
William H. Keeney	Schooner	28 March 1890	Little Kinnakeet	A
Blanche	Schooner	17/18 December 1890	Ocracoke Inlet	AF
Dudley Farlin	Schooner	26 December 1890	Bodie Island	E
Charles C. Lister	Schooner	22 January 1891	Ocracoke	A
J.W. Gaskill	Schooner	16 February 1891	Pea Island	AE
Strathairly	Steamer	24 March 1891	Chicamacomico	AN
Vibilia	Bark	25 May 1891	Poyners Hill	A
William H. Hopkins	Schooner	21 June 1891	Big Kinnakeet	A
Annie E. Pierce	Schooner	22 February 1892	Little Kinnakeet	A
Mattie E. Hiles	Schooner	30 October 1892	Currituck Inlet	A
Irene Thayer	Schooner	19 November 1892	Oregon Inlet	ABCD
Formosa	Bark	20 February 1893	Diamond Shoals	A
Nathan Esterbrook, Jr.	Schooner	20 February 1893	Little Kinnakeet	A
Martha	Schooner	4 March 1893	Cape Hatteras	A
Lillie F Schmidt	Schooner	9 March 1893	Ocracoke	A
Ravenwood	Barkentine	13 October 1893	Chicamacomico	AD
Wetherby	Steamer	2 December 1893	Diamond Shoals	A
(?)	Schooner	4 February 1894	Diamond Shoals	A
Florence C. Magee	Schooner	26 February 1894	Bodie Island	AC
A. P. Richardson	Schooner	26 September 1894	Ocracoke	AF
Richard S. Spofford	Schooner	27 December 1894	Ocracoke	A
Hester A. Seward	Schooner	6 January 1895	Ocracoke	A
Laura Nelson	Schooner	30 March 1895	Bodie Island	AE
Addie Henry	Schooner	14 April 1895	Ocracoke	AF
J. W. Dresser	American Barkentine	23 July 1895	Cape Hatteras/"outer Diamond Shoal"	AM
Martin S. Ebel	Schooner	5 November 1895	Big Kinnakeet	A
Emma C. Cotton	Schooner	27 December 1895	Pea Island	AC
James Woodall	Steamer	12 January 1896	New Inlet	A
Maggie J. Lawrence	Schooner	10 February 1896	Pea Island	ACE
Glanayron	Steamer	22 May 1896	Cape Hatteras	A
E.S. Newman	Schooner	11 October 1896	Pea Island	AE
George M. Adams	Schooner	1 May 1897	Nags Head	A
Hesperides/Hespirides	Steamer	9 October 1897	Cape Hatteras	AR
Mathilda	Ship	27 October 1897	Bodie Island	A
Samuel W. Hall	Schooner	24 December 1897	Chicamacomico	A
Samuel W. Tilton	Schooner	17 February 1898	Chicamacomico	A

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Milton	Schooner	27 April 1898	Bodie Island	AC
George C. Fessenden	Schooner	27 April 1898	Chicamacomico	A
S.G. Hurt	Schooner	10 August 1898	Little Kinnakeet	A
June	Sloop	11 August 1899	Oregon Inlet	ABCD
Florence Randall	Schooner	16 August 1899	Big Kinnakeet	A
Robert W. Dasey	Schooner	17 August 1899	Little Kinnakeet	A
Minnie Bergen	Schooner	18 August 1899	Chicamacomico	A
Roger Moore	Schooner	30 October 1899	Big Kinnakeet	A
Ariosto	Schooner	24 December 1899	Ocracoke/"3 miles south of Hatteras Inlet"	AF
Jane C. Harris	Schooner	25 February 1900	Oregon Inlet	ABCD
Lissie S. James	Schooner	12 March 1900	Ocracoke	A
William H. Kenxal	Schooner	2 May 1900	Cape Hatteras	A
Virginia	Steamer	2 May 1900	Cape Hatteras	A
Hettie J. Dorman	Schooner	5 May 1900	Cape Hatteras	A
Palestro	Steamer	9 August 1900	Cape Hatteras	A
George R. Congdon	Schooner	31 January 1901	Cape Hatteras	A
Ida Lawrence	Schooner	4 December 1902	Ocracoke	A
Wesley M. Oler	Schooner	5 December 1902	Hatteras Inlet	A
William H. Shubert	Schooner	16 February 1903	Bodie Island	A
J.F. Becker	Schooner	26 April 1903	Oregon Inlet	ABCD
Benjamin M. Wallace	Schooner	26 March 1904	Chicamacomico	AF
Montana	Schooner	11 December 1904	Pea Island	AC
Northeastern	Steamer	27 December 1904	Cape Hatteras	AR
Cordelia E. Hays	Schooner	15 January 1905	Cape Hatteras	A
Thomas A. Goddard	Barge	9 December 1905	Nags Head	A
Robert H. Stevenson	Schooner	13 January 1906	Cape Hatteras	A
Jennie Lockwood	Schooner	13 February 1906	Pea Island	ACE
Hilda	Schooner	6 February 1907	Cape Hatteras	A
Oriente	Bark	28 April 1907	Poyners Hill	A
Addie Morrill	Barkentine	3 October 1907	Cape Hatteras	F
Bluefields	Iron steam screw	4 January 1908	Cape Hatteras	F
Leonora	Schooner	8 January 1908	Cape Hatteras	A
Flora Rogers	Schooner	23 October 1908	Bodie Island	AC
Brewster	Steamer	29 November 1909	Cape Hatteras	A
Governor Ames	Schooner	13 December 1909	Chicamacomico	A
Frances	Schooner	1 February 1910	Big Kinnakeet	A
Catherine M. Monohan	Schooner	24 August 1910	Off Ocracoke	A
Spero	Bark	24 December 1910	Hatteras Inlet	A
Harriet C. Kerlin	Schooner	6 February 1911	Cape Hatteras	A
Wellfleet	Schooner	6 March 1911	Cape Hatteras	A
Charles J. Dumas	Schooner	26/27 December 1911	Pea Island	ACE

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Mary S. Eskridge	Schooner	31 December 1911	Big Kinnakeet	A
Annie F. Kimball	Schooner	8 January 1912	Cape Hatteras	F
Harry Prescott	Schooner	18 January 1912	Cape Hatteras	A
Elm City	Schooner	25 March 1912	Little Kinnakeet	A
John Maxwell	Schooner	2 November 1912	New Inlet	A
Richard F.C. Hartley	Schooner	2 September 1913	Chicamacomico	A
George W. Wells	Schooner	3 September 1913	Ocracoke	A
Helen H. Benedict	Schooner	6 February 1914	Nags Head/6.5 miles N Bodie Island Light	AE
Isle of Iona	Steamer	13 December 1914	Ocracoke	A
George N. Reed	Schooner	20 January 1915	Pea Island	AC
Idler	Yacht	24 January 1915	Cape Hatteras	A
Alice Murphy	Schooner	3 April 1915	Cape Hatteras	F
Prinz Maurits	Steamer	3 April 1915	Off Cape Hatteras	A
The Josephine	Schooner	3 April 1915	¾ mile S Kill Devil Hill Lightship	AE
Elsie A. Bayles	Schooner	5 April 1916	New Inlet	A
Lulu M. Quillin	Schooner	11 December 1917	Little Kinnakeet	A
Veturia	Steamer	20 February 1918	Cape Hatteras	AR
Harpathian	Steamer	5 June 1918	Off Currituck	A
Vinland	Steamer	5 June 1918	Off Currituck	A
Vindeggen	Steamer	8 June 1918	Off Currituck	A
Pinar del Rio	Steamer	9 June 1918	Off Nags Head	A
Nat Meader	Schooner	26 June 1918	Cape Hatteras	A
Hattie George	Tug/Steam screw	29 June 1918	Nags Head/Oregon Inlet	ABD
Elizabeth T. Doyle	Schooner	30 July 1918	Cape Hatteras	A
Stanley M. Seaman	Schooner	5 August 1918	Off Cape Hatteras	A
Merak	Steamer	6 August 1918	Little Kinnakeet	A
Diamond Shoals	Lightship	6 August 1918	Cape Hatteras	A
Mirlo	Tanker	16 August 1918	Chicamacomico	A
Nordhav	Bark	17 August 1918	Off Bodie Island	A
Proteus	Steamer	19 August 1918	Off Hatteras	A
Gracie D. Chambers	Schooner	13 February 1919	Poyners Hill/Currituck Beach	AE
Black Hawk	Yacht	6 November 1919	Oregon Inlet	AC
Explorer	Tugboat	12 December 1919	200 yds. Off Nags Head Pier	AN
Sunbeam	Schooner	17 December 1919	Off Currituck	A
Powel	Steamer	6 April 1920	Off Hatteras	A
Louisa M.	Schooner	8 December 1920	Off Currituck light	E
Carroll A. Deering	Schooner	31 January 1921	Diamond Shoals	A
Mary J. Haynie	Schooner	24 May 1921	Ocracoke	A
Laura A. Barnes	Schooner	1 June 1921	Bodie Island	ACEN
I. C. White	Steam screw	21 January 1922	Off Bodie Island	E
Blanche C. Pendleton	Schooner	21 January 1922	Off Bodie Island	EF

VESSEL NAME	TYPE	ACTUAL OR APPROXIMATE LOSS DATE	ACTUAL OR APPROXIMATE SHIPWRECK LOCATION	REFERENCE
Agawam	Gas yacht	16 March 1922	NE of Diamond Shoal Lightship	F
USS *New Jersey*	Battleship	5 September 1923	Diamond Shoals	A
USS *Virginia*	Battleship	5 September 1923	Diamond Shoals	A
Santiago	Steamer	21 March 1924	Off Hatteras	A
Dorothea L. Brinkman	Schooner	22 March 1924	Oregon Inlet	ABCDEL
Irma	Schooner	29 April 1925	Bodie Island	AE
Victoria S.	Schooner	23 August 1925	Ocracoke	A
Isabella Parmenter	Schooner	1 November 1925	Chicamacomico	A
Beatrice	Gas yacht	27 January 1927	Cape Hatteras	F
Adelaide Day	Schooner	8 November 1927	Off Cape Hatteras	AF
Kyzikes	Tanker/Greek?	4 December 1927	1.5 miles N Kill Devil Hills CG station	AF
Cibao	Steamer	4 December 1927	Hatteras Inlet	A
George W. Truitt, Jr.	Schooner	20 February 1929	Ocracoke Inlet	A
Bainbridge	Schooner	5 February 1929/4 February 1929	Nags Head	AF
Brainbridge	Schooner	5 February 1929	Nags Head	E
A. Ernest Mills	Schooner	3 May 1929	Currituck Beach	A
Carl Gerhard	Steamer	23 September 1929	Kill Devil Hills	A
Catherine G. Scott	Schooner	14 October 1930	Off Hatteras	A
Anna May	Oil screw trawler	9 December 1931	Off Diamond Shoals	AF
Glory	Steamer	26 August 1933	Off Nags Head	AE
Nomis	Schooner	16 August 1935	Hatteras Inlet	A
Tzenny Chandris	Steamer	13 November 1937	Off Kitty Hawk	A
Albatross	Trawler	21 February 1940	Ocracoke Inlet	A
Allan Jackson	Tanker	18 January 1942	Cape Hatteras	A
Brazos	Cargo	18 January 1942	Cape Hatteras	A
Norvana	Cargo	18 January 1942	Cape Hatteras	A
City of Atlanta	Cargo	19 January 1942	Cape Hatteras	AR
Empire Gem	Tanker	23 January 1942	Creeds Hill	A
Venore	Cargo	23 January 1942	Creeds Hill	A
York	Cargo	January 1942	Kill Devil Hills	A
Blink	Cargo/Norwegian registry	11 February 1942	Off Cape Hatteras	AF
Buarque	Passenger	15 February 1942	Kill Devil Hills	A
Olympic	Tanker	23 February 1942	Kill Devil Hills	A
Norlavore	Cargo	24 February 1942	Cape Hatteras	A
Anna R. Heidritter	4-masted schooner	1 March 1942/2 March 1942	Off Ocracoke	AFL
Arabutan	Cargo	7 March 1942	Cape Hatteras	A
Chester Sun	Tanker	10 March 1942	Big Kinnekeet	A
Ceiba	Cargo/Freighter	15 March 1942	Off Nags Head	AEF
Resource	(?)	15 March 1942	Kill Devil Hills	A
Alcoa Guide	Cargo	16 March 1942	Cape Hatteras	A
Tenas	Barge	17 March 1942	Creeds Hill	A

VESSEL NAME	TYPE	ACTUAL OR APPROXIMATE LOSS DATE	ACTUAL OR APPROXIMATE SHIPWRECK LOCATION	REFERENCE
Australia	Tanker	17 March 1942	Diamond Shoals	AR
Acme	Tanker	17 March 1942	"12 miles, 148° from Cape Hatteras Light"	F
E.M. Clark	Tanker	18 March 1942	Ocracoke	A
Liberator	Cargo	19 March 1942	Cape Hatteras	A
Kassandra Louloudis	Cargo	19 March 1942	Cape Hatteras	A
Teresa	Cargo	21 March 1942	Cape Hatteras	A
Narraganset	Tanker	25 March 1942	Cape Hatteras	A
Dixie Arrow	Steel tanker	26 March 1942	25 miles SW of Hatteras Light	AF
Carolyn	Cargo	27 March 1942	Nags Head	A
City of New York	Passenger	29 March 1942	Cape Hatteras	A
Rio Blanco	Cargo	1 April 1942	Cape Hatteras	A
Otho	Cargo	3 April 1942	Cape Hatteras	A
Ensis	Tanker	4 April 1942	Cape Hatteras	A
British Splendour	Tanker	6 April 1942	Cape Hatteras	A
Lancing	Tanker	7 April 1942	Cape Hatteras	A
Kollskegg	Tanker	7 April 1942	Cape Hatteras	A
San Delfino	Tanker	9 April 1942	Cape Hatteras	A
U-85	German submarine	14 April 1942	Nags Head	A
Empire Thrush	Cargo	14 April 1942	Cape Hatteras	AR
Desert Light	Cargo	16 April 1942	Oregon Inlet	A
Empire Dryden	Cargo	19 April 1942	Oregon Inlet	A
Harpagon	Cargo	19 April 1942	Cape Hatteras	A
Agra	Tanker	20 April 1942	Off Cape Hatteras	AF
Chenango	Cargo	20 April 1942	Kill Devil Hills	A
Lady Drake	Cargo	5 May 1942	Oregon Inlet	A
West Notus	Cargo	1 June 1942	Cape Hatteras	A
Pleasantville	Cargo	8 June 1942	Cape Hatteras	A
F.W. Abrams	Tanker	10 June 1942	Ocracoke	A
USSYP *389*	Antisub	19 June 1942	Cape Hatteras	A
Nordal	Cargo	24 June 1942	Ocracoke	A
William Rockefeller	Tanker	28 June 1942	Cape Hatteras	A
City of Birmingham	Cargo	30 June 1942	Cape Hatteras	A
U-*701*	German submarine	7 July 1942	Cape Hatteras	AR
U-*576*	German submarine	15 July 1942	30 miles off Cape Hatteras	P
Bluefields	American freighter	15 July 1942	30 miles off Cape Hatteras	P
Keshena	Tug	19 July 1942	Cape Hatteras	A
Louise	Cargo	16 December 1942	Kinnakeet	A
Wellfleet	Tug	4 March 1943	Cape Hatteras	A
Belgian Airman	Cargo	14 April 1945	Nags Head	A
Benson H. Riggin	Oil screw	3 December 1953	In Ocracoke Inlet	F
Miss Pamlico	Oil screw	20 June 1960	Oregon Inlet	BCD

VESSEL NAME	TYPE	ACTUAL OR APPROXIMATE LOSS DATE	ACTUAL OR APPROXIMATE SHIPWRECK LOCATION	REFERENCE
Sarah J.	Oil screw trawler	14 January 1961	Oregon Inlet	BD
Townsend		April 1962	Oregon Inlet	BD
W.J. Townsend	Oil Screw	15 December 1962	Oregon Inlet	BCD
Lois Joyce	Trawler	12 December 1982	Oregon Inlet	CD
USS *LST-471*	WW-II ship	Scrapped-lost in transit	Near Rodanthe	N
USS *LST-292*	WW-II ship	Scrapped-lost in transit	1.4 miles S of Rodanthe pier	N

Shipwreck Inventory References:

A=(Stick 1952:244-257)
B=(Dames and Moore 1979:9-12)
C=(North Carolina Department of Transportation 1989: C5-C6)
D=(North Carolina Division of Archives and History, UAB Site File)
E=(Mitchell 1975)
F=(Berman 1972)
G=(National Park Service n.d.a; n.d.b.; n.d.c.)
H=(North Carolina Humanities Council)
I=(*Flake's Bulletin* 5 December 1866:11 [Galveston TX])
J=(Watts 1985)
K=(Marx 1983)
L=(Burgess 1978)
M=(USLSS 1897)
N=(NOAA 2010)
O=(Watts 1985)
P=(*The Washington Post*, 21 October 2014)
Q=(Ashe 1908:149)
R=(Hudy 2009)

Attachment B

Buxton Magnetic Anomaly Table

Attachment B: Buxton Magnetic Anomaly Table

Anomaly	X Coordinate	Y Coordinate	Survey Line	Target #	Signature	Intensity	Duration	Assessment
001-1-pm-84g-125.6f	3047137.6	563451.4	1	1	Positive Monopolar	84g	125.6f	Cable or Pipeline
001-2-pm-11.1g-175.9f	3047548.3	564167.1	1	2	Positive Monopolar	11.1g	175.9f	Cable or Pipeline
002-1-pm-10.3g-171.6f	3047173.3	563418.6	2	1	Positive Monopolar	10.3g	171.6f	Cable or Pipeline
002-2-dp-5g-149.7f	3047614.3	564154.1	2	2	Dipolar	5g	149.7f	Cable or Pipeline
002-3-dp-26.9g-226.7f	3049755.5	565469.5	2	3	Dipolar	26.9g	226.7f	Cable or Pipeline
003-1-pm-10.2g-171.4f	3047195.7	563316.2	3	1	Positive Monopolar	10.2g	171.4f	Cable or Pipeline
003-2-pm-6.2g-116.3f	3047660	564131.5	3	2	Positive Monopolar	6.2g	116.3f	Cable or Pipeline
004-1-dp-6.4g-182.3f	3047114.5	563106.3	4	1	Dipolar	6.4g	182.3f	Cable or Pipeline
004-2-pm-3.7g-100.9f	3047651	563947.3	4	2	Positive Monopolar	3.7g	100.9f	Cable or Pipeline
004-3-mc-29.2g-487.6f	3048263.9	565052.5	4	3	Multicomponent	29.2g	487.6f	Cable or Pipeline
005B-1-nm-6.4g-120.9f	3047124.8	563049.2	005B	1	Negative Monopolar	6.4g	120.9f	Cable or Pipeline
005B-2-dp-3.7g-123f	3047654.2	563938.5	005B	2	Dipolar	3.7g	123f	Cable or Pipeline
005B-3-mc-26.3g-772.4f	3048261.6	564944.1	005B	3	Multicomponent	26.3g	772.4f	Buffered for Avoidance
006-1-dp-4.3g-97.2f	3047240	563145.4	6	1	Dipolar	4.3g	97.2f	Cable or Pipeline
006-2-pm-5.1g-115.6f	3047801.1	564078.8	6	2	Positive Monopolar	5.1g	115.6f	Cable or Pipeline
006-3-mc-31.1g-458.6f	3048233.8	564802.8	6	3	Multicomponent	31.1g	458.6f	Buffered for Avoidance
006-4-dp-12.2g-155.4f	3048605.6	565419.3	6	4	Dipolar	12.2g	155.4f	Cable or Pipeline
007-1-nm-5g-94.5f	3047259.3	563098.4	7	1	Negative Monopolar	5g	94.5f	Cable or Pipeline
007-2-pm-14.7g-176.9f	3047844.5	564049.3	7	2	Positive Monopolar	14.7g	176.9f	Cable or Pipeline
007-3-mc-25.4g-323.9f	3048206.7	564573.2	7	3	Multicomponent	25.4g	323.9f	Buffered for Avoidance
007-4-dp-13.8g-150.2f	3048694.2	565494.2	7	4	Dipolar	13.8g	150.2f	Cable or Pipeline
008-1-mc-51.6g-106.4f	3048064.5	564310.1	8	1	Multicomponent	51.6g	106.4f	Cable or Pipeline
008-2-dp-25g-208.8f	3048649.7	565320.8	8	2	Dipolar	25g	208.8f	Cable or Pipeline
009-1-pm-7.2g-125f	3047223	562836.8	9	1	Positive Monopolar	7.2g	125f	Cable or Pipeline
010-1-dp-556.7g-510.8f	3048340.9	564596.4	10	1	Dipolar	556.7g	510.8f	Buffered for Avoidance
010-2-nm-8.1g-141.4f	3047347.2	562928.7	10	2	Negative Monopolar	8.1g	141.4f	Cable or Pipeline
010-3-mc-14.5g-404.5f	3048083.1	564123.3	10	3	Multicomponent	14.5g	404.5f	Cable or Pipeline
010-4-nm-30.8g-118.6f	3048827.8	565381.3	10	4	Negative Monopolar	30.8g	118.6f	Cable or Pipeline
010-5-dp-271.5g-730.6f	3048412.5	564748.9	10	5	Dipolar	271.5g	730.6f	Buffered for Avoidance
010-6-dp-20.1g-174.7f	3048904	565524.6	10	6	Dipolar	20.1g	174.7f	Cable or Pipeline
011-1-dp-882.6g-514.4f	3048440.4	564773.1	11	1	Dipolar	882.6g	514.4f	Buffered for Avoidance
011-2-nm-24.4g-118.2f	3048953.7	565526.7	11	2	Negative Monopolar	24.4g	118.2f	Cable or Pipeline
012-1-dp-4.5g-135.3f	3047409.9	562823.8	12	1	Dipolar	4.5g	135.3f	Cable or Pipeline
012-2-dp-262.9g-389.6f	3048552	564750.6	12	2	Dipolar	262.9g	389.6f	Buffered for Avoidance

Anomaly	X Coordinate	Y Coordinate	Survey Line	Target #	Signature	Intensity	Duration	Assessment
012-3-dp-13.3g-91.5f	3049014.7	565509.6	12	3	Dipolar	13.3g	91.5f	Cable or Pipeline
013-1-nm-9.7g-135.5f	3047456.6	562773.5	13	1	Negative Monopolar	9.7g	135.5f	Cable or Pipeline
013-2-pm-65.3g-514.8f	3048595.9	564731.5	13	2	Positive Monopolar	65.3g	514.8f	Buffered for Avoidance
013-3-dp-86.9-204.6f	3049115.3	565544.7	13	3	Dipolar	86.9	204.6f	Cable or Pipeline
014-1-dp-6.7g-183.4f	3047331.5	562505.3	14	1	Dipolar	6.7g	183.4f	Cable or Pipeline
014-2-dp-17.2g-555.1f	3048506.3	564438.9	14	2	Dipolar	17.2g	555.1f	Buffered for Avoidance
014-3-nm-19.4g-152.9f	3049062.4	565404.2	14	3	Negative Monopolar	19.4g	152.9f	Cable or Pipeline
015-1-dp-13.3g-230.6f	3049116.1	565398.6	15	1	Dipolar	13.3g	230.6f	Cable or Pipeline
015-4-nm-8g-167.3f	3047345.5	562470.5	15	4	Negative Monopolar	8g	167.3f	Cable or Pipeline
015-2-mc-8.4g-594.5f	3048523.4	564420.8	15	2		8.4g	594.5g	Buffered for Avoidance
015-3-dp-10.7g-217.6f	3049130.3	565387.3	15	3	Dipolar	10.7g	217.6f	Cable or Pipeline
016-1-pm-8.2g-129.7f	3047478.7	562517.4	16	1	Positive Monopolar	8.2g	129.7f	Cable or Pipeline
016-2-dp-8.6g-135.1f	3049263.8	565526.6	16	2	Dipolar	8.6g	135.1f	Cable or Pipeline
017-1-dp-10g-213.4f	3047432.7	562398.3	17	1	Dipolar	10g	213.4f	Cable or Pipeline
017-2-dp-14.5g-244.8f	3049322.6	565568.8	17	2	Dipolar	14.5g	244.8f	Cable or Pipeline
018-1-nm-10.5g-130.2f	3047336.1	562124	18	1	Negative Monopolar	10.5g	130.2f	Cable or Pipeline
018-2-pm-17.5g-222.3f	3049263.1	565378.6	18	2	Positive Monopolar	17.5g	222.3f	Cable or Pipeline
019-1-pm-7.9g-202.3f	3047335.1	562048.1	19	1	Positive Monopolar	7.9g	202.3f	Cable or Pipeline
019-2-pm-11.5g-212.5f	3049328.9	565384.9	19	2	Positive Monopolar	11.5g	212.5f	Cable or Pipeline
020-1-nm-10.4g-80.8f	3047436.9	562099.2	20	1	Negative Monopolar	10.4g	80.8f	Cable or Pipeline
020-4-nm-7.8g-142.9f	3047452.8	562091	20	4	Negative Monopolar	7.8g	142.9f	Cable or Pipeline
020-2-dp-12.5g-156.6f	3049499.8	565510.9	20	2	Dipolar	12.5g	156.6f	Cable or Pipeline
020-3-dp-12.8g-255.1f	3049509.9	565504.2	20	3	Dipolar	12.8g	255.1f	Cable or Pipeline
021-1-mc-10.3g-204f	3047403.8	561961.6	21	1	Multicomponent	10.3g	204f	Cable or Pipeline
021-2-pm-9g-168.7f	3049555.1	565535.2	21	2	Positive Monopolar	9g	168.7f	Cable or Pipeline
022-1-mc-8.2g-191.7f	3047298.8	561676.5	22	1	Multicomponent	8.2g	191.7f	Cable or Pipeline
022-2-pm-10.8g-168.9f	3049496.3	565376.7	22	2	Positive Monopolar	10.8g	168.9f	Cable or Pipeline
023-1-dp-12g-232.6f	3047276.3	561563.6	23	1	Dipolar	12g	232.6f	Cable or Pipeline
023-2-pm-25.9g-251.3f	3049543.8	565355	23	2	Positive Monopolar	25.9g	251.3f	Cable or Pipeline
024-1-mc-17.2g-175.9f	3047342.5	561557.4	24	1	Multicomponent	17.2g	175.9f	Cable or Pipeline
024-2-dp-11.8g-140.2f	3049715.1	565510.3	24	2	Dipolar	11.8g	140.2f	Cable or Pipeline
025-1-dp-8.6g-209.9f	3047316.8	561407.3	25	1	Dipolar	8.6g	209.9f	Cable or Pipeline
025-3-nm-10.9g-271.9f	3047193.8	561229.8	25	3	Negative Monopolar	10.9g	271.9f	Cable or Pipeline
025-2-dp-20.9g-212.6f	3049643.3	565322.5	25	2	Dipolar	20.9g	212.6f	Cable or Pipeline
026-1-mc-15.8g-408.6f	3047179.7	560848.3	26	1	Multicomponent	15.8g	408.6f	Cable or Pipeline
026-3-mc-18.3g-310.1f	3047176.1	561054.1	26	3	Multicomponent	18.3g	310.1f	Cable or Pipeline
026-2-dp-7.6g-98.1f	3049742.5	565344.5	26	2	Dipolar	7.6g	98.1f	Cable or Pipeline
027-1-mc-35.9g-275.3f	3047124	560888	27	1	Multicomponent	35.9g	275.3f	Cable or Pipeline
027-2-dp-11.6g-202.3f	3049780.8	565326.2	27	2	Dipolar	11.6g	202.3f	Cable or Pipeline

Anomaly	X Coordinate	Y Coordinate	Survey Line	Target #	Signature	Intensity	Duration	Assessment
028-1-dp-12.3g-238.3f	3049927.3	565488.8	28	1	Dipolar	12.3g	238.3f	Cable or Pipeline
029-1-mc-30.1g-438.5f	3047150.5	560743.5	29	1	Multicomponent	30.1g	438.5f	Cable or Pipeline
029-2-dp-10.7g-175.7f	3049968.4	565458.2	29	2	Dipolar	10.7g	175.7f	Cable or Pipeline
030-1-dp-18.1g-337.1f	3047132.6	560621.9	30	1	Dipolar	18.1g	337.1f	Cable or Pipeline
030-4-mc-14.4g-438.3f	3047044.2	560431.5	30	4	Multicomponent	14.4g	438.3f	Cable or Pipeline
030-2-dp-9.2g-193.1f	3050017.2	565490.4	30	2	Dipolar	9.2g	193.1f	Cable or Pipeline
030-3-dp-9.6g-230.7f	3049941.9	565334.5	30	3	Dipolar	9.6g	230.7f	Cable or Pipeline
031-1-dp-11.7g-233.3f	3046959.1	560196.8	31	1	Dipolar	11.7g	233.3f	Cable or Pipeline
031-2-dp-21.2g-236f	3049976.5	565312.7	31	2	Dipolar	21.2g	236f	Cable or Pipeline
032-1-mc-13.2g-341.5f	3047054.4	560257.2	32	1	Multicomponent	13.2g	341.5f	Cable or Pipeline
032-2-pm-18g-231.1f	3050162	565466.7	32	2	Positive Monopolar	18g	231.1f	Cable or Pipeline
033-1-dp-18.2g-348.5f	3047015.6	560156.8	33	1	Dipolar	18.2g	348.5f	Cable or Pipeline
033-2-pm-24.9g-258f	3050212.6	565472.5	33	2	Positive Monopolar	24.9g	258f	Cable or Pipeline
034-1-mc-18.6g-288.7f	3046867.5	559748.7	34	1	Multicomponent	18.6g	288.7f	Cable or Pipeline
034-2-pm-4.4g-99.4f	3050194	565333.9	34	2	Positive Monopolar	4.4g	99.4f	Cable or Pipeline
035-1-pm-33.7g-138.6f4	3046832.2	559652.7	35	1	Positive Monopolar	33.7g	138.6f4	Cable or Pipeline
035-3-pm-35.7g-177.7f	3046849.5	559646	35	3	Positive Monopolar	35.7g	177.7f	Cable or Pipeline
035-2-dp-8.5g-202f	3050211.6	565291.4	35	2	Dipolar	8.5g	202f	Cable or Pipeline
035-4-dp-9.4g-131.5f	3050207.9	565297.4	35	4	Dipolar	9.4g	131.5f	Cable or Pipeline
036-1-mc-18.4g-397.4f	3046925.4	559671.1	36	1	Multicomponent	18.4g	397.4f	Cable or Pipeline
036-2-dp-7.7g-175.8f	3050383.7	565453.7	36	2	Dipolar	7.7g	175.8f	Cable or Pipeline
037-1-mc-25.9g-219.6f	3046881.3	559460.3	37	1	Multicomponent	25.9g	219.6f	Cable or Pipeline
038-1-mc-27.9g-428.3f	3046772	559233.1	38	1	Multicomponent	27.9g	428.3f	Cable or Pipeline
038-2-dp-9.7g-204.3f	3050396.6	565293.6	38	2	Dipolar	9.7g	204.3f	Cable or Pipeline
039-1-pm-43.4g-288.6f	3046748.7	559078.9	39	1	Positive Monopolar	43.4g	288.6f	Cable or Pipeline
039-2-pm-22.4g-183.8f	3050433	565288.4	39	2	Positive Monopolar	22.4g	183.8f	Cable or Pipeline
040-1-pm-22.8g-248.3f	3046848.5	559193.3	40	1	Positive Monopolar	22.8g	248.3f	Cable or Pipeline
040-3-pm-24.5g-262.7f	3046844.3	559146.8	40	3	Positive Monopolar	24.5g	262.7f	Cable or Pipeline
040-2-dp-10.9g-145.5f	3050573.3	565399.1	40	2	Dipolar	10.9g	145.5f	Cable or Pipeline
040-4-dp-30g-246.2f	3050552	565424.5	40	4	Dipolar	30g	246.2f	Cable or Pipeline
041-1-mc-20.7g-424.3f	3046820.6	559027.3	41	1	Multicomponent	20.7g	424.3f	Cable or Pipeline
041-2-nm-21.3g-197.4f	3050616.2	565357.9	41	2	Negative Monopolar	21.3g	197.4f	Cable or Pipeline
042-1-mc-15.8g-378.2f	3046676	558677.5	42	1	Multicomponent	15.8g	378.2f	Cable or Pipeline
042-2-nm-24.8g-201.9f	3050538.7	565182.8	42	2	Negative Monopolar	24.8g	201.9f	Cable or Pipeline
043-1-pm-13.1g-174.2f	3046610.4	558576	43	1	Positive Monopolar	13.1g	174.2f	Cable or Pipeline
043-2-nm-29.4g-229.6f	3050588	565153.5	43	2	Negative Monopolar	29.4g	229.6f	Cable or Pipeline
044-1-mc-5.9g-170.1f	3046754.2	558649	44	1	Multicomponent	5.9g	170.1f	Cable or Pipeline
044-2-nm-14.8g-188.9f	3050718.2	565281.2	44	2	Negative Monopolar	14.8g	188.9f	Cable or Pipeline
045-1-dp-16.1g-220.2f	3046701	558446.3	45	1	Dipolar	16.1g	220.2f	Cable or Pipeline

Anomaly	X Coordinate	Y Coordinate	Survey Line	Target #	Signature	Intensity	Duration	Assessment
045-3-nm-16.7g-179.4f	3046602.2	558288.8	45	3	Negative Monopolar	16.7g	179.4f	Cable or Pipeline
045-2-dp-13.3g-196.7f	3050781.8	565254.5	45	2	Dipolar	13.3g	196.7f	Cable or Pipeline
045-4-pm-31.5g-187.5f	3050705.2	565132.6	45	4	Positive Monopolar	31.5g	187.5f	Cable or Pipeline
046-1-mc-18.6g-306.4f	3046616.1	558182	46	1	Multicomponent	18.6g	306.4f	Cable or Pipeline
046-2-pm-33.2g-239.3f	3050737.7	565110.4	46	2	Positive Monopolar	33.2g	239.3f	Cable or Pipeline
047-1-pm-11.6g-216.5f	3046610.3	558096.9	47	1	Positive Monopolar	11.6g	216.5f	Cable or Pipeline
047-2-pm-24.8g-251f	3050790.9	565083.7	47	2	Positive Monopolar	24.8g	251f	Cable or Pipeline
048-1-dp-20.4g-250.2f	3046686.5	558127.1	48	1	Dipolar	20.4g	250.2f	Cable or Pipeline
048-3-nm-20.6g-144.6f	3046699.9	558082.4	48	3	Negative Monopolar	20.6g	144.6f	Cable or Pipeline
048-2-pm-10.6g-180.9f	3050958.5	565248.5	48	2	Positive Monopolar	10.6g	180.9f	Cable or Pipeline
048-4-pm-13.2g-190.3f	3050957.7	565253.1	48	4	Positive Monopolar	13.2g	190.3f	Cable or Pipeline

Attachment C

Buxton Sonar Target Table

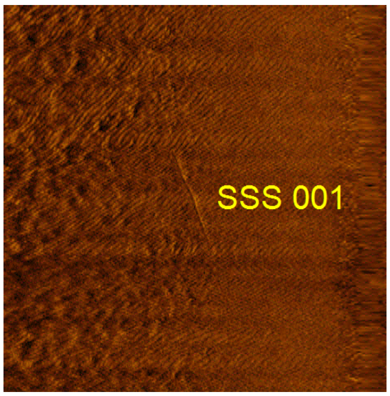
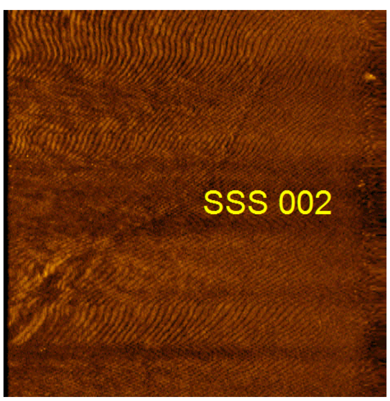
Attachment C: Buxton Sonar Target Table

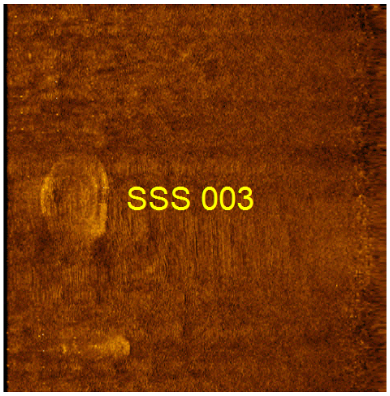
TARGET	X COORDINATE	Y COORDINATE	ASSESSMENT
SSS 001	3048210.815	564352.6116	Cable, wire or pipe on bottom
SSS 002	3047337.229	562410.0784	Possible cable, wire or pipe
SSS 003	3046609.099	559364.9698	Bottom surface feature
SSS 004	3047547.881	559366.8131	Bottom surface feature
SSS 005	3049618.725	565107.7177	Possible bottom surface debris
SSS 006	3048141.158	564289.2726	Small linear objects

Attachment D

Buxton Sonar Target Reports

BUXTON SONAR TARGET REPORTS

Target Image	Target Info	User Entered Info
	SSS 001 • Sonar Time at Target: 1/1/2015 2:41:05 PM • Click Position 35.2497148401 -75.4882674896 (WGS84) 35.2495366560 -75.4886743838 (NAD27LL) 35.2497148401 -75.4882674896 (LocalLL) (X) 3048210.81 (Y) 564352.61 (Projected Coordinates) • Map Projection: NC83F • Acoustic Source File: C:\Users\NEMO\Desktop\BUXTON-DARE CO NC (CSE) 2014-2015\OBX CSE Buxton Sonar\OBX Buxton Sonar 1-1-15\OBX sonar_data150101100300.sdf • Ping Number: 23552 • Range to target: 90.16 US ft • Fish Height: 33.32 US ft • Heading: 38.100 Degrees • Event Number: 0 • Line Name: OBX sonar_data150101100300 • Water Depth: 0.00 US ft • Positioning System to Sensor: 0.0000	Dimensions and attributes • Target Width: 0.84 US ft • Target Height: 0.00 US ft • Target Length: 46.02 US ft • Target Shadow: 0.00 US ft • Mag Anomaly: 008-1 ? • Avoidance Area: • Classification1: • Classification2: • Area: • Block: • Description: Cable, wire or pipe on bottom surface.
	SSS 002 • Sonar Time at Target: 1/2/2015 3:35:47 PM • Click Position 35.2444656121 -75.4914216709 (WGS84) 35.2442874703 -75.4918284708 (NAD27LL) 35.2444656121 -75.4914216709 (LocalLL) (X) 3047337.23 (Y) 562410.08 (Projected Coordinates) • Map Projection: NC83F • Acoustic Source File: C:\Users\NEMO\Desktop\BUXTON-DARE CO NC (CSE) 2014-2015\OBX CSE Buxton Sonar\OBX Buxton Sonar 1-2-15\OBX sonar_data150102110100.sdf • Ping Number: 75902 • Range to target: 105.98 US ft • Fish Height: 26.30 US ft • Heading: 34.800 Degrees • Event Number: 0 • Line Name: OBX sonar_data150102110100 • Water Depth: 0.00 US ft • Positioning System to Sensor: 0.0000	Dimensions and attributes • Target Width: 1.34 US ft • Target Height: 0.00 US ft • Target Length: 153.69 US ft • Target Shadow: 0.00 US ft • Mag Anomaly: 014-1, 015-4 & 017-1 ? • Avoidance Area: • Classification1: • Classification2: • Area: • Block: • Description: Possibly cable, wire or pipe.

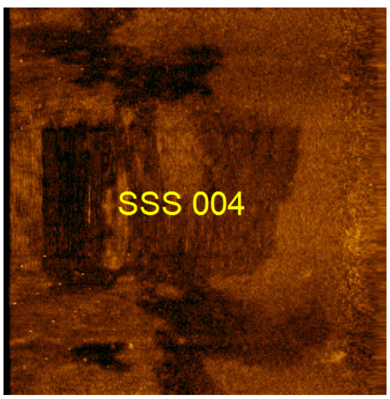


SSS 003

- Sonar Time at Target: 1/2/2015 5:28:07 PM
- Click Position
  35.2361745683 -75.4942189846 (WGS84)
  35.2359964687 -75.4946257166 (NAD27LL)
  35.2361745683 -75.4942189846 (LocalLL)
  (X) 3046609.10 (Y) 559364.97 (Projected Coordinates)
- Map Projection: NC83F
- Acoustic Source File: C:\Users\NEMO\Desktop\BUXTON-DARE CO NC (CSE) 2014-2015\OBX CSE Buxton Sonar\OBX Buxton Sonar 1-2-15\OBX sonar_data150102124800.sdf
- Ping Number: 159120
- Range to target: 145.10 US ft
- Fish Height: 25.06 US ft
- Heading: 224.800 Degrees
- Event Number: 0
- Line Name: OBX sonar_data150102124800
- Water Depth: 0.00 US ft
- Positioning System to Sensor: 0.0000

Dimensions and attributes

- Target Width: 41.29 US ft
- Target Height: 0.00 US ft
- Target Length: 103.97 US ft
- Target Shadow: 0.00 US ft
- Mag Anomaly: No
- Avoidance Area:
- Classification1:
- Classification2:
- Area:
- Block:
- Description: Bottom surface feature.

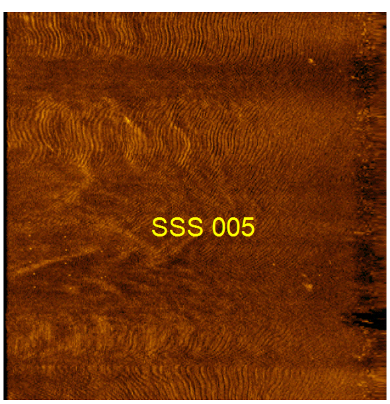


SSS 004

- Sonar Time at Target: 1/1/2015 7:17:20 PM
- Click Position
  35.2360885130 -75.4910767865 (WGS84)
  35.2359103781 -75.4914836381 (NAD27LL)
  35.2360885130 -75.4910767865 (LocalLL)
  (X) 3047547.88 (Y) 559366.81 (Projected Coordinates)
- Map Projection: NC83F
- Acoustic Source File: C:\Users\NEMO\Desktop\BUXTON-DARE CO NC (CSE) 2014-2015\OBX CSE Buxton Sonar\OBX Buxton Sonar 1-1-15\OBX sonar_data150101143800.sdf
- Ping Number: 228180
- Range to target: 149.71 US ft
- Fish Height: 33.48 US ft
- Heading: 219.100 Degrees
- Event Number: 0
- Line Name: OBX sonar_data150101143800
- Water Depth: 0.00 US ft
- Positioning System to Sensor: 0.0000

Dimensions and attributes

- Target Width: 46.71 US ft
- Target Height: 0.00 US ft
- Target Length: 82.44 US ft
- Target Shadow: 0.00 US ft
- Mag Anomaly: No
- Avoidance Area:
- Classification1:
- Classification2:
- Area:
- Block:
- Description: Bottom surface Feature with linear feature.



SSS 005

- Sonar Time at Target: 1/2/2015 5:14:15 PM
- Click Position
  35.2516514003 -75.4834650525 (WGS84)
  35.2514731521 -75.4838720778 (NAD27LL)
  35.2516514003 -75.4834650525 (LocalLL)
  (X) 3049618.72 (Y) 565107.72 (Projected Coordinates)
- Map Projection: NC83F
- Acoustic Source File: C:\Users\NEMO\Desktop\BUXTON-DARE CO NC (CSE) 2014-2015\OBX CSE Buxton Sonar\OBX Buxton Sonar 1-2-15\OBX sonar_data150102123300.sdf
- Ping Number: 148850
- Range to target: 130.05 US ft
- Fish Height: 24.08 US ft
- Heading: 40.500 Degrees
- Event Number: 0
- Line Name: OBX sonar_data150102123300
- Water Depth: 0.00 US ft
- Positioning System to Sensor: 0.0000

Dimensions and attributes

- Target Width: 0.00 US ft
- Target Height: 0.00 US ft
- Target Length: 0.00 US ft
- Target Shadow: 0.00 US ft
- Mag Anomaly: No
- Avoidance Area:
- Classification1:
- Classification2:
- Area:
- Block:
- Description: Possible bottom surface debris.

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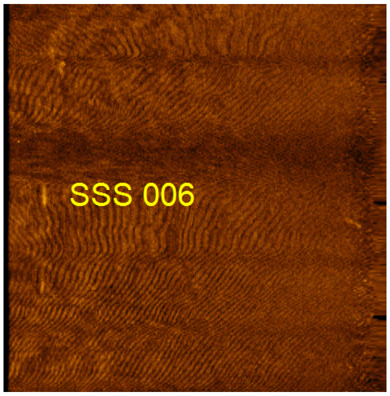
<td>
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<td>SSS 006
• Sonar Time at Target: 1/2/2015 3:09:58 PM
• Click Position
35.2495476839 -75.4885081619 (WGS84)
35.2493695028 -75.4889150478 (NAD27LL)
35.2495476839 -75.4885081619 (LocalLL)
(X) 3048141.16 (Y) 564289.27 (Projected Coordinates)
• Map Projection: NC83F
• Acoustic Source File: C:\Users\NEMO\Desktop\BUXTON-DARE CO NC (CSE) 2014-2015\OBX CSE Buxton Sonar\OBX Buxton Sonar 1-2-15\OBX sonar_data150102103200.sdf
• Ping Number: 56788
• Range to target: 174.11 US ft
• Fish Height: 31.03 US ft
• Heading: 44.600 Degrees
• Event Number: 0
• Line Name: OBX sonar_data150102103200
• Water Depth: 0.00 US ft
• Positioning System to Sensor: 0.0000</td>
<td>Dimensions and attributes
• Target Width: 2.59 US ft
• Target Height: 0.00 US ft
• Target Length: 13.15 US ft
• Target Shadow: 0.00 US ft
• Mag Anomaly: 008-1 ?
• Avoidance Area:
• Classification1:
• Classification2:
• Area:
• Block:
• Description: Small linear objects</td>
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