

IN PURSUIT OF A HUMBLE BEAST: A GEOSPATIAL ANALYSIS FOR THE WHALING
FISHERY ON SHACKLEFORD BANKS

By

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May, 2025

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ABSTRACT

The purpose of this thesis is to investigate the spatial relationship between shore whaling activities on Shackleford Banks and the community that undertook them. From the colonial period to the decline of whaling activities at the beginning of the 20th century, North Carolina's shores were an established hub for the whaling industry of the Atlantic Ocean. Although the Cape Lookout whaling ground did not amass the same offshore productive capacity as New Bedford or Nantucket, Cape Lookout whaling was nonetheless historically pertinent to the establishment of North Carolina's economy and settlement. To date, relatively little scholarly research has been conducted into the spatial relationship between the shore whaling activities of Shackleford Banks and the communities that undertook it. By interpreting the results of a geospatial analysis and comparing it to historical sources, sites optimal for whaling activities on Shackleford Banks may come to light.

IN PURSUIT OF A HUMBLE BEAST: A GEOSPATIAL ANALYSIS FOR THE WHALING
FISHERY ON SHACKLEFORD BANKS

A Thesis

Presented to the Faculty of the Program in Maritime Studies of the Department of History
East Carolina University

In Partial Fulfillment of the Requirements for the Degree
Master of Arts in Maritime Studies

By

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May, 2025

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Dedication

Diese Diplomarbeit ist meiner Frau Silja gewidmet, die mich während dieses Prozesses unterstützt und mich motiviert hat, meine Träume zu verwirklichen. Ohne Sie an meiner Seite hätte ich das nicht schaffen können.

Acknowledgement

I would like to express my immense gratitude for the many people who have assisted and supported me in researching this thesis. I would specifically like to thank Dr. David Stewart, Dr. Nathan Richards, Dr. Jason Raupp, Dr. Jennifer McKinnon, Dr. Lynn Harris, Jeremy Borelli, Mark Keusenkothen, and Karen Underwood for guiding me through coursework and field work to complete this master's degree. I am grateful for My advisor, Dr. David Stewart, and committee members, Dr. Nathan Richards and Dr. Christopher Oakley, for guiding me throughout this process to produce this thesis. I would also like to thank my cohort, who have become close friends and continue to encourage me to pursue my goals. Last but not least, I owe a tremendous amount of gratitude to my family for supporting my endeavors and adventures that lie in the path ahead of me.

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Chapter One: Introduction

Introduction

At the apex of the global whaling industry in the mid-1800s, oil and other products were well-sought commodities that could provide a high profit from harvesting a single whale.

Cetacean migration patterns attracted the industry to develop around the mid-American coast on the Atlantic seaboard, as well as around Australia and islands in the Pacific Ocean. Originating from New England, industry leaders sent ships to range the waters of the Atlantic and Pacific oceans for several years in search of whales, which contributed to a large portion of America's economy at the time (Hohman 1928:3-4). In addition to pelagic whaling, where small boats would launch from a larger ship in pursuit of a whale, shore whaling became common practice for some coastal communities when the opportunity arose. Among the communities which adapted shore whaling methods to suit their local environment was that of Shackleford Banks, North Carolina. Situated in an opportune location with access to the right whale (*Eubalaena glacialis*) migratory pattern on the mid-Atlantic coast, Shackleford Banks is tucked into Core Sound, adjacent to Cape Lookout, North Carolina (NC). Settlers first came to the area with the intention of whaling and fishing, and consequently built the foundations for several small communities that lasted from the mid-1700s to 1902, when the San Ciriaco hurricane devastated the banks and displaced the families that once called them their home (Barnes 2007:36).

Since many American whaling interests in New England expanded into pelagic ventures, shore whaling did not last on American shores, aside from a small number of sites like Shackleford Banks. This thesis will contribute not only to the research of Shackleford Banks whaling activities, but also the vestigial American shore whaling industry and the communities

that sustained it. Little research has been conducted into the industrial landscape of the whale fishery that operated in the Cape Lookout area (Reeves and Mitchell 1988; Simpson and Simpson 1988; Jateff 2006; Bradley 2015). Descendants from the Diamond City community take pride in their families' participation in the area's fisheries, gladly sharing stories about whaling adventures passed down through past generations. Curated at the Core Sound Waterfowl Museum, these narrative and oral histories are invaluable and provide a wealth of insights into whaling in this place and at that time (Coe 1969; Guthrie 1978; Philips 1980; Eldridge 1982). By connecting these sources to other historical and archaeological research, an accurate portrayal of the industry and the community that supported it becomes evident. Whaling for the Cape Lookout area was a lucrative opportunistic business for those involved (Kerr 1875:15*n*; Reeves and Mitchell 1988:11). This thesis will provide a deeper understanding of shore whaling operations in this region by means of geospatial analysis as they connect to other shore whaling sites around the world.

Research Questions

This thesis seeks to explore the geospatial scope of the whale fishery of the Core Sound and Cape Lookout region. To conduct geospatial analysis for this region, the following questions will guide this research.

Primary Question

How did Shackleford Banks whalers interact and adapt to the local geography and the natural environment to maximize productivity in the whale fishery?

Secondary Questions

1. Can geospatial analysis of whaling on Shackleford Banks help to predict locations of former industrial and settlement areas?
2. Can archaeological survey data help to establish optimal locations for whaling activities?
3. What were the advantages and disadvantages of this geography?
4. How do these whaling camps compare to other shore whaling sites around the world?

Previous Research

Several sources provide a wealth of research on the lives and methods of Shackleford Banks shore whalers. Although archaeological resources are sparse, historical resources provide insight as to where certain aspects of the whaling industry occurred.

Historic Literature

The National Marine Fisheries Service (NMFS) under the National Oceanic and Atmospheric Administration (NOAA) holds many responsibilities that pertain to monitoring and regulating American fisheries. Technical reports of general interest give context to certain fisheries, which aid in conservation and management efforts for fishery resources. Randall R. Reeves and Edward Mitchell authored “NOAA technical report NMFS 65: History of Whaling in and Near North Carolina” (1988), which reports on the whaling industry’s origin from colonial ventures, until its decline in the twentieth century. Mitchell and Reeves have thoroughly investigated available primary documents to provide a detailed description of shore whaling camps that existed on Cape Lookout, methods employed in whaling, and statistics regarding catches and sales of right whale oil and products. Although this report is comprehensive for the available sources in 1988, only historic sources were utilized, and Reeves and Mitchell did not

include any archaeological investigations. As such, this report provides a substantial historical background to perform archaeological research.

Edward D. Mitchell (1939-2019) and Randall R. Reeves both have extensive backgrounds studying human exploitation, as well as policy regarding, marine mammals. Initially beginning his research studying fossils of pinnipeds, Mitchell earned his PhD from the University of California, Berkely in 1967. Mitchell also worked as a research scientist for the Fisheries Research Board of Canada prior to earning a doctoral degree. His extensive career revolved around changing policies for the betterment of marine mammals, as well as researching the history of marine mammal exploitation that created the status of which their populations exist today. The Edward D. Mitchell Research Library at the Los Angeles County Museum of Natural History holds 2,216 volumes of material pertaining to the subjects of Mitchell's research (Reeves et al. 2020:733-737). Randall Reeves, similar to Edward Mitchell, has taken part in drafting conservation action plans, advising government agencies and intergovernmental bodies, and preparing Red List assessments. Reeves worked as a research associate at the Smithsonian Institution and the Arctic Biological Station near Montreal. Reeves earned his doctorate degree from McGill University, writing his dissertation on the history and management of narwhal hunting. The scope of his career has centered around whaling and marine mammal conservation with several journal publications, as well as numerous co-authored books and articles. Mitchell and Reeves are both members of the International Whaling Commission's Scientific Committee, which ensures management for whaling and conservation of whales for 88 member countries (mmc.gov 2024). The research conducted by Mitchell and Reeves has proven to be invaluable to the history of whaling not only from the coast of North Carolina, but on a global scale.

Similar to “History of Whaling in and Near North Carolina” (Reeves and Mitchell 1988), Marcus B. Simpson, Jr., and Sallie W. Simpson authored “The Pursuit of Leviathan: A History of Whaling on the North Carolina Coast” (1988), which was published in the 65th volume of *The North Carolina Historical Review*. This article describes the whaling industry and the Cape Lookout right whale fishery’s contribution to the greater industry. Simpson and Simpson use colonial court cases, pictorial depictions of whaling, and ships logs from whaleships that caught whales on North Carolina’s coast to direct a narrative about the industry’s development from shore whaling camps and pelagic whaleships. The methods employed by Shackleford Banks shore whalers are detailed by several historic sources such as R. E. Earll, a federal official who observed shore whalers on Shackleford Banks, and H. H. Brimley, the director of the North Carolina Museum of Natural Sciences.

North Carolina’s Outer Banks encompass the majority of its coast and host a diverse array of maritime cultures. David Stick’s *The Outer Banks of North Carolina, 1584-1958* (1958) includes a compilation of those maritime cultures, descriptions of their industries, and important events or characteristics of their histories. Cape Lookout, Core Banks, Shackleford Banks, and Diamond City are included in these descriptions along with the region’s whaling history. Important whaling stories are written in as much detail as was available to David Stick at the time this book was researched, which includes details about methods employed in the right whale fishery and stories of more notable catches.

Archaeology

Few in-depth archaeological surveys have been conducted at Shackleford Banks. The National Park Service’s (NPS) foundation document for the Cape Lookout National Seashore briefly discusses the importance of Diamond City as a whaling village (NPS 2012:44). The NPS

general management and development plan for the seashore from 1982 states that virtually nothing remains from Diamond City on Shackleford Banks, although some structures from Portsmouth village are intact on Cape Lookout (NPS 1982:22).

Dr. John Ehrenhard identified 36 sites as part of a 1976 assessment of archaeological and historical resources before the acquisition of Cape Lookout by the NPS. None of the sites identified on Shackleford Banks are included on the National Register (Jateff 2006:7). The study demonstrated how the banks had minimal aboriginal and prehistoric cultural remnants, as well as investigations of the few remaining archaeological resources (Whisnant and Whisnant 2015:17). However, several sites relevant to the families that occupied Shackleford Banks were recorded. These sites include the cemetery west of Diamond City, Diamond City itself, and other locations with historic artifacts.

Theses

Emily Jateff (2006) conducted visual surveys for archaeological sites on the eastern portion of Shackleford Banks as part of her master's thesis. Although her research focused primarily on identifying the Diamond City settlement, a large portion of it revolved around the whaling industry. Using cartographic sources, archival data and information gleaned from oral histories, Jateff defined two areas of high potential: the first related to the location of 18th century whaling habitation sites and the second focused on the location of the 19th century town of Diamond City. Although the sites in the first survey area were hypothesized as having been lost with the opening of Barden Inlet, the second area Jateff identified includes remains which could represent Diamond City, though no solid conclusions were defined (Jateff 2006:74).

Although not focused specifically on the Cape Lookout area, Ryan Bradley (2015) researched the whaling industry on the NC shore. This research highlighted the fact that shore

whaling was rare in the continental United States, with the only known examples being those documented in NC and southern California (Bradley 2015:5). Through a study of material culture of a disparate assemblage of whaling-related artifacts gathered from NC coastal communities, Bradley compiled a comprehensive narrative for the state's whaling industry and an inventory of much of its known heritage.

Thesis Structure

This chapter serves to introduce this thesis and the research, both historical and archaeological, that supports its results. Chapter Two gives background context to the American whaling industry from its Basque origins, as well as the procession of whaling from processing drift whales, to shore whaling, to pelagic whaling. Chapter Three describes the lives of opportunistic shore whalers and the community that lived on Shackleford Banks, as well as the primary sources that describe this community. Chapter Four outlines the methods employed to perform a geospatial analysis of the Cape Lookout region's right whale fishery. Chapter Five extrapolates on the inventory of artifacts recorded during the 2021 survey of Shackleford Banks, as well as explains and interprets the results of the geospatial analysis. Chapter Six discusses the research conducted for this thesis, as well as answers the research questions proposed in this chapter.

Chapter Two: North American Whale Fisheries

Introduction

This chapter discusses the history of whaling activities conducted in North America from their inception through their demise in the early twentieth century. To understand its industrial development, a synthesis of the evolution of North American whaling activities is presented, beginning with the North American Basque whale fishery and continuing through the rise and decline of the New England whale fishery. Primary sources that exist for New England whaling are described, as well as explanations for why whaling companies kept these records. The shore-based methods employed in North Carolina waters are reminiscent of the earliest days of New England whaling, in which a market for whales grew beyond what people could process from drift whales and expanded into an active hunt at sea (Simpson and Simpson 1988:4). Annual migratory routes of several species of cetaceans passed near the shores of the North American seaboard. The modern migratory pattern of the North Atlantic Right Whale, the most sought-after species, is displayed in Figure 1. Since the north Atlantic right whale population has suffered immensely due to the whaling industry, the modern feeding and calving grounds depicted in Figure 1 only represent a fraction of their boundaries during the period when whalers were active at Cape Lookout (NOAA 2024). The immense calving grounds which existed along North Carolina's coast resulted in arguably the longest era of the American whale fishery because of its caped geography and placement along several cetacean migratory routes.



FIGURE 1: North Atlantic Right Whales migrate seasonally along the eastern coast of the United States (Carlson et al. 2012:2.5).

North American Whaling Background

The North American Atlantic coast is home to many different species of whale. Foreign ventures and native populations alike realized its potential and as early as the sixteenth century, Basque whaleships voyaged from the Bay of Biscay on the Iberian Peninsula to Labrador and Newfoundland on the Canadian coast. Whaling had long been a profitable industry in Basque waters, but declining populations resulted in an ever-increasing search for new hunting grounds. Two theories hypothesize the need for expansion: either cod fishers explored new areas after depleting the Bay of Biscay and found North America to be more profitable for whaling rather than the cod fishery; or whalers decided to follow pods of whales to their northern feeding grounds to lengthen the whaling season (Grenier et al. 2007:31). Galleon fleets carried whalers to the Strait of Belle Isle in Labrador, which seasonally acted as storage for whale produce that had been processed by a coinciding whaling station on shore (Aguilar 1987:195). Although no catch records of the Basque fishery in North America exist, a single Spanish galleon is estimated to carry the tonnage of 12 right whales, and that a fleet of between 20 and 30 galleons took part in the fishery annually during the fishery's most productive decades (Aguilar 1987:196). Galleons would arrive and anchor in a safe harbor from June until November or December, and a crew would construct shelters and structures necessary for a whaling station. Given that the Basque were among the first European groups to industrialize the whale fishery, the early rendition of flensing and the trying out process would have required all members of the crew and would occupy the attention of harpooners and boatsteerers, therefore one crew would only have the time and resources to yield 10 to 12 right whales in one season (Aguilar 1987:195).

The Basque whaling fishery in the Strait of Belle Isle, however, was depleted by the early seventeenth century. The dwindling resources combined with a demand for galleons to support

the assembly of a war fleet after the defeat of the Spanish Armada in 1588, as well as a sudden change in climate known as the Little Ice Age, led to a rapid decline of the Basque whale fishery in North America (Grenier et al. 2007:36). As a result, many Basque sailors found employment on French or English Whaleships in Spitzbergen, transferring their knowledge onto other European powers.

Although the Basque were the first Europeans skilled in whaling in the western hemisphere, Native Americans developed a whale fishery prior to European contact. English explorer Captain George Waymouth described Native Americans hunting whales during his American expedition in 1605:

One especial thing is their manner of killing the whale, which they call powdawe; and will describe his form; how he bloweth up the water; and that he is twelve fathoms long: and that they go in company of their king with a multitude of their boats; and strike him with a bone made in fashion of a harping iron fastened to a rope, which they make great and strong of the bark of trees, which they veer out of him; then all their boats come about him as he riseth above water, with their arrows they shoot him to death; when they have killed him and dragged him to shore, they call all their chief lords together, and sing a song of joy: and those chief lords, whom they call sagamores, divide the spoil and give to every man a share, which pieces so distributed, they hang up about their houses for provisions; and when they boil them they blow off the fat and put to their pease [sic], maize, and other pulse which they eat (Starbuck 1878:5).

From the early colonial period in New England, whales were seen as a profitable target from the perspective of the English government, who taxed sales and exports of whale oil and bone, to those engaged in the whale fishery, who made a large profit from a single whale. The

first colonial whale fishery originated from the drift whales that washed ashore in Southampton, Long Island, from which locals would render the oil, barrel it into casks, and sell. Historical records of court proceedings from Southampton extrapolate on the intricacies of the legal process for ownership over drift whales. In March 1644, a town ordinance divided the municipality into four wards of eleven persons, with each ward to attend to the drift-whales cast ashore (Starbuck 1878:9). When whales beached within a ward, two people from each ward (selected by lot) were to be employed to cut them up. Portions were then divided equally among the community, specifically to “every inhabitant with his child or servant that is above sixteen years of age” under the agreement that if such an event occurred within the boundaries of every other ward, the inhabitants would be entrusted to divide it up equally as well (Starbuck 1878:9). The Plymouth and Massachusetts Bay colonies had a simpler system of dividing profits: one third went to the local government, one third to the finder, and one third to the municipality in which the whale was found (Davis et al. 1997:34).

The Development of Shore Whaling

Drift whales, however profitable and integrated into the colonial legal system, did not satisfy the growing demand for whale products. Boats began to launch from New England whaling stations in pursuit of pods as early as the mid-seventeenth century (Starbuck 1878:10). Native Americans were incentivized to aid in the whaling process, given that many coastal communities had established a method to capture whales in a similar process as Native Americans. Instead of canoes and bone harpoons, the English employed sturdier whaleboats and iron harpoons. The industry grew into a full-fledged commercial operation with coopers, smiths, boat builders, and trade routes readily available to grow the business (Jateff 2006:13).

As whaling companies amassed along New England's shores, whales soon became a limited commodity that could hardly be obtained via a crew of between six to eight men in a boat hunting close to shore. The population of right whales rapidly declined by the 1730s, in part due to the abolition of a tax on whale products to encourage growth in the whaling industry (Saunders 1886:99). Because of this, companies sent boats further out to sea with whalers and provisions to last several weeks. This method is referred to as boat whaling, where whalers still relied on towing the whale back to a whaling station on shore to process it. This station contained a designated area to cut blubber into small pieces to render down to oil in a brick tryworks, or a large iron cauldron, and cask it in hogsheads (Davis et al. 1997:35). These boats ranged in size between a small shallop to a vessel of nearly 30 tons.

A New Era: Offshore Whaling

Boat whaling lasted through the eighteenth century as the fishery expanded. Offshore whaling, however, began in 1712 accidentally. Christopher Hussey, a Nantucket whaler, was blown off course into deep waters in pursuit of right whales. His crew came across a pod of sperm whales, which tend to stay offshore in deeper waters. Hussey is credited to being the first whaler to capture a sperm whale, which produces finer and larger quantities of oil, thus introducing a new era to the industry. By the late eighteenth century, most whaling operations were carried out entirely offshore from a sloop, schooner, or brig. By 1750, brick tryworks were moved from whaling stations on shore to these large vessels at sea, carrying along with them several whaleboats to launch far from land (Davis et al. 1997:35-36).

The breadth of the whale fishery grew beyond the Atlantic coast of North America down to tropical waters in the Caribbean and South America, eventually rounding Cape Horn and into the Pacific Ocean. American whaleships dominated the industry and could be found in all parts

of the world. Voyages lasted for several years, only anchoring at ports to restock resources or trade casks of whale oil (Simpson and Simpson 1988:26). As whale oil became a valuable commodity and the industry integrated into most aspects of life throughout the eighteenth and nineteenth centuries, whaleships became targets to privateers and pirates. During the war of 1812, the USS *Essex* brought the British whaling industry to a halt, paving a path for the United States to become a whaling hegemon. Commanded by Captain David Porter Jr., the USS *Essex* was the smallest frigate in the US navy at the beginning of the war at 860 tons. The USS *Essex* departed Philadelphia on October 27, 1812, for an 18-month cruise to the Pacific Ocean. This voyage would mark the United States' first ship to sail around Cape Horn (Merrill 1940:444). After entering the south Pacific, Captain Porter captured 12 whaling vessels and their cargo over a six-month period, valued at approximately \$3 million in 1813, effectively destroying the British whaling fleet (Hatfield 2013). Although Captain Porter was ultimately captured after losing a battle to the frigate HMS *Phoebe* and sloop HMS *Cherub*, the achievements made by the USS *Essex* gave the United States unrivaled access to the Pacific sperm whale fishery, as well as ensuring its position as a global naval power (Merrill 1940:446).

Finances and Record-Keeping

As the whaling industry expanded to every corner of the globe, a complex financial network grew to support its ventures. Vessels were funded and outfitted by the proceeds of investors, who invested in whaleships or whaling companies in exchange for a share of their revenue. In the nineteenth century, the average number of investors in a single vessel was nine, but newly formed companies could include upwards of 33 investors (Wallace Coplin 2016). This advanced investment model resembles an early form of venture capitalistic funding, where businesses and wealthy individuals would pool together capital under the control of an agent

(Akins 2019:44). Insurance policies were purchased for ships to protect a company from damages against a ship or loss of cargo due to wrecking, piracy, or privateering, ensuring that risks involved in whaling would not outweigh its valuable rewards. Marine insurance was a common practice that began as early as the fourteenth century; however, the risk involved in whaling and shipping whale cargo by the nineteenth century added to an insurance policy's premium (Hohman 1926:660-664; de Roover 1945:173).

Such financial activities warranted the need for extensive record-keeping to maintain a transparent account of insurance, purchases, contracted lays, and sales. Logbooks, account books, financial statements, and insurance policies have survived to today that keep a historical record of financial activities involved that sustain whaling companies. A financial statement filed by the Cold Spring Whaling Company provides an example of dividends paid monthly to investors between 1842 and 1843, paying a return of nine percent. Dividends paid between \$180 and \$13.50, depending on each investor's initial investment (Jones 1843:1-3). Accounting records pertaining to the Bark *Alfred Gibbs* purchasing equipment and provisions before its 1865 voyage detail the vessel's owners and shareholders, interest owed to them, revenue taxes, and items purchased with their proceeds. Among the bark *Alfred Gibbs*' owners is Dennis Wood, who owned the largest share at 12/32 of the ship and paid \$12,027.29 for his ownership (Jennings 1865:1-3). Following *Alfred Gibbs* return to New Bedford, a statement was filed by Captain Jennings detailing a net profit of \$49,585.61 from sales of whale oil and baleen, as well as "sperm oil", which sold for a higher price per barrel than right whale oil (Jennings 1870:1). This return would have entitled Dennis Wood to a share worth \$18,594.60, in theory, providing a profit of \$6,567.31.

Contracts between sailors and companies encouraged productivity by offering payment in lays, or shares from a voyage's overall profit, rather than an agreed upon salary. By offering a sailor a portion of a voyage's profits, whalers were encouraged to catch and process whales as efficiently as possible, knowing that processing more whales would provide a larger payment. Lays were determined by a crew member's role and experience, as well as the overall size of the crew, paying captains and first mates the largest lays, and "green hands", or sailors with little to no whaling experience, the smallest lays (Davis et al. 1997:150-152). Records for lays and wages paid were maintained in a ship's logbook. A logbook for the ship *Alfred Gibbs* of New Bedford lists each of its 32 crew members by name, their role, their lay, and their payment after a completed voyage from 1866 to 1869. Captain E. E. Jennings earned the largest lay of 1/15, or \$400. The smallest lay went to Roderick Antone, an "ordinary Seaman", with a lay of 1/210, or \$132.09 (Jennings 1869:1).

Logbooks written by captains of ships kept daily accounts of all factors observed throughout a voyage, including daily weather, longitude and latitude, interactions with passing ships, whales sighted, and whales captured. Although logbooks were common practice for ships long before the whaling industry expanded, recording whale sightings and hunts consequently maintained accounts for locations where whales were most abundant throughout the year (Reeves et al. 2011:41-42). A logbook for the Bark *Charles W. Morgan*, owned by J. & W.R. and Co. of New Bedford, Massachusetts, mastered by Captain John Maxfield Tinkham from September 26, 1871, to October 31, 1874, records the ship's location, wind direction, weather, and daily notes. This logbook also includes stamps in the shape of sperm whales to represent whales hunted. Figure 2 depicts three whale stamps following a logbook entry for October 31, 1873 (Tinkham 1874:260).

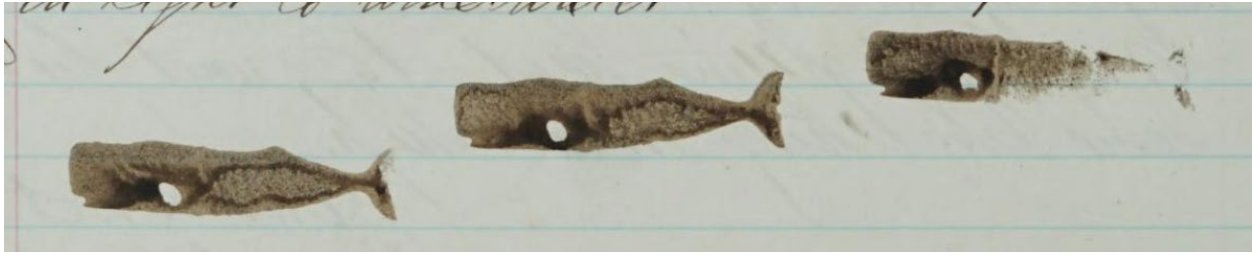


FIGURE 2: Whale stamps representing three whales hunted on October 31, 1873, in a logbook from *Charles W. Morgan's* 1871-1874 voyage (Tinkham 1874:260).

As captains recorded locations where whales were seen and hunted, the locations of hunting grounds became more widely known. Matthew Fontaine Maury, an American naval officer and oceanographer who served as the Superintendent of the U.S. Navy Depot of Charts and Instruments (later the U.S. Naval Observatory) from 1842 to 1861, compiled extensive data from ship logs and illustrated it on charts (Onge 2018). One of these charts, shown in Figure 3, displays his research for different whale species found in oceans beyond the depleted Atlantic, as well as population densities and seasonal migratory patterns. This chart centers primarily on the Pacific Ocean where New England whalers focused their effort to catch sperm whales by the nineteenth century.

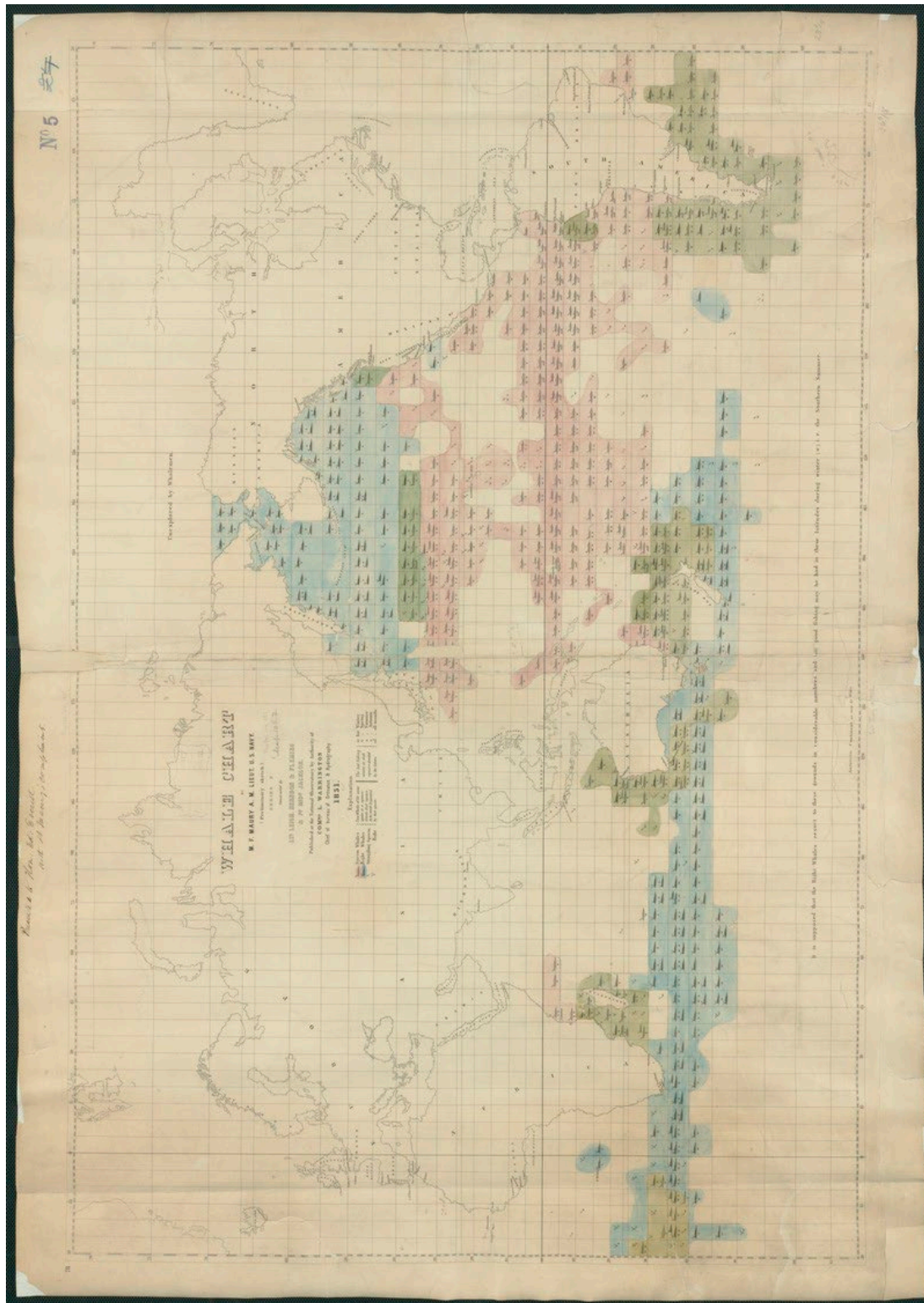


FIGURE 3: Matthew Fontaine Maury's 1851 Whale Chart depicting whale species and seasonal fluctuation, focusing primarily on the Pacific Ocean. (Courtesy of the Norman B. Leventhal Map and Education Center, Boston Public Library, Boston, MA).

North Carolina Whaling

North Carolina's barrier islands have an ideal topography that provides natural harbors along the annual migratory route of right whales, as well as several other cetacean species. Whales utilized these harbors to feed and rest as they migrated north in the summer and south in the winter. For as long as the New England colonies have been taking advantage of a seemingly endless population of whales, so too have coastal North Carolina communities. Early accounts of vessels sailing south from New England in the seventeenth century suggested that whalers ranged as far south as Cape Fear near the South Carolina border, and as far north as Currituck near the Virginia border (Reeves and Mitchell 1988:6). Three capes in particular-Cape Hatteras, Cape Lookout, and Cape Fear-allowed for the whaling industry to exist. Each of these regions along the Outer Banks have similar topographical features: they have a coastline running diagonally southwest to northeast and a safe harbor where ships can anchor, and whalers can camp safely ashore.

The prospect of whaling potential was first realized in North Carolina by the New England colonies when Humphrey Hughes of Long Island, New York, secured a lease from the secretary of Albemarle County, Peter Carteret, "for whaling in the inlet of Roanoak to the island of Caretuck [sic]" in 1666 in exchange for 1/15 of profits secured from the fishery to the Lords Proprietors of the Carolina colonies (Reeves and Mitchell 1988:3). Though colonial Carolina's residents had processed drift whales as early as the 1660s, the origin of shore whaling is not clear in the historical record. Carolina residents were granted "...free leave for the space of seaven [sic] years to commence from Michaelmas (September 29) next to take what whales they can and convert them to their own use..." in 1668, which was renewed 1691 for another 20 years, although it is not specified whether the concession is for the intention of drift whales or actively

captured whales (Saunders 1886:338; Cain 1984:359-360; Mitchell and Reeves 1988:3).

Communities under the jurisdiction of this concession took advantage of their right to process whales, as whale oil was shipped from Beaufort to as far away as London and Barbados (Simpson and Simpson 1988:6). The town of Beaufort was established in 1668 with the intention of being a whale product port, suggesting that perhaps the industry included actively capturing whales rather than just processing drift whales.

Eighteenth Century

In the eighteenth century, the whaling industry became so prevalent that whale oil was used as currency. Legal suits account for payments to be made in whale oil for the equivalent amount of shillings for which the suits were settled. For example, in a 1697 suit against James Carroon, Thomas Harvey requested that his debt be paid in whale oil, as well as another ten shillings worth of oil from William Steele in another suit. Whale oil was even accepted as an official provincial currency in 1715 and 1719 (Cain 1981:22; Cain 1984:471). Eventually, whalers from other colonies would migrate to the Carolinas with the intention of living there full time and sustain themselves by whaling. Samuel Chadwick, an immigrant to Carteret Precinct of North Carolina from New England, purchased 130 acres at Straits, North Carolina in 1725. He was later granted access to fish and whale via a license from the governor with the agreement that he would pay “one tenth parte of ye oyle [sic] and bone” from his catches (Rustull 1725). The tax for one tenth of the profits that whalers paid to the government was abolished in 1730 to encourage the fishery’s growth among Outer Banks communities. Unfortunately, following the abolishment of this tax, the historical record pertaining to whaling for this period no longer contains information directly regarding whaling. Instead, whaling references are limited to port export records of oil, court proceedings or ship inventories (Reeves and Mitchell 1988:6).

However, pictorial accounts of whaling do exist on the “New and Correct Map of the Province of North Carolina” by Edward Moseley in 1737. Along the coast of North Carolina are scenes of whales, whalers, schooners, and whale-like sea monsters, as displayed in Figure 4. This map, drawn under the order of Governor Richard Everard for the North Carolina-Virginia Boundary Commission, depicts the coast as having fertile waters for whaling.



FIGURE 4: “A New and Correct Map of the Province of North Carolina” with depictions of whales, whale-like sea monsters, and whalers along the North Carolina coast. (Edward Moseley, 1737. Courtesy of Joyner Library Special Collections, East Carolina University, Greenville, NC)

This region supported both shore whaling and pelagic whaling until the end of the century, when New England companies expanded into the Pacific Ocean and onto further whaling grounds beyond the Atlantic seaboard. The invention of tryworks as an integrated feature on a ship’s deck in the 1750s meant that whale ships could try out whales immediately after catching them, bypassing the need to build tryworks on shore to render blubber, therefore

extending a ship's voyage from a few weeks to a few months. This innovation developed when whale populations around New England began to decrease significantly, and whaling enterprises were pushed to explore more remote hunting grounds. This brought many whaleships to the Virginia and Carolina coasts, where sperm whales have been known to migrate to the deeper waters offshore. Governor Arthur Dobbs mentioned the Cape Lookout whale fishery in 1755 in a letter discussing the construction of a fort on Cape Lookout, stating that "the whale fishers from the Northward have a considerable fishery from Christmas to April, when the whales return to the northwd [sic]" (Saunders 1886:344-346).

Prior to the Revolutionary War, large tracts of land were sold along the coast for use in several fisheries. John Shackleford sold two tracts of land to Joseph Morse and Edward Fuller in 1757, which included the beach between Topsail Inlet and Cape Lookout and the rights to fish and whale in the coinciding Point Lookout Bay (Simpson and Simpson 1988:20). Cape Lookout's bight became a renowned location throughout the colonies, drawing New England whalers to settle permanently on the islands within Core Sound. Whalers' huts and camps are depicted on several maps, as well as described in numerous logs of passing schooners (Stick 1958:34). Shore whaling remained a consistent, albeit minor industry, during the last decades of the colonial period. In 1765, a French traveler recounted a small village of no more than 12 houses and "whale fishers' tents" on the beaches west of Cape Lookout Bay, the inhabitants of which subsided on fish and oysters and maintained a turpentine distillery (Anonymous 1921:733).

The Revolutionary War

Whale hunting remained active in North Carolina throughout the Revolutionary War despite Parliament prohibiting fisheries in the American colonies. David Wade of Captain Enoch

Ward's Core Sound militia had petitioned the council and governor in 1776 for what he saw as an unjust extension of his six-month tour, which was refused. Wade was then arrested for deserting the militia "to go awhaling" along "the banks" with Captain Pinkum, followed by Thomas Temple offering to be arrested in place of Wade (Clark 1907:895). However, Wade's decision may have in fact helped the Core Sound Militia because the whaler's huts were used as a makeshift fortification to deter British ships from anchoring nearby in March of 1778 (Gillikin 1975:77-78; Reeves and Mitchell 1988:8). As evidenced by resident William Borden's will, a payment was made to a Rhode Island man for whalebone that had been lost, indicating that whales were still being taken among the colonies and that Parliament's orders had little to no effect on the whaling fishery (Salter 1975:105).

Following the war, the whale fishery began a very subtle decline, as a result of growing demand for produce of the porpoise fishery. By 1790, the bottle-nosed dolphin fishery (incorrectly referred to as the porpoise fishery) was well established and brought in competitive quantities of oil. Fishing for dolphin required seine nets to draw pods close to shore, leading up to a mass stranding where dolphins would then be dispatched with blunt trauma. Since the process of hunting dolphin was far less dangerous, the business expanded from Cape Hatteras to Bear Inlet. A seasonal catch of nearly 500 dolphins yielded around 100 barrels of oil (Earl 1887:490), whereas the number of whales caught varied greatly from year to year. William Tatham's survey of the North Carolina coast from Cape Fear to Cape Hatteras in 1806 noted that whalers were active on Cape Lookout and partially employed throughout the winter, but the porpoise fishery was more important to the region (Tatham 1806). At that time, the whaling industry seemingly shifted from being the most profitable occupation to an opportunistic side venture.

Foreign demand for whale products, more specifically spermaceti and ambergris from sperm whales, maintained a fishery alongside the expanding dolphin fishery. The War of 1812 ended the British whale fishery in the Pacific, but France had a high demand for sperm whale oil and ambergris. There was also a domestic demand for sperm whale oil as well, since it burns cleaner and brighter and was suitable for use in lighthouses (Hohman 1928:36; Bradley 2015:23). Whaling was still active enough at that time for tools to hold value to be included in wills, despite the expanding dolphin fishery. Marmaduke Royal of Carteret County mentioned several whaling tools in his 1839 will, including several barrels, a spade, a lance, a whaleboat, and one fourth share of a porpoise sein net (Reeves and Mitchell 1988:8).

Towards the middle of the nineteenth century, North Carolina's whaling grounds supported both pelagic whaling from New England ships and opportunistic shore whaling from coastal communities. The installation of the tryworks onboard a whaleship mentioned previously allowed New England whalers to venture further beyond the Atlantic Ocean, only catching whales on the North Carolina coast when enroute to the Pacific Ocean or returning to their port of origin after long voyages. During this period in the 1840s, known as the Golden Age of Whaling, American whale companies dominated the international industry (Simpson and Simpson 1988:26). Since Right Whale populations were severely depleted, pelagic ships chased after Sperm Whales that occupied deeper waters offshore. Some ships, such as the *Edward and Rienzi* of Provincetown, took advantage of the now overlooked Hatteras ground where Sperm Whales were found to be abundant (Simpson and Simpson 1988:26).

The American Civil War

Many factors leading up to the American Civil War fostered a sharp decline of the whaling industry and the end of the golden age. Since whaleships focused their ventures on

whaling grounds beyond the Atlantic Ocean, a trip to the Pacific meant that a crew would have to navigate around Cape Horn of South America, where dangerous storms frequently cost sailors their lives. The depletion of whales in the Atlantic also meant that the price of sperm whale oil rose to a price between \$2.00 and \$2.50 per gallon, and right whale oil, which doesn't burn as bright or clean, cost between \$.75 and \$1.00 in 1850 (Beaton 1955:29). Because of these rising prices, consumers sought a cheaper alternative to close this price gap for illumination. Abraham Gesner's creation of kerosene for use in lamps in 1846 burned brighter and cleaner than any whale oil, and soon became a global competitor for whale oil (Beaton 1955:35). Looking back to Figure 3, Matthew Fontaine Maury's 1850 whale chart, the Atlantic Ocean is not represented because it had become so depleted. The dawn of the Civil War caused problems for Union ships traveling through the Atlantic to reach other parts of the world. Confederate raiders *Alabama* and *Shenandoah* even chased several New England-based whaleships into northern Pacific and western Arctic waters, where they waited until nightfall to set the ships ablaze with full cargos of oil (Starbuck 1878:100-103).

Although the golden age for pelagic whaling ended, shore whalers operating from the Outer Banks of North Carolina still managed to catch an allotment of whales. Elliot Coues, an army doctor stationed at Fort Macon between February 1869 and November 1870, made detailed observations about the flora and fauna around Carteret County. Included in his notes were several accounts of whalers from Shackleford Banks catching right whales, as well as an abundance of dolphin (Coues 1871:13). Coues recalled the residents of Shackleford Banks telling him that "they usually take two or three [whales] each spring" (Coues 1871:13). These notes indicate that the whale fishery moved entirely to opportunistic by this point, where no fisher was employed for the entire whaling season as a "whaler". Instead, whales were caught

when the fishers had boats ready on shore with tackle and were available to catch a whale. Furthermore, the distinct occupation of “whaler” was never used to specify any individual’s occupation on the 1850 census. Instead, their occupations are represented as “Fisherman” because whaling was considered one of many fisheries of which the population of Shackleford Banks participated (Hausner 2000: 170a-173b). This broad categorization of “fisherman” suggests that Shackleford Banks did not specialize in one specific fishery; rather, the right whale fishery was no more significant than the shad, shellfish, menhaden or mullet fisheries from which the population also subsided (Earll 1887:485-492).

The Modern Age of Whaling

Several harpoon guns were created and patented by whalers across the globe in the nineteenth century, which improved upon the efficiency and power of the models of whaling guns used for the Cape Lookout right whale fishery. Older whaling guns utilized a two-second fuse lit from the discharge of the gun, frequently misfiring, whereas newer harpoon guns utilized a harpoon tip fastened to a line and a projectile and were shot from either a mounted gun or a muzzle loaded shoulder gun. When operated correctly, the projectile exploded on impact rather than from ignition, dispatching a whale safer than the traditional method that involved either a potentially misfired bomb or several hand-thrown harpoons and a lance pierced into the whale’s side when a fatal shot was possible (Brimley 1908:6; Tønnessen and Johnsen 1982:44; Reeves and Mitchell 1988:9). Svend Foyn, a Norwegian whaler credited with ushering in the modern age of whaling, patented a shell harpoon in 1873 that became widespread internationally soon after its invention (Tønnessen and Johnsen 1982:44). The schooner *Daniel Webster* of Provincetown may have introduced the original whaling gun to North Carolinian shore whalers at Beaufort in 1874 during an unsuccessful season at the Cape Lookout ground (Simpson and Simpson

1988:34). By this period, the whaling industry was rapidly nearing its demise with only a few uses for whale products left on the market. Many whaleships cruised for years on end between whaling grounds ranging from the Arctic Circle to Antarctica. Figure 5 depicts an overview of whaling grounds across the globe as of 1880 and represents multiple cetacean species in varying shades of grey. The coast of North Carolina is still recognized as a right whale ground with a sperm whale ground offshore, although both populations were heavily depleted, and some years would pass with no sightings of any species of whale (Simpson and Simpson 1988:38).

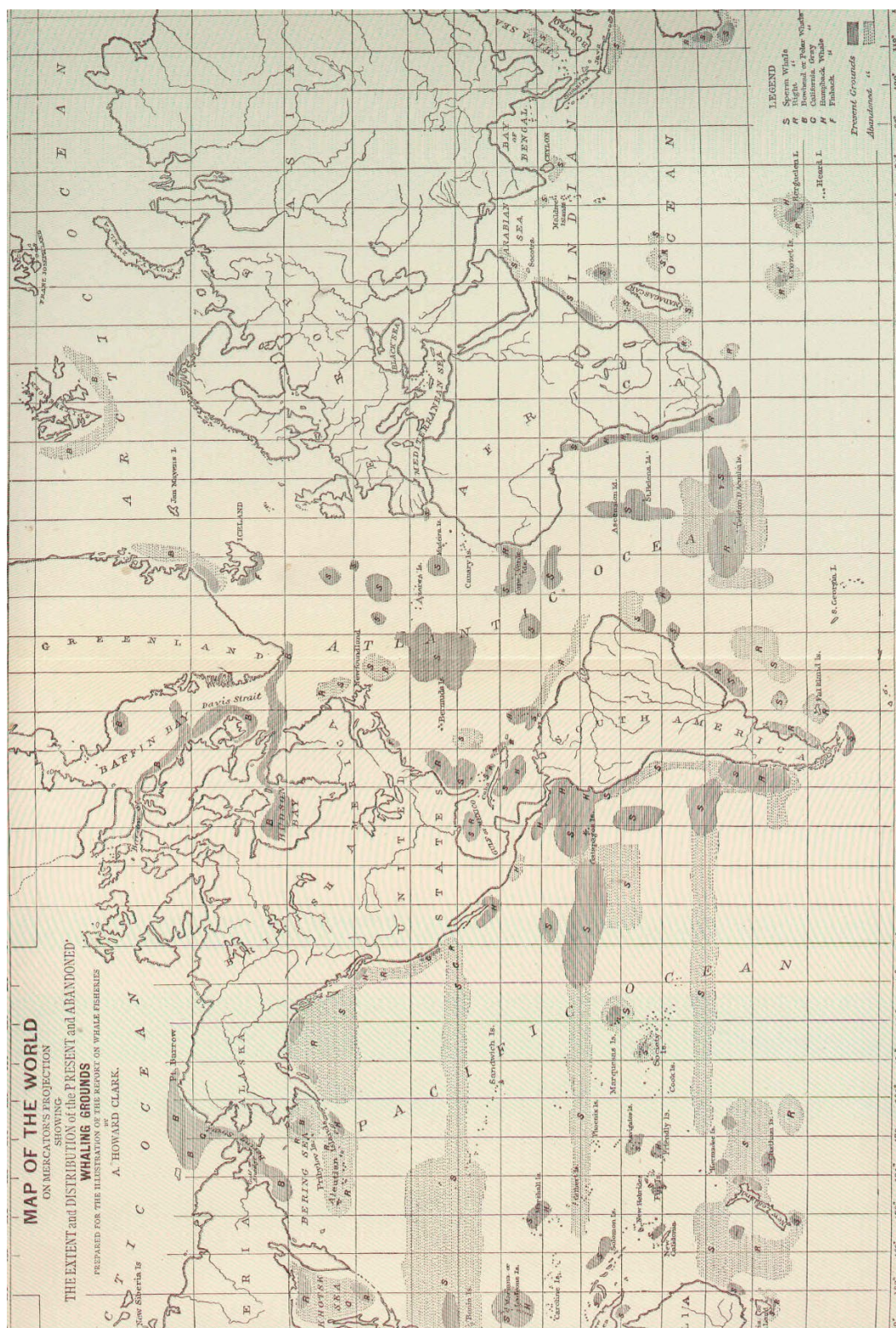


FIGURE 5: Map of the world on Mercator's projection showing the extent and distribution of whaling grounds. (A. Howard Clark, 1880. Courtesy of the NOAA photo library, NOAA National Marine Fisheries Service)

Conclusion

America's pelagic whaling industry amassed a global status unmatched by other nations that sought to profit from whaling. Eventually, the creation of venture capital gave the ability of investing to people other than the wealthy class. Although the whale fishery in North Carolina was not commercially viable for pelagic whalers by the late nineteenth century, shore whalers living on the Outer Banks continued the enterprise for decades longer, opportunistically supplementing their income between other fishery seasons. Cape Lookout became the state's most successful whaling ground until the fishery was no longer profitable. The community on Shackleford Banks, situated around a town known as Diamond City, named after the construction of the Cape Lookout lighthouse in 1885, engaged in shore whaling for several generations until several hurricanes drove residents to the mainland or other surrounding islands. Diamond City shore whaling, as well as the folklore and traditions created subsequently from the fishery, will be discussed in more detail in Chapter Three. The whales captured here are deeply engrained into North Carolina's history and are proudly remembered by the descendants of the whalers that caught them.

Chapter Three: The Shackleford Banks Whale Fishery

Introduction

Although the whaling grounds on the North Carolina Outer Banks did not contribute significantly to the global whale oil market, opportunistic whaling became a seasonal staple for its coastal communities. Shackleford Banks, situated within Cape Lookout Bight, was home to dozens of families that followed several seasonal fisheries. The most lucrative, although unpredictable and inconsistent, of these fisheries was the whale fishery. This chapter analyses the methods employed in shore whaling, the differences and similarities with other shore whaling operations in other parts of the world, the historical record that exists for the whale fishery, and the demographic of the community that lived on Shackleford Banks. Although this small tract of land was occupied for only a brief period, the population formed a unique maritime culture that utilized coastal activities in daily life.

Background

Temporary settlements were first mapped on Shackleford Banks in 1764 when H.M.S. *Viper*, captained by Jacob Lobb, recorded whalers' huts on the eastern portion of the banks where Diamond City would later exist (Figure 6). Captain Lobb's map also references "Davis House", which might refer to the property of Joseph or Solomon Davis, sons of William Davis, who owned property on Core Banks at the time that H. M. S. *Viper* surveyed Cape Lookout (SANC 1736:327; 1761:293; 1763:29). Whalers had used this area to establish whaling camps as early as 1725 when Samuel Chadwick was issued a license to use the surrounding waters to exploit the fishery (Rustull 1725). Since that period, Shackleford Banks' geography and location had played an important role in the regional whale fishery. Diamond City, the local name given to a small

town situated on the eastern portion of the banks, was established in 1885 by the families of whalers and fishers as a permanent settlement close to the whaling camps located on the western portion of the island (Stick 1958:187). Whaling was an important fishery for Diamond City until the inhabitants of Shackleford Banks were forced to abandon their settlements after intense hurricanes drove them to establish lives elsewhere.

FIGURE 6: A plan of the harbor of Cape Lookout surveyed and sounded by HMS Viper, Captain Jacob Lobb, 1764. This plan includes “whalers hutts (sic)” at location I, and “Davis House and Beacon” at location C (Lobb 1764).

By the nineteenth century, several families had established their lives around Diamond City. Originally named Lookout Woods because of the abundant forest of Eastern Red Cedar

(*Juniperus virginiana*) and Live Oak (*Quercus virginiana*), the town was renamed after the construction of the Cape Lookout lighthouse with its distinctive black and white diamond pattern (Godfrey and Godfrey 1976; Hancock 2008:12). Despite the formal name change, “Lookout Woods” would commonly be used to describe the settlements on the western portion of the banks (Hancock 2008:12). By the second half of the nineteenth century, approximately 500 residents lived in Diamond City. These families exploited forests to construct their houses, as well as boats for use in multiple fisheries (Stick 1958:311). The houses they built were simple and constructed from local materials:

The homes that comprised the settlements on Shackleford Banks were simple structures built of timber salvaged from shipwrecks or cut from the island’s small, dense forests. Axe-hewn cedar posts and rafters were joined with hand-carved wooden pegs soaked in whale oil, which helped tighten their joints. Nails were often unavailable, and this technique made it easier for residents to disassemble and move their homes, which they often did. (Barnes 2007:38)

Living on Shackleford Banks secluded communities from the mainland, which encouraged the residents to learn a wide range of skills to thrive. For example, Families maintained vegetable gardens and herds of livestock for sustenance (Stick 1958:189).

A community building used as a schoolhouse also served as a non-denominational church, which periodically held services for Methodists, Baptists, Mormons, and Pentecostals (Stick 1958:189). Each summer, a teacher was employed to educate children in the community building. Payment for teaching was \$20 a month and usually took place in the months of July and August when a teacher, often Tom Arrendel, could take time away from teaching on the mainland (Stick 1958:189).

The 1850 census lists the occupations of the heads of Outer Banks households as “Fishermen” or “Mariner,” although it was common to fulfill several occupations depending on the community’s needs (Hausner 170a-173b; Willis 2002:50). Members of the community most known for their occupations as captains to whaling crews also carried out important duties outside of the fisheries. For instance, Shackleford Banks whaling crew captain Devine Guthrie (Figure 7) also served as a preacher, community leader, and boatbuilder (Salsi, Eubanks 1999:10).



FIGURE 7: Master boatbuilder, whaler, and preacher Devine Guthrie on Shackleford Banks (Salsi, Eubanks 1999:10).

The many fisheries of Core Sound and Cape Lookout were the primary source of income for most households on Shackleford Banks. Shad, menhaden, shellfish, mullet, and right whale fisheries each existed simultaneously on Shackleford Banks. The most profitable of these in the

nineteenth and twentieth centuries was the mullet fishery, which swept massive schools southbound through the sounds from May until November. As mullet grew in popularity, Carteret County's coastline supported the largest mullet fishery in the United States in the 1870s and 1880s. With a combination of 37 seines, over 200 gill nets, and a large number of drag nets, the fishery produced 13,000 barrels of salt mullet and 40,000 bunches of fresh mullet in 1880 alone. Temporary camps (Figure 8) were built along the banks of Core, Back, and Bogue Sounds to house fishers, preserve and barrel fish, and watch over nets and boats (Cecelski 1993:3). These camps featured round huts built from a series of support poles and thatching made from foraged grasses (Cecelski 1993:6). Directly adjacent to them were lookouts used to target annually migrating schools of fish (Cecelski 1993:3).

Although the idea of a camp is not uncommon in North Carolina fisheries, this architectural design for the mullet fishery's huts is unique to Carteret County and is reminiscent of West African dwellings. It most likely emanates African American influence as early as the colonial era, when freed and enslaved black populations comprised an estimated 50 percent or more of the population on Core Sound and other coastal communities. R. Edward Earll, a biologist who observed the mullet camps on Shackleford Banks in 1880, noted that the typical mullet gang did not abide by racial barriers that existed elsewhere in the state, and that these gangs seemed indifferent to skin color (Earll 1887:483; Cecelski 1993:10-11).



FIGURE 8: A hut built on Shackleford Banks to house mullet fishers for the duration of the fishery's season. Pictured to the right of the hut is a seine net spooled on the shore (Cecelski 1993:5).

Opportunistic Whaling

While other activities occupied fishers on Shackleford Banks full-time, the right whale fishery did not justify constant attention. Since the population of right whales offshore from Diamond City was low in the nineteenth century, as evident in the schooner *Daniel Webster's* unsuccessful season in 1874-1875, a full-time whaling station was not feasible (Simpson and Simpson 1988:34). Companies using large whaleships to follow pods of whales did not develop in North Carolina as they did in New England. Instead, whalers built camps west of Diamond City near Wade Shore and Mullet Pond (Philips 1980:22-24). Those camps were similar to whaling stations built during New England's initial shore whaling phase that developed from

processing drift whales, which lead to launching boats from shore to haul back whales and render their oil on land (Starbuck 1878:9).

Key features of whaling camps were borrowed from other fisheries on Shackleford Banks. for example, similar lookouts were established, and huts were built for mullet camps. Some crews constructed houses on the western portion of Shackleford Banks where families had pieces of land that they used for processing catches and storing boats and tackle. The landscape provided high hills and dunes along the interior of Shackleford Banks that were used to spot whales either offshore or in the sound. The tallest hill, Yellow Hill, measured an estimated 1200 feet long, 400 feet wide, and rose at least 40 feet high in the late 19th century (Hancock 2008:12).

The Whaling Crew and Their Roles

To initiate a whale hunt, a lookout would signal that a whale was sighted in the nearby waters. The lookout was typically a former whaler (Reeves and Mitchell 1988:8). Whaling crews were comprised of six people in one boat, with four people rowing and following orders from the captain at the bow, and one steering the boat at the stern. Contrary to the maneuver that New England whalers undertook to fasten to the whale, which involved the boatsteerer and captain switching places, it was the captain's duty to lance or shoot the whale (Lewis 1926; Reeves and Mitchell 1988:10). Different catches varied depending on the situation. Sometimes the captain would control the boat with a bow oar as the boatsteerer harpooned the whale, and the captain would then dispatch the whale (Brimley 1894; Reeves and Mitchell 1988:10). The rowers had an important duty to haul the dead weight of the whale, which possibly required multiple crews.

Cooperation was an important characteristic among Shackleford Banks whalers. Since most whales required more than one boat and crew to haul it back to shore, the profit from a single whale would often be shared between many crews. Compensation was issued between the

crews via a system of shares: one share was given to each person that participated, and then an additional two shares went to the owner of the whale gun, one share to the owner of the boat, two thirds of a share to the owner of the tackle (harpoons, lances, drogues, line, etc.), and one third of a share to each harpooner and boatsteerer (Brimley 1894, 1971:113).

Towards the end of the nineteenth century, four to six boats would wait on the ocean-facing shore loaded with tackle and ready to launch (Stick 1958:190). Populations living among the Outer Banks, including Shackleford Banks, typically constructed boats to suit multiple functions, as opposed to building multiple crafts to suit specific needs. Work boats were often in the shape of a sharpie, which was a versatile vessel used in many Core Sound fisheries and often modified to better suit specific uses. A sharpie's typical shape includes an upright stem, a flat bottom, narrow proportions, a low freeboard, and a rounded stern (Alford 2004:6). However, on Shackleford Banks, sharpies were constructed with round bottoms and lapstrake planking and were sometimes referred to as whaleboats or pilot boats depending on the occupations in which they were employed (Coe 1969).

Catching the Whale

The act of catching a whale had some gruesome acts that seemed to disturb some of the last Shackleford Banks whalers, as noted in their reminiscences on their most profitable years. An interview conducted in 1969 between Joffre Coe, professor emeritus of anthropology at the University of North Carolina at Chapel Hill, and Stacy Guthrie, a whaler who was born in Diamond City, discusses the process behind catching and trying out a whale. The relationship between a mother and a calf is mentioned as being very similar to the relationship between humans, in that the mother fought to save her struggling calf until her final breath. Fastening to a calf and holding it as it cried was the main strategy employed to attract a larger cow (a female

whale). This act eventually led to the acceptance that whales are God-specified mammals, which means that they have a conscience, and therefore are unjust to hunt (Coe 1969).

Once a calf was harpooned by a captain, a drogue was attached to the line. A drogue, often called a drug or a drag, is a block of wood shaped with the intention to slow a whale from swimming, which tired the animal and would mark its location once it stopped (Brimley 1894; Eldridge 1982:10). At that point, the calf would call for the cow's help. It was important to keep the calf alive, otherwise the mother would abandon it (Coe 1969). The captain would harpoon the cow to fasten it to the boat or a drogue, in the same way the calf was fastened, except the goal was to dispatch her as quickly as possible.

For an ideal catch, the maneuver would last the amount of time it would take for the cow to spout three times: the first to spot her, the second to approach and fasten to her, and the third—sometimes an hour after the second—to dispatch her with a lance or bomb lance. The lancing target was on the whale's back between the skull and first vertebra, where a major artery that the whalers called the "life" was most accessible. On some occasions, a bomb lance was not accessible, and a lance was used to slice into the whale, often requiring a hammering motion from the captain. During this process, the whale is at its most dangerous and its tail could easily capsize, or destroy, a boat. The massive tail frantically slaps the water's surface trying to free the whale, but if the captain cut the whale's life in time, it would spew blood out of its blowhole and smother to death (Coe 1969).

Stacy Guthrie, a Shackleford Banks whaler who participated in the fishery beginning in his childhood, described this process with a somber tone. In an interview for a newspaper article in *The News and Observer*, Guthrie describes watching a cow try to save its calf: "I've seen a mother whale go to her calf, one that had been hit too deep with the iron, and raise the calf with

her head until it could breathe...” (Lynch 1969:85) Although he participated in catching several whales in his lifetime, he later believed that the act of catching a whale was a sin (Lynch 1969:85).

Processing the Whale

Once a whale was captured, it was towed to the most convenient shore. Usually, two boats with eight crew members were required to tow the heavy whale (Philips 1980:13). Time was an important factor because the whale would begin to smell rancid, and the blubber would rot. Flensing and trying out a whale produced a pungent scent that overwhelmed the air for weeks at a time, which would have made it desirable to keep whaling activities as far away from the town as possible. H.H. Brimley recorded the scent as “one to be remembered” while documenting Cape Lookout’s right whale fishery during the spring of 1894 (Brimley 1894; Simpson and Simpson 1988:44). The local whalers often joked that the process “smelled like money” because the odor signaled that a crew was successful (Guthrie 1956:5). The whale was brought in at high tide and attached to an anchor (Figure 9) so that the receding tide left more room to maneuver around the whale (Philips 1980:13; Stick 1958:191). Most whales were brought to their respective crew’s property or designated flensing area close to a captain’s home that kept tools for trying out. Some of the most discussed locations include Mullet Pond, Wade Shore, and Whale Creek (Guthrie 1956:6; Philips 1980:22-24). Meanwhile, women, children, and anyone available on shore were tasked with hauling down cast iron trypots, typically with 60 gallon capacities, building fires, and assembling arches to lift blubber into the trypots (Stick 1958:191; Coe 1969). Figure 10 depicts a typical trying out scene, where blubber was cut from the whale in square sheets to fit in the trypots easily. Blubber was rendered down into oil and then poured into barrels that were partially buried in the sand (Brimley 1894:6-7; Stick

1958:191). Molasses barrels or hogsheads were repurposed to package whale. Baleen, often referred to as “whale bone”, was cut from the whale’s pallet and sold for use in corsets, umbrellas, and horse-riding crops oil (Stick 1958:191).

Once the entire whale was rendered, taking as long as two weeks or more, products were sold to merchants in Beaufort or shipped elsewhere (Philips 1980:12; Stick 1958:192). Brimley (1894) states the market price for Baleen to be around \$1.65 per pound at the end of the nineteenth century, and whale oil sold for between \$.16 and \$.30 depending on quality (Brimley 1894; Reeves and Mitchell 1988:20). In total, a single whale was worth an average of \$1200 to \$1500, paying about \$35 to \$40 to each person involved in the operation (Kerr 1875:15n; Davis et al. 1984; Reeves and Mitchell 1988:20). For context, the monetary values for these products and labor in 1875-1894 are calculated to their inflated values in 2024 in Table 1.

Resource	Value in 1885	Value in 2024
Baleen (per pound)	\$1.65	\$53.63
Whale oil (per gallon)	\$.16-\$.30	\$5.20-\$9.75
Payment per person	\$35-\$40	\$1,137.68-\$1,300.21
Whole whale	\$1,200-\$1,500	\$39,006.31-\$48,757.89

TABLE 1: Calculated values of whale resources inflated from 1885 to 2024. Calculated via <https://www.in2013dollars.com/us/inflation/>. (Brimley 1894; Kerr 1875:15n; Davis et al. 1984; Reeves and Mitchell 1988:20)

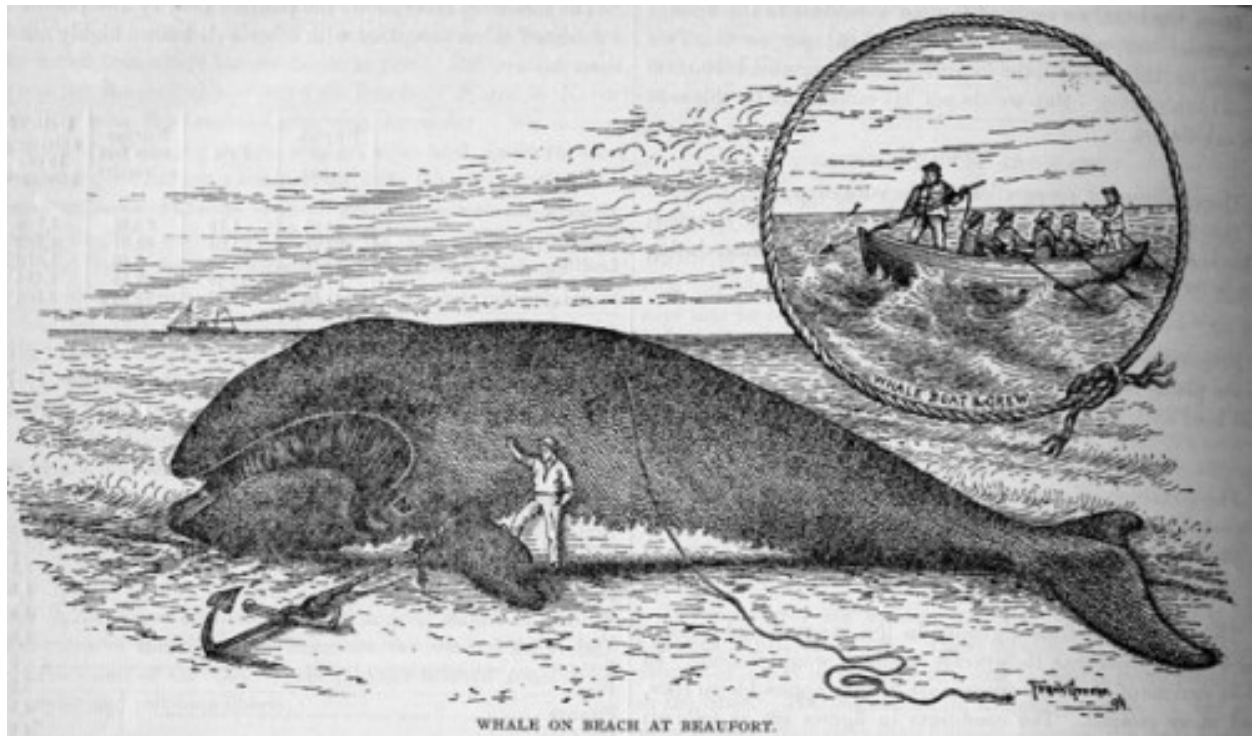


FIGURE 9: Whalers on Shackleford Banks used the changing tides to carry whales to a tidal zone, where a whale would be anchored onto stable beach as the tide receded (Brimley 1894; Stick 1958:191).

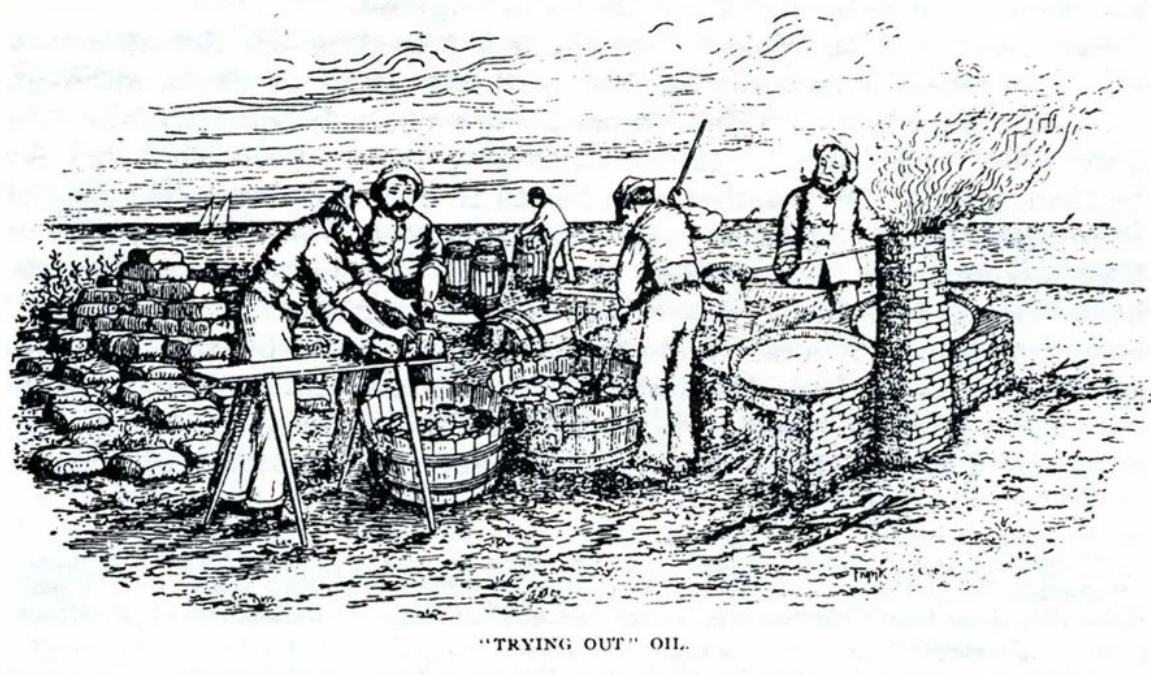


FIGURE 10: After a whale was secured on shore, all able hands cut the blubber into sheets, which were then rendered in large try pots and barreled in reused molasses or hogshead barrels (Brimley 1894; Stick 1958:191; Simpson and Simpson 1988:19).

Named Whales

Naming whales became a tradition for the most difficult or most interesting pursuits on Shackleford Banks. Not all whales were named, but those that were became solidified by local folklore and their stories are still told across North Carolina's coast. The two most popular stories are the struggle of the "Mayflower Whale," and the catch of the "Little Children's Whale." Other names include "Hain't Bin Named Yet", "The Lady Hayes Whale", "Extremely Fat", "Lee's Whale", "The Mary Queen Whale", "The Mullet Pond Whale", "Tom Martin's Whale", and "The Big Sunday Whale" (Reeves and Mitchell 1988:12-13).

The Mayflower Whale

Recalled as the largest whale caught by the Shackleford Banks whale fishery, the "Mayflower Whale" is perhaps the most widely known story on the Outer Banks. On the fourth of May 1874, a pod of ten whales was spotted southwest of Lookout Hill by an elderly Absalom Guthrie (Guthrie 1956:1). Josephus "Seef" Willis (Figure 11) captained his five sons in the "Red Oar Crew", the only all family whaling crew on the island. After a lengthy fight that lasted several hours, the Red Oar Crew finally began hauling the largest whale from the pod six miles back to shore (Guthrie 1956:3). The crew saw fires faintly burning on shore awaiting their return, as well as four other crews. By the time the fires had burned down to embers and dusk had begun peeking over the horizon, the Red Oar Crew finally came ashore, where the families of the whalers had prepared for flensing and rendering blubber. Two other whales, the "Lady Hayes Whale" and "Hain't Bin Named Yet", were also beached and cut into by the time the Mayflower arrived. The name "Mayflower" was decided upon by the Red Oar Crew on the lengthy haul to shore because the whale was caught in the month of May, and flower shaped scars lined its back from failed attempts of harpoons piercing its thick skin (Guthrie 1956:5-6).

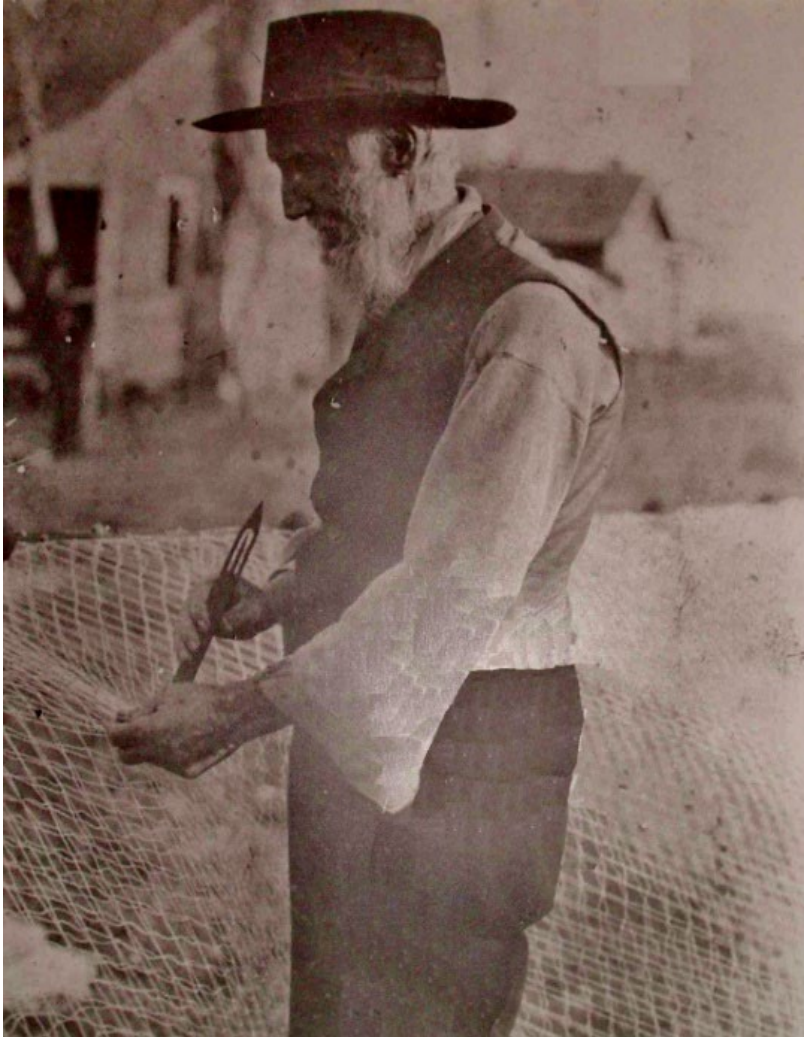


FIGURE 11: Josephus Willis, captain of the Red Oar Crew, caught the most famous whale at Cape Lookout, the Mayflower whale (Simpson and Simpson 1988:38).

The Little Children's Whale

Stacy Guthrie, the fisherman and whaler born on Shackleford Banks mentioned previously, provided an interesting perspective of growing up in Diamond City and seeing the last of its inhabitants leave. The San Ciriaco Hurricane swept through Core Sound in 1899 when he was nearly 16 years old, which was followed shortly after by the exodus of Diamond City. In his interview with Joffre Coe, he described how the “Little Children’s Whale” was captured and why it was named. While the normal crews that would have stood by to launch their whaleboats into the surf were preoccupied elsewhere on the island, a spout was spotted in the Cape Lookout

Bight. Stacy and other children rushed around the area to find as many idle hands as possible to make a boat crew, then rowed out to catch the whale. Mart Willis, captain of the crew, shot the whale with a whale gun and bomb lance. The whale was towed to shore near Mullet Pond, not far from where Stacy Guthrie lived. By the time the whale was beached, Stacy's brother took him by the hand and showed him around the whale. At only five years old, Stacy was small enough to fit inside the whale's mouth and cut out the baleen, only secured by his brother holding his feet from outside the whale's mouth. At that point, the crew, along with other members of the community, helped process the whale, profiting \$30 a person (Coe 1969).

The Cape Lookout whale fishery Compared to Global Shore Whaling Stations

The industrial landscape created and utilized at Shackleford Banks employs a similar model of shore whaling as many stations across the globe. Although the whaling camps on Shackleford Banks were solely opportunistic, operations established here resemble certain aspects of whaling stations in Australia and Labrador. Martin Gibbs (1995), professor of Australian archaeology at the University of New England in New South Wales, Australia, describes ideal features of western Australian whaling stations that were desirable in terms of location and organization. Stations were established in locations with semi-protected bays and located near a headland or high dune, which served as a lookout (Gibbs 1995:189). This description matches the landscape of Cape Lookout, which contains a protected harbor within the hook of its cape and sounds north of Shackleford Banks, as well as dunes throughout Shackleford Banks and Core Banks. Some south coast locations flensed whales in a channel below a granite sheet, where blubber was winched across to a tryworks situated along the vegetation line. Some locations on the west coast of Australia flensed whales in a manner similar to the Shackleford Banks method, where whales were towed to shallow waters and fastened to

the shore (Gibbs 1995:189). However, the employment of tides at Cape Lookout to float whales to shore eliminated any need for extra labor or machinery to maneuver a carcass (Brimley 1894; Philips 1980:13).

Contrary to Shackleford Banks whaling, the manager of the Castle Rock Whaling Company in western Australia kept a diary of whale sightings and catches, as well as daily tasks and occurrences at the station. This diary was intended to maintain a record for the absentee owners of the station (Gibbs 1995:32). As Shackleford Banks whalers owned, operated, and shared profits with only those directly involved, transaction records were not maintained.

Basque whaling stations located within the Strait of Belle Isle, Labrador, also share some similarities with Shackleford Banks. Many sites that contain artifacts related to whaling in this region are located in Red Bay, which is naturally shaped as a protected harbor with steep hills surrounding an inner basin (Tuck and Grenier 1981:183). Whales were flensed either close to shore or hauled close to the tryworks, although unlike the shore whaling camps at Shackleford Banks, there is evidence of potential slipways where whales were hauled to flense and carry sheets of blubber to trypots more easily (Tuck and Grenier 1981:186). Basque whalers passed their hunting, flensing, and trying out methods to English and Dutch companies as they expanded their ventures into Spitzbergen, modern day Svalbard, which may have subsequently been brought to North Carolina by English settlers (Tuck and Grenier 1981:186). A method of filtering oil is documented in both Shackleford Banks and Spitsbergen, which was necessary to prevent pouring any impurities or foreign objects into barrels. H. H. Brimley noted that whalers on Shackleford Banks ladled oil into a two-part strainer, crafted from troughs with auger holes in the bottom loosely plugged with bullrushes (Brimley 1894:6-7; Simpson and Simpson 1988:43-44). The first trough filtered oil into the second trough, which contains a partition and more

auger holes plugged with bullrushes. The oil is rendered perfectly clear and is poured into the bunghole of a barrel (Brimley 1894:6-7; Simpson and Simpson 1988:44). Basque whalers used a similar method in the sixteenth century to filter oil, albeit less streamlined than Shackleford Banks. A retired shallop or tubs made from half-barrels were filled with water near try pots, into which oil was ladled by whalers standing on scaffolding. Any impurities would fall to the bottom of the water, leaving the cooled oil floating on the surface; this was then ready to be barreled (Tuck and Grenier 1981:186-187).

Both examples from Australia and Labrador differ from Cape Lookout in terms of profitability. Whaling stations were established with the sole purpose of producing whale products, whereas the Cape Lookout whalers caught whales infrequently and inconsistently, while subsidizing on other fisheries and businesses. The Red Bay whaling station produced a yield of whale products valued at 10,000 ducats in 1571, which was equivalent to the price of two large galleons at the time (Tuck and Grenier 1981:180). The most successful year recounted by newspaper articles (Table 2) for the Cape Lookout whale fishery produced five whales in 1879, which is minimal compared to an average of 91 annual chase events from the Castle Rock Shore Whaling Station in western Australia (Gibbs 1995:130). Western Australian stations relied on producing capital for shareholders in a similar proto-venture capital model to offshore whaling companies, which necessitated a cost benefit analysis to justify the establishment of whaling stations (Gibbs 1995:63-64). Although whalers initially settled on Shackleford Banks with the explicit intention of whaling, the community created from this establishment did not look for more opportune locations that would be more profitable from whaling.

Primary Sources for the Cape Lookout Whale Fishery

Although shore whaling on Shackleford Banks shares many similarities with offshore whaling companies from New England or shore whaling ventures throughout the globe, written records were not kept to the same degree. While New England whaling companies bought insurance policies to protect many expensive assets, whalers on Shackleford Banks did not necessitate such a policy, as they utilized small watercraft and minimal tools to catch and render whales. Having a minimalistic toolset and process also eliminated the need for the proto-venture capital investment model from New England, and purchases towards whaling would most likely not have been recorded for business purposes, as these tools belonged to an individual rather than a business. A license was not necessary after 1730 to catch whales in North Carolina, therefore removing a tax record for the required one tenth of oil and bone paid to the government (Reeves and Mitchell 1988:6). The tradition of keeping a logbook on a ship was not adapted to shore whaling on Shackleford Banks, possibly for the following reasons: these whalers did not process whales at the same capacity as whaleships, there was no need to record whale sightings from a stationary position, and lays were paid as soon as the product was sold, compared to whaleships paying sailors a lay of total product sold from multiple whales at the end of a long voyage. Although the historical record for whaling on Shackleford Banks is less apparent compared to other whaling ventures, a record exists nonetheless in other forms. Catches and coinciding whaling records exist in federal census records, newspaper articles, port export records, and in land grants.

Census Records

The first US census was conducted in 1790 to collect information from households for taxation and governmental representation, asking for the head of each household, followed by

the number of free white males, both under and over the age of 16, free white females, all other free persons, and enslaved people. The following census in 1800 asked the same information, with a distinction between ages of free white males and females, with Indians, enslaved people, and free African Americans in another category without concern for age. The 1810 census collected the same enumeration categories, and a distinct township first appeared for “Shackleford Banks between Old Topsail Inlet and Cedar Inlet”, which included 15 households (US Census 1810). This township is missing from the 1820 census for Carteret County, and some of these households are not included in the enumeration. Industry data was collected in 1820, including agriculture, commerce, and manufacturing, as well as foreigners not naturalized (US Census 1820). Shackleford Banks appears again on the 1830 census as “Cape Banks”, enumerating 79 households from both Shackleford Banks and Cape Lookout. This census initiated a category for deaf, nonverbal, and blind people, followed by the addition of education information in 1840 (US Census 1830). Education categories include number of university or college students, number of academy and grammar school students, number of primary and common school students, number of scholars at public charge, and number of free white persons over 20 years of age who cannot read and write. The 1860 census added information regarding each individual’s value of real estate and personal estate, as well as a description of each individual’s specific profession. Districts enumerated covered broad categories such as Beaufort, Morehead City, and the remaining Carteret County townships. Following censuses show no indication of how many households lived on Shackleford Banks, placing Shackleford Banks with various surrounding townships (US Census 1860-1900). Unfortunately, Shackleford Banks is only distinctly represented in the 1810, 1830, and 1850 censuses, with no indication in the following censuses of how many people lived on Shackleford Banks.

Since the census of 1850 collected the value of each landowner's property within the region of Shackleford Banks and Harkers Island, this information can be compared to annual tax assessment lists between 1864 and 1866. An annual tax was levied on annual income greater than \$600 as part of the Internal Revenue Act of July 1, 1862. This act also included taxes on legacies and distributive shares of personal property (US IRS 1866:4-16). None of the individuals with the occupation of "fisherman" on the 1850 census were named on this annual tax list, suggesting that they did not have a reported annual income over \$600. Landowners that were also reported on the 1850 census were also absent from this list, indicating that by the time the tax act was enforced, the landowners of Shackleford Banks did not own enough property to be taxed, and that the legacy properties owned by Enoch Ward and Samuel Chadwick had since been sold or dispersed via inheritance to the point where no single person owns a significant enough property to be taxed (Hausner 2000: 170a-173b; US IRS 1866:4-16).

An absence of primary sources created directly by those involved in the Cape Lookout whale fishery might be explained by the United States Federal Census in 1840, which initiated a column asking for the number of individuals in a household that could not read or write. 199 of the 6,591 individuals recorded in Carteret County were marked as illiterate (US Census 1840). The 1850 census depicts that of the 22 landowners within the recorded district of Shackleford Banks and Harkers Island, only 12 had the ability to read and write. In fact, 64 of the 311 inhabitants of this district, 20 years of age or older, were illiterate. Of the 50 individuals with "Fisherman" as their listed occupation, only 24 were literate (Hausner 2000: 170a-173b). Consequently, most primary sources provided directly from whalers from Shackleford Banks exist as oral tradition instead of in written form. Primary sources were written by other sources and provided on behalf of these individuals, such as government records and newspaper articles.

Newspaper Articles

Newspapers across the state published articles detailing momentous catches from Shackleford Banks. Since catches were less common in North Carolina, each article had the capacity to share details involved in the hunt for each whale. In comparison, such details were not included in publications for New England whaling because of the numerous whaleships reporting several catches at once. A publication entitled “Whalemen’s Shipping List” from New Bedford, Massachusetts, shared statistics of sperm and whale oil imported for the month, whaleships departing and returning to New Bedford, and stock prices for whale products. On one occasion, this publication shared a story from North Carolina about the “exciting and dangerous efforts” put forth by shore whalers, most likely to retain a sense of adventure within the industry. A story of a captain launching three bombs at a whale near Cape Lookout ends with blood spraying ten feet into the air and raining down over the crew that lanced it, which paid an estimated \$900 to be split among the crew (*Whalemen’s Shipping List* 1878:2). Likewise, *The New Bernian* included a story for the benefit of Morehead City fishermen about whalers catching a whale near Long Island, New York, narrated with the same sense of adventure employed in the articles describing whalers in Carteret County (*The New Bernian* 1894:1).

Whaling in Carteret County was seemingly regarded as a spectator activity, as several newspaper articles describe crowds flocking from Moorehead City or Beaufort to watch whalers catch and haul whales to shore. Local newspapers periodically published updates about the whalers, even when there were no catches during the week (*Wilmington Journal* 1876:3). Whaling was portrayed as a sport to take pride in, rather than a business. H. H. Brimley’s whaling excursion was described in *The New Berne Weekly Journal* as the crew flensed the whale piece by piece. Photos are described, but not provided, as the crew worked on trying the

whale, which were intended for the collection of state scenes in Raleigh (*The New Berne Weekly Journal* 1884:3). On May 17, 1876, *The Beaufort Eagle* wrote in the “Local Briefs” column that Professor Kerr, the state geologist at the time, traveled to Core Banks with the intention to catch a whale for exhibition at the centennial (*The Beaufort Eagle* 1876:3). Another article published on the same page describes a whaling scene witnessed by a sabbath school from Harkers Island:

Happily we were just in time to witness the interesting scene of the whalemens successful return from a whale fight, a fine subject by the way for artistic talent. Six boats with their crews of sturdy whalemens were just triumphantly towing the prize ashore. The successful Cornell Crew might have seen a stroke made in a time and with a force worth their imitating. As they near the shore, there are happy wives and children assembled from all along the beach, to greet the coming conquerors. Now the whale is aground in about 12 feet of water, some 100 yards from shore. Heretofore all has been quiet; but now, as is if their custom, the boats come together; the brave, life-risking whalemens with one accord spring 36 their feet, and at the word-Hip, hip! to tarpaulins are circled above 36 bronzed joyous faces, and from 36 bare throats in thunderous tones went up terrific “Hurrah’s!” The crowd from shore responded with shouts of welcome and waving of handkerchiefs, shawls, and hats. Boys turned somersaults to more fully demonstrate their joy; mothers held up “baby” and tried to point their tiny forefinger proudly at “Papa.” Never was a victorious warrior in his triumphant return, more proudly or more worthily greeted (*The Beaufort Eagle* 1876:3).

Another article from *The Charlotte Observer* describes a crowd that gathered to witness a crew catch a whale:

The great whale captured at Cape Lookout Tuesday, by the brave and hardy Morehead fishermen, attracted crowds of visitors from Beaufort, Morehead and vicinity. Many would have gone down from Newbern had a train been run so that a visit to the interesting scene could have been made and the visitor have gotten home the same day. These great monsters of the deep never fail to attract attention (*Charlotte Observer* 1894:2).

Articles that published information about whaling have preserved an important degree of data that was otherwise not recorded. Randall R. Reeves and Edward Mitchell (1988) initially compiled information from articles and other sources about whales killed near Cape Lookout. Due to a wider availability of historic articles written during the most active period of the Cape Lookout whale fishery, more information has come to light, adding to the information that Reeves and Mitchell (1988) have already gathered. Table 2 depicts catches described in articles, dates they were caught, estimated profits earned from product yield, location where the whale was dispatched or flensed, and any other information collected.

Date	Profit	Yield	Location	Notes	Source
March 1839		60 barrels	A few miles south of Portsmouth		<i>The Republican</i> 1839:1; <i>Sag Harbor Corrector</i> 1839:3; Reeves and Mitchell 1988:12
April 16, 1857	\$1,000	50 barrels	Near Shackleford Banks	60 or 70 feet long, caught by Samuel Moore and Absolom Guthrie	<i>Beaufort Journal</i> 1857:1; <i>Wilmington Journal</i> 1857:2; Reeves and Mitchell 1988:12
May, 1869			Off Shackleford Banks	45 feet	Coues 1871:13; Simpson and Simpson 1988; Reeves and Mitchell 1988:12
April 6, 1872		Very large	Shackleford Banks		<i>The Charlotte Democrat</i> 1872:2

May 4, 1874		40 barrels, 700 lbs of bone	Cape Lookout	"Mayflower", 50 feet	True 1904:246; C.S. Brimley 1947:7; H.H. Brimley 1971:110-111; Guthrie 1956:1-5; Lewis 1926; Reeves and Mitchell 1988:12
May 4-5, 1874		25 barrels, 450 lbs of bone	Cape Lookout	"Hain't Bin Named Yit"	Guthrie 1956:6; Reeves and Mitchell 1988:12
May 4-5, 1874		35 barrels, 650 lbs of bone	Cape Lookout	"Lady Hayes"	Guthrie 1956:6; <i>Beaufort News</i> 1946:1; Reeves and Mitchell 1988:12
May 14, 1876	\$1,664		Shackleford Banks	72 feet, Cornell Crew	<i>The Beaufort Eagle</i> 1876:3
March 1878	\$.41 per gallon, plus bone	20 barrels	Cape Lookout	42 feet	<i>The Observer</i> 1878:2; <i>Whalemen's Shipping List</i> 1878:2; Reeves and Mitchell 1988:12
May 1878	\$900	Very fat	Reported from Moorehead City, most likely Shackleford Banks	42 feet	<i>Pee Dee herald</i> 1878:3
1879	\$4,000	5 whales	Beaufort region	4 crews, 72 men	Earll 1887:490; Clark 1887:49; Reeves and Mitchell 1988:12
March 5, 1885	\$800		Shacklefords Beach	45 feet, 2 boats, Captain Garrison Willis	<i>The Daily Journal</i> 1885:1; <i>The Weekly Star</i> 1885:2
February 11, 1888	\$2,000		Off Shackleford Banks	60 feet	<i>Greensboro North State</i> 1888:4
February, 1888	\$1,500		Near Cape Lookout	37 feet, Tyre Moore's crew	<i>The Weekly Record</i> 1888:1; Reeves and Mitchell 1988:12
1888		52 barrels	Cape Lookout	"Little Children's Whale", Mart Willis was the harpooner	<i>Beaufort News</i> 1946; Reeves and Mitchell 1988:12
March 18 or 19, 1894	\$451.60	25 barrels, 156.5 lbs of bone	Cape Lookout	30 feet, "Lee"	True 1904:246; Brimley 1894; 1971:113; Reeves and Mitchell 1988:12

March 20, 1894	\$1,500-\$2,000 for oil, \$7 per pound for bone	40 barrels, 1,000 pounds bone	Shackleford Banks, processed on ocean side, caught 8 miles offshore	55-60 feet, 5 boats, 25 men interested in returns	<i>Charlotte Observer</i> 1894:2; <i>New Berne Weekly Journal</i> 1894:1
1897			Cape Lookout	"Mary Queen"	<i>Beaufort News</i> 1946; Reeves and Mitchell 1988:13
February 14, 1898	\$1,800	65 barrels,	Shackleford Banks, near the bar	60 feet, Captain Moore's crew	<i>The Charlotte Observer</i> 1898:1
February 15, 1898		27 barrels, 650 lbs of bone	Cape Lookout	46 feet, "Mullet Pond Whale" in natural history museum of University of Iowa	True 1904:246; Brimley 1971:107; Thomson 1987; Reeves and Mitchell 1988:13
February 18, 1898			Cape Lookout		Simpson and Simpson 1988; Reeves and Mitchell 1988:13
April 3, 1898	\$1,000		Cape Lookout	3 boats	Paul 1961; Paul and Paul 1975; Reeves and Mitchell 1988:13
April 1908		45 barrels	Cape Lookout	43 feet, "Tom Martin"	Seymour 1984; Reeves and Mitchell 1988:13
May 17, 1908		Oil not saved, 300 lbs of bone	Cape Lookout	39 feet, "Big Sunday"	Brimley 1908; Reeves and Mitchell 1988:13
1909			Cape Lookout		Stick 1958:194; Reeves and Mitchell 1988:13
March 16, 1916		30 barrels from body, 3 from jaw, 5 from liver	Cape Lookout	57 feet	<i>News and Observer</i> 1983; Reeves and Mitchell 1988:13

TABLE 2: Newspaper articles detailing whales hunted at or near Cape Lookout.

Newspapers also published land for sale that was seized by the government to pay for debts. In 1885, the *Carteret County Telephone* listed numerous properties across Carteret County

and their “delinquents” names. Four properties were listed on Shackleford Banks and Cape Banks, which included 25 acres near The Haul Over by the heirs of Polly Ann Davis, 25 acres on Cape Banks by Joseph Guthrie, 18 acres at Whale Creek by Absolom Guthrie, and 25 acres on Cape Banks by William Willis (*Carteret County Telephone* 1885:2).

Port Export Records

The Treasurer and Comptroller port archive series provides a vast record of ships that entered and exited North Carolina’s ports, as well as their cargos, for the latter half of the eighteenth century. Although documentation from several decades has not survived, particularly the most active whaling decades depicted in the newspaper analysis, this collection provides an insight as to how common whale product was exported from North Carolina during the eighteenth century. The North Carolina Underwater Archaeology Branch has compiled these numerous entries into a master excel sheet, including 3,075 entries for the port of Beaufort. Of these entries, only 11 exports contain oil or whalebone (Reeves and Mitchell 1988:5; NCDCCR 2024). Reeves and Mitchell (1988) notes that these exports might not even represent a quantity of oil produced locally, as some entries may represent re-exportations from elsewhere (Reeves and Mitchell 1988:8). The establishment of a railway at Morehead City in 1858 most likely replaced maritime transportation of cargo, which provides some explanation as to why some port records may not exist in the nineteenth century (Adams 1983:5). Table 3 depicts export records from the port of Beaufort that contain oil in their cargo.

Date	Name	Vessel Type	Tons	Captain	Bound For	Cargo
May 22, 1787	<i>Nancy</i>	Schooner	12	Soloman Fuller	Maryland, Baltimore	Oil, Tar
April 17, 1789	<i>Charlotte</i>	Sloop	18	Samuel Chadwick	Massachusetts, Boston	Naval Stores, Oil

December 29, 1789	<i>Active</i>	Schooner	67		Roanoke	Salt, Oil, Sugar, Coffee, Cheese
May 7, 1789	<i>Fanny</i>	Schooner	60	Benjamin Leecraft	Guadeloupe	Timber, Shingles, Oil, Tar, Livestock
May 31, 1788	<i>Industry</i>	Sloop	30	Hubble	Pennsylvania, Philadelphia	Naval Stores, Pork, Oil, Peas, Lumber, Skins
June 16, 1788	<i>New York Packet</i>	Sloop	60	Griffin	New York	Corn, Flour, Staves, Oil, Peanuts, Ground Nuts
May 2, 1789	<i>Betsey</i>	Schooner	80	Captain Smith	England	Naval Stores, Tobacco, Rice, Oil, Staves
February 17, 1789	<i>Friendship</i>	Sloop	65	Captain Johnston	Bath	Tobacco, Molasses, Sugar, Rum, Oil, Dry Goods
April 25, 1789	<i>Polly</i>	Schooner	65	Captain Turner	West Indies	Pork, Scantling, Lumber, Shingles, Oil
April 27, 1785	<i>Nancy</i>	Sloop	20	John Gordon	Rhode Island	Naval Stores, Rawhide, Potatoes, Whalebone

TABLE 3: Records from the Port of Beaufort that detail ships exporting whale oil or bone.

Land Grants

Land grants, or parcels of land owned by the government transferred to private owners, portray land surveys for a number of individuals on Shackleford Banks. The North Carolina Department of Cultural Resources (NCDRC) photographed a collection of land grant records on microfilm ranging between 1735 and 1957, all of which are available via nclandgrants.com. These documents detail the purchaser of each parcel, the acreage, and dimensions of each survey conducted, accompanied by plats containing hand-drawn maps. Each survey begins with a point located either on or near a placename, or along the border of another private property. These surveys did not employ the use of a coordinate system; rather, cardinal directions were paired

with angles in degrees, followed by a distance measured in poles. For example, a survey for George W. Willis in 1827 reads as follows:

Surveyed for George W. Willis a tract or parcel of land situated and lying in the county of Carteret on Core Banks, near Cape Lookout, beginning at a stake on the sound side, a little to the eastward of Blinds Hammock, running N70° W 89 poles, to a stake on the west side of the head of the Otter pond, thence S80° W 89 poles, thence S70° E 89 poles, and thence N20° E to the beginning, containing forty nine and a half acres. Said land was sold by the sheriff of Carteret for taxes and not being surveyed within the time limited by law. Became vacant, [illegible] April 27th, 1827 (NCDCCR 1827)

One grant to William Stiron in 1800 describes the location as “Hog Island reef or shoal beginning at the southeast point opposite to the whalers camp point on Hog Island” (NCDCCR 1800). Hog Island is located west of Portsmouth Island, part of a chain of smaller islands separating Core Sound and Pamlico Sound. The mention of whaler’s camps indicates that at some point before 1800, whaling was attempted near Ocracoke Inlet. There is no further indication from this plat as to who owned or whaled in this location, but considering the low exportation of oil reported in the Beaufort port records for the region, this whaling camp was most likely short lived.

In total, 2,055 land grants exist within Carteret County between 1722 and 1902. Eight of these grants exist on or near Shackleford Banks and Cape Lookout, including land granted to Joseph Fulford in 1783, John Fulford in 1798, Levi Pigot in 1811, George W. Willis in 1827, G. W. Springle and Ralph Howland in 1878, Tyre Moore and Cull Pigott in 1878, and Tyre Moore Jr. in 1897 (NCDCCR 1783; 1798; 1811; 1827; 1878a; 1878b; 1897). Appendix B depicts the surveys conducted for each grant, as well as their written descriptions. Due to the reliance on

local landmarks as the vertices of each parcel, such as trees or stumps, these surveys are difficult to map exactly as they were surveyed when they were sold. Placenames that are still used today, or ones that were recorded on maps from the time period, assist in locating the general location for these parcels. Figure 12 depicts seven of these eight grants projected onto a modern satellite image in the general areas described in their respective grants. John Fulford's grant of 1798 was excluded because the survey was not drawn to scale and did not align with the satellite image beyond its description. This grant was described as being "at Cape Lookout including the hammock", which presumably included the area that is now submerged under Barden Inlet (NCDCCR 1798).



FIGURE 12: Locations of land grants throughout Shackleford Banks and Cape Lookout. Image created by the author via ArcGIS Pro, ESRI.

The Downfall of Diamond City

Diamond City successfully maintained its position as a center for the Shackleford Banks community until a series of treacherous storms wreaked havoc across the east coast at the end of the nineteenth century. The first storm occurred in 1896 and would today be referred to as a hurricane. It displaced fertile soil with sand, flooded homes, lost livestock, and began to transform the shrub-laden landscape into the dune and marsh covered environment that it resembles today (Hancock 2008:19). That storm convinced many of the Ca'e Bankers that Diamond City would not be habitable in the near future, and a steady decline in the community's population began.

In 1899, the San Ciriaco Hurricane would confirm those suspicions. Powerful winds moved tides from the sound and ocean together, flooding Shackleford Banks and all remaining houses. The once mountainous dunes that whalers used as lookouts were washed away, and by the time the storm was finished, graves at the local cemetery had become uncovered with bones and caskets strewn about the apocalyptic landscape (Hancock 2008:20).

By 1902, most houses and all families had moved their houses to the mainland or other islands. Since these houses were built by hand with the help of multiple families, houses were carefully taken apart board by board and moved across the sound to be reconstructed in new locations (Stick 1958:193). Some were even lifted onto sharpies and moved in one piece. The hurricane brought together the community in a way that is unmatched, where dozens of people helped to move houses without expecting any sort of payment, although they were often presented with a large meal (Stick 1958:193). Locations where the Diamond City diaspora moved include "The Promised Land" at Moorehead City, Marshallberg, Salter Path, and Harkers Island (Stick 1958:193-194).

Several hurricanes have shaped Shackleford Banks into the island that it resembles today. The hurricane of 1933 opened Barden Inlet, permanently separating Shackleford Banks from Portsmouth Island. Figure 13 depicts Cape Lookout's changing shoreline between 1873 and 1997. This shifting shoreline has potentially moved artifacts away from their original locations, as well as removed the surrounding context for areas where houses or whaling sites once existed.



FIGURE 13: Changing shorelines surveyed by the USGS on Cape Lookout and Shackleford Banks from 1873 to 1997. Data for this image was obtained from sciencebase.gov national assessment of shoreline change for the state of North Carolina (Kratzmann et al. 2017). Image created by the author via ArcGIS Pro.

The maritime forest on Shackleford Banks, known as Lookout Woods, provided juniper and red cedar that residents used, along with wood salvaged from shipwrecks, to construct houses and boats (Eldridge 1982:2; Barnes 2007:38). By felling trees, however, human activity

would remove an underlying root structure that supported large dunes. Once sand was freed from this root structure, hills and dunes moved freely and covered access to groundwater where trees and large shrubs thrived (Senter 2003:339). Figure 14 depicts a large dune, labelled as a “sandwave”, encroaching onto a portion of lush shrubbery. Figure 15 depicts a barren portion of Shackleford Banks, with structures placed in an attempt to stabilize these sandwaves. The depletion of trees, in conjunction with free-moving dunes, created an increasing vulnerability to hurricanes, which ultimately drove the population to emigrate to the mainland or more protected islands.



FIGURE 14: A photo captured in 1902 of a large sandwave (bottom right) encroaching onto an area of Shackleford Banks where shrubs thrived due to access to ground water (Senter 2003:343).



FIGURE 15: A barren portion of Shackleford Banks photographed in 1902 where structures were placed to stabilize sand (Allen 2024).

Conclusion

The whale fishery on Shackleford Banks met its demise shortly after Diamond City was washed away by hurricanes at the end of the nineteenth century (Barnes 2007:36). Although whaling continued for over a decade following the exodus from Shackleford Banks, modern inventions gradually out competed a need for whale oil and bone (*News and Observer* 1983:1; Reeves and Mitchell 1988:18). Influence from Shackleford Banks can be found throughout the surrounding islands and cities where its communities' descendants still live today. Despite the demise of whaling, other fisheries increased in productivity and attracted fishers from all over the state to build camps on the now deserted Shackleford Banks (Cecelski 1993:1). A diminishing need for whale oil and attraction to more profitable fisheries finally ended the era of shore-based whaling on Shackleford Banks.

Chapter Four: Geospatial Analysis and Archaeology

Introduction

By viewing data through a geospatial lens, many factors in the landscape used for the right whale fishery on Shackleford Banks become evident. Whaling Camps centered around Shackleford Banks and Cape Lookout operated through an intricate web of social and environmental connections, which supported the right whale fishery. All available hands helped to process a whale once a crew brought it to shore, drawing the local community into an impromptu, temporary whale oil plant. Using geospatial analysis, spatial patterns can be determined from this web of connections that demonstrate the breadth of the whale fishery within the Shackleford Banks population, how far whalers were willing to travel to capture a whale, and how much effort the community was willing to contribute to assist in the rendering process. This chapter discusses the importance of Geographic Information Systems (GIS) to demonstrate geospatial analyses of archaeological sites, as well as its implementation in this thesis.

GIS Applied to Archaeology

The use of GIS in archaeology has made available new perspectives of research brought about by new technology. Naturally, the archaeological field has gravitated towards the integration of GIS for spatial analysis, as well as immerse the public into history (Verhagen 2017). Through the interpretation of topographical data, anthropological sites, historical accounts, and observed biological habits, geospatial analysis over a certain area can be formed. Several tools, such as viewshed, heat mapping, depth and elevation topography, and polygon

overlaying, aid in visualizing data into a display that is easy to understand by broader audiences (Menéndez-Marsh et al. 2023).

Geospatial analysis is a method that archaeologists use to collect, project, and manipulate information to portray a spatial dataset in a display that is organized and easy to understand. This has directed archaeologists to study sites from a broader perspective and to consider geological and environmental factors as a part of anthropological decision-making. Through the use of visualizations, geospatial analysis displays patterns that would not be as obvious in the form of tables and charts. Modeling habits by studying geospatial analyses gives insight as to how human trends develop over time and space, which increases the accuracy of predictions for where archaeological sites exist (Whitley 2017:103-105).

Examples of Landscape Studies that Employ Geospatial Analysis

By utilizing GIS, features of a broader landscape can be interpreted through geospatial analysis. Features such as resource densities, human occupation, viewshed, and topography are helpful in identifying anthropological uses of a landscape through time. The following studies are examples of how GIS is used to conduct geospatial analyses throughout diverse landscapes.

Geospatial Analysis of Historical Cartographic Data of Kollam Fort

The port of Kollam in present day Kerala, India has served as an important trading site throughout India's colonial history (the sixteenth century to the nineteenth century). Throughout its rich history, the port has been occupied by Portuguese, Dutch, English, and South Indian forces (Gupta and Rajani 2020). Because of its many occupations, the port's factories and forts have been recorded repeatedly on European historical maps and documents. This study employs GIS to geospatially analyze the accuracy of which these historical resources depict sites within a defined study area where remains of Fort St. Thomas exist.

To conduct this study, Ekta Gupta and M.B. Rajani of the National Institute of Advanced Studies (Bangalore, Karnataka, India) compiled maps referencing Fort St. Thomas in full or partial detail. These maps, spanning each denomination that once controlled the fort, were georeferenced if possible, or otherwise used for their depictions of anthropological features. The author notes that it was common practice to copy maps by hand during the colonial period, so spelling variations and scaling errors were taken into consideration. Feature representation was found to be referenced or omitted according to a given map's function; furthermore, cartographic detailing progressed over the colonial period. Because of this progression, the maps compiled do not depict the same features that existed simultaneously over the same space. Following the research of historical maps and visual analysis of modern satellite images, Gupta and Rajani compiled spatial data into a map for use in a handheld GPS for a survey conducted in December 2019. Locations of fort remains were photographed and documented to be georeferenced in QGIS, an open-source GIS software (Gupta and Rajani 2020). These marked locations were then overlaid onto a satellite image base map to depict the apparent boundaries of each occupying nationality's construction.

The results of the study's geospatial analysis were a comprehensive diagram of colonial features overlaid on a modern satellite image of the port (Figure 16). The fort's moat was visible in cropmarks, which helped distinguish a more specific area where the survey found remaining ramparts and fort structures. Roads and modern structures were built on top of fort structures after the fort was abandoned, disguising these features from sight on a satellite image alone. Areas of the fort were uncovered that were previously lost or unknown to the public following the site's abandonment. The employment of GIS aided this study to compile historic

maps and satellite images together to ultimately redefine the boundaries of which Fort St. Thomas exists in the present context (Gupta and Rajani 2020).

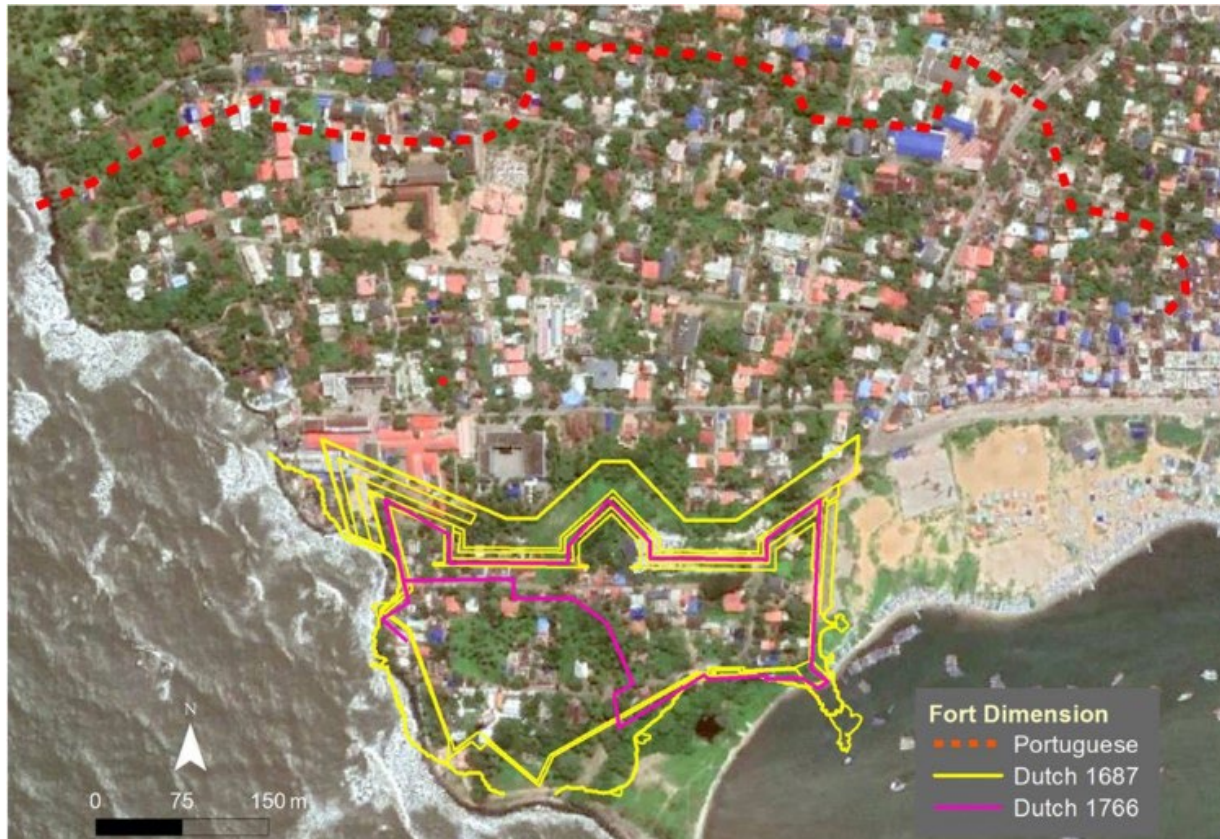


FIGURE 16: Map of Fort St. Thomas in the port of Kollam, Kerala, India, depicting the extent to which Portuguese and Dutch occupations constructed or destroyed its boundaries (Gupta and Rajani 2020).

A Geospatial Analysis of Mycenaean Habitation Sites Using a Geocumulative versus Habitation Approach

Messenia, Greece contains the highest concentration of Mycenaean sites and artifacts. To prove that Mycenaeans held certain criteria for where they settled, George Malaperdas and Nikolaos Zacharias of the University of The Peloponnese applied GIS and geospatial analysis to examine relationships between the locations of Mycenaean settlements in Messenia and the

geomorphological characteristics of the area of their establishment (Malaperdas and Zacharias 2018). This study presents the Geocumulative versus Habitation approach (GCH), which is an attempt to collect and associate the geological and environmental characteristics of the studied Mycenaean habitation sites with available archaeological record (Malaperdas and Zacharias 2018).

Field work included taking precise GPS coordinates of areas with Mycenaean sites of interest, ranging from secondary camps to political centers. Additionally, topographical data collected by the Geographical Service of the Greek Army was used to create a digital terrain model (DTM) combined with classifications of geological rocks, faults, rivers, and lakes. Terrain was classified by elevation, slope, and aspect. These factors were geospatially analyzed via GIS to find correlations between morphological patterns and settlement locations. To avoid bias on the part of the researchers, ArcGIS was employed to randomly spot test 10 points on the map of Messenia and compare them to the largest 10 settlements. Two more tests were conducted using 50 and 100 points, which isolated the 10 best correlated values of each. This test concluded that Mycenaean residential areas were not randomly placed; instead, they centered around an ideal value of resources (Malaperdas and Zacharias 2018).

Resulting from this study were apparent Mycenaean preferences based on settlement patterns and geomorphology. A large majority of sites resided on flat ground or small hills in low elevation with a small sloping grade. All sites are oriented southward, protecting them from northern winds and providing crops with maximum exposure to sunlight. Geology of the region showed a preference for marls and sandstones, which are well suited for agriculture and building material. All settlements are located very close to water resources, which provided drinking water, fish, and transportation (Malaperdas and Zacharias 2018). The implementation of

geospatial analysis and GIS allowed this study to further examine the cultural and environmental habits of Mycenaean settlements, demonstrating their knowledge of the value of resources needed to improve their living conditions.

Landscapes of State Formation: Geospatial Analysis of Aksumite Settlement Patterns (Ethiopia)

The ancient kingdom of Aksum, located in present-day Ethiopia, existed as a major political power and influence over many surrounding territories adjacent to the Red Sea from 800 BCE to 1450 CE. Settlements have been theorized to originate from either a migration from Arabia, or from indigenous African culture. Michael J. Harrower, Department of Near Eastern Studies, Johns Hopkins University, and A. Catherine D'Andrea, Department of Archaeology, Simon Fraser University, report results of spatial analysis of site sizes, site clustering, trade routes, and spatial associations of sites with landforms and hydrology to determine the rise and fall of Aksum (Harrower and D'Andrea 2014).

Over the span of four field seasons from 2005 to 2008, a 196 square kilometer area was surveyed. Sites dating to the stone age were relatively few, compared to a rapid increase in population from pre-Aksumite, Aksumite, and Post-Aksumite sites (Harrower and D'Andrea 2014). This study focused in particular on agricultural production and trade routes and reports results of new GIS hydrological modeling, landform classification, least-cost path modeling, rank-size, and site clustering analysis (Harrower and D'Andrea 2014).

Geospatial Analysis Applied to Maritime Context

The employment of GIS and geospatial analysis helps maritime research depict certain aspects of a coastal landscape or seascape. The following examples use viewshed analysis, heat mapping, and artifact or site mapping to portray spatial aspects of their respective research.

NOAA Critical Habitat Designations

Species that have experienced population loss due to climate change or human activities, such as the northern right whale, face potential extinction if current practices do not change. NOAA has designated several areas in United States-controlled waters to protect and encourage population growth of these endangered species. By performing geospatial analyses, GIS mapping displays population densities, food resources, and habitat needs for these species.

The north Atlantic right whale population was dramatically affected by the right whale fishery along the American Atlantic coast. As of 2011, only 465 north Atlantic right whales were identified, leading to the endangered species' habitat to be designated as critical, which would restrict human activities from damaging the habitat or harming the whales (NOAA 2015:6). Figures 17 and 18 display population sighting data for north Atlantic right whales collected over a period of 12 years. This data is displayed by color variations to depict population density, as well as plotting specific points to depict the spatial breadth of the whale's habitat. An area designated as the north Atlantic right whale's critical habitat is then defined from this spatial data.

NOAA has designated numerous critical habitats for the protection of species of coral, mollusks, turtles, fish, whales, seals, and sea lions. Data collected to support these designations is accessible to the public online through the National ESA Critical Habitat Mapper application. The use of geospatial analysis to investigate species for critical habitat candidates is vital to explain where and why a species requires a designation.

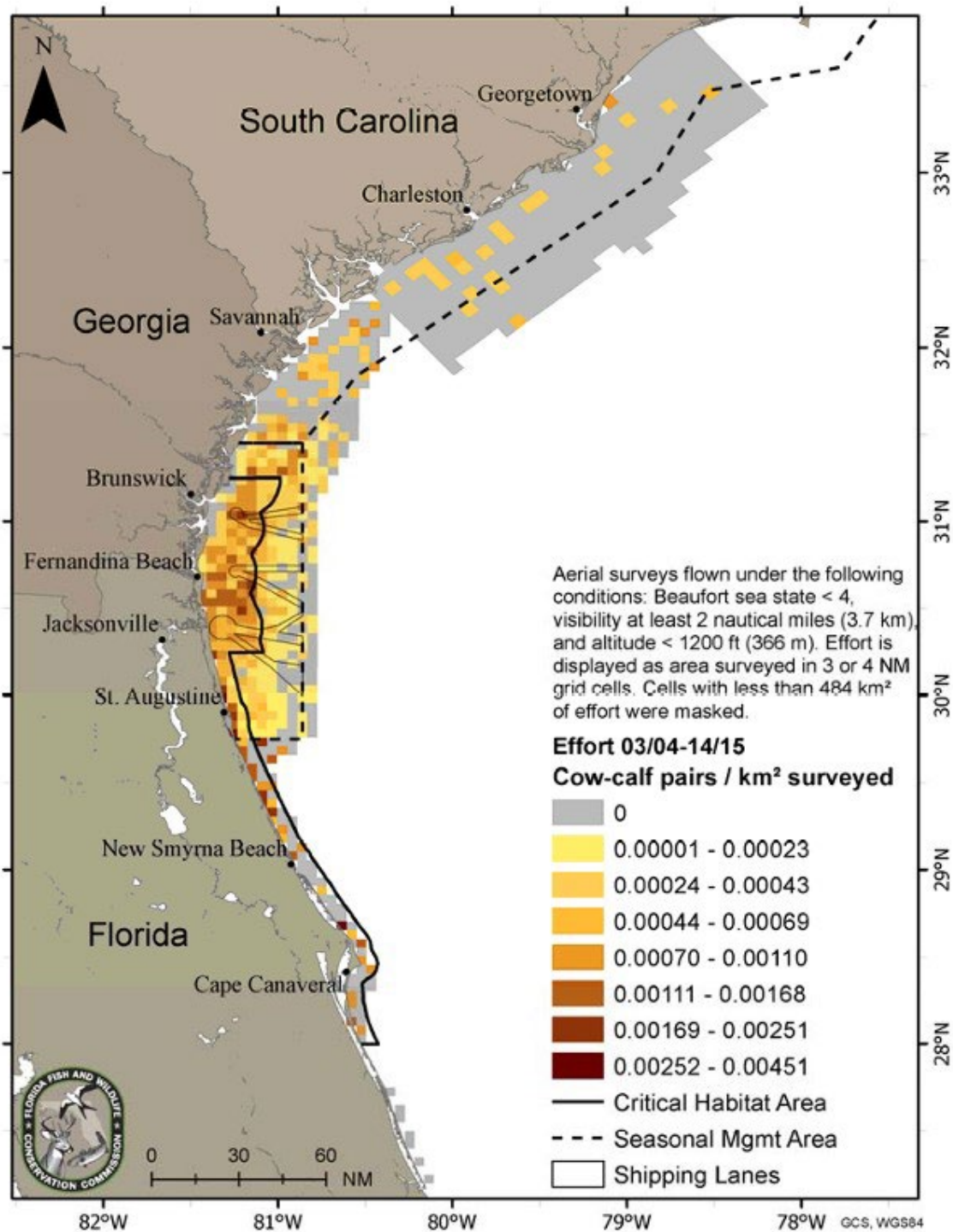


FIGURE 17: Sightings of north Atlantic right whale calf and mother pairs in their winter migration locations between 2003 and 2015 (NOAA 2015:54).

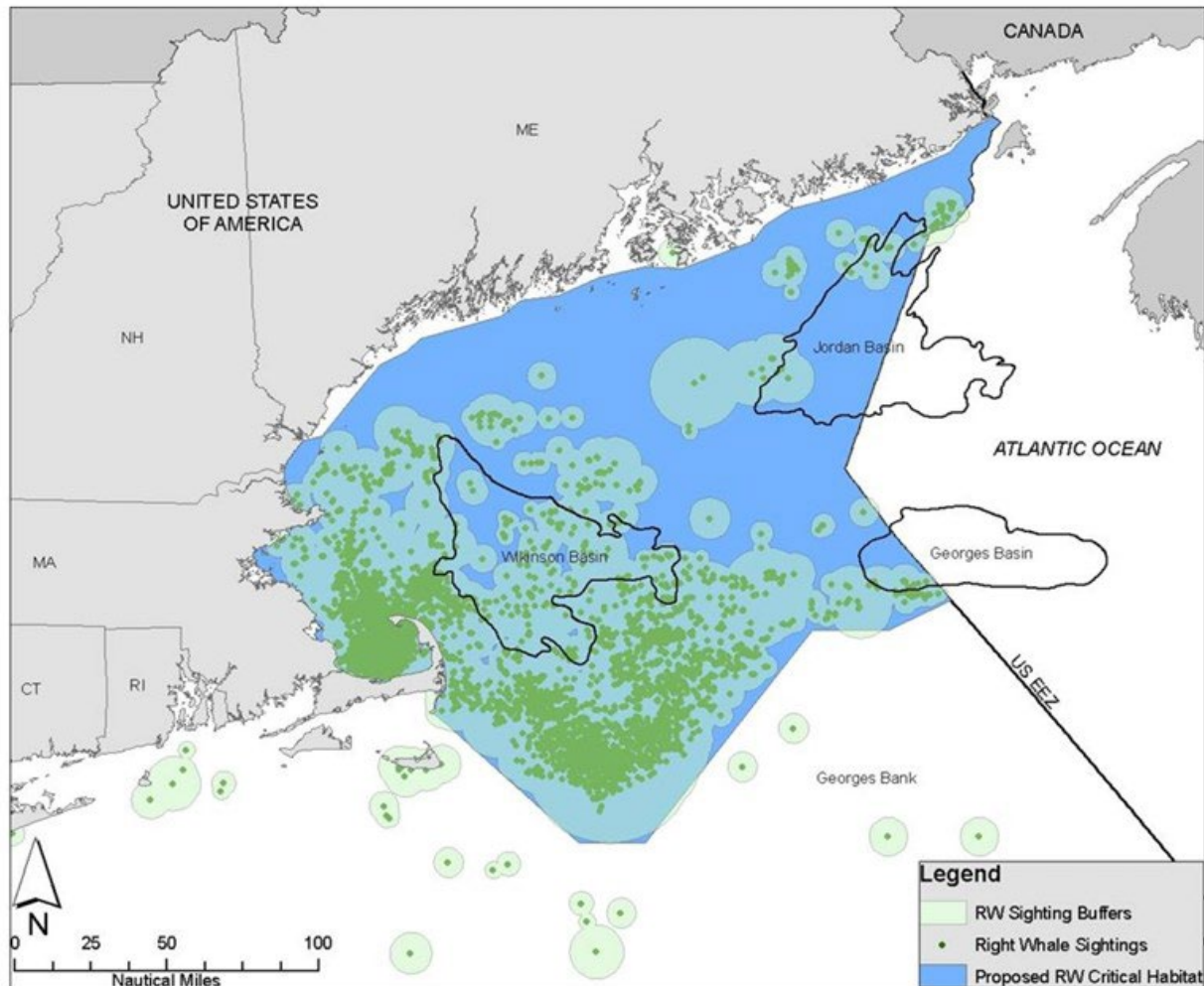


FIGURE 18: Sightings of north Atlantic right whales in their summer feeding grounds between 2003 and 2015 (NOAA 2015:78).

Modeling distance with time in ancient Mediterranean seafaring: a GIS application for the interpretation of maritime connectivity

Mediterranean seafaring has connected ancient societies through trade and exchange of culture. Although environmental and technological factors have been acknowledged to explain why societies have developed relationships, their implementation in trade route modeling is limited in research. Justin Leidwanger (2013) uses wind headings and speed, vessel speed, and geography to create a GIS model for anisotropic travel times throughout the Aegean maritime landscape. This modelling provides a more accurate depiction of the travel cost to maintain

trading relationships among cultures, which assists in explaining how certain societies formed relationships with each other. The Pabuç Burnu vessel was used as a case study because of its cargo originating from multiple ports. Leidwanger hypothesizes that the ship's mariners focused on shorter journeys that took no longer than three days, and that more exotic cargo found in the wreck was acquired through trade rather than from their ports of origin (Leidwanger 2013:3307). The GIS modelling employed in this study provides an insight into the time and space utilized for maritime connectivity in the ancient Mediterranean world. This application allows for a more accurate depiction of the cost of trade, which can be integrated into other transportation and communication landscape models.

Submerged Inland Landscapes of the Aucilla Basin, Northwest Florida, USA: Populating the Late Pleistocene and Early Holocene Landscape

The geological record of Florida's changing coastline disguises archaeological sites that once existed on dry land, but now appear underwater. Jesse Halligan performed a geospatial analysis of Late Pleistocene and Early Holocene underwater sites within the Aucilla Basin to provide more information about the earliest people to occupy Florida. Site location data, including soil layers, chert quarries, landforms, and hydrology, were plotted onto a NOAA coastal data relief to create an estimated coastline at the time that these sites were formed. Random sites were plotted to test against any pattern bias encountered in the study. Sites were found in clusters near resources, with a decreasing likelihood to find younger sites in submerged settings (Halligan 2022). These results were compared to the random test sites, which demonstrated a clear correlation of sites in close proximity to resources. This indicates that people exploited resources near the shore, and continued to revisit the shore as it encroached inland. The geospatial analysis methodology employed in this research can be replicated in other

areas that have experienced drastic coastal changes in human prehistory, which may describe the landscape from which early humans sought resources. Although the number of sites is scarce and may not definitively describe a movement inland as the shoreline engulfed occupied areas, this research contributes to our understanding of the earliest human history of Florida and North America.

Of Blood, Salt, and Oil: An Archaeological, Geographical, and Historical Study of North Carolina's Dolphin Fishery

North Carolina's dolphin fishery has a history similar to the right whale fishery that existed at Cape Lookout. Throughout the Outer Banks, dolphin factories existed to exploit an active fishery between 1793 and 1929 (Huss 2019:1-4). George Huss' (2019) master thesis integrated geospatial analysis to depict the dolphin fishery at Hatteras. By conducting a viewshed analysis, the parameters of a lookout's ability to spy a dolphin fin were depicted, with respect to 20/20 vision as well as 20/10 vision (Huss 2019:116). Viewshed is a useful aid to assist with defining an area's boundaries, such as the dolphin and right whale fisheries, and is also applicable to describe the landscape that people utilize in an industrial setting. Huss also described environmental patterns among areas where dolphin fishing occurred. Geospatial analysis of the area studied showed that dolphin hunting occurred in shallow cove-like areas where fishers could trap dolphins by dragging a seine net to shore (Huss 2019:168). An artifact analysis correlated with the geospatial analysis, where artifacts were identified in photographs, from museum collections, and within the area identified to be the boundary of the dolphin fishery.

Ship Ashore!: The Role of Risk in the Development of the United States Life-Saving Service and its Effects on Wrecking Patterns Along the North Carolina Coast

The United States Life Saving Service (USLSS) established 29 stations along North Carolina's shoal-laden coast beginning in 1874. Prior to the establishment of the USLSS, thousands of lives were lost at sea without hope of rescue. Joshua Marano's (2012) master thesis employs statistical and geospatial analysis to study the USLSS' effect on risk and wrecking patterns near Oregon Inlet, NC. Marano, similar to Huss, employs viewshed analysis to determine the extent of seascape visible to life saving stations and lighthouses. Shipwrecks within this viewshed were also depicted in densities, where concentrations of wreck sites and their proximities to life saving stations were recorded by means of heat mapping. This use of geospatial analysis provided a new spatial perspective to the USLSS compared to the wrecks over a seascape that they served.

Research Methodology

To conduct geospatial analysis for the whale fishery on Shackleford Banks, both historical and archaeological research were necessary. Several repositories across eastern North Carolina hold important documents about the people who lived on Shackleford Banks and participated in North Carolina's whale fishery. Since whaling on Shackleford Banks was opportunistic and not as advanced as the New England whaling enterprises, details regarding how whalers interacted with the geography and seascape are less readily available. Nonetheless, key information exists within oral histories with people who lived on Shackleford Banks or Harkers Island. Further details exist within United States censuses, land grants, newspaper articles, and port records described in the previous chapter.

Historical Research

Repositories such as the Core Sound Waterfowl Museum, the Outer Banks History Center, and State Archives of North Carolina contain several archival materials that depict how whalers conducted each step in the whaling process. Situated on Harkers Island adjacent to Shackleford Banks, the Core Sound Waterfowl Museum (CSWM) seeks to preserve the heritage and history of Harkers Island, Shackleford Banks, and the communities that exist within Core Sound. The CSWM's collection primarily features handmade duck decoys and artifacts from the communities it serves, including two harpoons donated by Shackleford Banks whalers (Figure 19). This collection houses several oral histories that contain interviews with people who lived and worked on Shackleford Banks that were either affiliated with the whale fishery or observed whalers in action. This assemblage of interviews is found within the museum's "Carolina Coastal Voices" project, which seeks to preserve the maritime heritage of the Outer Banks and Downeast region. Many of these people interviewed, including Stacy Guthrie, Orlandah Philips, Ken Eldridge, and Lettie Guthrie, discuss their experiences with whaling, life on Shackleford Banks, and the development of the Cape Lookout National Seashore.



FIGURE 19: Two harpoons donated to the Core Sound Waterfowl Museum. Both harpoons feature toggling mechanisms to fasten into a whale. Photographed by author.

The Outer Banks History Center is a regional archival research facility located in Manteo, North Carolina, and houses collections that pertain to coastal North Carolina. Although this repository contains a wealth of archival materials pertaining to the Outer Banks, information regarding Shackleford Banks and whaling in the Cape Lookout region is limited to *News and Observer* and *Carteret County News-Times* newspaper articles, and notes recorded by Captain Irdell Rose about Diamond City and the families that lived there (Salisbury 1954; Rose 1955; Guthrie 1956; Lynch 1969). However, this repository houses a large collection of maps that depict North Carolina's coast dating back to initial European explorations.

The State Archives of North Carolina (SANC) houses materials important to all aspects of North Carolina's history, with many satellite repositories, such as the Outer Banks History Center. Several colonial and state records contain information about the formative years of North Carolina's whale fishery (Saunders 1886; Clark 1907). The H.H. Brimley collection at the State Archives contains Brimley's own notes taken while witnessing the many fisheries that Shackleford Banks exploited. Curated by Eugene Odum, Brimley describes his personal observations on how whalers hunted, flensed, and tried whales, detailing the materials used and the filtration process employed to render whale blubber into finished oil (Brimley 1971). As the director of the North Carolina State Museum, Brimley also collected the skeletons of "The Mayflower Whale", which was hunted by captain Josephus Willis in 1874, and "Trouble the Whale", which washed ashore Wrightsville Beach in 1928.

Several maps and charts of Cape Lookout, Core Sound, and the North Carolina coast provided valuable information as to how the waters surrounding Shackleford Banks have changed over time, as well as how people have exploited fisheries in this region. The North Carolina Maps project of the State Archives of North Carolina has compiled the largest

collection of the state's maps. By combining the collections from not only the state archive, but also the University of North Carolina-Chapel Hill and Outer Banks History Center, the state archives have made over 1,500 maps and charts accessible online. Maps published by the United States Geodetic Survey, United States Coastal Survey, NOAA, and early surveys were georectified through ArcGIS pro, which assisted in marking preliminary historical areas to compare to the archaeological survey of Shackleford Banks.

Preliminary Identification of Potential Whaling Sites

Historical sources as well as oral histories were implemented to identify areas where whaling activities were most likely to occur. By analyzing the steps involved throughout the whaling process, the industrial landscape as described in the historical record becomes apparent. This analysis will aid in connecting archaeological, historical, and ephemeral sites into how the landscape of the right whale fishery existed on Shackleford Banks.

Spotting a Whale

Lookouts are described in interviews as natural features along Shackleford Banks. Although Other whaling stations employed formal lookouts, whalers on Shackleford Banks often spotted whales from hills or dunes, or occasionally while waiting on the beach (Guthrie 1978:7). The heights of hills and dunes were, and still are, constantly changing, as noted by William Tatham's survey of the North Carolina coast in 1806. While Tatham was tasked with finding a suitable location for Cape Lookout's first lighthouse, he encountered "Blinds Hill", the tallest hill in the Cape Lookout region, measuring 60 feet in height, surrounded by several other hills ranging from 25 feet to 47 feet (Tatham 1806). Tatham expressed concern that these hills might obstruct the light if the lighthouse were not built on top of Blinds Hill, however these features had moved or eroded before the lighthouse began construction (Stick 1958:309). The initial

lighthouse was established in 1812 and stood 107 feet tall but was deemed insufficient due to lack of visibility of the shoals, which provoked the construction of the current lighthouse in 1859 (Duggan et al. 2012). The height of Blinds Hill was employed as an example of a tall hill ideal for a lookout with a wide vantage point over the Cape Lookout harbor and the ocean slightly beyond. To understand the expansive perspective lookouts had access to, a viewshed analysis was performed for lookout dune projected to a height of 60 feet.

ArcGIS Pro's viewshed tool was employed for this viewshed analysis. The viewshed tool labels cells from surface elevation raster data with either a "1" or a "0" ("1" labels cells visible from the set observer locations, and "0" labels cells not visible from the set observer locations), which is compiled into a visual arc onto the base map (ESRI 2024a). Figure 21 depicts the tool's parameters required to produce a viewshed. For this viewshed analysis, an existing dune near Diamond City Hills was selected to portray a viewshed over Cape Lookout. This dune, situated on the south shore of Shackleford Banks near where Figures 20 and 23 indicate the location of Diamond City, measures 19 feet in height. Figure 20 labels this dune as "Lookout Dune" between 1850 and 1890, indicating that it was still a significant feature in the landscape of Shackleford Banks. This dune was used as the point of observation from which the viewshed is projected because it matches the area where Tatham described Blinds Hill. The observer's height was input as 41 feet, which is the difference between the existing 19-foot height of the dune and the 60-foot height of Blinds Hill. An additional six feet were added to the observer's height to replicate a person standing on the hill, a measurement that is slightly taller than the average man in 1863-1864 (Hathaway 1959:181). By using a height taller than the average male height for this period, the resulting viewshed includes an area closer to the maximum potential viewshed

available to people stationed at lookouts. Figure 22 depicts the viewshed from a hill measuring 60 feet tall where Blinds Hill or Lookout Dune once stood.

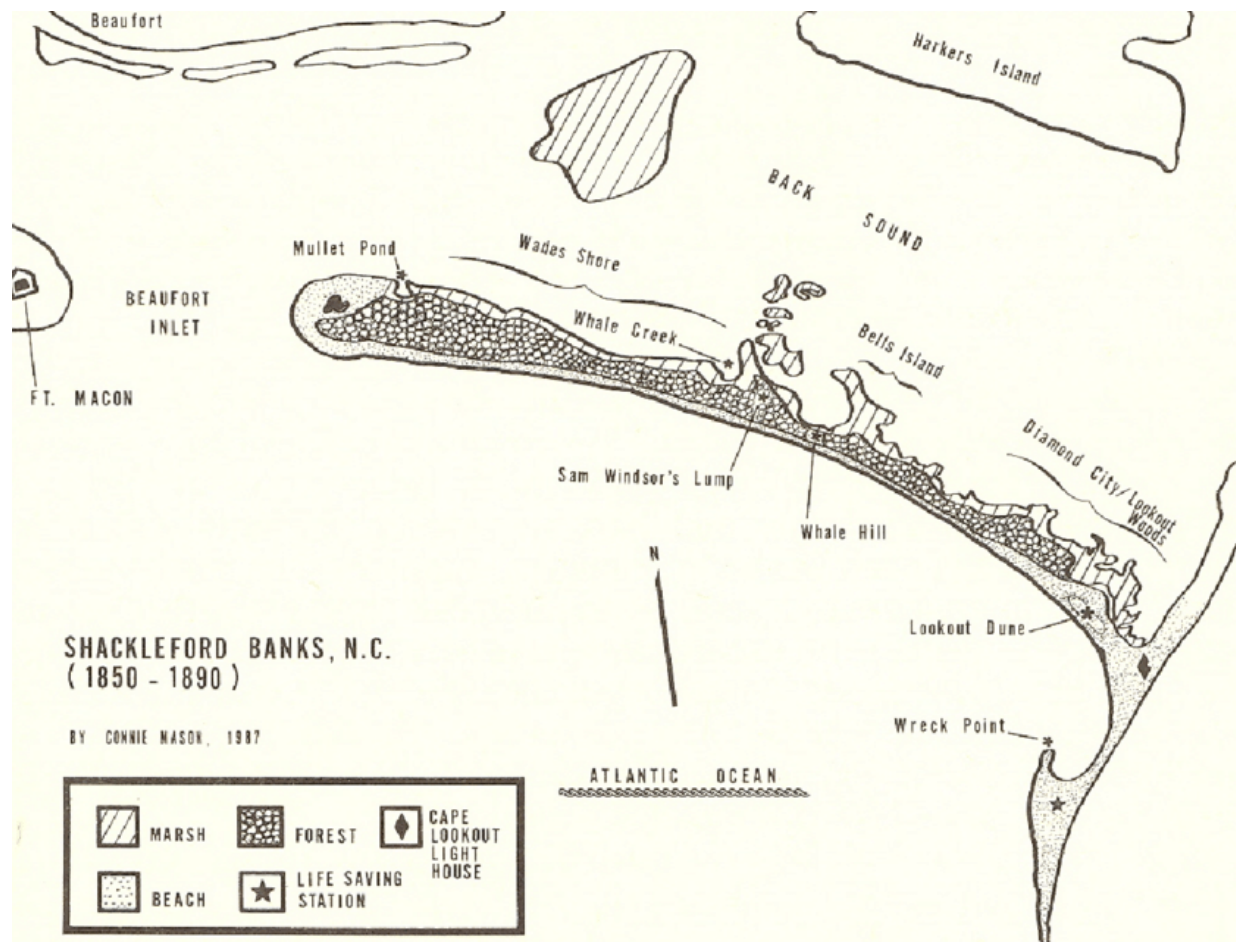


FIGURE 20: Map of Shackleford Banks fishing and whaling communities 1850-1890 (map courtesy of Connie Mason, National Park Service, 1987).

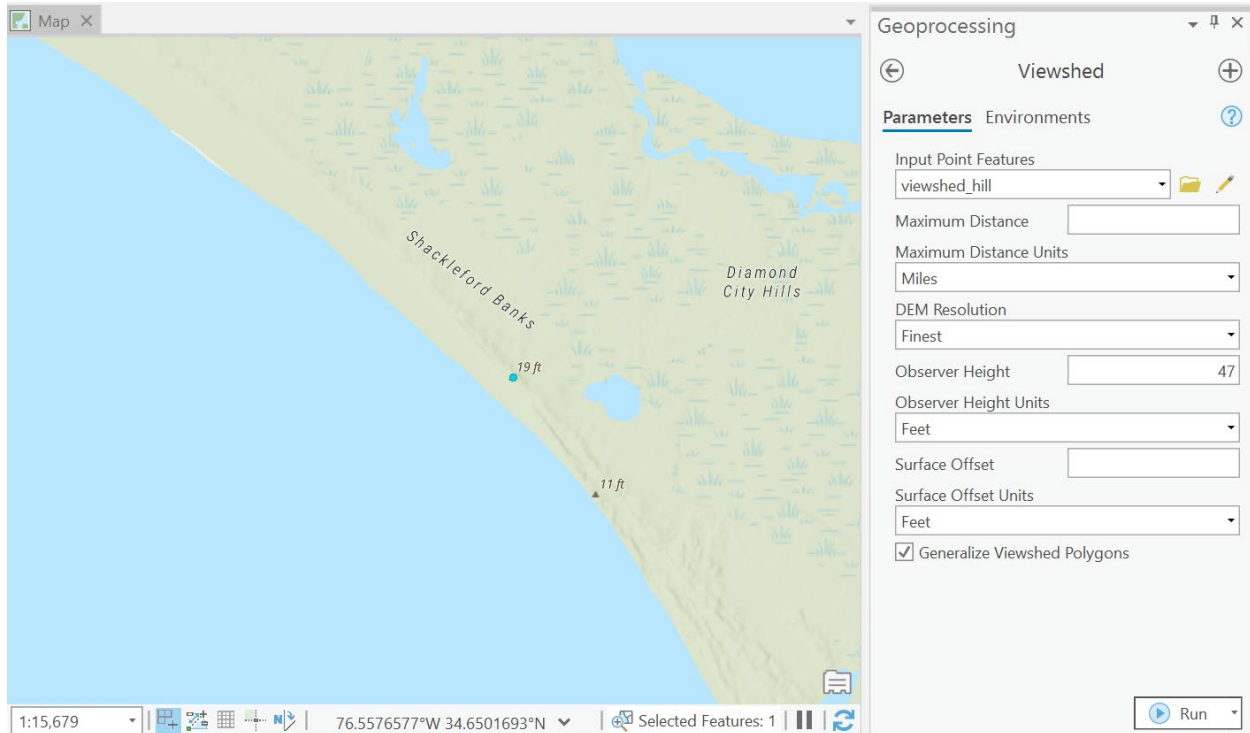


FIGURE 21: Screenshot of the parameters for the viewshed tool in ArcGIS pro, ESRI. Image created by the author.

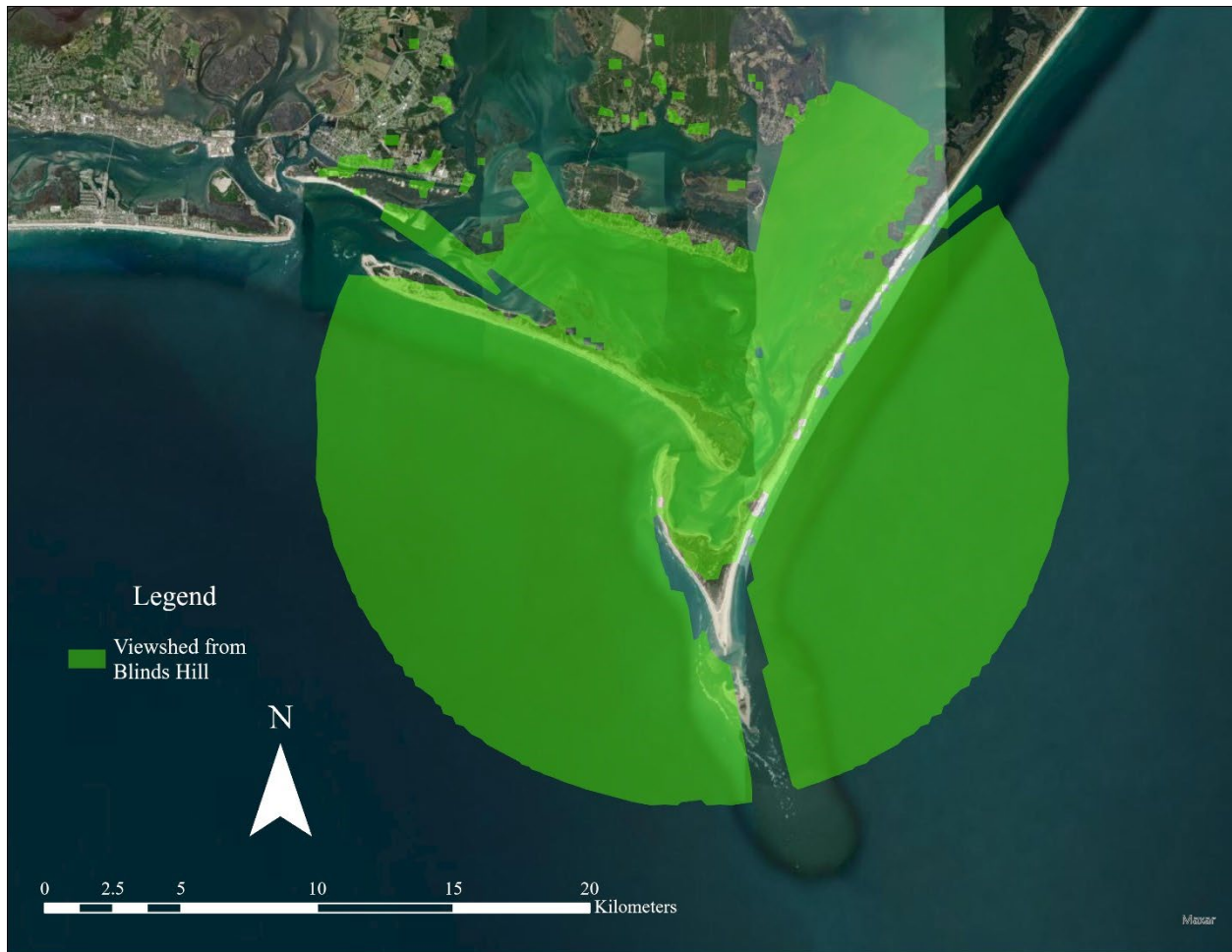


FIGURE 22: A viewshed over Cape Lookout from a projected height of 66 feet at the possible site of Lookout Dune. Image created by the author via ArcGIS Pro, ESRI.

Launching Boats

Boats were loaded with tackle on shore near whaling camps, ready to be launched at the sighting of a whale. When Whalers first settled on Shackleford Banks, their camps were mapped on the south-facing shore of Shackleford Banks where Barden Inlet currently exists. Figure 6 Depicts these camps as early as 1764, when captain Jacob Lobb surveyed the harbor of Cape Lookout (Lobb 1764). Eventually, as Diamond City grew in population, whalers and fishers moved westward to Wade Shore, Whale Creek, and Mullet Pond to exploit seasonal fisheries more easily. An interview with Ken Eldridge describes pilot boats ready on the southern shore adjacent to John Lewis' family neighborhood (Eldridge 1986:10). An interview with Orlandah

Philips also describes Joe Lewis' neighborhood where a breakwater exists east of Mullet Pond, not to be confused with John Lewis' neighborhood near Whale Creek (Philips 1980:27). Figure 23 depicts Ira Lewis' recollection of the neighborhoods on Shackleford Banks. These interviews indicate that whaling crews prepared their boats as close to the harbor as possible, instead of spending time to launch them near their camps on the opposite shore.

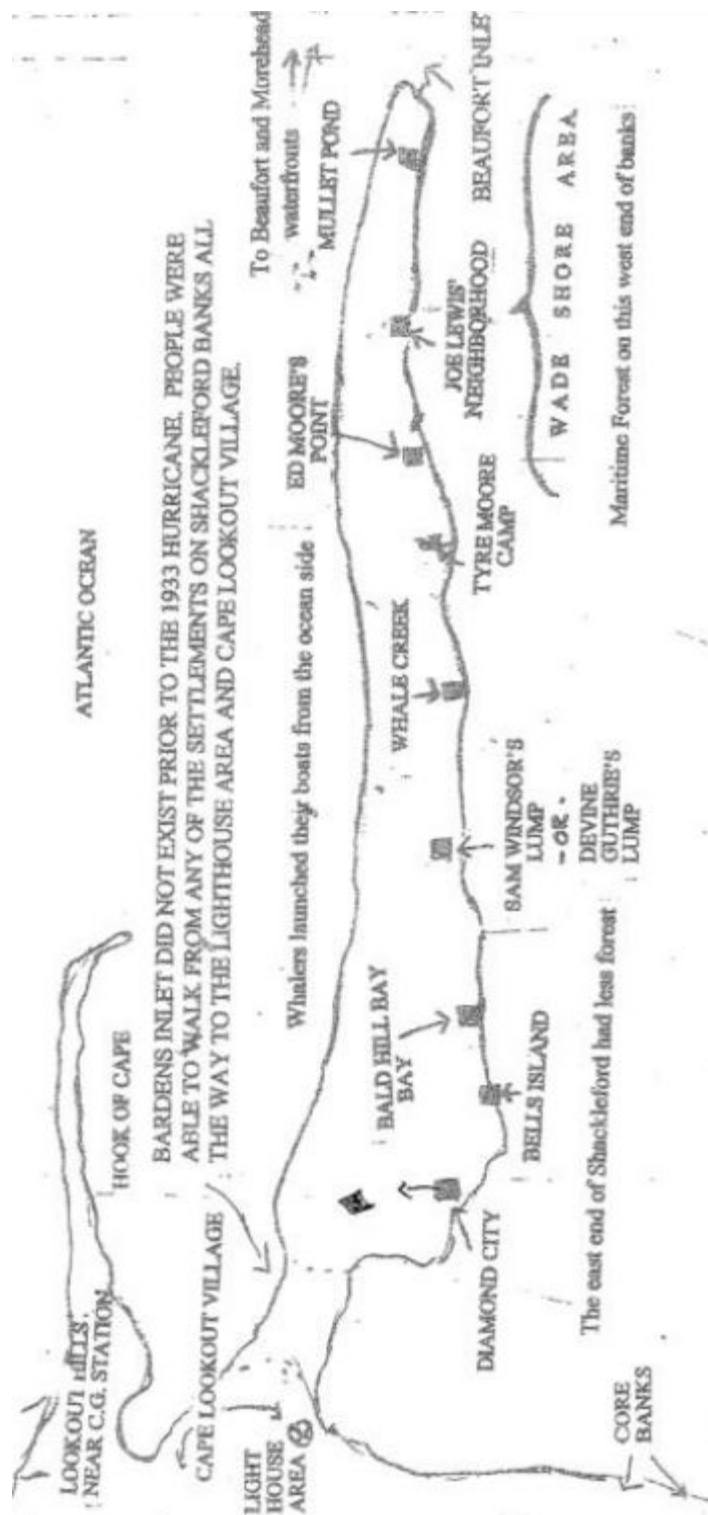


FIGURE 23: Hand drawn map by Ira Lewis, a descendant of Diamond City whalers, approximating the locations of sites on Shackleford Banks in the mid-1880s (Tursi 2014).

To better understand where whaling camps might have existed, Appendix A consists of historic charts that depict houses and camps across Shackleford Banks. These charts and maps were georectified in ArcGIS pro so that the houses and camps could be compiled onto a modern satellite image of Shackleford Banks. A feature class was created for these dwellings, and each mark symbolizing a dwelling from Appendix A was recorded within that feature class. Figure 24 depicts these houses and camps compiled onto a modern satellite image of Shackleford Banks. By mapping these locations, areas described by Ira Lewis (Tursi 2014), Eldridge (1986) and Philips (1980) may be located, therefore raising the probability of finding archaeology related to whaling camps near these locations.



FIGURE 24: A compilation of houses marked on maps from Appendix B created on ArcGIS Pro, ESRI. Image created by the author.

Flensing, Trying Out, and Barreling

Rendering a whale from a carcass to packaged product requires weeks of labor, as well as a wide array of tools. Brimley's description of a tryworks on Shackleford Banks and depiction in Figure 10 suggests that brick structures were constructed near camps (Brimley 1894:6-7). Tools and trypots may have been removed from the site and used in other applications after processing a whale, however a brick structure would most likely have remained at the trying site. Such structures most likely existed at the location of whalers' huts in Figure 6, Joe Lewis' neighborhood at Mullet Pond, and John Lewis' neighborhood at Whale Creek where captains of whaling crews settled (Philips 1980:23).

Archaeological Research

East Carolina University's Maritime Studies program conducted archaeological research on Cape Lookout and Shackleford Banks during the summer field school of 2021. Prior to archaeological surveying, permits were acquired in accordance with state and federal law. Since the Cape Lookout National Seashore encompasses Shackleford Banks and Cape Lookout, an approved "Scientific Research and Collecting Permit" was obtained from the National Park Service. This permit detailed the non-disturbance nature of the terrestrial survey, as well as the NPS conditions and restrictions, and a summary of permitted field methods. The boundaries of the terrestrial research area are depicted in Figure 25. An approved permit was also acquired from the Underwater Archaeology Branch of the North Carolina Office of State Archaeology, which permitted non-disturbance archaeological research in Back Sound and Cape Lookout Harbor vicinity. The boundary of the submerged research area is depicted in Figure 26. Both permits were kept available during field work in the event that an NPS or state official would need to inspect them.

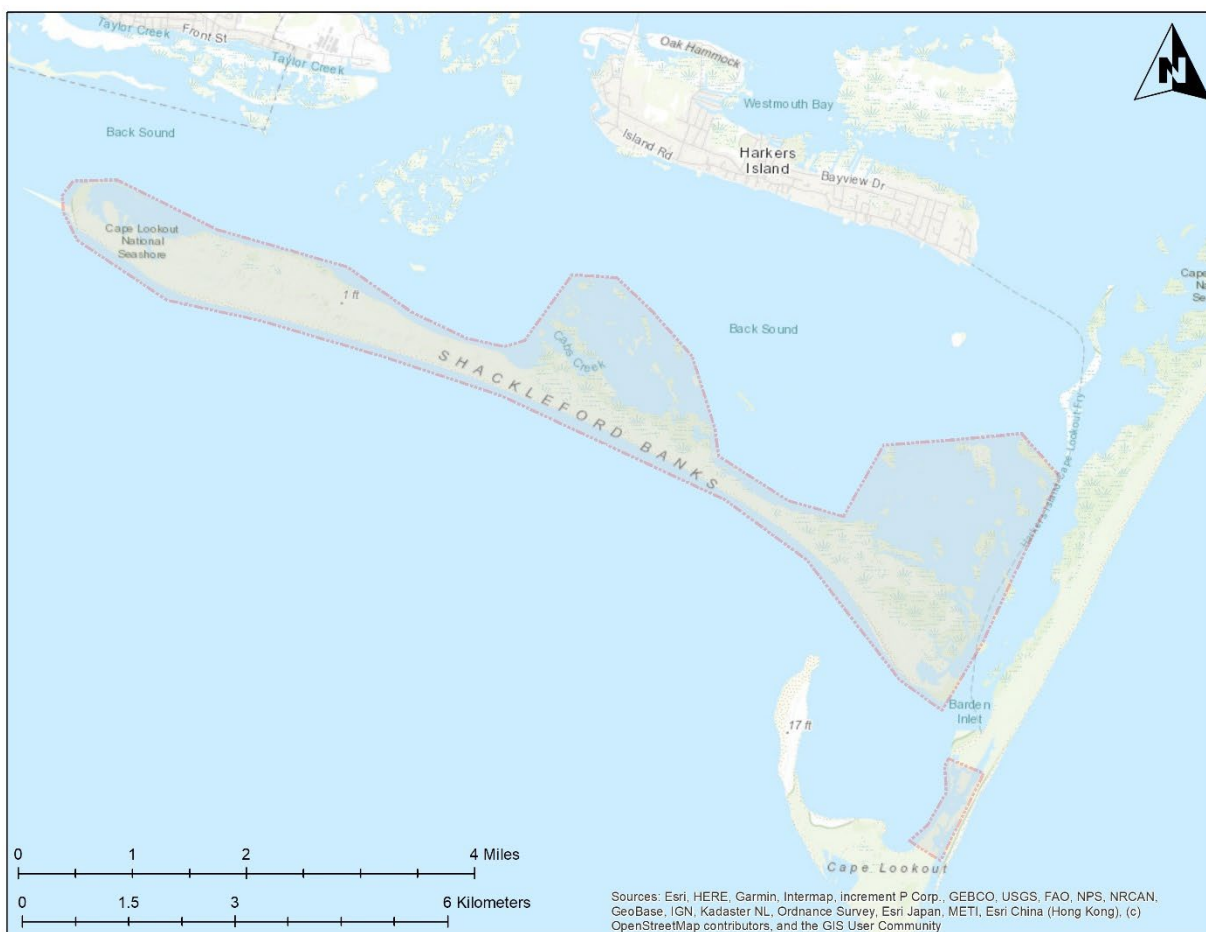


FIGURE 25: Permitted terrestrial survey area for ECU's Program in Maritime Studies summer field school of 2021. Image created by Dr. Nathan Richards.

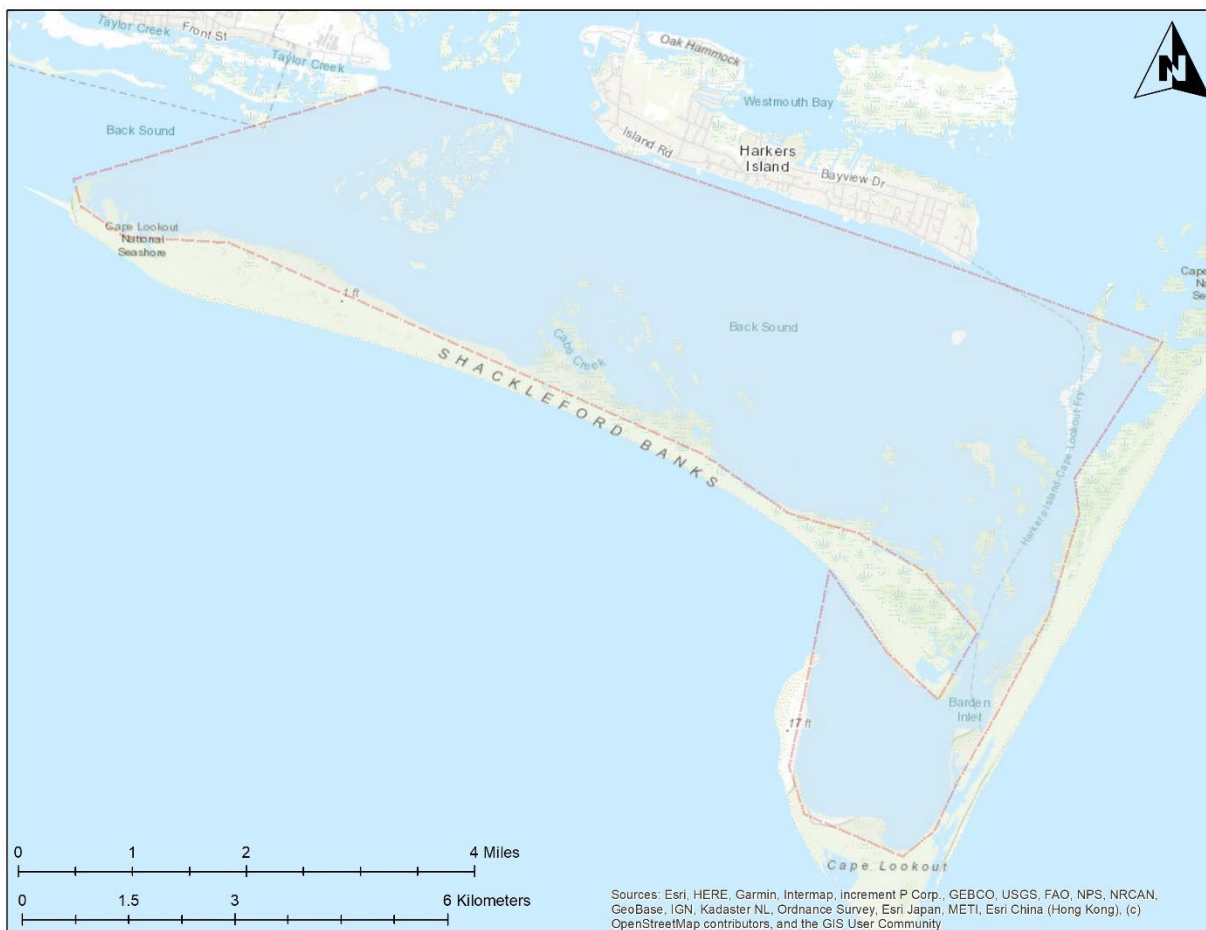


FIGURE 26: Permitted submerged area for ECU’s Program in Maritime Studies summer field school of 2021. Image created by Dr. Nathan Richards.

The field school focused on several areas of interest to collect archaeological data. Several wreckage sites were documented on the harbor-facing shore of Core Banks that were suspected to be the remains of *Seychelle*, as well as a site referred to as the “Radford Wreck”. Students also performed a magnetometer survey over Barden Inlet, which was once land connecting Shackleford Banks to Cape Lookout. Figure 27 depicts the resulting magnetometer data, which identified nine potential sites of interest. These targets were investigated, resulting in no archaeology documented among these sites.

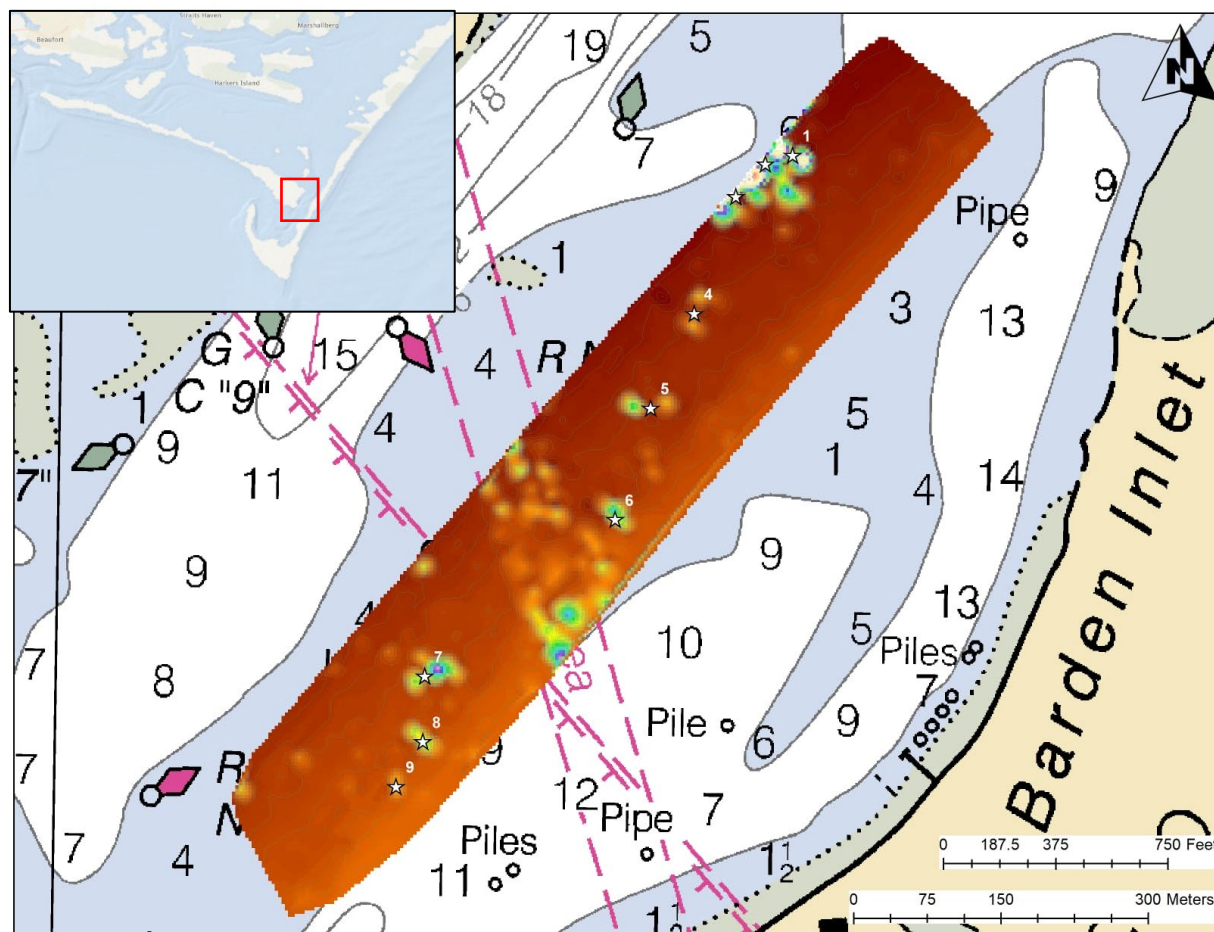


FIGURE 27: The resulting magnetometer data recorded during ECU's Maritime Studies summer field school of 2021. Image created by Dr. Nathan Richards.

A surface survey was conducted across the entire shore of Shackleford Banks to identify and document any visible artifacts. To efficiently conduct the survey, a group ranging between four and six surveyors walked abreast along the beach over the course of four days. The group was equipped with a GPS and cameras to document any visible artifacts or archaeological features. Following field work each day, these locations and photos were organized into a spreadsheet, as well as any relevant notes. Since the field school was not permitted to excavate by any means, only artifacts visible on the surface of the beach or in the surf were documented. Various materials, including brick, wood, nails, ceramics, metal car parts, and glass bottles, were

found throughout the entirety of the survey. Provided that this area has experienced extensive hurricanes and turbulent weather, as well as constant tourism, the locations and positions where artifacts and features were found are not necessarily in-situ. After the field school was completed, these artifacts were categorized and applied to a basemap in ArcGIS pro to identify any apparent distribution patterns. A bias exists in that artifacts were only recorded along the route of the survey, which followed primarily the shore. The interior of the island was not surveyed except for an area in the eastern portion of the island.

Artifact Processing

In order to interpret the distribution of artifacts recorded, each artifact was categorized into one of six categories: construction materials, industrial artifacts, domestic artifacts, modern artifacts and objects, unidentifiable metal objects, natural features, and Miscellaneous artifacts. In total, 318 artifacts and sites were recorded and categorized. A deeper extrapolation for the reasoning behind how these artifacts were identified and classified can be found in the following chapter.

Conclusion

This chapter outlined previous examples of geospatial analysis in archaeology, repositories that contain historical documentation of Shackleford Banks and the Cape Lookout right whale fishery, and the methodology employed to analyze artifacts recorded during the survey of Shackleford Banks. The following chapter extrapolates artifact categorization, and implements the methodology described in this chapter to geospatially analyze these artifacts to identify spatial patterns that may relate to the right whale fishery.

Chapter Five: A Geospatial Analysis of the Shackleford Banks Right Whale Fishery

Introduction

This chapter seeks to analyze the historical, cartographic, and archaeological data presented previously in this thesis through a geospatial lens. By inspecting this data, patterns of occupation and industry may become apparent. Ultimately, the goal of this chapter is to determine whether a geospatial analysis of Shackleford Banks can highlight areas related to the Cape Lookout right whale fishery.

Artifact identification and Classification

Artifacts and features recorded from the 2021 survey of Shackleford Banks were identified and classified into seven distinct categories according to their material or apparent function. Each classification was sorted into subcategories to better interpret the artifact assemblage recorded for this survey. Appendix C lists each location recorded, their category and subcategory, a brief description, and a numeration labeling each location. Some locations are listed twice because a cluster of artifacts were observed together. These clusters were duplicated for categorization, representing one location across multiple categories. Table 4 displays the number of artifacts recorded in their respective categories, and figure 28 depicts artifact locations.

	Construction	Industrial	Domestic	Modern	Unidentified Metal	Natural Features	Miscellaneous
Total: 322	129	72	48	31	22	10	6

TABLE 4: Categories of artifacts recorded while surveying Shackleford Banks.



FIGURE 28: A map of artifacts recorded during ECU's Maritime Studies summer field school survey of Shackleford Banks. Image created by the author via ArcGIS Pro, ESRI.

Construction

Construction	Brick	Metal Nails and Fasteners	Planking	Stone	Timbers	Pilings
Total: 129	54	11	3	3	19	39

TABLE 5: Subcategories of construction artifacts recorded while surveying Shackleford Banks.

Construction artifacts were identified as materials associated with architecture or the construction of buildings. Although domestic artifacts and construction materials may exist in the same locations, a distinction was made between the two categories. Construction materials suggest locations where buildings and structures once stood, and domestic artifacts provide context as to which of these sites may have been houses, as well as other sites where houses could have been removed. Houses were built from local wood felled from the forest that existed on Shackleford Banks, as well as salvaged shipwreck timbers. These timbers were joined by trunnels, or wooden pegs, more often than nails, although nails may have been employed depending on availability (Barnes 2007:38). Bricks were utilized for hearths or wells, and possibly as footings for structures (Brimley 1894; Philips 1980). Structures were either destroyed by the series of hurricanes at the turn of the nineteenth century, moved to the mainland or other sheltered islands following the San Ciriaco Hurricane, or used as seasonal vacation or fishing houses until they were intentionally burned down prior the National Park Service acquiring Shackleford Banks (Stick 1958:311; Morris 2009:139). As Table 5 depicts, this category was further organized into subcategories, which comprised of bricks and brick fragments, metal fasteners, planking, stone, timbers, and pilings.



FIGURE 29: A map of the spatial distribution of Construction artifacts on Shackleford Banks. Image created by the author via ArcGIS Pro, ESRI.

Brick and Stone

Bricks and brick fragments comprised of 54 of the 129 construction artifacts recorded. Most of the brick artifacts, apart from two depicted in figures 30 and 32, did not contain mortar and were heavily deteriorated from exposure to sand and the ocean. Maker's marks, or any indication of their origins and ages were not observed, making it difficult to determine when and where these bricks were made. Bricks are depicted in Brimley's (1894) scene of whalers processing blubber, but bricks are also a common, versatile structural material that could have been employed in wells, support pillars, and hearths across the island. Three stones were also recorded, which may have been used alongside bricks as a structural material. These stones were recorded because Cape Lookout's geography does not contain many large stones, which suggests that these stones may have served as ballast brought to Shackleford Banks.

Two sites stood out compared to the locations of brick artifacts where structures may have once existed. The first site, depicted in figure 30, contained a large number of loose bricks in a mound with little vegetation coverage, although there were lush bushes and grasses surrounding the perimeter of the brick mound. When compared to the map of house locations extracted from cartographic sources (Figure 24), the location of this site exists in close proximity to the location of two houses west of Whale Creek. Figure 31 indicates the location of the site, as well as historic locations of houses in its vicinity.



FIGURE 30: Photo of a mound of bricks in a clearing near Whale Creek. Photo captured by Stephanie Sterling, June 16, 2021.



FIGURE 31: Location of the brick mound site and historic house locations within its vicinity. Image created by the author via ArcGIS Pro, ESRI.

The second site, depicted in figure 32, contains two portions of mortared bricks that resemble a broken structure. These fragments do not appear to have soot or burns from consistent use as a fireplace or tryworks, although this site was initially inferred to be a fireplace or fragment of a chimney. This site does, however, resemble the location of a well described by Orlandah Philips in an interview:

I says, ‘Do you know about that pile of brick down there, that’s about 50 feet from the dry sand on high water?’ And I said, ‘What was it, somebody’s chimney?’ He said, ‘No, it wasn’t,’ He says, ‘I know all about it.’ He said, ‘It was a well.’ He said, ‘Both of my

grandfathers.’ He says, ‘When I was a boy, I drank water out of that well many times.’ I said, ‘Well, where was the house?’ He said, ‘Off shore of that.’ And he said, ‘There was a garden off shore of the house.’ And where that offshore I’m talking about, right now on high water, you could run a boat there drawing ten foot of water, where his house was (Philips 1980:27).

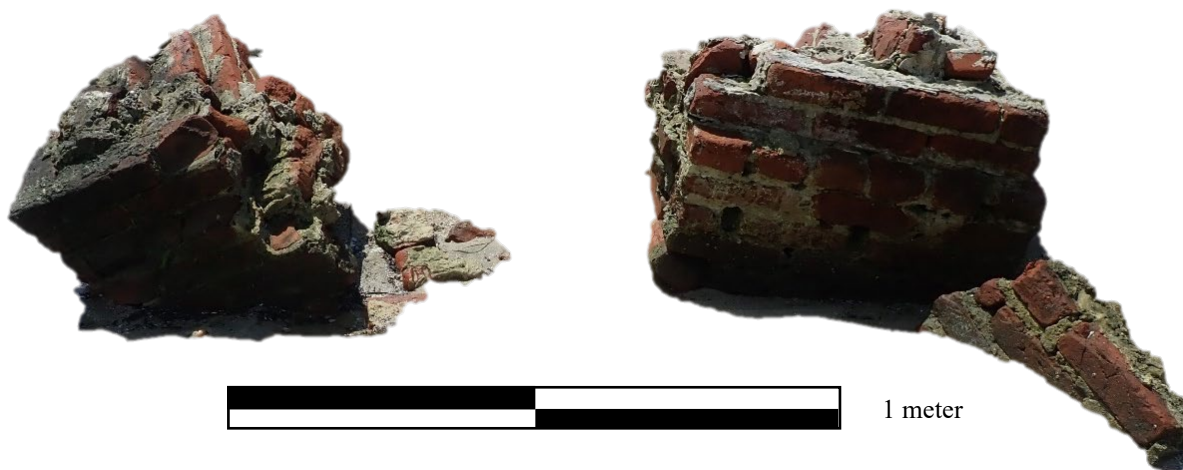


FIGURE 32: Photo of a brick structure near Mullet Pond with a scale bar measuring one meter. Photo captured by Jill Schuler, June 17, 2021.

Metal Fasteners

Eleven of the construction materials recorded were metal fasteners. These artifacts range between roofing tacks, nails, and wrought iron pegs. The exact purpose for which these items were intended is not clear, as they are heavily concreted, although characteristic points and nail heads can be recognized, as exemplified in figure 33. The approximate ages of nine fasteners can be determined from photographs, however, concretions cover the majority of each nail, causing difficulties in dating them to exact periods of manufacturing. Five nails appear to be either hand-wrought or early machine-cut, due to their inconsistent widths throughout the length of the nail. Hand forged nails have been manufactured since the early eighteenth century and continue to be

in use today in certain circumstances (Nelson 1968:2). Early machine-cut nails first appeared in the 1790's and ceased use in the 1830's when wire-cut nails became popular (Nelson 1968:4). Four nails appear to be modern wire-cut nails, which first appeared in the 1850's. These four nails have sharp points and a consistent width throughout (Nelson 1968:7).



FIGURE 33: Artifact 80: A wire-cut roofing tack. Photo captured by Jill Schuler, June 16, 2021.

Timbers

Houses and structures were constructed from either salvaged wood or felled trees from Shackleford Banks, suggesting that there would not be a uniform shape or species of wood to signal a distinct purpose for construction. 19 timbers were recorded that resembled milled or hewn wood for the purpose of construction, distinct from nine telephone poles categorized as modern artifacts. Figure 34 depicts a large beam with a square profile. This beam was heavily degraded from exposure to sand and weather. Several uniform holes can be found in pairs along the length of the beam, suggesting that it may have served as a support beam for a house. Since samples were not collected, the species and age of the wood are unknown. Three planks with

tongue and groove joinery were also recorded, where the edges of planks were carved to interlock with one another.



FIGURE 34: Artifact 135: A large, possibly structural, beam. Photo captured by Stephanie Sterling, June 24, 2021.

Pilings

32 sites were recorded with at least one piling utilized as a structural element of a building. Pilings were recognized as large wooden posts standing erect, with the bottom portion buried in the ground. Pilings employed for the structural support of structures were categorized separately from fence posts and dock pilings. These structural support pilings were identified either by the artifacts found nearby, or their location inland or near other pilings to form a square the size of a house. Seven of these sites contain burns on these posts, suggesting that they once supported houses that were burned down by their occupants.

Of the seven recorded sites containing burnt pilings, one site contained eight posts formatted in a square, most likely where a house once stood. Figure 35 depicts the site, although the three rear posts are not visible in the photo due to overgrown vegetation. When compared to cartographic house locations, this site appears to correlate with a house location Figure 36 depicts the site's location compared to cartographic house locations. Two houses once existed within a short radius of this burnt site, but due to the margin of error that these hand-drawn historical maps contain, it would be impossible to know whether the burnt pilings correlate with these two houses.

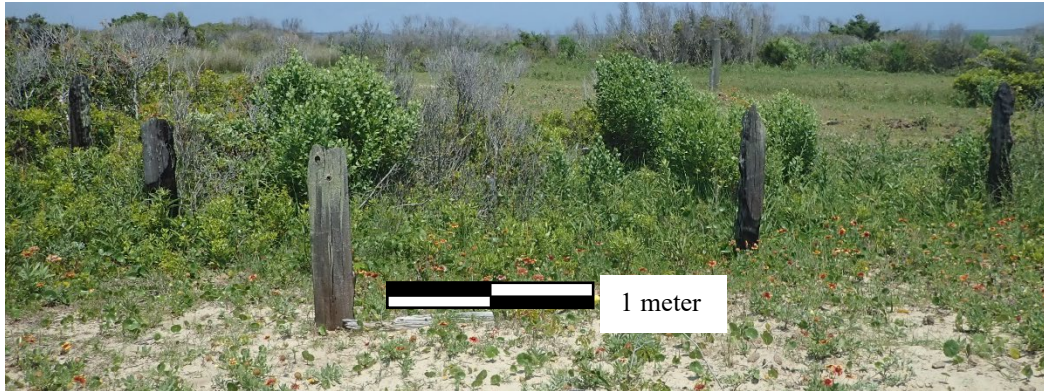


FIGURE 35: Location 116: Burnt pilings erected in the formation of a house. Photo captured by Michaela Hoots, June 19, 2021.



FIGURE 36: Historical house locations compared to the pilings at location 116. Image created by the author via ArcGIS Pro, ESRI.

Industrial

Industrial	Piling	Dock/Jetty	Barrel	Fence Post	Miscellaneous	Timber
Total: 76	34	7	14	18	2	1

TABLE 6: Subcategories of Industrial artifacts recorded while surveying Shackleford Banks.

Artifacts that indicate an association with industries at Cape Lookout were categorized as “Industrial.” These items include barrels, fences and fence posts, docks, and dock pilings. In total, 72 artifacts were recorded that potentially served an industrial purpose. Table 6 depicts the numbers of artifacts for each subcategory.



FIGURE 37: A map of the spatial distribution of industrial artifacts on Shackleford Banks. Image created by the author via ArcGIS Pro, ESRI.

Barrels

14 barrels were recorded during the survey of Shackleford Banks. Although the barrels are heavily decayed and concreted with oyster shells, their sizes may indicate what they may have stored. Hogsheds, measuring approximately 30 inches in diameter and 48 inches tall, were used to store and ship tobacco, which were then reused to cask whale oil (Brimley 1894; Stick 1958:191; Simpson and Simpson 1988:19; Holcomb 2009). The barrels recorded on Shackleford Banks appear to have hoop diameters ranging between about 50 and 75 centimeters, or 20 inches to 30 inches. Barrels with diameters near 20 inches most likely held beer, wine, dry goods, or gunpowder (Smith 2009:11). Figure 38 depicts a barrel with wooden slats still in place, located on the eastern portion of Shackleford Banks facing Core Sound. 13 barrels were recorded near this location, while only one barrel was recorded near Whale Creek. Figure 39 depicts what might be the staves of a barrel emerging from the shore at Whale Creek.



FIGURE 38: artifact 170: A deteriorated barrel partially buried in sand. Photo captured by Lydia Downs, June 24, 2021.



FIGURE 39: Artifact 107: The staves of a deteriorated barrel emerging from the shore at Whale Creek. Photo captured by Jill Schuler, June 16, 2021.

Docks and Jetties

Two docks and three potential jetties were recorded throughout Shackleford Banks. In 2010, the NPS published a technical report detailing known erosion control structures surveyed throughout its national seashores (NPS 2010). This survey reported three structures near Shackleford Point on the western portion of the island, mapped in Figure 40, which is currently landlocked. The jetties surveyed by the Maritime Studies field school of 2021 were located on the eastern portion of the island but may be piles of ballast stones or the remains of stone structures.

The dock structures, located on the eastern portion of the island on the harbor-facing shore, may relate to the fishing or whaling industries conducted throughout Cape Lookout. In conjunction with the presence of barrels and houses throughout this area, these docks are most likely associated with the island's industrial epicenter.

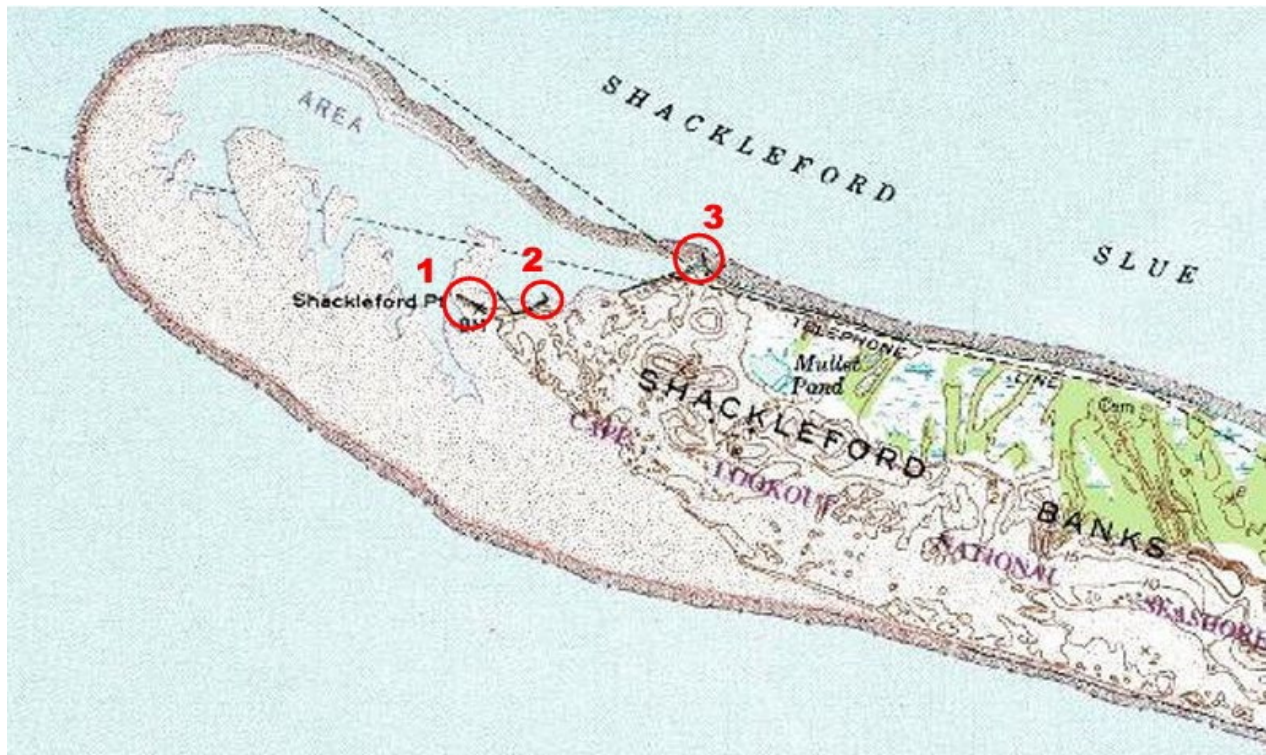


FIGURE 40: Three erosion control structures constructed on Shackleford Banks in or prior to 1882, surveyed by the NPS in 2010 (NPS 2010:41).

Fences

Fourteen fence posts, fenced areas, and pens were recorded during the survey. While fences were constructed around houses to keep roaming livestock away from vegetable gardens, pens were also employed to round up wild ponies. Ponies were corralled twice annually in May and July to control the population of horses on the island, as well as sold elsewhere for profit, however the specific dates when these fences were constructed and ponies rounded up are not recorded (Stick 1958:90). These events occurred prior to the NPS acquiring Cape Lookout, and potentially as early as permanent residents settled on Shackleford Banks.

Industrial Timbers

One single location was recorded as an industrial timber site. The shape of a boardwalk is evident in Figure 41, with several slats laid perpendicular to larger supporting timbers. This

structure was not categorized with the industrial docks as it does not appear to be in-situ and may have drifted into its current location from a storm or high tide.



FIGURE 41: Artifact 134: The remains of a partial boardwalk. Photo captured by Stephanie Sterling, June 24, 2021.

Industrial Pilings

Industrial pilings were categorized separately from construction pilings due to their apparent relation to industries. As context for these pilings was limited to a comment mentioning their apparent association with a dock or formation in a dock-like structure, their locations assisted in providing further context. 34 pilings were recorded along the sound-facing shore of Shackleford Banks. 15 of these locations contain comments relating them to either docks, or mention pairs or lines of pilings.

Miscellaneous Artifacts

Two miscellaneous industrial artifacts were recorded. The first artifact was labeled as a scraper handle. Unfortunately, no photo was taken of this item and no further context was provided. The second miscellaneous industrial artifact was a concretion of oysters in the formation of a dock. Figure 42 depicts the concretion in the surf, with two lines of potential pilings.



FIGURE 42: Artifact 87: An oyster concretion formed over what is potentially a dock. Photo captured by Jill Schuler, June 16, 2021.

Domestic

Domestic	Ceramic	Glass	Bottles	Miscellaneous
Total: 48	21	19	5	3

TABLE 7: Subcategories of domestic artifacts recorded while surveying Shackleford Banks.

Artifacts categorized as “Domestic” include items and materials found within a household. As depicted in Table 7, domestic artifacts observed during the survey consist of 48 artifacts and sites. As stated in the previous section, domestic artifacts and construction materials may exist simultaneously, potentially indicating the site of a house. Subcategories for domestic artifacts include ceramic sherds, glass shards, bottles and fragments of bottles, and a miscellaneous category containing a single shelf bracket.



FIGURE 43: A map of the spatial distribution of domestic artifacts on Shackleford Banks. Image created by the author via ArcGIS Pro, ESRI.

Ceramic

Fragments of ceramic employed as cookware, tableware, or other vessels comprised of 21 locations of the recorded domestic artifact category. Ceramic materials consisted of stoneware, earthenware, and terra cotta. Makers marks were visible on four of these fragments, which assists in indicating the date and manufacture of these ceramics. Two sherds appeared to be native American net-impressed vessel fragments. This form of decoration first appeared around 400 BCE during the Middle Woodland period, where a piece of fabric or net would be pressed against clay before firing, resulting in a pattern similar to the sherd in Figure 44. This specific piece would be impossible to date more precisely without the employment of stable isotope analysis, as the decorative net-impressed style was prevalent as early as 400 BCE and lasted until 800 CE, and beyond in some locations (Herbert 2003:5-8).

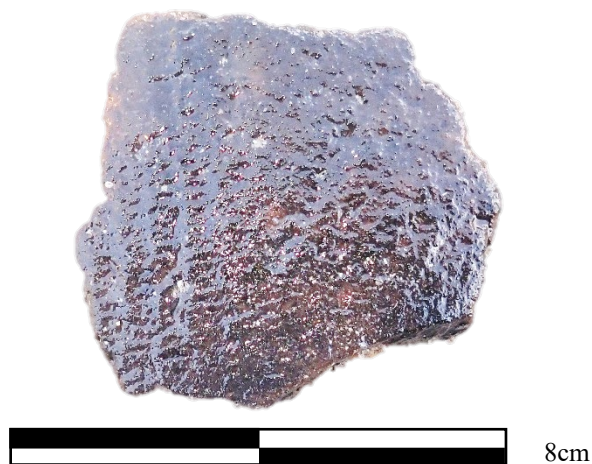


FIGURE 44: Artifact 40: Woodland fabric-impressed ceramic sherd. Photo captured by Stephanie Sterling, June 16, 2021.

several sherds of earthenware comprise of shell-edged pearlware, which has a faint blue sheen over white ceramic from the presence of cobalt in its glaze, and an edge embossed with light lines. The edge is painted blue, which bleeds into the embossed decoration. Scalloped edge

designs of pearlware were manufactured in England and date to 1775-1860, and the sherd depicted in figure 45 with a flat edge dates to 1830-1860 (Magid 2010:C-24).



FIGURE 45: Artifact 101: Scalloped edge pearlware dating to 1830-1860. Photo captured by Jill Schuler, June 18, 2021.

Maker's marks were visible on four of the ceramic sherds. Although no complete maker's marks were visible, fragments and partial marks aided in locating the manufacturer and date for each piece. One sherd of creamware, depicted in figure 46, shows a partial mark with the word "WARRANT" within an ellipse, and an intricate design within the ellipse. This mark resembles that of the Maryland Pottery Company, which marked creamware with the illustrated mark depicted to the right of the sherd in Figure 46 between 1880 and 1892 (Barber 1904:147).

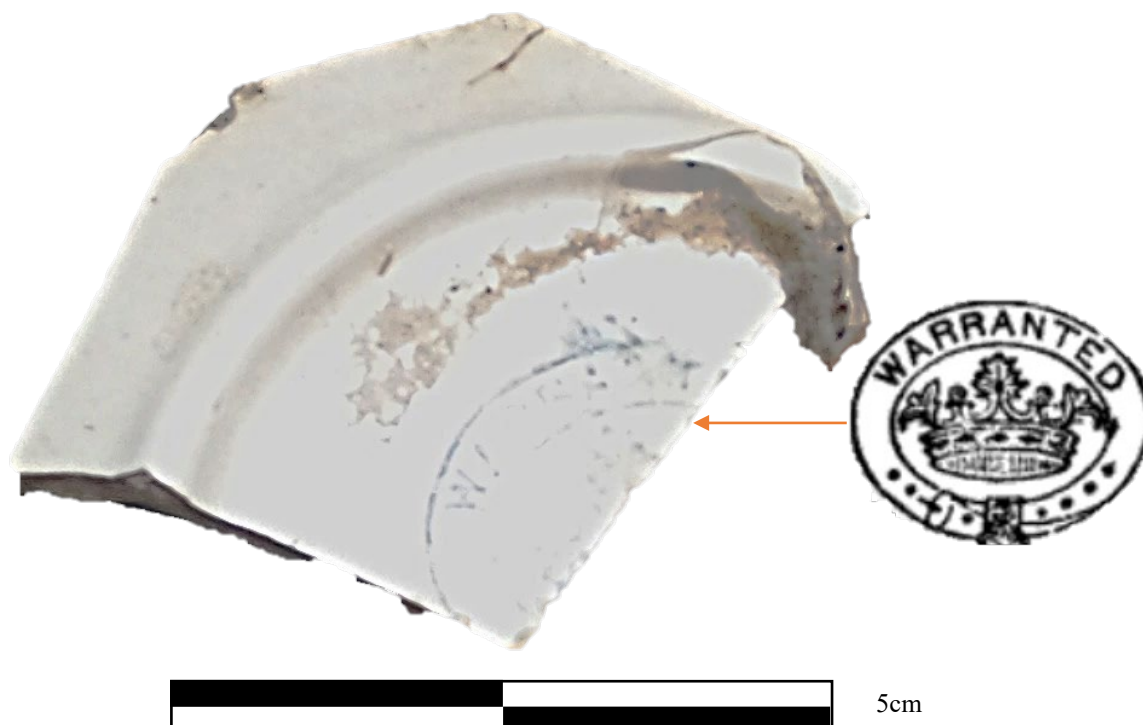


FIGURE 46: A creamware sherd with a visible maker's mark (left), and a recreation of the maker's mark (right) (Barber 1904:147). Photo captured by Dr. Raupp, June 24, 2021.

Another maker's mark contains the word "CHINA" over the tail of a lion. Beginning in the 1870s, American potters stamped their ironware with marks featuring variations of the British royal coat of arms to replicate british ceramics of higher quality. Eventually, as the quality of American ironware increased, potters began to stamp their ceramics with an eagle, some even going so far as to depict an eagle attacking a british lion (Birks 2016). Figure 47 depicts the partial mark, accompanied by a depiction of the complete maker's mark.



FIGURE 47: A graniteware sherd with a partially visible maker's mark (left) accompanied by a depiction of the complete maker's mark (right) (Birks 2016). Photo captured by Dr. Jason Raupp, June 24, 2021.

Two other maker's marks were partially visible. One reads "St....Fine....Japan 103" which may originate from St. Regis Fine China of Japan, and 103 indicates the style of ceramics. The final maker's mark reads "Granite...P...Co.", which resembles a logo used by Edwin Bennett Pottery Company of Baltimore Maryland between 1892 and 1895 on semi-granite porcelain wares (Barber 1904:146).

Glass

A total of 14 window or decorative glass shards were recorded during the survey. Five of these glass shards were melted, which suggests that they may have been melted from house fires. The colors of glass were only recorded for two locations: one with milk glass, and one with solarized amethyst (purple). Dating the milk glass would be impossible, as there is no photograph or further information for this artifact. However, milk glass was commonly used to manufacture cosmetic and toiletry bottles between the 1870's and 1920's (Lindsey 2024).

One location contained three shards of purple glass from a solarized amethyst vessel. This type of glass was manufactured with manganese added to naturally iron-rich sand to produce a clear and colorless result. When exposed to sunlight over a long period of time, the glass transforms from clear to an amethyst color. This process was employed in domestic glassware and window glass as early as 1865 and until the 1920's (Lockhart 2006:45, 54). Figure 48 depicts two of the three shards that have turned purple from extended exposure to sunlight.



FIGURE 48: Artifact 122: Solarized amethyst glass shards. Photo captured by Lydia Downs, June 24, 2021.

Bottles

Eleven locations containing bottles were recorded in total. Each of these locations were located along the shore of Shackleford Banks facing the sound, with the highest concentration located on the eastern portion of Whale Creek. After further investigation, six bottles were categorized as modern, as they post-date the period when whalers were active at Cape Lookout. Only one photograph was taken of a bottle dating to the nineteenth century. Figure 49 depicts a small cobalt blue glass bottle, which closely resembles a medicinal *Bromo-Seltzer* bottle that was manufactured between 1890 and 1928 (Lindsey 2024).



FIGURE 49: Artifact 102: A cobalt blue glass bottle, possibly a medicinal *Bromo-Seltzer* bottle dating to 1890-1928. Photo captured by Jill Schuler, June 18, 2021.

Miscellaneous

Three artifacts were categorized as miscellaneous domestic items. The heel of a shoe was recorded with visible nail holes around its perimeter (Figure 50). Its material was not recorded, which makes dating the heel difficult. Leather soles have been manufactured in the United States as early as the first European settlers arrived and continue to be manufactured today (Shannon 1932:252, 255). Rubber heels, however, were first patented in 1899 by Humphrey O'Sullivan of Lowell, Massachusetts (O'Sullivan 1899). Both materials are plausible, but further investigations would be impossible, as the items surveyed were not collected.



FIGURE 50: Artifact 139: The heel of a shoe. Photo captured by Stephanie Sterling, June 24, 2021.

A metal shelf bracket and hinge were also categorized as miscellaneous domestic artifacts. Although the exact use of this hinge is unknown, as it is heavily concreted, it most likely served as a door hinge to a house. Figure 51 depicts a photograph of the concreted hinge.



FIGURE 51: Artifact 136: A concreted door hinge. Photo captured by Jill Schuler, June 18, 2021.

Modern

Modern	Utility Poles	Car Parts	Fence	Bottle	Road	Miscellaneous	Marker
Total: 31	9	9	1	6	2	2	2

TABLE 8: Subcategories of modern artifacts recorded while surveying Shackleford Banks.

Modern artifacts were categorized, but ultimately omitted from archaeological analysis due to their absence during the period when whalers were active on Shackleford Banks. To ensure that these artifacts were not associated with the whaling industry or the period when whalers were active, dating these artifacts was crucial. Items identified as modern include telephone poles, cars and car parts, bottles, geodetic and datum markers, and other miscellaneous items. Table 8 depicts the subcategorizations for modern artifacts as well as their quantities.



FIGURE 52: The spatial distribution of modern artifacts on Shackleford Banks. Image created by the author via ArcGIS Pro, ESRI.

Telephone Poles

Many telephone poles were erected during the 1950s and 1960s across Cape Lookout and Shackleford Banks, nine of which were recorded in the initial survey (NPS 2005:Two-16).

Figure 53 depicts an erect utility pole, which was identified by its round profile and tall height.

Utility poles are distinct from pilings in that their height, or length, extends beyond the length of a fence post or supporting structure for a house.



FIGURE 53: Artifact 109: A utility pole erected after permanent residents left Shackleford Banks. Photo captured by Lydia Downs, June 19, 2021.

Cars and Car Parts

Nine recognizable car parts were recorded in the survey. Cars were introduced haphazardly across Cape Lookout and Shackleford Banks as an attempt to control erosion or block sand from burying camps throughout the 1950s, 1960s, and 1970s, which has left behind a debris field of rusted metal fragments (Godfrey and Godfrey 1976:133). Figure 54 depicts the remains of a car, including tires and a chassis, surrounded by other various metal concretions. An array of unidentifiable metal fragments recorded in this survey may also correlate with the debris field noted by Godfrey and Godfrey (1976).



FIGURE 54: Artifact 116: The remains of a car in the surf of Shackleford Banks. Photo captured by Jill Schuler, June 16, 2021.

Bottles

Bottles recorded during the survey included important markings to assist in dating each piece. The most common bottle observed, depicted in figures 56 and 57, was an amber Clorox bottle with outlined letters spelling “CLOROX” across the top, and a grained texture down the label panel. This Specific bottle dates between 1951 and 1954, which post-dates the departure of permanent residents from Shackleford Banks (thecloroxcompany.com). Two bottles included the statement, “Federal law forbids the sale or reuse of this bottle”, which was required by law beginning January 1, 1935. This statement was mandated to discourage the reuse of bottles for homemade alcohol following the repeal of the U.S. national alcohol prohibition (Lindsey 2024). The bottom of a Hiram Walker and Sons, Ltd. Whisky bottle was also found, which possibly dates to 1907. Figure 55 depicts the bottom of this bottle, which marks the size of the bottle as two liters (2L), the date as 1907 (7), and Canada as the bottle’s place of origin.



FIGURE 55: Artifact 64: The bottom of a Hiram Walker and Sons bottle manufactured in 1907. Photo captured by Stephanie Sterling, June 16, 2021.



FIGURE 56: Artifact 110: The bottom of a Clorox bottle dated to 1951-1954. Photo captured by Stephanie Sterling, June 16, 2021.



FIGURE 57: Artifact 110: A Clorox bottle dated to 1951-1954. Photo captured by Stephanie Sterling, June 16, 2021.

Geodetic/Datum Markers

Two markers were recorded that appear to be markers for geological surveys. The first marker contains a bronze disc with an inscription that reads, “U.S. Coast & Geodetic Survey Triangulation Station” with a triangle in its center. This disc is placed on a ceramic pipe filled with concrete, which matches the description of the USGS triangulation station ‘Jack’ monumented in 1933. This station is described as “a standard bronze disc in the top of tile” in 1933, and later as “a bronze disc set in concrete at the center of the top of tile” in 1942 (NGS 2024).

The second marker appears to be a NPS marker with a steel disc set in a PVC pipe. This disc contains the inscription, “NPS BI-CALO 02”, which may indicate that it is a datum point set in 2002.

Miscellaneous

A single light bulb and tracks from a road were classified as miscellaneous. This lightbulb is a standard modern incandescent lightbulb that may have been carried to its location by a storm. Two miscellaneous locations related to a road of some sort, with one description noting truck tracks, and the other an end of a road heading north. As there is no further information provided for these sites, dating these to a specific year would be impossible. However, a road and tracks would most likely associate to the introduction of cars beginning in the 1950’s (Godfrey and Godfrey 1976:133).

Natural

Natural	Dunes	Pond	Forest Floor
Total: 8	4	3	1

TABLE 9: Subcategories of natural features recorded while surveying Shackleford Banks.

Five sites were recorded between eight marked locations. Table 9 depicts the quantities and variations of natural sites recorded. The first of these sites is a high dune, which currently exists near the western tip of Shackleford Banks on the ocean-facing shore. This dune provides a large vantage point over the ocean, and any whale migrating through the region would pass through the viewshed of this dune. Another dune was recorded 40 meters south of the first dune closer to the ocean. Orlandah Philips (1980) describes a dune in this area as Yellow Hill, which correlates with Hancock's (2008) description of Yellow Hill as 40 feet tall (Philips 1980:23; Hancock 2008:12). A third dune was recorded as Lookout Hill, located on the eastern point of the island west of Barden Inlet. This dune exists in a similar location as Lookout Dune on the map of Shackleford Banks between 1850 and 1890 (Figure 20). The fourth site records a large marsh on the western portion of Shackleford Banks, speculated to be Mullet Pond, which is fed by a tidal inlet located on the sound-facing shore. One final site was noted as a woody forest floor, however no photos were captured at this location. This site was most likely an exposed compacted soil area where Lookout Woods once existed, that is now eroding into the sand.

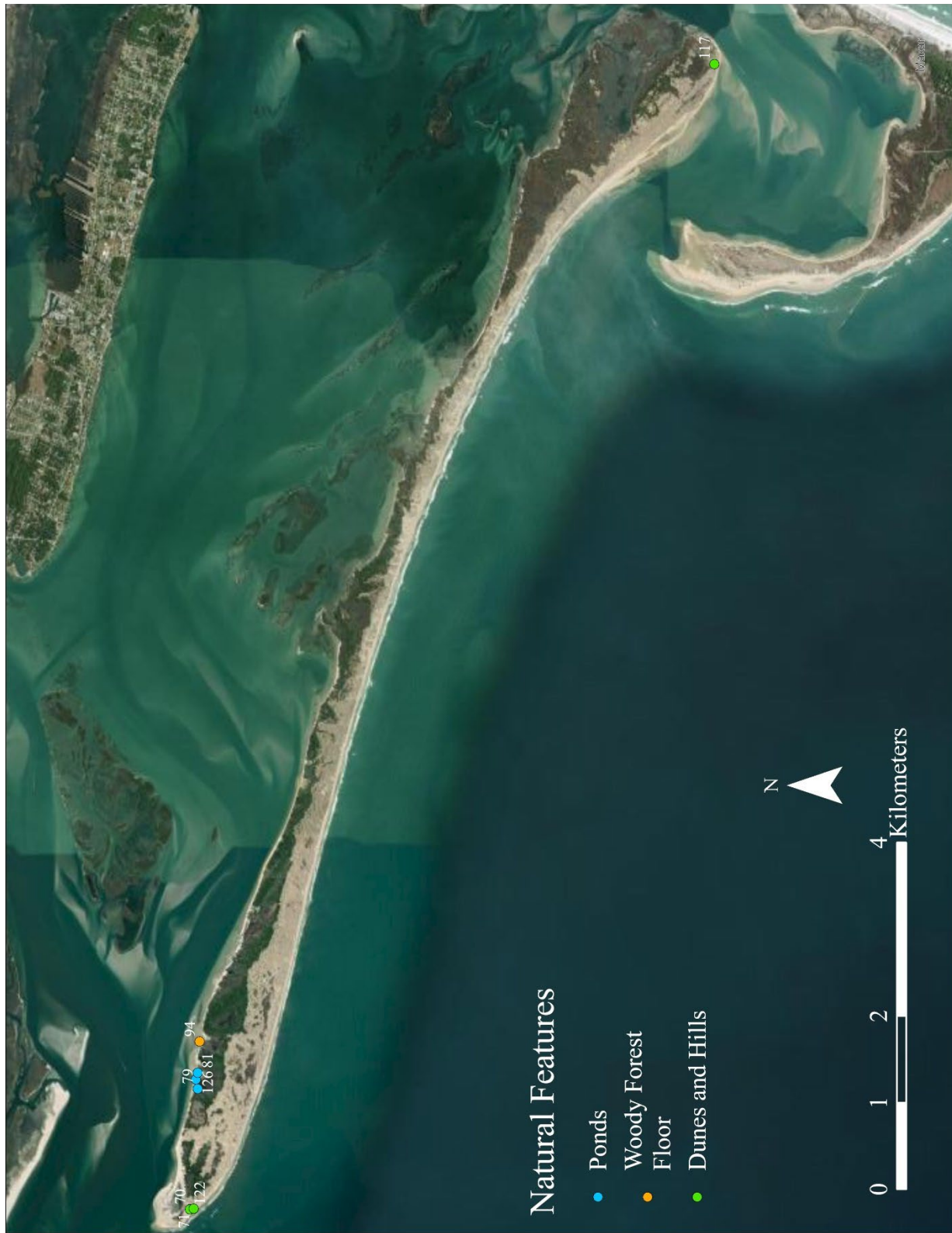


FIGURE 58: The spatial distribution of natural features recorded on Shackleford Banks. Image created by the author via ArcGIS Pro, ESRI.

Miscellaneous

Miscellaneous	Cemetery	Cluster	Wood	Shell
Total: 6	1	3	1	1

TABLE 10: Subcategories of Miscellaneous artifacts recorded while surveying Shackleford Banks.

Miscellaneous artifacts and sites include recognizable features and materials whose functions may be uncertain or multifaceted. These marked locations include a cemetery, three artifact debris fields, a cut shell, and a wooden panel shaped similar to a door, as depicted in Table 10.



FIGURE 59: The spatial distribution of miscellaneous artifacts recorded on Shackleford Banks. Image created by the author via ArcGIS Pro, ESRI.

Wade's Shore Cemetery, located on the western portion of Shackleford Banks near the sound-facing shore, contains the remains of 20 individuals that once lived on Shackleford Banks. The most recent individual to be interred at this site was Rebecca Lewis, whose grave is marked with "R.L." and the date February ninth, 1919 (NPS 1976).

Three debris fields were recorded, although no further information was provided for two of these fields. One photo, Figure 60, was taken for a single debris field; however, the specific objects observed in person are not as apparent in this photo.



FIGURE 60: Location 38: A debris field of artifacts recorded on Shackleford Banks. Photo captured by Stephanie Sterling, June 24, 2021.

A single conch shell with a smooth, possibly cut, edge was recorded on the eastern portion of the island, inland of the ocean-facing shore. Figure 61 depicts the shell's interior and

exterior with a clean cut or break, which exposes the interior. While conch shells are common in this region, the shape of this shell might have been deliberately cut. Early inhabitants of Shackleford Banks commonly used oil lamps made from shells, where a shell would be shaped to hold oil, and a wick would be placed at the narrow end of the shell (Garrity-Blake and Amspacher 2017:232).



FIGURE 61: Artifact 132: A conch shell with a smooth, potentially cut, edge. Photo captured by Lydia Downs, June 24, 2021.

A panel of plywood with thin pieces of wood lining its perimeter was recorded in the center of the island. While measurements were not noted, this piece of wood appears to be either a door, or a panel from a structure. Figure 62 depicts the piece of wood floating in a marsh.



FIGURE 62: Artifact 196: A wood panel that resembles a door. Photo captured by Stephanie Sterling, June 24, 2021.

Unidentified Metal

Unidentified Metal Artifacts	Unidentified Metal	Wire
Total: 23	20	3

TABLE 11: Subcategories of unidentified metal artifacts recorded while surveying Shackleford Banks.

Several iron fragments, metal debris fields, and metal concretions were recorded during the survey. In total, 23 locations, as depicted in Table 11, were marked with unidentified metal artifacts, including two pipes and three wires. Debris fields and individual fragments of iron are most likely the remains of cars, as mentioned previously. Wire cables, depicted in figure 63, resemble fallen telephone wire. Wires were observed at both the eastern and western points of the island, which may have crossed the island when they were constructed.



FIGURE 63: Artifact 72: One of three wires recorded on Shackleford Banks. Photo captured by Jill Schuler, June 17, 2021.



FIGURE 64: The spatial distribution of unidentified metal artifacts recorded on Shackleford Banks. Image created by the author via ArcGIS Pro, ESRI.

Geospatial Analysis of Artifacts on Shackleford Banks

By analyzing the distribution of artifacts over the entirety of the survey's search area, concentrations of specific artifact categories may indicate how these areas were utilized. ArcGIS pro's Kernel Density tool was employed to analyze any areas of concentration for each respective category of artifact recorded. This tool calculates the magnitude of points in an area to produce a smoothly tapered surface between each point (ESRI 2024b). The settings for each input feature category are displayed in figure 65. Since each point has an equal value, the population field was set to "NONE". Output cell size was automatically calculated by the tool, which used the lesser measurement between the width or height of the search area divided by 250. For this situation, the lesser measurement was the search area's height of 5,504.999 meters. Search radius was left as the tool's default setting, which adjusted the area based on the spatial configuration and number of input points. Spatial outliers were automatically corrected as to not alter the search radius (ESRI 2024b). The resulting output is determined by the formula:

$$Density = \frac{1}{(radius)^2} \sum_{i=1}^n \left[\frac{3}{\pi} \cdot pop_i \left(1 - \left(\frac{dist_i}{radius} \right)^2 \right)^2 \right]$$

For $dist_i < radius$

Where:

- $i = 1, \dots, n$ are the input points. Only include points in the sum if they are within the radius distance of the (x,y) location.
- pop_i is the population field value of point i, which is an optional parameter.
- $dist_i$ is the distance between point i and the (x,y) location (Silverman 1986; ESRI 2024b).

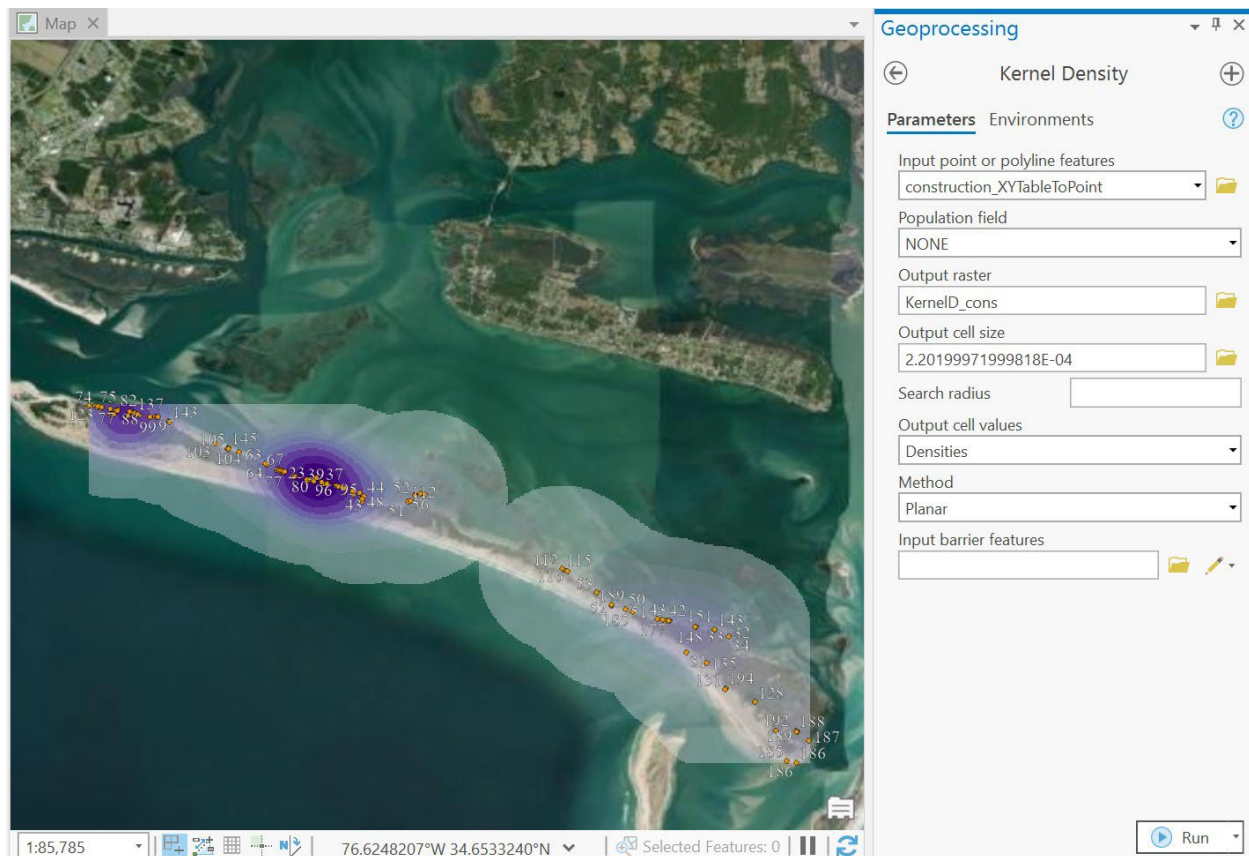


FIGURE 65: A screenshot of the parameters for the Kernel Density tool in ArcGIS pro, ESRI. Image created by the author.

Construction Material Distribution

The distribution of construction materials surveyed across Shackleford Banks provides insight as to where structures once existed, as well as their purpose. Figure 66 displays the kernel density of construction materials throughout the survey area. The densest concentration of artifacts exists in the center of the island near Whale Creek. A less dense concentration exists at the western end of the island near Mullet Pond. A less prominent concentration exists in the eastern portion of the island, where Figures 20 and 23 indicate where Diamond City once existed.

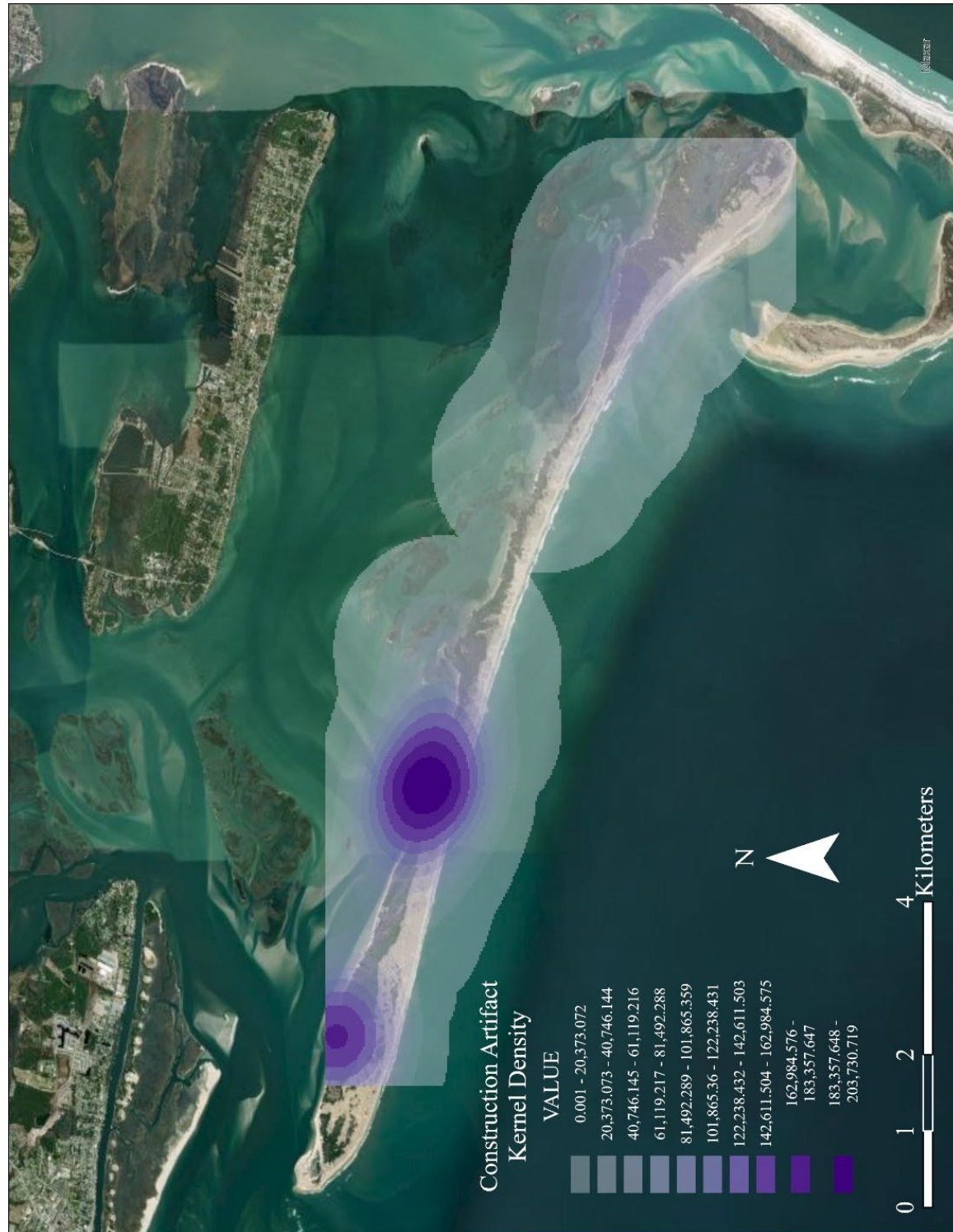


FIGURE 66: Kernel density of construction artifacts on Shackleford Banks. Image created by the author via ArcGIS Pro, ESRI.

Industrial Artifact Distribution

Industrial artifacts assist in determining potential areas where the residents of Shackleford Banks conducted their livelihoods, including processing whales. Figure 67 presents nearly opposite results as the construction artifact densities, where the highest concentration of industrial artifacts exists on the eastern portion of the island. Two faint concentrations exist at Whale Creek and Mullet Pond, although they are not prominent enough to produce a clear epicenter.

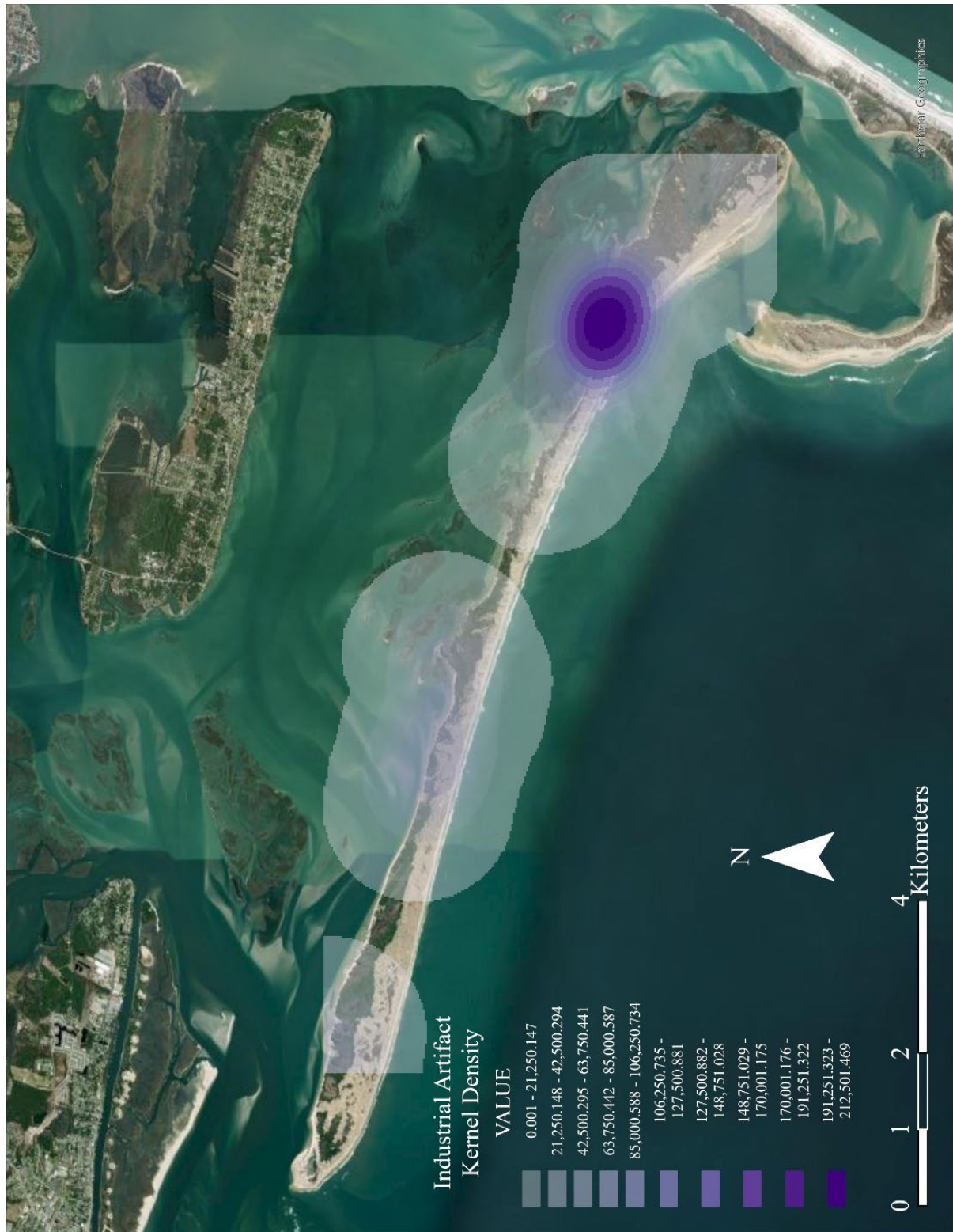


FIGURE 67: Kernel density of industrial artifacts on Shackleford Banks. Image created by the author via ArcGIS Pro, ESRI.

Domestic Artifact Distribution

Domestic artifacts assist in determining where families lived on Shackleford Banks. Similar to the industrial artifact densities, Figure 68 depicts the most prominent kernel density of domestic artifacts in the eastern portion of the island. A faint density also exists near whale creek, suggesting that the majority of people lived where Diamond City may have been, while a small population expanded west.

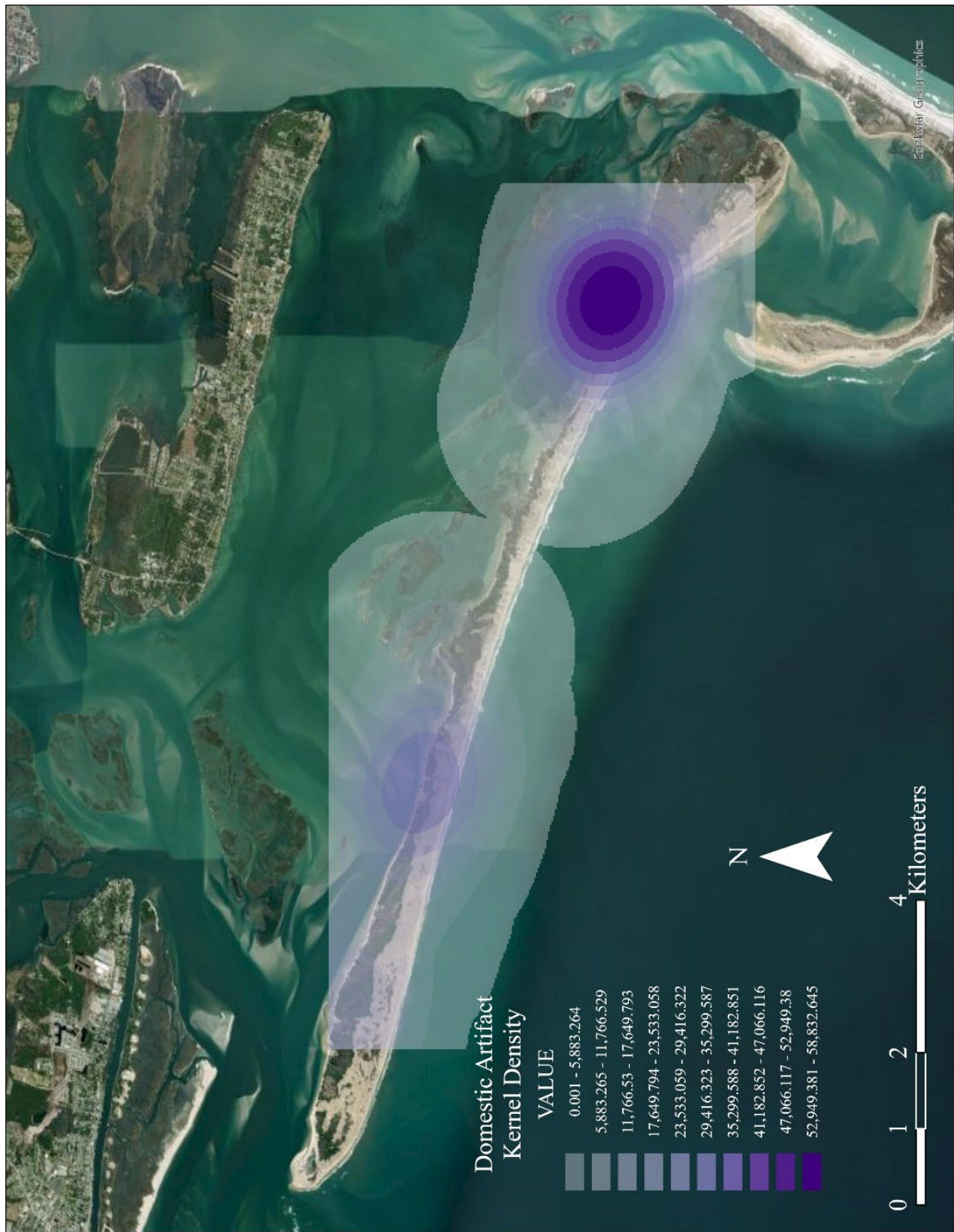


FIGURE 68: Kernel density of domestic artifacts on Shackleford Banks. Image created by the author via ArcGIS Pro, ESRI.

Cartographic House Location Distribution

Although houses have not existed on Shackleford Banks since the NPS acquired Cape Lookout National Seashore, a correlation between historic house sites and archaeological construction, industrial, and domestic artifact concentrations is evident. Figure 69 displays historic house kernel densities. The highest densities of houses existed at Whale Creek and the likely location of Diamond City, with small neighborhoods along Wade Shore, and the earliest settlements located where Barden Inlet exists today.

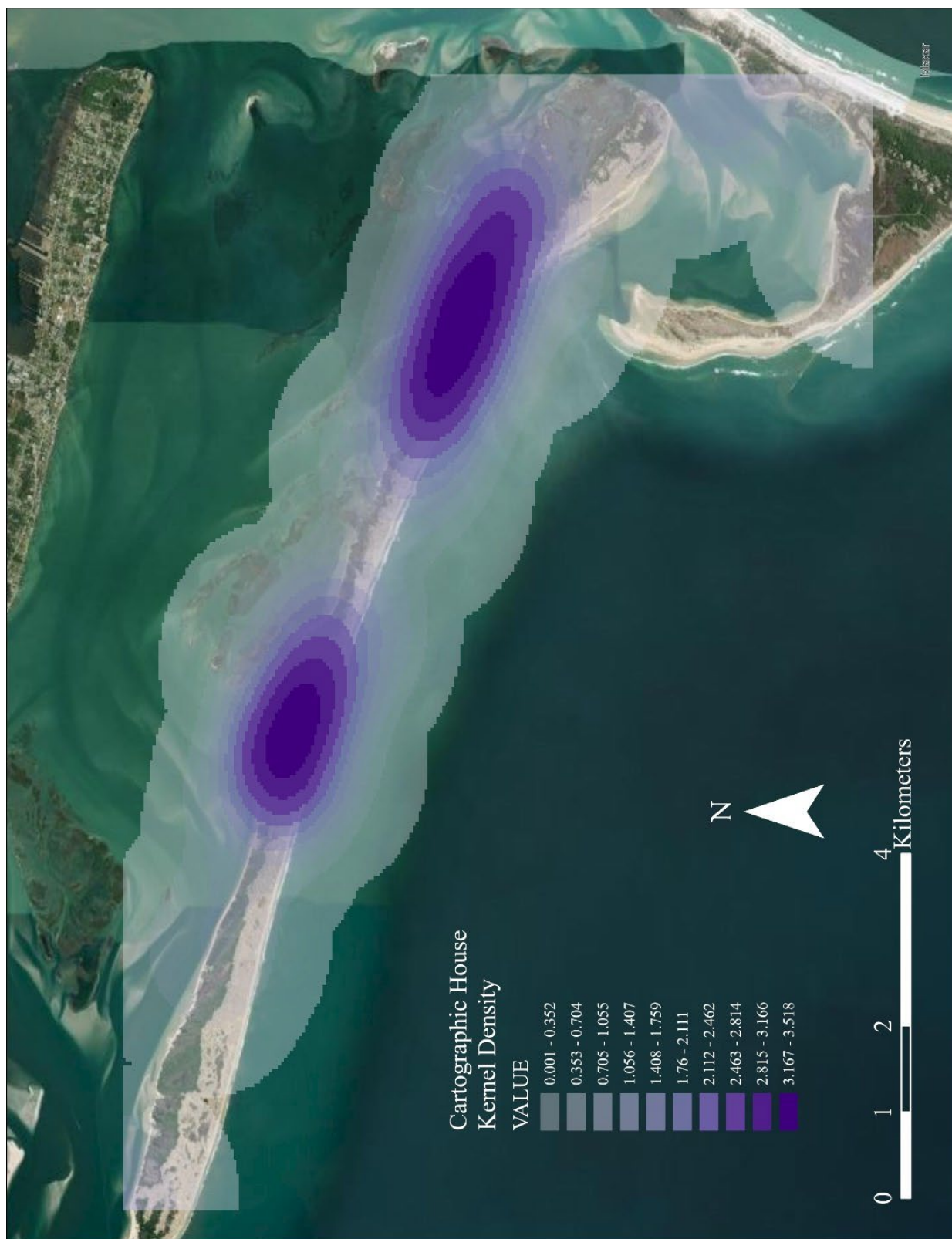


FIGURE 69: Kernel density of cartographic house locations on Shackleford Banks. Image created by the author via ArcGIS Pro, ESRI.

Interpretation of the Geospatial Analysis

Upon analyzing the densities and distributions of artifacts and house sites on Shackleford Banks, a pattern of human activity becomes apparent. Three artifact categories were geospatially analyzed to most accurately determine where whaling activities may have occurred. Domestic, construction, and industrial artifacts directly relate to the lives of whalers on Shackleford Banks, while natural sites and miscellaneous artifacts do not immediately signal specific functions of areas. Modern and unidentified metal artifacts were categorized and dated specifically due to their unrelated nature to the whale fishery and permanent residents of the island, therefore omitting them from geospatial analysis.

The eastern portion of Shackleford Banks contains the densest concentrations of artifact categories, apart from construction materials and artifacts. Concentrations of house sites correlate with Ira Lewis' hand-drawn map and Orlandah Philips' description of the neighborhoods along Shackleford Banks (Philips 1980:22-24; Tursi 2014). Construction material kernel densities, however, do not correlate with the house location densities. This may be due to the fact that houses were removed from the island, leaving behind only a few pilings where they once stood. The majority of construction materials surveyed may therefore remain from seasonal fishing or vacation houses that were built after permanent residents left Shackleford Banks. Mullet camps constructed on the western portion of the island that may have also housed whalers were constructed from grass and scavenged wood, which were not expected to last much longer than a single season, therefore leaving a low probability for archaeological finds (Cecelski 1993:5). The presence of a cemetery at Wade's Shore, which contains the remains of people interred after the exodus in 1902, correlates with the construction kernel densities central and west on the island to originate from nonpermanent residents (NPS 1976; Barnes 2007:36).

This geospatial analysis correlates with historic sources in that Diamond City served as an epicenter for the island's industry and population. The presence of several barrels suggests that goods were shipped to and from Shackleford Banks primarily from the eastern portion of the island, while the presence of pilings along the sound-facing shore suggest that fishing and whaling occurred at Whale Creek, Mullet Pond, or along Wade's Shore. Dunes and hills that overlook both the western ocean shore and harbor of Cape Lookout provide a wide viewshed over the majority of the area's whaling grounds, which would allow for whalers to observe and hunt whales anywhere on the island.

Indicators leading to locations where whalers processed whales after hunting them are place names and whale names. Whale Creek, located along the center of the sound-facing shore, contains ideal conditions for whalers to float a whale within it at high tide and flense it at low tide. This location was undoubtedly named because of its relation to the whaling industry, and houses mapped in Figure 24 most likely relate to John Lewis' family who lived there to exploit these conditions. Whale names, specifically the "Mullet Pond Whale," indicate that Mullet Pond also served as a flensing site, as it contains similar conditions as Whale Creek. Although this pond was named for its employment in the mullet fishery, the name of a whale related to this site suggests that it also experienced some degree of exploitation from the right whale industry. Kernel densities of houses, construction, industrial, and domestic artifacts at these locations, albeit faint in some cases, reinforce historical accounts with evidence in the archaeological record.

Conclusion

This chapter extrapolated how each artifact recorded during the ECU maritime studies field school's survey of Shackleford Banks in 2021 was categorized depending on their apparent

material or function. The spatial distribution of these categories was then analyzed by means of geospatial analysis using kernel densities, which assisted in determining where residents of Shackleford Banks lived and worked. Although whaling sites cannot be pinpointed, this geospatial analysis aided in uncovering areas that were most likely employed in the right whale fishery.

Chapter Six: The World of the Whaler on Shackleford Banks

Introduction

Through detailed analysis of the historical and archaeological record that exists for Shackleford Banks, the world as the Diamond City whalers knew it becomes discernable. This thesis seeks to bring the Cape Lookout right whale fishery into light as it existed in the past, as well as how it exists today. At present, the right whale fishery that once existed at Cape Lookout currently exists ephemerally in folkloric stories, maps, recordings, and archives, with some indications in the archaeology of Shackleford Banks suggesting where the whaling industry once existed. This chapter attempts to answer the research questions presented in the first chapter, as well as presents avenues of further research.

Interpretation of Geospatial Analysis Results

The results of this geospatial analysis demonstrate several viable locations where whalers could have utilized the geography of Shackleford Banks and Cape Lookout to their advantage. No patterns were evident to conclude the explicit locations of whaling camps or boat launching sites. However, natural features presented themselves as possible sites where lookouts may have existed, as well as archaeological remains of houses, docks, and industrial sites that may have been constructed by the families and crews that hunted whales and subsided on fishing. The presence of barrels at the eastern portion of Shackleford Banks suggests that whale oil may have been shipped from this location, while industrial pilings westward of this location suggest that docks and structures were constructed along the sound-facing shore to serve in the fishery industries that existed here. Although the eastern portion of the island appeared as the strongest kernel density for houses, industrial, and domestic artifacts, densities at Whale Creek and Mullet

Pond also occur. Construction artifacts occur strongest at both Whale Creek and Mullet Pond, reinforcing the importance of these sites, at the very least, as fishing locations.

Research Questions Answered

How did Shackleford Banks whalers interact and adapt to the local geography and the natural environment to maximize productivity in the whale fishery?

Whalers utilized the topography and geography of Cape Lookout, Core Sound, and the many islands throughout the region to exploit the right whale fishery. Hills and dunes that were much taller than they are today were employed as lookouts to create a vast viewshed over the waters that surround Cape Lookout and Shackleford Banks. These lookouts were located throughout the island, which allowed whalers to follow pods of whales until they were in an opportune location to pursue. Tides were employed to haul whales close to shore, providing a dry workspace around whales at low tide. Ponds that connected to the sound were employed as whales were floated into the ponds to provide shelter from waves.

Can geospatial analysis of whaling on Shackleford Banks help to predict locations of former industrial and settlement areas?

the nature of these events and the tools used in whaling might not leave behind artifacts in-situ. Unlike the sites at Red Bay or throughout Australia, whaling was a part-time venture when the opportunity presented itself. Camps were used for other fisheries and trypots were used elsewhere for chores. Harpoons, in some capacity, were kept by family members of whalers or donated to Museums. Explicit sites were not recognized through geospatial analysis to relate to whaling, but locations of former industrial and settlement areas do become apparent. Three locations enlightened by geospatial analysis contain artifact-dense regions, which correlate with maps indicating the location of Diamond City, Whale Creek, and Mullet Pond (Figures 20 and

23), as well as Orlandah Philips' description of the neighborhoods on Shackleford Banks (Philips 1980). Since Diamond City is no longer a functioning town and is no longer included on modern maps or charts, pinpointing its location is no longer possible. However, the artifact kernel densities that exist on the eastern portion of Shackleford Banks suggest that the "Diamond City" that exists ephemerally may have once existed within the boundaries of these kernel densities.

Land grants and house locations may also suggest an association with the fisheries of Cape Lookout. Land grants owned by Tyre Moore, Levi Pigot, and Tyre Moore Jr. at Whale Creek may have been strategically purchased to efficiently exploit the several fisheries that existed at Cape Lookout. Tyre Moore Jr.'s grant stretched along the ocean shore and expanded toward Whale Creek. This property would have been optimal to launch boats from the ocean shore in pursuit of a whale, and bring back catches to Whale Creek on the sound side of the same property. Tyre Moore and Levi Pigot's parcel north east of Whale Creek would have also been optimal as a designated area for seasonal whaling camps to render whale oil following a pursuit.

Can archaeological survey data help to establish optimal locations for whaling activities?

ECU's 2021 summer field school confirmed that there were, at one point in time, active fisheries throughout Shackleford Banks. However, surface surveying alone could not determine whether these sites were employed specifically in the whale fishery. Investigating the environment that whalers faced aided in the deductive reasoning that it would not be practical to flense and try out a whale from the southern shore by beaching a whale and waiting for the tide to recede; rather the effort put forth in towing a whale near camps within the sound would have been justified. Shore whaling stations elsewhere in the world that exist in areas where flensing space was limited utilized mechanisms to haul whales out of turbulent water for an easier flensing process. No archaeological or historical data suggests the use of such a mechanism at

Cape Lookout, and historical accounts depict flensing to have occurred from the sound-facing shore. High dunes that once stood even taller would have been optimal locations to spot whales entering the Cape Lookout harbor. Archaeological survey data suggests that the areas identified by geospatial analysis would have been optimal for whaling, but the constantly changing environment that exists on Shackleford Banks causes obstacles for archaeological investigation without historical research.

What were the advantages and disadvantages of this geography?

Diamond City's geographical location provided a convenient environment for shore whaling. Whalers took advantage of the protected harbor of Cape Lookout, which right whales used as a feeding ground along their migratory route. Several accounts of whaleships that ventured from New England to Cape Lookout resulted in unprofitable whaling seasons, which gave opportunistic shore whalers an advantage to hunt any whale that entered their hunting grounds.

The relatively calm Core Sound provided ample space for crews to process whale oil not far from their hunting grounds, as well as the ability to transport whalebone and casks of oil to Beaufort. Broad beaches gave the advantage of adequate space to haul a whale to shore and flense it when the tide receded. While other whaling operations may have altered the landscape to better suit their needs, Shackleford Banks provided beneficial features that whalers used without the need to alter them.

The whale fishery was only feasible at Cape Lookout by means of opportunistic shore whaling because of the scarcity of resources and availability of right whales. The number of whales caught each year varied between zero and five, which means that whaling alone was not guaranteed to provide a stable profit. Opportunistic catches provided a windfall profit that was

divided amongst the crew that caught each whale, which proved that a profit was possible and worth pursuing, although the community would have found a more stable income from other industries.

How were these whaling camps different from other shore whaling sites around the world?

The techniques employed by the Shackleford Banks shore whaling camps resembled shore whaling implemented across the globe by European empires. One major factor that separates these whaling camps from other shore whaling stations is the approach from Diamond City whalers. Whaling stations established by larger companies found strategic locations to exploit whale populations, whereas whalers from Shackleford Banks hunted opportunistically, but whaling was not a regular occupation (Reeves and Mitchell 1988:18). Cape Lookout's right whale fishery yielded very few catches compared to stations established by companies with profit as their primary goal. As such, documentation of profits, expenses, and investments was paramount for these stations, whereas profits from whale products processed by Cape Lookout whalers were divided at the point of sale without documentation.

Whalers in this region have maintained a traditional toolset used throughout European whaling operations, dating back to the early Basque whalers, with the exception of the bomb lance. Tools employed include harpoons of various shapes, trypots, boats with pointed bows and sterns, and drogues. However, some of these tools were borrowed from other occupations to fulfill a need. For example, sharpies built for fishing, transportation, and moving cargo were used as whaleboats as well. Tools and methods employed by other whaling stations were optimized to catch as many whales as possible, including mechanisms to move carcasses. Shackleford Banks whalers did not adapt the landscape to suit their needs, rather they adapted their methods to suit the landscape of Cape Lookout.

Trypots from Shackleford Banks were significantly smaller than those used in larger operations and were utilized elsewhere as domestic appliances (Bradley 2015:137). The trying out process was not as optimized as their industrial counterparts. With the help of the families of a whaling crew, trying out took several days, sometimes multiple weeks, to completely render a whale, whereas whaling stations flensed and tried a whale in a fraction of that time.

Many whaling stations were established in locations with similar geographic features as Cape Lookout's harbor. A protected hunting ground was desirable where high hills or features overlooked a vast coverage of the water. Western Australian stations and Basque stations established in Labrador were intentionally founded in such harbors, both with higher lookouts that could oversee much greater hunting grounds (Gibbs 1995:189; Tuck and Grenier 1981:183).

Other fisheries were exploited throughout Cape Lookout to sustain a stable profit for families. Therefore, the decline in demand for whale oil did not devastate Diamond City's economy as much as it might have for stations that relied solely on whaling for income. In fact, shore whaling continued at Cape Lookout until the San Ciriaco Hurricane drove the residents living on Shackleford Banks away, because the fishery could still produce a profit.

Further Research

This study is by no means complete and gives way to further avenues of study in the Cape Lookout right whale fishery, Shackleford Banks, and Diamond City. Excavation, or any archaeological investigation that requires disrupting the surface, was prohibited in the permit acquired for the 2021 field school. If possible, the two sites identified from the archaeological survey could benefit from shovel testing to gain a more accurate idea of what they are. They may also benefit from further investigation with a magnetometer to determine whether they were used

as tryworks or if the sites have any distinct magnetic signatures. Similar research has been conducted to detect archaeological hearths in Alaska, which resulted in the discovery of hearths spanning 12,000 years of human occupation (Urban et al. 2019). Although the right whale fishery at Cape Lookout has only existed for a fraction of the period of human occupation for the hearth study in Alaska, a similar approach may be undertaken to find sites where tryworks were established. Furthermore, a gradiometric or ground-penetrating survey may also uncover locations of shore whaling camps, or whether archaeology exists beneath the surface.

Several fisheries that existed at Shackleford Banks utilized the same tools adapted for different uses. Historical and archaeological resources are sparse for Cape Lookout's communities, and stories passed to future generations via oral tradition are beginning to fade away. Further research among other fisheries may incite more passion and awareness to contribute to the historical and archaeological record that exists for the right whale fishery.

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FIGURE 70: 1850 Navigation chart of Beaufort harbor, which depicts houses near mullet pond. Image courtesy of the NOAA Historical Map and Chart Collection.



FIGURE 70: 1850 Navigation chart of Beaufort harbor, which depicts houses near mullet pond. Image courtesy of the NOAA Historical Map and Chart Collection.



FIGURE 73: 1876 US Coast Survey of Core Sound and Straits, with houses and structures marked throughout. Image courtesy of the NOAA Historical Map and Chart Collection.

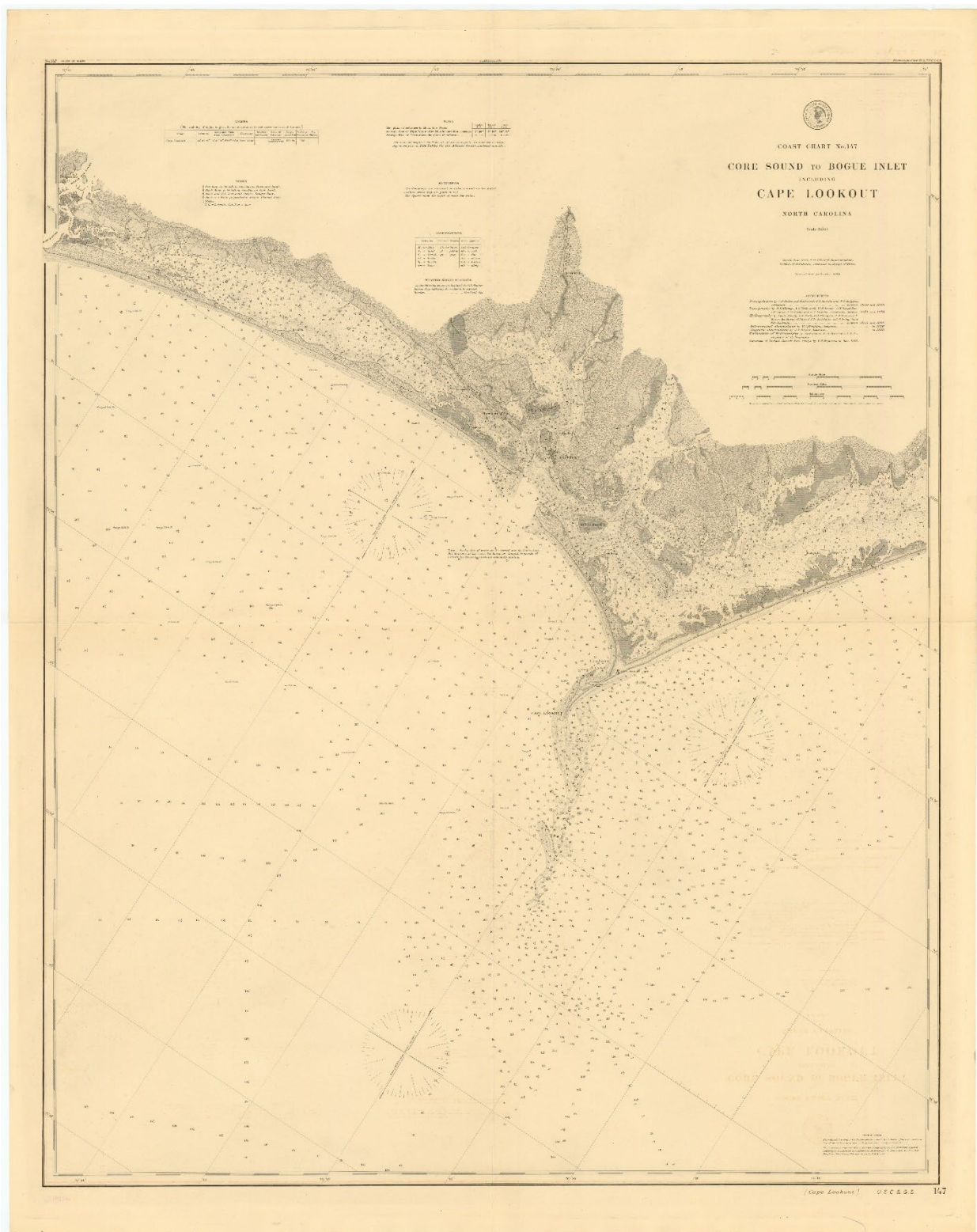


FIGURE 74: 1896 chart of Core Sound to Bogue Inlet, including Cape Lookout, North Carolina. Image courtesy of the NOAA Historical Map and Chart Collection.



FIGURE 75: 1899 US Coast Survey of Core Sound and Straits, with houses and structures marked throughout. Image courtesy of the NOAA Historical Map and Chart Collection.

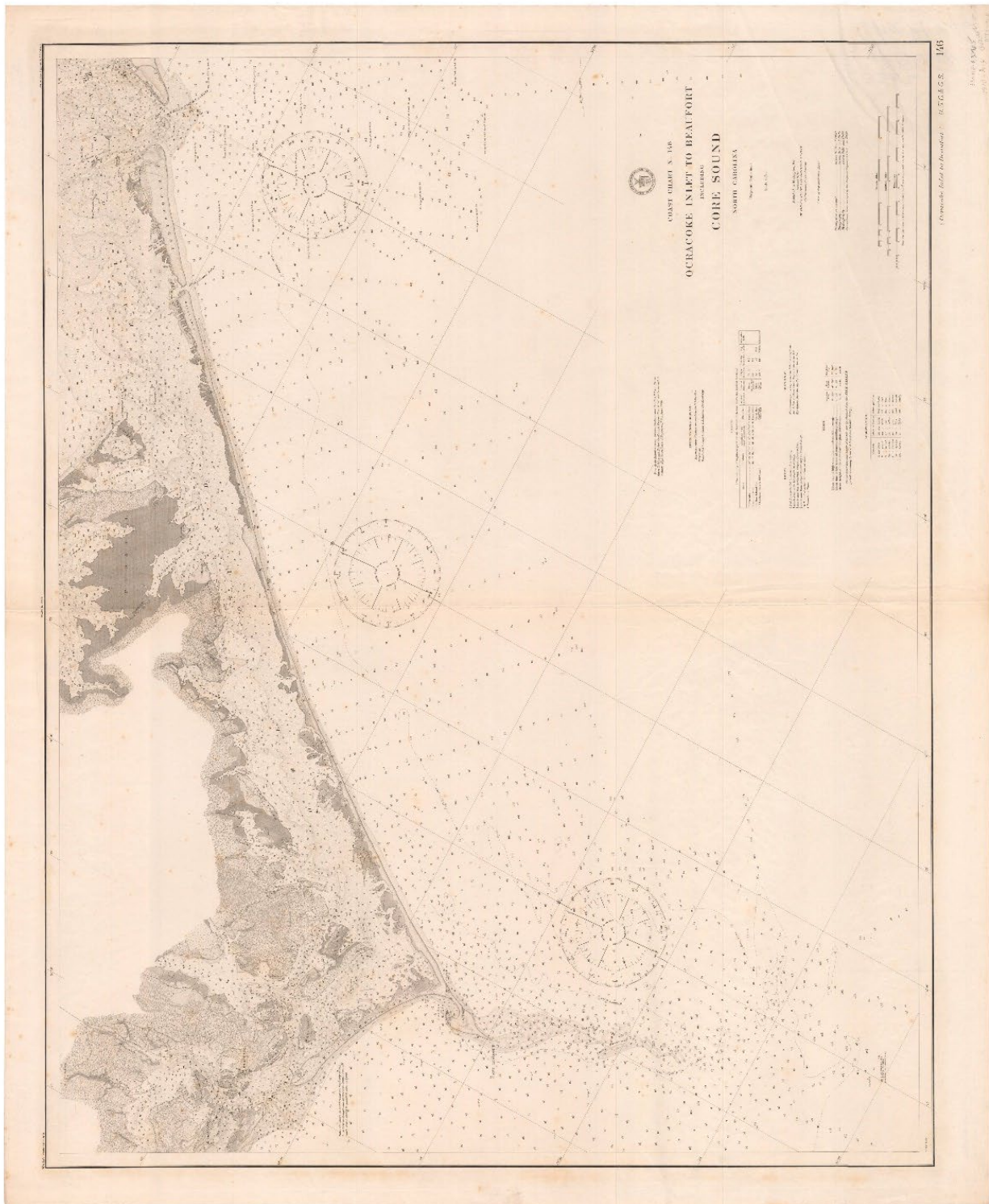


FIGURE 76: 1910 Coast chart no. 146 Ocracoke Inlet to Beaufort including Core Sound, North Carolina. US Coast and Geodetic Survey. Image courtesy of the North Carolina Maps Collection, State Archives of North Carolina.

Appendix B: Land grant surveys on Shackleford Banks and Cape Lookout.

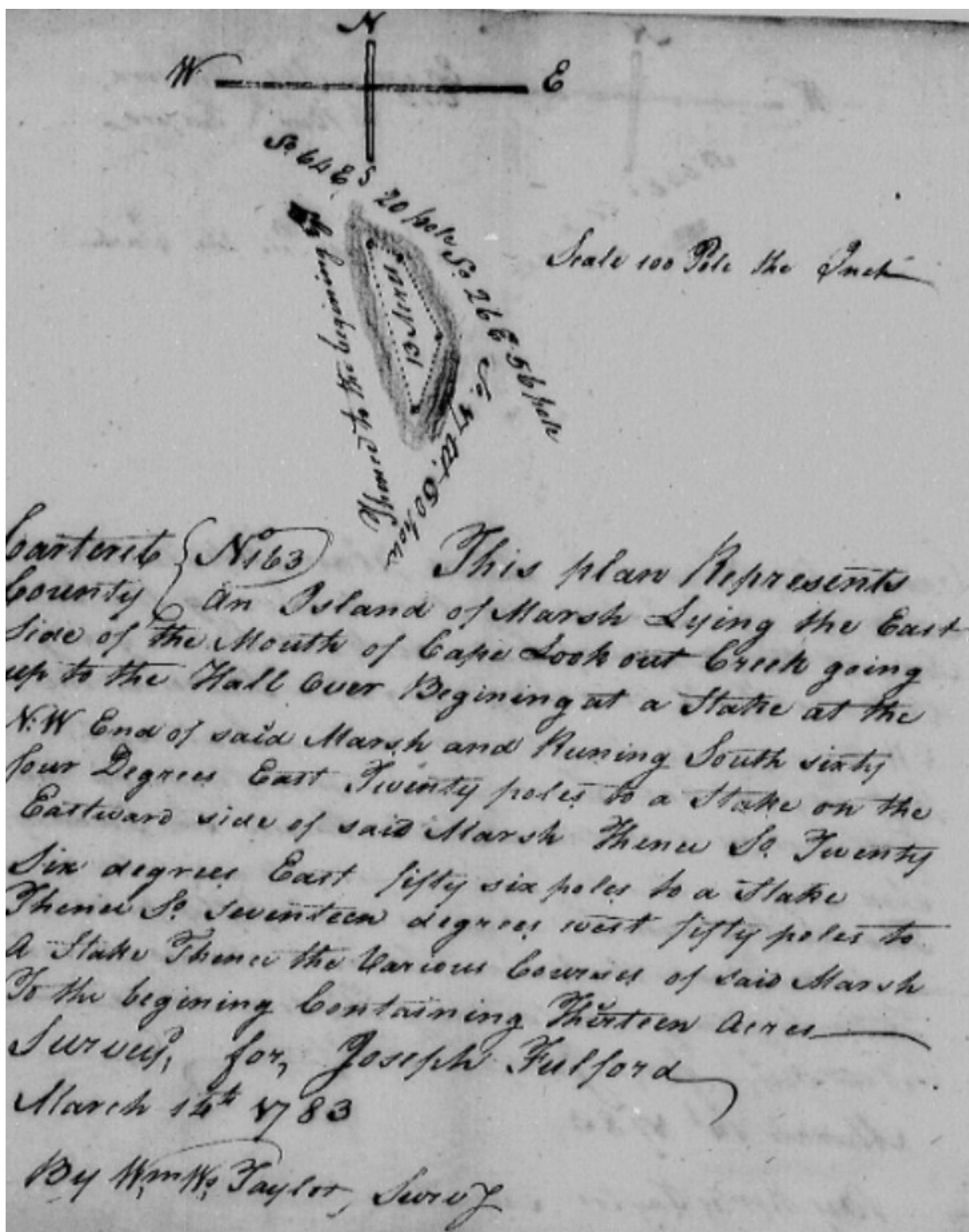


FIGURE 77: Joseph Fulford's 1783 land grant survey for an island of marsh on Shackleford Banks (NCD CR 1783).

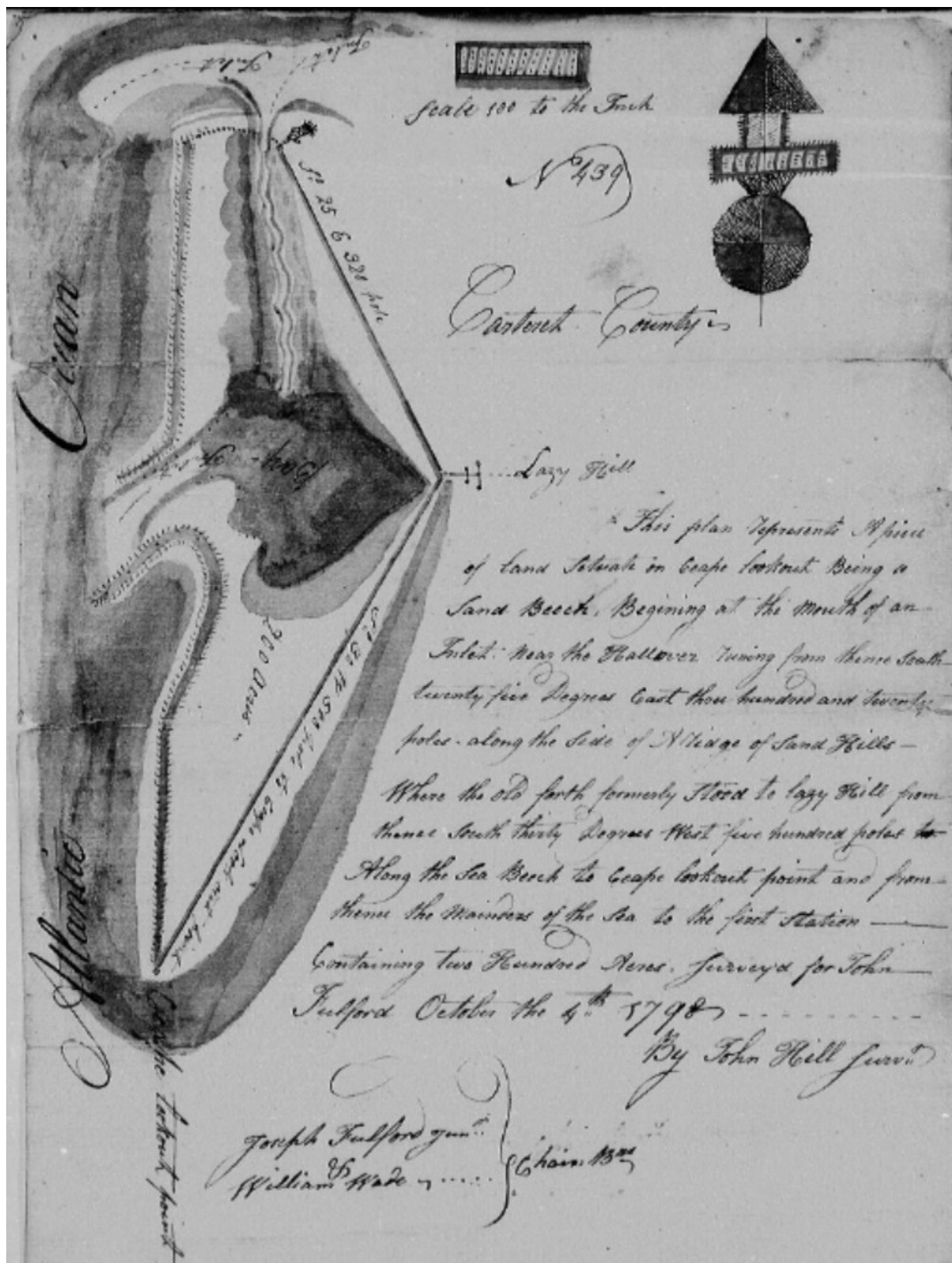


FIGURE 78: John Fulford's 1798 land grant survey for a piece of land on Cape Lookout (NCDNR 1798).

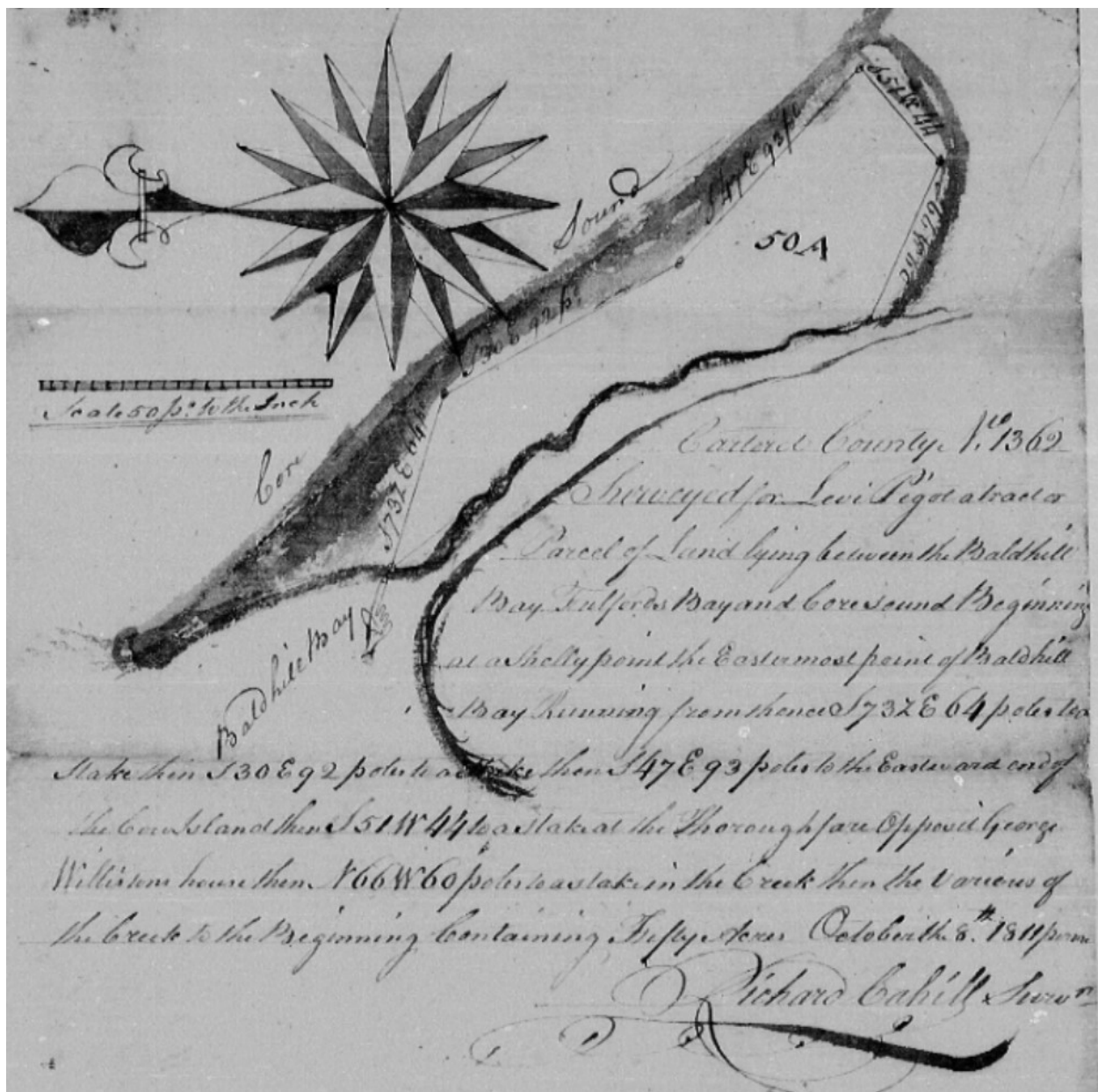


FIGURE 79: Levi Pigot's 1811 land grant survey between Bald Hill Bay, Fullerd's Bay, and Core Sound (NCDCCR 1811).

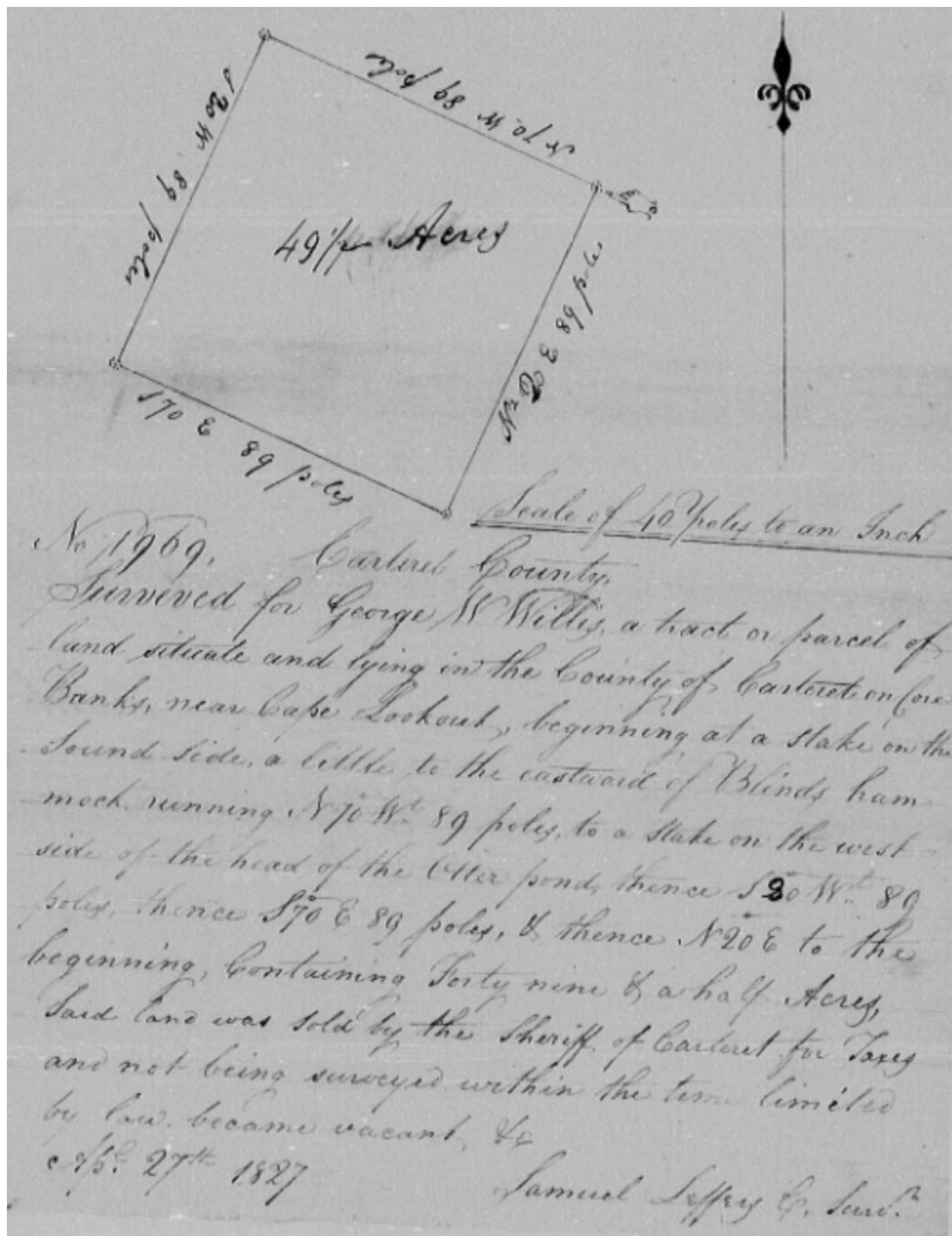


FIGURE 80: George W. Willis' 1827 land grant survey for a parcel of land on Core Banks near Cape Lookout (NCD 1827).

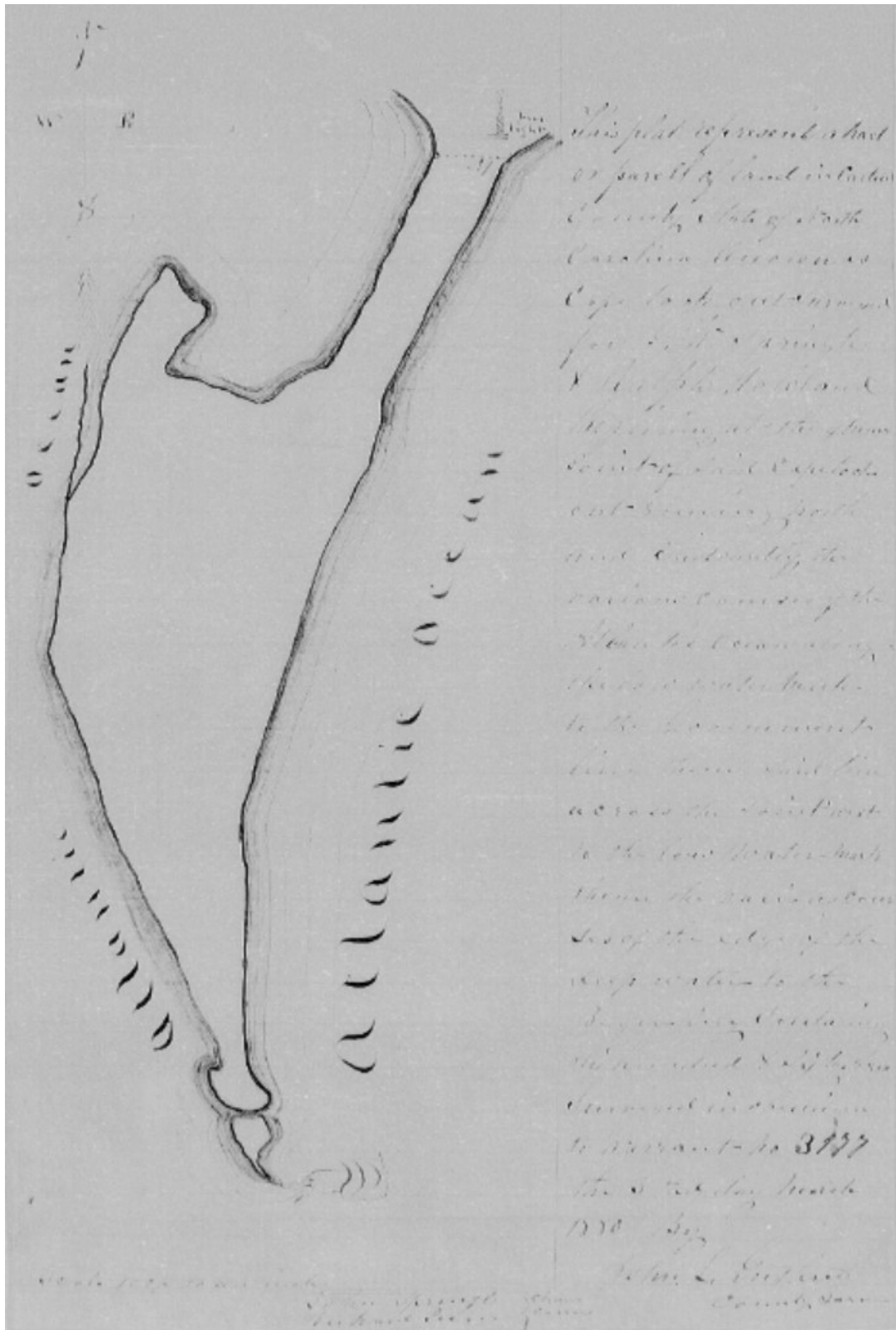


FIGURE 81: G.W. Springle and Ralph Howland's 1878 land grant survey for a tract of land on Cape Lookout (NCDCCR 1878a).

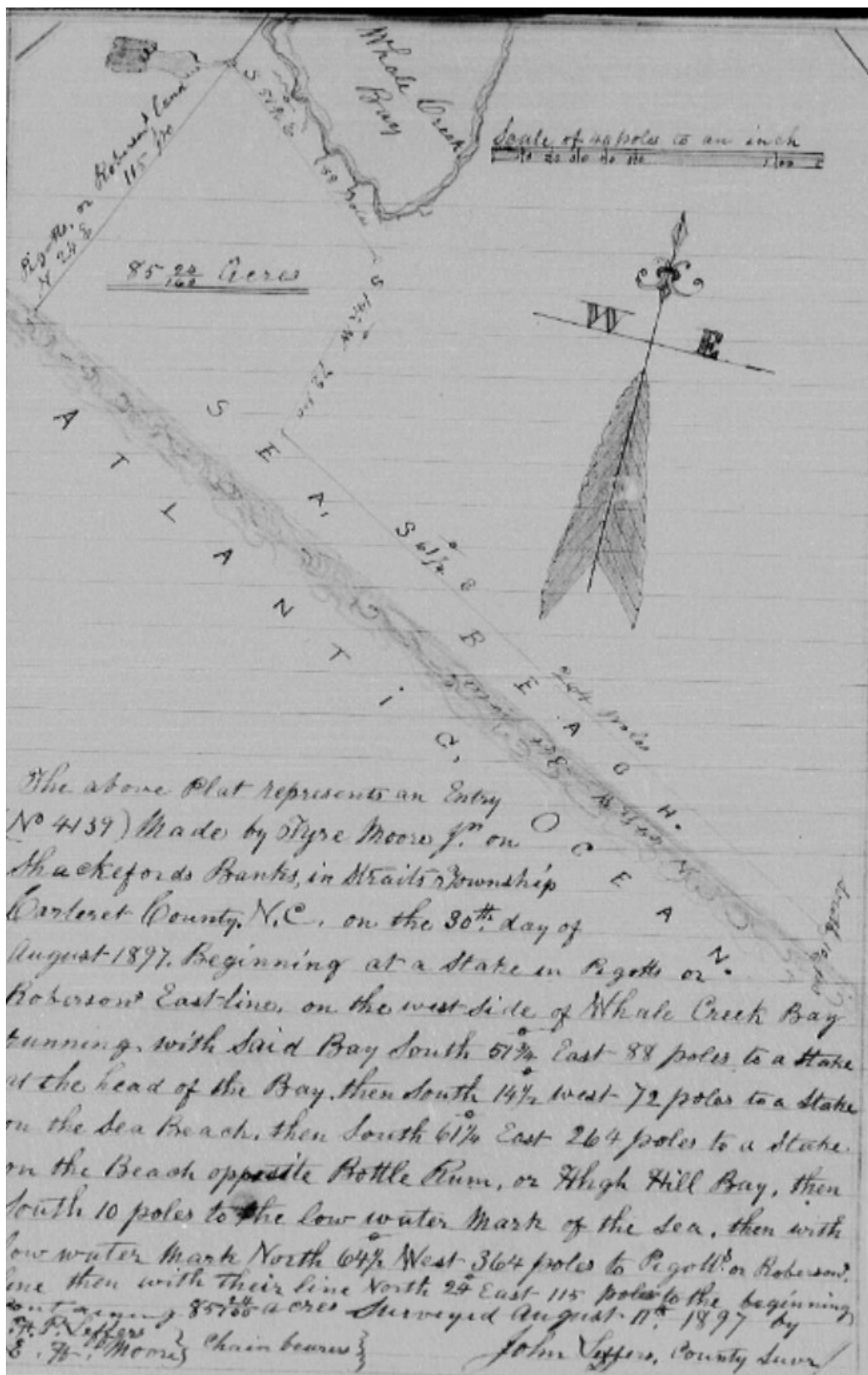


FIGURE 83: Tyre Moore Jr.'s 1897 land grant survey on Shackleford Banks (NCD CR 1897).

Appendix C: Artifact and site data recorded while surveying Shackleford Banks.

Construction Artifacts

Latitude	Longitude	Elevation	Time	Subcategory	Numeration	Comment
34.676234	-76.61269801	-3.850756	2021-06-16T13:35:44Z	Brick	64	burned brick fragment
34.67543797	-76.61120703	-3.634126	2021-06-16T13:51:19Z	Brick	67	Brick fragment
34.67498903	-76.61014002	-3.620308	2021-06-16T14:19:25Z	Brick	23	Burned iron brick
34.67503698	-76.61000499	-3.155586	2021-06-16T14:22:46Z	Brick	77	Brick corner fragment
34.67328901	-76.60404696	-8.854827	2021-06-16T15:24:09Z	Brick	37	Many bricks
34.673215	-76.60378402	-7.27794	2021-06-16T15:26:42Z	Brick	38	brick Cluster
34.67326102	-76.60338999	-4.572301	2021-06-16T15:30:11Z	Brick	92	multiple clusters of brick
34.67324501	-76.60339301	-10.161123	2021-06-16T15:31:16Z	Brick	39	Iron and brick
34.67323503	-76.603249	-4.771015	2021-06-16T15:33:55Z	Brick	93	Possible site. Clusters of iron, brick, tabby
34.67294997	-76.60210303	-4.648021	2021-06-16T15:39:52Z	Brick	95	Brick
34.67294997	-76.60186398	-4.61254	2021-06-16T15:41:44Z	Brick	96	Five brick fragments
34.67286497	-76.60163599	-4.110882	2021-06-16T15:45:17Z	Brick	97	Brick clusters
34.67219702	-76.599494	-3.645983	2021-06-16T16:00:52Z	Brick	103	large brick cluster with tabby
34.67163996	-76.59927699	-7.800458	2021-06-16T16:05:02Z	Brick	43	Lots of bricks tabby
34.67133997	-76.59773698	-12.232537	2021-06-16T16:17:22Z	Brick	44	10m brick frag
34.67054897	-76.59801601	-7.054003	2021-06-16T16:28:15Z	Brick	48	Brick
34.67054796	-76.590866	0.377686	2021-06-16T16:47:45Z	Brick	112	Brick
34.67051603	-76.59083901	-7.212625	2021-06-16T16:48:27Z	Brick	51	Brick
34.67164599	-76.58979999	-7.231286	2021-06-16T16:54:28Z	Brick	53	Brick
34.67167902	-76.58885099	-6.792744	2021-06-16T17:04:40Z	Brick	57	Twenty piece of broken brick
34.68523004	-76.63915004	-0.80244	2021-06-17T14:41:56Z	Brick	74	Brick
34.68510498	-76.63885399	-1.278305	2021-06-17T14:50:07Z	Brick	75	Brick
34.68525602	-76.63875299	-2.578365	2021-06-17T14:50:22Z	Brick	123	Brick and iron scatter, about 20m
34.68498101	-76.63820003	-2.314012	2021-06-17T14:55:39Z	Brick	77	2 bricks
34.68458799	-76.63567096	-2.304681	2021-06-17T15:16:33Z	Brick	82	Brick structure
34.68448003	-76.63598604	-1.600663	2021-06-17T15:20:56Z	Brick	130	Cluster of brick
34.684346	-76.63607799	-1.556161	2021-06-17T15:25:14Z	Brick	131	Brick structure
34.68436201	-76.63611302	-3.10712	2021-06-17T15:36:12Z	Brick	84	brick clust
34.68401902	-76.63676396	-1.612019	2021-06-17T15:38:07Z	Brick	132	Brick structure
34.68445798	-76.63596801	-1.707517	2021-06-17T15:42:50Z	Brick	87	Brick clust
34.68457801	-76.635735	-1.707517	2021-06-17T15:44:28Z	Brick	88	Brick clust

34.68439998	-76.63386701	1.879685	2021-06-17T16:27:34Z	Brick	136	Brick
34.68373102	-76.63409701	1.746094	2021-06-17T16:30:53Z	Brick	91	Brick
34.68419898	-76.63320299	2.194475	2021-06-17T16:31:39Z	Brick	137	Large brick cluster, Bricks go back into shoreline. About 75 bricks in the water near possible burned sand.
34.68421801	-76.63318497	-3.293734	2021-06-17T16:33:00Z	Brick	92	Lots of brick
34.68388701	-76.63237503	0.223937	2021-06-17T16:51:09Z	Brick	96	Brick
34.68357	-76.63069798	7.055347	2021-06-17T16:57:26Z	Brick	139	Brick cluster looks like a campfire
34.68361703	-76.62990396	4.493584	2021-06-17T17:01:15Z	Brick	140	Brick scatter
34.68359599	-76.629954	0.242598	2021-06-17T17:01:34Z	Brick	97	Brick scatter
34.68350697	-76.629581	3.995196	2021-06-17T17:06:16Z	Brick	142	30m brick scatter
34.68352298	-76.62944798	0.242598	2021-06-17T17:07:06Z	Brick	99	Brick scatter
34.68289602	-76.62784997	3.455813	2021-06-17T17:13:47Z	Brick	143	Small brick scatter
34.68275	-76.62773497	3.865277	2021-06-17T17:15:32Z	Brick	144	Brick and iron scatter
34.67949799	-76.62068202	-0.158622	2021-06-17T17:40:09Z	Brick	103	Brick
34.67883398	-76.61869803	8.909267	2021-06-17T17:56:02Z	Brick	145	Brick and cinder block concretion
34.67872099	-76.61883197	-0.158622	2021-06-17T17:57:49Z	Brick	104	Brick structure frag
34.67871504	-76.61862804	-0.298582	2021-06-17T18:00:28Z	Brick	105	Brick scatter
34.66009397	-76.56699501	6.214241	2021-06-19T17:17:36Z	Brick	115	Debris field of brick
34.63035003	-76.53097202	-1.25665	2021-06-24T12:44:09Z	Brick	186	Fasteners and bricks
34.65087497	-76.54364303	-2.614726	2021-06-24T17:03:37Z	Brick	143	brick
34.65127897	-76.546543	-1.35456	2021-06-24T17:24:29Z	Brick	151	brick
34.65223099	-76.55097703	3.32547	2021-06-24T18:35:47Z	Brick	42	Debris scatter, brick. and iron
34.65228899	-76.55167599	4.683478	2021-06-24T18:38:16Z	Brick	43	Artifact Scatter, iron brick
34.67513203	-76.61049902	-3.499009	2021-06-16T14:06:51Z	Brick	21	Burned brick clustr
34.67638202	-76.612912	-3.739506	2021-06-16T13:28:58Z	Fastener	63	wrought iron peg
34.67541098	-76.61085399	-3.854133	2021-06-16T13:57:26Z	Fastener	68	Nail
34.67532196	-76.61075902	-3.485209	2021-06-16T13:59:08Z	Fastener	69	Possible tack
34.67526203	-76.610467	-3.752614	2021-06-16T14:07:19Z	Fastener	73	Possible tack
34.67520604	-76.61025401	-4.062119	2021-06-16T14:15:54Z	Fastener	76	Nail
34.67511602	-76.60993299	-3.27384	2021-06-16T14:24:50Z	Fastener	78	Nail
34.67445804	-76.60828502	-3.124744	2021-06-16T14:34:56Z	Fastener	80	Nail
34.67326102	-76.60338999	-4.572301	2021-06-16T15:30:11Z	Fastener	92	nail
34.67266599	-76.60101799	-4.855067	2021-06-16T15:50:39Z	Fastener	101	Iron piece with fasteners
34.67181296	-76.59832296	-2.050288	2021-06-16T16:12:55Z	Fastener	105	Nail

34.63035003	-76.53097202	-1.25665	2021-06-24T12:44:09Z	fastener	186	Fasteners and bricks
34.65650501	-76.56180896	2.452073	2021-06-24T19:33:13Z	Piling	53	House inside pen or fence
34.67395403	-76.60652298	-3.789953	2021-06-16T14:48:17Z	Piling	81	Two posts; are degraded
34.67365203	-76.60649397	-5.878336	2021-06-16T14:50:48Z	Piling	30	Many posts
34.67396099	-76.60652901	-10.525021	2021-06-16T15:01:38Z	Piling	31	Post 1
34.67385999	-76.60604797	-7.865773	2021-06-16T15:10:27Z	Piling	32	Post2
34.67389402	-76.60605904	-2.771252	2021-06-16T15:10:40Z	Piling	82	Two pilings
34.67378296	-76.60561002	-2.742281	2021-06-16T15:12:53Z	Piling	83	Two pilings
34.67335003	-76.60345897	-4.420988	2021-06-16T15:27:08Z	Piling	91	Nine wooden posts
34.67326102	-76.60338999	-4.572301	2021-06-16T15:30:11Z	Piling	92	wood pilings
34.67219702	-76.599494	-3.645983	2021-06-16T16:00:52Z	Piling	103	Piling
34.67153301	-76.58988599	-7.82845	2021-06-16T16:52:56Z	Piling	52	Center of posts
34.67172403	-76.58902399	-6.792744	2021-06-16T17:03:10Z	Piling	56	Timber/piling
34.671561	-76.58838697	-7.035342	2021-06-16T17:07:18Z	Piling	59	Piling
34.67810802	-76.616968	0.223937	2021-06-17T18:07:52Z	Piling	106	Post
34.66018299	-76.56716198	7.380577	2021-06-19T17:16:31Z	Piling	112	Pilings 3
34.65975501	-76.56624198	6.391524	2021-06-19T17:20:34Z	Piling	116	Burnt pilings
34.63506896	-76.53086498	-2.189638	2021-06-24T13:04:36Z	Piling	188	Pilings
34.64977602	-76.54144999	-0.354216	2021-06-24T16:47:36Z	Piling	32	Pilings
34.64975196	-76.54141202	-0.352176	2021-06-24T16:47:53Z	Piling	33	pilings
34.64973402	-76.54140196	-0.350832	2021-06-24T16:48:01Z	Piling	34	pilings
34.64971902	-76.54145099	-0.348161	2021-06-24T16:48:09Z	Piling	35	pilings
34.65123396	-76.546485	-1.698128	2021-06-24T17:21:45Z	Piling	147	Post, one structure
34.65125198	-76.54657904	-2.750296	2021-06-24T17:22:17Z	Piling	148	Burnt post
34.65126498	-76.54657803	-2.871082	2021-06-24T17:23:12Z	Piling	149	Post
34.65127897	-76.546543	-1.35456	2021-06-24T17:24:29Z	Piling	151	Post
34.65217098	-76.55059003	3.407556	2021-06-24T18:31:21Z	Piling	176	Two posts with board
34.65217802	-76.55063001	3.062367	2021-06-24T18:32:33Z	Piling	177	Two posts with board
34.65393897	-76.55726898	2.194424	2021-06-24T19:20:17Z	Piling	50	First corner, burned structure
34.65397703	-76.55733503	2.751704	2021-06-24T19:21:00Z	Piling	51	Second corner
34.65447902	-76.55950301	7.843939	2021-06-24T19:25:29Z	Piling	189	Eight burnt posts
34.65454901	-76.55948399	2.99506	2021-06-24T19:25:46Z	Piling	52	Burned pilings, open area
34.651283	-76.54655096	-1.41833	2021-06-24T17:24:09Z	Piling	150	Post
34.68479896	-76.6369	-3.429734	2021-06-17T15:12:12Z	Piling	127	Piling

34.67092004	-76.59817703	-5.561092	2021-06-16T16:25:09Z	Piling	47	Post
34.674336	-76.60841301	-5.150542	2021-06-16T14:34:53Z	Piling	25	Burned post
34.68373102	-76.63409701	1.746094	2021-06-17T16:25:45Z	Piling	90	2posts
34.683943	-76.636397	-1.129014	2021-06-17T15:38:16Z	Piling	85	Post
34.68391903	-76.63626499	-1.660863	2021-06-17T15:39:31Z	Piling	86	Post
34.63963701	-76.53740102	-4.548331	2021-06-24T14:12:11Z	Piling	128	Pilings
34.67260497	-76.60071398	-4.753144	2021-06-16T15:53:52Z	Planking	102	Wooden planking with iron piece and 30m iron scatter east on shoreline
34.68419898	-76.63320299	2.194475	2021-06-17T16:31:39Z	Planking	137	tongue and groove planking
34.68416101	-76.633147	-3.293734	2021-06-17T16:38:10Z	Planking	93	Tongue and grove plank
34.67370803	-76.60559803	-2.400063	2021-06-16T15:13:54Z	Stone	84	Stones
34.67361901	-76.60564397	-8.668213	2021-06-16T15:14:39Z	Stone	33	Ballast?
34.68505503	-76.63827396	-2.4384	2021-06-17T14:58:15Z	Stone	78	Flat stone
34.67412402	-76.60509403	1.078125	2021-06-16T15:17:42Z	Timber	34	Timber
34.67359202	-76.60551597	-5.598415	2021-06-16T15:18:16Z	Timber	35	Timber
34.673444	-76.60421804	-3.880085	2021-06-16T15:23:44Z	Timber	88	Wood piece out of ground
34.67096203	-76.59796597	-3.806922	2021-06-16T16:24:00Z	Timber	46	Wood
34.67060898	-76.590477	0.772467	2021-06-16T16:51:39Z	Timber	113	Timber
34.68540003	-76.64012896	-1.502241	2021-06-17T14:31:40Z	Timber	73	Large timber
34.68402296	-76.63265901	3.569278	2021-06-17T16:49:48Z	Timber	138	Piece of wood with frame and brick next to it
34.68398801	-76.63263897	-0.54118	2021-06-17T16:49:56Z	Timber	95	Wood sheet
34.63057802	-76.53241899	-0.573106	2021-06-24T12:38:23Z	Timber	185	Wooden timber
34.63368704	-76.52901996	-0.903285	2021-06-24T12:56:00Z	Timber	187	Burnt wood timbers
34.635119	-76.53089499	-3.30266	2021-06-24T13:05:15Z	Timber	189	Timbers in the water
34.635076	-76.531011	-1.434311	2021-06-24T13:08:57Z	Timber	190	Possible House Timbers
34.63522101	-76.53408196	-1.327724	2021-06-24T13:23:49Z	Timber	192	Lichen timbers
34.64171698	-76.54184503	-1.972394	2021-06-24T14:48:06Z	Timber	194	Timbers in the water
34.64158002	-76.54200504	-3.28552	2021-06-24T14:48:47Z	Timber	131	timbers
34.64560996	-76.54485899	0.045509	2021-06-24T15:34:14Z	Timber	135	Large beam
34.64732599	-76.547938	1.476645	2021-06-24T15:49:49Z	Timber	31	Wood debris field
34.65240098	-76.55237798	6.674226	2021-06-24T18:44:49Z	Timber	178	wood beams
34.65353899	-76.55625301	5.323928	2021-06-24T19:04:09Z	Timber	185	Board

Domestic Artifacts

Latitude	Longitude	Elevation	Time	Subcategory	Numeration	Comment
34.67139504	-76.58862602	-5.654399	2021-06-16T17:08:42Z	Bottle	60	Glass jar
34.67998104	-76.62281597	-0.158622	2021-06-17T17:35:30Z	Bottle	102	Blue bottle
34.65240098	-76.55237798	6.674226	2021-06-24T18:44:49Z	Bottle	178	Bottle
34.65242503	-76.552368	5.19349	2021-06-24T18:45:12Z	Bottle	45	Intact bottle
34.65591199	-76.561112	6.522196	2021-06-24T19:31:46Z	Bottle	190	Small bottle
34.67566897	-76.61155203	-4.761015	2021-06-16T13:47:11Z	Ceramic	66	Piece of ceramic
34.67525398	-76.61035703	-4.108924	2021-06-16T14:10:21Z	Ceramic	74	Ceramic sherd
34.67443096	-76.60829499	-2.9033	2021-06-16T14:33:27Z	Ceramic	79	Whiteware ceramic sherd
34.673215	-76.60378402	-7.27794	2021-06-16T15:26:42Z	Ceramic	38	ceramic Cluster
34.67326102	-76.60338999	-4.572301	2021-06-16T15:30:11Z	ceramic	92	plate ceramic clusters, ceramic
34.67323503	-76.603249	-4.771015	2021-06-16T15:33:55Z	Ceramic	93	Possible site. Clusters of ceramic
34.67292599	-76.60230797	-9.899864	2021-06-16T15:39:58Z	Ceramic	40	Terra cotta sherd
34.67294997	-76.60186398	-4.61254	2021-06-16T15:41:44Z	ceramic	96	ceramics
34.67266699	-76.60116903	-4.173674	2021-06-16T15:48:42Z	Ceramic	99	Ceramic sherd
34.67145899	-76.58882199	-4.926605	2021-06-16T17:14:21Z	Ceramic	62	Ceramics
34.68436201	-76.63611302	-3.10712	2021-06-17T15:36:12Z	Ceramic	84	Ceram
34.68388701	-76.63237503	0.223937	2021-06-17T16:51:09Z	Ceramic	96	small ceram
34.68282804	-76.62810998	-0.167952	2021-06-17T17:13:59Z	Ceramic	101	Ceram
34.65087497	-76.54364303	-2.614726	2021-06-24T17:03:37Z	Ceramic	143	ceramic
34.65118703	-76.54628601	-2.295059	2021-06-24T17:18:52Z	Ceramic	145	Ceramic with makers mark, possibly a plate
34.65126498	-76.54657803	-2.871082	2021-06-24T17:23:12Z	Ceramic	149	ceramic
34.65126799	-76.54742796	-0.93019	2021-06-24T17:28:19Z	Ceramic	156	ceramic
34.65175398	-76.54840403	1.949581	2021-06-24T17:46:39Z	Ceramic	161	ceramic debris
34.65223099	-76.55097703	3.32547	2021-06-24T18:35:47Z	Ceramic	42	Debris scatter, ceramic
34.65325199	-76.555215	3.28776	2021-06-24T19:16:09Z	Ceramic	48	Ceramic
34.65126598	-76.54651601	0.375362	2021-06-24T17:24:52Z	Ceramic	152	Post with possible sink fragments nearby
34.675328	-76.61075399	-3.553738	2021-06-16T13:59:49Z	Glass	70	Melted glass
34.67133997	-76.59773698	-12.232537	2021-06-16T16:17:22Z	Glass	44	10m glass frag
34.684533	-76.63433497	1.462269	2021-06-17T16:24:53Z	Glass	134	Melted glass shard and large iron fragment
34.67849602	-76.61855604	9.217537	2021-06-17T18:02:34Z	Glass	146	Glass shard
34.63443797	-76.53411197	-2.61103	2021-06-24T13:26:50Z	Glass	122	3 sherds of purple glass
34.63434502	-76.53404499	-3.168297	2021-06-24T13:30:47Z	Glass	123	1 piece of clear glass
34.64158002	-76.54200504	-3.28552	2021-06-24T14:48:47Z	Glass	131	Glass

34.65002697	-76.54160799	-1.753974	2021-06-24T16:47:43Z	Glass	140	Sherd of milk glass
34.65087497	-76.54364303	-2.614726	2021-06-24T17:03:37Z	glass	143	Melted glass
34.65097999	-76.54404502	-2.057905	2021-06-24T17:06:59Z	Glass	144	Glass and Iron debris field
34.651283	-76.54655096	-1.41833	2021-06-24T17:24:09Z	glass	150	glass
34.65175398	-76.54840403	1.949581	2021-06-24T17:46:39Z	Glass	161	Glass debris
34.65246703	-76.552483	6.066219	2021-06-24T18:47:13Z	Glass	179	Melted glass
34.65397996	-76.55736999	5.717755	2021-06-24T19:20:54Z	Glass	188	Melted glass
34.65016996	-76.54169398	-1.942656	2021-06-24T16:44:43Z	Misc	139	Shoe heal
34.68439998	-76.63386701	1.879685	2021-06-17T16:27:34Z	misc	136	iron scatter and hinge
34.68333296	-76.629292	-0.830432	2021-06-17T17:08:40Z	misc	100	Metal bracket

Industrial Artifacts

Latitude	Longitude	Elevation	Time	Subcategory	Numeration	Comment
34.67034303	-76.59588098	-0.047548	2021-06-16T16:29:11Z	Barrel	107	Barrel well remains?
34.65043902	-76.54232397	-2.499944	2021-06-24T16:59:35Z	Barrel	142	Possibly two barrels
34.65182204	-76.54855901	2.040159	2021-06-24T17:52:03Z	Barrel	162	Two wooden barrels
34.65179102	-76.548671	1.728092	2021-06-24T17:56:11Z	Barrel	163	Wooden barrel
34.65209001	-76.54999701	3.792511	2021-06-24T18:21:27Z	Barrel	167	Possible barrel
34.65212697	-76.55010497	3.197968	2021-06-24T18:23:06Z	Barrel	168	Two barrels
34.652118	-76.55008502	3.168421	2021-06-24T18:23:43Z	Barrel	169	Barrels
34.65209202	-76.55013599	2.870603	2021-06-24T18:25:22Z	Barrel	170	Barrels
34.65215798	-76.55028803	3.821719	2021-06-24T18:26:57Z	Barrel	172	Barrel
34.65216503	-76.55036699	2.505498	2021-06-24T18:27:30Z	Barrel	173	Barrel
34.65212001	-76.55033003	2.074846	2021-06-24T18:28:39Z	Barrel	175	Barrels
34.65220802	-76.55077402	1.59875	2021-06-24T18:34:10Z	Barrel	41	Barrel
34.65242503	-76.552368	5.19349	2021-06-24T18:45:12Z	Barrel	45	barrel slats
34.65300799	-76.55470002	4.850299	2021-06-24T18:50:56Z	barrel	46	Barrel
34.63201904	-76.53545198	1.178656	2021-06-24T12:27:46Z	Dock	184	Dock timbers
34.65354804	-76.55597096	4.775814	2021-06-24T19:00:37Z	Dock	183	End of dock
34.65379598	-76.55582503	5.228354	2021-06-24T19:01:47Z	Dock	184	End of dock
34.67123704	-76.59766599	-10.608996	2021-06-16T16:19:03Z	Fence	45	Fence post
34.66965202	-76.59275796	-7.137979	2021-06-16T16:39:42Z	Fence	50	Fenced square
34.67132798	-76.58881897	-6.130264	2021-06-16T17:15:33Z	Fence	63	Rectangular fence post with barb wire
34.671446	-76.58917302	-5.085227	2021-06-16T17:19:39Z	Fence	65	Fence post, round

34.67144801	-76.58930998	-5.113219	2021-06-16T17:20:14Z	Fence	66	Fence post, round
34.63373196	-76.530896	0.401137	2021-06-24T12:56:52Z	Fence	118	South east of fence post.
34.63382198	-76.53100597	0.422347	2021-06-24T13:02:00Z	Fence	119	South west of fence post
34.63392098	-76.530867	0.322894	2021-06-24T13:04:21Z	Fence	120	North west of fence post
34.63384101	-76.530709	0.157117	2021-06-24T13:06:07Z	Fence	121	North east of fence post
34.64256397	-76.54299201	2.002171	2021-06-24T14:58:45Z	Fence	195	Fence posts
34.65300799	-76.55470002	4.850299	2021-06-24T18:50:56Z	Fence	46	pen/fencing
34.65337001	-76.55579503	7.115718	2021-06-24T18:59:29Z	Fence	182	Fence post
34.653685	-76.55677504	7.314463	2021-06-24T19:06:53Z	Fence	186	End of fence post line
34.65643904	-76.56191097	3.241491	2021-06-24T19:33:49Z	Fence	54	End of pen or fence
34.65541301	-76.56116598	3.128567	2021-06-24T19:42:01Z	Fence	55	burnt wood, remains of pony pen
34.65942702	-76.56655898	8.285654	2021-06-19T17:25:51Z	fence	117	Three posts, one with hinge
34.658863	-76.56618498	8.845496	2021-06-19T17:28:48Z	fence	118	Fence posts, burnt piling
34.63963903	-76.53734604	-4.648796	2021-06-24T14:11:30Z	fence	127	Pilings
34.67360199	-76.60449497	-3.548198	2021-06-16T15:21:08Z	misc	87	Possible site old dock? Oyster clusters, 20x20m. Revisit and map on low tide
34.65251396	-76.55256397	1.493086	2021-06-24T19:10:43Z	Misc	47	Scraper handle
34.65140202	-76.54757498	-0.074521	2021-06-24T17:30:13Z	jetty	157	End of possible jetty, 35m end to end
34.65166404	-76.54778704	-1.216689	2021-06-24T17:32:11Z	jetty	158	End of possible jetty
34.65043399	-76.54183497	0.537879	2021-06-24T16:34:22Z	jetty	137	Inland jetty end
34.65114797	-76.54180001	-0.463173	2021-06-24T16:36:50Z	jetty	138	Jetty end
34.673517	-76.60459204	-8.565575	2021-06-16T15:20:36Z	piling	36	Dock?
34.67216299	-76.60020696	-8.416284	2021-06-16T15:56:41Z	Piling	42	Dock timber
34.670151	-76.59487196	0.026362	2021-06-16T16:33:43Z	Piling	108	Four pilings sticking out of water
34.65122198	-76.54728203	-0.069176	2021-06-24T17:27:29Z	Piling	154	Post in a line
34.65124402	-76.54732101	-1.395156	2021-06-24T17:27:53Z	Piling	155	Post in a line
34.65126799	-76.54742796	-0.93019	2021-06-24T17:28:19Z	piling	156	Post in a line
34.65177602	-76.54826598	1.776312	2021-06-24T17:44:52Z	Piling	159	Post
34.65180201	-76.54827897	1.218663	2021-06-24T17:45:27Z	Piling	160	Post
34.65193897	-76.54994496	5.476831	2021-06-24T18:17:55Z	Piling	165	Large post in line with posts in water
34.65211297	-76.54991303	3.566337	2021-06-24T18:19:31Z	Piling	166	Other end of post line
34.65126799	-76.54650897	0.425429	2021-06-24T17:25:11Z	piling	153	Post with iron nearby
34.652147	-76.55021704	3.798233	2021-06-24T18:25:56Z	Piling	171	Post
34.65331301	-76.55470898	6.952444	2021-06-24T18:53:13Z	Piling	180	Post
34.65322198	-76.55530804	4.412605	2021-06-24T18:58:07Z	Piling	181	Four posts

34.65372196	-76.55687202	7.120019	2021-06-24T19:15:28Z	Piling	187	Three post
34.67184104	-76.589515	-7.501876	2021-06-16T17:01:14Z	Piling	54	Post next to whale creek
34.67187004	-76.58937	-7.427231	2021-06-16T17:01:42Z	Piling	55	Piling
34.67218897	-76.59934203	-3.392545	2021-06-16T16:03:13Z	Piling	104	Piling
34.67261603	-76.60105697	-4.168817	2021-06-16T15:50:10Z	Piling	100	Pilings
34.67261	-76.60104498	-6.111603	2021-06-16T15:51:34Z	Piling	41	Post
34.67366704	-76.60512504	-3.043605	2021-06-16T15:18:27Z	Piling	85	Two pilings
34.67356897	-76.60464702	-3.45236	2021-06-16T15:19:58Z	Piling	86	Two pilings
34.67346797	-76.604155	-4.180916	2021-06-16T15:24:11Z	Piling	89	Piling
34.67336001	-76.60373096	-3.730775	2021-06-16T15:25:38Z	Piling	90	Piling
34.67414103	-76.60745203	-6.503492	2021-06-16T14:45:28Z	Piling	29	Post stump
34.68446603	-76.63407102	1.935021	2021-06-17T16:26:36Z	Piling	135	Two pilings
34.68450601	-76.63452197	-1.101022	2021-06-17T16:21:50Z	Piling	89	Post
34.68453803	-76.634542	1.890381	2021-06-17T16:22:10Z	Piling	133	Piling
34.68473299	-76.63639599	-2.84635	2021-06-17T15:13:43Z	Piling	128	Piling
34.68468396	-76.63594002	-2.257241	2021-06-17T15:15:35Z	Piling	129	Piling
34.68505201	-76.63782301	-2.192897	2021-06-17T14:56:34Z	Piling	124	Piling
34.68486099	-76.63738699	-2.60548	2021-06-17T15:09:11Z	Piling	125	Piling
34.68517497	-76.63880303	-1.278305	2021-06-17T14:51:28Z	Piling	76	Post
34.65327404	-76.55529496	3.222087	2021-06-24T19:16:38Z	Piling	49	Wood pilings
34.64532296	-76.54449203	1.25401	2021-06-24T15:32:08Z	Timber	134	Board walk

Miscellaneous Artifacts and Sites

Latitude	Longitude	Elevation	Time	Subcategory	Numeration	Comment
34.68306097	-76.629868	0.242598	2021-06-17T17:03:32Z	Cemetery	98	Cemetery
34.64963604	-76.54151402	-4.388885	2021-06-24T16:52:13Z	Cluster	141	Debris field
34.64773301	-76.54059403	-0.038341	2021-06-24T17:13:24Z	Cluster	36	Debris field
34.64660003	-76.53705996	0.423038	2021-06-24T17:39:07Z	Cluster	38	Debris field
34.64727703	-76.54446898	0.303497	2021-06-24T16:11:07Z	wood	196	Door like panel in water
34.64260496	-76.54294398	-0.17473	2021-06-24T15:19:38Z	Shell	132	Cut shell

Natural Features

Latitude	Longitude	Elevation	Time	Subcategory	Numeration	Comment
34.68529198	-76.65055403	5.215857	2021-06-17T13:42:28Z	Dune	70	High dune
34.68531503	-76.65058899	3.855188	2021-06-17T13:42:52Z	Dune	122	Top of sand dune

34.68492201	-76.65049796	5.523769	2021-06-17T13:46:13Z	Dune	71	High dune
34.630948	-76.53189202	7.200243	2021-06-24T12:38:42Z	Dune	117	Lookout HILL?
34.68430501	-76.63316997	-3.293734	2021-06-17T16:44:54Z	Nature	94	Woody floor?
34.684519	-76.638079	-0.643818	2021-06-17T15:04:24Z	pond	79	Clearing next to pond
34.68468798	-76.63714098	-1.111139	2021-06-17T15:10:43Z	pond	126	Mullet pond?
34.68449897	-76.63643003	-2.304681	2021-06-17T15:13:45Z	pond	81	Tidal inlet to pond

Modern Artifacts

Latitude	Longitude	Elevation	Time	Subcategory	Numeration	Comment
34.67524602	-76.61030397	-3.785461	2021-06-16T14:13:22Z	Car	75	Two pieces of car rim
34.67033297	-76.59691698	3.605907	2021-06-16T17:56:48Z	Car	116	Car
34.67698703	-76.61394297	3.74998	2021-06-16T18:41:09Z	Car	117	Car
34.67695601	-76.613963	3.733623	2021-06-16T18:41:16Z	Car	118	Car
34.67693204	-76.61396703	-1.847477	2021-06-16T18:41:26Z	Car	69	Car
34.67696196	-76.61392998	3.648462	2021-06-16T18:41:38Z	Car	119	Car
34.67706598	-76.61416098	3.807317	2021-06-16T18:42:07Z	Car	120	Car
34.67736103	-76.61454102	3.090098	2021-06-16T18:44:10Z	Car	121	Car parts
34.64106596	-76.54147496	-2.968308	2021-06-24T14:45:29Z	Car	130	Tire in proximity to wood and glass
34.63541002	-76.53337101	-1.018681	2021-06-24T13:19:50Z	Fence	191	Modern fence posts
34.66982402	-76.59177401	0.923644	2021-06-16T16:42:45Z	Bottle	110	Glass clorox bottle
34.67133997	-76.58927201	-4.842629	2021-06-16T17:22:48Z	Bottle	67	Bottles
34.67160903	-76.58878603	-7.091326	2021-06-16T17:06:02Z	Bottle	58	Big glass bottle, orange juice?
34.670454	-76.590881	0.282412	2021-06-16T16:46:52Z	Bottle	111	Old bottle
34.68498101	-76.63820003	-2.314012	2021-06-17T14:55:39Z	Bottle	77	bottle bottom
34.67122497	-76.58884697	-4.198812	2021-06-16T17:16:39Z	Bottle	64	Brown glass base
34.671906	-76.59942702	-3.172435	2021-06-16T18:08:46Z	Marker	68	Nps datum point
34.65198096	-76.54924499	0.667733	2021-06-24T18:10:41Z	Marker	164	Geodetic survey marker
34.64686599	-76.53813796	-0.605786	2021-06-24T17:25:08Z	misc	37	Debris field
34.639979	-76.53964302	-2.902566	2021-06-24T14:30:17Z	Misc	129	Light bulb
34.67109396	-76.59736902	-1.222342	2021-06-16T16:22:31Z	Piling	106	Modern piling
34.64521098	-76.54442699	1.509122	2021-06-24T15:30:53Z	Road	133	End of road heading North
34.67148799	-76.58881	-4.553378	2021-06-16T17:13:58Z	road	61	Truck Tracks
34.66996098	-76.59407903	-8.043056	2021-06-16T16:36:00Z	Telephone	49	Telephone pole
34.67001898	-76.59413603	1.320976	2021-06-16T16:36:19Z	Telephone	109	Telephone pole

34.67020104	-76.59614702	3.945879	2021-06-16T17:53:54Z	Telephone	114	Telephone pole?
34.67021998	-76.59621097	3.831169	2021-06-16T17:54:15Z	Telephone	115	Telephone pole?
34.66034803	-76.56790897	5.841013	2021-06-19T17:08:04Z	Telephone	109	Telephone pole, burnt posts
34.63649296	-76.53598599	-1.383188	2021-06-24T13:57:32Z	Telephone	193	Telephone pole
34.64638302	-76.54552099	-1.352421	2021-06-24T15:41:22Z	Telephone	136	Horizontal telephone pole
34.65647902	-76.56172799	6.765038	2021-06-24T19:34:18Z	Telephone	191	telephone pole
34.65655899	-76.56183796	5.56424	2021-06-24T19:35:32Z	Telephone	192	telephone pole

Unidentified (UID) Metal Artifacts

Latitude	Longitude	Elevation	Time	Subcategory	Numeration	Comment
34.65231699	-76.55170902	4.281387	2021-06-24T18:41:56Z	UID metal	44	Iron pipe
34.67597499	-76.61235804	-3.795374	2021-06-16T13:40:23Z	UID metal	65	piece of iron
34.67527997	-76.61062298	-3.756002	2021-06-16T14:04:34Z	UID metal	71	Unidentified ferrous material
34.67529204	-76.61056699	-4.013433	2021-06-16T14:05:52Z	UID metal	72	Metal fragment
34.67505399	-76.61027002	-4.086843	2021-06-16T14:14:10Z	UID metal	22	Iron clstr
34.67446198	-76.60858501	-6.326209	2021-06-16T14:32:09Z	UID metal	24	Iron
34.67435997	-76.60822299	-1.408934	2021-06-16T14:39:06Z	UID metal	26	UId ferrous
34.67428797	-76.60796399	-5.980973	2021-06-16T14:41:13Z	UID metal	27	Concretion
34.67423801	-76.60781002	-6.06495	2021-06-16T14:43:36Z	UID metal	28	Galvanized
34.67315096	-76.60310299	-4.397711	2021-06-16T15:35:44Z	UID metal	94	Two iron clusters
34.68452998	-76.63665298	-2.304681	2021-06-17T15:12:45Z	UID metal	80	Iron scatter
34.63203404	-76.53468898	2.310956	2021-06-24T12:29:30Z	UID metal	116	Unidentified Iron
34.635133	-76.53637198	-2.568129	2021-06-24T13:40:46Z	UID metal	124	Unidentified Iron
34.642122	-76.54243704	1.046788	2021-06-24T14:58:27Z	UID metal	29	Unidentified Iron
34.65097999	-76.54404502	-2.057905	2021-06-24T17:06:59Z	UID metal	144	Glass and Iron debris field
34.65397996	-76.55736999	5.717755	2021-06-24T19:20:54Z	UID metal	188	UID iron
34.67276699	-76.60126501	-4.47218	2021-06-16T15:47:29Z	UID metal	98	Steel plate
34.65125701	-76.546472	-0.843435	2021-06-24T17:20:43Z	UID metal	146	Pipe
34.65222102	-76.55070201	0.583045	2021-06-24T18:33:45Z	UID metal	40	Filled in pot or bowl
34.65541301	-76.56116598	3.128567	2021-06-24T19:42:01Z	UID metal	55	UID Iron
34.68614602	-76.64575799	-1.576887	2021-06-17T14:04:48Z	wire	72	Rusty cable
34.63759099	-76.53505996	-2.909314	2021-06-24T14:00:53Z	wire	125	Wire cable
34.63764799	-76.53511402	-2.802457	2021-06-24T14:02:44Z	wire	126	Wire cable