ABSTRACT

RECONSTRUCTING THE WATERFRONT: AN HISTORICAL AND ARCHAEOLOGICAL RECONSTRUCTION OF THE NINETEENTH CENTURY PORT OF WASHINGTON, NC

By

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Director: Dr. Nathan Richards

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The purpose of this project is to gather historical and archaeological data to illuminate potential relationships between economic and social trends in the construction of wharf structures and enhance our understanding of the multitude of factors that drive the growth and decline of port communities. Ports and harbors have long been understudied aspects of maritime archaeology. Yet, they are gateways into the historical and commercial past of regional, as well as international cultures. Therefore, this study is a unique opportunity to analyze waterfront installations within their economic context. To do this, the coastal town of Washington, NC, situated along the Tar-Pamlico River, will be used as a case study. Historical and archaeological information will be gathered from several sources and will be assessed for correlation.

Reconstructing the Waterfront: An Historical and Archaeological Examination of the Nineteenth Century Port of Washington, NC

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Dedication

This thesis is dedicated to my mother, Ann Marie Nebel Nassif.

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CHAPTER ONE: INTRODUCTION

From antiquity to modern times, humanity has endeavored to transport raw materials and manufactured products alike through the world's many inland waterways and vast oceans. In order to facilitate maritime commerce, societies created artificial waterfront structures to aid in the unloading and processing of tradeable goods. Through time, embryonic landings evolved into the modern ports visible today, complete with industrial machinery, grand constructions, and, eventually, bureaucratic management structures. Ports became locations of cultural, commercial, and ideological exchange, being places where people of diverse social and economic backgrounds interacted throughout history. Peter Quartermaine stated that "above all, ports have always traditionally been sites which offer, even invite, acceptance and the appreciation of difference. For such reasons, which are both overlaid and connected by changes in modern location and technology, ports have much to tell us of cultural, as well as commercial trading" (Quartermaine 1999:22). Despite that, very few archaeological studies have been undertaken to understand the economic factors which contributed to port development and expansion, reflected in both the archaeological and historical records.

The town of Washington, NC (FIGURE 1), offers an excellent opportunity to identify and record these trends as present in the historical and archaeological record. While the majority of the town's historical working waterfront has been entombed underneath modern development, significant archaeological resources exist on the periphery of the port, along the southern and western shorelines of the Pamlico River. Historically, these areas possessed infrastructure related to industry, rather than receptacles solely constructed to for commercial trade. The Pamlico River sites under examination for this project were home to the S.R. Fowle & Son Company

Sawmill and the Eureka Lumber Company Sawmill, specifically their waterfront facilities. The final site corresponds to an unidentified landing, termed the South Shore Landing Site. While they were not necessarily areas where vessels returning from European or other American ports would berth, they, and their physical location, explain the role of their industries in developing the port of Washington, as well as its expansion. Due to this, a careful archaeological and historical examination will disclose a more complete narrative of the once prominent river town.

FIGURE 1. A Map of North and South Carolina showing Washington and its location along the Tar-Pamlico River. (Scott, Joseph 1795). North Carolina, The United States Gazetteer. F. & R. Bailey, Philadelphia, PA. David Rumsey Historical Map Collection. Arrow added by author

Previous Research and Importance

Prior to this study, very little archaeological work had been conducted on Washington's waterfront structures. Even fewer had been directed on port structures in North Carolina as a whole. The lack of information made this study an important step towards forwarding our understanding of port construction and development. Previous studies of Washington's waterfronts stem from several reports compiled during a previous East Carolina University Maritime Studies Field School. This includes Chris McCabe's (2004) "Cultural Heritage Assessment of the South Shore Washington, North Carolina Landing Site: ECU04-TRN-0001," Erica Seltzer's (2004) "Terrestrial Site Assessment: Site Number ECU04-TRN-0003," and Matthew De Felice's (2004) "An Assessment of a Submerged Resource on the South Shore of the Pamlico River Site # ECU04-UW-0003." Their studies concluded that each location, that of the South Shore Landing Site and the Eureka Lumber Company island structure, possessed substantial port infrastructure and had tremendous potential for further archaeological investigations.

In contrast, much has been written about Washington's role in the Pamlico River commercial system from a historical perspective. James Cox's (1989) thesis "The Pamlico-Tar River and its Role in the Development of Eastern North Carolina" and Chris McCabe's (2007) thesis "The Development and Decline of Maritime Commerce and its Impact upon Regional Settlement Patterns" firmly established the vital role waterborne commerce played in developing each county which the river flowed through. Even further, Justin Edwards (2015) thesis "Tar River Blounts and a Transitional Maritime Cultural Landscape, 1778-1802" brought a focus towards the prominent merchant family and how they had directly impacted economic,

population, and societal growth in eastern North Carolina. Yet, no attempt has been made to link the economic aspect of Tar-Pamlico waterborne commerce to the Washington infrastructure which inevitably facilitated it. Historical reporting has demonstrated the commercial trends and narratives throughout the region's history. Archaeological studies have indicated the potential for further study at each identified archaeological site. Therefore, the importance of this thesis lies in the ability to link the two datasets in order to paint a more complete portrait of how the port of Washington developed according to economic trends. Furthermore, it provides an opportunity to examine historical port infrastructure which is noticeably lacking from Washington's modern waterfront.

Objectives

The predominant narrative of the port is that, after its founding in 1776, the port blossomed and became the focal point for trade on the Tar-Pamlico River. Historians have noted and celebrated the importance of the river port as one component of the river trade system. Herbert Paschal praised early Washington as being "an important trading center" (Paschal 1976:3). Wingate C. Reed stated that waterborne commerce "increased greatly" as soon as the North Carolina General Assembly named the town as a port of entry in 1790 (Reed 1962:163). Through the nineteenth and early twentieth centuries, Washington facilitated the exports of numerous goods that waxed and waned according to consumer demands and other economic factors. Of these, the most prominent exports were naval stores, lumber products, and agricultural yields. Eventually, and even from the beginning when considering the many shipbuilding ventures in early nineteenth century Washington (Litchfield 1976), industrial

machineries became commonplace in the port alongside a thriving shipping industry. These formed a symbiotic relationship between Washington's shipping industry and the expanding industrial sector of the port (FIGURE 2).

FIGURE 2. 1884 photograph by William Garrison Reed, soldier in the 44th Massachusetts Regiment, taken from the Pamlico River Bridge entering Washington showing a lumber warehouse (R), Castle Island (C), and downtown Washington (L). (Photo courtesy of the Craven County Digital History Exhibit).

This research attempts to correlate economic trends with the construction of waterfront installations. Through three similar, yet different, archaeological sites, conclusions can be made regarding how the port prioritized space and incorporated innovative technology into their port facilities. The South Shore Landing site, S.R. Fowle & Son Sawmill, and Eureka Lumber

Company Sawmill possessed waterfront facilities that propagated and promoted waterborne industry and commerce. Economic data, displayed within the archaeological context, can explain how Washington reacted to a changing economy through the construction and adaptation of waterfront installations. Potentially, the methods employed in this study may be developed and improved upon into future studies of port infrastructure.

Lastly, it is crucial to consider that these installations were not located along the traditional waterfront and that they were locations of industry in addition to potential vessel berths. When looking at Washington's current waterfront, very little remains of the once vibrant port. Beside the warehouses and historic buildings, visitors to the town today do not see many remnants of what used to be an important trading and industrial community centered on the Pamlico River. These three sites can become prominent visible links to the town's heritage which align with the National Register for Historic Places criteria for inclusion as a historic site (National Park Service 1990).

Research Questions

Using the town of Washington, NC as a case study, this research project will use historical and archaeological records pertaining to its port to ascertain *what social archaeological approaches can be applied to the port to provide a complete history of its development and decline during nineteenth and early twentieth centuries*. To answer the primary research question, this project will seek out potential patterns within the historical and archaeological record, including:

- How did the intra-harbor relationship change throughout the period of study?
- In what ways did the intra-industry relationships alter throughout the period of study?
- Is there any correlation between changes in infrastructure technology and societal developments?
- What developments took place that fostered or detracted from industrial development on one side of the river over the other?
- What were the logistics of the intra-harbor relationships?
- How does the archaeological record reflect changing consumer demand for the principal exports?

Importantly, this study also seeks to use the archaeological record as a way of reconstructing the Port of Washington through time to visually depict how development and decline visually changed its waterfront and left indelible traces within its landscape (in the archaeological record).

Thesis Structure

The thesis is broken into eight chapters. *Chapter One: Introduction*, focuses on introducing the work and includes a brief historical background, the objectives of this study, the research questions which frame the study and the structure breakdown. The introduction transitions into the second chapter, *History*. *Chapter Two: Commercial History of the Port of Washington* includes a historical narrative beginning with the reasons that colonial settlers inhabited the modern port of Washington. Chronologically, it documents the ebb and flow of

various exports according to secondary sources, as well as primary sources including newspapers and journals. The remainder of the chapter explains the eventual decline of the shipping industry in the twentieth century.

Chapter Three: Theoretical Approaches to Port and Harbor Studies describes the multiple theoretical frameworks employed to examine the archaeological components of the thesis. Social archaeological approaches enable the study to attribute structures and material to the individual or business firm which utilized it. Gordon Jackson's work connecting technological improvements in port infrastructure, even the creation of new ports, explains the way ports respond to economic stimuli. Finally, geographic port studies explain the spatial relationship between a port, its city, and the hinterland which depends on the port for imports and exporting their products.

Chapter Four: Methodology describes the process which historical research was performed throughout the data collection process from historical collections in Joyner Library and Brown Library. It also describes the survey process for each site and the illustration process of survey proformas. *Chapter Five: Historical Data from Several Prominent Businesses and Industries which Utilized the Port of Washington* presents the historical data in graph form according to each firm or individual consulted for this study. *Chapter Six: Wharf, Bricks, and Piles, Archaeological Results* describes the findings from each archaeological site. This transitions into *Chapter Seven: Analysis of Washington's Nineteenth and Early Twentieth Century Port Economy* which describes the archaeological meaning and relevance of the findings from *Chapter Five* and *Chapter Six: Results*. Lastly, *Chapter Eight: Conclusion* summarizes the project and reiterates the key findings from the survey. Additionally, it offers advice towards future studies and shows where this research was lacking.

CHAPTER TWO: COMMERCIAL HISTORY OF THE PORT OF WASHINGTON

Introduction

As European colonists began their inhabitance of North Carolina during the sixteenth and seventeenth century, they found a land teeming with possibility and untapped potential. The first settlers situated themselves throughout the colony's Coastal Plain region with its plentiful natural resources and inland waterways which linked them to the Atlantic via the treacherous inlets along the Outer Banks (Ready 2005:50). Despite the apparent abundance in natural resources, North Carolina lagged behind its neighboring colonies in terms of infrastructure and access to the wider Atlantic commercial market for a variety of reasons. Along the colony's coastline, there remained no viable location to establish a deep-water port. Instead, colonists focused on establishing settlements at locations along the region's vast inland waterways that would supplement the lack of overland transportation between towns, as well as a link to the larger Atlantic trade network (Fenn and Wood 2003:36).

The town of Washington, situated at the confluence of the freshwater Tar River and the saltwater Pamlico River, served a prominent role in the development of the eastern part of North Carolina. Its location enabled the town to act as a shipping terminus for exportable goods from the state's resource rich Coastal Plain, as well as offering a safe harbor for merchant vessels sailing from throughout the Atlantic trade network. Therefore, as a region, scholars have paid particularly close attention to the numerous settlements established along the Tar-Pamlico's riverbanks and how these settlements worked together to bring forth economic prosperity to this region. Washington certainly benefitted by being a part of this network, but little scholarly

attention has been given to the town's economic growth and that of the surrounding communities dependent upon it for shipping. From its inception in the latter half of the eighteenth century, Washington served as a loading point for North Carolina's exportable goods and importable products from northern colonies and the West Indies. The town would retain its importance until the twentieth century, when infrastructure improvements no longer necessitated waterborne commerce.

This chapter will chart the development of commerce in Washington and the factors that led to its growth as a shipping terminus in the nineteenth century. In order to do this, the town's colonial and early federal industries will serve as a starting point since many continued to be prominent in nineteenth century Washington.

Eighteenth Century Washington

As settlers descended on the Pamlico River region in the seventeenth century, they found land teeming with natural resources and the potential for agricultural development. Once the population began to increase, settlers became aware of the need for a central location in order to gather to conduct trade and commercial business (Reed 1962:43). Initially, the town of Bath served as this central location. Located downriver of Washington, Bath enjoyed a period of significant economic importance during the early colonial period, even being named the first official port of entry in the province (FIGURE 3) (Lefler and Newsome 1973:55). Upon its establishment, North Carolinians along the Pamlico River had a port linking them to the larger colonial trade network, as well as other parts of the colony inaccessible by land. Prophetically, one visitor to Bath in the early eighteenth century declared the Pamlico area "not the

unpleasantest part of the country-nay, in all probability it will be the center of trade, as having the advantage of a better inlet for shipping and being surrounded with the most pleasant savannas very useful for raising cattle" (Reed 1962:45-46). Rather than Bath, however, a more advantageous location along the river would attract the focus of planters and merchants to facilitate their waterborne trade.

FIGURE 3. Washington and Bath along the Pamlico (Clements and Price 1822)

Further upriver from Bath, settlers congregated along the northern banks of the confluence of the Tar-Pamlico River as early as the beginning of the eighteenth century. In 1726, the eight Lords Proprietors granted 337 acres of land, including present-day Washington, to Chris Dudley (Paschal 1976:1). This location proved advantageous for trade for numerous

reasons, but most importantly it afforded those engaged in commercial activities greater access to the resource rich back-country, being 20 miles upriver then Bath (Reed 1962:106). Ownership of the land referenced as Peatown, Forks of the Tar, and Bonner changed hands several times in the following years before being inherited by Colonel James Bonner from his father. In 1776, Col. Bonner laid out 30 acres of his farm, including 1,200 feet of Pamlico River frontage, into 60 lots and six streets (Reed 1962:102). At this time, the town also received its current name, in honor of the commander of the Continental Army, George Washington.

After playing a significant role in the Revolutionary War, its shallow harbor offered merchants supplying the Continental Army refuge from the British blockade, Washington developed rather quickly in the remaining decades of the eighteenth century. The town was incorporated by the General Assembly in Hillsborough in 1782 (Paschal 1976:3) and, shortly thereafter, replaced Bath as the county seat of Beaufort County in 1785 (Reed 1962:109). Washington became the economic focal point of Tar-Pamlico communities, linking the interior of the new state to the wider Atlantic trade network. Years later, Herbert Paschal reflected upon the town's blossoming industrial sector, describing Washington "as an important trading center. Several large wharves had been erected and sometimes as many as twenty sailing vessels could be seen lying in the harbor. From Washington, brisk trade was conducted with upriver settlements as far as Tarboro" (Paschal 1976:3). The region's abundance of agricultural goods encouraged economic growth, especially during a period before significant industrial investment.

In North Carolina's Coastal Plain, several industries sprouted up during the colonial period. Hugh Talmage Lefler and Albert Ray Newsome emphasized the burgeoning naval stores and lumber industries as being paramount in developing this part of the state. They emphasized their importance by concluding that "in the eighteenth century, seven-tenths of the tar, more than

one half the turpentine, and one-fifth of the pitch exported from all the colonies to England came from the longleaf pine forests of North Carolina" (Lefler and Newsome 1973:97). In addition to these key exports, North Carolinian merchants also exported tobacco, salt pork, skins, and barrel staves in exchange for rum, molasses, sugar, coffee, and other manufactured goods from abroad (Powell 1989:132). In Washington, similar products appeared along its waterfront for export both upriver and out to the Atlantic. Paschal considers Washington's chief exports from the eighteenth century to be tar, pitch, turpentine, rosin, tobacco, shingles, and boards (Paschal 1976:4). The surrounding region provided plentiful forests which sustained these lumber-based industries, which, when cleared, turned into bountiful farmland. Using the region's plentiful supply of pine and other timber, local planters and merchants seized the opportunity provided them to established lucrative business ventures in the cultivation and export of these products.

By 1787, Washington had already begun to experience significant growth. In four short years, the town had grown from thirty families (Paschal 1976:3) to sixty (Attmore 1787:28). William Attmore, a merchant from Philadelphia, travelled to eastern North Carolina and recorded his observations of the growing countryside. Upon arriving in Washington, he remarked that the town contained "several convenient wharffes" and that "there are sometimes lying here near 20 sail of sea Vessels" (Attmore 1787:28). Attmore continued to describe the mercantile activities along the waterfront in detail during his stay in the waterfront community. From Washington, he observed that flatboats and scows carried up to seventy to eighty hogsheads of tobacco west along the Tar River to Tarboro, an assessment repeated by Lefler and Newsome (Attmore 1787:28; Lefler and Newsome 1973:268). In addition to that, Attmore noted that the town erected a rum distillery, possibly to offset the importation of the spirit (Attmore 1787:29). Visitors, like Attmore, did much to promote the growing town. At the turn of the century,

Washington appeared set to dominate commerce in Beaufort County and occupy a significant role in the development of North Carolina.

As the nineteenth century loomed on the horizon, two major industries appeared set to dominate Washington's commercial scene for the foreseeable future. Initially, the naval store industry provided most North Carolina's exports during the Colonial and early Federal period. William Powell claims that sixty percent of Great Britain's colonial naval stores exports came from North Carolina by 1768, especially from the Cape Fear Region (Powell 1989:135). After the Revolutionary War, instead of exporting to England and supplying the Royal Navy, shipping magnates sent turpentine, rosin, and tar northwards to the shipbuilding centers of Maine and Massachusetts. In addition to that, the vast pine forests also provided a steady amount of lumber. Both goods could be floated down the Tar River to their penultimate destination of Washington, where they could be processed for export (Watson 2003:113).

Both naval stores and lumber provided a constant stream of commercial activity for the young town. By 1794, Washington contained ten wharves along its waterfront, supplying the incessant stream of ships with these products (Hill 1984:5). Much like the rest of North Carolina, early commercial activity centered on the naval store industry. Wingate Reed asserts that "naval stores were Washington's most important and profitable initial exports" (Reed 1962:106). Just as well, lumber exports formed an equally profitable venture for the port. In February 1787, the brig *Russell*, hailing from Washington, was captured by French privateers. The *North Carolina Gazette* described the ship as being "loaded entirely of lumber" destined for New Providence before altering course into the path of the privateers (North Carolina Gazette 1797:3). *Russell* met a fate not too unfamiliar for many American merchants of this time period, but that did not stop Washington's merchants from exporting their valuable products northwards. Here, North

Carolina pine would be used in the construction of vessels, houses, and a variety of other industries that fueled the nineteenth century Industrial Revolution. This new century also increased Washington's significance in the development of the Tar-Pamlico region, as well as the rest of the state.

Antebellum Washington

The nineteenth century brought forth unparalleled success in Washington's waterborne commerce, the only cessation occurring during the trade wars with England and France. Before and after the minor conflicts, the port of Washington became the lifeblood of Beaufort County (Reed 1962:124-125). The same industries recorded by Attmore dominated the markets and wharves of the bustling port, but the town's abundance in natural resources permitted many alternative ventures to develop. Industry began to develop on the southern side of the river in order to prevent fire damage in addition to an expanding lumber industry. As Thomas Clayton later commented, "the primary factor stimulating the growth of towns was trade. Consequently, most were located at points convenient to water or overland transport" (Clayton 2003:289). Trade flowing in both directions from Washington increased economic development and, ultimately, prosperity to the waterfront town in the nineteenth century.

North Carolinians in the nineteenth century heavily depended upon waterborne transportation both for themselves and for moving agricultural goods from the many plantations along riverbanks. Thomas Clayton reinforces this notion in his chapter "Close to the Land: North Carolina, 1820-1870" within *The Way We Lived in North Carolina* (2003). Antebellum North Carolina depended upon the fingerlike inland waterways as their preferred method of

transportation, especially since the state didn't develop quality roads in many areas (Clayton 2003:318). This placed towns like Washington at a great advantage. Reed claims that "for the early settlers of Beaufort County, water transportation was, for all practical purposes, their only means of travel" (Reed 1962:161). Situated on a waterway stretching from Tarboro in the west to the Pamlico Sound in the east, Washington became the primary location for waterborne commerce and transportation for the region.

Whereas the town's early economy depended upon the vast forests for naval stores, now merchants utilized these expanses to refine lumber, shingles, and barrels (Reed 1962:168). John G. Blount, of the Washington Blount's, the early town's premier merchant family, capitalized on the growing significance of the lumber industry. A letter from his Baltimore associate, Joseph Coppinger, urged Blount to buy and erect a machine to power his sawmill. He continued to say that "one or both of these machines as appendages to a lumber yard might I should suppose be made abundantly productive in your neighborhood in the supply of the West India Islands with lumber and plained boards" (Morgan 1982:110) Later, Blount enquired about building lumber mills in the vicinity of Washington to another associate in Massachusetts, who encouraged the Washington merchant to advance his plan (Morgan 1982:166). While not indicative of an outright switch from naval stores to lumber, local merchants, like the Blount family, began to recognize the importance of embracing alternative industries. Diversifying mercantile interests insulated the town's economy from a bad harvest and other failings, as well as promoting social and economic growth in Washington.

The initial decades of the nineteenth century saw the town and Beaufort County grow in population. The Census of 1820 listed the town of Washington as having a population of 1,034 people (Talmadge and Lefler 1973:315). Ten years later, the 1830 Census reported the

population of Beaufort County had doubled, with 10,948 people residing within county limits (Worthy 1976b:11). These population increases coincided with rapid development within the town and its trading infrastructure. Merchants and financiers erected warehouses, distilleries, and many other industrial facilities. In a similar vein, the state of North Carolina, as well as the town of Washington, realized the inadequacy of many of its transportation systems and busily set about improving them. In the decades proceeding the Civil War, unparalleled economic activity surged through Washington, as many reaped the rewards of an expanding mercantile sector.

Since the establishment of the town, its location along the Tar River posed a significant problem for economic growth. The town proper, situated along the northern banks of the confluence of the Tar and Pamlico Rivers forced those living in Chocowinity and other communities along the southern bank to travel by ferry, boat, or cross further upriver. Addressing this, a bridge was constructed in 1784 by the Washington Toll Bridge Company connecting the Bonner Road to Chocowinity to Bridge Street in town (Reed 1962:166). In 1812, a charter was issued for a new, more substantial bridge to be constructed. Pauline Worthy lists the toll prices as five cents per person, fifty cents per four-wheel vehicle, and, importantly, lumber and shingles were charged a fee based on the square footage (Worthy 1976b:10). Later, improvement efforts would focus instead on the navigability of the Tar-Pamlico River, especially with the advent of the steamship. Before this innovation however, Washington needed a stimulus in the form of pioneering business owners. The town presented opportunities for those already residing there, as well as for families who uprooted their life to relocate and capitalize on the economic fervor sweeping through the state.

One of these families, the Fowles of New England, set their sights on the burgeoning river town in the early nineteenth century. In 1812, brothers Josiah and Luke completed their

move to Washington and quickly established their mercantile footprint in the town. Six years after their move, the brothers established their shipbuilding business on Castle Island and were joined by their brother Samuel (Worthy 1976b:11). Their business quickly blossomed, offering a wide variety of goods from their store which supplemented their shipbuilding interest. Their daybooks indicate the expanse of their merchant investments, their schooners travelling north to New York and to the West Indies (FIGURE 4).

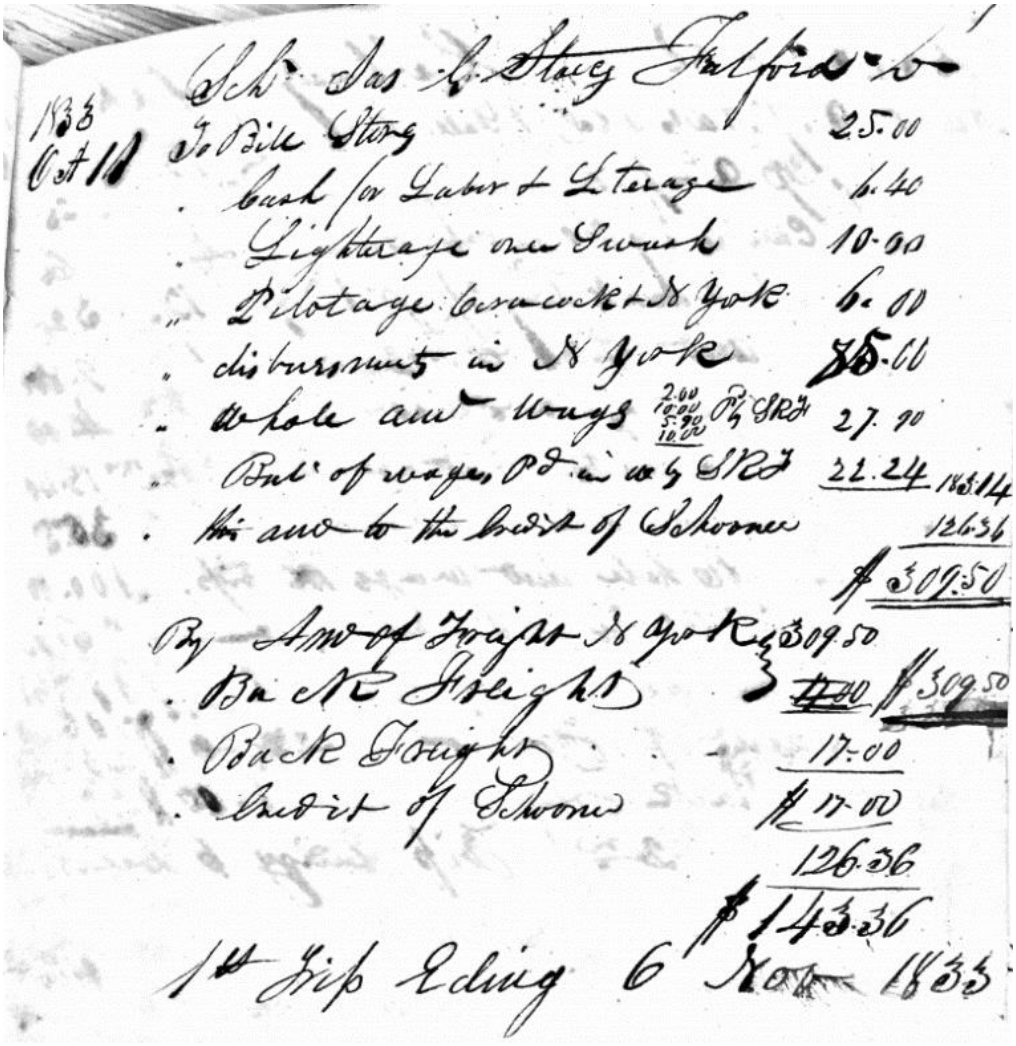


FIGURE 4. Sample Journal entry from S.R. Fowle shipping records (S.R. Fowle 1835)

The Fowle brothers cultivated their business to include a wide variety of goods and services, quickly making themselves a mainstay amongst Washington's most influential citizens. Their success paved the way for others in the following years as the town began to swell.

With an excess of lumber, Washington, once reliant upon ships built from northern states, began to build their own vessels. Shipwrights plied their trade since the foundation of the town but experienced a revival during the 1830s. War with Britain forced the artisans to construct sea going vessels fit for privateering, but now their labor focused on creating sturdy merchant vessels. Many advances occurred during this period in terms of construction technology. Captain Hezikiah Farrow constructed the first marine railway in the town, used to raise vessels out of the water for repairs (Still 1981:33). Local newspapers celebrated Farrow's railway and the obvious benefits it would bring to the river town. The *Roanoke Advocate* witnessed the railway being used to haul *Two Brothers*, a schooner from Bath, out of the water for prompt repairs. The author exclaimed that all "our merchants are highly indebted to our enterprising fellow citizen" and thanked Farrow "for introducing this valuable improvement amongst us" (Roanoke Advocate 1830:3). Soon, additional railways could be seen along Washington's Pamlico River frontage, capable of servicing a wide variety of vessels (North State Whig 1853:2). Farrow's railway, as well as others, afforded merchants the luxury of having speedy repairs conducted on their fleet. A well-maintained fleet of merchant ships sustained the constant shipping to and from Washington.

In conjunction with the resurgent shipbuilding industry, the production of lumber increased in antebellum North Carolina. Reed claims that after the Revolutionary War, naval stores no longer could be considered the most important export from Beaufort County's forests, but rather production shifted towards making shingles, lumber, barrel heads, and staves (Reed

1962:168). While the aforementioned products may have been produced in greater quantity than naval stores, both remained important exports for the region. In his historical research report of the Washington waterfront, Michael Hill asserts that "naval stores would remain central to the local economy through the antebellum period" (Hill 1984:5). The lack of scholarly consensus towards the importance of these two industries makes it difficult to draw conclusions from historical data. Both lumber and naval stores, especially turpentine, consistently appear in daybooks and ledgers of prominent Washington businesses leading up to the Civil War (Fowle 2016). Undoubtedly, both continued to be primary exports of the region and town, regardless of their ranking against each other.

Initially, the manufacturing of naval stores was locally based, occurring amongst North Carolina's vast pine forests. The chaotic and labor-intensive task predominately involved black laborers who would store turpentine and tar in thirty-two-gallon barrels to be hauled down to the docks (Fenn and Wood 2003:65). Naturally, Washington became the receiving point for upriver production of turpentine, as well as other byproducts from the distillation process. The Tar River flowing into Washington not only received its name due to its importance as a waterway for the vast production of tar, but also obtained the moniker "Turpentine Run" from a publisher at the Tarboro Press (Tarboro Press 1841:2). The river became a conduit for the transportation of the distilled spirit well through the nineteenth century.

Overall, the state of North Carolina continued to invest tremendous amounts of capital and energy into the production of turpentine and naval stores. At the advent of the Civil War, Milton Ready considered the state to possess more than 1,600 turpentine distilleries (Ready 2005:183). In addition to Ready's assertion, Powell exclaims that "turpentine was far and away the state's leading manufactured product by 1860" (Powell 1989:316). Washington, and Beaufort

County, certainly contributed to these figures. Lefler and Newsome determined there to be 84 distilleries within the county (Lefler and Newsome 1973:398). Already established as a terminal for the naval stores produced upriver and in Beaufort County's backcountry, Washington's merchants continued to benefit from this profitable venture. J.G. Blount shipped turpentine as far north as the northern metropolises of Boston and New York (Morgan 1982:75, 158, 323). Blount's vessels shipped many hundreds of dollars of turpentine through their shipping conglomerate, much obliged by his northern business connections. His early success encouraged others to generate a consistent contribution through an industrial infrastructure (Litchfield 1976:229-230).

Since naval stores were highly flammable, the town of Washington needed to be mindful of where they established distilleries. Across the waterfront on the southern bank of the Pamlico River, turpentine distilleries were constructed in the early nineteenth century. Pauline Worthy noted the importance of turpentine exported from Washington's many distilleries, as well as the production of tar (Worthy 1976b:11). Observations from antebellum newspapers reiterated the growth of the turpentine industry along the Pamlico River opposite the town. The *Tarboro Press* recalled that opposite the town on the Pamlico were several turpentine distilleries, the most notable of which was owned by Dr. Freeman and Mr. Houston. These "scientific gentlemen" distilled the spirit in accordance with state-of-the-art advances of contemporary science. Not only does the article emphasize the importance of the turpentine industry, the author also stresses the commercial aptitude of the waterfront community, going as far to state that "no one can leave Washington without regret" (Tarboro Press 1845:1). Publications such as this reveal the importance of Washington in regional economics, especially for communities upriver like

Tarboro. Without a port linking it to the waterborne trade networks, the development of these upriver towns may have differed.

Tangentially, Washington's lumber industry experienced the same benefits of industrialization as the naval stores industry. Work traditionally completed by hand could now rely on mechanical power to cut lumber in large quantities quickly and precisely. In Washington, business partners Tannyhill and Lavender constructed the first steam saw and planning mill. Located on Harvey Street, the mill was later sold to Benjamin F. Hanks, who regularly operated lumber barges from Washington to Norfolk and Baltimore (Reed 1962:171; Worthy 1976b:11). Hanks expanded his lumber operation in the 1850s when he erected a new mill in town. The *North State Whig* reported that:

> Mr. Hanks is putting up a new saw mill, we are glad to learn, and will speedily have it in operation. This will add the value of some millions of feet of lumber to the productive labor of the place. Mr. Hanks has lately completed a new planning mill which prepares boards to the hands of the carpenter, tongued and grooved and planed. Besides this mill, when the one now building is completed-we have three saw mills in operation, cutting some nine million feet of lumber annually-The steam saw mill of Messrs. Fowle & Son is working finely (North State Whig 1853:2).

Due to Washington's location along the river, logs were easily transported to the mills lashed together or on flat-bottom boats. Upon arrival, mills worked to convert the raw wood into boards of lumber, staves, shingles, and a variety of other products. In addition to being converted into

building and packaging material, lumber powered the innovative technology that made travel upriver increasingly simpler, the steamboat.

Before the introduction of the steam engine, traffic upriver relied upon boat pilots poling the shallow drafted vessels. A strenuous and timely process, the introduction of steam powered boats to Washington increased trade emanating both towards Tarboro and out towards the Atlantic. These vessels proved extremely effective in traversing the upper portion of the Tar River and they eventually supplanted sail carrying vessels in the Pamlico River trade (Reed 1962:162). Local shipbuilders redirected their efforts into building these new vessels. Tannyhill and Lavender built the steamer *Edmund D. McNair*, later sold to Benjamin Hanks, in order to tow logs to their newly constructed sawmill (Worthy 1976b:11). Later, the firm Myers and Sons build the steamer *Amidas*, which towed flats upriver to Tarboro, and Hanks added *Astoria* to his fleet (Watson 2002:137). While, initially, only a small amount of the steamers had been constructed in town, their utilization in the lumber industry is particularly important. Steamers purchased from New Bern and Norfolk shipyards performed admirably transporting valuable trade goods, even if some upriver steamers faced difficulty navigating the fluctuating Tar River and proved unsuccessful. Regardless, by the middle of the century, many considered Washington to be one of the most important shipbuilding centers in the entire state (Hill 1984:6).

Thanks to the addition of steam propulsion, Washington again experienced a period of prosperity as a port. The state of North Carolina experienced economic growth in a variety of industries as well. Production of 500 lb. bales of tobacco increased five times over the period from 1840 to 1860. In addition, industrial goods and capital invested in manufactured goods increased substantially (Powell 1989:311,315). Washington can be viewed as a microcosm of the state's economic improvement and expansion. The 1840 census listed the town as having

produced 153,522 bushels of corn, 87,180 bushels of cotton, and 106,987 barrels of naval stores (Wheeler 1851:28-29). According to Alan Watson, "Washington…became the principal commercial center of the Pamlico River and one of the larger towns in North Carolina at mid-nineteenth century" (Watson 2002:136). Commercial activity dominated the waterfront which encouraged many to establish mercantile pursuits within the town, many of which became successful and remained so towards the twentieth century. The 1860 slave schedule of Washington indicates merchants possessing a significant labor force (National Archives 1860).

Just prior the Civil War, the antebellum city was "handling more than half of the water borne commerce of the State" (Reed 1962:163). Several merchants opened general stores along the waterfront of Washington, most notably that of the Fowle family, E.S. Hoyt, and Myers' and Son. Other merchants in the city specialized their craft and the goods they offered, demonstrating the continuing development of the town. Fish markets, wagon manufacturing, and many others now appeared along the commercial district of the town (Reed 1962:168-172). Its commercial success and location along the river proved fateful for the community, as military commanders from both the Union and Confederacy deemed the town strategically important. Both sides occupied the town at various times during the war, virtually ceasing economic activity. Unfortunately for the community, the impending Civil War brought fundamental changes to the nation, Washington not being an exception.

Recovery and Return to Prosperity

After the Union occupation during the Civil War and their destruction of the city, Washington and the surrounding community began the difficult task of rebuilding their

livelihoods. To those returning home from battle, they discovered their once thriving and bustling port city a mere skeleton of its former self (Reed 1962:192). Southern economies, rooted predominately in the cultivation of agricultural commodities, needed years and even decades in order to return to some semblance of normalcy. Reed noted that, in North Carolina, the "hardest hit of all was the 'plantation economy' counties of the east, including Beaufort" (Reed 1962:200). Reconstruction policies and government did little to promote growth either. Regardless, the port community of Washington faced the task of continuing to embrace the industrial developments of the prior half century in lieu of eastern North Carolina's traditional agriculturally based economy.

Unfortunately, state policies initially did little to combat the lack of adequate industrial infrastructure. Many leading citizens in North Carolina returned to their agricultural ways and continued to propagate the societal framework large agricultural interests needed. Lefler and Newsome noted that "scarcity of capital, experience, and industrial habits caused a return to the prewar regime of staple crop, agriculture" (Lefler and Newsome 1973:504). For towns like Washington, however, industrial roots had already been established over the course of the previous decades. Combined with its role as a port city still engaged in trade up and down the Atlantic, the town seemed poised to enter a new economic era. Still the river and region's shipping hub for both importable and exportable goods, the port would benefit from several initiatives in the coming years (Elliot and Craighill 1872:855-856). First, the long-standing issue of creating a navigable Tar-Pamlico River needed to be addressed.

Tar-Pamlico River traffic had long been plagued by many obstacles from tidal effects, fallen timbers, and technological inadequacies. In the first half of the nineteenth century, several attempts were made to remedy these problems. Early steamboat traffic on the river encouraged

the state government to appropriate funds for the removal of a shoal below the town of Washington, but nothing came of the endeavor until the intervention of the Army Corps of Engineers from 1836 to 1838. Even the Washington firm Myers and Son assumed responsibility in clearing a navigable channel upriver to Tarboro (Watson 2002:73). Hoping to dredge a channel for their steamer *Amidas*, the firm invested its own laborers and capital in the form of machinery for the job. Unfortunately, little came of these efforts. Like many other previous attempts, the operation failed and navigability along the Tar River remained difficult for larger drafted vessels (Watson 2002:136-137).

After the Civil War, however, local officials recognized the pressing need of creating a navigable river for a variety of reasons. Pilings laid across the Pamlico River below Washington during the Civil War presented an obvious hindrance to shipping. Shortly after Reconstruction, government officials requested proposals from private industries for removing the pilings in addition to a sandbar (The Morning Star 1877a:1). The steamboat *Cambridge* was dispatched to Washington to commence dredging operations, averaging the removal of 400 cubic yards of sediment every day. An author from the *Washington Press* exclaimed that "when this work is done the river will be in as good condition as it was before the war, the piling which obstructed it having all been removed (The Morning Star 1877b:1). *Cambridge* continued to work on the Pamlico River through December of that year, directing its efforts to clearing a channel over the bar after removing the wartime pilings (The Morning Star 1877d:4). Merchants and travelers anxiously awaited the results of the steamer's work, anticipating that it would come to fruition unlike previous efforts.

In fact, the efforts of *Cambridge* and other machinery did wonders to improve navigation along the river. With reasonably navigable channels both upriver and downriver, commercial

activity experienced a resultant boom. In an article from Elizabeth City's *Carolinian*, the author pronounced that:

> … on the Pamlico and Tar Rivers, NC, since about 1876, about $56,000 has been spent in opening up about 60 miles of river, reducing freights by from 12 to 25 per cent and increasing the commerce by $1,800,000 per year, thus showing a development of $32 of annual commerce for each dollar spent by the government. Besides this, the town of Washington has increased 25 per cent in population and property… the development of [these places since 1876 being almost entirely due to the river improvements (Wilmington Messenger 1887:5).

While it may be difficult to determine the validity of the author's statement regarding the economic benefit derived from these improvements, Washington did grow tremendously in the succeeding decades. New industries and innovative technologies appeared along the town's waterfront and shipping benefited from the removal of obstructions. Furthermore, its resurgence aided in the development of the many communities that depended on goods shipped through its busy port (Burgess 1967).

During the 1870s, the state of North Carolina began to move away from its dependence on the production of cash crops and fully embraced the industrial endeavors that proved so fruitful in other regions of the United States. Lefler and Newsome state that "the decade of the 1870s was marked by transition, expansion, and the real beginning of the Industrial Revolution in North Carolina" (Lefler and Newsome 1973:505). Washington's waterfront teemed with new industries and steamboats, plying their trade through the more navigable Tar-Pamlico River

system. More and more people found employment and industries that previously were not present or readily available to them. In addition, these technological advancements increased output from the town's many factories, resulting in greater amounts of money passing through the hands of Washington's inhabitants.

With the advent of modern technology and the resultant shift towards industrial production, some of Washington's traditional industries diminished. Naval stores, the premier industry of the town, and the eastern part of the state, lost out to the production of lumber. Merchants and owners of sawmills shipped large quantities of readily available North Carolina to northern states, as they did years earlier, but on a much larger scale (Ready 2005:274). The establishment of additional sawmills and lumber firms in Washington added to the production of others constructed prior to the war. C.W. Kugler, from New Jersey, opened his steam sawmill and planning mill in Washington in the 1880s. W.N. Archbell opened his own sawmill and planning mill in the same decade (Reed 1962:171-172).

In addition to these newcomers, already recognized and established merchants began to advance their own lumber production. S.R. Fowle & Son, the company formed by the Fowle brothers upon their arrival to the town earlier in the nineteenth century, erected additional sawmills around Washington. Samuel's son, James, inherited the company's vast timber tracts and commercial holdings and expanded them. According to Louis May, in the 1880s the Fowles:

> …decided the go into the lumber business. The family was the owner of large timber tracts near Blounts Creek and their first sawmill was established at Blounts Creek in the mid 1880's. During the 1890's the Fowles decided to erect a large sawmill in Washington and chose a site on the south side of the Pamlico near the

> foot of the present bridge…Here was erected a large band sawmill, four dry kilns, a large wharf and lumber storage and shipping building…The mills capacity was forty to fifty thousand feet per day and was one of the largest to operate in Washington for many years thereafter (May 1976:339-340).

Indicative of the time, S.R. Fowle & Son fully embraced the transition from naval stores production to lumber. Converted into boards, shingles, staves, and a host of other products, the Pamlico's rich pine forests supplied numerous customers up and down the east coast. Lumber production continued to become Washington's premier commercial interest through the nineteenth and into the early twentieth century (FIGURE 5). Although the production of lumber represented a local innovation, traditional industries, such as shipping, remained paramount to Washington's economic prosperity.

Vital to the success of any port community is its ability to facilitate the shipment of goods internally and externally. Nowhere was this more evident than Washington, which possessed a smaller industrial and developable footprint than other ports like Wilmington. Steamships traversing the Tar-Pamlico River became a more common sight after the war. Several steamship companies owned property and harbor space in Washington, including the Old Dominion Steamship Company, the Clyde Steamship Company, and eventually the Norfolk Southern Railroad. The Norfolk Southern Railroad steamers eventually usurped the other companies, purchasing Old Dominion steamers for their own use (Litchfield 1976:233-234). Even shipbuilding, which had experienced a period of decline in the immediate aftermath of the war, rebounded from in the final years of the century (Hill 1984:8).

Tabulated statement of commerce on Pamlico and Tar Rivers, N. C., from 1883 to 1909—Continued.

[In tons of 2,000 pounds.]

Commodities.	1891	1892	1893	1894	1895	1896
Coal and minerals	1,000	4,325	71	650	10,999	4,500
Cotton	7,000	3,794	3,392	3,568	2,711	3,722
Cotton seed	.....	1,099	36	1,339	2,770	2,861
Cottonseed meal	.....	.....	77	435	496	1,013
Cottonseed oil	.....	.....	314	306	.....	.....
Eggs	.....	.....	.....	.....	52	86
Fertilizers	2,000	2,500	1,600	2,991	30,060	10,162
Fish and oysters	8,000	250	25	320	370	449
Grain, hay, and straw	250	2,185	15	8	6,111	16,057
Live stock	200	44	31	18	20	376
Lumber, timber, etc	150,000	63,656	100,000	94,000	101,294	181,636
Machinery	1,000	30	1,000	201	.....	50
Naval stores	1,000	437	.....	.....	.....	.....
Poultry	.....	.....	1	18	16	12
Rice	500	568	631	339	1,650	88
Rosin	.....	.....	90	146	230	212
Shingles	.....	.....	4,500	3,667	2,639	1,791
Tobacco	150	6	1	14	11	15
Tar	.....	665	547	317	.....	.....
Turpentine:						
Crude	.....	.....	.....	.....	230	174
Spirits	.....	.....	22	29	47	46
Wood	.....	.....	.....	.....	6,420	1,820
Unclassified	24,500	27,538	7,152	11,600	17,102	26,820
Total	195,600	107,097	119,505	119,981	183,230	261,890

Commodities.	1897	1898	1899	1900	1901	1902
Coal and minerals	5,200	2,850	2,035	4,939	7,904	4,250
Cotton	4,930	5,299	4,894	4,397	10,328	10,954
Cotton seed	3,450	5,070	18,828	4,752	9,375	12,804
Cottonseed meal	524	352	1,515	1,776	3,605	3,745
Cottonseed oil	575	731	647	622	1,054	3,481
Eggs	100	48	88	115	383	1,038
Fertilizers	18,000	22,962	34,083	.....	11,870	23,369
Fish and oysters	1,106	3,564	6,477	32,342	16,485	18,428
Grain, hay, and straw	17,000	4,025	14,269	17,990	13,800	26,216
Live stock	107	190	240	220	400	928
Lumber, timber, etc	271,583	271,976	274,830	440,958	729,133	629,482
Machinery	3	100	40	300	287	1,757
Poultry	10	9	58	43	54	60
Rice	140	195	556	151	157	44
Rosin	42	72	30	5	5	11
Shingles	342	669	1,669	32,025	425	4,967
Tobacco	14	3	20	34	21	1,135
Tar	.....	.....	114	8	31	50
Turpentine:						
Crude	150	85	.....	3	.....	20
Spirits	12	18	5	.....	.....	.....
Wood	1,880	1,885	11,135	34,226	8,160	10,333
Unclassified	38,346	28,802	136,043	37,757	111,832	76,984
Total	363,514	348,905	507,528	612,741	935,314	832,016

FIGURE 5. Commercial levels along the Tar and Pamlico Rivers from 1833 to 1909 (Rossell 1911)

Newspapers emphasized and promoted the town's importance as a trade port during this period. Advertisements and notices glorified the commercial activity along Washington's waterfront, as well as informing citizens of the far-flung destinations of their merchant's fleets. As in years prior, Washington's schooners regularly touched in West Indies ports laden with lumber and shingles (The Morning Star 1878b:1). S.R. Fowle & Son's own vessel, *Carolina,* made one such run carrying 517,000 shingles, 20,000 feet of lumber, and a supply of naval stores (The Morning Star 1879a:1). Waterborne commerce remained tremendously importance to Washington during its recovery from the Civil War. The improvements in navigation and shipbuilding technology fostered the production of more ships to supplant existing merchant fleets. Coming towards the conclusion of the nineteenth century, however, technological adaptations again altered the development of the town.

The coming of the railroad in the early nineteenth century revolutionized the United States in a variety of ways. Not only did they allow people to travel great distances in a relatively short period of time, railroads quickly became the main facilitators in the shipment of tradeable goods. As such, the pending development of towns across the state depended on establishing a railroad terminal or stop (Nathans 2003:405). Especially in North Carolina, where roadbuilding projects met varying degrees of success, railroads afforded reliable transportation for a variety of purposes. Nowhere was this more paramount than the town of Washington, which still operated as a link between many inland communities and the oceangoing trade network.

North Carolina adopted government policies that encouraged the growth of railroad networks between important communities. Perhaps owing to the varying degrees of success experienced in government sponsored infrastructure initiatives, the state government incentivized the private sector to spearhead the development of the railroad. According to Ready, "after 1870,

the general assembly turned over the task of developing a railroad system to private investors, but with assurances that the state would invest heavily in and guarantee the results of the effort" (Ready 2005:271). Washington quickly embraced this policy and opened real estate along its waterfront for the establishment of railroad terminals. One such company, the Jamesville and Washington Railroad and Lumber Company, received a right of way grant to construct a railroad line into downtown Washington. Granted the rights in 1877, this rail line provided the company direct access to the waterfront to haul lumber for export). Shortly thereafter, in 1890, the city voted on the purchase of terminal property for the Wilmington and Weldon Railroad Company. Eventually termed the Atlantic Coast Line, the vote passed, and another major railroad brought commerce and prosperity to the estuarine community beyond 1892 (Worthy 1976a:66,68).

The arrival of the Atlantic Coast Line brought tremendous benefits to the town of Washington. The company constructed a terminal in the center of Washington's waterfront district, thus providing a direct link for waterborne commerce on steamers to transition to the rail system simply and efficiently (FIGURE 6). As a railroad conglomerate, the Atlantic Coast Railroad owned rails that connected the entirety of the southeastern United States from Florida to Virginia. The spider web of tracks proved vitally important for the state of North Carolina, long without reliable overland transportation. Lefler and Newsome remarked that the "Atlantic Coast Line system dominated rail transportation in the Coastal Plain area of the state" (Lefler and Newsome 1973:517). Washington rapidly absorbed large quantities of lumber and wholesale goods, its waterfront teeming with activity ranging from the unloading of ships to the arrival of freight cars. After the destruction brought upon the community by the Civil War, the town finally appeared to have rebounded.

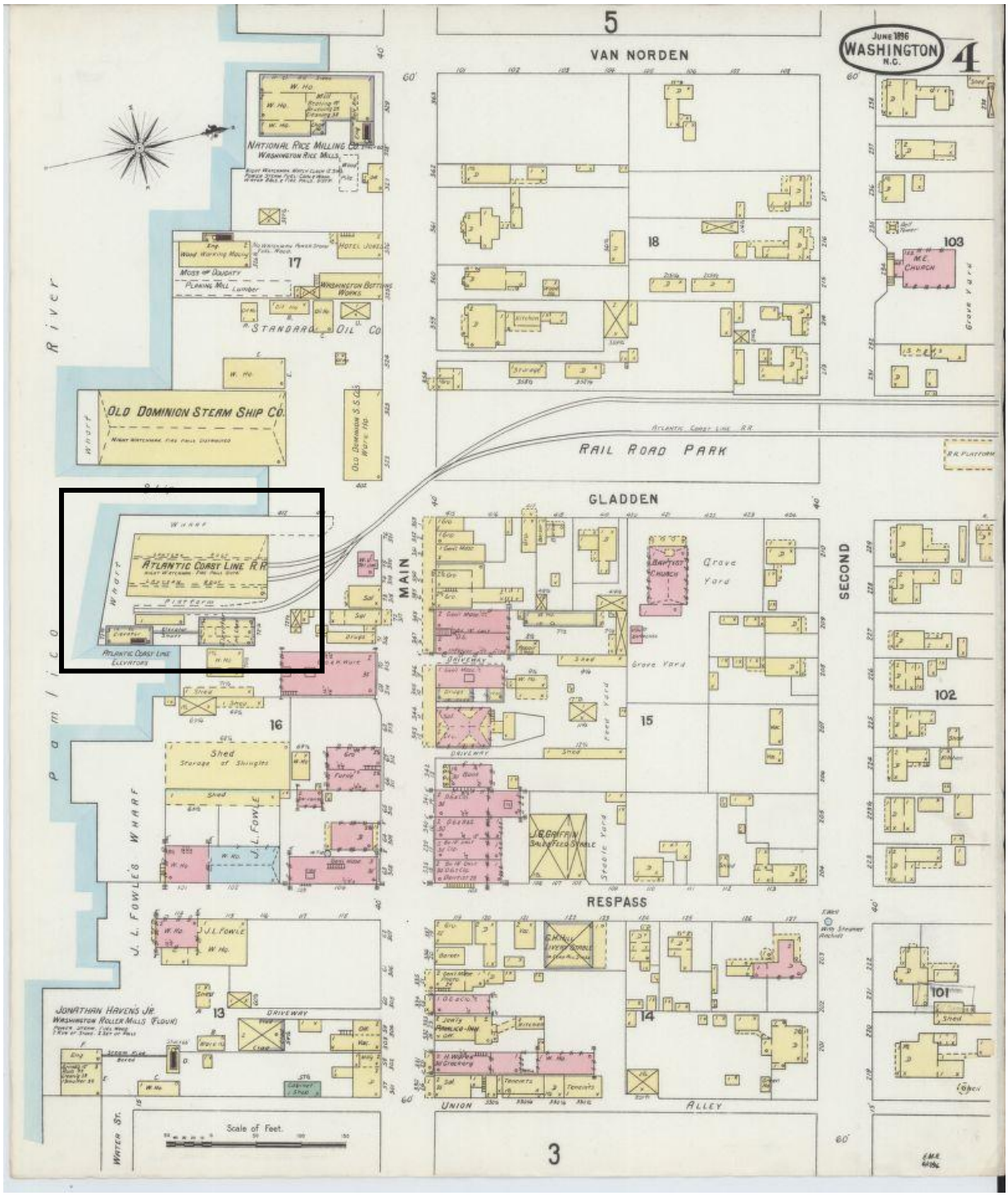


FIGURE 6. Sanborn Insurance Map showing the Atlantic Coast Railroad Terminal along Washington's waterfront. Rectangle added by author. (Sanborn Insurance Maps 1896)

With the coming of the twentieth century, Washington seemed ready to assert itself as one of the premier port communities in the state. Historical commentators reflected on the flourishing waterfront town and its importance in the facilitation of trade. One writes "between 1895-1900, Washington began growing, became thrifty and prosperous and quite a distributing center, and was one of the nicest towns to live" (Ellison 1976:89). In fact, the town's commercial output did grow. Historical research from North Carolina's Department of Cultural Resources determined that tonnage shipped through Washington in the year 1873 totaled 1,125 tons, with grain and cotton being the notable increases. In addition to that, the study notes that during the period from 1876 to 1891, commerce through the harbor increased from $500,000 to $4.8 million annually (Hill 1984:8-9). The resultant prosperity from Washington's economic success certainly attracted the interest of many and regional publications certainly promoted the town's importance.

Newspapers throughout the state cheered and, perhaps, stimulated the industrial fervor that swept through towns like Washington. After the 1880s, as evident in Washington, industrialization rapidly descended on the state and the state's newspapers "began to plead for more industry" (Lefler and Newsome 1973:506). Not only did they plead for more industry, they also encouraged people to relocate to these new industrial centers. In Washington, the leading papers espoused the beauty and potential of the town, emphasizing its commercial capabilities. In one article, the author detailed the benefits of the entire region for those seeking to relocate to the waterfront community. The author emphasizes the significantly lower rates charged on freight on several goods shipped from Washington, indicating its suitability for large-scale industrial and shipping investment (Washington Progress 1889:1). In a later article, titled 'The Pride of the East', the author considers the town to be "unparalleled in shipbuilding facilities"

and “an inviting field for the investment of capital or for permanent residence” (Washington Gazette 1895:5). While newspapers and promoters heaped praises on the town, Washington’s period of economic prosperity rapidly approached its conclusion. The twentieth century brought more change to the town, several of which brought about its eventual decline.

The twentieth century presented a crossroads for the town of Washington. In terms of population and economic development, the town still appeared to be growing. At the turn of the century, the town had a population of 4,842 while Beaufort County had 26,404 inhabitants (Reed 1962:206). Unfortunately, the technological advances made in the previous century became obsolete and irrelevant due to factors beyond Washington’s economic control. Steamers from the Norfolk Southern Railroad and Atlantic Coast Line continued to carry goods upriver and out towards the coast until transportation by rail, and eventually automobile, became the more economically viable option (Litchfield 1976:233-4). Washington’s usefulness as a trade port declined as rail terminals moved away from the town as well, taking with them the flow of trade. The economic focal point of Beaufort County since its inception slowly began to erode. The waterfront, however, remained a significant aspect of Washington’s community identity notwithstanding the decreased importance of waterborne trade. Despite that, a 1911 Army Corps of Engineers report observed that the city still possessed 27 wharves and the capability to unload goods directly from a ship to freight, and vice-versa, due to the Norfolk Southern Railroad and Atlantic Coast Line (Rossell 1911:14).

Conclusion

For almost two centuries, the waterfront community of Washington played an extremely important role in the facilitation of trade and transport of goods, as well as the economic

development of the region. Initially a convenient landing which early colonial planters utilized to export their crop and import manufactured goods, it developed into a major port terminal during the eighteenth and nineteenth centuries. As such, a wide variety of goods and materials drove the town's economic activities. At first, naval stores and agricultural products seemed commonplace amongst the town's wharves and loading facilities, eventually supplanted by sawn lumber and related products. Finally, the town became more of a destination for wholesale products destined for the railroad terminals that dotted the waterfront. As innovation and technology improved, rather than help the town continue to grow, it ultimately aided in its demise.

Unfortunately, the coming of the steamship and railroad signaled the beginning of the end for the port of Washington. Mechanical propulsion streamlined the process of waterborne commercial transportation. Shipping increasingly required larger ships which could not navigate the shallow waters of the Tar-Pamlico River. Concurrently, North Carolina's railroad boom in the nineteenth century permitted efficient overland transportation which the state desperately needed. Eventually, market factors determined that the more economical transportation option lie in railroads and, eventually, the automobile. Railroads connected North Carolina's major industrial centers of Raleigh, Wilmington, and Charlotte at the expense of smaller communities like Washington. As overland transportation became more efficient and affordable, the very waterways that helped shape the state were seemingly devoid of economic activity.

For scholars, determining the factors that led to the development and success of port cities is imperative. Many ports developed out of necessity or geographical positioning conducive to trade. In some of these instances, however, this growth and development may be attributable to certain goods, industries, or strategical issues. As evident in this case study, products and industries propelled the town forward during its growth in the eighteenth and

nineteenth centuries. Due to the multitude of explanations, scholars need to arrive at a consensus in order to understand the mechanisms behind the growth of ports.

The construction of a historical narrative is beneficial in determining an appropriate theoretical framework from which to view the rise and fall of a port. Within a narrative, trends and patterns may be identified. In the case of Washington, a sound understanding of its geographical positioning and constraints assists scholars in determining why certain industries were focused in one area or another. The geographical position of certain industry's influence the intra and inter port relationships, which are demonstrated through the historical record. An understanding of these relationships permits a greater understanding of the inner workings of a waterfront community.

CHAPTER THREE: THEORETICAL APPROACHES TO PORT AND HARBOR STUDIES

Introduction

Ports have long been the facilitators of commerce between towns and nations, as well as a transition from one landscape to another. Not only an economic center, they are also areas within which cultures collide. Yet, there have not been many significant archaeological studies undertaken to document the growth and decline of port communities. Rather, archaeological studies have tended to focus on individual waterfront structures and their construction over time, in lieu of examining factors which contributed to the overall health of the port (Huey 1984; Heintzelman 1985; Langley 2000; Oniz et al. 2014). Geographical perspectives on port development, however, have discussed at length the spatial relationship between port industry and the city, as well as their location within a larger trade network (Hilling 1984; Hilling and Hoyle 1984; Hoyle 1988; Hoyle et al. 1992). By blending many approaches, historical and archaeological analysis can document the growth and expansion of a port through time.

As a port expanded and developed in relation to its commercial necessity, those that utilized the port certainly recognized the need to develop additional infrastructure in accordance to increasing trade volume. Alongside the demand for additional waterfront trade facilities, water-based industries required their own property amongst the already developed areas of the port. Responding to economic trends, the port of Washington expanded and accommodated a wide variety of industries which led to the development of relationships inside and outside the confines of the estuary.

Studies of ports by archaeologists are not copious. As an underdeveloped type of study, it is understandable that there is also a lack of developed theoretical approaches to the subject. Nevertheless, port studies by archaeologists have extensively documented and described individual components of ports such as wharves, piers, and related waterfront structures. Their interpretations of remnant structures generally focus on an identification of construction methods and methodology (Huey 1984; Langley 2000; Oniz et al. 2014). Alternatively, others have examined ports as wholes in regard to their societal function. Adam Rogers' publications on social approaches to port studies add a nuanced approach to waterfront studies, especially regarding the way in which societies utilized and viewed waterfront structures (Rogers 2011, 2013). Additionally, archaeologists have correlated certain economic trends towards the growth of port infrastructure (Jackson 1984) and the commercial relationships formed during certain developmental periods (Coroneos 2004).

Geographical studies of port systems have focused more on spatial growth and the port system from a planning perspective. Josef Konvitz, historian and global authority on urban development, documents the mandates of historical planners in the construction of ports for military or commercial efficiency in historic Europe (Konvitz 1982). Geographer B.S. Hoyle and his colleagues have focused on the spatial development in modern ports through observing historic ports like Marseille (Hoyle et al. 1984, 1988; Hilling and Hoyle 1984; Hoyle and Pinder 1992). Their framework, while designed for modern shipping facilities, may hold ideas applicable in the study of historical port expansion.

This project proposes to combine of archaeological perspectives port development and geographical observations on spatial development in order to document the relationships which brought growth and, also, decline to the port of Washington, and perhaps contribute to the

formulation of theoretical paradigms relating to the subject In this chapter, the aforementioned port studies will be investigated to ascertain and understand the authors' theoretical approaches so that they may be extracted and applied towards this study of the port of Washington.

General Theory

Within the study of ports, it is evident that each scholar's methodology and goals possess links towards major archaeological theoretical paradigms. While they do not follow a general paradigm progression over time, dependent upon the objectives of the study, each scholar alludes towards a larger body of archaeological theory. Studies which concentrate on dating or simply identifying an individual structure (Huey 1984; Langley 2000; Oniz et al. 2014) seem bound within the historical archaeological paradigm. Bruce Trigger describes historical archaeology as "focused on studying the epigraphy, art, and architecture of ancient civilizations in order to enhance knowledge of the elite cultures of those societies that was originally derived from surviving texts" (Trigger 1996:535). Matthew Johnson reiterates that point, especially the focus on historical texts driving the archaeology (Johnson 2010:190-191). Huey's (1984), Langley's (2000), and others (Oniz et al. 2014) sought to determine construction dates through archaeological investigations grounded in historical literature and cartographic sources. While they may have attempted to incorporate larger concepts, like trade patterns, into their studies, ultimately that was not their primary objective.

Those that have studied ports in their entirety, however, have sought to understand the complex relationship between trade, industry, and port installation construction as a functional process. Bruce Trigger defines functional and processual studies as trying "to understand social

and cultural systems from the inside by determining how different parts of these systems are interrelated and how these parts interact with one another" (Trigger 1996:314). He continues further by saying that "Functionalism is a synchronous approach that attempts to understand how systems operate routinely without accounting for major changes. Processual approaches seek to understand how and why such systems change irreversibly" (Trigger 1996:314). As part of a system, both in culture and in a historic port, each structure or industry had a defined function and should be understood within that context (Johnson 2010:80). Jackson's (1984), Konvitz's (1978), and geographer's (Hoyle et al. 1984, 1988; Hilling and Hoyle 1984; Hoyle and Pinder 1992) studies of entire ports share this view. Ports are a conglomerate of symbiotic and synchronous relationships that reflect larger social, economic, and cultural trends, and should be studied as such.

Archaeology of Waterfront Structures

Historical images of ports have showcased bustling waterfronts with trade vessels docked at the town's many wharves and piers (FIGURE 7). Perhaps due to this remembrance, the remains of wharves, jetties, and piers have been the focus of many archaeological studies. Structures from antiquity to modern times have been discovered along riverbanks and shorelines across the world. Analysis of these structures has sought to uncover their construction methodology and materials in order to determine their provenance, as well as their period of usage. Importantly, studies such as these have also alluded to their functionality within its regional and, sometimes, international economy (Huey 1984; Langley 2000; Oniz et al. 2014).

FIGURE 7. Artists rendition of a view of Amsterdam in 1544 by Cornelis Anthoniszoon (Huey 1984:25)

During the European colonization of America, waterborne commerce provided links to neighboring towns, colonies, and to the European homeland. Ports bore the responsibility of exporting the valuable agricultural products from the colonies, while importing materials and manufactured goods which the fledgling populations could not produce yet. Places like New York City and Boston, whose harbors could easily accommodate several sizeable vessels, became the economic drivers of their respective colonies. Excavations at Old Slip in New York City uncovered the remains of historical waterfront structures associated with the eighteenth century Cruger's Wharf. The excavation aimed to determine whether the wharf had been constructed according to contemporary Dutch or English construction traditions. Accordingly,

the author concluded that “the landfill process and the rapid creation of slips in New York in the 1690s roughly corresponds to the ascendancy of English and French Huguenot mercantile interests over the mostly Dutch pro-Leisler interests” (Huey 1984:33). The presence of a significant amount of archaeological materials associated with English manufacturing attests to this as well (Huey 1984:33). Likewise, the state of Maryland depended for much of its existence on trade via the many inland waterways from the Chesapeake Bay. On the Wicomico River, archaeologists sought to identify the construction date of the remains of a wharf at Mulberry Landing using a variety of methods. In her report, Dr. Susan Langley affirmed that the primary objective, or challenge, of the field work “was to confirm the correct [date]” of construction (Langley 2000:339). In order to do so, archaeologists recorded the site and invested significant attention towards identifying the construction methodology used to erect the structure. Dr. Langley analyzed construction materials, such as wooden treenails and iron pins, to supplement the dendrochronological analysis. The study concluded that the timbers dated from the eighteenth century, rather than her earlier hypothesis that the wharf had been constructed later in the nineteenth century. Their analysis also determined that the Mulberry Landing structure represented the second earliest structure studied by archaeologists (Langley 2000:347).

In Europe, cultures created wharves, docks, and piers dating back to the beginning of recorded history, many of which remain in the archaeological record today. In Beylikdüzü, a district within Istanbul province in Turkey, archaeologists uncovered the remains of a building and other structures potentially related to the historic port located on the shoreline of the peninsula between the Küçükçekmece and Büyükçekmece lakes during the 2000s. Their discovery of the site has made it a protected area and further investigations in 2011 and 2012 explicitly set out to determine the function, and usage period, as well as to explore the

surroundings of the harbor remains (Öniz et al. 2014:179). In order to do that, archaeologists recorded sediment stratification along the structure, which is presently encapsulated within sediment from a landslide. They concluded that the main building went through three episodes of rebuilding and materials discovered throughout the site indicate it to have been constructed during the Byzantine Period (Öniz et al. 2014:181). Additionally, archaeologists also discovered two parallel structures of stone jutting out into the Sea of Marmara further strengthening their harbor related conclusion (Öniz et al. 2014:183).

Individually, these studies provide substantive information and conclusions regarding the construction methods, period of usage, and function of historic port structures. They, however, do little to address the contemporary utilization of these structures and the relationships bred from trade agreements and patterns which stemmed from the creation of these docks and wharves. Dr. Susan Langley attempted to determine correlation between other construction methods at similar colonial wharves to the one at Mulberry Landing, as well as Paul Huey in New York (Huey 1984:33; Langley 2000:343). Huey went a step further and sought to define the trade relationships that facilitated the growth of New York City's waterfront during the Colonial Period (Huey 1984:24). Regardless, their approaches towards port infrastructure have created a methodical way to archaeologically investigate waterfront infrastructure.

Social Archaeology

Adam Rogers, an archaeologist specializing in Roman Britain, has explored various theoretical approaches in which to view Roman interaction with the water. In one of his early works, Rogers states that "predominately, there have been two main ways in which ports and

harbours have been studied archaeologically: exploring in detail the construction methods, technologies, and chronologies of individual installations; or examining the relationship between different ports and harbours through trade routes and the geography of connectivity" (Rogers 2011:207). To diversify archaeological analysis of ports, Rogers proposes to implement approaches from social archaeology to investigate the way in which societies viewed, interacted with, and operated waterfront structures. Doing so would enable archaeologists to critically examine archaeological material and "place it within its wider social and historical context" (Rogers 2013:182).

Within Rogers' research into waterfronts, he advocates for several different applications of social archaeological theory. One such application is the analysis of port architecture in terms of individual structures, as well as the overall landscape of the port. The structural forms of ports and harbors are reflections of the individuals which constructed them and the cultures which used them. Therefore, an understanding of individual or societal motives can be gleaned through this alternative approach (Rogers 2013:185). Additionally, the enlargement of port infrastructure (i.e. spatial growth), often came about due to the wishes of individuals, rather than dictated by civic authorities. Especially in areas which ports developed according to economic needs instead of according to strict planning, like Washington, Rogers' social approach can reveal the societal attitudes and views of waterfront construction (Rogers 2013:185).

Along with structural analysis, Rogers promotes the ability to understand taskscapes and behavior within a port. Waterfront communities developed differently than inland communities and established their own unique customs towards industrial activities. Rogers argues that the expansion of the waterfront infrastructure could potentially lead to changes in the organization of waterfront activities which impacted individuals. Just as well, social approaches could lead to a

contextual understanding of the structures from the people which labored on them (Rogers 2013:187). Justifying that idea, Rogers provides the example of the innovation of the victualing yard in the seventeenth century. The victualing yard "represented changes in the organization of activities and human behaviours as foods were prepared and stored centrally for the first time. Their development also represented the beginning of larger scale changes in the relationship between ports and settlements as docklands were built away from the main areas of settlement" (Rogers 2013:188). People needed to interact with the port in some degree every day in these communities. Any operation at a shipyard or dock crane involved individuals occupying a role which impacted an entire system.

Congruently, ports and port structures shape and reflect the image of individual communities whose livelihoods depended on the maritime economy. Very rarely could a clear distinction be made between working space and personal space in waterfront communities. Prominent individuals in medieval ports flaunted their wealth and constructed elaborate homes at water's edge. Conversely, people have often lived on waterfront structures such as warehouses and docks. Investigating the structures and people within the port system will illustrate the array of people residing in and entering a port, all of which assist in creating the individual characteristics which identify it (Rogers 2013:189,191). Since millions of people, both within the confines of the port city and the hinterland, draw their fortunes from port activities, inevitably, ports developed in the image of their population (Kontogeorgis 2017:27).

Lastly, Rogers' own archaeological study examined religious imagery and symbolism associated with Roman ports. People living adjacent to bodies of water faced different experiences than their inland counterparts. As such, Rogers sets out to "[examine] the social and religious contexts of artificial waterfront development and the impact of these installations in

terms of the alterations they made to land and water" (Rogers 2013:207). Especially true in early societies, the oceans and water represented a mythical entity not fully understood. Even in more modern times, many societies and cultures continue to develop unique belief systems regarding their interaction with water. As an area where the boundary between land and sea are blurred, ports became part of this spiritual transcendence (Rogers 2011:214). Even artifact assemblages, like the pottery discovered on Lower Thames St. in London, when investigated in the context of disposition, revealed an association with religious ceremonies which would have occurred along the historic waterfront (Rogers 2011:218).

As for Washington, social archaeological approaches may be incorporated within the applied theoretical framework. Being a smaller settlement, merchants and prominent individuals constructed waterfront structures more according to their need. Not only would waterfront designs reflect their interests, but also their daily lives. Rogers states "that we can use the evidence of port and harbor constructions to approach aspects of the lives and experiences of the people that built them, used them, and lived near them. They were more than simply technologies to enhance trade and economics" (Rogers 2011:215). Washington's waterfront, which developed throughout the nineteenth century, harbored individuals with business interests that shaped the destiny of the town. Their shipping capabilities and connections in northern commercial centers enabled the town to grow accordingly. The incorporation of societal growth factors and an archaeological documentation of that growth further enhances the capability of recreating historic waterfronts.

Developmental Focus

Since waterfront structures participated in the grander port system, archaeological studies have focused on determining what factors encouraged and inhibited property development in port cities. Not exclusive to just waterfront structures, these works additionally correlate port development to parallel development in infrastructure in the town related to the waterfront. This can be accomplished using a variety of data sources including trade statistics, population data, and historical maps and images. In reconstructing Tudor Portsmouth, Dominic Fontana used historic paintings and maps to document the systematic build-up of harbor defenses around the port. Fontana finds inherent value in historical images since they reveal contemporary perceptions of waterfront life in Tudor England, in addition to providing a contextual understanding of Tudor defense strategy (Fontana 2013:264). While maps and paintings provide valuable, unorthodox archaeological information, they lack in substantive data. Examinations of ports needs concrete evidence, particularly economic data, to accurately describe trends in port growth or decline.

Perhaps the most comprehensive archaeological study of ports and harbors, Gordon Jackson's, *The History and Archaeology of Ports* (1983), chronicles the development of England's ports from the fifteenth century to modern time. Jackson aims to identify trade relationships and trends in overall trade which made ports prosperous or stagnate and decay. While little archaeological investigations have been conducted into England's many historical ports, this should not reflect their historical importance in England's legacy as a nation. As trade patterns and relationships fluctuated with time, resource availability, and resource demand, some ports met their demise while others succeeded tremendously. As such, Jackson exclaims that

"few ports have been able to cater for expanding or changing trade without creating and altering facilities, and the history of ports is therefore one of regular and frequent change in physical environment, wealth and relative standing (Jackson 1983:10). This change is often explicitly documented in historical economic statistics and the archaeological record.

Explaining his analytical framework, Jackson begins with the growth of English ports in the fifteenth century. He notes that, at first, England's trade ports were situated along places where the sea met a navigable, inland waterway. Therefore, this made the positioning of a port a compromise. It needed to be located away from the turbulent waters at the mouth of a river, but also close enough for convenience of trade (Jackson 1983:12). While the location of London isn't indicative of a geographic efficiency in trade, Jackson attributes its growth as a port to England's cloth trade through London's cloth merchants. Wool, mostly from East Anglia, became the primary English export to the European continent during the fifteenth through seventeenth centuries. Of the major English cities of this time, besides London, none were in an area which afforded them a great link to the continent. Many merchants in the cloth trade established houses and guilds along London's Thames River waterfront. Additionally, Jackson concludes that "the cloth trade, with its attendant warehousing and shipping, encouraged the growth of the city's port function, but at the same time exerted a considerable influence on its population, which was required to grow to cater for this trade" (Jackson 1983:16-18). The growth of London during the period which English merchants dominated the cloth trade coincided with the decline of England's minor port settlements. The emergence of the eighteenth century and additional, profitable industries enabled them to return.

The eighteenth and early nineteenth centuries witness England, Great Britain, rise to prominence on the national stage, becoming the supreme maritime power of its day. Their

demonstrated dominance of the high seas permitted English trade to spread throughout the known world. As such, England's minor ports became revitalized with the discovery of new resources, trade patterns, and port innovations. In order to accommodate growing demands for trade, several ports began improvement projects to upgrade inadequate and incapable facilities. The regions of Cornwall, Northumberland, and harbors on the Tyne and Wear Rivers were rich in minerals that needed an outlet to the sea. The northern port of Cullercoats, adjacent to the Tyne's entrance into the North Sea, developed specifically for exporting coal from the Whitely colliery. Many other minor ports, like Cullercoats, developed in response to the demands for a product and even more constructed pier structures in order to tame the waterfront (Jackson 1983:36-38). Furthermore, Jackson later claims that during the eighteenth and nineteenth centuries, merchants always strove to build structures which accommodated existing trade rather than trade expected in the future (Jackson 1983:46).

In Liverpool, growing trade with Ireland and the beginnings of the transatlantic trade network encouraged the town to develop commercial wet docks. In response to a naturally inaccessible harbor, engineers and planners began to discuss ways to bring ships along the River Mersey's shore, rather than lay aground in low water as they traditionally did. Landowners directed their attention towards the Pool, an unloading area much removed from the necessary warehouses. In order to address this issue, the town spent an enormous amount of money to open approximately four acres of water space in 1715 (Jackson 1983:46-47). The waterfront would undergo several installments of improvements, reflected in the addition of several major docks (FIGURE 8). Reflecting, Jackson writes "It would, however, be a mistake to argue that Liverpool's trade grew in the eighteenth century *because* she [sic] developed a dock system. No doubt some trade was attracted by good facilities, but it would be truer to say that the docks were

created because trade was growing" (Jackson 1983:47). His example of Liverpool as a case study fully encapsulates his theoretical approach to archaeologically examining ports. Trade and economic factors enabled forgotten ports like Liverpool, and Newcastle amongst many others, to rebuild and expand their waterfront infrastructure.

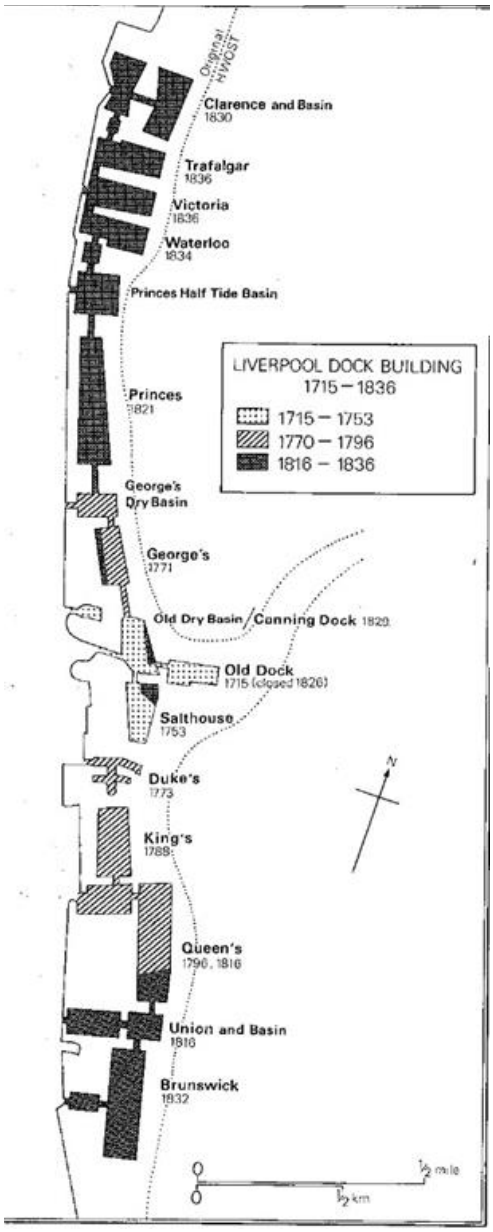


FIGURE 8. The expansion of harbor facilities in Liverpool Harbor (Jackson 1983:46).

Into the latter half of the nineteenth century, English ports continued their trend in growth during *Pax Britannia*. This period also corresponded with innovation in construction methods and shipbuilding technology. In order to accommodate the changes incurred from steamships, railroads, and the slow transition to containerization, ports needed to adapt. Eighteenth century ports were incapable of servicing the larger vessels constructed during the nineteenth century. Not only ships, but altered working conditions and technology made earlier structures obsolete. No longer were ships expected to remain tied up to a dock for weeks at a time, standardization of shipping and regular passenger routes demanded constant coming and going within a port (Jackson 1983:73).

Addressing this, English engineers and designers constructed internal piers, the most notable of which being St. Katherine's Dock in London. Internal piers like these also increased trade efficiency with their addition of quayside, dockside, warehouses which could hold goods for extended periods of time and alleviated intra-port traffic congestion. Both steamships and rail transportation fundamentally altered waterborne commerce and transportation. Steamers initially supplanted sailing vessels in coastal trade routes by the 1850s. By 1850, steamers entering Hull accounted for 52 percent of cleared tonnage and at London, they accounted for 34 percent of tonnage (Jackson 1983:74). Since steamers often were constructed to greater specifications than their sailing counterparts, port facilities needed to be altered. Locks needed to be enlarged and dock spacing needed to be increased so that the constantly moving steamers could freely move about the port. This even led to competition amongst the major ports. Those not willing to construct improved facilities faced the threat of not having an established steamer line within their port, losing out on valuable trade income. Naturally, authorities sought to provide "enticing

facilities for steamers" and England's major ports began substantial construction projects to meet those needs (Jackson 1983:75).

Railroads presented their own set of problems to England's ports since they needed both waterfront and hinterland property in order to function. Appearing at a similar time as the steamships posed an interesting dilemma for port authorities to consider. Coincidentally, Jackson found that the usefulness of Great Britain's national railway network supported steam powered water commerce (Jackson 1983:75). Many ports aimed to include railways amongst already existing infrastructure, or, in some cases, private railroad companies established their own ports to service their railroad line. The railroad line would normally be involved in the export of a commodity like the Stockton-Darlington Railway, exporting coal, in the northeast. The railroad company constructed their first *staithe* (a name for a dock structure) at Stockton, but the location's limitations became obvious. The town's distance from a deep-water channel forced the company to construct coal specific landings at the mouth of the River Tees, leaving Stockton behind. Jackson notes the growth of tonnage borne by the Stockton-Darlington Railway, from 1820 to the mid-1830s, tonnage increased from 60,000 per annum to 350,000 per annum (Jackson 1983:83). Efficient railways linking ports to hinterland commodities such as Shilloth and northwestern iron, as well as Cardiff with the Welsh coal mines (Jackson 1983:87,88). Again, the decision to build or relocate a port stemmed from trade demands, a common theme throughout his work.

Moving towards the twentieth century, England's ports continued to adapt to changing economies and the growing global trade network. Steamships found their role within ports where their services were required, like Liverpool's transatlantic trade, and railroads continued to rapidly transport commodities from resource rich areas to the ports. England's coastal and

foreign trade experienced tremendous growth during this period, which Jackson explained through tabulated data derived from *Annual Statements of Trade and Navigation* in order to demonstrate import trends, net tonnage, and port investments in Wales and England (Jackson 1983:114-116). These increases in shipping and expenditure correspond to another series of port improvements. He determines that these increases were:

> … associated with a number of interlocking trends in port development. The first was obviously the growing interest in accommodating large ships which led ports already well endowed with 'old' docks to invest heavily in 'new' ones: in long, wide and deep locks; in long internal walls for berthing longer ships, and in vast areas of uncluttered space for turning them; and in advanced machinery such as cranes and hoists. At least one deep lock was essential if a major port was to placate its shipowners and fight off its rivals, but at the same time a countervailing trend was observed in the increasing interest in riverside quays and pontoons outside the dock system: for short-haul rapid-transit vessels in Liverpool and Hull and the newer packet ports of the south-east; for the largest liners at Liverpool and Southampton; and, towards the end of the period, for oil tankers in many places (Jackson 1983:119).

Leading up to the beginning of the twentieth century, increasing English trade encouraged dock construction projects. Substantial volumes of cargo required innovative working structures, cranes and hoists, and a general reorganization of space to accommodate larger vessels. Additionally, as some ports grew in accordance with trends in trade, others were bypassed and

fell into decay as commercial processes became streamlined and more efficient. Jackson succinctly ties together the relationship between trade and economies and the port developments which maintained them.

While not entirely like Jackson's study of English ports, Cosmos Coroneos' investigation of Tasmania's Port Arthur and Carnarvon Bay captures the developmental history of one of the penal colony's early settlements. Port Arthur became the link between the penal settlement and the world at large, the transitive area which supplied manufactured goods and food supplies to the colonists. Coroneos' study was published alongside other archaeological and historical investigations into Port Arthur's maritime heritage which aimed to "expand our understanding of the sea in shaping the relationships between Port Arthur and its outstations and the numerous probation stations set up around the Tasman Peninsula" (Tuffin 2004:6). For this publication, Coroneos specifically examined both industrial and settlement sites throughout Carnarvon Bay.

Coroneos investigated the physical remains of Carnarvon Bay's historic waterfront industries (Tuffin 2004:8). By doing so, he was able to recreate the trade and transportation networks which sustained the region during its development. He expressed these relationships through maps hypothesizing routes of travel between industrial sites, as well as passenger routes (FIGURE 9). Concluding his article, Coroneos noted that his survey has "contributed to a growing understanding of individual convict industries and activities, the linkages between them, the significance of surviving sites and the potential for sites within the wider cultural landscape." He also determined that the region went through two phases of waterfront development. At first, development was a decentralized process leaving each landing to create in its own image and non-uniform traffic patterns. Eventually, construction became more centralized with increased inhabitation, while traffic patterns became uniform (Coroneos 2004:97). Visual descriptions of

trade and passenger routes illustrate the inter-port and intra-port relationships which made the region a viable port. Combining historical and archaeological research, Coroneos successfully documented economic and population growth in Port Arthur.

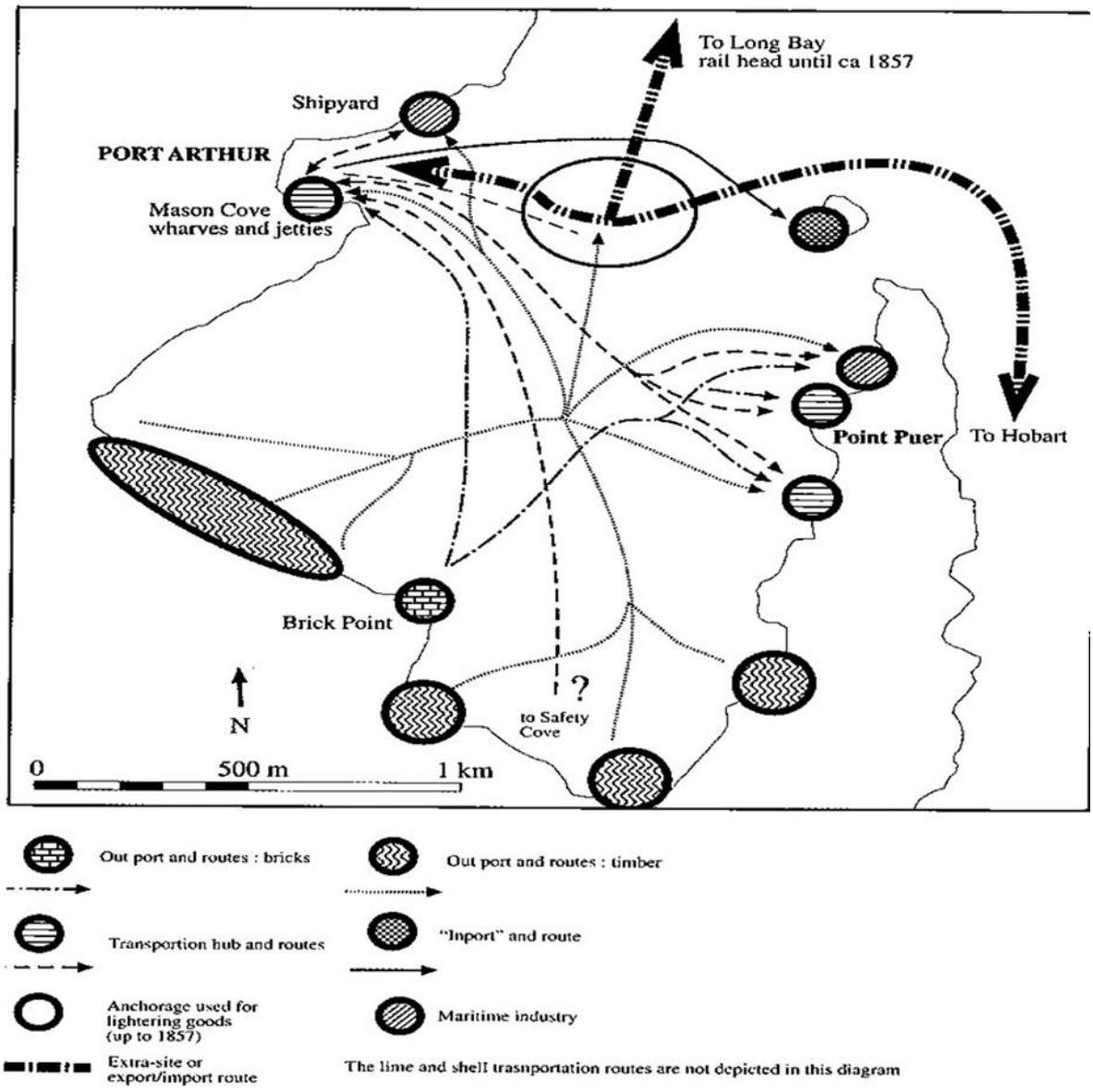


FIGURE 9. Inter harbor connectivity in Port Arthur, Australia (Coroneos 2004:84).

Archaeological port studies document the development of harbor structures in a variety of ways. Cartographic and imagery sources present archaeologists the chance to reconstruct ports in situations with little archaeological evidence to examine. More applicably, economic data permits quantitative analysis into why particular industrial trends required specialized infrastructure. Jackson reiterates this claim by arguing "changes in the nature of trade and in the type of ships are more likely to demand new and more elaborate facilities" (Jackson 1983:115). Additionally, archaeological investigations paired in tandem with historical research permits a foundational understanding of how port infrastructure interacted in a developing region. Coroneos concludes his research affirming the historical development and distribution of waterfront structures reveal improvements to the Tasmanian port's regional economy, technology, and labor principles (Coroneos 2004:97). Each methodology incorporates elements of historical and archaeological research in order to describe the growth of a port community. Invariably, these methodologies occasionally neglect the geographic and spatial factors which create or constrain growth within a port. With the intention of recreating a waterfront, geographical studies provide supplementary concepts to explain the natural growth processes of a port.

Geographic Studies

The construction of a port city, in addition to the many structures within it, requires incredible feats of engineering, large amounts of expenditure, and a tremendous understanding of the geographic constraints which the port is located within. Additionally, port city planning has evolved conceptually over time as maritime trade has become increasingly sophisticated. The

appropriate placement of wharves and industry in relation to geographical limitations and waterborne traffic patterns of the harbor determined the effectiveness, and eventual growth, of a port. As such, geographical studies of historic port city planning aim to determine the factors which necessitated the spatial growth of ports, as well as to understand the growth of one location over another. A nuanced understanding of spatial perspectives has the potential to illuminate the thought process behind the establishment of waterfront industry in Washington in one location against another.

Investigating the development of European ports during the early modern period, Josef Kronvitz noted several trends in historical port development over time. As European trade increased during the fifteenth through eighteenth centuries, contemporary port planners became fixated on solving the problems stemming from increasing commercial activity. They focused specifically on the issue of spacing amongst interrelated industries and locations, as well as how best to utilize that space (Kronvitz 1978:4). Increasing specialization within the artisan and skilled labor communities meant that the shipping industry and merchants, amongst many other groups, required conducting business with multiple firms. Kronvitz states that "within the perimeter of the arsenal or dock district, shipbuilding, outfitting and freight handling were broken down into a series of separate tasks, each of which was assigned its own space; these tasks were coordinated and integrated in terms of the relationship between their individual spaces" (Kronvitz 1982:26). Especially in terms of large-scale trade organizations, their merchant fleet would not unload cargo at the same place it received its repairs. Rather, it would need to be moved to another location which could perform those functions while not hampering the important processes of the port. These principals became important as space began to diminish, and ports needed to smartly allocate valuable property.

Historical port planning also revolved around the idea of the port city, a settlement which the functions of the port exist adjacent to and, to a large extent, shape the identity of the city. Historically, these two entities often existed adjacent to one another, oftentimes the city's main streets ran along the water's edge. This close association mixed industry and business into the personal lives of the inhabitants. Kronvitz states that "until the late eighteenth century, therefore the port city was literally and figuratively a whole, whose parts, however different, were understood to be functionally related to each other. Port city planning in the early modern era was grounded in a series of widely held assumptions about the influence of a port city's spatial organization on the pursuit of commercial and military power" (Kronvitz 1982:23). The city and its port came to form a symbiotic relationship, each dependent upon on one another. The analysis of decisions made by port planners reveal their attempts to maintain this spatial relationship. As time progressed, however, this relationship deteriorated as the port began to be constructed away from the city.

From a geographic perspective, ports present a fascinating case study. Their steady growth over time demonstrates the way in which those who planned and constructed the harbor adapted to their geographic confines. Geographers have also provided guidelines and framework to use in the study of historical ports. Geographers Brian Hoyle, David Hilling, and David Pinder, amongst many others, investigate the factors which aided port growth throughout history (Hilling 1984; Hilling and Hoyle 1984; Hoyle 1988; Hoyle and Pinder 1992). Their discussions on port growth contribute a great amount of information towards understanding waterfront development. Admittedly, the authors direct their focus on understanding the waterfront transition of trade, regardless of the historical context which that transaction took place in (Hilling and Hoyle 1984:1). Therefore, Hoyle, Hilling, and Pinder's theoretical approaches

applied in their geographic analysis of ports can be applied in the archaeological examination of Washington's waterfront.

When examining ports geographically, it is important to understand the functional relationship between the port and the city it is associated with, as well as the hinterland which it provides water access to. Even if several miles separate these distinct entities, the relationship between the success of the port and the development of the city and hinterland is evident throughout history. Regarding port cities from the ancient Mediterranean to the 19th century, Hoyle defines them as having significant spatial association between its parts and having functional interdependence (Hoyle 1988:7). The development of the port impacted the spatial growth of the city as well. As such, Hilling and Hoyle argue that "much geographical research and writing on ports at different scales has implicitly, if not explicitly, been concerned with the complex interrelationships manifest in the systems of which ports are component elements" (Hilling and Hoyle 1984:3). As technology developed and ports became modernized into the twentieth century, the distance between the port and the city increased. Nonetheless, their functional dependence upon each other remained (FIGURE 10).

Attempting to determine specifically what caused ports to grow and expand, geographers generally consider trade efficiency and capacity to be the primary factor in determining the degree in which a port will expand. This concept is like Gordon Jackson's approach to port growth and its relationship with trade capabilities. Both Brian Hoyle and David Hilling agree that trade proficiency acts as a catalyst for growth, but also creates the public environment which demands such growth. This can be entirely dependent upon a export, as seen in Jackson's investigation of the northern and Welsh coal ports. Hoyle and Hilling describe these ports by stating that "some ports are unifunctional, dependent entirely on a single energy, mineral, or

agricultural resource or the product of a particular mine, plantation, or processing plant" and that their fortunes are tied to the successful "exploitation" of that commodity (Hilling and Hoyle 1984:7). Ports tied to the export of one good will prosper and fail according to the demand for that good. Just as well, the relationship between the port and city will depend greatly upon maintaining export levels.

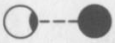
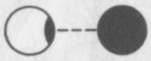
Stage	Symbol ○ city ● port	Period	Characteristics
I Primitive cityport		Ancient–medieval to 19th century	Close spatial and functional association between city and port
II Expanding cityport		19th–early 20th century	Rapid commercial and industrial growth forces port to develop beyond city confines, with linear quays and break-bulk industries
III Modern industrial cityport		mid-20th century	Industrial growth (especially oil refining) and introduction of containers and ro-ro facilities require separation and increased space
IV Retreat from the waterfront		1960s–80s	Changes in maritime technology induce growth of separate maritime industrial development areas
V Redevelopment of the waterfront		1970s–90s	Large-scale modern port consumes large areas of land- and water-space; urban renewal of original core

FIGURE 10. Stages in the Evolution of the Port-City Interface (Hoyle 1988:7).

Not only does the vitality of the port depend upon maintaining profitable levels of trade, so too does the inland region which it supplies. The hinterland oftentimes provides the exported resource for the port and, naturally, its development often coincides with that of the port. Geographers consider their fortunes to be dependent on one another, success in one area bringing similar prosperity to its counterpart. This bilateral relationship often leads to advances in port infrastructure, technology, and overall growth. In addition to that, the success of the hinterland

can often be viewed as one of the major factors in the creation or development of ports, again like Jackson's archaeological theories. Hoyle and Hilling also mention inland transportation being a contributing factor towards the development of ports but admit that they often develop independent of the port (Hilling and Hoyle 1984:7). This is particularly applicable for the examination of Washington because the Pamlico River town served as the conduit of trade for the Tar-Pamlico region. With so many communities dependent upon the port, and vice-versa, Washington and its hinterland had parallel developments. Washington's transition from exporting predominately naval stores to lumber is evident through the increased presence of sawmills in the latter half of the nineteenth century (Sanborn-Perris Map Co. Limited 1885, 1891, 1896, 1901; Sanborn Map Company 1904, 1911, 1916).

Since many activities and industries made the port their home, relationships developed between these industries encouraging certain patterns of growth. Even within these relationships and spatial provenance of industries, certain regions within the port city developed according to a facet of port operations. Hilling reemphasizes the notion that the port "provides the interface between land and sea transport. At this interface cargo transfer takes place and in older port areas there has emerged adjacent to it an urban functional zone in which the distinctive socio-economic features derive from their association with port activity" (Hilling 1988:20). Not only does this argument indicate that workers in certain industries create their own functional areas, or quarters, but that certain industries prospered in one location rather than another. Washington had industrial areas which changed over time in response to economic needs.

Hilling also discusses the maritime quarter and its association with the development of the port. The maritime quarter refers to the port related urban landscape which is oftentimes located adjacent to a specific port facility (Hilling 1988:20). Much like the identified relationship

between the port and the hinterland, Hilling's geographical perspective sees similar patterns amongst the growth of the maritime quarter in relation to that of the port. Hilling considers the quarter, or sailortown, an integral part of the port and its development mirrored that of the port. In London, small settlements like Wapping, Stepney, Limehouse, and Poplar along the Thames sprouted up due to the increase in resettled sailors and immigrants. Since London steadily developed into an extremely busy port, those employed in port activities established homes and businesses adjacent to it (Hilling 1988:22-23). Again, this concept acknowledges the dependence of an area or region on port commerce. He notes that "the vitality of a maritime quarter will clearly be a function of the prosperity of the port with which it was associated" (Hilling 1988:31). While Hilling focused on living quarters and residences of a certain group of individuals, this can certainly be applied towards spatial analysis of the establishment of industry locations. Developing sawmills in particular areas reveal Washington's perception towards that land, invariably these sites became home to additional properties entirely dependent upon the mill.

Lastly, geographical investigations of ports address the concept of spatial organization and how historical ports organized the natural environment in order to maximize efficiency. Quite remarkably, historic port planners molded and shaped nature in their quest to construct a profitable interface for trade. This included creating artificial structures like breakwaters, locks, and canals, redesigning infrastructure according to technological innovations, and, sometimes, breaking out of the port confines to expand its footprint. Hoyle proclaims that "rapid commercial and industrial developments in the nineteenth century forced many ports to break out of their traditional confines, and the seeds of port-city separation were widely scattered. At the same time, however, the expansion of port facilities exerted a marked influence upon patterns of urban

land use" (Hoyle 1988:9). At this time, geographers note the beginnings of the modern port, one separated by distance from the city it services. In ports like Washington, there was not a significant amount of distance which separated port functions from the urban landscape. While distance did not present a significant obstacle, the locations which the town constructed the S.R. Fowle and Son Company Sawmill and the Eureka Lumber Mill point towards this argument. This notion can also permit hypothesizing on the factors which encouraged waterfront construction at the South Shore Landing Site.

Focusing on European ports, Brian Hoyle and David Pinder analyzed the relationship between port development and the natural space they were situated in. Beginning with the major ports of the fifteenth and sixteenth cities before ultimately discussing modern ports, the authors document several factors which affected the development of European port cities. They introduce the terms; *water site* and *land site*, which correspond to the physical location a port is situated in, as well as *water situation* and *land situation*, which identify the societal attitude towards their water and land usage. These four factors determine the need for expansion and the method of expanding a port (Hoyle and Pinder 1992:3). Furthermore, the authors downplay the role of the environment in addressing port expansion and place greater emphasis on the nature of trade and society. They write that "there is no geographical coincidence between the distribution of fine harbours or other first-class water sites and the pattern of port development, for ports originate and grow where trade demands their facilities rather than where nature provides an appropriate local framework" (Hoyle and Pinder 1992:4). These terms create a framework with which to observe the development of a port through time. Especially in Washington, where the harbor is not naturally conducive to large-scale trade. The interaction between these factors will determine the success of port development.

Geographical perspectives of historical ports present interesting concepts which can be applied in an archaeological investigation. Scholars such as Brian Hoyle, David Hilling, and David Pinder recognize the spatial interdependence amongst the port's many activities, as well as the importance of trade in shaping development trends. Most importantly, geographical analysis attempt to describe the spatial relationship between the port and city, as well as activities within the port. In recreating Washington's nineteenth century waterfront, these elements should be employed in order to sequentially document the spatial development of its waterfront. Combined with archaeological theory from Jackson, Coroneos, and Rogers, an effective theoretical framework for studying historical ports will be configured.

Conclusion

With the intention of establishing a solid theoretical framework to study the historic port of Washington, it is necessary to blend archaeological and geographical thought together. Social archaeological approaches will assist in forming an understanding of nineteenth century Washington's attitude towards their town's expansion and growth of port facilities. Jackson and Coroneos address the economic factors driving port development and the relationships which sustained economic success. Finally, geographical analysis addresses both concepts, but is more applicable in crafting the understanding of a port's spatial development. Effectively intertwined, these concepts authorize a thorough recreation of a historic port.

Rogers' social archaeological approaches will be employed in the study of businesses and individuals which conducted their business along the waterfront. Their ownership of shipping conglomerates and industrial sites brought these individuals to interact with the water daily,

moving their wares through the port of Washington. Ultimately, their manipulation of the shoreline reflects themselves and Washington's society.

Jackson's effective correlation of historical economic trends and trade data to the growth of England's ports will be the quantitative framework which the port of Washington will be examined. Throughout the history of the port, different goods and commodities occupied the position of the primary export. With that, different waterfront structures involved in those commodities were constructed. This establishes the reasoning behind their construction, as well as their function within the port. As the region developed and diversified their economy, these changes will be reflected through alterations along the shoreline.

The growth and expansion of Washington's nineteenth century waterfront also impacted the inter- and intra-port relationships which made that success possible. A crowded waterfront forced entrepreneurs to construct their mills and wharves further away from the epicenter of the port. Routes of travel became altered both inside and outside of the harbor. Cosmos Coroneos' recreation of the relationships within Carnarvon Bay demonstrate how Australia's colonists shifted these routes as landings changed and technology brought greater efficiency to their waterborne economy.

Geographical studies of ports offer an explanation to the spatial progression of port development. Brian Hoyle and David Hilling identify patterns in spatial growth as ports develop over time. The developments in port infrastructure occur within the normal progression of port development according to economic, geographic, and social factors. Their framework can reveal the reasoning behind the establishment of certain industries in particular locations. Certain industries needed additional space to operate or the nature of their activities deemed their

fixation elsewhere. The growth of the port can reveal how the town of Washington utilized their space within their confined environment.

Archaeologically, there are many ways to examine port infrastructure. Many scholars have addressed individual structures while others opt to reconstruct the port on the macro level. Regardless, the multitude of approaches tend to present problems for those seeking to correlate the two. As such, a blend of archaeological approaches will be employed to examine the nineteenth century waterfront of Washington, NC. Combined with geographical port planning theory, a complete developmental history can be established. Using both archaeological and historical data, a recreation of Washington's nineteenth century port is possible.

CHAPTER FOUR: METHODOLOGY\

Introduction

To examine the development of the historic port of Washington, historical and archaeological data was analyzed and incorporated into a cohesive narrative. What remains of Washington's historical waterfront along the Pamlico River has been exposed to natural erosion and human intrusion over time. These phenomena have disrupted or removed much of the port's historic past from the archaeological record. Nevertheless, ports like Washington represent a portal into the past due to their significance in promoting economic growth and vitality, especially in infrastructure-deprived regions. Through a combination of archaeological surveys and historical research the port of Washington can be reimagined and reconstructed.

Historical research focused on the predominant industries that utilized the port of Washington. Oftentimes, these firms, and those that owned them, became the driving force for Washington's expansion during the nineteenth century. Archaeological data collected from several historic sites on the Pamlico River became the primary building block from which reconstructions emerged. Shoreline surveys, diagnostic photography, illustration techniques, and legacy sonar data from earlier East Carolina University Program in Maritime Studies permitted a more complete understanding of the construction methodology and development of the port through time. Furthermore, applying this methodology to dilapidated waterfront structures served as an alternative framework form which to study historical ports.

Historical and Theoretical Research

Through constructing an overall narrative of Washington's port development, secondary sources, and previous historical archaeological studies into the history of the region provide a starting point. These range from broad narratives of Eastern North Carolina's development to those more focused on Washington and its setting on the Pamlico River. Hugh Lefler and Albert Newsome's *North Carolina: The History of a Southern State* (1973), William Powell's, *North Carolina Through Four Centuries* (1989), as well Milton Ready's, *The Tar Heel State: A History of North Carolina* (2005), provide contextual information concerning North Carolina's economic development. Additionally, Joe Mobley's edited collection of essays, *The Way We Lived in North Carolina* (2003), delves deeper into the social perspective of North Carolina's development as a state. Lastly, North Carolina's struggle with maintaining adequate transportation systems by land and water undoubtedly contributed to Washington's port growth. Alan Watson's, *Internal Improvements in Antebellum North Carolina* (2002), records the many efforts made to clear the Tar-Pamlico River and their resultant effects on the river's economy.

Historical reconstruction which focuses specifically on Washington requires both primary and secondary source research. Secondary sources such as Wingate Reed's *Beaufort County: Two Centuries of Its History* (1962) and the collaborative work *Washington and the Pamlico* (1976) describe and highlight the town's growth during the succeeding century through industrial expansion. Both works portray Washington as the driving economic force for Beaufort County, as well as the surrounding region. Primary source documents including newspapers, firsthand accounts, as well as government reports add firsthand insight into how the town grew, the port

developed, and the public's perception of its growth (e.g. Attmore 1787; Elltion and Graighill 1873; Rossell 1911; Morgan 1982).

Previous archaeological and historical graduate student research regarding the Tar-Pamlico River have focused on the overall economics of Tar-Pamlico River system, often at the expense of Washington. Christopher McCabe's "The Development of Tar-Pamlico River Maritime Commerce and Its Impact upon Regional Settlement Patterns" (2007) and Justin Edward's "Tar River Blounts and a Transitional Maritime Cultural Landscape" (2015) certainly focus on the growth of the communities throughout the river system. As well as their foundation, both research projects address economic factors that spurred industrial development in the region. McCabe describes how the Tar-Pamlico opened the vast hinterlands of North Carolina to settlement expansion and economic opportunity (McCabe 2007:9). In contrast, Ann Merriman's "North Carolina Schooners, 1815-1901, and the S.R. Fowle and Son Company of Washington, North Carolina" (1996) focuses on the enterprising Fowle family, of whom were several generations of prominent Washington merchants. Merriman's study presented a much narrower scope in terms of economic focus, detailing the Fowle family's nineteenth century rise thanks to their shipping ventures in North Carolina and the West Indies (Merriman 1996:84). This author built upon the thoughts of Merriman, McCabe, and Edwards by focusing explicitly on the town of Washington and its growth as a nineteenth century port town.

As mentioned in Chapter 3, the archaeological examination of ports lacks a dominant theoretical principle to guide studies, therefore many approaches are meshed to view historical and archaeological data. These include studies focused on the identification of port and waterfront construction methods (Huey 1984; Langley 2000; Oniz 2014), as well as social perspectives on port functions (Rogers 2011, 2013). Gordon Jackson's economic-based study

and Cosmos Coroneos' study on the spatial-relationship of port structures in Tasmania, however, provides the greatest ability to correlate economic growth to port development (Jackson 1983; Coroneos 2004). To aid in comprehending the geographical development of a port, theoretical concepts were obtained from geographical and planning related studies. Perspectives from the historical developments of Europe's many ports, and those that built them, provides knowledge of the historical factors and reasoning behind the process of physical growing a port (Kronvitz 1978, 1982; Fontana 2013). Other, more contemporary minded studies seek to explain port growth in developing countries through the lens of historical patterns seen throughout the growth of Europe's ports (Hilling 1984; Hilling and Hoyle 1984; Hoyle 1988; Hoyle and Pinder 1992).

Finally, cartographic research represented the final component of background research. Along with other historical resources, maps published during the nineteenth and early twentieth centuries document the expansion of a waterfront presence along the southern side of the Pamlico River. The United States Geological Survey published several survey maps that outline this expansion during late nineteenth century. Maps published from 1855 to 1869 document Washington's spatial extent on the north side of the Pamlico River. Maps published after 1870 include a point labelled "wharf" on the southern side of the river directly opposite the town (FIGURE 11-12). Due to the consistent indication of structures along the southern shore, the area directly across the Pamlico River from Washington became one of the areas of focus for this study.

Additional USGS survey maps published during the nineteenth century describe the remnants of wharf structures protruding from the southern shoreline. The survey of Chocowinity Quadrangle in 1903 and 1905 have clearly recorded the two wharves which are very similar to those of the Fowle Sawmill located directly east of the US-17 Bridge (FIGURE 13). The 1951

Washington Quadrangle maps again depict two wharves on the southern shore of the Pamlico River, but they also include the remains of two additional structures west of the Fowle Sawmill wharves. More recent, the National Oceanographic and Aeronautic Administration's nautical chart of the Pamlico River shows the same waterfront structures as the USGS surveys. Beginning in 1968, their depictions are similar in location to those found in the Chocowinity Quadrangle's. In addition to those, the nautical charts show remains along the shoreline directly east of the supposed Fowle Mill wharves. In 2012, these eastern structures are labelled 'ruins.'

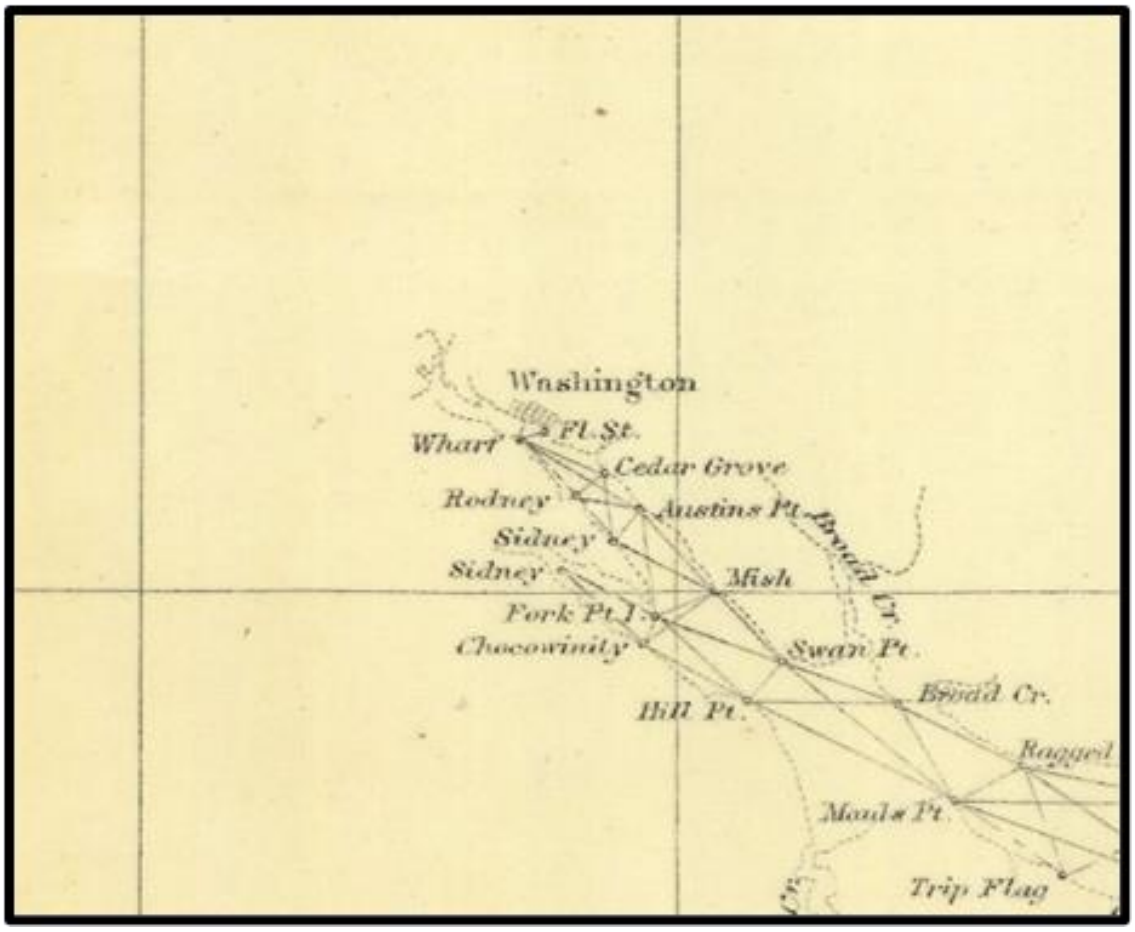


FIGURE 11. Sketch D showing the progress of the survey in Section No. IV from 1845 to 1870 (U.S. Coast Survey).

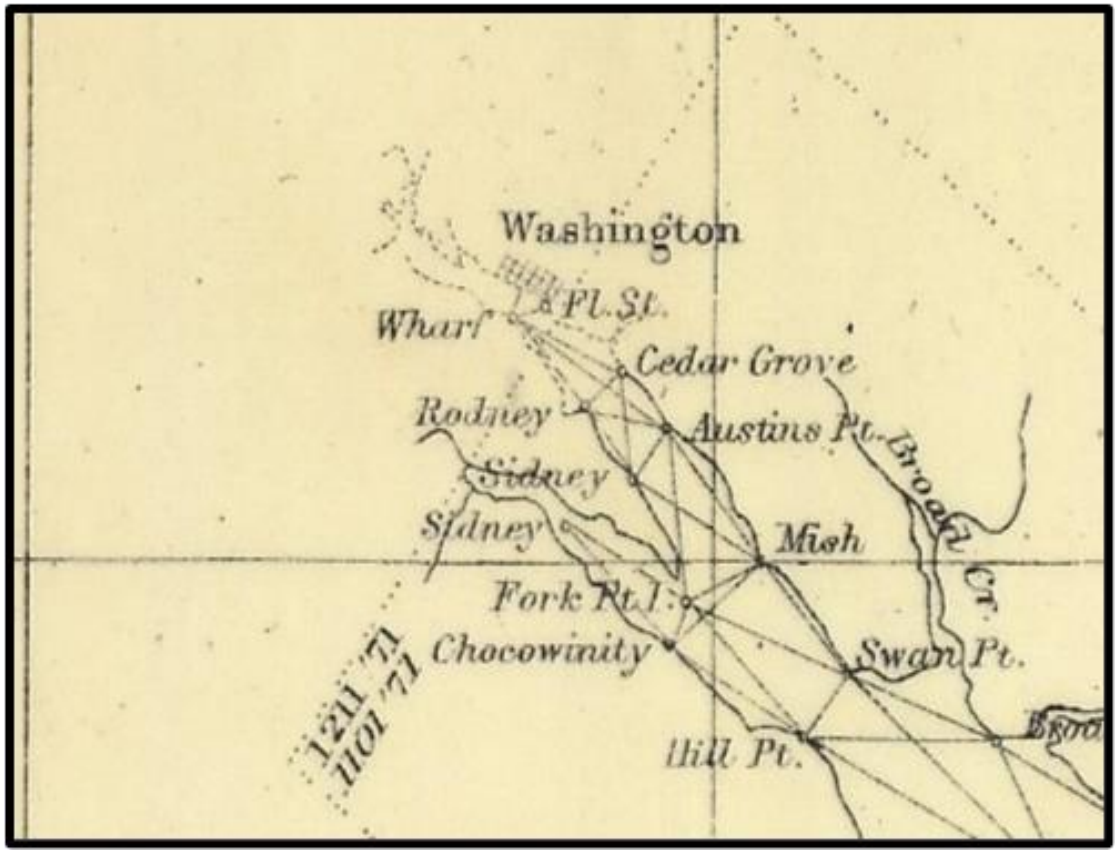


FIGURE 12. Sketch D showing the progress of the survey in Section No. IV from 1845 to 1871 (U.S. Coast Survey).

In addition to historical maps procured from NOAA's Historical Charts Index and other cartographic sources, Sanborn Fire Insurance Maps from 1885-1896 were obtained, downloaded, and georeferenced into ArcGIS Pro. These maps exclusively focus on the downtown area of Washington and demonstrate the gradual development and modernization of the waterfront over the span of a decade. Since many of the buildings in these charts are still standing, the georeferencing process was simple. Control points were applied to corners of still standing buildings, such as the First Baptist Church and the S.R. Fowle & Son warehouse, as well as major intersections. Once blended, they were organized into layers according to year and can easily be cycled through to showcase the transforming waterfront.

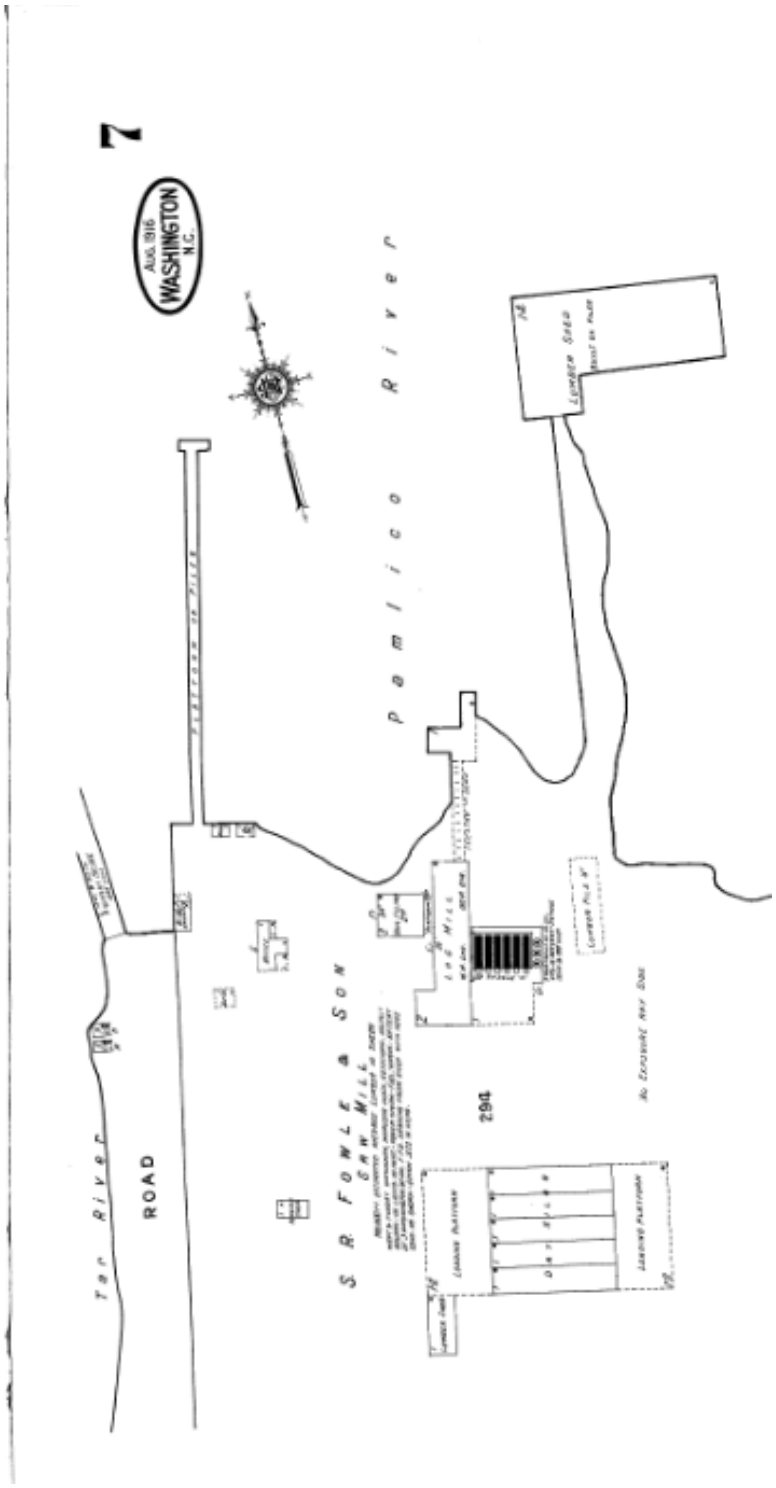


FIGURE 13. S.R. Fowle & Son Company Sawmill located across the river from Washington, NC (Sanborn Insurance Map 1916).

Historical Data

Most historical data collected for this study belongs to either the Joyner Library North Carolina Collections in Greenville, NC or the Brown Family Library in Washington, NC. Many archival collections came from prominent businesses and individuals from Washington that utilized the port in some function throughout the nineteenth and early twentieth century. These include the S.R. Fowle & Son Manuscript collection in Joyner Library (S.R. Fowle & Son 1987) and another collection of earlier Fowle family business documents in Washington (S.R. Fowle 2016). Manuscripts were consulted to determine the usage of the waterfront and the changing perception of the waterfront from the merchant class of nineteenth century Washington (Burgess 1967; Rodman 1977; S.R. Fowle & Son 1987). Historical data derived from merchant's ledgers, shipping records, and other general financial records will be used to identify and quantify historical economic trends (Burgess 1967; Rodman 1977; S.R. Fowle & Son 1987). Each of these collections contains economic data related to shipping a variety of commodities from Washington including naval stores, lumber, and cotton to ports throughout the Atlantic Ocean.

More specifically, these collections can provide new insight into the economic trends that defined the port of Washington and the eastern portion of the state. Daybooks and shipping records from the early Fowle shipping enterprise show the budding firm's importance in establishing Washington as a shipping center during the early nineteenth century. The firm engaged in shipping along the Atlantic seaboard to the large commercial centers of New York and Boston, as well as regular trips to the Caribbean islands of Martinique and St. Kitts. Predominately, the firm exported staves, shingles, and naval stores and their vessels returned

laden with molasses from the West Indies and manufactured goods from the northern states (S.R. Fowle 2012).

After the Civil War, Washington's economy modernized, bringing new industry and efficient transportation together to rejuvenate the town. The Styron Transportation Company was a subsidiary of the Norfolk Southern Railroad which operated out of the port of Washington during the late nineteenth century. Shipping manifests from a six-month period from August to December 1894 are in the J.A. Burgess Collection at Joyner Library. The company engaged in regular shipping of both people and commodities in a circular route from Washington to the smaller communities along the Pamlico River, even travelling as far as Ocracoke. Predominately, the firm shipped everyday items such as flour, sugar, chicken, eggs, and, in a few instances, fully assembled horse carriages (Burgess 1967). Similarly, the Rodman family shipped their farm's cotton via steamers north to the ports of Boston and New York. Their receipts and letters from their selling agents document their experiences exporting the cash crop (Rodman 1977).

Finally, the S.R. Fowle & Son mill records offer comprehensive production and distribution data for one of the larger sawmills at the port. After its construction in 1892, the S.R. Fowle Mill on the southern shore of the Pamlico River across from Washington became one of the town's largest sawmills. Joyner Library possesses most of the company's records which include production quotas for several years. Additionally, this collection includes timber purchases and land acquisitions, shipping records, employee records, financial statements, and purchases from the sawmill constructed in 1892. One order book, ranging from 1894 to 1897, indicates the firm or individual who placed each order as well as the individual cuts and quantities they desired (S.R. Fowle & Son 1987). Alongside additional data from prominent contemporary lumber industries, such as the Eureka, Kugler, and Moss Planning Mills, lumber's

role in Washington's late-nineteenth and early twentieth century economy becomes clear (Department of Labor and Printing 1911; Department of Labor and Printing 1912; Department of Labor and Printing 1913; Department of Labor and Printing 1914; Department of Labor and Printing 1915; Department of Labor and Printing 1916).

Historical Data Modelling

Once historical data had been collected, it needed to be organized and displayed in a visual format to model the historical trends within the port of Washington. To do so, historical data was entered into Excel which then could be converted into graph and chart form. Data remained segregated according to firm or business in all instances except data derived from the Bureau of Labor Statistics. Because this data compares the prominent lumber industries in Washington, these numerical values needed to be presented alongside each other.

The early S.R. Fowle & Son Company data is representative of the port's early economy. The firm's ledgers and records tally exports to the West Indies, Baltimore, and New York, while simultaneously referencing the intricate internal trading taking place between other Washington based firms and individuals. Individual transactions, whether they were a part of a large shipment to another port or a singular sale to a local consumer, were broken down according to commodity and value. In this collection, the predominant goods being moved through the Fowle business were associated with the naval stores industry, including tar, pitch, turpentine, and rosin. Different products were oriented along the horizontal axis of the Excel chart with the transaction date along the vertical axis. Monetary value, therefore, were easily aligned with the

corresponding product and transaction date. Doing so permitted efficient totaling of sales values, as well as creating figures which illustrate these transactions.

The same organizational methodology was repeated for the Styron Company, the S.R. Fowle Lumber Company, and the Rodman cotton shipping business. Each of these collections were organized in Excel according to products and transaction dates, with some slight variations. Monolithic collections, specifically the Rodman cotton shipping business, did not include a variety of products. Therefore, this collection was broken down into further diagnostic segments, such as total weight, total bales. Additionally, when collections, such as the Styron Company or the order forms for the S.R. Fowle Lumber Company, did not include a monetary value, the quantities of a shipment or cuts of lumber were enough to demonstrate economic trends (FIGURE 14).

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
1	Date	Via	Bales of Cottar	Weight (lbs)	Price/lb		Total	Destination	Notes								
2	11/21/1870	Norfolk Steamer	15	6,175			$ 1,031.66	Baltimore									
3	1/31/1871	Norfolk Steamer	18	8,051			$ 1,143.84	Baltimore	Three different qualities of cottan, Low middling, good ordinary?, and Stained								
4	2/27/1871	Steamer Olive	17	7,892			$ 1,054.95	Baltimore	Four different qualities of cottan; Low midg, good ordy, stained, and badly stained								
5	3/20/1872	Steamer Hackensack	46	19,340			$ 4,004.82	Baltimore	Five different qualities of cottan; low middling, stuck good ordinary, good ordinary, barely								
6	1/14/1873	Steamer Olive and Bay Line	36				$ 2,791.48	Baltimore	Sparse, doesn't indicate weight								
7	7/19/1873	Steamer Hackensack	10	3,692			$ 617.48	Baltimore	Different ut. unit for measurement?								
8	11/26/1873	Steamer Commerce	27	10,408	0.15		$ 1,561.20	Baltimore	Two entries same invoice								
9	12/4/1873	Steamer Hackensack	3	1,397	0.15		$ 209.55	Baltimore	Second of two entries on same invoice								
10	1/9/1874	Steamer Commerce	39	16,525			$ 2,540.72	Baltimore	15 (3/8) price per lb?								
11	1/9/1874	Steamer Commerce	1	401			$ 70.88	Baltimore	Appears to be attached to previous invoice but not recarded for same reason								
12	4/10/1874	Steamer Olive	17	7,256			$ 1,034.35	Baltimore	Two different qualities								
13	11/6/1874	Pamlico and Bay Line	30	12,663	0.14		$ 1,772.82	Baltimore	Ex dock?								
14	11/11/1874	Pamlico and Bay Line	5	2,106			$ 297.47	Baltimore	Delivered to? Appears to be related to previous invoice								
15	11/20/1874	Pamlico and Bay Line	5	2,124			$ 298.53	Baltimore	Less 3/8 on 1 bale 394 lbs. Previous total would have been 300.01								
16	1/22/1885	Old Dominion Steamship Co	22	9,060			$ 985.28	New York	New format, prices seem to have decreased (reflective of a different market in which they								
17	2/7/1885	Old Dominion Steamship Co	11	4,899			$ 514.40	New York									
18	11/10/1885	Old Dominion Line	12	5,409			$ 487.11	New York									
19	2/7/1887	Old Dominion Steamship Co	8	3,265			$ 302.01	New York									
20	12/16/1886	Old Dominion Steamship Co	20	8,462			$ 782.73	New York									
21	4/14/1887	Old Dominion Steamship Co	3	1,397			$ 127.48	New York	Prices have dropped to 9 (1/8)								
22	Totals		345	130522			$ 21,628.76										
23																	

FIGURE 14. Excel spreadsheet of W.B. Rodman shipping data. Note that the data is organized according to date. Price per pound was manually calculated in instances where it was not listed on the shipping receipts. (Data from Rodman 1870).

Problems Associated with Historical Data

There were many problems with collecting and collating historical data. Since these datasets were often not recorded on standardized forms, or had legible handwriting, many of the financial records were haphazardly recorded, making them illegible or difficult to decipher. Furthermore, oftentimes these same records did not have any numerical value attached to a good, whether that be quantity of goods shipped, units of weight, or monetary value of the shipment. As such, these entries and tallies were excluded from any graphing as part of the historical data analysis. Entries where the type of good, quantity, weight, and other descriptive values were not identifiable or had elements missing were still used to explain trends and relationships based on their qualitative value.

Archaeological Data

Archaeological data was obtained from several shoreline surveys conducted at three archaeological sites on the Tar/Pamlico River adjacent to Washington, NC (FIGURE 15). Each of these sites correspond with areas of historic industry and waterfront infrastructure. They are referred to as ‘Site A,’ an unidentified structure on the southern shoreline across from downtown Washington, ‘Site B,’ the site of the former S.R. Fowle & Son lumber mill adjacent to the NC HWY 17 Business Bridge, and the Eureka Lumber Company mill, approximately .5 miles upriver from downtown Washington.

These three sites had been identified by East Carolina University and noted of their potential from previous studies and field schools on the Tar/Pamlico River. In 2004, the

Maritime Studies Fall Field School documented both the South Shore Landing Site and the Eureka Lumber Company log boom. The S.R. Fowle & Son Sawmill had not been previously noted in academic or government studies. Each were selected for this study due to the lack of other available waterfront sites, as well as possessing links to Washington's historical industries.

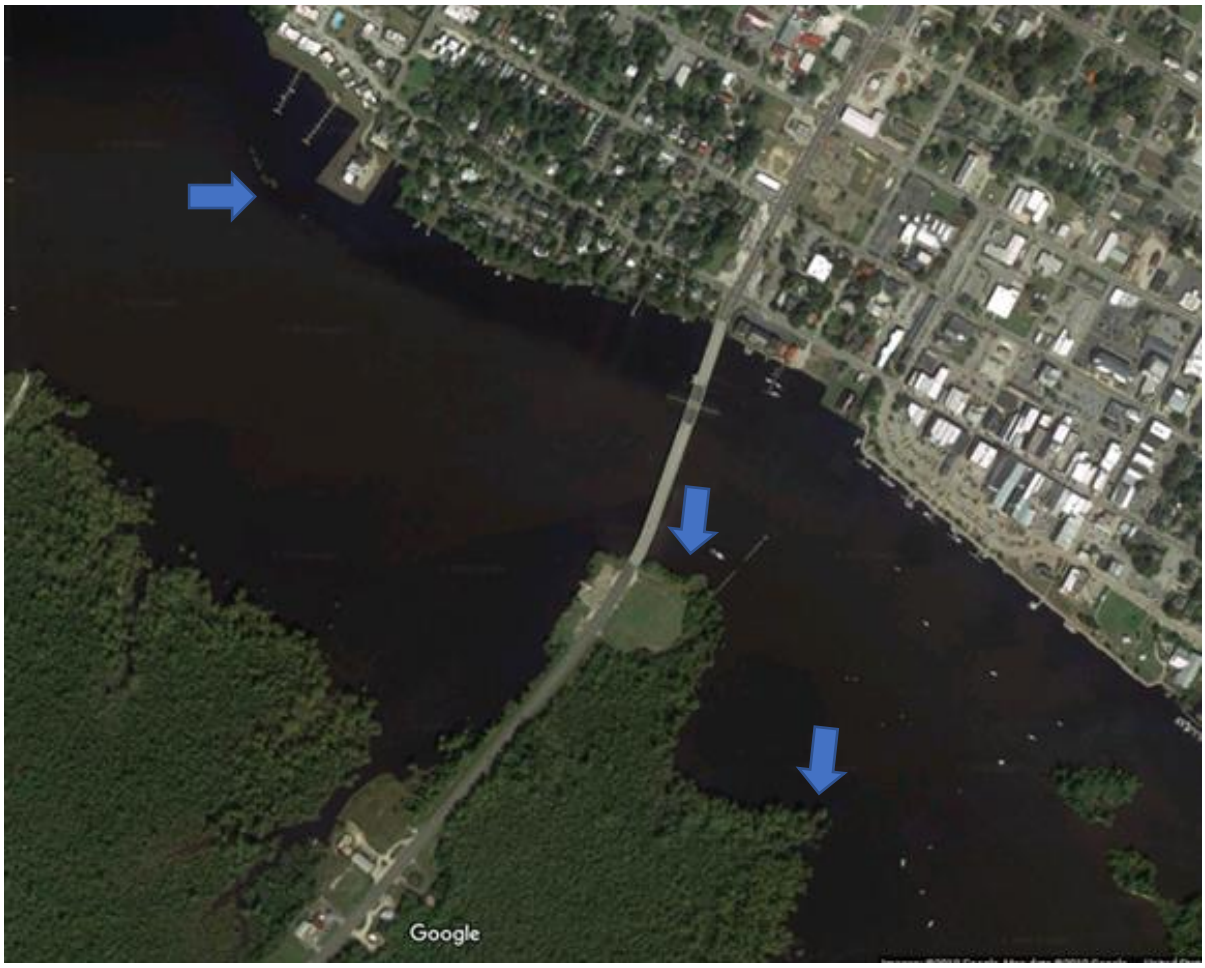


FIGURE 15. Image showing Washington waterfront and Pamlico River. Survey sites are indicated by arrows added by the author (Image courtesy of www.google.com/maps).

Shoreline Survey

The survey of the waterfront locations along Washington's Pamlico River shoreline necessitated employing both terrestrial and underwater survey techniques. Building upon an early survey by East Carolina University's Maritime Studies Program's 2004 Fall Field School, this phase was composed of non-disturbance techniques including a transect snorkel survey, Total Station recording of exposed features, diagnostic photography, RTK position fixing, and GPS waypoint collection. All data collection culminated in positions in a UTM coordinate system with the World Geodetic Survey 1984 datum (WGS 1984) utilized. Archaeological surveys were performed at the three sites indicated in Figure 5. This survey methodology, with slight variation, took place at each of the three sites being studied.

The shoreline snorkel survey consisted of establishing a baseline in the water a short distance from the shoreline from which survey transects could be created. Using a 100m tape measure, surveyors established an arbitrary zero point which became the origin point for each of the two baselines at Site A and another at Site B. The tape measure was secured to two fence posts and driven into the riverbed. From these baselines, surveyors attached the '0' end of a 30 m tape measure to the baseline to form the transect lanes. Since there were few distinguishable landmarks along the shoreline, transect lanes 2m wide were erected using fence posts and tape measures (Green 2004:31). These enabled surveyors to rapidly work within these physical constraints. In most instances, transect lanes ran 10m in length, while some were shortened due to depth or proximity to the shoreline. With a wrist compass, surveyors placed transect lanes at 90 degrees to the baseline measurement. Then, surveyors operated in teams of two, each working in the adjacent survey lane, monitoring one another's progress and safety (FIGURE 16).

FIGURE 16. Surveyors recording transects at Site A East, November 3, 2019 (Photograph by the author).

At Site A, two baselines were established. The first ran 31.6 m. in length and the second 16 m. These two baselines further delineated Site A into Site A North, South, and East. The first, Baseline 1, ran 31.6 m at a 90-degree magnetic bearing from 31.6 to 0 m (18S 313297.4mE, 3934665mN) (18S 313262.3mE, 3934662mN). To compensate for the fluctuating water level and the current maneuvering the baseline, another fence post was added to the baseline at 18.5 m to mitigate the effects of the river current on manipulating the baseline (18S 313276.8mE, 3934663mN). These created 21 and eight transect lanes in Site A North and Site A South, respectively.

The second Site A baseline, Site A East used the 0 point from the previous survey, Site A North and Site A South. The baseline ran on a 180-degree bearing from the 0 point (18S 313298.4mE, 3934665mN) 16 m to the end of the baseline (18S 313303.6mE, 3934648mN).

At Site B, a 16 m baseline, Baseline 1, was established along a 120-degree heading from point A (313062,3935038) to point B (313076,3935030). Site B was further demarcated into North and South corresponding to the transect survey taking place on both sides of the baseline. Surveyors established 10 m transect lanes for the river portion of the survey and 6 m at maximum on the shoreline portion. Transects were shortened here due to a significant rock wall directly in front of the bulkheaded shoreline which impeded accurate survey. As such, this survey analyzed and documented 256 m2 of riverbed.

This component of the survey utilized tailored forms to streamline the process and ensure accuracy. Similar forms were used by Dr. Nathan Richards during his survey of Sarah Island in 2003 (Richards 2003:50-71). The proforma contains a 2x10m grid, representative of each transect lane, where surveyors illustrated and recorded any cultural material discovered in their individual lane. The notes section permits the individual to elaborate on their drawings or simply to explain their findings. Additionally, the proforma contains space to record the site location, the unit number, underwater visibility, as well as GPS coordinates which was used to spatially format the illustrations during data analysis. Bathymetric data can be recorded at each meter along the transect lane. Using a Rhino Ruler, surveyors measured the distance from the waterline to the riverbed at meter intervals and recorded their findings in the appropriate box. Using proforma with scaled spatial constraints enables the recording process to be conducted much more rapidly without trilateration or baseline offset measurements (FIGURE 17). Completed and illustrated proforma are displayed in Appendix A- Illustrated Proformas.

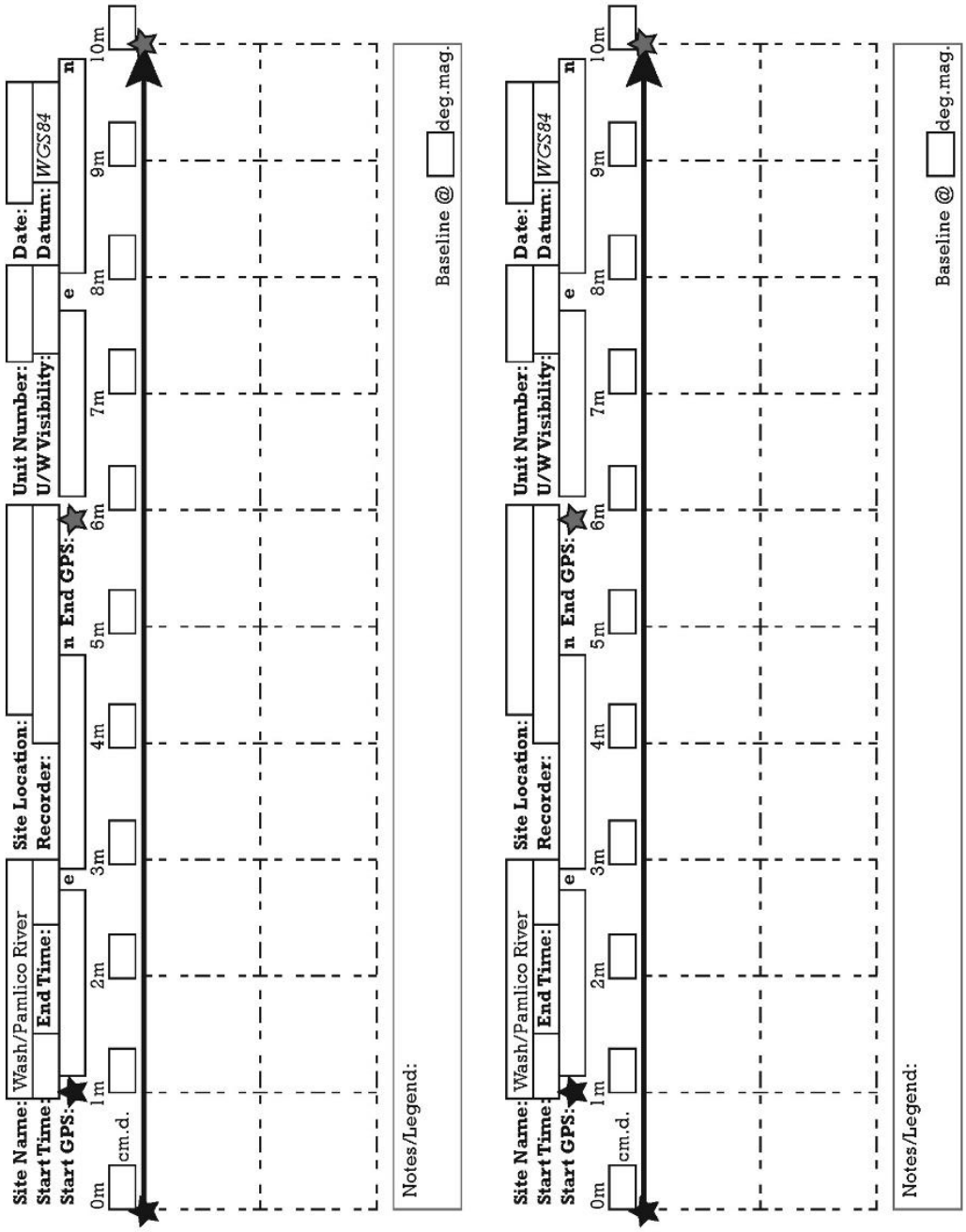


FIGURE 17. Survey proforma (by N. Richards and W. Nassif).

When necessary, measurements were taken from the baseline and survey transect lanes in order to ensure accuracy of recording features and cultural material. With tape measures and

seamstress tape, surveyors used baseline offset techniques to plot cultural material in transect lanes (Green 2004:95-96). Doing so enabled surveyors to record features and objects in their context with specific measurements and place them on the proforma correctly.

Transect lanes, baselines, various cultural materials, remnant waterfront structures and other items of importance were spatially recorded with GPS coordinates. Using a Garmin GPSMAP 64st handheld GPS, surveyors recorded UTM coordinates and saved them on the GPS unit. For terrestrial items, surveyors held the GPS directly over the point being recorded. When in the water, the GPS unit was placed inside of a waterproof bag. The surveyor held the receiver directly above the object with care not to submerge the unit. This information was later extracted and converted to a comma-delimited (.CSV) file. From there, that data could be uploaded onto Geographic Information Systems (GIS) for data analysis (FIGURE 18).

From the November 1-3 survey, 74 GPS waypoints were taken and uploaded into ArcGIS. These included the endpoints of the two baselines, as well as the start and end points of each survey.

From the March 11 survey, 46 GPS waypoints were taken and uploaded into ArcGIS. These included the endpoints of the baseline, as well as the start and end points of each survey. Beyond the survey area, the GPS recorded the location of 8 submerged pilings. The location of two decrepit pipes submerged near the Fowle site was also recorded by GPS.

Other GPS points collected include the location of several pilings of the eastern edge of the site. These points correspond to the pilings labelled B1-B6, mentioned in the later section. They were labelled A1-A6 when uploaded into the ArcGIS project. Four GPS waypoints were taken from the Eureka Lumber Mill Site, recording the location of the end of the sampled pilings, plank flooring, and a railroad tie.

FIGURE 18. Example of GPS waypoints from Site B.

In addition to spatial data from a GPS unit, a Total Station (Topcon ES-101 model with Topcon FC-5000 data collector) recorded distance, baseline and survey transect extent, as well as the locations of various cultural material. While the Total Station plotted the extent of the survey, it provided precise measurements for identified waterfront features. Compared to tape-based and estimated measurements from shoreline surveys, the Total Station delivers greater accuracy of distance measurements. Jeremy Green states that "the instrument can give relative positions of points to millimeters, provided surveying procedures are used" (Green 2004:42). With enhanced accuracy, the Total Station aided in accurately recording waterfront structures at Site A and at other sites (FIGURE 19).

The total station collected 77 points through the Topcon FC-5000 data collector. These ranged from the two control points, baseline extent, beginning and ends of transect lanes, structure, waterline, two posts, and two barrels.

Along with the Total Station, surveyors utilized another distance-measuring instrument to accurately plot and record survey data, as well as waterfront structures. A Real Time Kinematic System (RTK) relies upon multiple satellite fixes to determine spatial location through a base station and a rover communicating through a Bluetooth connection (Topcon Positioning Systems, Inc. 2012; Topcon, Inc 2016). With the base station established in an open field along the shoreline, surveyors brought the rover station into the river to record the locations of the baseline, transect lanes, and relevant cultural material. In contrast with the Total Station, the RTK allowed for a more efficient and quicker method of collecting spatial data. However, any satellite obstruction, whether due to trees or lack of satellite fixes, hindered the RTK and led to several delays during data collection.

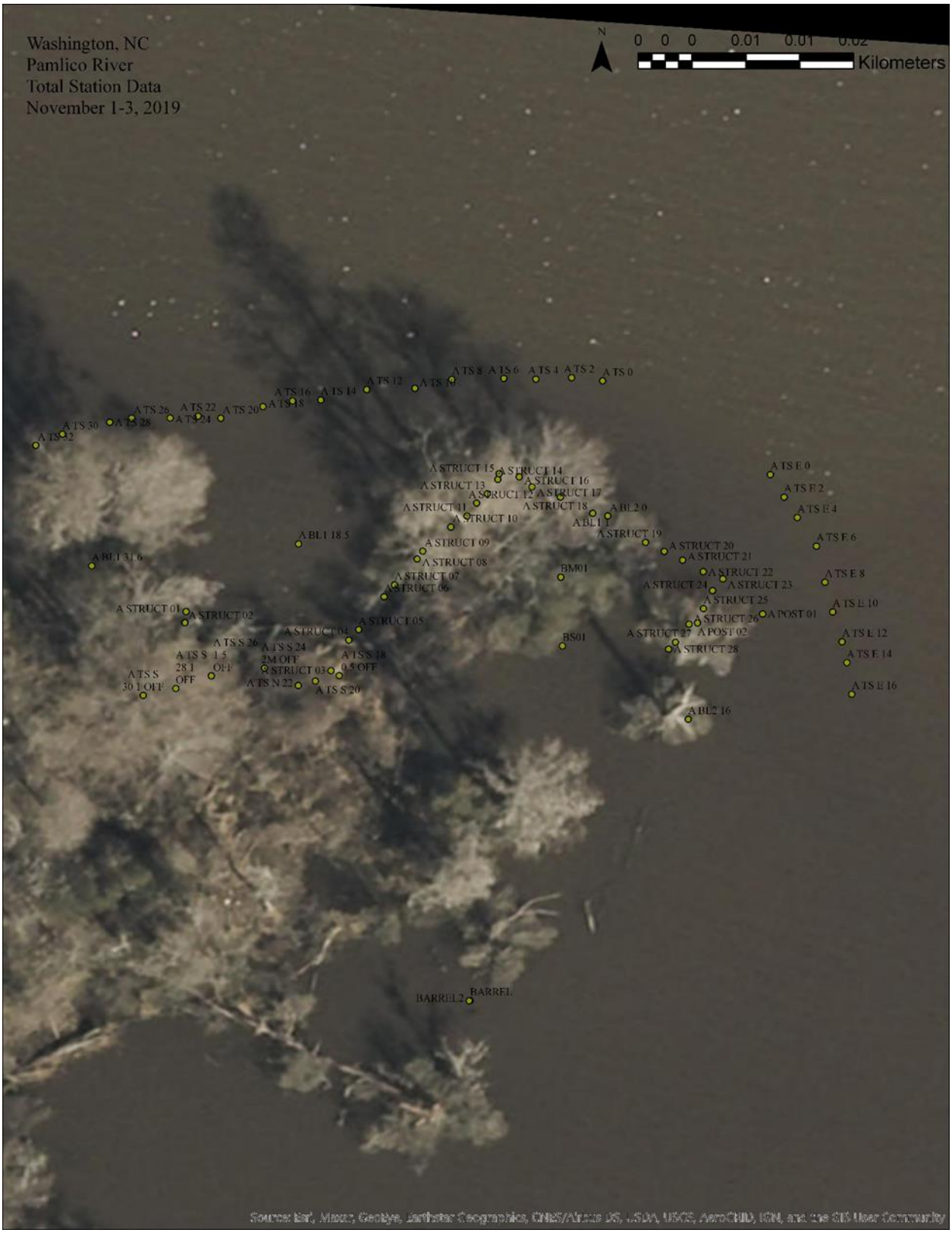


FIGURE 19. Example of Total Station data collected from Site A.

The Topcon HiPer V GNSS receiver collected the location of seven pilings at the Fowle Mill site. It also captured the end of the baseline and each two-meter interval, signifying the start of each transect lane. Each position fix was uploaded into ArcGIS to analyze the spatial relationship between the modern shoreline and the waterfront structure (FIGURE 20).

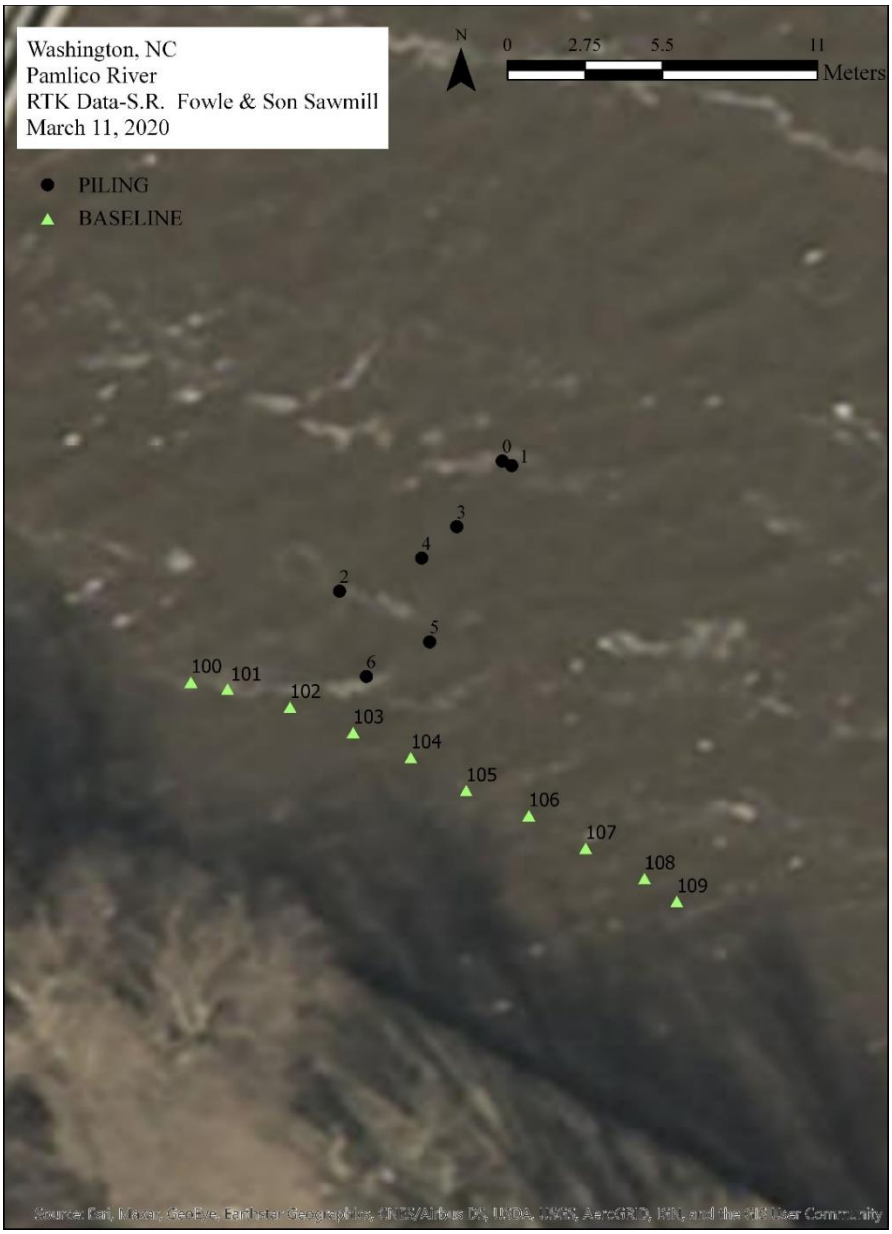


FIGURE 20. RTK data collected from Site B, the S.R. Fowle & Son Sawmill.

At the Fowle Mill site, the plotting of pilings through positioning systems or through the shoreline methodology would have been problematic and redundant. Most of the pilings are not visible during normal water levels and, combined with the low visibility in the Tar/Pamlico River, posed a hazard for surveyors in the water. Therefore, over several days, basic measurements were taken using a Rhino folding ruler. For the piling, diameter measurements were taken at the top of the piling and where the piling met the riverbed. If fasteners were present, diameter measurements of the head and overall length were recorded.

On July 6, 2020, several pilings related to the eastern pier of the S.R. Fowle & Son Lumber Mill were analyzed. Water levels had decreased significantly, with the lowest recorded stage that day being 2.11 ft. at 11:00 am. GPS fixes of each piling were obtained as well as several photographs of the deteriorating pilings and the attached fasteners.

On July 14, 2020, the same pilings were revisited to obtain measurements of the pilings and fasteners. Water levels were similar to those a week prior, with a stage of 2.52 ft. being recorded at 11:00 am. Specific measurements recorded were the diameter of the head of the fastener, the distance from the head to where it met the pile, the diameter of the pilings, and the distance between pilings. The latter measurements were relatively inaccurate due to only having one available surveyor that day.

On July 20, 2020, a team of surveyors returned to the Fowle Mill site. The initial focus was to return to the eastern pilings to better record the vertical and horizontal distance between pilings. The team accomplished this for the first thirteen pilings, naming them B1-B13. Measurements were taken from fastener to fastener. Afterwards, the team repeated the earlier procedures with the western pilings. Diameter measurements were taken with the Rhino folding

ruler at the exposed top of the piling and at the base of the piling. The team did so at nine pilings, labelled P1-P9.

On August 6, 2020, a team of surveyors measured pilings at the Eureka Lumber Company island structure. The team sampled 20 pilings along the northern wall of the structure and five on the southern, river side.

Photography

Over several field excursions, photography aided in diagnostic recording of cultural material and potential waterfront structures. These photographs supplement the archaeological survey and provide greater context to the thesis narrative. Pilings, large spills of historic brick and ballast stones, and various other cultural material were photographed from multiple angles and perspectives. Additionally, photographs taken during river blowouts, when a significant northwesterly wind blows the water out of the Pamlico River, aided in comprehending the construction techniques of both the Eureka and Fowle sites. Both the author and members of the community provided photographs from these rare instances from a variety of dates, locations, and perspectives.

The surveyors used cameras borrowed from East Carolina's Program in Maritime Studies, specifically an Olympus Tough TG. This model permits underwater photography, due to its waterproof casing, which was difficult to utilize in the murky conditions of the Pamlico River (Olympus 2019). Regardless, photographs of the bricks, pilings, and fasteners permitted comparisons to be made between construction techniques and methodologies at each site.

Photographs taken for this study served a variety of purposes. Many of them were, ultimately, not included in this study's narrative. A table of total photographs taken for this study is included below (TABLE 1).

TABLE 1.
DIAGNOSTIC PHOTOGRAPHS

Date	**Site**	**# of Photographs**	**Model**	**Description**
11/1-2019-11/3/2019	South Shore Landing	66	Olympus Tough	Diagnostic and documentary imagery of shoreline survey
11/1/2019-11/3/2019	South Shore Landing	79	GoPro HERO7 Silver	Diagnostic and documentary imagery of shoreline survey
2/27/2020	Eureka Lumber Company, S.R. Fowle & Son Sawmill	42	Olympus Tough	River 'blowout' photos of waterfront infrastructure
3/11/2020	S.R. Fowle & Son Sawmill	9	Olympus Tough	Diagnostic and documentary imagery of shoreline survey
07/06/2020	S.R. Fowle & Son Sawmill	15	Olympus Tough	Pilings and fasteners from eastern infrastructure
07/14/2020	S.R. Fowle & Son Sawmill	9	Olympus Tough	Fastener heads from eastern infrastructure
07/20/2020	S.R. Fowle & Son Sawmill	24	Olympus Tough	Bricks recovered from Fowle site near western infrastructure
08/17/2020	South Shore Landing	75	GoPro HERO8 Black	Bricks, barrel staves, barrel heads, glass fragments, and other diagnostic features from the

				eastern shoreline of the site.
08/17/2020	South Shore Landing	65	Olympus Tough	Bricks, glass fragments, and other diagnostic features from the eastern shoreline of the site.
08/17/2020	South Shore Landing	118	Fujifilm FinePix XP130	Bricks, cobble and ballast stones, glass fragments, ferrous material, and other diagnostic features from Site A South.
08/17/2020	S.R. Fowle & Son Sawmill	93	Olympus Tough	Bricks and other cultural material from the western sector of the site.

Other photographs used in this study were obtained from prior field schools, reports, and community members which willingly supplied them to the author.

To better portray field photographs, many were brought into Adobe *Photoshop* for editing. This enabled backgrounds to be cropped and lighting to be adjusted so that each photograph best resembled the artifact in the field. Doing so made images obtained from surveys were photography was not a priority or without assistance more appealing for this thesis.

Aerial Imagery

Due to the difficulty of surveying the Eureka Lumber Company site with the shoreline survey methodology, aerial photographs from the North Carolina Department of Transportation (NCDOT) Historical Imagery Aerial Imagery Index aided in understanding the scope and

deterioration of the site (NCDOT Historical Aerial Imagery Index 1959; NCDOT Historical Aerial Imagery Index 1961). From the 1950s to the 1990s, NCDOT photographed many locations throughout the state to document the rapidly developing infrastructure system. These images were obtained from their ArcGIS map viewer, downloaded, and Georeferenced in ArcGIS Pro.

Side-scan Sonar

In 2004, a team of ECU students and faculty surveyed the Pamlico River adjacent to Washington, portions of the Tar River, and many of the numerous creeks which feed into the Pamlico through side-scan sonar. The team surveyed the waterways to identify a multitude of shipwrecks and abandoned vessels present there. While most of the legacy data does not cover the Washington waterfront area, several images provide significant detail of the remnant historical structures.

Over the course of 11 days in the spring and fall of 2004, the team collected 2,197 .MST sonar files. Each file represents one minute of recorded time. Sifting through the 2,000 files from March, April, and September of 2004, only 173 files were retained and merged to form sonar mosaics with relevant imagery. These included images contained soundings from each site, most from the Eureka site, showing evidence of submerged waterfront structures (FIGURE 21). Additionally, these sonar images indicate the depth of the Pamlico River and the channels which led to each site. After blending these files together in SonarWiz 7.1, the mosaics were exported as .TIFF files and uploaded into ArcGIS Pro for further analysis (FIGURE 22).

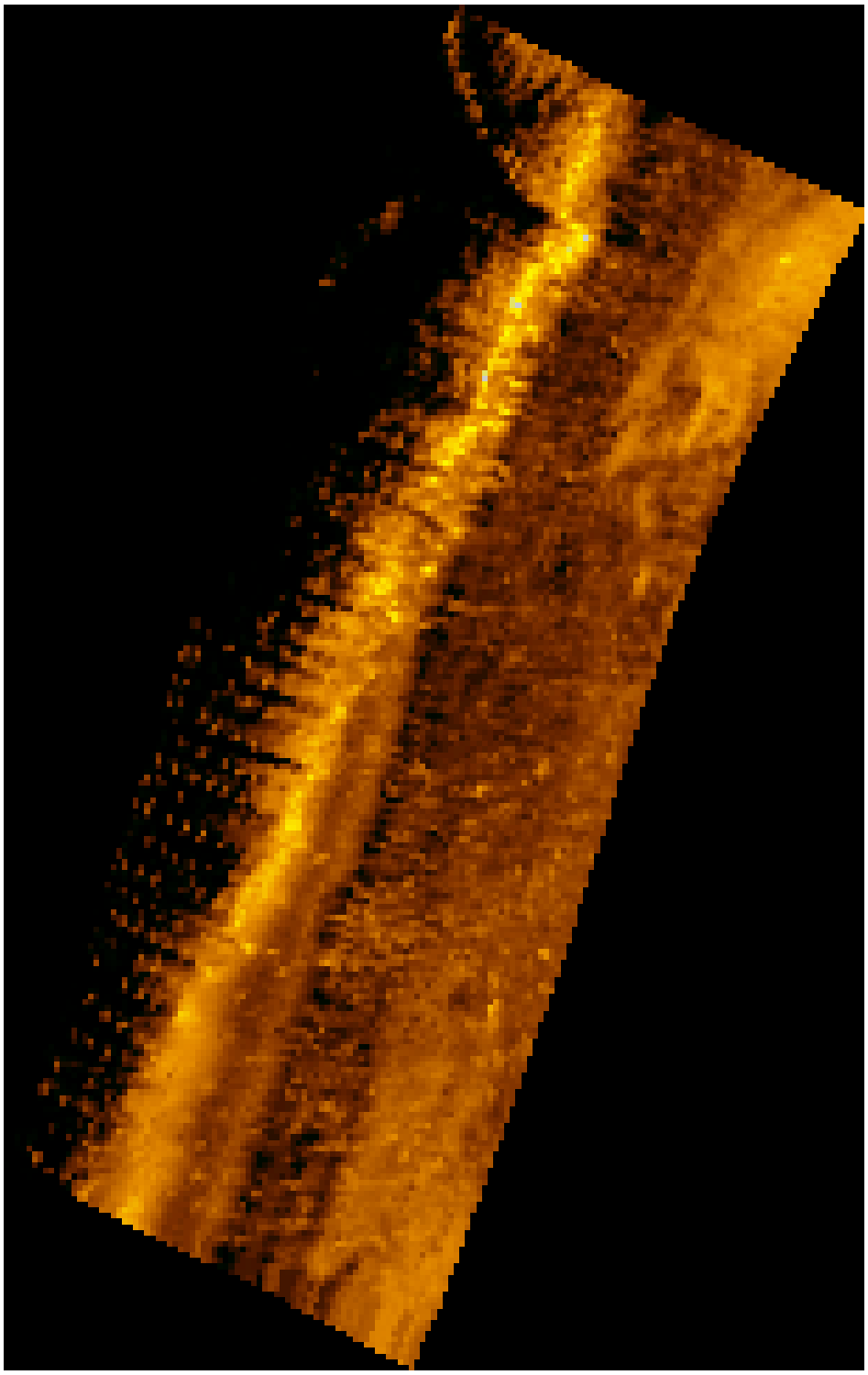


FIGURE 21. GeoTIFF file from Sidescan Sonar survey from East Carolina University's Maritime Studies Program Field Survey of the Tar-Pamlico River in 2004.

FIGURE 22. Coverage Map of retained sonar files from 2004 sonar survey.

Archaeological Illustration

After collecting field and legacy data, the proformas and sonar files needed to be illustrated to coherently explain the findings of the surveys. Using two programs, Adobe Illustrator and ArcGIS Pro, proformas and sonar mosaics became simple, cohesive site maps detailing the waterfront remains and the surrounding cultural material.

For Site A and Site B, the S.R. Fowle Lumber Mill, proformas were uploaded to Adobe *Illustrator* for digitization. At first, each scanned proforma was uploaded and illustrated individually. The scanned images were placed on top of a blank, base proforma from which digitization would be applied and their transparency was reduced to 50% so that the initial digitization process resembled tracing the field observations. Detailed consideration was given to the large quantities of brick, cobble stone, debris, and sediment type during this stage of illustration (FIGURE 23). This process was repeated for each 2m transect lane, a total of 46 individual proformas, so that they could be compared and further adjusted as needed.

After individual digitization, the proformas were collated into a comprehensive illustration capturing the various cultural elements of Site A and Site B. First, a baseline representation was drawn to characterize the baseline established in the field. The length of that baseline, measured in pixels, was divided by the number of corresponding meters, baseline 1 at Site A equaled 31.6m and baseline 2 equaled 16m, so that 1m equaled a set number of pixels. Then, that ratio of meters to pixels permitted the creation of each 2x10m transect lane stemming from the baseline. Individual illustrations could then be added to the comprehensive illustration and formed a rough site map (FIGURE 24).

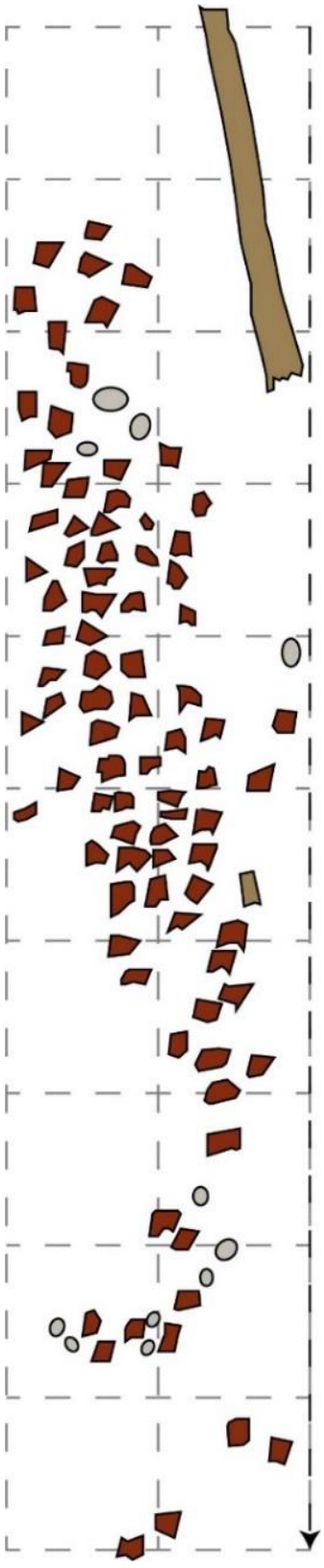


FIGURE 23. Individual illustration of transect lane 28-30m, Site A South.

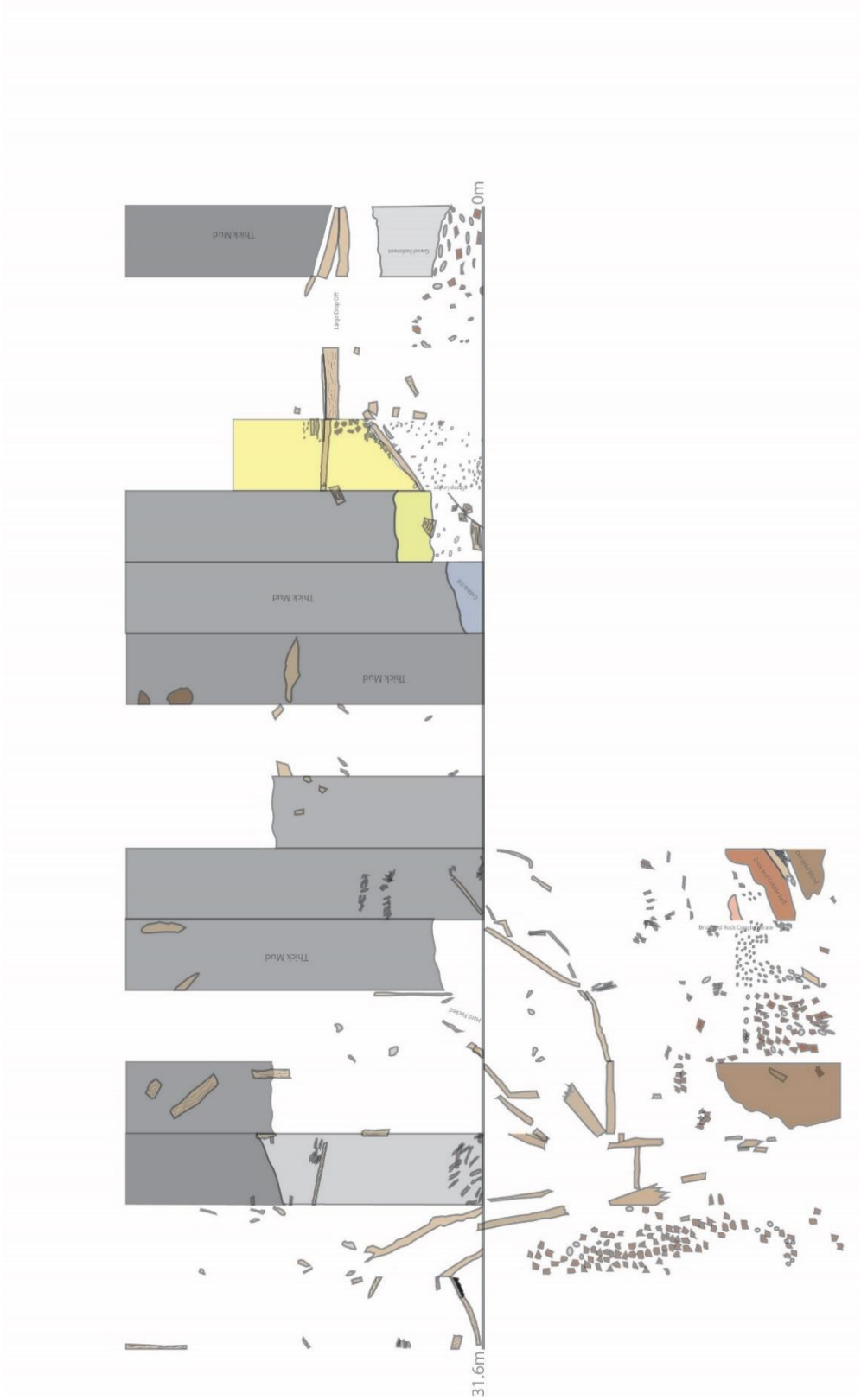


FIGURE 24. Rough comprehensive illustration of Site A North and South.

The final step in the process involved blending these individualized images to form a clear and cohesive site map. In *Illustrator*, the rough drawings were combined into a single layer and a new, final layer was created. Like the initial illustration phase, the final site map became an exercise in tracing and redrawing the concrete, established features and cultural material. In certain instances, many of the images needed to be reviewed and adjusted to make sense of the field recordings. Surveyors collaborated to reach a consensus on their field illustrations so that greater continuity could be made across transect lanes and the baseline. While this represented a slight problem during this phase, it encouraged an enhanced attention to detail which ultimately made the site illustrations clearer and more representative of each site.

Bathymetric data was added to site maps last. Collected on proformas during surveys, this data revealed the slope of the riverbed approaching the shoreline, accentuating the remnant structures. First, the illustrated site maps were uploaded into ArcGIS and georeferenced by correlating the illustrated baseline and transects with the spatial data obtained from the Total Station, RTK, and GPS.

Once appropriately placed in the mapping software, GPS coordinates were obtained for each meter along a transect lane. These coordinates could then be paired with bathymetric data obtained during the surveys. Both the coordinate pair and the corresponding depth were entered into an Excel spreadsheet and converted into a .CSV file.

The bathymetric spreadsheet was added to the ArcGIS Pro project database and made into an X,Y layer (.LYR) file. This displayed data as points on the basemap corresponding to their coordinates. To illustrate the depth measurements in simple, two-dimensional format, the symbology was altered to a graduated color scheme, continuous blue, and breaking contours into five groupings (FIGURE 25).

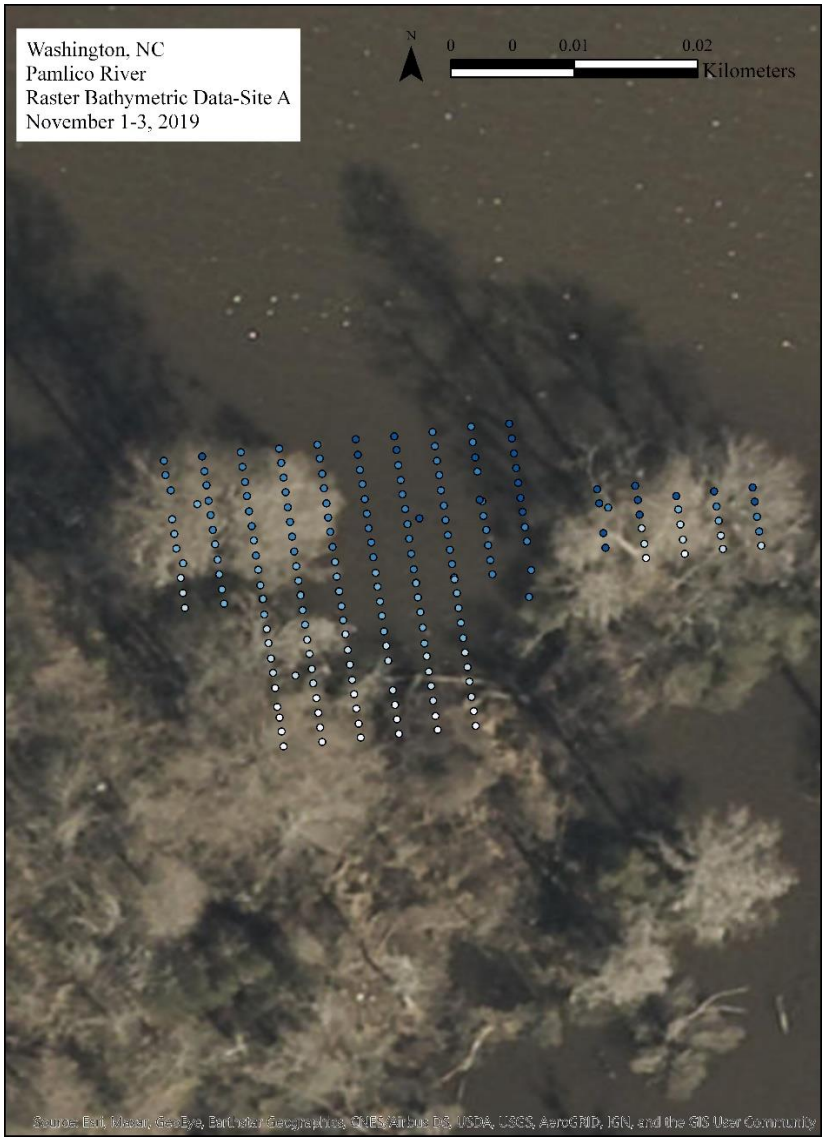


FIGURE 25. Bathymetric data from Site A displayed in a graduated color scheme according to their coordinate pair.

Once the bathymetric data had been illustrated in coordinate system format, symbology in the form of contour lines was added to further illustrate the sloping riverbed. First, two spatial analyst functions, IDW and Tin, mathematically applied the depths based on their coordinates

throughout the entirety of the site. Both formulas generated images with depth portrayed through a color ramp (FIGURE 26).

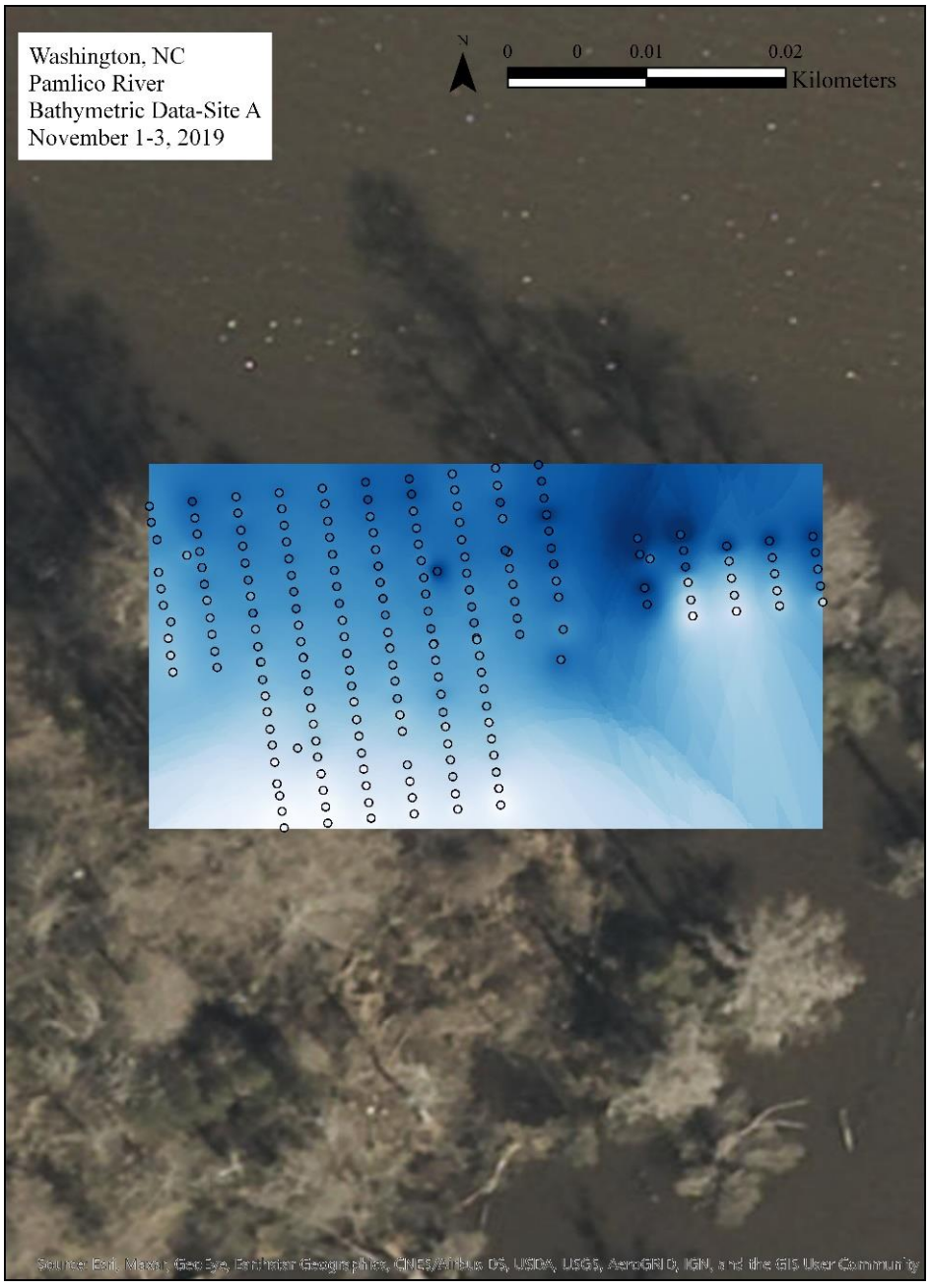


FIGURE 26. Bathymetric data from Site A displayed as a rasterized image with coordinate pair overlayed on top.

Next, contour lines were added to better demonstrate the relationship between the depth and the archaeological site. Contour lines were added and formatted through another GIS function, Contour, which displayed the raster data in a simplistic, linear format. Classification of the contour lines was based on intervals of ten centimeters of depth (FIGURE 27). Once this shape file had been created, the contour lines and the illustrated site maps could be exported as .jpeg files together.

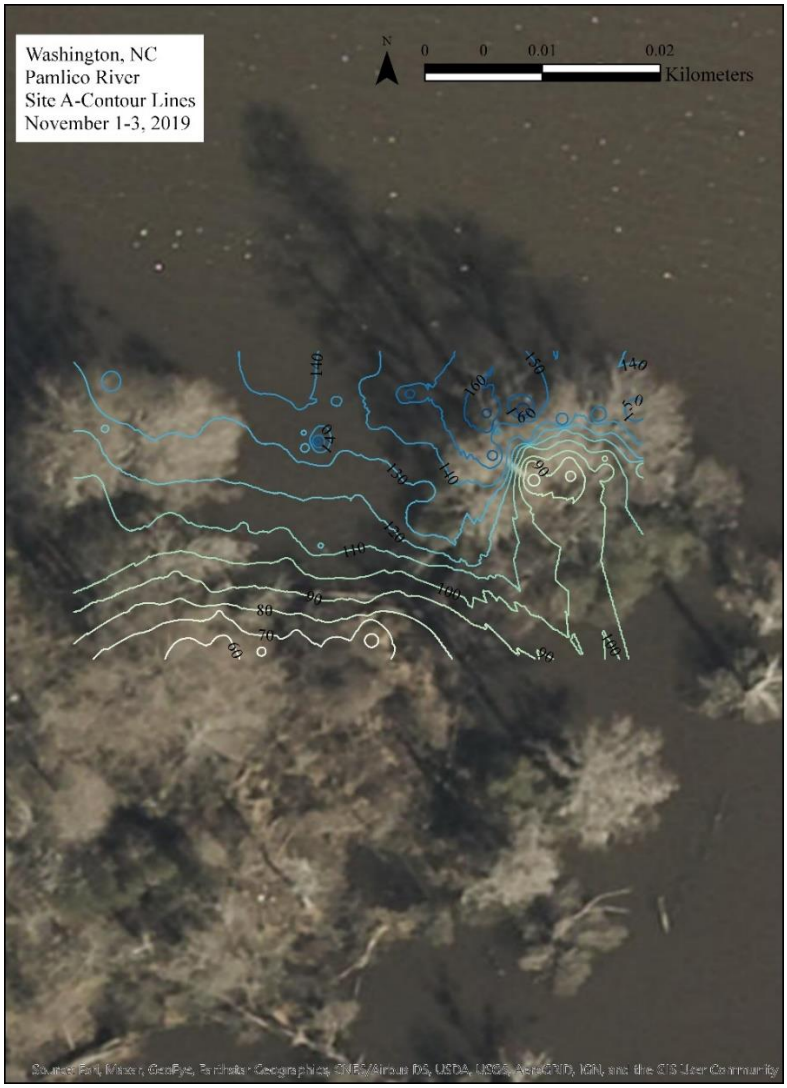


FIGURE 27. Site A bathymetric data displayed as contour lines; depth measured in cm.

Implementation

This study aimed to unify historical and archaeological data pertaining to the port of Washington. In some instances, this process was relatively straightforward. The two data sources aligned perfectly and charted the economic development of the port through their records. In the case of Site A, this methodology allowed for inferences and generalizations which placed the landing in a variety of historical contexts according to the archaeological record there. Each site potentially corresponds with a specific period of development in Washington's past, and historical records from those respective periods will be linked to each site. These various datasets will be explained and described in the following chapters, *Chapter 5: Historical Data from Several Prominent Businesses and Industries which Utilized the Port of Washington*, *Chapter 6: Wharf, Bricks, and Piles, Archaeological Results,* and will be linked together in Chapter 7: *Analysis of Washington's Nineteenth and Early Twentieth Century Port Economy*.

CHAPTER FIVE: HISTORICAL DATA FROM SEVERAL PROMINENT BUSINESSES AND INDUSTRIES WHICH UTILIZED THE PORT OF WASHINGTON

Introduction

Given the relative scarcity of historical records, sampling a variety of sources, from prominent individuals which utilized the port, will best demonstrate the economic trends within it. Additionally, these consulted records will provide generalizations which can explain the importance of archaeological sites with no correlation amongst the historical record. The Fowle's exported large quantities of naval stores, shingles, staves, and lumber, most of North Carolina's top exports during the early nineteenth century (S.R. Fowle 2016). Later, innovation in waterborne commerce encouraged many to utilize steam-powered vessels to ship their products beyond the Pamlico River port (Burgess 1967; Rodman 1977). Finally, by the end of the nineteenth century, lumber production in the form of sawmills and planing mills dominated the port landscape (Department of Labor and Printing 1911, 1912, 1913, 1914, 1915, 1916; S.R. Fowle & Son Company1987).

This chapter will be organized chronologically according to when a business or industry operated. Due to the majority of historical data collected from the S.R. Fowle business enterprise, those records will be presented chronologically in sequence, before addressing the other datasets (FIGURE 28). First, the S.R. Fowle shipping records from the 1810s to the 1850s will chart the early economy of Washington (S.R. Fowle 2016). Second, S.R. Fowle & Son shipments from 1877-1886 will depict the gradual decrease of naval stores exports (S.R. Fowle & Son Company 1877). Finally, the expansion and dominance of the lumber industry will be

presented through the S.R. Fowle & Son Company Sawmill production figures and invoices (S.R. Fowle & Son Company 1987). The chapter will then address the other historical datasets, beginning with William Blount Rodman's cotton shipments will demonstrate the crossroads which waterborne commerce found itself at (Rodman 1977). Then, Styron Transportation Company manifests reveal the expansion of Washington's harbor network (Burgess 1967). Lastly, the dominance of the Eureka Lumber Company will be displayed alongside Washington's other prominent lumber industries in the beginning of the twentieth century (Department of Labor and Printing 1911, 1912, 1913, 1914, 1915, 1916).

FIGURE 28. Timeframe for historical data consulted for this study, categorized by business/industry.

S.R. Fowle (1817-1897)

Beside the Blounts and Bonners, perhaps no single family had more impact on the economic development of Washington than the Fowles. Brothers Josiah and Luke moved to the Pamlico River community from New England in the beginning of the nineteenth century. Shortly thereafter, younger brother Sam joined them, and the trio established a shipbuilding business on Castle Island (Worthy 1976:10-11) (FIGURE 29). They then expanded their operations, using their own vessels, into shipping the region's many farming and natural resources across the Atlantic trade network.

Washington's Early Trade

The Fowle enterprise exported a variety of agricultural products to large urban centers like Boston, New York, and Philadelphia, in addition to islands in the West Indies. Tangentially, their vessels returned laden with molasses and rum from the West Indies, as well as finished products from the northern cities. In one entry in a Fowle company daybook, the Fowle's sold 4 barrels of rum to W. Belfour for a total of $93.75. (S.R. Fowle 1817). Half a month later, another journal entry records that Thomas Latham purchased one barrel of New England rum worth $27.60 (S.R. Fowle 1817). Journal entries even reveal the intricacies of the early shipping industry, one mentioning that "Henry Austin paid freight of goods from Baltimore per Sch. *Joseph Watson*", a total of $50 (S.R. Fowle 1817). Fowle vessels brought a wide variety of goods to market in Washington, many of which could not be produced locally. The Fowle's trade network, nurtured in the early nineteenth century, was continued, and replicated by others, well into the twentieth century.

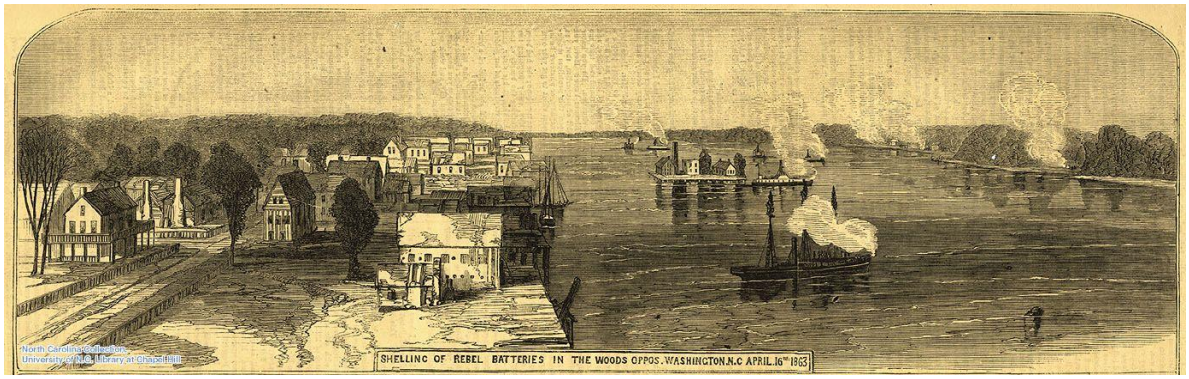


FIGURE 29. Image depicting the Battle of Washington during the Civil War. Castle Island is depicted in the middle of the river with its industrial foundation still standing. (Image courtesy of the University of North Carolina, Wilson Library, Photographic Archives, 1863)

In terms of expansion and prosperity, a port's primary exports deserve significantly more attention. Imports and exports contributed to historic economic development, but the latter was a true reflection of the commodities which encouraged the enlargement of a port, and its continued relevance. Specifically, from the town's foundation up to the first half of the nineteenth century, the exportation of naval stores. In *Tapping the Pines: The Naval Stores Industry in the American South* (2004), Robert B. Outland states that "in 1842, three distilleries that together consumed up to two hundred barrels a day were operating in that town. Within four years, Washington, where naval stores represented nearly 75 percent of the value of all products leaving port, had seven turpentine distilleries in operation, and another under construction" (Outland 2004:44-45). Being one of the premier shipping merchants in town, the Fowle's capitalized on the plentiful naval stores produced through the region.

Inside the Fowle daybooks are several entries which record shipments of naval stores. While by no means a comprehensive, exhaustive account of their shipments, these entries highlight their role in propagating the profitable naval stores industry through their own business. Within Washington, the Fowle business supplied tar, pitch, rosin, and turpentine to individuals for many purposes. A Mr. Joseph purchased $2 worth of rosin for his sloop *Polly* (S.R. Fowle

1817). D.H. Havens, of the prominent Havens family, purchased 15 barrels of turpentine worth $33 in late November 1837 (S.R. Fowle 1838b). Two weeks later, they recorded three sales of 12, 88, and 108 barrels of scrape turpentine to Mary and Loduwick Ridditt, as well as Peter Yeates, worth a grand total of $139.60 (S.R. Fowle 1838b).

Yet, the more profitable option remained to export naval store products larger markets outside of North Carolina. Fowle vessels sailed as far north as New York and Boston, as well as to the Caribbean. Two journals from the newest Fowle Papers collection at the Brown Family Library record several Fowle shipments of tar, rosin, and turpentine aboard company vessels. The schooners *James G. Stacey, Melville, Marion, Pamplico,* and the brig *Edmund Tillett* carried 1,796 barrels of turpentine, 1,021 barrels of tar, and 279 barrels of rosin in total over the span of sixteen years. *James G. Stacey*, in 1836 and 1837, brought its wares to the West Indies, the former being its first voyage to the Caribbean (S.R. Fowle 1838a) (FIGURE 30). The other entries did not list a destination, or a monetary value to most entries, but one can reasonably assume their destinations from other, separate entries. In another journal entry dated March 21, 1849, *Pamlico*, interchangeable with *Pamplico*, was recorded as having sailed $773 worth of rosin and turpentine to New York City (S.R. Fowle 1849).

In addition to naval stores, Fowle vessels also carried large quantities of shingles, staves, and, sometimes, cut lumber. Staves and shingles became one of the town's primary early exports since the land surrounding Washington was rich in woodland resources, namely pine and cypress trees (Paschal 4:1976). Both were vital products in the eighteenth century; staves were used for making barrels and wooden shingles in the construction of roofs and walls. On *James G. Stacy*, the Fowle's exported 99,000 staves and 40,000 shingles, with 71,000 of those going to the West Indies in 1834, 1836, and 1837. Later, *Melville* made two voyages, on November 9, 1849 and

January 24, 1850, laden with a combined cargo of 94,000 staves and 14,000 shingles (FIGURE 31).

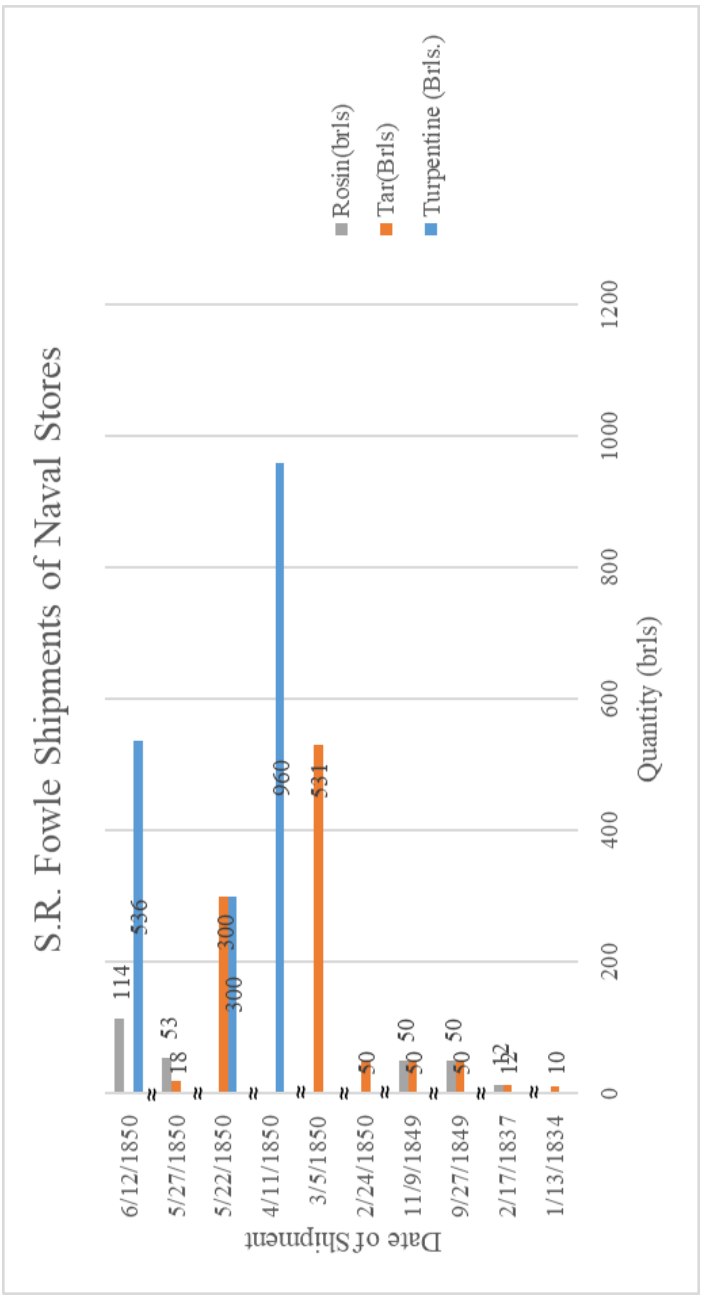


FIGURE 30. S.R. Fowle Shipments of Naval Stores, 1834-1850. Data is not temporally contiguous. (data from S.R. Fowle 1838b, 1849).

FIGURE 31. S.R. Fowle Shipments of Staves and Shingles, 1834-1850. Data is not temporally contiguous. (data from S.R. Fowle 1838b, 1849).

The inclusion of lumber amongst these entries is reflective of the emerging industries in Washington and North Carolina. With such an abundant resource surrounding Washington, it is odd that there were not more transactions including lumber within the Fowle papers. Outland hypothesizes that limited access to sawmills, especially prior to the steam engine, and difficulty in transporting lumber contributed to the state's malaise in capitalizing on their pine forests (Outland 2004:36). Two early Fowle journal entries on August 17 and 30 record sales of 2,241 and 2,114 ft. of plank to Rothy Latham and exported aboard *Happy Return*, respectively (S.R. Fowle 1817). In the later shipping records, *Edmund Tillett* made two trips laden with lumber, one on September 27, 1849 and the other February 24, 1850. In total, the vessel carried 97,179 ft of lumber to unknown destinations (S.R. Fowle 1849).

S.R. Fowle & Son Shipments (1877-1887)

The Fowle conglomerate continued their shipping operations after the Civil War. The family business purchased waterfront property and constructed a warehouse during the mid-nineteenth century (FIGURE 32). This warehouse and related facilities became the nexus of the Fowle business interests and continues to be a prominent feature of the Washington waterfront today (National Park Service 1978:50).

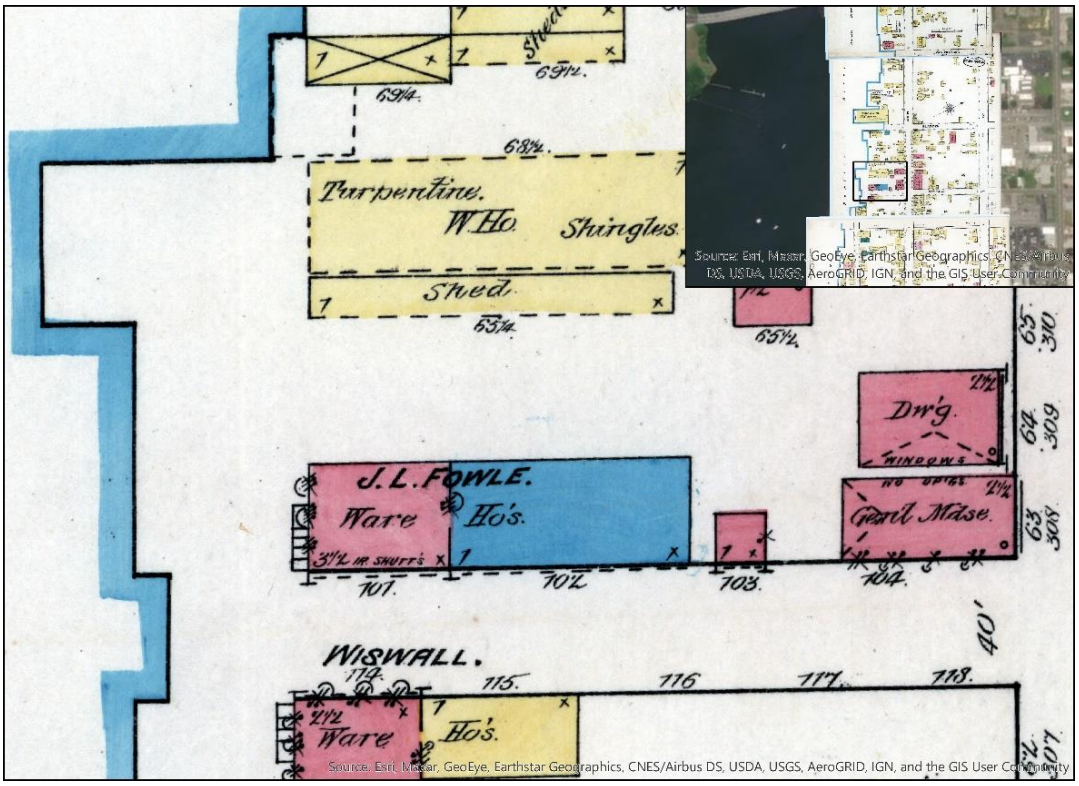


FIGURE 32. Fowle Warehouse within Washington Harbor. (Sanborn-Perris Map Co., Limited 1885)

In one shipping ledger, the S.R. Fowle & Son Company made 110 shipments using a combination of their own vessels and contracted shipping firms within Washington (S.R. Fowle

& Son Company 1877). Vessels owned by the Fowles include *Nelly Potter*, *Caroline*, and *Cora* while they contracted shipping through the Clyde Steamship Company and the Old Dominion Steamship Company. Predominately, these records include large shipments of tar, rosin, and turpentine, in addition to lumber, shingles, and staves. Importantly, these records indicate the expansive trade network revolving around Washington, with destinations including New York, Philadelphia, and many Caribbean islands (FIGURE 6).

Of the fifteen shipping records from 1877, eleven went to New York and the W.K. Hinman & Co sailmakers (Board of Managers of the New York Produce Exchange 1875:207; Board of Alderman of the City of New York 1877:503). *Nelly Potter* sailed monthly to New York, laden with large quantities of tar, rosin, and turpentine. One such shipment, on August 31, 1877, *Nelly Potter* carried 620 barrels of tar, 329 barrels of rosin, and 50 barrels of turpentine which netted a revenue of $2,278.73. Later that year, *Nelly Potter* again sailed to New York with 300 barrels of tar, 400 barrels of rosin, and 100 barrels of turpentine, in addition to 71 bales of cotton, netting a revenue of $5,364.37. Within this year, however, S.R. Fowle & Son made a solitary shipment to the Caribbean island of St. Vincent. On board *Caroline*, the Fowle's sent relatively smaller amounts of naval stores compared to their cargos bound for New York, only 13 barrels of tar, 10 of rosin, and 6 of turpentine, but delivered significant quantities of lumber products, including 32,000 ft. of planks, 313,000 shingles, and 7,000 staves. While only a solitary shipment to the West Indies was recorded, the cargo composition on board became representative of the trade patterns established through these records. This would continue throughout the sampled records (S.R. Fowle & Son Company 1877).

By 1880, trade to the West Indies had increased significantly. Fowle vessels made four trips to the Caribbean, three to St. Vincent and one to Barbados. Their cargo compositions

continued the trends before, greater amounts of lumber products and less naval stores, compared to their New York shipments. In one such shipment, on October 2, 1880, to St. Vincent, *Caroline* bore 300,000 shingles and 10,000 staves compared to 4 barrels of tar, 5 of rosin, and 2 of turpentine. In comparison, *Nelly Potter* bore 37 barrels of tar, 714 of rosin, and 28 of turpentine with no lumber products. Interestingly, the two shipments netted similar revenue totals, the Fowles earned $1,165.39 from their St. Vincent shipment compared to $1,292.60 from W.K. Hinman & Co. in New York (S.R. Fowle & Son Company 1877).

By 1886's conclusion, additional Caribbean islands had appeared amongst the S.R. Fowle & Son Company shipping records. Fowle vessels hailed at ports in St. Kitts and St. Martins, in addition to many records denoted "West Indies" (S.R. Fowle & Son 1877). W.K. Hinman remained the predominant recipient of the northern shipments, but cities like Philadelphia, Baltimore, and Norfolk became ports of call for Fowle vessels (FIGURE 33).

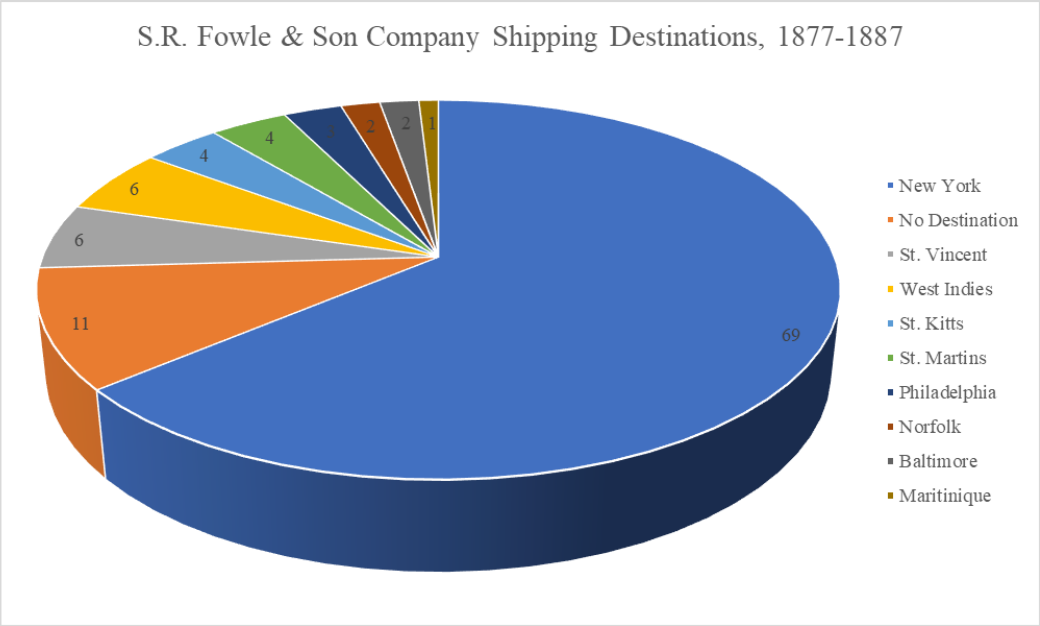


FIGURE 33. Shipping Destinations from S.R. Fowle Shipments, 1877-1887. (data from S.R. Fowle & Son Company 1877)

Yet, the most revealing observation from these records remains the dramatic decrease of exported naval stores during this ten-year period. By compiling the total barrels shipped during each year, the data highlights naval stores diminishing importance amongst Washington's exports. In 1877, S.R. Fowle & Son Company shipped a total of 3,744 barrels of tar, 3,901 of rosin, and 668 or turpentine. The following year, the totals roughly remained the same with tar exports even increasing. Yet, for each subsequent year, naval stores exports trended downwards with small exceptions (FIGURE 34).

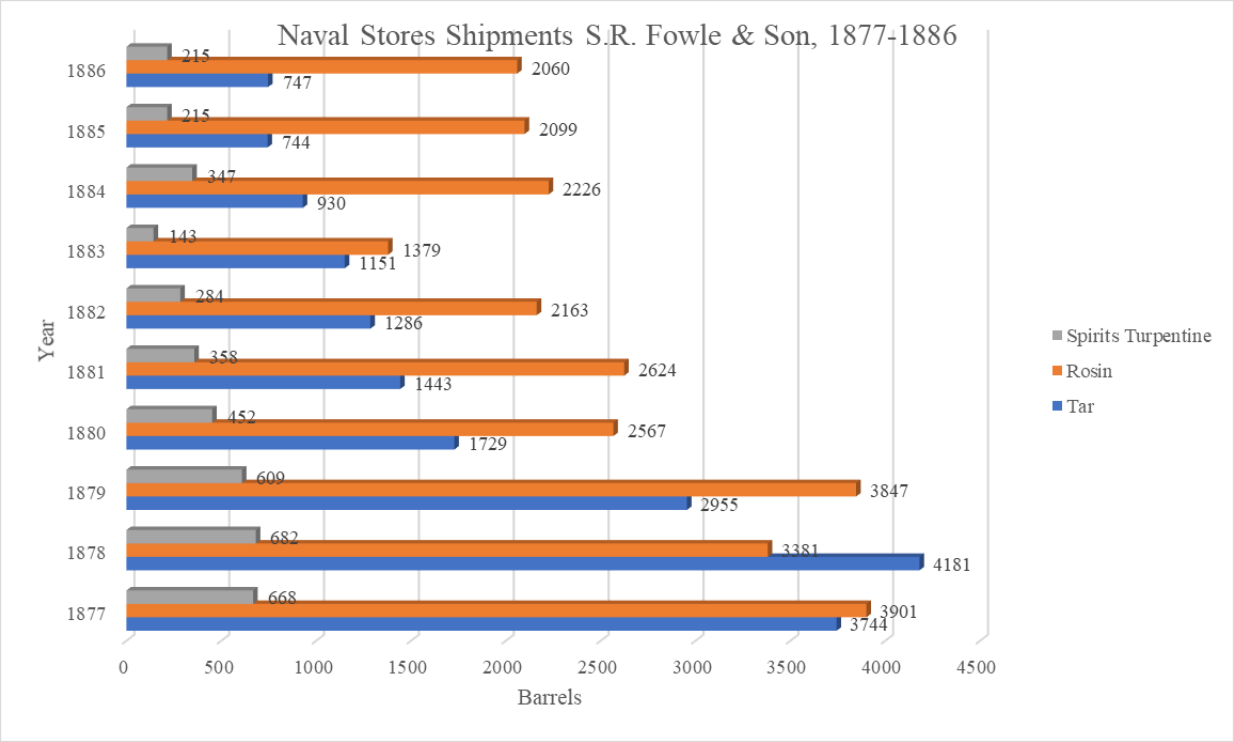


FIGURE 34. S.R. Fowle & Son Company Naval Stores Shipments, 1877-1886. (data from S.R. Fowle & Son Company 1877)

S.R. Fowle & Son Company Mill Production (1892-1893)

After constructing and operating lumber mills throughout Beaufort County, S.R. Fowle & Son Company decided to erect a mill in town. The newly minted S.R. Fowle & Son Company Sawmill was incorporated in 1892 (Department of Labor and Printing 1911:39). The mill possessed a large band sawmill, five boilers, four dry kilns, and the capacity to load lumber directly into a barge from the mill (May 1976:339). The Fowle mill rapidly became one of the most important lumber mills in the town and continued to operate into the 1920s.

Once incorporated and constructed, the mill quickly began operating at a high level. Joyner Library contains many records relating to the Fowle mill including ledgers, sales records, and production information. One of the more significant pieces of information is the production records from the first few months of the mill's period of operation. Over nine months, from August 1892 to April 1893, the growth of production volume, as well as the diversification of products, is clear.

In August, production began in earnest. Their offered products included 3x4, 3 in., 2x10, poplar, and cypress cuts of lumber, in addition to #1, #2, and #3 boxes. Overwhelmingly, they produced #3 boxes each day at least at 50% volume (FIGURE 35). In the next month, the same trend continued. Each recorded day of production, #3 boxes formed over 60% of the daily production volume. Additionally, the mill began to diversify their production offering. More consistently, the mill produced 3x4, 3 in., and poplar cuts of lumber (FIGURE 36).

The production data became skewed in the months of October and November. In the earlier months, the output values were neatly organized according to the specific cut and wood species. Between October 3, 1892 and November 21, 1892, all totals were listed underneath a

column labelled '#1 box' and were exponentially higher than any other previous listing. Because of that, these values were excluded from the study.

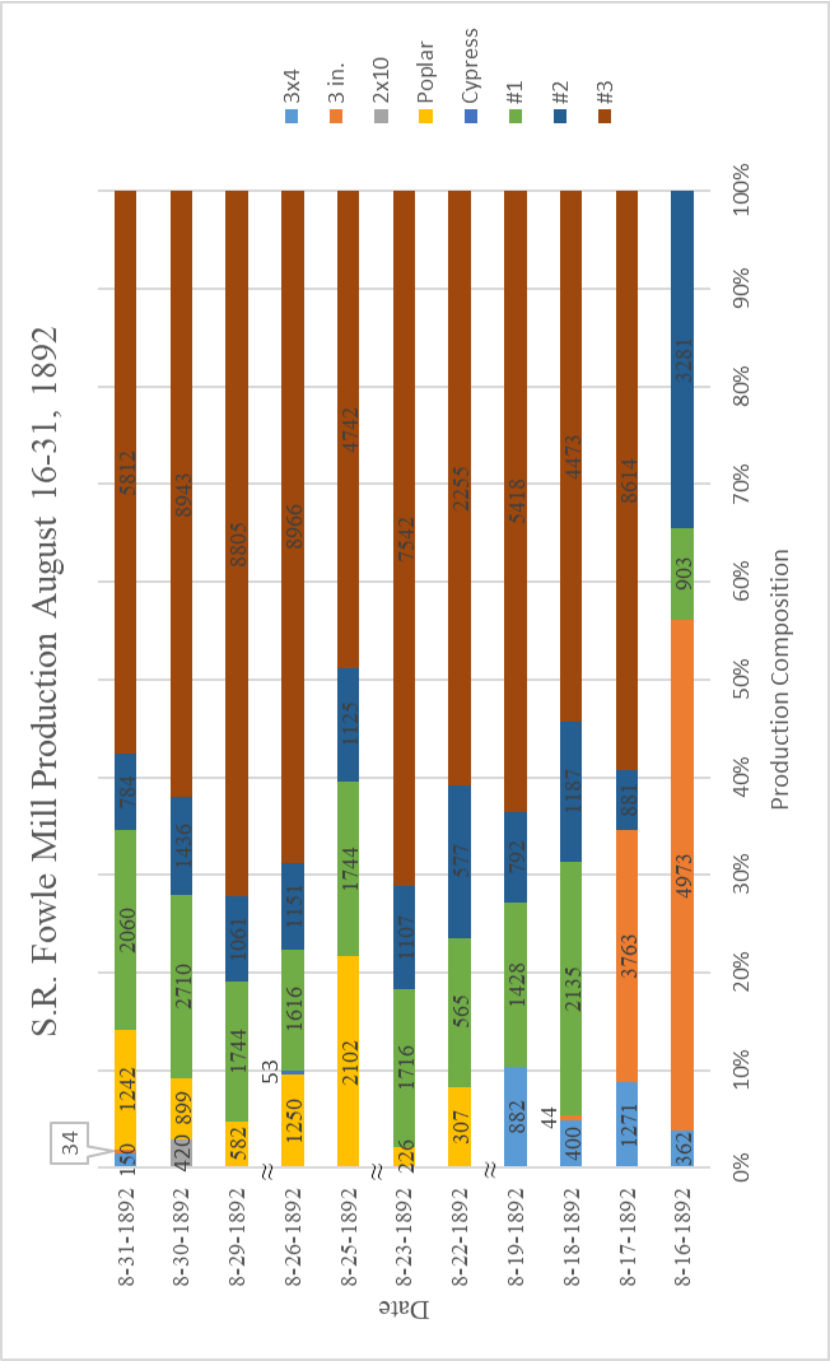


FIGURE 35. S.R. Fowle & Son Company Sawmill Production Levels August 16-31, 1892. (data from S.R. Fowle & Son Company 1892)

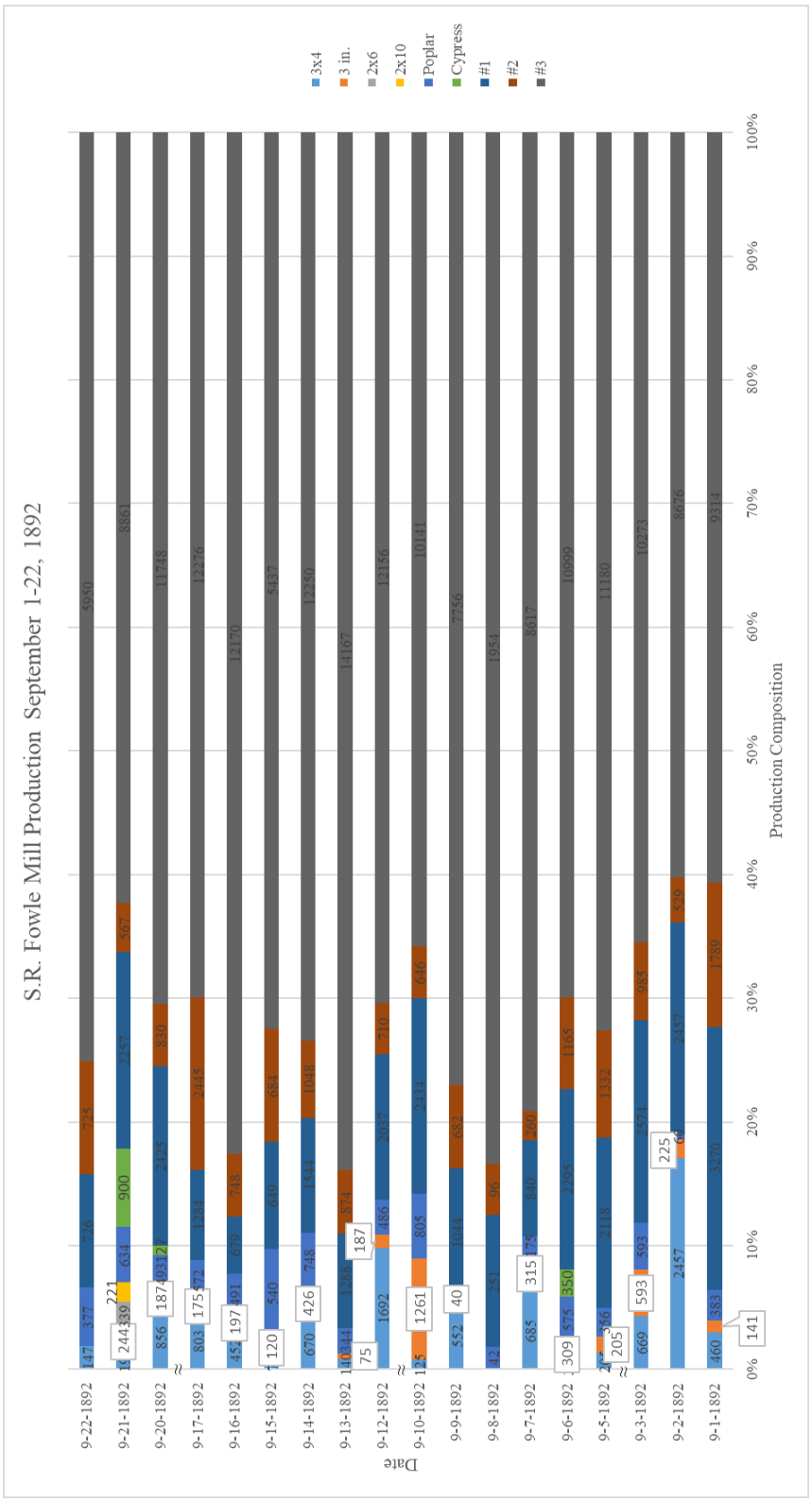


FIGURE 36. Sawmill Production Levels, September 1-22, 1892. (data from S.R. Fowle & Son Company 1892)

By December, the recording process had resumed its normal procedure of separating output levels according to specific cuts. Boxes remained the predominant product manufactured by the mill, but, during this month, the mill began to offer alternative cuts of lumber. Their records indicate the presence of 5x4 and 2x12 cuts alongside a category labelled ‘P378’ (S.R. Fowle & Son Company 1892) (FIGURE 37).

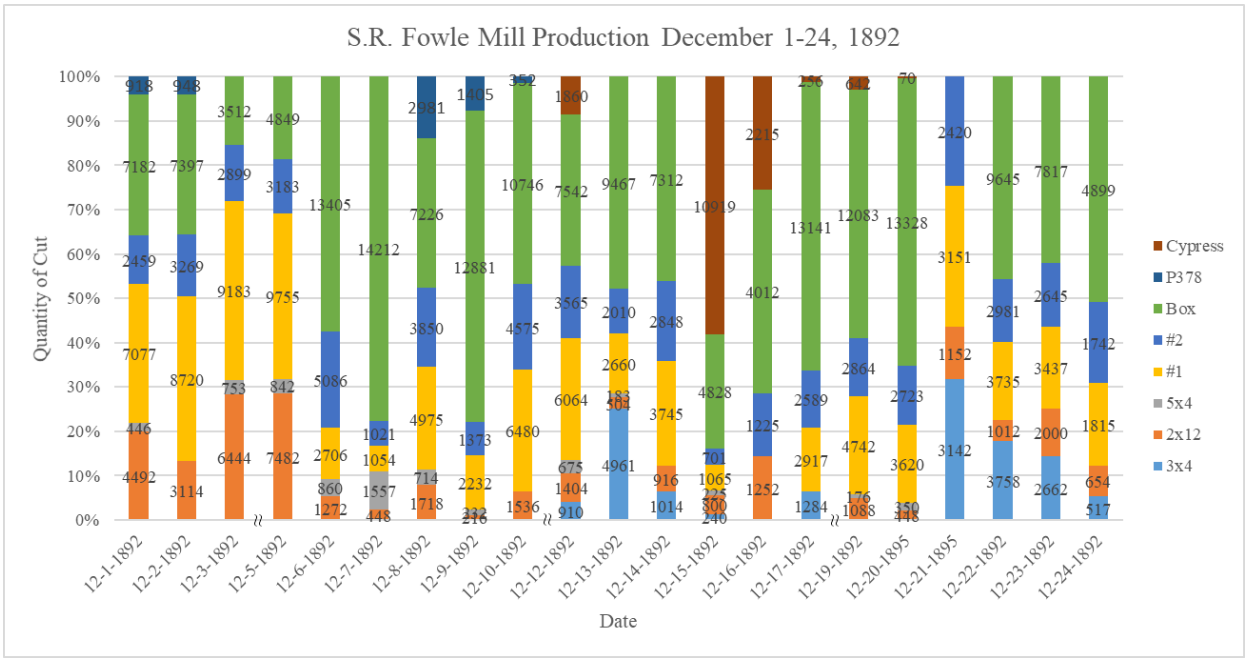


FIGURE 37. Sawmill production levels, December 1-24, 1892. (data from S.R. Fowle & Son Company 1892)

The turn of the year witnessed the Fowle Mill ramp up their production capabilities. They again expanded their product offering, adding 1x4, 2x4, 2x6, and many other cuts, in addition to outpacing any previous total volume obtained in the month of February. Again, boxes remained the primary output (FIGURE 38). In March and April, they continued these trends and continued to exceed their overall production volume from previous months (FIGURE 39 and FIGURE 40).

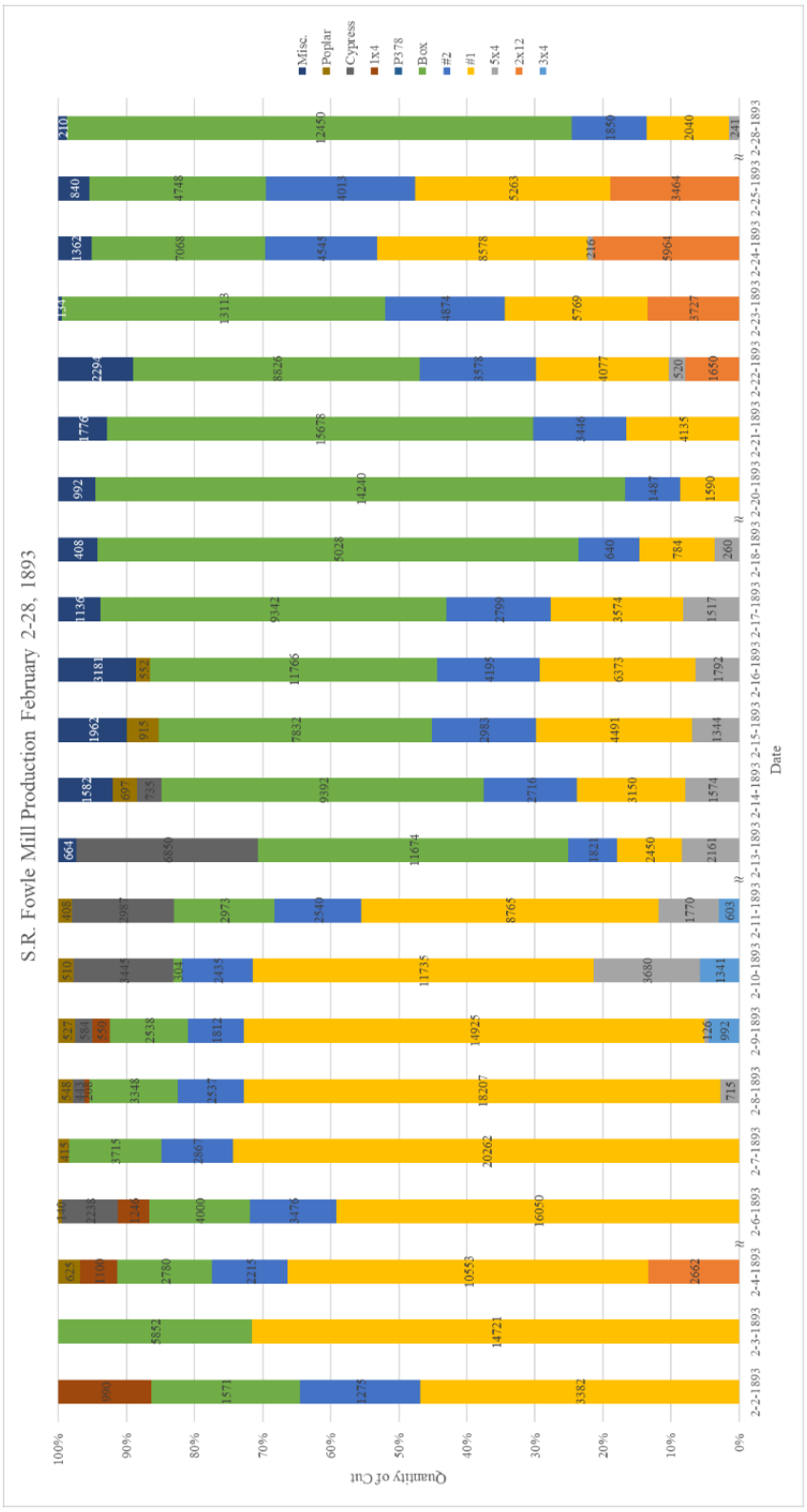


FIGURE 38. Sawmill production levels, February 2-22, 1893. (data from S.R. Fowle & Son Company 1892)

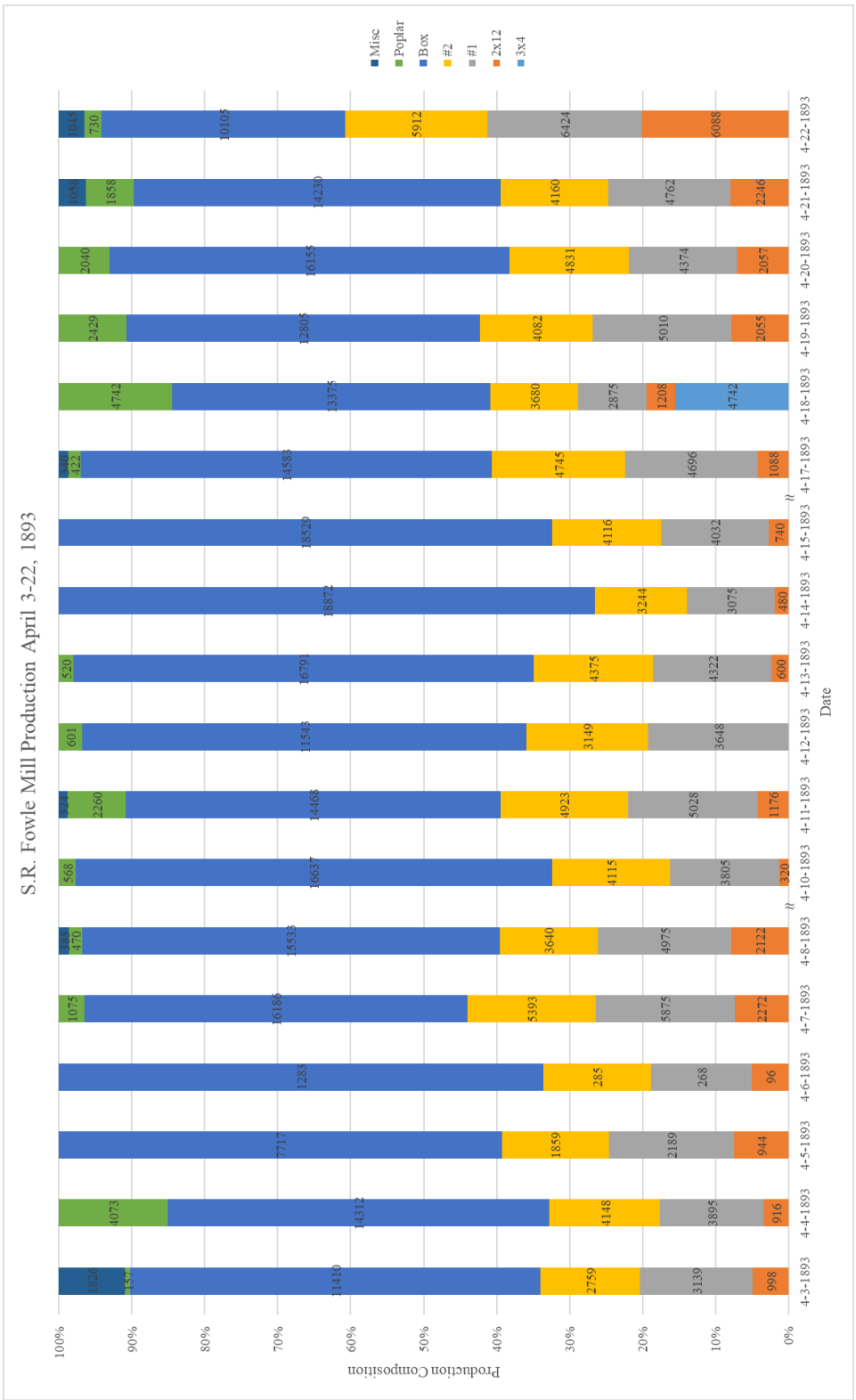


FIGURE 39. Sawmill production levels, April 3-22, 1892. (data from S.R. Fowle & Son Company 1892)

S.R. Fowle Mill Order Forms (1894-1897)

After a few months of operation, the S.R. Fowle & Son Mill had established itself as one of the premier lumber mills in town. Soon, it began to offer its services to individuals in the community, private enterprise, and for material to be exported throughout the Atlantic. In Joyner Library, one notebook contains over 800 individual, handwritten orders placed at the Fowle Mill. Included within are the names of prominent businesses which the Fowle's had exchanged with for decades, various local government projects which Fowle lumber created, and vessels which carried their lumber to various locations in North Carolina and abroad (S.R. Fowle & Son Company 1894).

The Fowle family had established business relationships from their beginnings with other prominent Washington families. These prominent families, in turn, created their own businesses which became synonymous with the port of Washington. Many of these trading relationships were visible throughout these records. The mill consistently sent quantities of lumber to the Moss Planning Mill, of many different cuts and species. Also represented amongst the Fowle customers include Blounts, Havens, and William Blount Rodman. Other businesses include the Doughty Mill and the Washington Planning Mill, but neither ordered as much, or as frequently, as the Moss Planning Mill (S.R. Fowle & Son Company 1894).

Much like other lumber mills, the Fowle Mill supplied much of the local community with lumber for building houses, buildings downtown, and churches. One entry, labelled 'Gordon House', recorded over 5,025 ft. of flooring on July 19, 1894, which was followed up by another entry of 450 ft. of flooring, 13 pieces of 1x10x16, 100 ft. of 1.5x1.5x16, and 25 ft. of 5x5x16 in

September of that year. Other homes which the Fowle's cut and supplied lumber for include the Jackson House, the Crabtree House, and the Bennett House (S.R. Fowle & Son Company 1894).

Also included amongst their residential customers were several Beaufort County projects and Washington churches. On July 17, 1894, Beaufort County ordered 860 ft of 1x6x16, 600 ft. of 2x4x16, 155 ft. of 2.5x12x22, 675 ft. of 3x4x16, and several more cuts for the Washington Bridge. On April 2, 1896, the S.R. Fowle & Son Company Sawmill provided lumber material for the construction of the colored schoolhouse. It did so again on January 8, 1897, specifically 400 ft. of flooring and 800 ft. of ceiling. They also supplied lumber for the construction and renovation of two of downtown Washington's churches. On March 23, 1896, the Fowle lumber helped remodel the First Baptist Church (S.R. Fowle & Son Company 1894; High 1976: 300). Later, in January 1897, Fowle lumber again helped improve the First Presbyterian Church (S.R. Fowle & Son Company 1894; High 1976:300).

Finally, the S.R. Fowle & Son Sawmill propagated the same trading patterns which propelled the three brothers into prominent Washington citizens, exporting the region's rich natural resources north and abroad. Fowle owned vessels continued to sail to the many destinations, carrying cargo representing the new economy of Washington. On November 11, 1894, two entries recorded entries destined for Roanoke Island, where the Pamlico and Albemarle Sounds meet. One entry recorded a shipment of 4,000 ft. of 3 in. heart pine and the other 1,000 ft. of 1x10x16 cut and 500 ft. of 4x12x16 cut. The schooner *Missouri* returned to Roanoke Island on June 30, 1896 carrying 7.5 cords of firewood. In July 1897, the schooner *Annie Wahab* transported 150 ft. of 1x3 log run planking and 200 ft. of cypress planking of the same measurement to an unknown destination (S.R. Fowle & Son Company 1894). Lastly, *Cora* carried 50,000 ft. of plained flooring to an unknown destination in 1897. While the records do

not indicate the destination for this shipment, based on earlier Fowle shipping records in the previous section, it is reasonable to assume that this shipment was bound for the West Indies.

Unfortunately, due to the complexity of the recorded orders, it would be impossible to exhibit the data in graph format. The sawmill provided an extensive offering of cut lumber that would make a graph impractical to display and decipher. The data, however, does reveal the extensive trade network, both inside and outside of Washington, that depended on the S.R. Fowle & Son Company Sawmill as consumers or as interrelated industries. As such, this data will be displayed in Chapter 7 according to the individuals and firms contingent upon the output of the mill. Doing so will illustrate the trade network stemming from the mill.

Rodman Cotton Shipping (1870-1874, 1885-1887)

After the Civil War, Washington, and the rest of the southern states, began the arduous task of rebuilding their homes and their local economies. Slowly, industrialization began to take hold of the state. Despite the state's attempts to modernize their economy and infrastructure, North Carolina still lagged behind the rest of the country. Especially in the Coastal Plain, in towns like Washington, industrialization needed capital investment which was unavailable outside of the urban centers of Raleigh, Greensboro, and Charlotte (Durden 1984:310-311). Many resumed their traditional ventures in agriculture due to the lack of available capital investment (Lefler and Newsome 1973:504). One such individual, William Blount Rodman, continued to grow cotton on his family's vast landholdings around the Pamlico River. Through the port, the Rodman family exported cotton by steamer to markets in Baltimore and New York.

Through his agents in the Robinson Company, the state Supreme Court Justice sought to regain the fortune he had amassed prior to the outbreak of the war. Before secession, cultivating cotton had been a crucial portion of the North Carolinian economy. Lefler and Newsome state that "cotton production rose from 34,617 five-hundred-pound bales in 1840 to 73,845 in 1850, and to 145,514 in 1860", with those figures coming from farms in eastern North Carolina (Lefler and Newsome 1974:392). Many large- and small-scale farmers sought to return to their prior livelihoods. Cotton had been a profitable enterprise for many, and the Justice attempted to do the same. After fleeing with his family to Greensboro to escape the war, Rodman returned to Washington and revived his agricultural production.

From 1870-1886, Rodman employed the Robinson Co. as his purchasing agents and general commission merchants first in Baltimore, then in New York. The agrarian judge would ship his cotton from Washington via steamer to Norfolk and then on to the larger northern metropolises. During this sixteen-year period, Rodman shipped a total of 345 bales, with 291 going to Baltimore and 54 to New York. The bales sold for a total of $21,628.76 and weighed a cumulative 130,522 lbs. (Rodman 1977).

Not only did Rodman ship significantly more cotton to Baltimore than New York, he earned more revenue as well. In total, he made 14 shipments to Maryland's capital netting a total of $18,429.75 in revenue. Baltimore also received Rodman's largest shipments in terms of weight and bales. On four occasions, he loaded over 10,000 lbs. of cotton aboard steamers, the largest single shipment being 46 bales weighing 19,340 lbs. on March 20, 1871 (FIGURE 40-42).

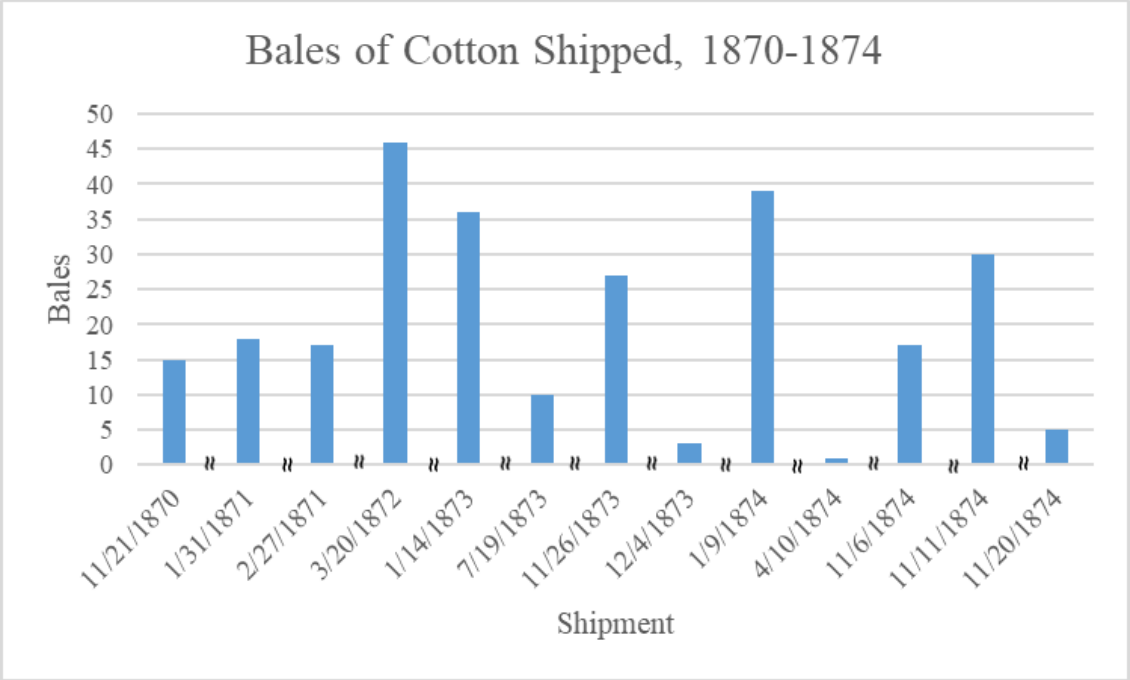


FIGURE 40. Bales of Cotton Shipped through the Robinson Company, 1870-1874. Data is not temporally contiguous. (data from Rodman 1877).

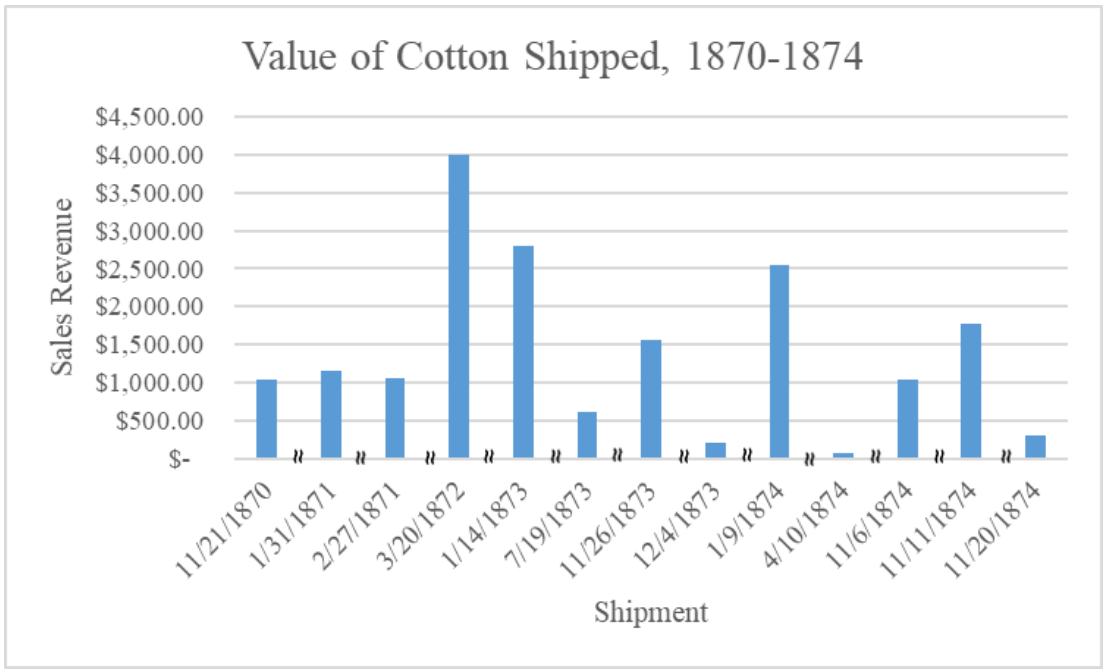


FIGURE 41. Value of Cotton Shipped through the Robinson Company, 1870-1874. Data is not temporally contiguous. (data from Rodman 1877).

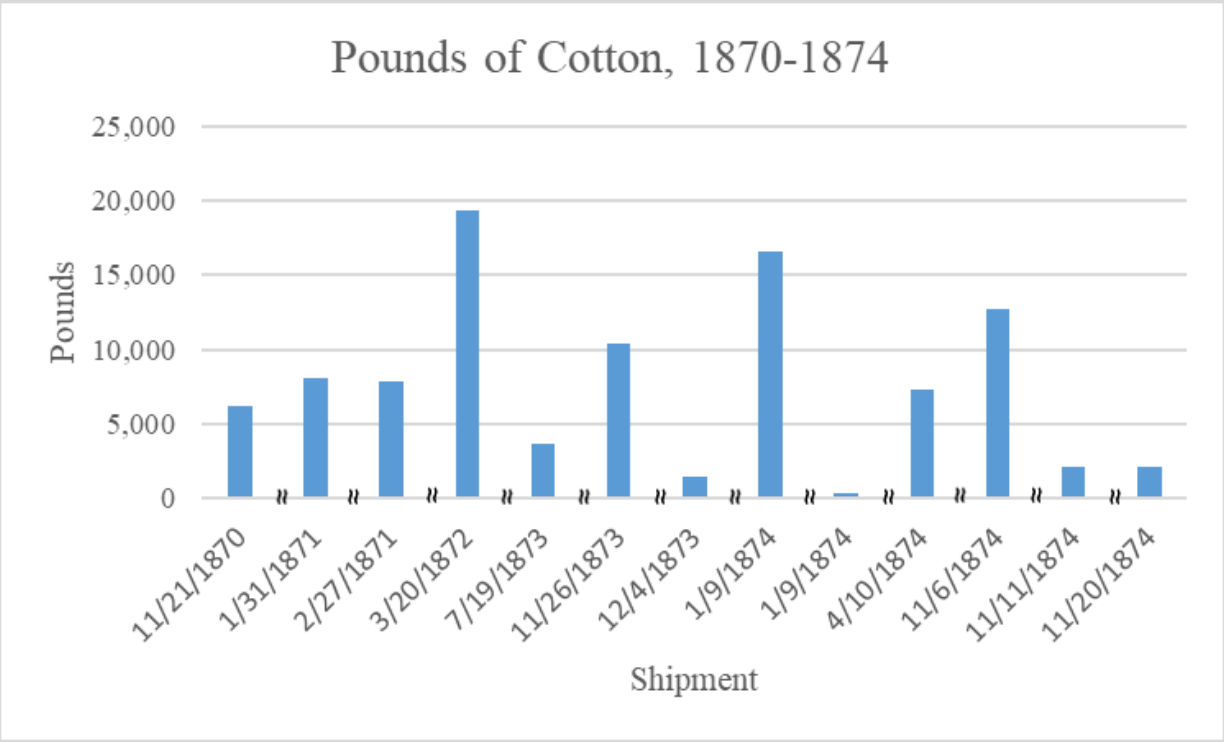


FIGURE 42. Pounds of Cotton Shipped through the Rodman Company, 1870-1874. Data is not temporally contiguous. (data from Rodman 1877)

After receiving notice from his agents in the Robinson Co., Rodman began to export his crop to New York to capitalize on a new market. Initially, he experienced similar levels of success in terms of product shipped and sold. On January 22, 1885, Robinson Co. receipts indicate the acquisition of 22 bales of Rodman cotton weighing 9,060 lbs. for the $985.28. Two weeks later, another receipt shows a further purchase of 11 bales of cotton for $514.40. Eventually, however, shipments through the Robinson Co. diminished and ceased after 1887 (FIGURE 43-45).

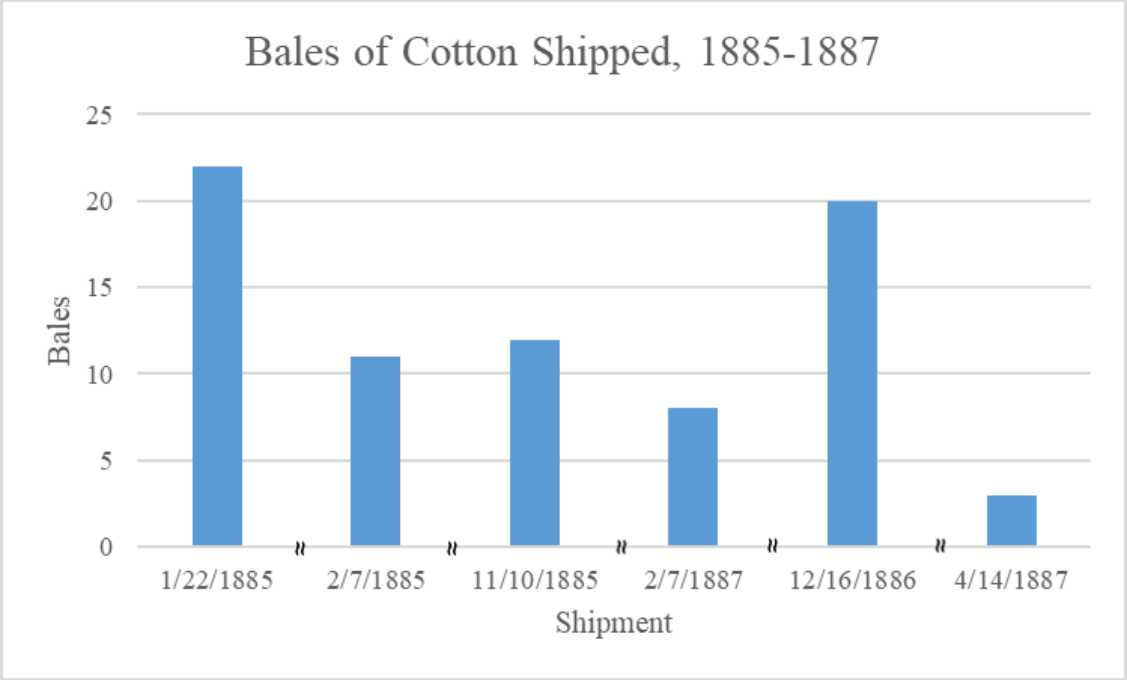


FIGURE 43. Bales of Cotton Shipped through the Robinson Company, 1885-1887. Data is not temporally contiguous. (data from Rodman 1877)

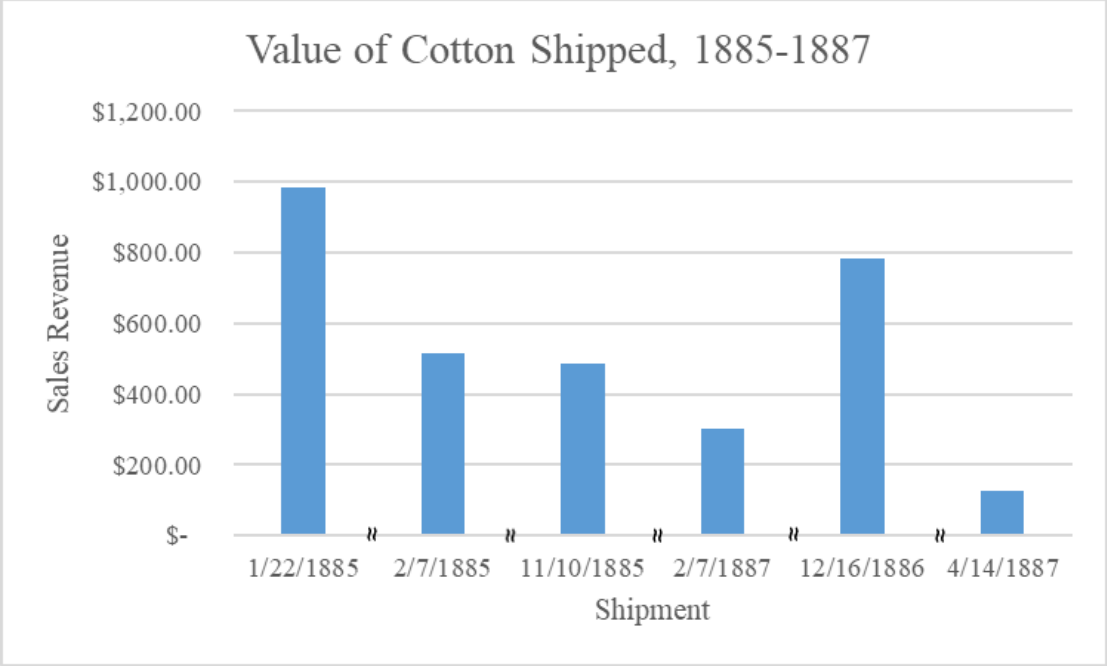


FIGURE 44. Value of Cotton Shipped through the Robinson Company, 1885-1887. Data is not temporally contiguous. (data from Rodman 1877)

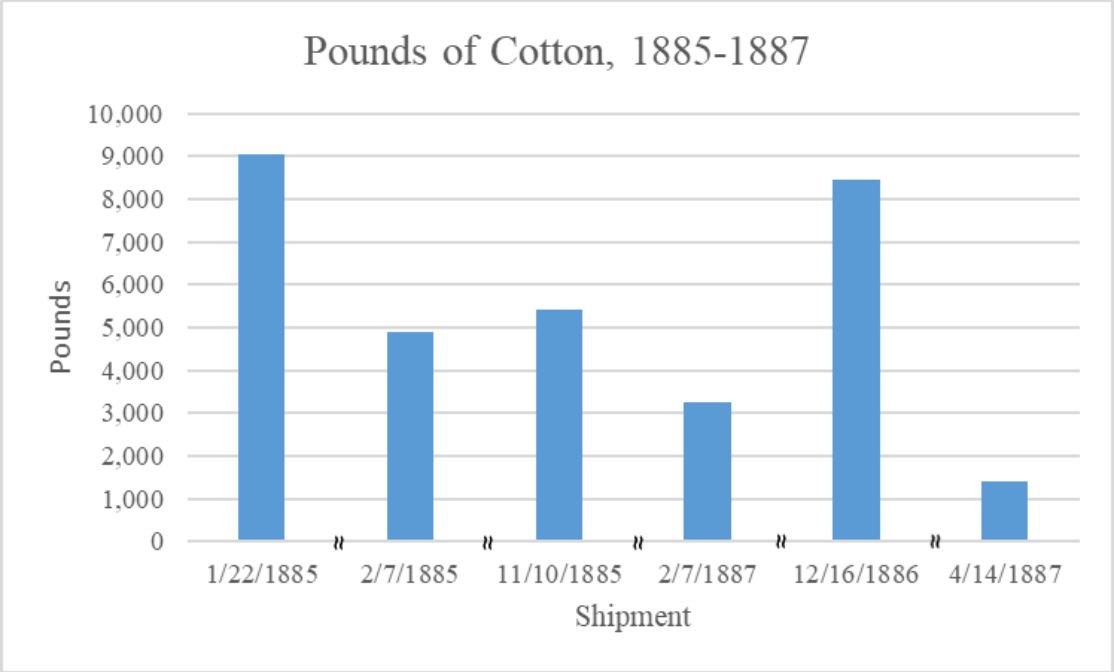


FIGURE 45. Pounds of Cotton Shipped through the Robinson Company, 1885-1887. Data is not temporally contiguous. (data from Rodman 1877)

Two observations can be made through collating this historical data. First, the price per pound that the Robinson Co. was willing to offer decreased consistently across the sixteen-year period. From the first shipment, Rodman received a rate of $0.17 per pound of cotton. Following that, it decreased slightly before peaking at $0.21 per pound. From that point, however, the rate consistently fell from $0.17 to $0.09. This trend may be indicative of the decreasing quality of his cotton. In several of the first receipts, the purchasing agents separated the bales in terms of their quality, using such terms as “middling” and “badly stained”, each fetching a distinct price. After that, all bales are lumped and priced together (Rodman 1977).

Secondly, these sales receipts bear witness to the two economic forces gripping southern states after the Civil War. On one hand, many sought to return to their agricultural heritage which was, and still is, extremely necessary. On the other, many were ready to modernize and

industrialize through promoting manufacturing, constructing railroads, and the transition from sail to steam. Steamboats had been utilized along the Tar/Pamlico River since the 1830s and the advantages of steam transportation was readily apparent to those engaged in commercial activities (Litchfield 1976:233). Rodman shipped his cotton via individually contracted steamers like *Norfolk* and *Hackensack*, the Pamlico and Bay Line, and the Old Dominion Steamship Company (Rodman 1977) (FIGURE 46).

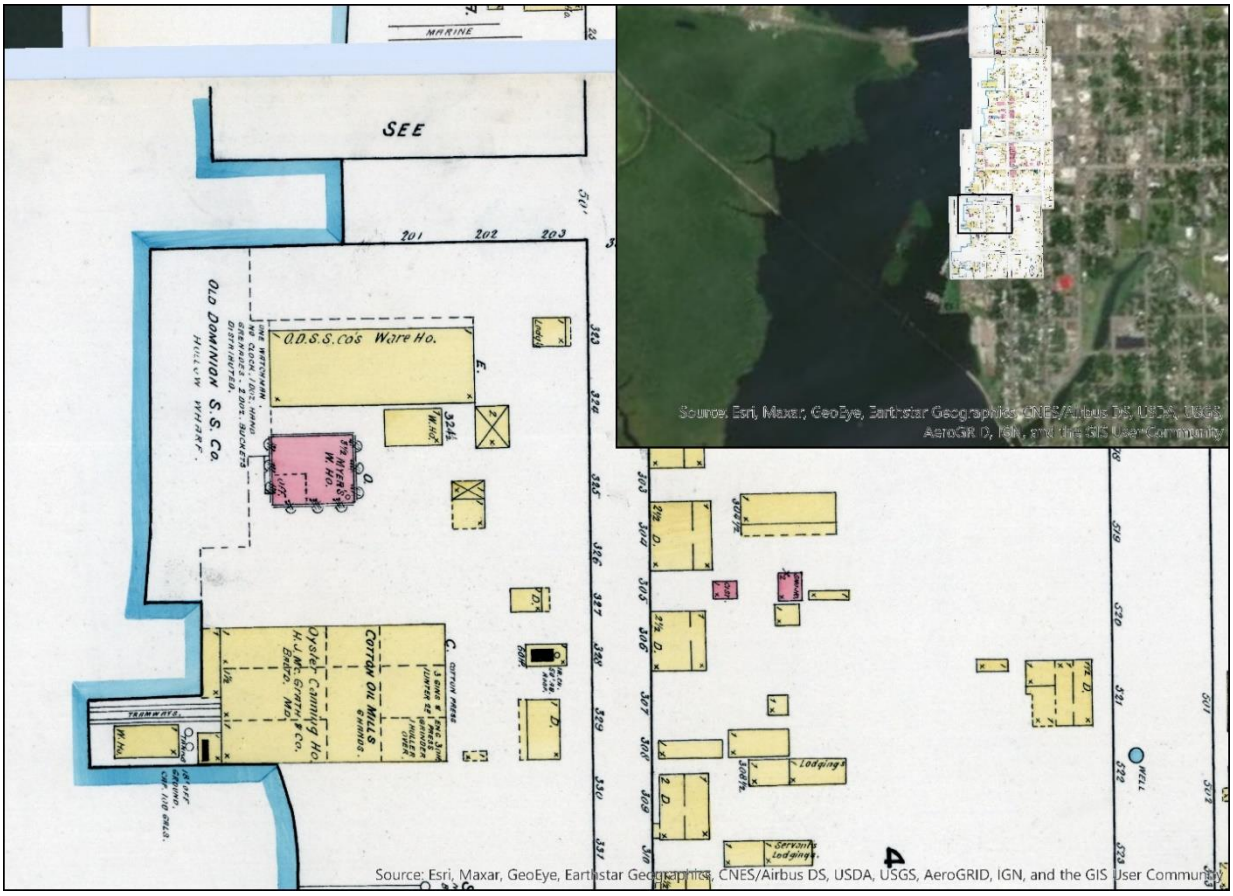


FIGURE 46. Location of Old Dominion Steamship Company Wharf within Washington Harbor. (Sanborn-Perris Map Co., Limited 1885)

Styron Transportation Company (1894)

As steamboats became more efficient and reliable, their presence along Washington's waterfront became more common. With the steamship came large shipping conglomerates, such as the Clyde Steamship Company, the Old Dominion Steamship Company, and the Norfolk Southern Railroad (Litchfield 1976:233). These shipping businesses encouraged standardization and efficiency in shipping patterns, as well as working in tandem with the new railroad terminals which had acquired waterfront property.

The Styron Transportation Company, a subsidiary of the Norfolk Southern Railway Company, owned and operated the steamer *Aurora* in the late nineteenth century. *Aurora* connected many small communities along the Pamlico River with the port, departing from Washington and making stops at Gaylord, Lake Landing, Aurora, Bay Side, and many others (*Washington Gazette* 1896:3). Not only did the company offer freight service, the steamer carried passengers from their small communities to Washington. As general manager of the company, J.A. Burgess would have been responsible for the day-to-day operations of the enterprise. While little historical information is available regarding Burgess, his involvement with the Styron Company permitted the collection and curation of 136 shipping manifests from *Aurora* in Joyner Library (Burgess 1894).

The steamer made regular circuit trips around the Pamlico River and its tributaries on a weekly basis. The *Washington Gazette* listed their route as follows; on Monday and Fridays "Leave Washington at 6 a.m., toughing at Bay Side, Gaylords, Aurora, Swan Quarter and Lake Landing" and on Tuesdays and Saturdays, "leaves Lake Landing at 6 a.m., touching at Lake Comfort, Aurora, Gaylords, Bay Side and Washington" (*Washington Gazette* 1896:3). Each of

these towns are represented in the collection, while also adding the communities of Leechville, Makleysville, Scranton, and Oregon (Burgess 1894).

For this study, more consideration is be given to the exports from Washington to these communities. Again, these reflect economic productivity originating from the home port and reflect the prosperity within its own harbor. Despite the sloppy recording, leading to most goods to be labelled as unidentified, the manifests demonstrate the vital function the Styron Company occupied in supplying the small towns on the Pamlico Rive system. *Aurora* transported common, everyday items such as flour, sugar, eggs, and other groceries to these isolated communities. Even boots and shoes are included within these manifests (Burgess 1894). The steamer service became the way for smaller areas to stay connected to the port. Steam services, like those provided by *Aurora*, effectively expanded the port's hinterland which it supplied and exported its valuable commodities.

For example, the community of Leechville, located where the modern Highway 264 Bridge crosses the Pungo River, received 21 shipments from *Aurora*. Besides those labelled 'unidentified, the most frequent commodities shipped were cabbage, flour, pork, and ice. Total shipments of flour alone weighed 4,700 lbs. and pork weighed 1,690 lbs. Other items listed on the manifests include nails, cheese, coffee, salt, and an open buggy (FIGURE 47).

Mackleyville, a community near the mouth of the Pungo River, was another stopping point for *Aurora*. From this collection, 17 manifests documented cargo shipments from Washington to Mackleyville, and another from Aurora to Makleysville (Burgess 1894). Much like the manifests from Leechville, flour featured prominently on the goods shipped to Mackleyville. Listed three times, flour shipments accounted for 14,560 lbs. lbs of cargo. Other items of note from this sample include a shipment of 1,290 lbs. of molasses, 1,740 lbs. of pork,

and 2,614 lbs. of fish. Even listed on the Mackleyville manifests were large quantities of rice and coffee (FIGURE 48).

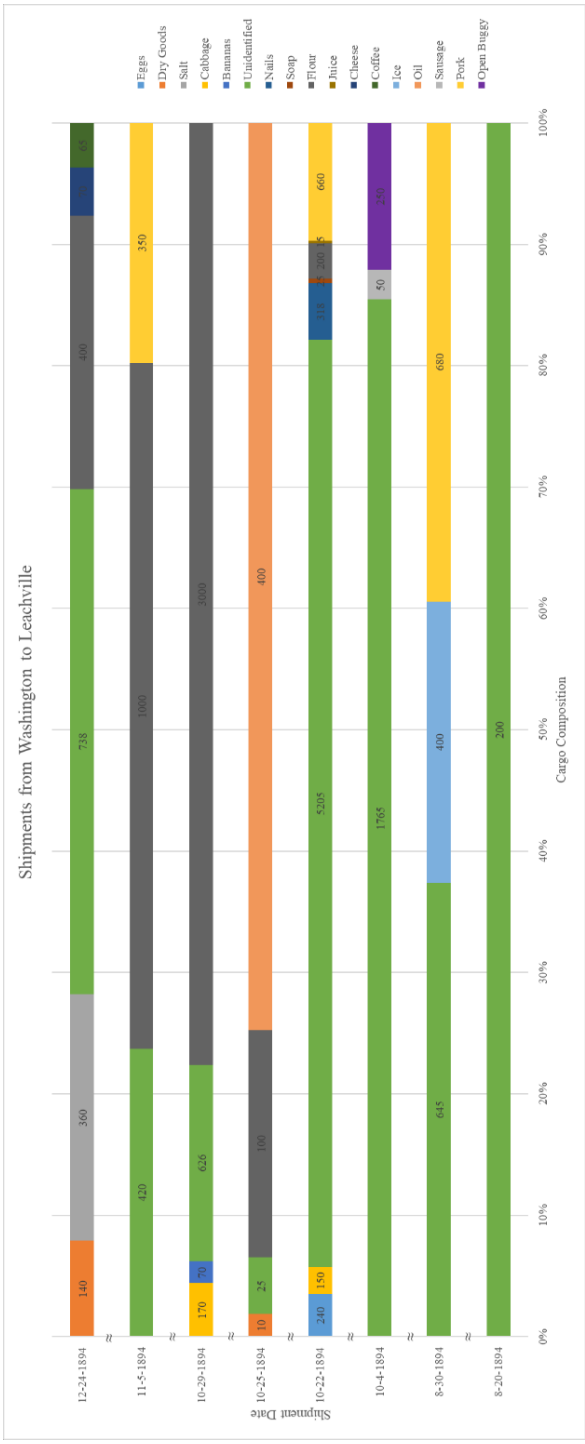


FIGURE 47. Aurora Shipments from Washington to Leachville. Data is not temporally contiguous. (data from Burgess 1894)

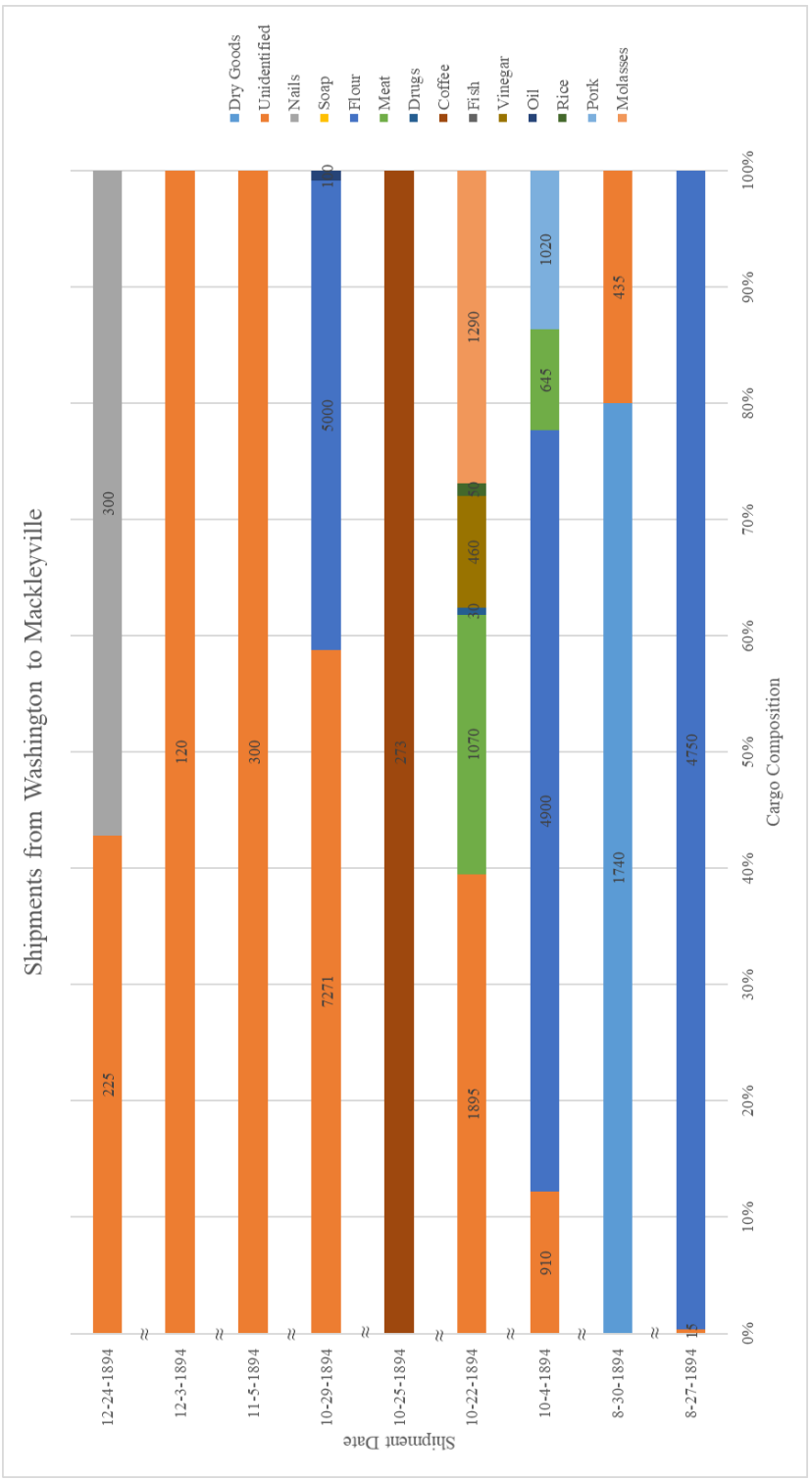


FIGURE 48. Aurora shipments from Washington to Mackleyville. Data is not temporally contiguous. (data from Burgess 1894)

None of these communities could be considered large or prosperous during this period, save maybe Aurora. Compromised of farmers, they depended upon shipments from Washington for much of their necessities and basic commodities. An October 4 shipment to Aurora contained 848 lbs. of nails, 1,000 lbs. of flour, 1,074 lbs. of sugar, 2,260 lbs. of meat, and 528 lbs. of coffee (FIGURE 49). A week later, on October 10, 1894, *Aurora* shipped 1,000 lbs. of flour and 755 lbs. of sugar to Gaylord on October 25, 1894, in addition to 20 lbs. of tobacco (Burgess 1894) (FIGURE 50). Earlier in August of that year, Scranton received a shipment of 4,600 lbs. of flour (FIGURE 51). As part of the same circuit as the October 25 stop in Gaylord, Swan Quarter received its lone shipment of 400 lbs. of flour (Burgess 1967) (FIGURE 52).

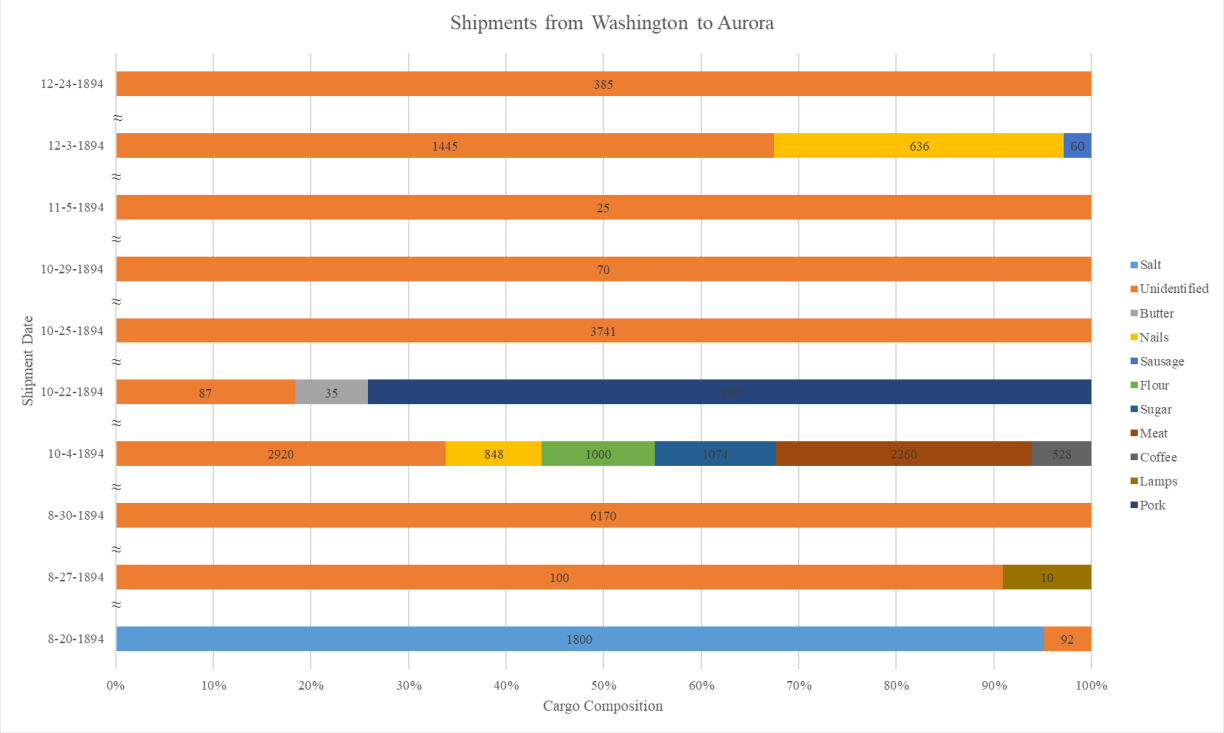


FIGURE 49. Aurora shipments from Washington to Aurora. Data is not temporally contiguous. (data from Burgess 1894)

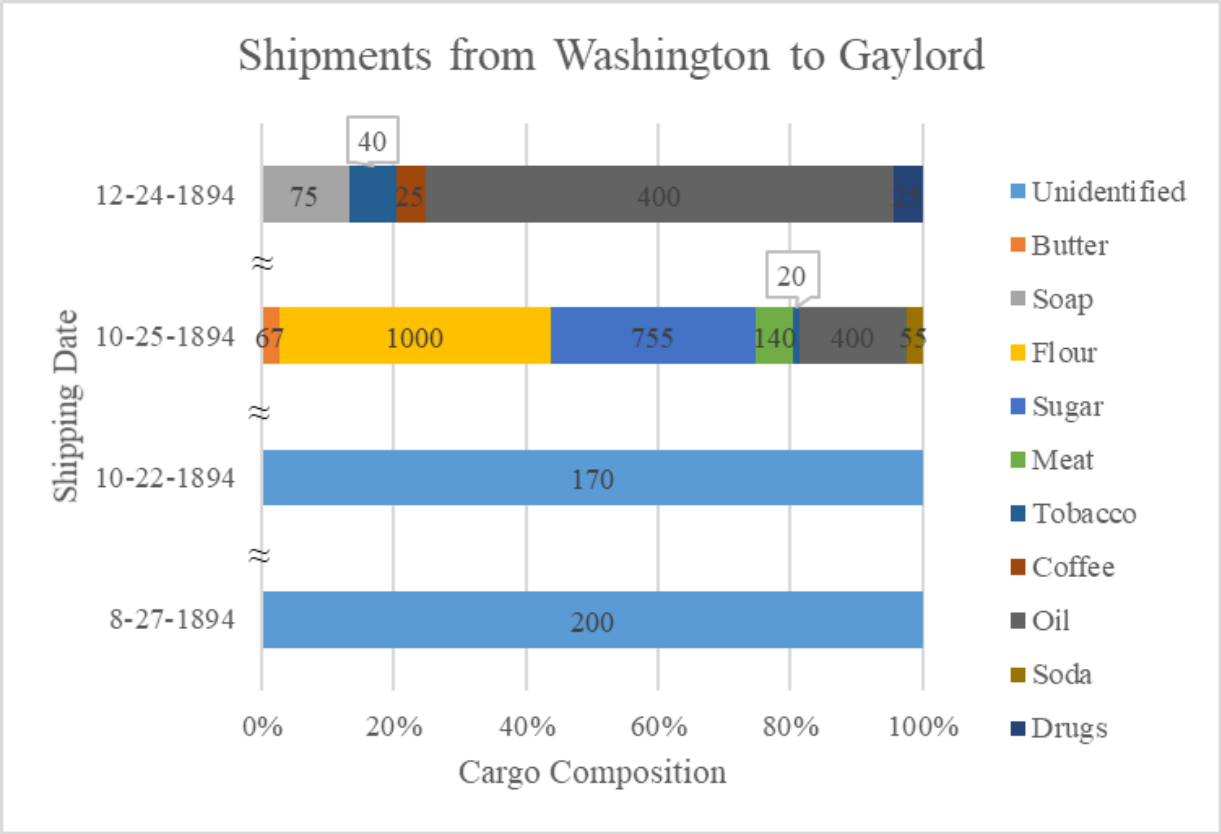


FIGURE 50. Aurora shipments from Washington to Gaylord. Data is not temporally contiguous. (data from Burgess 1894)

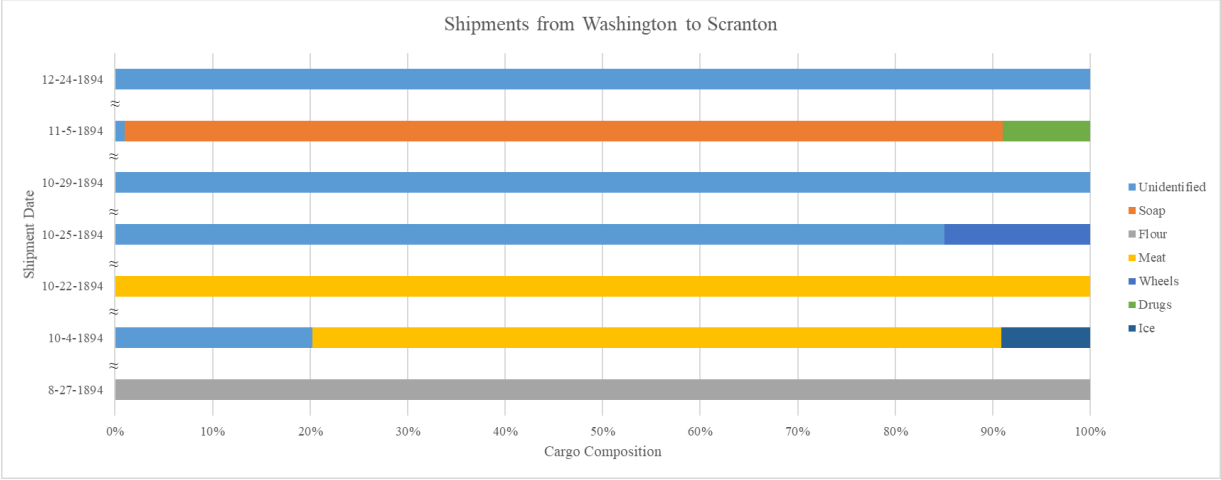


FIGURE 51. Aurora shipments from Washington to Scranton. Data is not temporally contiguous. (data from Burgess 1894)

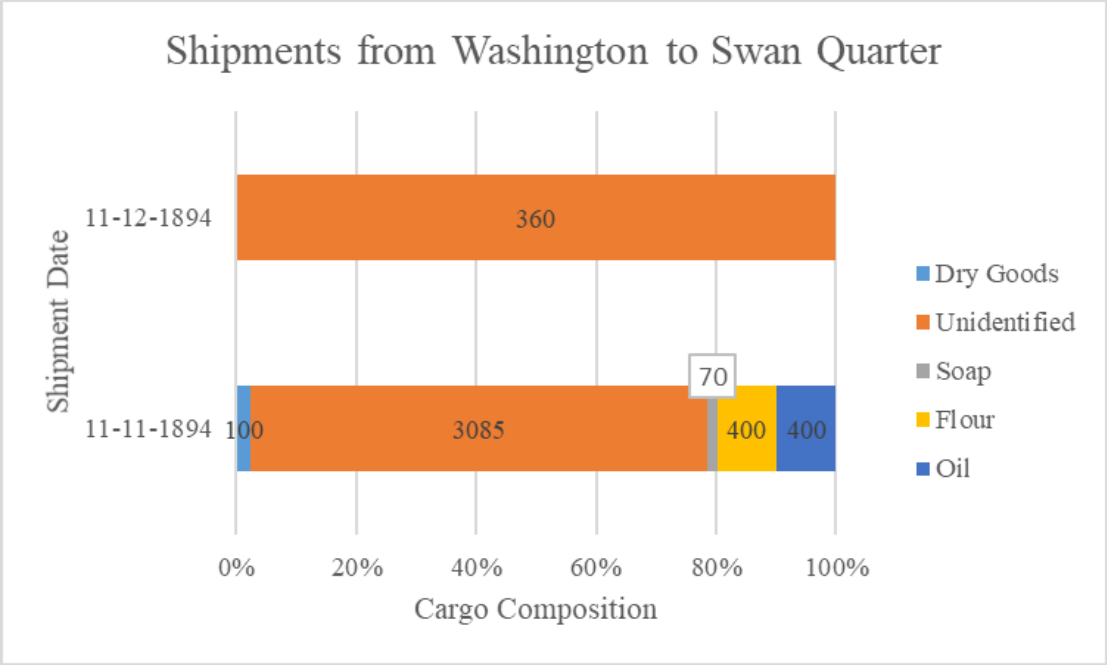


FIGURE 52. Aurora shipments from Washington to Swan Quarter. Data is not temporally contiguous. (data from Burgess 1894).

These trade patterns, however, were not flowing solely in one direction. Many of these communities used *Aurora* and the Styron Transportation Company to get their own goods and produce to market. Their dependence on, or participation with, the freight service reflects the developing economy of eastern North Carolina during the late nineteenth century. Manifests for goods being shipped to Washington resemble the early agricultural commodities which small farmers and local inhabitants could grow and sell without a large labor force. From Aurora and Oregon, Washington received two shipments of cotton weighing 1,500 lbs. (Burgess 1894). Lake Landing sent 2,050 lbs. of oats and 175 lbs. of chicken (Burgess 1894). Most revealing, however, were two shipments of potash, 3,600 and 180 lbs. respectively, from Aurora and Pungo Mill (Burgess 1894; Burgess 1894) (FIGURE 53). Mining for potash has since become one of

Beaufort County's largest industries and its presence amongst these manifests appears to represent the beginnings of this lucrative industries. Still a naturally occurring substance, originally a byproduct from clearing virgin forests, shipments of potash become another symbol of the break from an agriculturally dominated economy to a more modern, industrial system (Fite 1951:133).

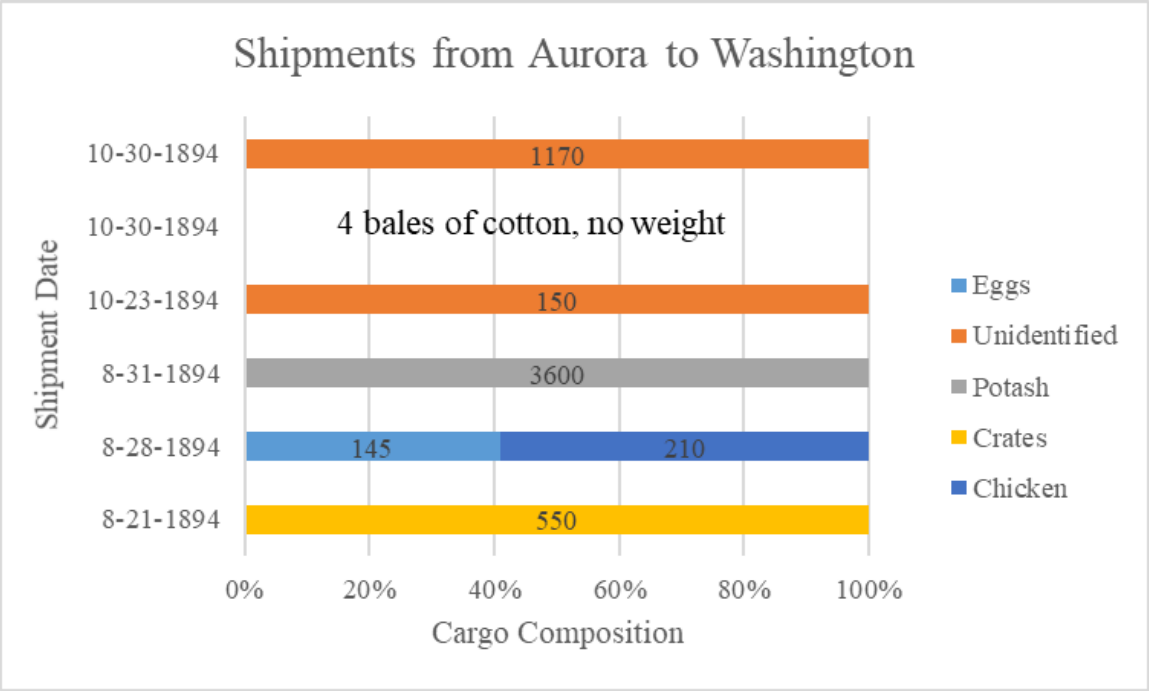


FIGURE 53. Aurora shipments from Aurora to Washington. Data is not temporally contiguous. (data from Burgess 1894)

Eureka Lumber Mill (1911-1916)

As lumber began to supplant the naval stores industry and agricultural products as Beaufort County's primary export, more and more lumber mills began to appear along Washington's Pamlico River. Founders George T. Leach, George A. Phillips, and W.T. Campen

incorporated the lumber mill in the year 1893, which quickly grew into one of the larger mills on Washington's Pamlico River frontage (Bureau of Labor and Printing 1909:94; Van Camp 2000). Quickly, the Eureka Lumber Company grew into the premier lumber producer in Washington and became a significant feature along the river (FIGURE 54-55).

FIGURE 54. Aerial photograph from 1955 of the Eureka Lumber Company Sawmill and Log Pool. Rectangle added by author. (Photo courtesy of https://www.washingtonharbour.org/about.htm)

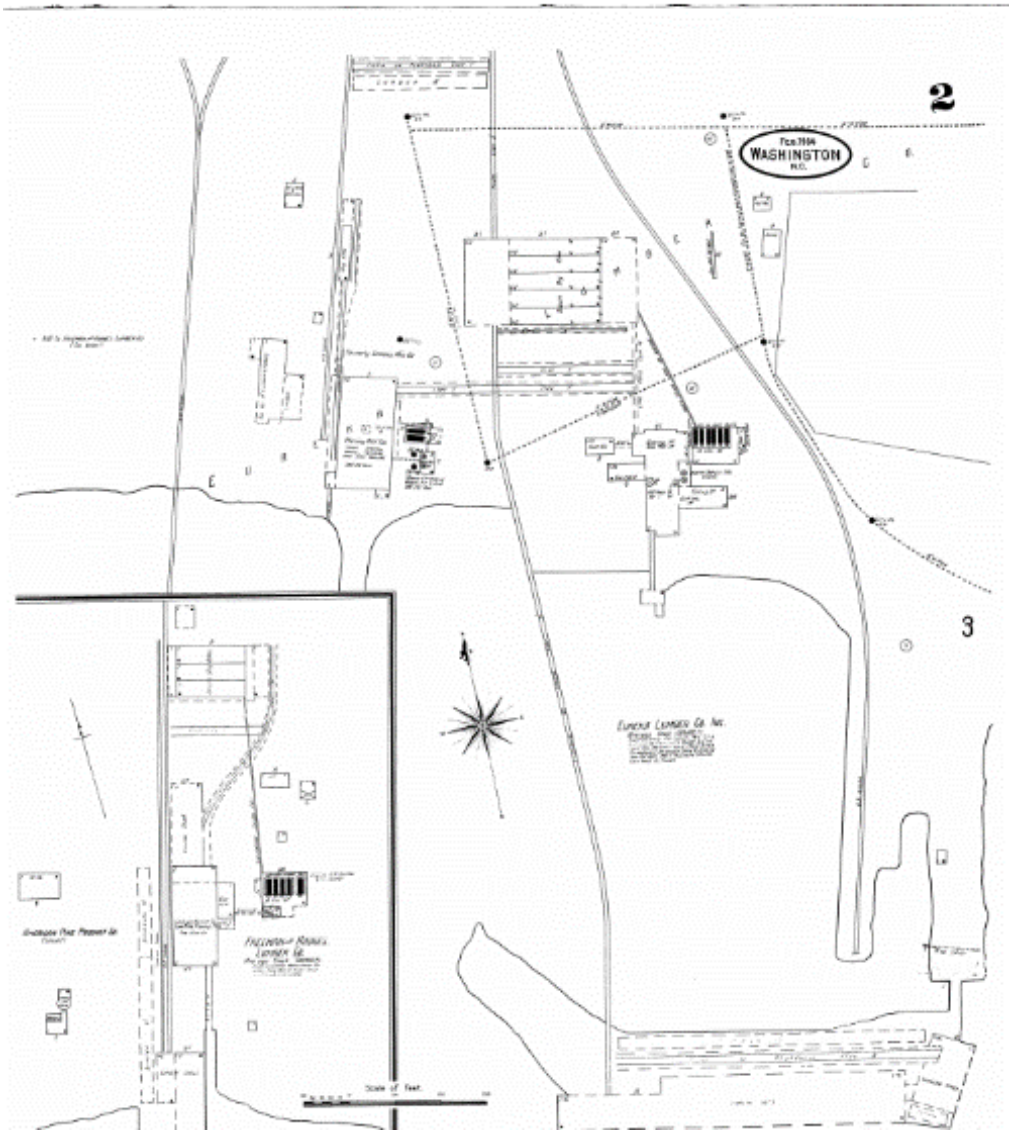


FIGURE 55. 1904 Sanborn Fire Insurance Map depicting the Eureka Lumber Company complex. (Sanborn Map Company 1904)

Historical data documenting Eureka Lumber Company's rise to prominence are few and far between. Historical ledgers, accounts, and other financial statements were not available to consult for the purpose of this study. Nevertheless, publications from North Carolina's Bureau of Labor recorded the annual production volume of the most prominent factories in each North Carolina county. These include the Eureka Mill, the S.R. Fowle Mill, the Kugler Mill, the Moss

Planning Mill, and many other non-lumber industries. While the reports do not specify the units of output, the general level of output can be inferred to be recording feet of lumber.

Over a six-year period from 1911-1916, the Department of Labor and Printing compiled information regarding the output levels of four of the most prominent lumber mills in Washington, Eureka, S.R. Fowle, Kugler, and Moss. The only mill that was represented across each year was the Moss Planning Mill. The reason why the others were excluded are unclear; in some instances, they would be listed in the respective table of miscellaneous factories, but they were not accompanied by output data. The years where the Eureka Mill was included, there superiority in the marketplace was clear. Even in 1915, when the Bureau of Labor Statistics recorded the Fowle Mill's highest output level, the Eureka Mill outproduced them by close to 70,000 feet of lumber (FIGURE 56).

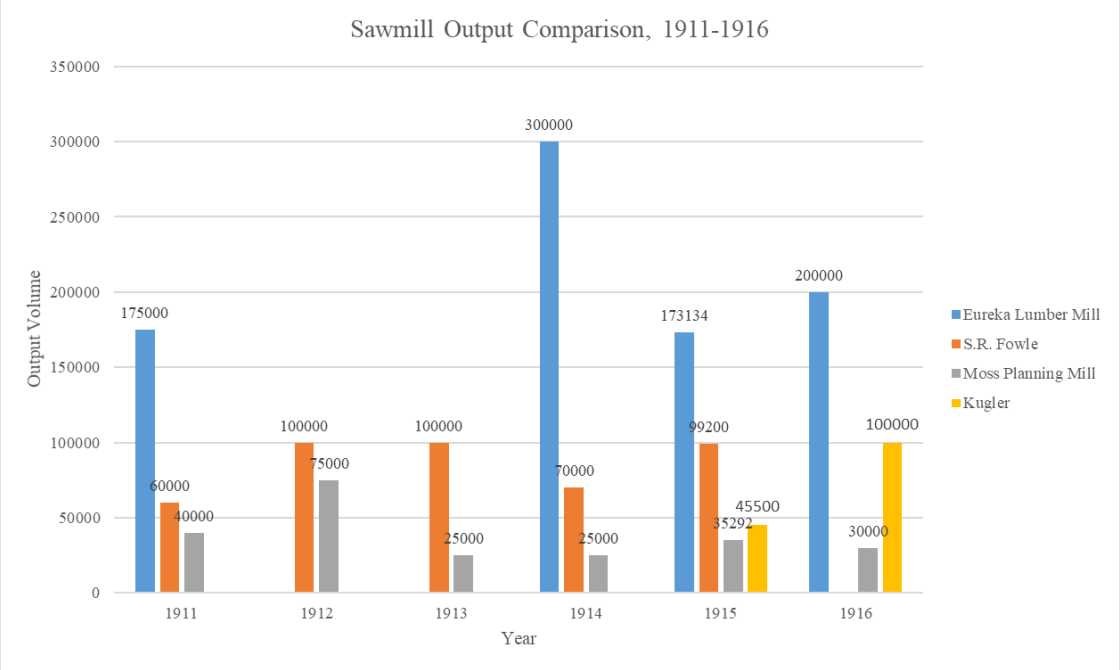


FIGURE 56. Production comparison of the Eureka Lumber Company Sawmill, the S.R. Fowle & Son Company Sawmill, the Kugler Lumber Mill, and the Moss Planning Mill. (data from Bureau of Labor and Printing 1911, 1912, 1913, 1914, 1915, 1916).

Conclusion

Washington's economy, like any port's, changed and adapted according to internal and external stimuli. A wide variety of businesses competed and collaborated so that the river community remained a functional port. When earlier enterprises experienced decline, or economic innovations made other ventures possible, innovative individuals introduced new industry and opportunity. Thus, Washington remained a vital river port, for shipping and industry, for nearly a century and a half.

This chapter outlined port economic activity from a variety of businesses and individuals. Certain collections possessed direct links to archaeological sites discussed in the following chapter, *Chapter Six: Archaeological Results*, while others were consulted to identify and create economic trends that can be attributed to unidentified archaeological sites. The chapter began with the introduction of early Fowle shipping records (Fowle 2016), the cotton shipments of William Blount Rodman (Rodman 1977), and the later S.R. Fowle & Son shipments (S.R. Fowle & Son 1987). Port modernization was evident through the Styron Transportation Company manifests (Burgess 1967) and records from the S.R. Fowle & Son Sawmill and the Eureka Lumber Company (Bureau of Labor and Printing 1911, 1912, 1913, 1914, 1915, 1916). The statistical evidence here will help explain how the archaeological sites examined for this study were utilized and, eventually, abandoned.

CHAPTER SIX: WHARF, BRICKS, AND PILES, ARCHAEOLOGICAL SURVEY RESULTS

Introduction

Archaeologists and scholars who have studied ports have taken two main approaches towards studying the development of port infrastructure. Some have taken the structures at face value, seeking to understand construction techniques and methodologies (Heintzelman 1985; Norman 1987; Langley 2000; Oniz et al. 2014). Others have sought to chart the economic vitality of a port through the archaeological record, many times at the expense of thoroughly understanding the facilities which supported trade (Jackson 1984; Coroneos 2004). Both tactics have benefits and undoubtedly offer explanations for the stimuli behind a port's growth. Yet, neglecting one aspect of the development process may not account for the variety of factors that go in to constructing port facilities. By understanding archaeological data within the historic narrative of the port, this author seeks to compile a more comprehensive picture of the historic port of Washington.

This chapter will be arranged chronologically according to each archaeological site's period of utilization. First, Site A, the South Shore Landing, will be discussed. Second, the S.R. Fowle & Son Company Sawmill pier structures. Finally, the chapter will conclude with the Eureka Lumber Company log pool island structure. See the overall map below for the location of each archaeological site within Washington harbor (FIGURE 57).

Each section in this chapter, according to each individual site, will be structured as follows. Each site's location will be displayed within the context of Washington harbor. A general description of the site will be given afterwards, complete with comprehensive site maps

and site illustrations. Next, material culture and infrastructure features will be described and then, contextualized within archaeological literature. Finally, each site will be described chronologically according to their utilization period. Doing so will provide the context which led to the abandonment and deterioration of the site, as well as provide clues for future illustrations of the fluctuating port economy.

FIGURE 57. Site overview showing the three archaeological sites. Green rectangles indicate areas which employed the transect survey methodology. Red rectangles indicate the position of the pile-platform structures. The black rectangle indicates the extent of the Eureka Lumber Company site. Rectangles added by author.

Site A-South Shore Landing Site

On November 1-3, 2019, a team of faculty and students surveyed an unidentified waterfront structure along the southern shoreline of the Pamlico River. The inconspicuous site across the river from downtown Washington presented significant challenges during the background research phase but evolved into one of the more interesting and complex sites. In total, this site encompassed roughly 730 m^2 of riverbed in addition to a significant terrestrial portion (FIGURE 58).

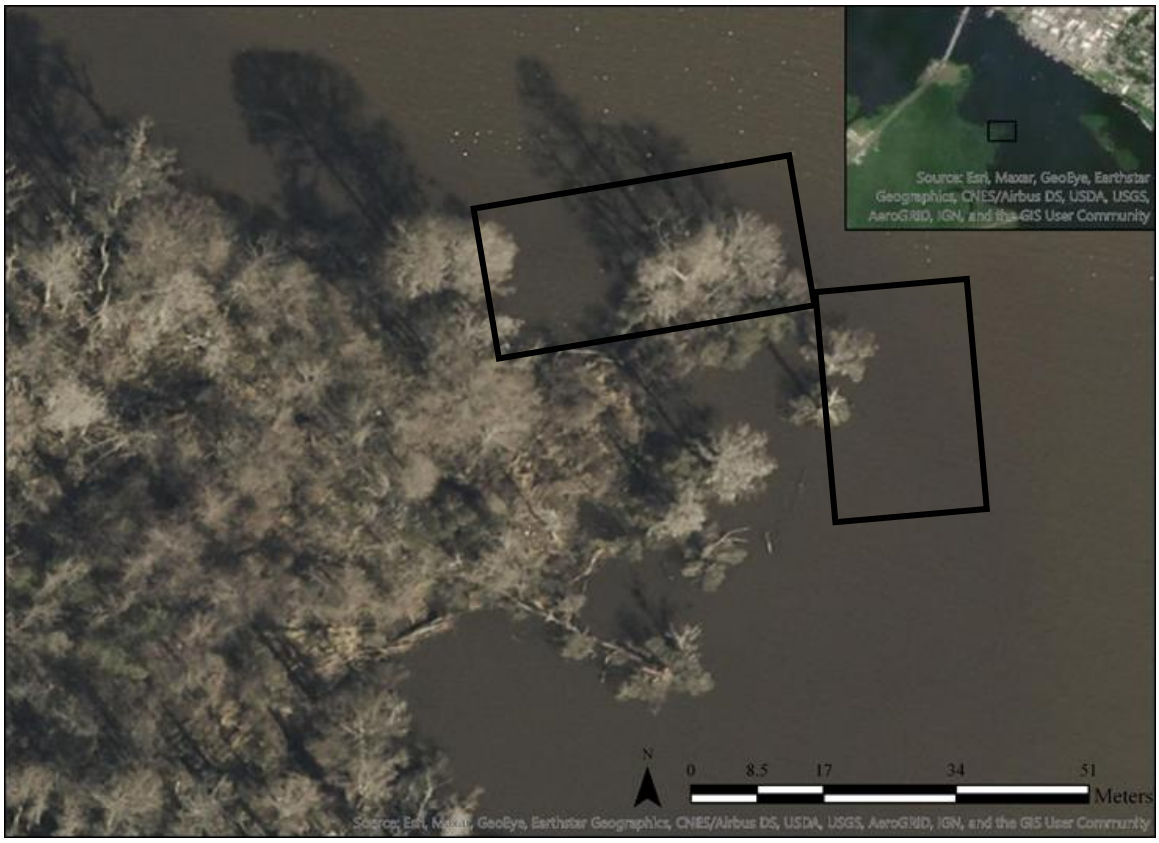


FIGURE 58. Map depicting the two survey areas of the South Shore Landing site. (L) rectangle indicates the survey area corresponding to Site A North and South and (R) rectangle indicates the survey area corresponding to Site A East. Inset shows the site's location within Washington harbor. Rectangles added by author.

While most of the surveyed area contained thick mud and minimal cultural material at the extremities, the areas in proximity to the baseline possessed tremendous evidence suggesting that it was once a waterfront structure. Beginning with Site A North, a wooden structure running parallel to the baseline starts from the 0-2 m transect and continues into the 6-8 m transect. This structure also marks a significant drop off in river depth from the exposed terrestrial site into the river. The edges of this structure are rounded, potentially evidence of milled lumber. Almost adjoining this structure at a 45-degree angle is another piece of wooden structure sharing the same construction characteristics. Deeper into the river from this structure and baseline was an area of thick mud with little cultural material present. (FIGURE 59).

Site A possessed extensive amounts of brick and stone both fragmented and whole, with varying dimensions. Bricks, cobble, and larger ballast stones were found embedded in the riverbed and butted directly up against the supposed structure. Their proximity to the embedded, wooden structure indicates that they had once been utilized as fill within the structure (see black rectangle in Figure referenced above). Several bricks and ballast stones were removed from the riverbed in order to photograph them in the approximate location denoted by the red rectangle on the Site A North and South Site Map above (FIGURE 60-62).

Alongside the brick and ballast discovered at Site A, a solitary ferrous fastener was discovered near the red rectangle above. The fastener measured approximately 19 cm in length and had become warped near the middle. It had a head that was flush with the shaft and did not possess any manufacturing markings or identifications. The location which the fastener was discovered was significantly removed from any wooden structure as well (FIGURE 63).

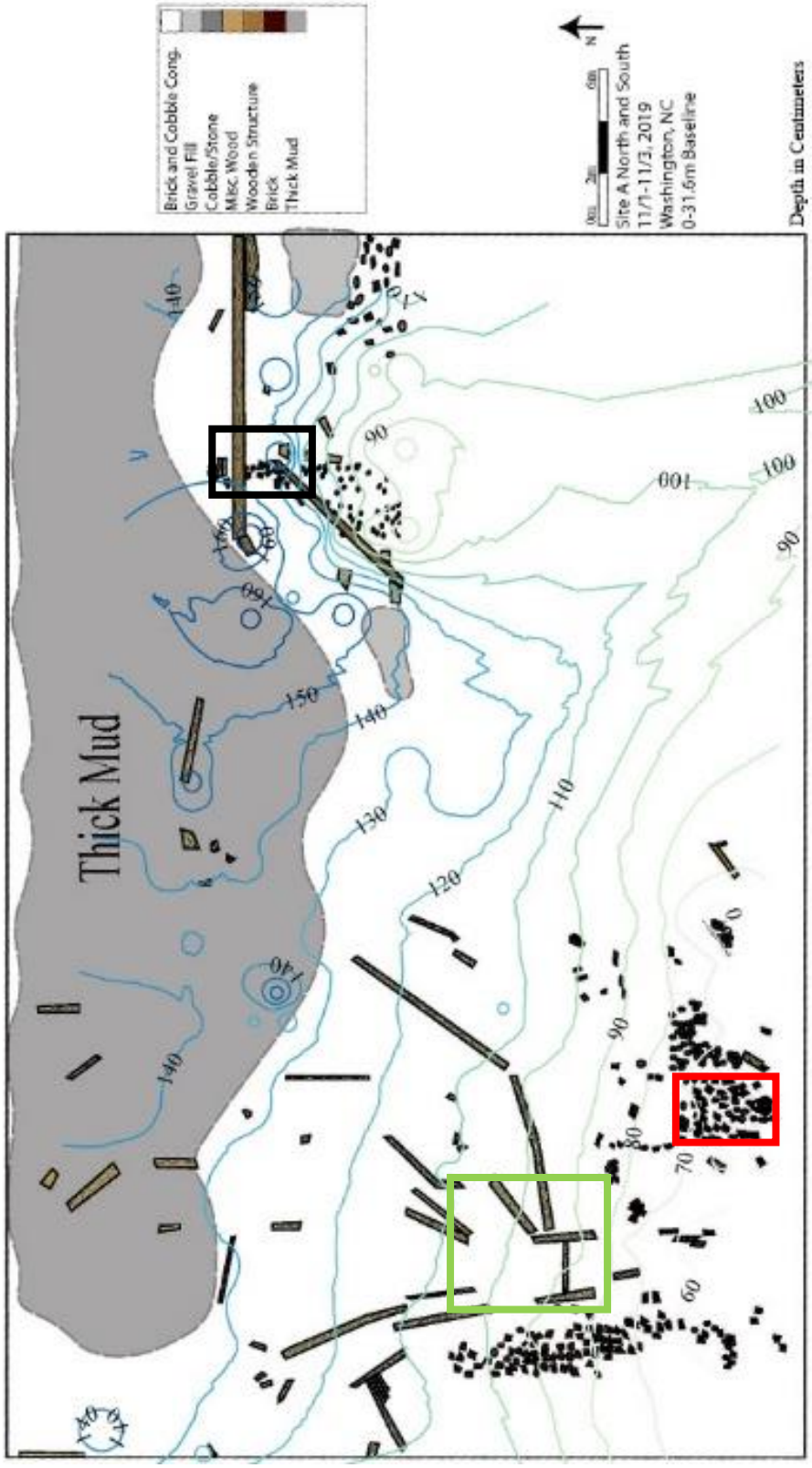


FIGURE 59. Site A North and South site map. Image by Will Nassif

FIGURE 60. Brick fragment recovered from Site A. (Photo by Will Nassif, November 2019)

FIGURE 61. Whole brick recovered from Site A. (Photo by Will Nassif, November 2019)

FIGURE 62. Ballast stone recovered from Site A. (Photo by Will Nassif, November 2019)

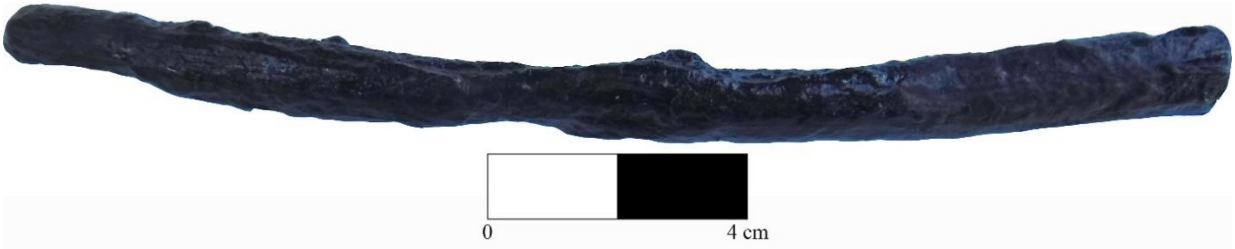


FIGURE 63. Iron fastener recovered from Site A. (Photo by Andrea Yoxsimer and Darby Robbins, August 2020)

Site A South was also significantly shallower than Site A North, permitting simple surveying and recording of cultural material. More fragmented wood and planked lumber

washed into this shallow area, which was recorded on the proforma, indicated by the green rectangle in the site map above. None of these materials seemed associated with any larger structure.

In Site A East, the structure identified earlier continued into this section, formed a jointed right angle, and continued back towards the shoreline. Where the two pieces of lumber met, there were two holes which appeared to be the location of fasteners, each approximately 5 cm in diameter. Much like Site A North and Site A South, Site A East possessed large quantities of bricks, cobble, and ballast stones, fragmented and whole, in addition to fragmented and plank lumber (FIGURE 64). A single glass shard was discovered in transect 8-10m, indicated by the black rectangle below. Etched onto the glass was the name Meyer, Pitts, & Co., a late nineteenth and early twentieth century liquor distributor from Baltimore (General Assembly of the State of South Carolina 1894:540) (FIGURE 65).

Further down the eastern shoreline of the point forming Site A, many barrel heads and barrel staves were discovered. They were discovered in a cove directly south of the survey denoted by the gold rectangle below (FIGURE 66). Two of the barrel heads photographed had been broken in half, one more cleanly than the other. The barrel stave was approximately 40 cm in length and grew in diameter from the base to the deteriorated top. At the base, notching was still visible from where the stave would have attached to the barrel head. Much like the glass discovered in Site A East, these findings are not indicative of a specific maritime commercial activity. Rather, the fact that these ended submerged in such a shallow area points towards this area, at one point, being utilized for some sort of general commercial activity (FIGURE 67-70).

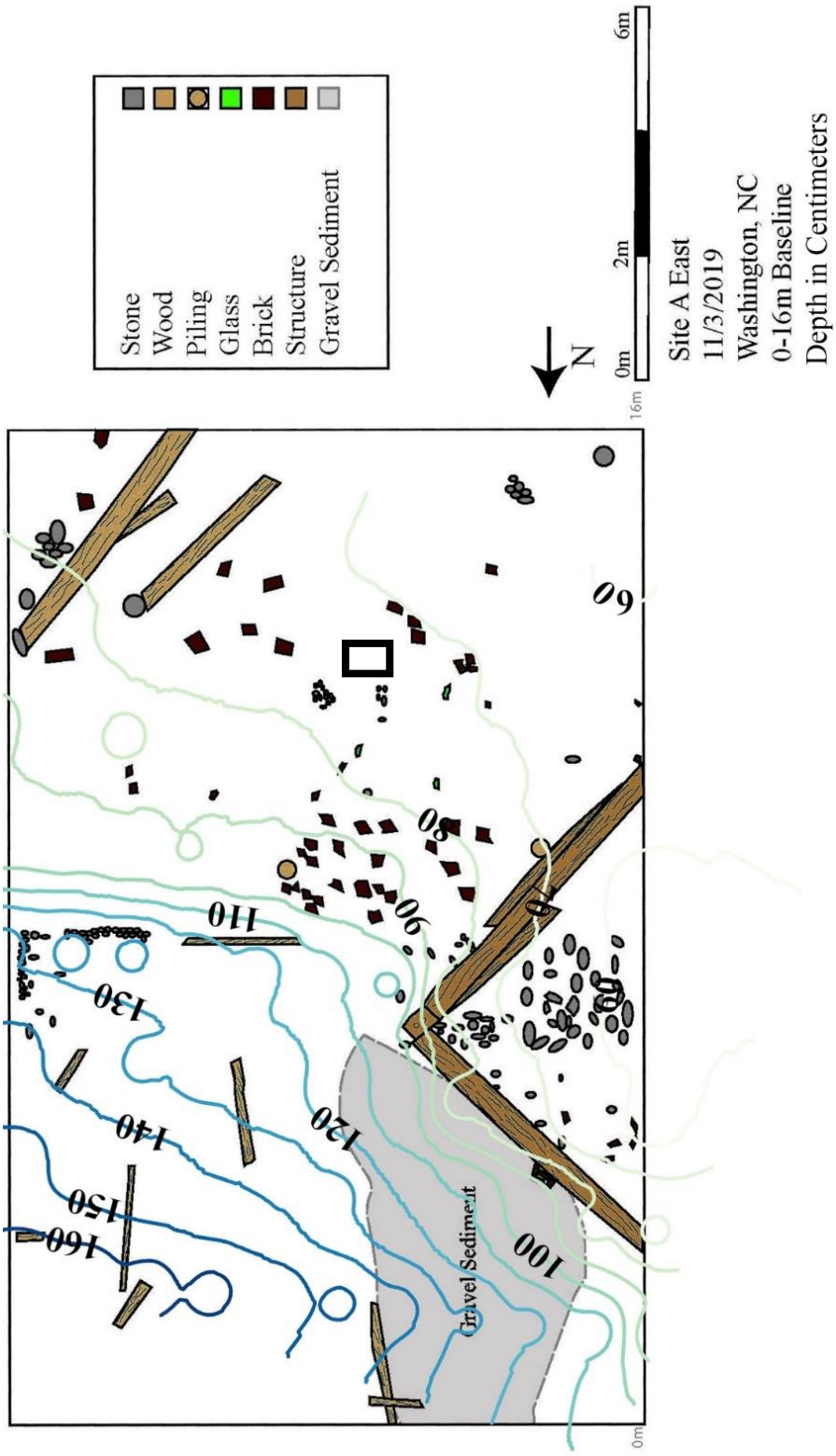


FIGURE 64. Site A East site map. Image by Will Nassif.

FIGURE 65. Glass fragment recovered from Site A. (Photo by Will Nassif, November 2019)

Analyzing the site, starting with the structure, the archaeological record indicates that it is a crib/cobb wharf hybrid. Molly R. McDonald defined crib wharfs as having perpendicular alternating horizontal headers and stretchers in addition to "containing floors to help retain the cobbles, gravel, and other types of fill within them" (McDonald 2011:42). Cobb construction, on the other hand, "refers to a framework of headers and stretchers forming a cell or crib unit… constructed of either squared timbers or logs in the round" (McDonald 2011:43). Furthermore, she claims that cobb wharves needed larger fill, ballast and cobble, in order to weigh down the structure (McDonald 2011:43).

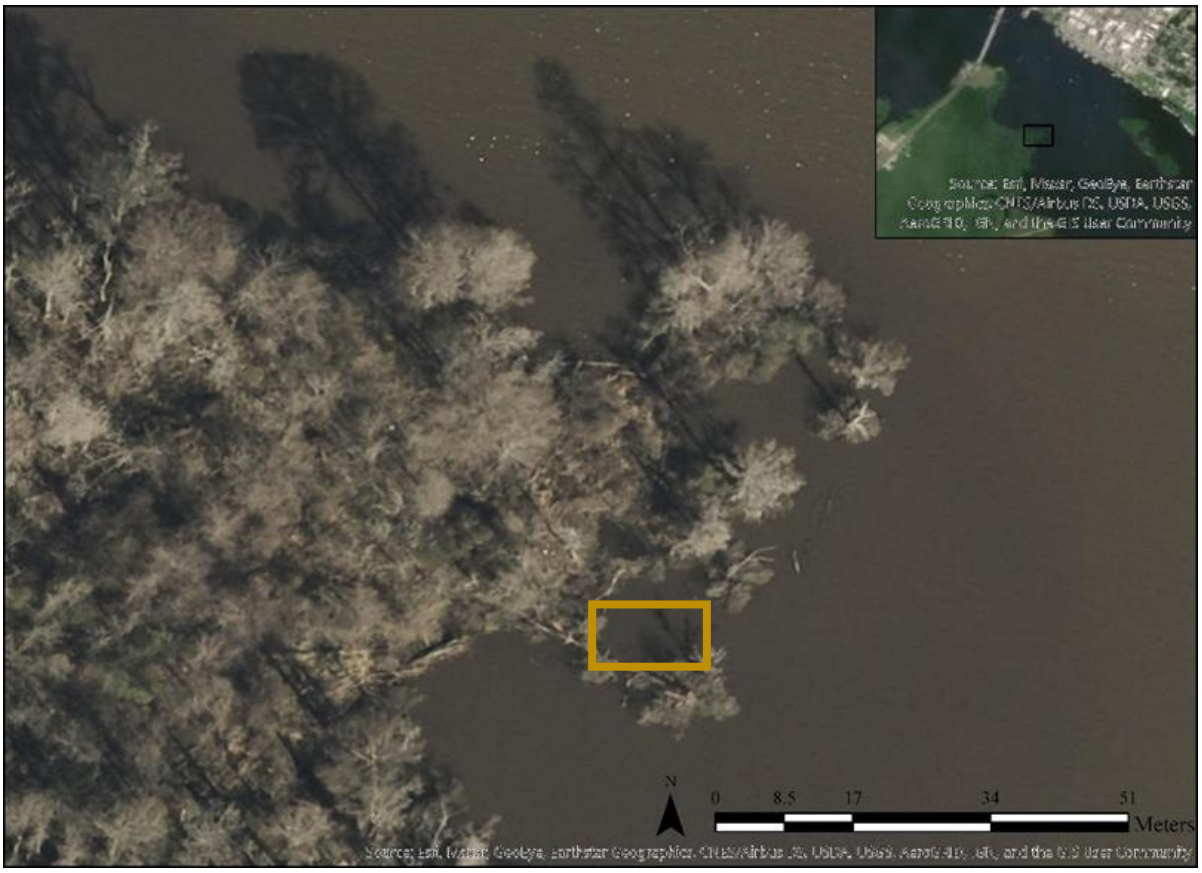


FIGURE 66. Map depicting the approximate location of barrel heads and staves photographed. Rectangle added by author.

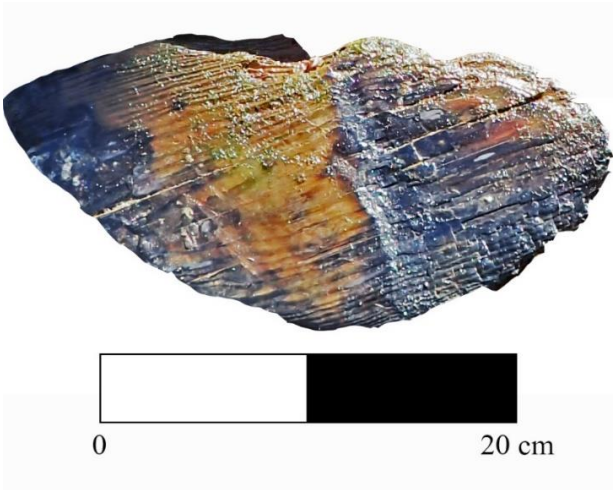


FIGURE 67. Barrel head fragment from Site A. (Photo by Will Nassif, November 2019)

FIGURE 68. Barrel head fragment from Site A. (Photo by Will Nassif, November 2019)

FIGURE 69. Barrel stave from Site A. (Photo by Will Nassif, November 2019)

FIGURE 70. Barrel stave fragment from Site A. Note the notching on the left where the stave would be 'fitted' to the barrel head or another part of the barrel. (Photo by Will Nassif, November 2019)

The survey found an extensive amount of brick, cobble, and, clearly, ballast stones. Ballast stone discovered here were significantly larger and heavier compared to the cobble found alongside them. These materials did not float down river and snag on the natural point on the shoreline, they were intentionally placed there. The ballast stones are not naturally occurring or formed in this region of North Carolina. Often, Washington merchants would dispose of their old ballast stone along the shore and it would be used for a variety of alternative purposes, like the construction of houses or retrieved to be used as ballast in another vessel. Litchfield states that Washington's wharves and docks were filled with "dirt from northern ports and foreign countries" (Litchfield 1976:232). It may be interpreted that discarded ballast stone and brick also became fill material in Washington's wharves.

The bricks discovered at Site A did not have any identifying features. Without manufacturing marks or signatures, it is difficult to attribute a manufacturing date or period. Karl

Gurcke states that “until the late eighteenth century, bricks were predominately made by hand. By the mid-nineteenth century, however, the main kinds of brick machines in use today had already been invented and were in use, and at the beginning of the twentieth century, machines could virtually eliminate all aspects of the industry” (Gurcke 1987:106). Comparing the bricks unearthed at Site A against those found at the Fowle Mill, the former appears misshapen and non-uniform. This seems to imply handmade manufacturing, or a preliminary attempt at machine manufacturing.

Another aspect of this shoreline feature was the presence of layered wood beneath the sediment in the survey area and elsewhere around the site. McDonald referenced earlier wharf studies which mentioned crib wharfs having “floors” to hold the fill within the lumber structure (McDonald 2011:42). During the survey, participants noticed that layers of plank existed beneath the river sediment. In some areas, visible planking was noticed through layers of mud (FIGURE 71). Wooden planks would have been readily available and inexpensive due to Washington’s expanding lumber industry. It also, according to McDonald, was a much simpler method of construction since it avoided using complex joins (McDonald 2011:50).

Lastly, the shape and size of the structure plotted with the Total Station aligns with later cartographic sources which portray the site as a rectangular peninsula complete with industrial buildings supported by it. The portion of the structure found during the Site A North section of the survey felt rounded, milled, and there was a significant increase in depth from inside the structure into the river. In the Site A East survey section, the timber formed a right angle where there was evidence of a mortise and tenon joint. Close examination of the joint revealed that the upper portions of the frame met and were fastened together with two pegs (FIGURE 72). Unfortunately, the survey did not discover any evidence of any wooden or metal fasteners there.

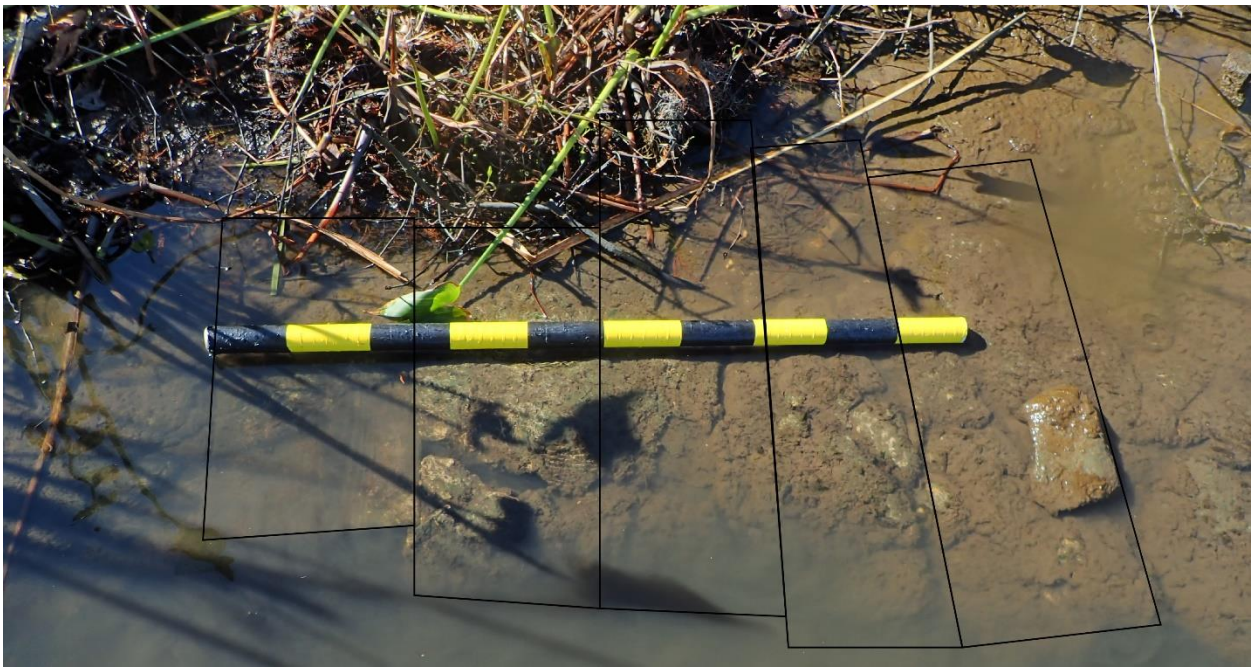


FIGURE 71. Planking buried beneath sediment at Site A. Rectangles added by the author to depict planking. (Photo by Will Nassif, November 2019)

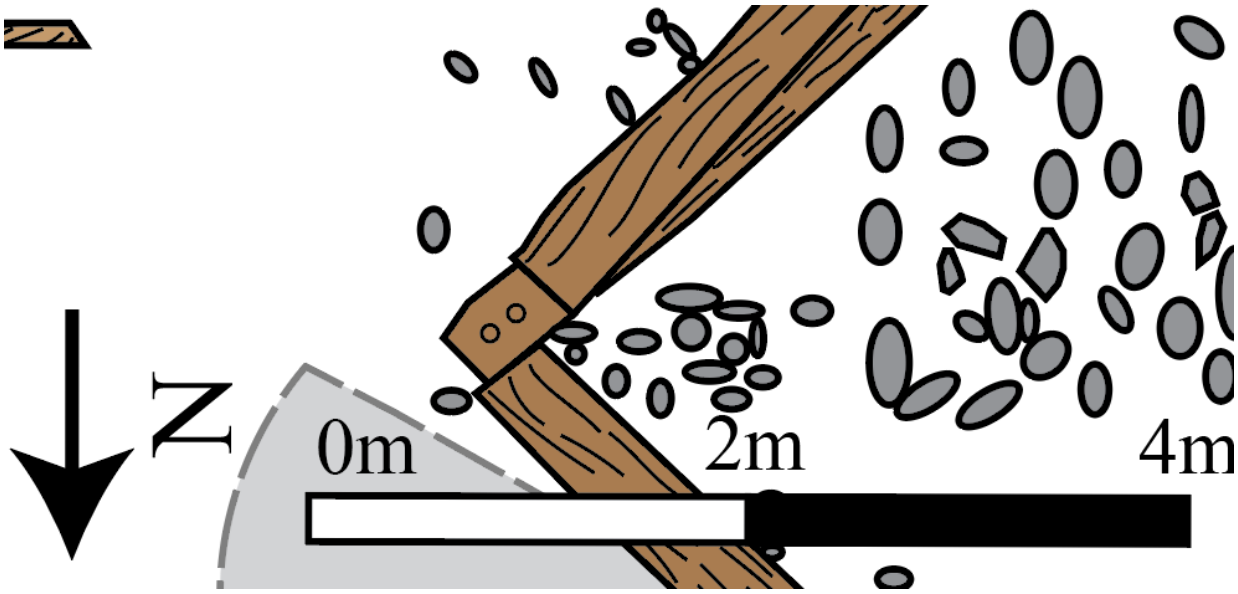


FIGURE 72. Enhanced image of structural joint from Site A East site map.

Considering all the evidence, this partially buried structure appears to have been involved, in some fashion, with the early economy of Washington. Newspapers and cartographic sources have referenced structures on the southern shoreline of the Pamlico River since the 1840s. The construction methods and material associated with the structure is consistent with other seventeenth- and eighteenth-century wharves (Hientzelman 1985; Norman 1987; McDonald 2011). Unfortunately, the lack of identifying historical documents means that it cannot be attributed to one industry or another. Nevertheless, due to the existing time parameters established through newspapers, cartographic resources, and the archaeological material, this structure appears most likely to be emblematic of Washington's agricultural past.

Historical records indicate waterfront structures being located across the Pamlico River from Washington as far back as 1845 (Worthy 1976:11). An article in the *Tarboro Press* promoting the business nexus of the Pamlico River referenced the presence of turpentine distilleries across the river from downtown (Tarboro Press 1845:1). Survey maps from the U.S. Coast Survey starting in the 1870s indicate a location on the southern bank of the Pamlico labelled 'wharf', but it is unclear as to what location that label specifically applies to (U.S. Coast Survey 1870, 1871). Locals have mentioned that this area corresponds with a historical ferry. The most indicative piece of cartographic evidence comes from an 1871-1872 survey map performed by the U.S. Coast Survey. Different from the map series mentioned previously, this series specifically focuses on the Pamlico River instead of the entire North Carolina coastline. The survey area has a clearly defined, rectangular waterfront structure, like other wharves defined on the downtown shoreline. Additionally, the map shows the land surrounding the point to be cleared of trees and vegetation, in contrast to how the point is today. Unfortunately, the

point has no defining labels besides ‘windmill,’ which does not indicate any industry or ownership (U.S. Coast Survey 1872) (FIGURE 73).

In conclusion, the site appears to have been a cobb/crib wharf hybrid functional between the 1840s and 1872. The wharf cribbing, the headers and stretchers, remain and were illustrated in the Site A East Site Map (FIGURE 64) and enhanced (FIGURE 72). Cobb can refer to the “the use of cob or cobblestones to sink the timber cribs” (Small 1941:3). The structure may very well have been altered and improved over time, but archaeological evidence of said alterations or improvements were not discovered during the site survey. These dates correlate to the earliest recorded instance of industry and structure along the southern shore of the Pamlico River and the latest cartographic resource of industry there. Archaeological data, the articulated structures, bricks, and ballast stone, indicates the construction material and methodology used to construct the cobb/crib hybrid structure. Bathymetric data bolsters the archaeological evidence by showing a significant drop in depth on the river side of the structure compared to the overgrown, terrestrial portion of the landing site, as evident in both the Site A North and South and Site A East site maps. It is unclear, however, what specific industry utilized the location, as well as what contributed to the abandonment of the site. Beyond the archaeological material mentioned earlier, no industrial footprints or remains are present within the site. There is no indication as to what happened to the windmill referenced below. Due to the abandonment and deterioration of the site, the waterfront structure and the industrial buildings once present there, it is reasonable to assume that construction material was salvaged for use in later construction projects along Washington’s waterfront.

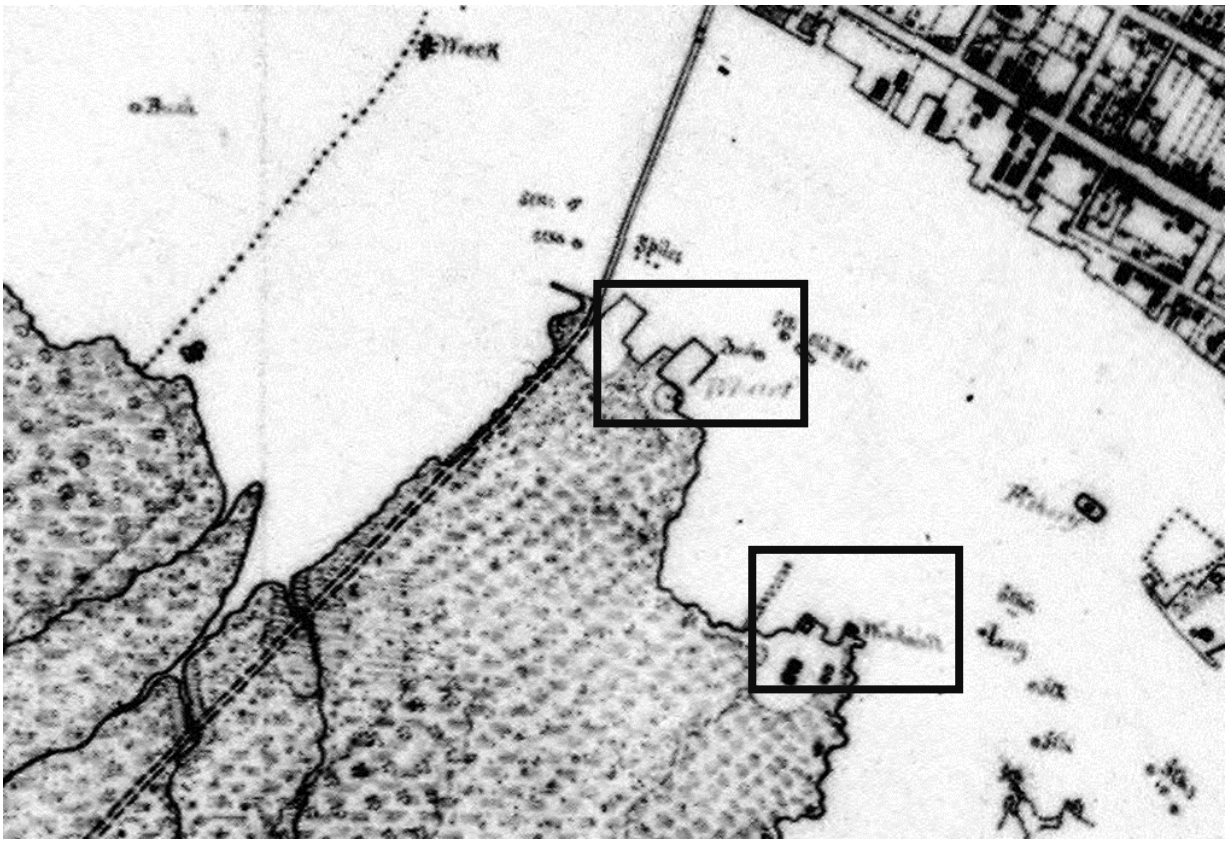


FIGURE 73. Enhanced imagery from 1871-1872 U.S. Coast Survey Map. Note ‘windmill’ in bottom right hand corner at Site A and ‘wharf’ at S.R. Fowle & Son Sawmill, denoted by black rectangles. (U.S. Coast Survey 1872)

S.R. Fowle & Son Company Sawmill

Incorporated in 1892, the S.R. Fowle & Son Company Sawmill was constructed adjacent to the historic Pamlico River Bridge, now the modern NC Highway 17 Business Bridge, on a location that had been previously utilized for unknown commercial activity (Department of Labor and Printing 1911:39). Presently, nothing can be seen of the terrestrial component of the complex and the modern shoreline is bulkheaded along the entirety of this portion of the southern Pamlico River. Much of the historic infrastructure may be buried underneath the

sediment and brush, but, unfortunately, this study did not seek to confirm any infrastructure was still present. During the construction of the oil storage facility and sale of the sawmill equipment, mentioned later, much of the industrial footprint would have been removed or buried underneath the modern vacant lot. Fortunately, two sets of piling structures are visible at periods of low tide and river blowouts. These two structures, and the riverbed which they were embedded in, became the central focus of the archaeological investigation of this site (FIGURE 74-76).

FIGURE 74. Map depicting the extent of Site B, the S.R. Fowle & Son Company Sawmill. Black rectangles indicate the location of the two pier structures. Green rectangle indicates survey area. Inset shows site's location within Washington harbor. Shapes added by author.

FIGURE 75. Western pier structure at S.R. Fowle & Son Company Sawmill. (Photo by Will Nassif, March 2020)

FIGURE 76. Eastern pier structure at S.R. Fowle & Son Company Sawmill. (Photo by Will Nassif, February 2020)

The primary objective of this survey was to discover the location of pilings beneath the waterline to determine where this structure began, as well as how the river level changed over time. In the 160 m^2 survey zone, Site B North, seven pilings were located and recorded with the survey proforma (FIGURE 77). Embedded in the riverbed, these pilings had deteriorated to some extent and possessed little resemblance to their original form. Nine pilings closer to shore had diameters ranging from 16 cm to 22 cm at the riverbed. At the water's surface, these same pilings measured from 6 cm to 23 cm with varying degrees of degradation. No additional diagnostic features (such as fasteners or cross beams) were discovered on the pilings.

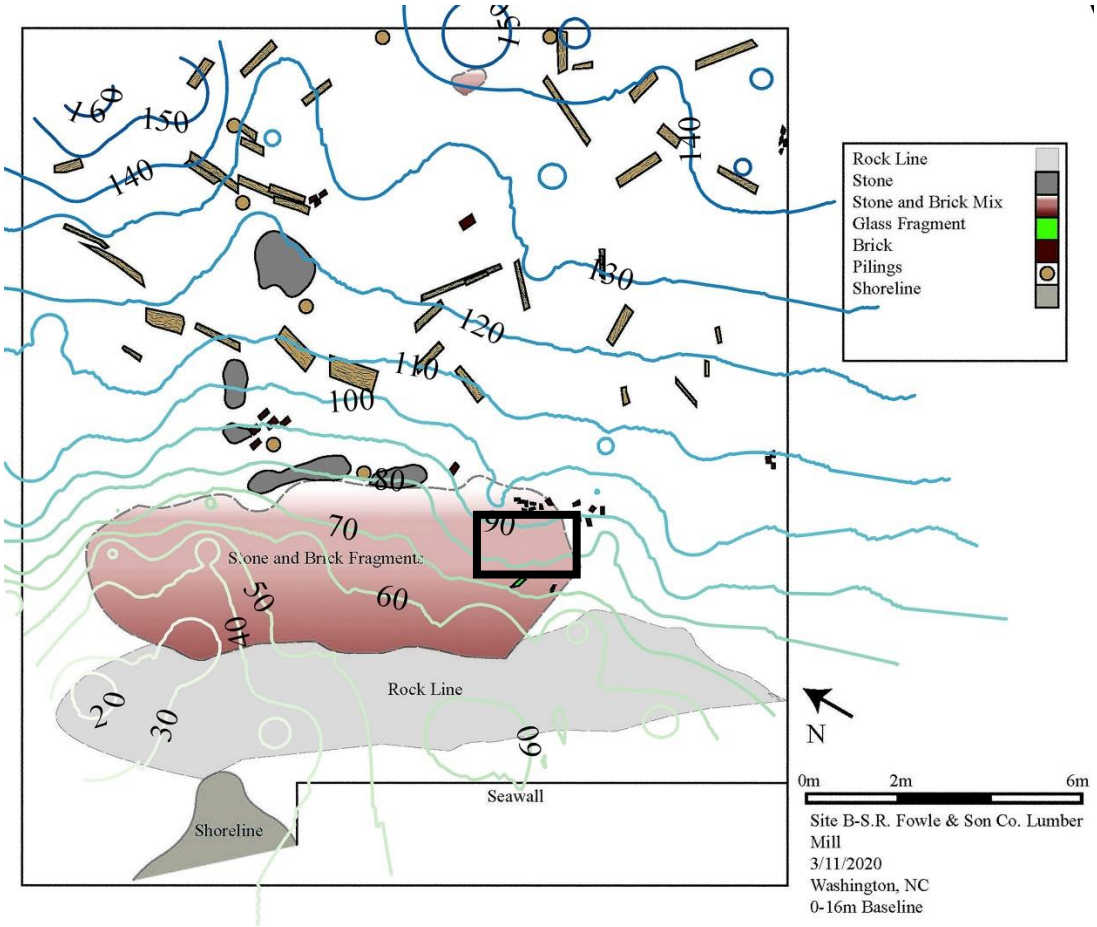


FIGURE 77. Site B site map

Little cultural material was revealed in the survey on the opposite side of Site B's baseline beyond scatters of brick and stone. A single grass fragment was found embedded in the riverbank but contained no descriptive features or markings, denoted by the black rectangle in the site map above. Approximately .5 m in front of the bulkheaded shoreline, a large rock/concrete formation ran parallel to the shoreline the length of the baseline. This became a major hindrance during this portion of the survey since it obscured much of the cultural material and made snorkeling and wading hazardous.

Further east down the southern shoreline, additional pilings are visible alongside two more modern structures. Hidden beneath the waterline, except during river blowouts, these pilings seem inconspicuous and are often obscured during periods of high tide or murky conditions. Upon closer examination, these pilings extend into the river and share similar characteristics to those found near the bridge. In terms of diameter, of twenty-nine pilings closest to shore labelled P1-P30, they range from 17 to 20 cm at the base. Additionally, these pilings have deteriorated to some extent and are embedded deep into the fine silt sediment. Furthermore, the distance between pilings along a vertical axis, extending into the water, ranges from 3.6 m to 4.83 m. Horizontally, the distance ranges from 1.53 to 1.94 m from piling to piling.

Furthermore, many of these pilings still possessed horizontal beams securely fastened to them. These were present among the last seven sets of pilings sampled. The beams retained their original form reasonably well and ranged in length from 2.31 to 2.5m. Other dimensional measurements include width ranging between 16 and 20 cm and height ranging between 13 and 18 cm.

Fasteners were only noticeable on the eastern set of pilings. The heads are flush with the fasteners' shaft and have a diameter of 2 cm (FIGURE 78). From the head of the fastener down

the shaft 6 cm, the fasteners are tapered and resemble a modern screw (FIGURE 79). For most of the identified pilings, these fasteners protrude from the piling and remain exposed in the river (FIGURE 80). As mentioned before, many pilings further out from the shoreline still have a horizontal timber attached to them with the iron fasteners.

FIGURE 78. Fastener head from eastern pilings at Site B. (Photo by Will Nassif, July 2020)

FIGURE 79. Tapered fastener from eastern pilings at Site B. (Photo by Will Nassif, July 2020)

FIGURE 80. Piling and fastener from eastern pilings at Site B. (Photo by Will Nassif, February 2020)

A key technological observation from the S.R. Fowle & Son Company waterfront was the presence of more modern brick material. It is difficult to correlate the brick to the pier system there, but the physical characteristics of the brick provide a time signature. Almost all the brick scattered throughout the site were intact and had perforations on both heads of the brick (FIGS). Karl Gurcke determined that "the perforation of bricks appears to be a nineteenth century phenomenon that went hand in hand with the invention and perfection of the stiff-mud auger machine" (Gurcke 1987:42). Perforations, or other depressions, in the brick provided a "key" for the mortar to set in to during construction (Gurcke 1987:42). One of the archaeological bricks still had mortar attached to it (FIGURE 81-84). Pile-platforms could have been supplemented with cobble, ballast, and other material fill along the riverbed to anchor the sediment in place, yet this seems unlikely for this site.

FIGURE 81. Brick photographed at Site B. (Photo by Will Nassif, July 2020)

FIGURE 82. Brick photographed at Site B. (Photo by Will Nassif, July 2020)

FIGURE 83. Brick photographed at Site B. (Photo by Andrea Yoxsimer and Darby Robbins, August 2020)

FIGURE 84. Brick photographed at Site B. (Photo by Will Nassif, July 2020)

Considering the ferrous fasteners, secondary literature lacks consensus on the classification and description of similar iron materials. Terminology for these materials range from drift bolt, from the 1930s, which referred to a "bolt with a body or shank either of circular, octagonal, or square form and with a tapered point that does not pass right through the timbers being fastened" (McCarthy 2005:132). The survey of the Florida Bronze Pin wreck discovered additionally referred to several iron fasteners as drift bolts, which had been "driven into an augured hole, not directly into the wood" (Shefi et al. 2009:21). The construction of the Bangor & Aoostook Railroad in Maine also utilized the drift bolts to secure longitudinal members and other supports to the submerged pilings. Ralph H. Rockwood mentions that "outside of each of the outer piles, spruce fender piles were driven and drift-bolted to the caps. On the outer end of the stringer was drift-bolted a 12 by 12-inch hard pine cap and outside of this, resting on the top of the fender piles, and flush with the cap sill, was placed an 8 by 10-inch hard pine fender cap, which was drift-bolted to the fender piles and to the cap sill" (Rockwood 1906:543). Others have

historically referred to similarly functioning objects as simply bolts or pins (McCarthy 2005:178).

The plot of land which became the Fowle Mill had, according to historical maps, two rectangular wharves (see earlier Figure). At some point between 1872, its first appearance on the U.S. Coast Survey map and 1892, the incorporation of the Fowle Mill, these were removed and replaced with two piling platforms. The first full cartographic depiction of these two pile platforms is found in the 1901 Sanborn Insurance Map. The two piers had no descriptive features or terminology beyond labelling the river beneath them 'log boom' (Sanborn Insurance 1901:3) (FIGURE 85). By 1916, the structure closest to the Pamlico River bridge received the label platform on piles, while the eastern structure was described as a lumber shed built on piles (Sanborn Insurance 1916:7) (FIGURE 86).

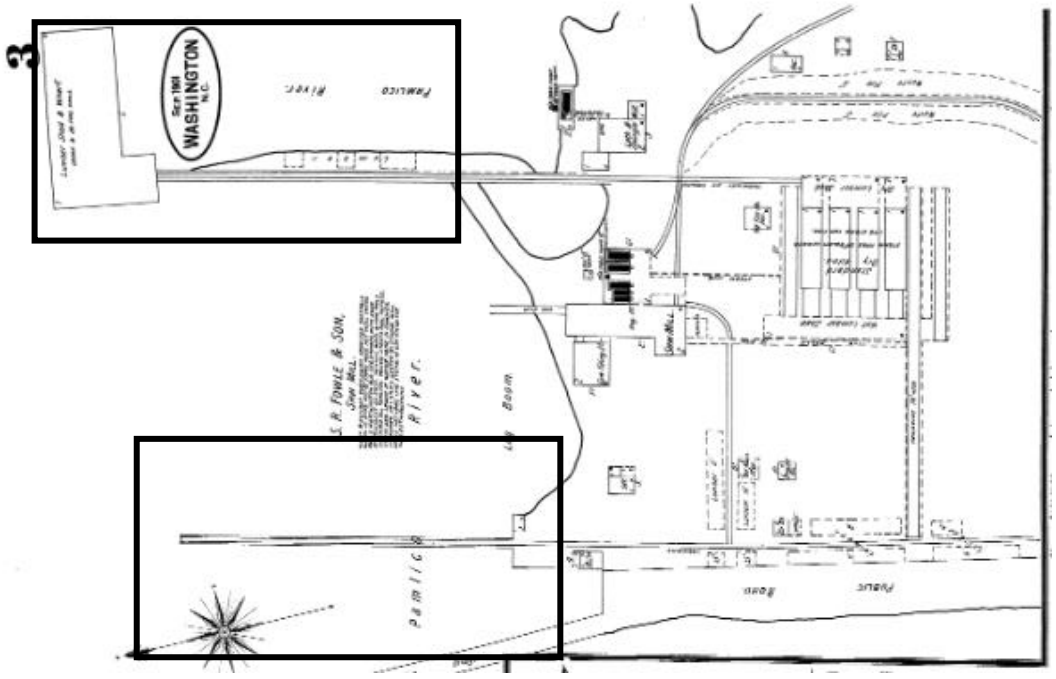


FIGURE 85. S.R. Fowle & Son Company Sawmill. Rectangles added by author (Sanborn-Perris Map Co., Limited 1901)

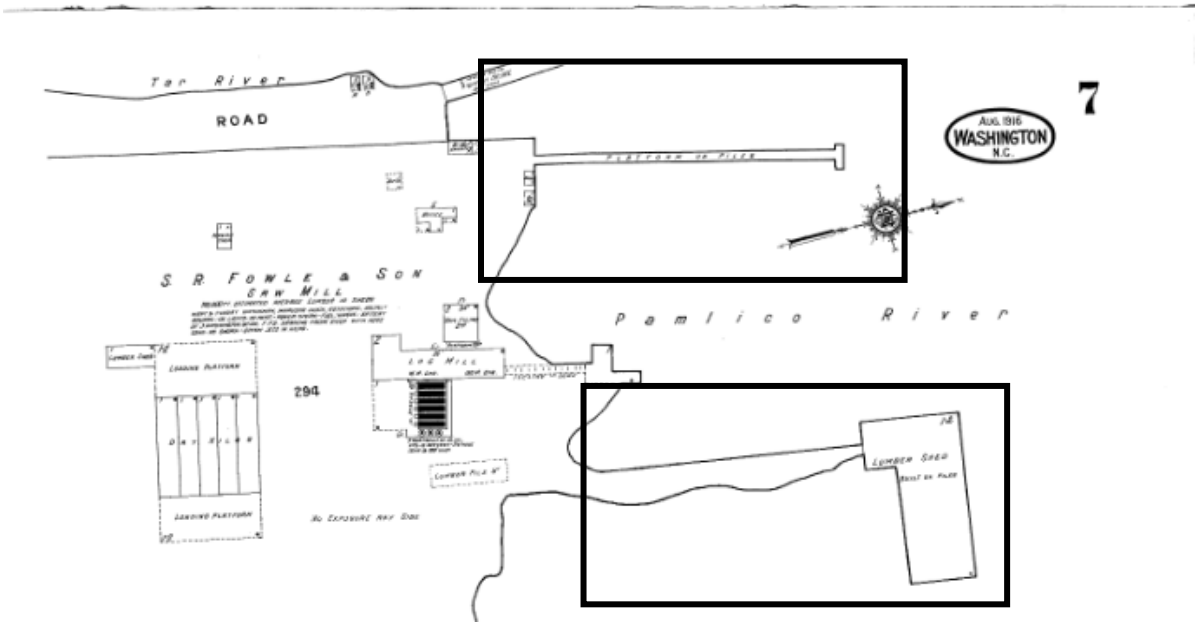


FIGURE 86. S.R. Fowle & Son Company Sawmill. Rectangles added by author. (Sanborn Map Company 1916)

Joseph Norman describes pilings as "columnar members which are drive vertically, or near vertically, into the ground to form a foundation for construction purposes or to act as a barrier against horizontal forces" (Norman 1987:17). He classifies pilings into two groups; sheeting piles which would be used for perimeter purposes, such as those used in coffer dams, and heaving piles to support material erected on top of them (Norman 1987:17). At first glance, these piling structures align more with Norman's description of heaving piles. The archaeological record certainly supports that notion, since many of the eastern pilings still have their horizontal component attached to them. An understanding of how timber would be floated down the Tar River to the Fowle Mill, as well as the labelling on the 1901 Sanborn Map, point towards these two piling platforms forming a basin, log boom, which raw timber from upriver could be stored for processing later. Even the shoreline survey discovered large quantities of

lumber, logs, and other debris which had gotten snared within the remnant structures. Even in such a dynamic environment, cultural material and debris would be anchored in place thanks to the placement of the two piers.

Carleton Greene noted the advantages of erecting pile platform structures. First, wooden pilings were an inexpensive alternative to constructing a crib wharf or a more elaborate concrete reinforced structure (Greene 1917:9). That certainly applied to waterfront construction in Washington, since many lacked the capital resources to construct elaborate wharves or docks. Besides, lumber for pilings remained plentiful and easily obtained to be modified for such a purpose. Additionally, he claims that pile-platforms were;

> Usually the most advantageous in localities where the water is not too deep and the bottom is suitable for piles. It offers less obstructions to the free flow of water, sewage, and ice, does not materially affect the tidal prism, may be rapidly constructed, and may be readily altered, removed, or enlarged (Greene 1917:112).

The archaeological survey of these pilings did not uncover any evidence of cross beams or any other support structures. In simpler terms, these were just pilings embedded in the riverbank which, at one point, had horizontal beams which the platform planks attached to via fasteners. Compared to the relatively complex design and construction of a crib wharf, these piers were significantly cheaper and easier to construct. Furthermore, according to Norman's definitions, both Fowle structures can be considered heaving pilings.

In conclusion, these two pile-platforms structures appeared to be utilized by the S.R. Fowle & Son Company Sawmill during their operational history. The archaeological data is

reflected and confirmed in cartographic sources, like the Sanborn Insurance Maps. Additionally, archaeological material, like the brick, resemble late nineteenth century construction techniques. After its foundation in 1892, the mill operated continuously until it was abandoned by the 1930s, with a small hiatus in 1913 after receiving significant damage in a hurricane (Landsea et al 2012). The mill infrastructure was sold and relocated to Williamston during the 1930s (May 1976:340). Between its abandonment and its eventual sale, the plot of land adjacent to the NC HWY 17 Business Bridge came to be utilized as an oil storage facility. The oil company constructed their own waterfront facilities, which presently remain alongside the historic sawmill facilities (FIGURE 87).

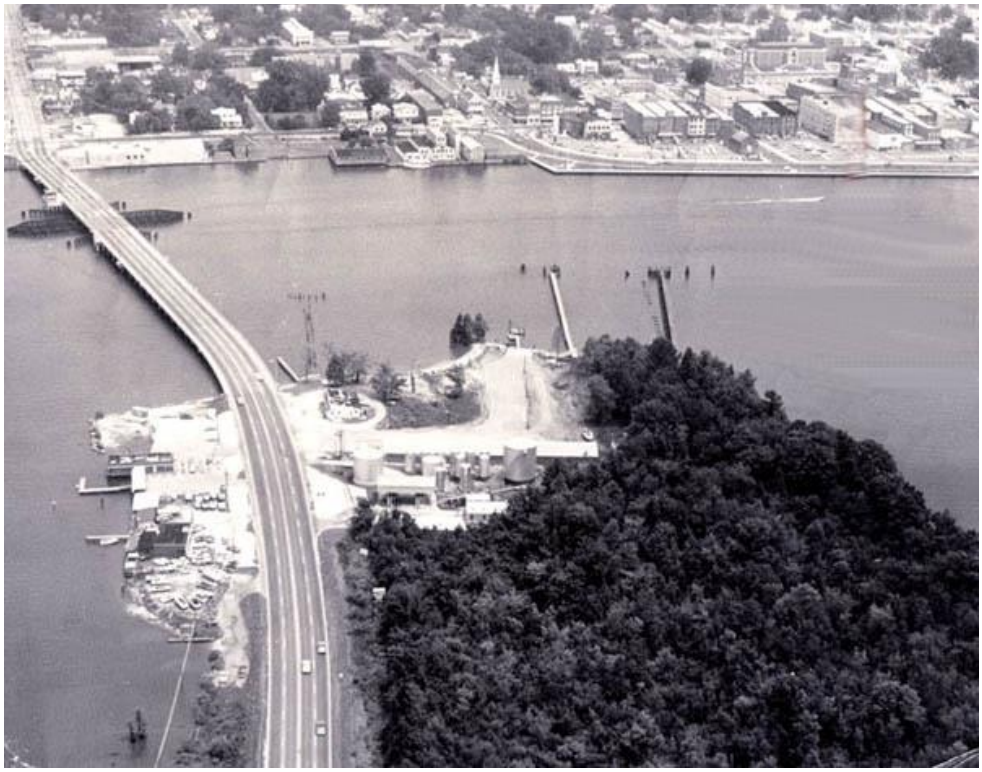


FIGURE 87. Aerial photograph of the Oil Storage Company facility. (http://www.beaufort-county.com/Washington/washingtonariel.htm)

Eureka Lumber Company Log Pool Island Structure

The final site is located along the northern shore of the Tar/Pamlico River approximately .5 miles from downtown Washington. In the waters directly in front of the modern Washington Harbor neighborhood remains the foundations of the Eureka Lumber Mill log pool (FIGURE 88). Adjacent to the contemporary marina can be seen many pilings and other infrastructure components of the large structure during low tide. Unfortunately, very little of these remains are visible during normal conditions and conducting a similar shoreline survey to Site A and B was near impossible due to low visibility and potential hazards to divers (FIGURE 89-90). To offset these limitations, alternative data sources and methodologies, including sidescan sonar imagery and aerial photography, aided in examining the massive structure.

FIGURE 88. Map showing the extent of the Eureka Lumber Company log pool. Inset shows site's location within Washington harbor. Rectangles and arrows added by author.

FIGURE 89. Pilings from eastern extent of Eureka Lumber Company log pool. (Photo by Will Nassif, February 2020)

FIGURE 90. Central portion of Eureka Lumber Company log pool. Arrow added by author to indicate sampled pilings. (Photo by Will Nassif, February 2020)

During an August 6, 2020 survey, diameter measurements were obtained from sampled pilings on the northern and southern portions of the Eureka island structure. Again, measurements were taken at the base and the top of the pilings. Of the 20 sampled northern pilings, seen in the image above, diameters ranged from 18 cm to 29 cm at the base and 4 cm to 21 cm at the top, indicated by the black arrow below and the image above. The large variation of piling measurements at the top is due to some pilings suffering from significant deterioration. In contrast, the pilings on the river side of the structure had diameters ranging from 21 to 28 cm on the riverbed and from 17 to 20 cm at the top, indicated by the orange arrow below (FIGURE 91). Additionally, these pilings, in places, were buttressed by interior planking.

FIGURE 91. Map showing location of sampled pilings (orange and black arrows) and cultural material (black rectangle).

Four of the twenty-five pilings still had iron fasteners in various conditions. Many were bent and in various stages of corrosion. Fasteners on the northern pilings had diameters ranging from 2 to 3 cm, 16 of which had a diameter of 2 cm. On the southern pilings, four pilings had fasteners that were substantially larger and heavier than those found elsewhere in the site. Each had a diameter of 3 cm and one recovered fastener had a length of 50.5 cm, discovered within the black rectangle above (FIGURE 92-93). Many of the pilings, on both sides of the structure, had two fasteners embedded in them, potentially to reinforce the horizontal beams which formed the perimeter of the site.

FIGURE 92. Fastener photographed from Eureka Lumber Company log pool. (Photo by Will Nassif, August 2020)

FIGURE 93. Zoomed image of wrought iron fastener. (Photo by Will Nassif, August 2020)

The survey of the Eureka Mill also discovered evidence of plank flooring running beneath the fine sediment. In the center of the structure, a significantly larger piling was discovered, potentially a central support, with a diameter of 50 cm. Slightly buried in the sediment was what appeared to be a modern-machine cut flooring nail or a variety of plank spikes measuring 19 cm in length with a 2 cm diameter head (Nelson 1968) (McCarthy 1996, 2005) (FIGURE 94). Most interestingly, a piece of rail, potentially corresponding to the historic tramway once present on the historic structure measuring 2.24 m in length was discovered on the southern end of the structure submerged in approximately 1 m of water (FIGURE 95). These two items were discovered within the black rectangle on the figure above.

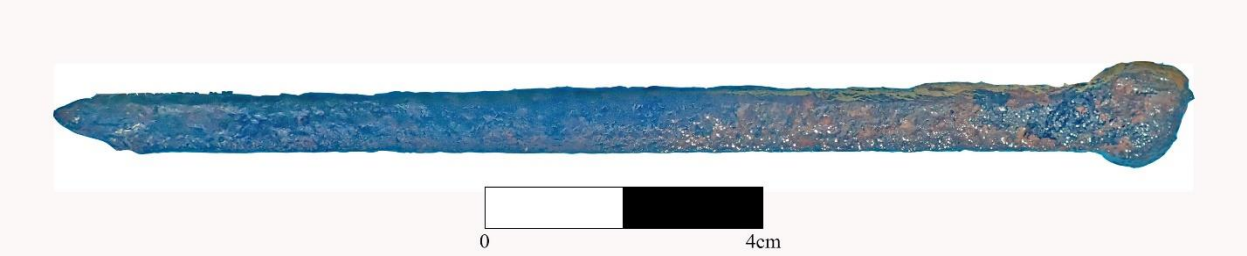


FIGURE 94. Nail photographed from Eureka Lumber Company log pool. (Photograph by Will Nassif, August 2020)

FIGURE 95. Rail line photographed from Eureka Lumber Company log pool. (Photograph by Will Nassif, August 2020)

Sidescan sonar imagery accentuated the physical remains of the Eureka Lumber Company log pool. Imagery reveals the overwhelming quantity of pilings, in addition to areas of lumber that appears to have broken away from the structure. Lumber spills are identified by the blue rectangle below. Furthermore, the sonar imagery clearly displays the piling plank buttressing along the riverfront pilings mentioned earlier, as evident by the gray arrow below. Lastly, the outline of the structure is succinctly presented along the entirety of the riverfront of the structure, as well as the area indicated by the green arrow (FIGURE 96). When compared to historical aerial imagery from the North Carolina Department of Transportation, the structure is clearly identified, indicates the significant infrastructure on top of the island, and demonstrates how it deteriorated over time (FIGURE 97-98).

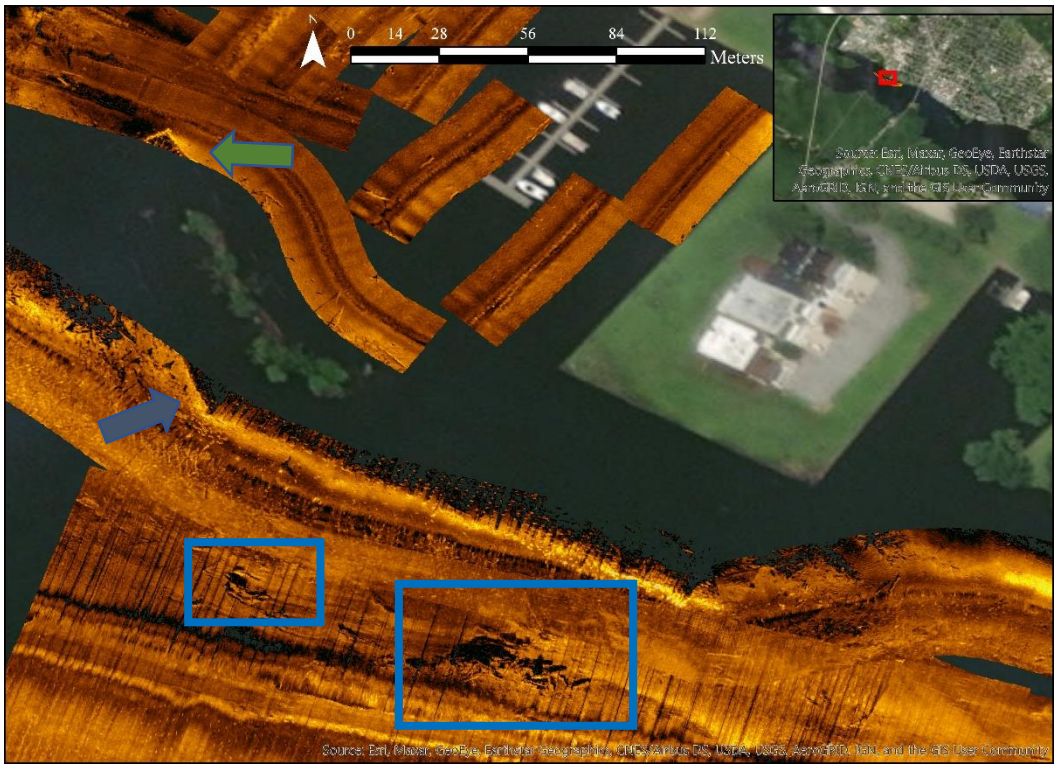


FIGURE 96. Sonar mosaic of the Eureka Lumber Company log pool. Arrows and rectangles added by author.

FIGURE 97. NCDOT aerial photograph of the Eureka Lumber Company log pool. (NCDOT 1959)

FIGURE 98. NCDOT aerial photograph of Eureka Lumber Company log pool. (NCDOT 1961)

The Eureka log boom, in comparison, was a more complex and elaborate structure than Site A and the Fowle piers. The structure first appeared in the 1901 Sanborn Insurance Map of Washington. The drawing details the tramway running from shore out to a lumber shed and wharf on the Pamlico River. Another tramway runs horizontally across the island structure, linking the one end of the island to another (Sanborn Insurance 1901:12). The eastern edge of the island was connected to the shoreline by a narrow, man-made isthmus, creating a basin which logs could be floated into the pool from the west.

Many of the pilings are visible at normal water levels, seen against the backdrop of the now overgrown island. During river blowouts, the true extent of the island is evident. Since the structure itself was much larger, those who built it opted for an increased number of pilings. Just as well, the island structure occupied a vitally different role than those further downriver. Not only did the island serve as a literal enclosure, it also supported significantly more infrastructure on top of it. Two tramways met to carry lumber to and from the storage shed and the sawmill on the riverbank. Additionally, it served as a wharf which barges and transports, such as *Minerva*, could load river for export to cities like Philadelphia (The Messenger 1902).

According to Greg Norman's classification of pilings, this pile-platform utilizes both heaving and sheeting piles. One the land side of the structure, pilings were found embedded in the riverbank without any support. In contrast, the pilings on the river side of the structure were substantially thicker and had buttressed, albeit deteriorated, planking behind them. This, in effect, created a coffer dam which encapsulated whatever material was employed to serve as the structures fill from spilling out into the river. The only variation between Norman's classification and the pilings discovered on the site would be that rather than the pilings themselves creating

the coffer dam through their close proximity to one another, those that built the structure chose to do so with additional material (Norman 1987:17).

Another crucial element of understanding the archaeological site are the many fasteners, and nail, discovered attached to pilings and submerged individually. The fasteners along the land side of the island structure closely resembled those at the S.R. Fowle & Son Company Sawmill pilings. Most had a diameter of 2 cm and still demonstrated their functional purpose, evident by many still supporting the horizontal beams that would have held up the structures' plank platform (FIGURE 99).

FIGURE 99. Western extent of log pool, showing horizontal beams secured to pilings by fasteners. (Photo by Will Nassif, February 2020)

All fasteners discovered at the site aligned themselves with the definitions of drift bolts mentioned beforehand. Archaeological literature regarding ship construction (McCarthy 2005:132,178; Shefi et al. 2009:21) and descriptions of other piling structures (Rockwood 1906:543) share a similar definition for metal objects which secure wooden pieces perpendicular to each other without exiting the other side. While the fasteners, or drift bolts, at the island structure share similarities, and in one instance appear larger than those elsewhere, with others discovered within the port of Washington, functionally, they are similar. These were driven through vertical wooden pilings and supported longitudinal pieces of lumber which created the perimeter of the island structure.

Lastly, the solitary identified nail potentially resembles Nelson's description of either a flooring nail or common nail, but substantially larger. The iron nail has rectangular sides and was rectangular in cross-section. Furthermore, Lee Nelson describes this category of nails as having "uniformly convex" heads on either side (Nelson 1968). More likely, however, the iron nail more closely aligns with Michael McCarthy's definition of a spike. He determined that spikes were square sectioned iron fasteners that were substantially larger than similarly constructed nail classifications. Furthermore, he stated that "the spike was to be driven with the edge of the chisel point across the grain and in light timbers…they are either driven flush with the timbers" (McCarthy 2005:176). The nail or spike discovered at the Eureka site closely resembles McCarthy's round-headed spike (McCarthy 1996:186) (**Error! Reference source not found.**). While only one was discovered at the site, it is not reasonable to use this as an identification of the site's construction.

Summarizing the site, the Eureka Lumber Company log pool became one of the larger structures created along Washington's waterfront. Incorporated in the year 1893, the Eureka

Lumber Company developed into one of the most productive lumber mills that utilized Washington's Pamlico River frontage (Bureau of Labor and Printing 1909:94). Louis Van Camp describes the mill as the "largest sawmill operation in Washington at the turn of the century" (Van Camp 2000). He noted that in 1956, the lumber conglomerate Weyerhauser purchased the facility and shut down operations a few months after their takeover. Most of the infrastructure on site, the sawmill, kilns, and other machinery was purchased in 1958 by Henry Griffin of Williamston or in 1975 to another mill in West Virginia (Van Camp 2000). This concludes that the lumber mill's operational life lasted from 1893 to 1956 and explains why much of the mill's terrestrial infrastructure is not documented on historical aerial photographs from 1959 and 1961.

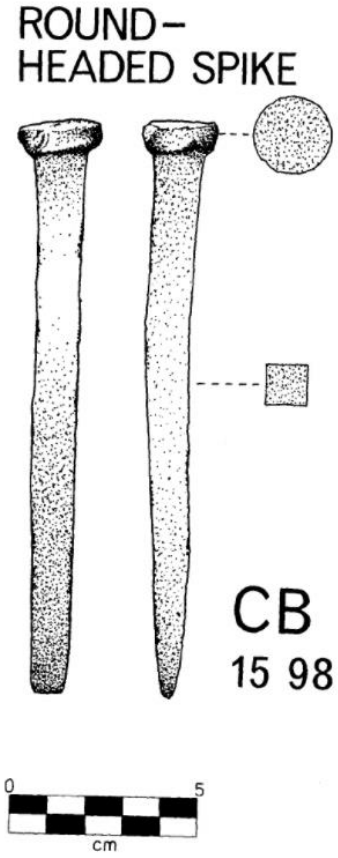


FIGURE 100. Round-headed spike. (McCarthy 1996:186)

Conclusion

This chapter presented each archaeological site chronologically in terms of their operational lifespan. The South Shore Landing Site, Site A, according to historical and cartographic sources was a functional, industrial center from the 1840s to 1872. The S.R. Fowle & Son Company Sawmill, adjacent to the modern Pamlico River bridge utilized two pile-platform piers from 1892 until the mill was abandoned and eventually sold in the 1830s. Lastly, the Eureka Lumber Company log pool became the nexus of one of Washington's largest lumber production center from its incorporation in 1893 until it was sold in 1956. Each site was described in its totality, its material culture analyzed according to archaeological literature, and given an operational lifespan. In the following chapter (Chapter 7), the results from the proceeding chapter (Chapter 5), as well as this one will be synthesized in order to describe the growth and development of the port of Washington.

CHAPTER SEVEN: ANALYSIS OF WASHINGTON'S NINETEENTH AND EARLY TWENTIETH CENTURY PORT ECONOMY

Introduction

The question remains on how to best blend multiple, diverse datasets to recreate or reimagine the once thriving port of Washington? Historical data from prominent individuals and businesses can explain the economic factors which facilitated the growth of the river port. Archaeological data from three waterfront sites reveals three similar, yet fundamentally different structures which played a role in the creating and sustaining economic growth. Without a unified theoretical approach to port studies, however, it becomes necessary to draw from multiple approaches to explain the way economic, technological, and other factors contributed to port development and expansion. Therefore, to answer the research questions posed earlier, a unique merger of archaeological and historical data with the theoretical concepts mentioned in Chapter 3 will be applied to Washington's historic port.

In his seminal study of England's ports, Gordon Jackson explains his observations on what caused them to construct newer facilities and expand. He states that "few ports have been able to cater for expanding trade without creating and altering facilities, and the history of ports is therefore one of regular and frequent change in physical environment, wealth, and relative standing" (Jackson 1983:11). The same can be said of ports across the world, especially at Washington. Individuals and their enterprises persisted throughout the port's operational history due to their ability to adjust and adapt to fluctuating economic factors. To better understand

Washington's growth, the historical focus should be directed towards these prominent firms and figures since they were more often able to capitalize on the economic trends.

As for archaeological data, each site possessed different construction features. Additionally, these become portals from which to understand how merchants, industrialists, and other individuals shaped the Pamlico River to suit their own needs. Archaeologists have noted the trends between economic trends and port facility technology through the archaeological record in ancient ports (Blackman 2008; Oleson and Hohlfelder 2011). Surely, the same observation can be made about these structures found along the Pamlico River. Certainly, each can be understood as more than technological items, to consider the "social implications of the work" (Rogers 2013:185).

This chapter is outlined as follows. First, the harbor relationships will be examined through the period of study. These relationships include those within the confines of Washington's harbor, intra-harbor relationships, and the role of Washington in the wider Atlantic trade market, inter-harbor relationships. Second, Washington's industry relationships will be examined based on the commodities exported from the port. These include how exports, specifically naval stores and lumber products, encouraged and supported the shipping industry as well as beginning to form specialized relationships with other local industries. Third, infrastructural changes along the waterfront will be examined according to historic economic trends. Each site will be discussed, placed, and analyzed according to the economic context during its functional life. Lastly, with these prior sections in mind, the chapter will conclude with an explanation of how the port developed and what encouraged construction along the periphery of the harbor.

Harbor Relationships

The historical record documents how port-dependent businesses worked, invested, and operated together throughout the period of study. Being a relatively small community, the same families often engaged in the same business practice, and with similar businesses, generation after generation. As such, these families' and firms' financial records offer insight into the overall economic development of the port of Washington, and how they achieved that together. This section will examine intra-harbor relationships in two distinct periods, before the Civil War and after the Civil War.

Intra-Harbor Relationships Pre-Civil War

Before the economic devastation wrought on Washington during the Civil War, the port had already established itself as one of the most important shipping locales in North Carolina. Within the port, the many industries coexisted, competed, and collaborated to sustain themselves. Through the historical sources consulted, the intra-harbor relationships focused on the Fowle family's mercantile offering.

After moving to Washington, the Fowles quickly engaged with the established mercantile community. Not only did they supply naval stores, shingles, staves, and other goods for export to other commercial centers, their daybooks and ledgers indicate they supplied those same products to their commercial rivals and dependents. Amongst the journal entries mentioned earlier, the Fowle journals indicate further business amongst the other prominent Washington families. The Grimes family, prominent farmers from modern Grimesland, purchased 1,200 shingles in two

installments (S.R. Fowle 1838b). The Marsh family, who often engaged in business with the Fowles, were frequently represented amongst the journal entries as well (S.R. Fowle 1838b). Other frequent entries include the Havens family, Tannehill & Lavender, and the Williams family (S.R. Fowle 1838b).

These trade relationships reflect the preliminary nature of commerce in Eastern North Carolina during early antebellum era. Shipping conglomerates, like the Fowles, brought in goods from New England, New York, and the West Indies, which were not available to the predominantly agricultural economy of North Carolina. Trade was centered on the river system, mostly because no viable overland transportation route was available at this time. As such, waterborne commerce through Washington, thanks to the prominent shipping families the Fowles, the Blounts, and others became the "life blood" of the local economy (Pashal 1976:5).

Considering the South Shore Landing Site, Site A, the true purpose and function of the landing remains shrouded in obscurity. What is clear, however, is that there are references to industry being present along the southern shoreline of the Pamlico River. The *Tarboro Press* (1845) references turpentine distilleries located on the southern shoreline opposite Washington. The U.S. Coast Survey's survey map (1872) recorded the point as a rectangular structure, with several small, nondescript buildings and a point labelled "windmill" (FIGURE 73). While these sources do not definitively state that this landing could have been the site of a turpentine distillery, the historical sources indicate an industrial presence there. Regarding the windmill, other turpentine distilleries made use of similar machinery to provide water to cool the heated sills. National Park Service publications have noted that an industrial complex containing a turpentine distillery constructed by John Avirett Sr. in Onslow County possessed a windmill for just that purpose (National Park Service 1989). The windmill once present at the South Shore

Landing Site could have fulfilled a similar purpose, drawing water from the Pamlico River in order to prevent overheating and fires.

As such, this site potentially formed a crucial component of Washington's early economy revolving around the production and exportation of naval stores. The South Shore Landing became either the repository for naval stores shipped downriver from producers along the Tar River, or one of the manufacturing locations of the prosperous naval stores industry. When examined within the context of the early S.R. Fowle business records, the relationship between the landing and the Fowle's Castle Island infrastructure is evident. The landing could serve as a storage for naval stores, or any other commodity, which permitted the Fowle's to use Castle Island primarily for their shipbuilding and shipping interests. Then, it became an important part of the intra-harbor economy which supplied naval stores, and other commodities, to local families such as the Havens, the Farrows, and the Marshes (FIGURE 101).

Inter-Harbor Relationships Post-Civil War

After the Civil War, the economic landscape of Washington modernized. Modernity arrived in the form of industrial manufacturing, improved steam capabilities, and, later, railroads (Reed 1962; Ellison 1976; Loy and Worthy 1976). While the port relationships from the antebellum era persisted and survived, there was greater participation in waterborne commerce because of an increase of shipping options, with shipping corporations becoming more prevalent along Washington's waterfront. While this can be attributed towards general population growth as well, both of Washington and Beaufort County, but also because more individuals and business interests found economic opportunity through the expanding port network.

FIGURE 101. Early trade network of Washington, NC showing the South Shore Landing Site in relation to Castle Island and other prominent individuals mentioned in early Fowle business records. Locations correspond to homes and businesses depicted in late-nineteenth century maps. (Sanborn-Perris Map Co., Limited 1885, 1891)

Planters and merchants contracted steamers to export their crop, which offered greater efficiency in shipping products up and down the Tar-Pamlico River. Rodman's cotton records highlight his relationship with the Old Dominion Steamship Company, which had purchased several vessels from the John Myers and Sons shipbuilding firm in 1872 (Litchfield 1976:231). Two receipts, dated 1/14/1873 and 4/10/1874, record his cotton shipment being borne on the steamer *Olive*, a vessel owned by the Old Dominion Steamship Company (Litchfield 1976:239; Rodman 1977). Once Rodman started to redirect his shipments to New York, the shipper was exclusively listed as Old Dominion Steamship Company or Old Dominion Line (Rodman 1977). Shipping arrangements existed during the first half of the nineteenth century, prevalent throughout the Fowle shipping records, but an increased steamship presence at the port allowed more entrepreneurs access to the regional and world market (S.R. Fowle 1817, 1838a, 1838b, 1849). By 1885, according to Sanborn Insurance Maps, the Old Dominion Steamship Company purchased waterfront real estate adjacent to J. Myer's and Son warehouse, permitting them direct access to the Pamlico River and permitting more efficient loading and unloading of goods at Washington. The Old Dominion Steamship Company's physical presence on the Pamlico River, however, did not prove to be a fruitful relationship for William Blount Rodman. The first year he conducted business with the Robinson Company agents, he made one shipment at the end of the year to Baltimore for a price of seventeen cents per pound of cotton (FIGURE 102).

In 1874, William Blount Rodman exported a significantly greater amount of cotton to Baltimore, with the final four shipments borne by the Old Dominion steamers *Olive* and *Pamlico*. Interestingly, the final two shipments only contained five bales of cotton, in comparison to the shipment on January 9th and November 6th, which carried 40 and 30 bales respectively (FIGURE 103).

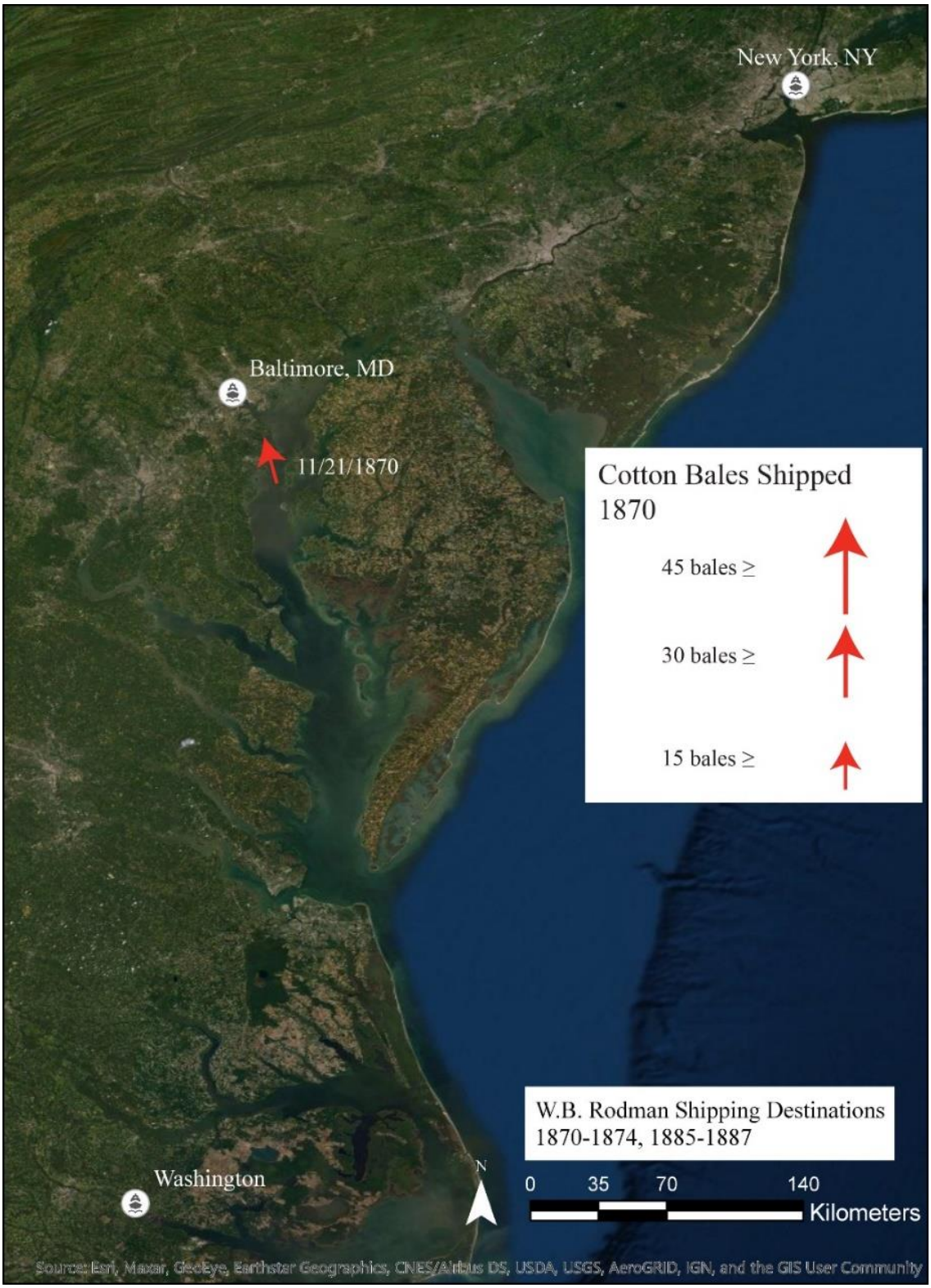


FIGURE 102. William Blount Rodman's cotton exports to Baltimore, 1870. (data from Rodman 1870)

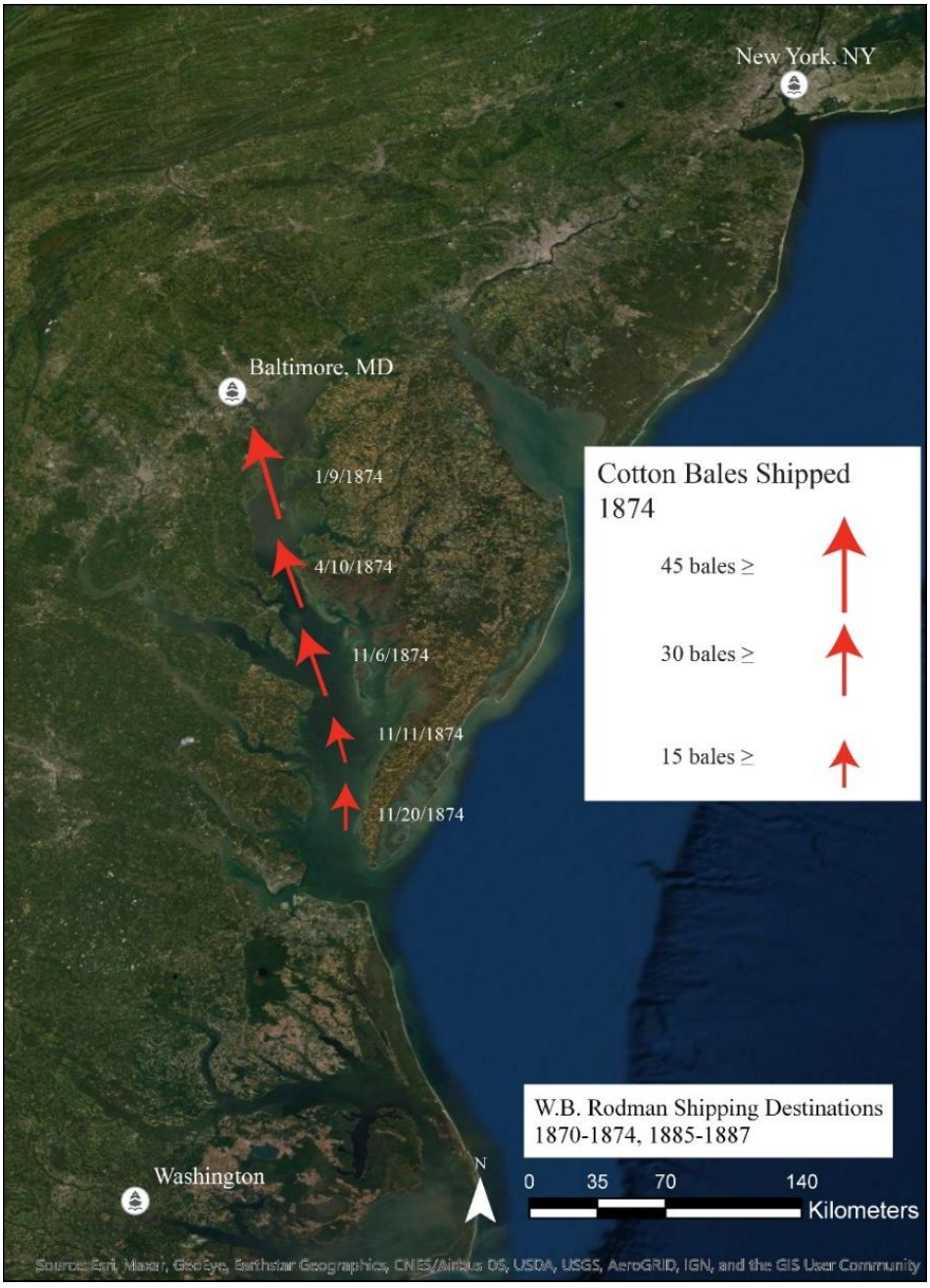


FIGURE 103. William Blount Rodman's cotton exports to Baltimore, 1874. (data from Rodman 1870

In 1885 and 1887, Rodman's cotton exports decreased in terms of the price netted per pound in the New York marketplace. Whereas his earlier shipments averaged approximately sixteen cents per pound of cotton shipped, his shipments to New York only netted approximately

10 cents per pound. Additionally, Rodman only shipped a total of 76 bales of cotton to New York compared to 269 to Baltimore, albeit with substantially less shipments (FIGURE 104-105).

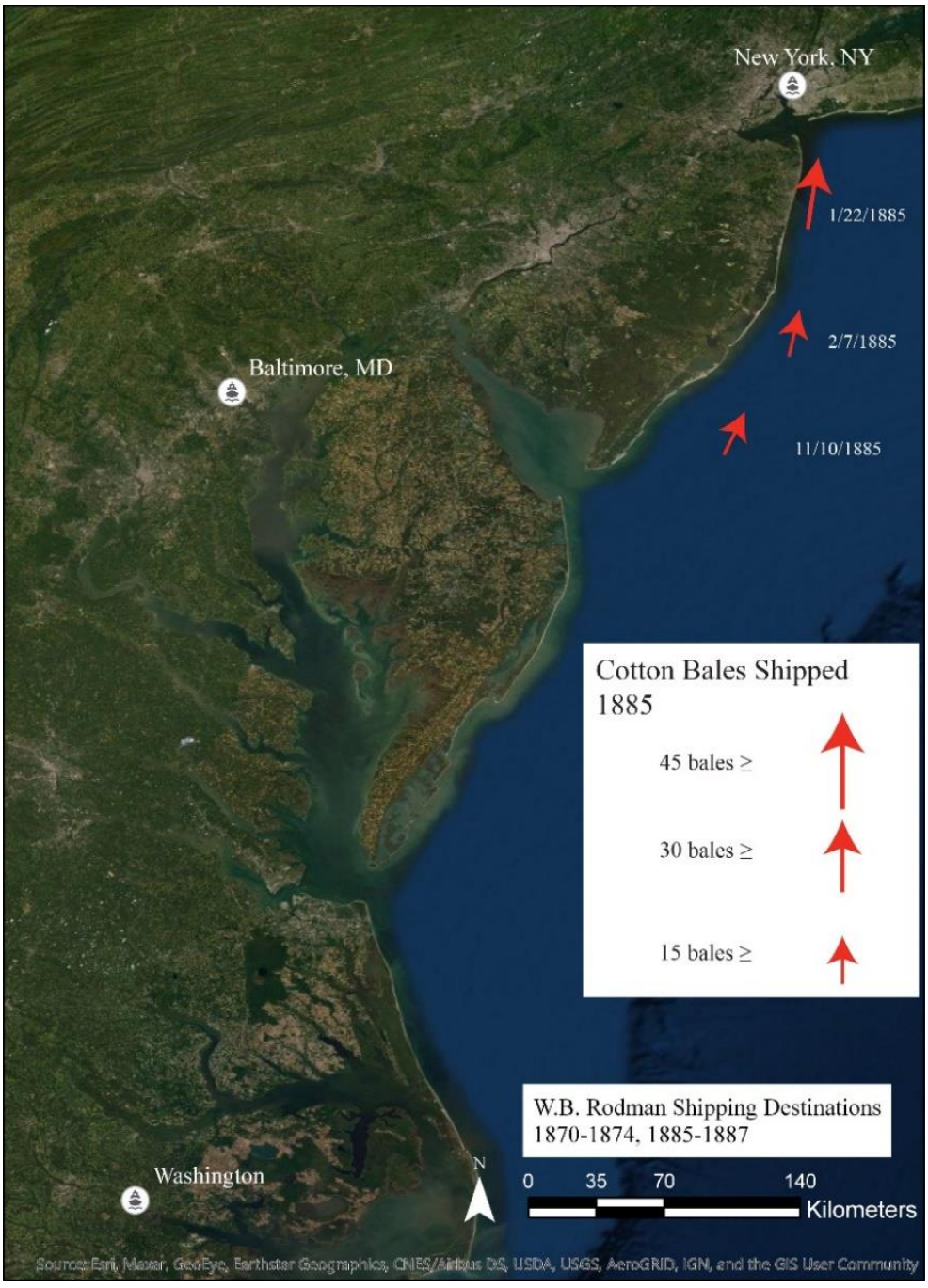


FIGURE 104. William Blount Rodman's cotton exports to New York, 1885. (data from Rodman 1870)

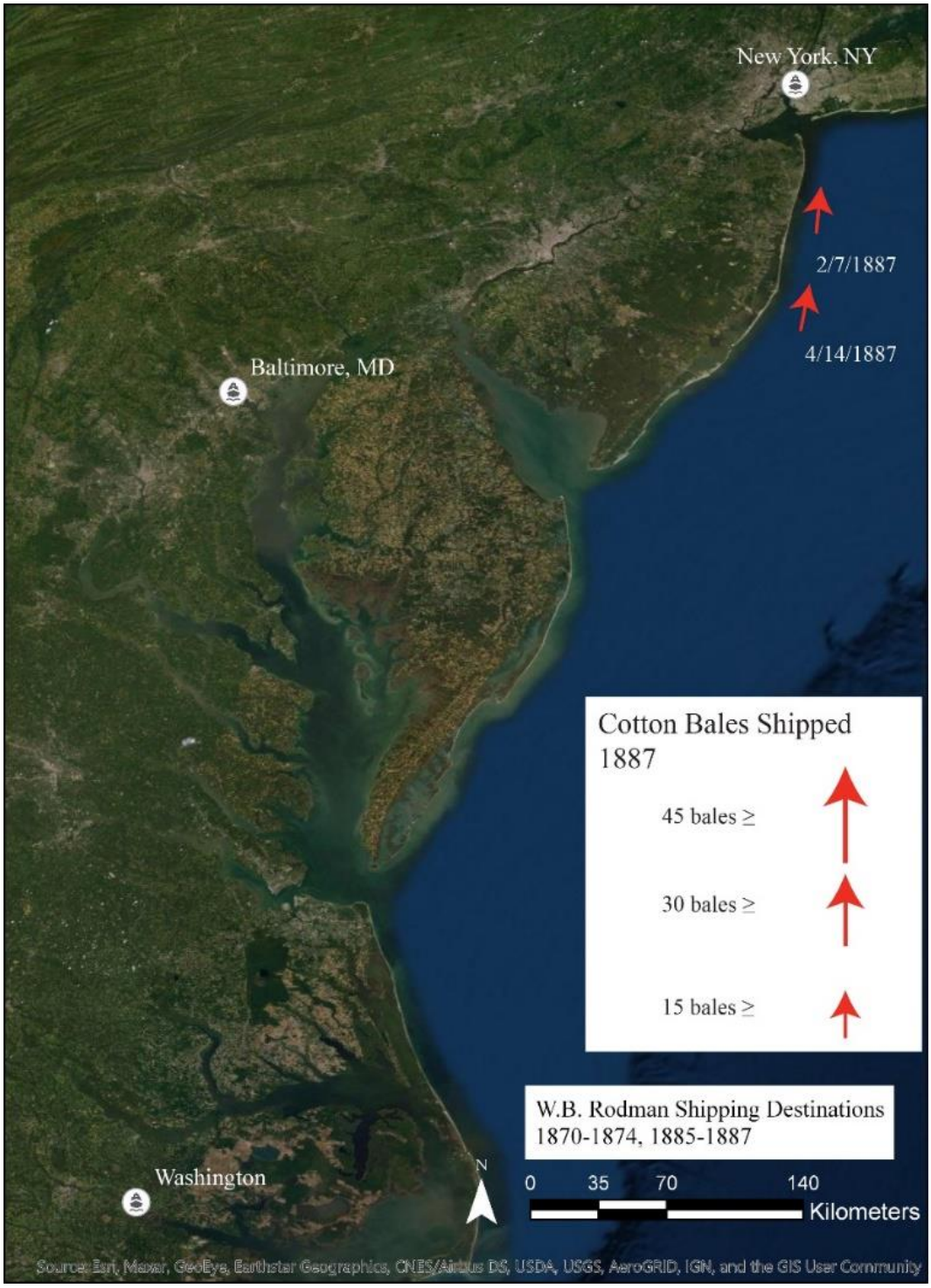


FIGURE 105. William Blount Rodman's cotton exports to New York, 1887. (data from Rodman 1870)

These records do not correspond to any of the archaeological sites surveyed for this study. As such, attempting to correlate these statistics to the sites investigated is impossible. The records do, however, indicate two things. First, the harbor network had been expanded to more people, thanks to more efficient waterborne transportation through steam travel. Rodman's transactions also signify a general trend away from shipping products like cotton and naval stores through small, regional ports like Washington when more efficient transportation means began to emerge.

Another example of the expanding port network is evident within the manifests of the Styron Transportation Company. Whereas Washington's early trade network had goods flowing to Washington and farmers, merchants, and other community members obtaining imported goods within the confines of Washington, steam transportation expanded the intra-harbor network. Now, communities, such as Gaylord, Mackleyville, Scranton, and Leechville, which had depended upon Washington since the town's founding could have necessary supplies and groceries brought to them in a speedy, efficient manner, rather than sailing or poling the Tar/Pamlico River to port. Even the S.R. Fowle & Son Company contracted with Styron Transportation to ship flour, coffee, and other items to Leechville on December 24, 1894 (FIGURE 106-107).

Conversely, *Aurora* enabled these smaller communities to utilize Washington's larger, interstate shipping services to export commodities like potash, as well as providing a larger market for fishing communities along the Pamlico Sound (FIGURE 108). Other imports to Washington include common items such as chickens, eggs, and even carriages which were excluded from the maps below.

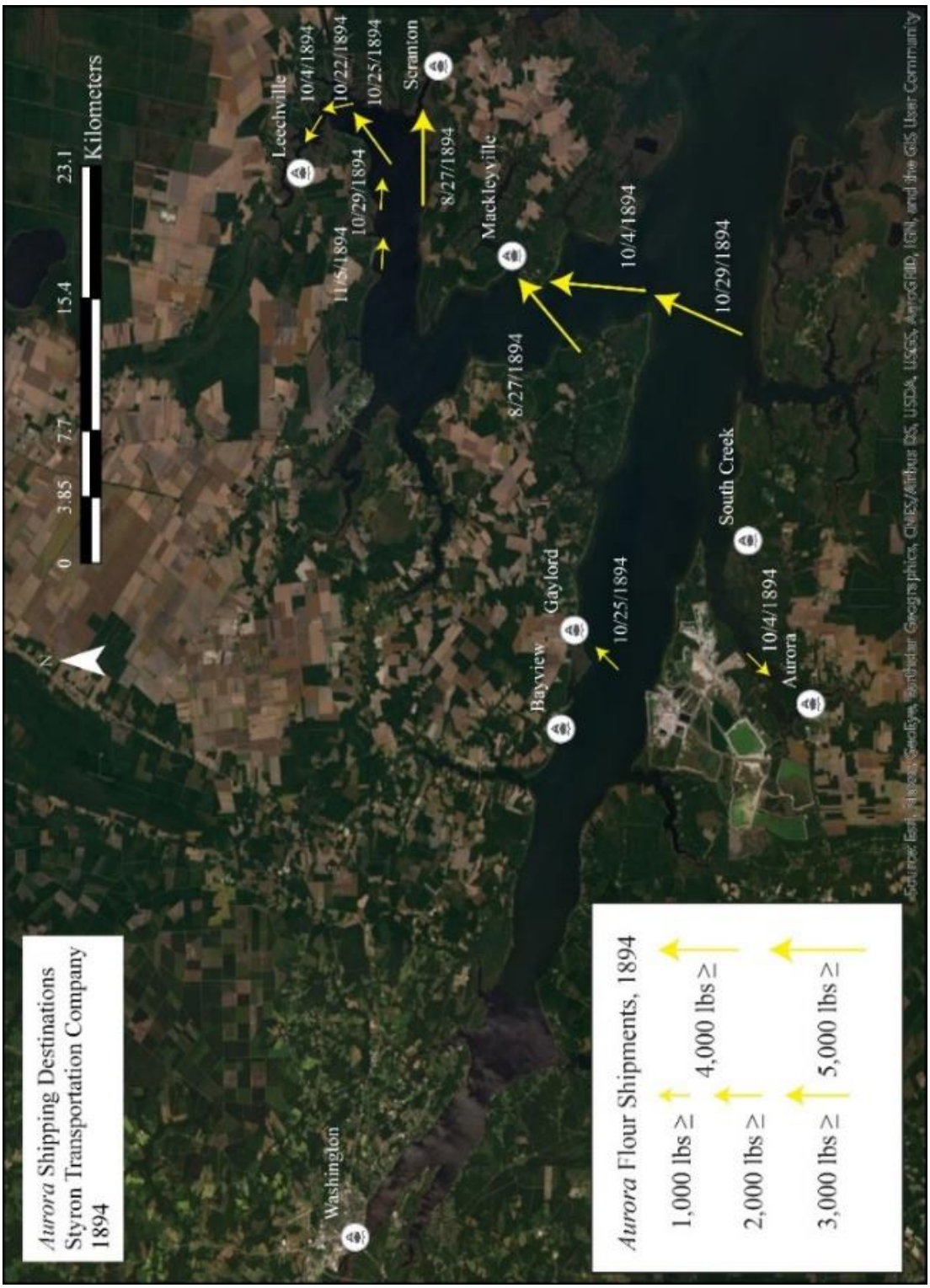


FIGURE 106. Aurora flour shipments to Pamlico and Pungo River communities, 1894. (data from Burgess 1894)

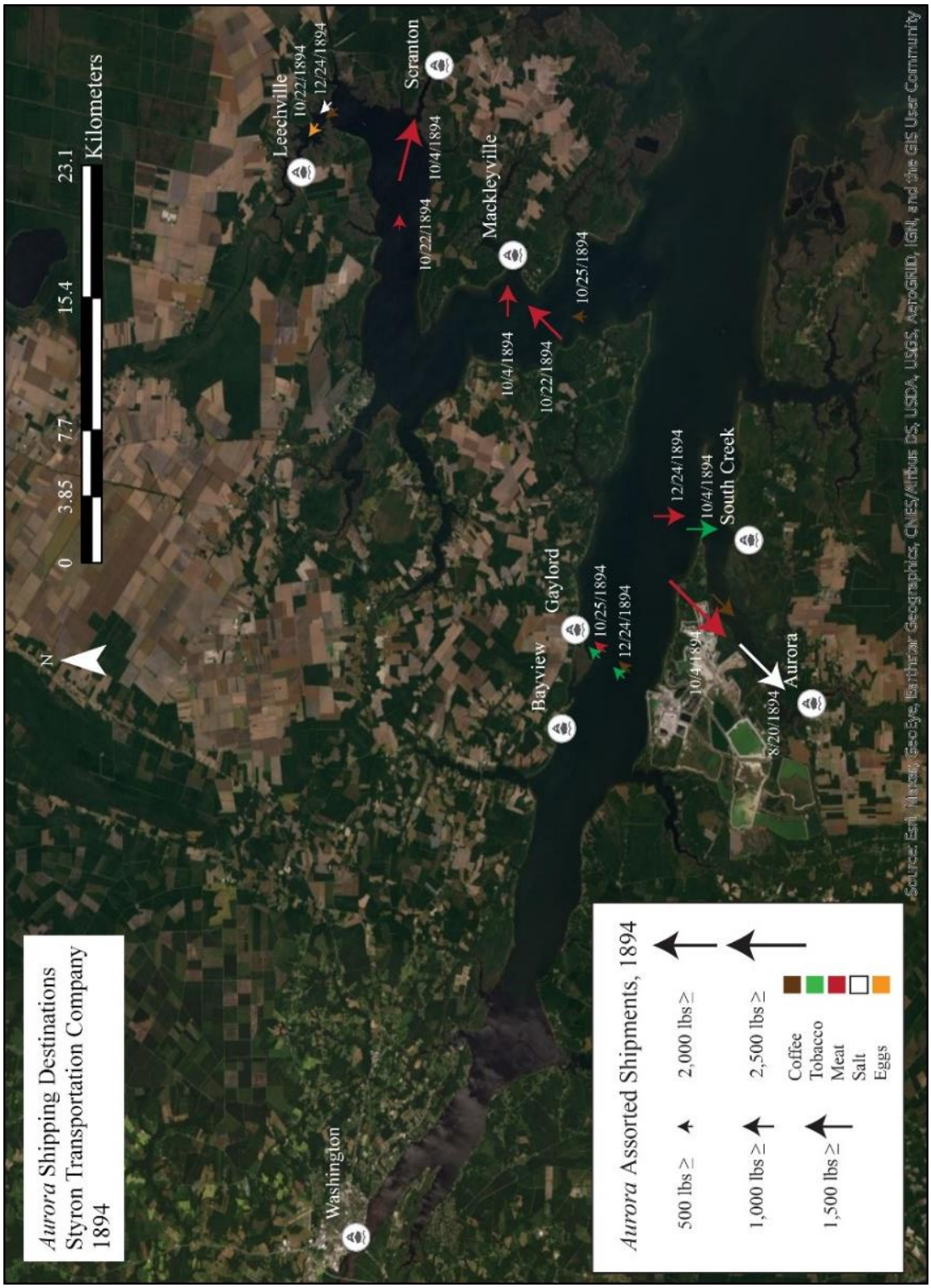


FIGURE 107. Aurora shipments of coffee, tobacco, meat, salt, and eggs, 1894. (data from Burgess 1894)

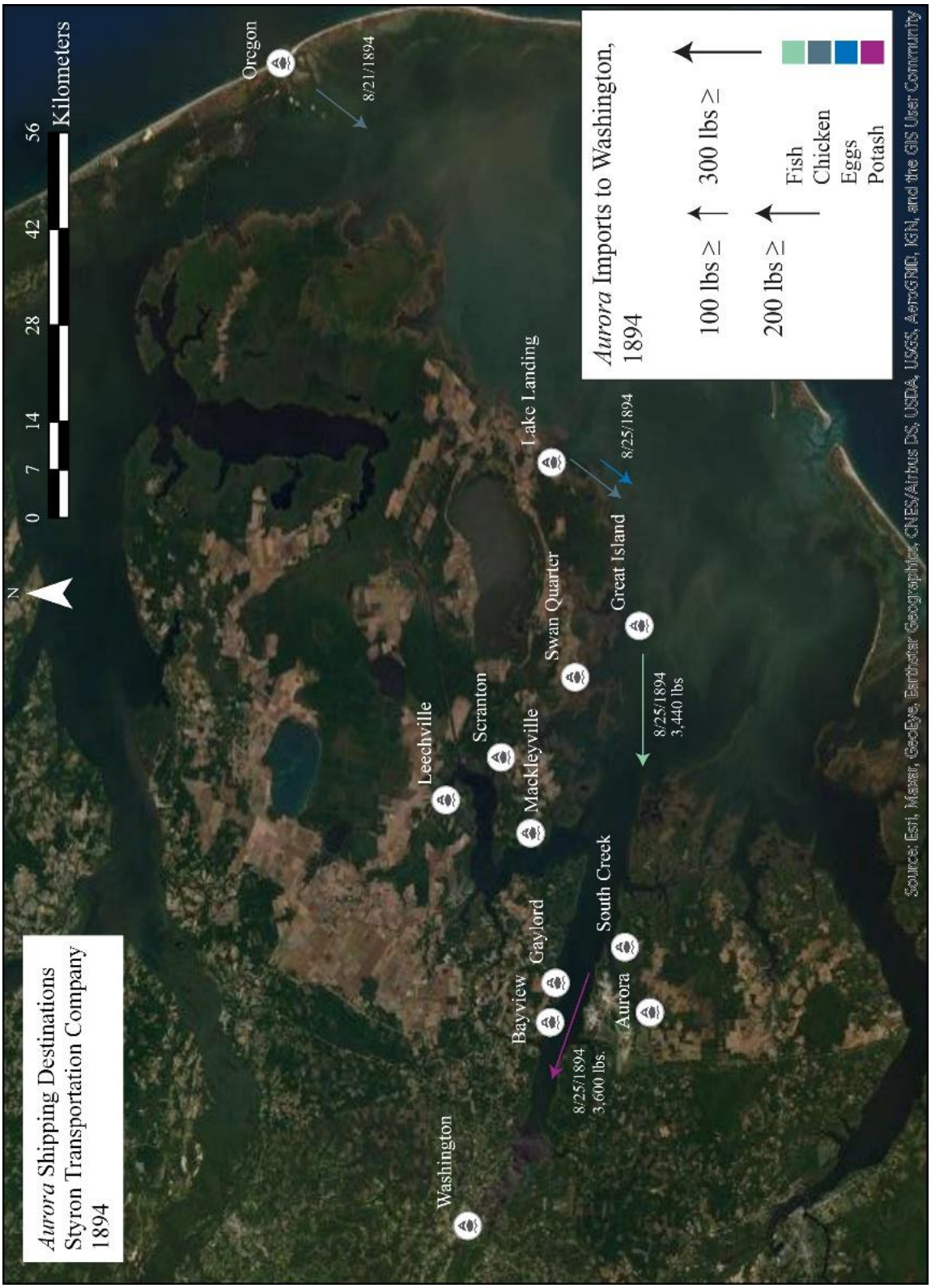


FIGURE 108. Imports to Washington from the Pamlico River and Pamlico Sound, 1894. (data from Burgess 1894)

Aurora's manifests also reveal another relationship developing towards the end of the nineteenth century. J.A. Burgess, the general manager of the line, was also the chief manager of the Norfolk & Southern Railroad. The steamer's profitability helped bring the rail line to Washington, where they still operate today. Additionally, the Styron Transportation Company shipped freight bound for the Old Dominion Steamship Company, as well as conducting business with other rail networks. A caption from Louis Van Camp's, *Images of America, Washington, North Carolina*, states that "in 1906, Styron Transportation Co. had a railroad dock only a short walk away from the Atlantic Coast Line train depot" (Van Camp 2000:12). The Atlantic Coast Line also obtained riverfront real estate and utilized the existing wharf structure there. Surely, Styron birthed their vessels on the Atlantic Coast Line's wharf to use the terminal to load and unload their freight. As a subsidiary of the Norfolk Southern Railroad, and maintaining relationships with other railroad firms, *Aurora* utilized the innovative transportation system brought to Washington at the end of the nineteenth century.

Intra-Harbor Relationships Post-Civil War

While the intra-harbor relationships certainly altered after the Civil War, waterfront industries still collaborated with one another. Once the Fowle sawmill was constructed and operational, they maintained relationships with complimentary, specialist businesses. The Fowle Mill continued the relationships their predecessors had established with the Havens and the Blounts, while expanding their own intra-harbor network. Amongst their fulfillment records, the Fowle Sawmill supplied lumber to the Havens family, the Myers & Son family, and even to their own business, often listed under the name J.L. Fowle (S.R. Fowle & Son 1987). Furthermore,

their order forms shed light on the waterfront collaboration through specialized industries. Sawmills often did not possess the appropriate facilities to refine their product, so they sent them to planing mills: in the case of the S.R. Fowle & Son mill, they became patrons of the Moss Planing Mill. Of over 800 orders, a total of 91 were from the Moss Planning Mill (S.R. Fowle & Son Company 1894). Located on the eastern edge of the Washington waterfront, the planning mill would refine the cut timber into dimensional, functional pieces of planks and seasoned lumber (FIGURE 109).

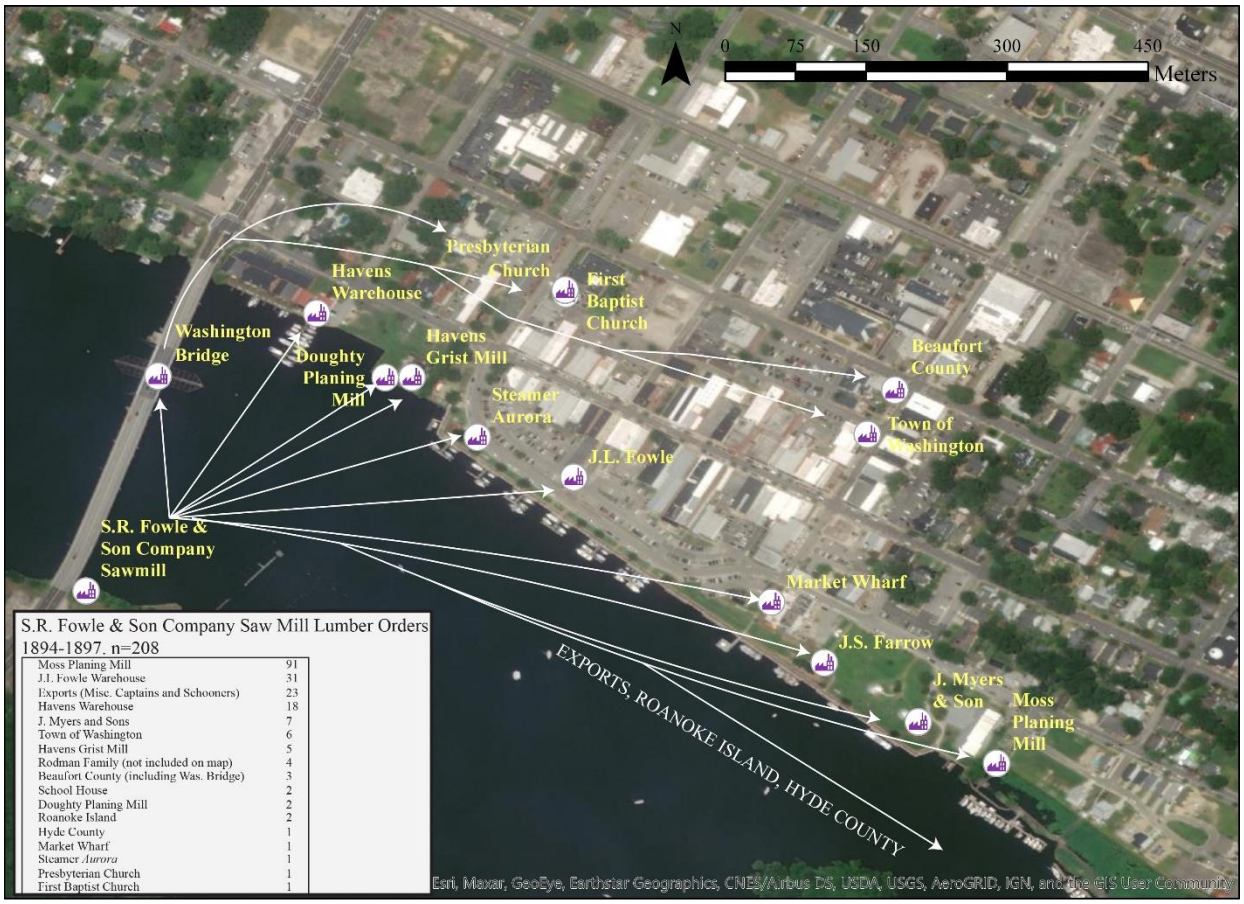


FIGURE 109. Companies, individuals, and construction projects included in the S.R. Fowle & Son Company Sawmill order forms, 1894-1897. (data from S.R. Fowle & Son Company 1894)

In conclusion, the intra-harbor relationships through the period of study mostly remained the same. The merchant class collaborated and conducted business with one another throughout the period of study. Technological advances, in the form of steamships and railroads, permitted more participation in the intra-harbor economy. At the arrival of the twentieth century, Washington's harbor network resembled that of other modern ports, with waterfront industries collaborating and conducting business within the confines of the expanding port.

Industry Relationships

As mentioned before, merchants and industries within the port needed to work in partnership to promulgate their success and maintain their relevancy through the period of study. The shipping industry exported naval stores and agricultural products cultivated in Beaufort County's forests and abundant farmlands. Later, the shipping industry also supported the increasingly lumber-oriented economy of Washington. Similar symbiotic commercial relationships have been observed at other ports in geographic studies. Geographers David Hilling and Brian Hoyle summarize the relationship between industries and the port as;

> The demand for port services, as for any other transport, is not an end in itself but derives from other activities. Inevitably, the individual port and the systems in which they combine reflect changes in demand which are a function of spatial and structural modifications of economic activity in the hinterlands and forelands. (Hilling and Hoyle 1984:6)

In other words, the relationship between the port and its industries, as well as industries and other industries, can be observed through the changing consumer demand at home and abroad. Therefore, these relationships can be analyzed according to the two phases of Washington's economy: naval stores and agriculture, and manufacturing-based relationships

Industry Relationships: Naval Stores, Agriculture, and Shipping

North Carolina's eighteenth century and antebellum economy depended upon the natural resources and agricultural products grown on eastern plantations. These exports included grain, naval stores, staves, shingles, lumber, and salt pork. In return, North Carolina merchant vessels returned laden with rum, molasses, sugar, coffee, clothing, manufactured goods, and other household items (Powell 1989:132). Merchants, like the Fowles, maintained relationships with local farmers and landholders which supplied them with the agricultural products for export.

The Fowle shipping records from 1834-1850 demonstrate the relationship between shipping and the naval stores industry. The Fowle's first foray into Washington's economic sphere was building merchant vessels for the Atlantic trade. Each of the twelve shipping entries in the Fowle collection listed Fowle owned or constructed vessels bearing naval stores and other products. These include *James G. Stacey, Edmund Tillett, Melville, Marion,* and *Pamlico* (S.R. Fowle 1817, 1838a, 1838b, 1849; Litchfield 1976:236-237). While Washingtonians obviously constructed vessels to suit their own trade needs, the Fowle records show a relationship within their own enterprise. Thanks to their shipbuilding center on Castle Island, the Fowle family could save money by using their own vessels to export products. Other families, such as the Marsh and

Blount families, had to purchase or contract vessels from elsewhere to fulfill their shipping needs (Litchfield 1976:234-235).

Steamboats perpetuated the relationship between the agricultural hinterland and Washington's shipping industry. Although steaming up the Tar River from Washington was fraught with danger, many shipping firms in the antebellum era invested significant time and financial resources into promoting steam navigation on the Tar River revolving around Washington. William Tannehill and Benjamin Lavender received the exclusive rights to steam navigation on the Tar River in 1836 with their steam vessel *Edmund D. McNair*. Myers & Son quickly followed up by constructing *Amidas* in 1849, although it was limited to passenger transportation. Benjamin Hanks, who operated one of the first steam sawmills in Washington, owned *Astoria* which brought timber downriver for processing (Litchfield 1976:233-241; Watson 2002:136-137).

Even the relatively modern steam shipping industries continued to propagate the agricultural economy after the Civil War. William Blount Rodman returned from the war to his cotton plantation and exported his crop to Baltimore and New York via the Old Dominion Steamship Company (Rodman 1977). Their presence along the Washington waterfront made loading and unloading of goods more efficient. Additionally, these offered increasingly standardized shipping and transportation routes which both merchants and communities could orient their schedules around. Once they obtained a connection to the railroad, the relationship between waterborne commerce and Washington's traditional industries changed dramatically (Litchfield 1976:234).

Industry Relationships: Industrialized Economy

Even though Washington and North Carolina embraced the modern economy of the post-Reconstruction South, nevertheless, products derived from the natural environment remained significant port exports. Fowle vessels maintained regular commercial trips to the West Indies, exchanging cut lumber, staves, and the remnants of the naval stores industry for molasses and rum. Yet, the relationship between industry, merchants, and transportation experienced significant transformations after 1880. Once railroad lines purchased waterfront property and constructed terminals there, waterborne commerce obtained previously unparalleled prosperity for a brief period.

As mentioned before, the Styron Transportation Company profited from the addition of railroads to the port interface. The subsidiary of the Norfolk Southern Railroad did not possess a direct physical link to that railroad network, but their general manager, J.A. Burgess, held managerial status in both firms. Additionally, an 1896 report from the Board of Railroad Commissioners of North Carolina listed the final stop on the Norfolk and Southern Line at Pantego (North Carolina Board of Railroad Commissioners 1896:101). Located up the Pantego Creek, a tributary of the Pungo River, it is reasonable to assume that *Aurora* made stops at Belhaven, a few miles downriver from Pantego. Furthermore, other sources indicate that *Aurora* possessed relationships with other rail networks (Van Camp 2000:12). Styron Transportation's partnership with the Norfolk Southern Railroad is representative of other steamship and railroad conglomerates which utilized the Washington waterfront, including the Atlantic Coast Line in the 1890s (FIGURE 110).

In a communication between Mr. Burgess and the general freight and passenger agent for the railroad, H.C. Hudgins, Mr. Hudgins remarked on the possibility of expanding the railroad to Washington. He announced that "I am glad to hear there is a prospect of business improving by our line to and from Washington" (Burgess 1893). The passage seemingly indicates the railroad corporation's willingness to expand to the Pamlico River town at some point in the future. While the incorporation date of the Styron Transportation Company is unknown, historical literature places the formal arrival of the Norfolk & Southern Railroad to Washington at the end of the nineteenth century (Ellison 1976:91).

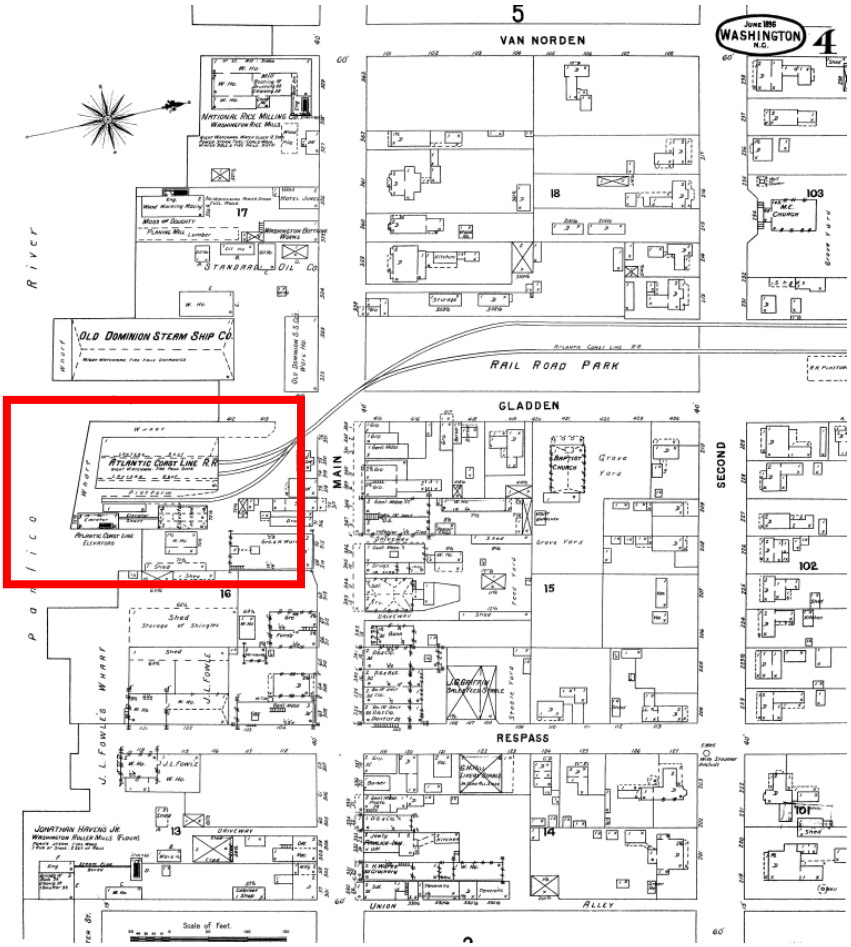


FIGURE 110. Atlantic Coast Line terminal adjacent to the Old Dominion Steamship Company warehouse and wharf. Rectangle added by author. (Sanborn Insurance Map 1896)

The railroad also brought tremendous benefits to the lumber industry, as evident at the Eureka Lumber Company and the S.R. Fowle Mill. A simple inspection of the Sanborn Insurance Maps of each lumber mill reveals how they utilized tramways within each property. Certainly not as expansive or elaborate as the large railroad corporations sprouting up at the end of the century, the lumber companies incorporated rail principles in order to make their business more efficient. Both Eureka and Fowle's tramways ran out into the Pamlico River and certainly formed prominent parts of the waterfront landscape (FIGURE 111-112).

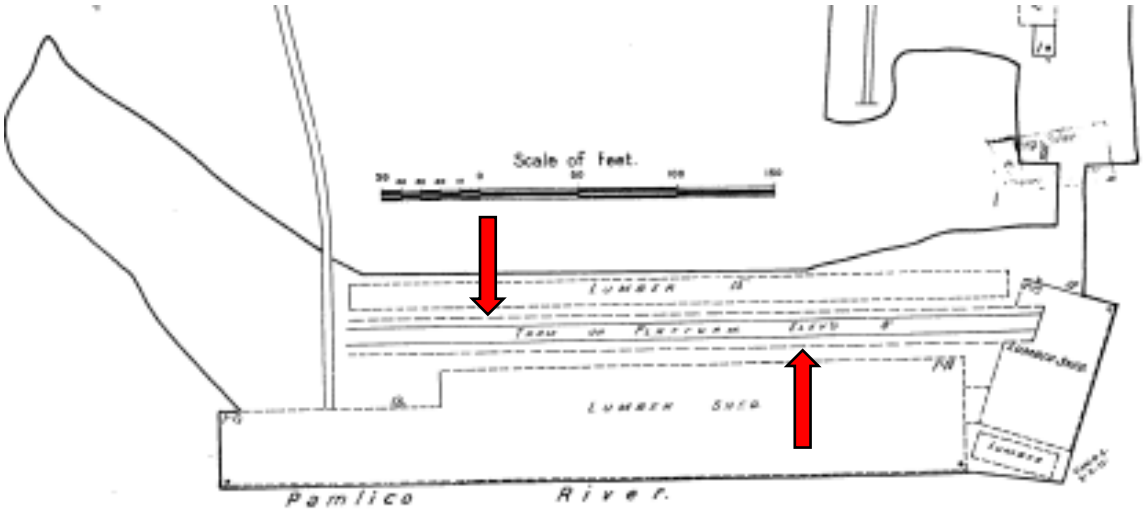


FIGURE 111. Eureka Lumber Company island structure. Tramway indicated by arrows added by author. (Sanborn Map Company 1911)

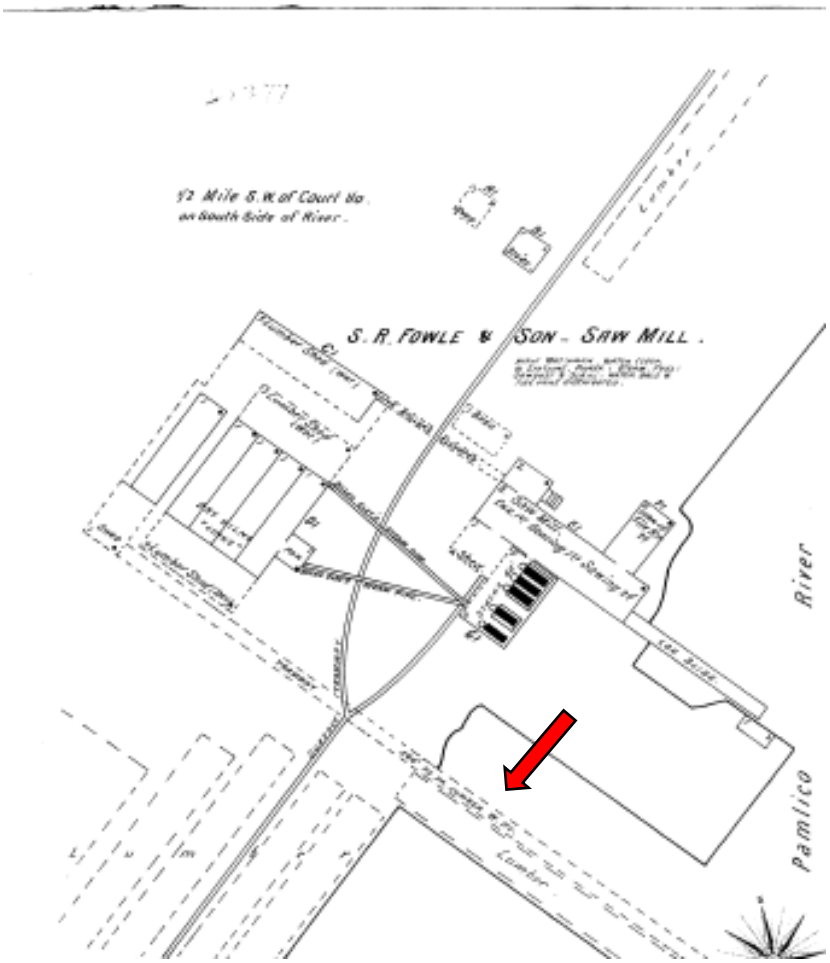


FIGURE 112. S.R. Fowle & Son Company Sawmill tramway on pile platform. Arrow added by author. (Sanborn Perris Map Co., Limited 1896)

Archaeological surveys of the Eureka Lumber Company island structure uncovered a solitary piece of rail corresponding to the tramway laid horizontally across the island. While the facility had been sold, as well as all machinery and infrastructure removed, it is surprising that such a large piece of material had not been salvaged for other purposes. Perhaps, since the mill was closed in the 1950s (Van Camp 2000), the railroad had already been supplanted by personal vehicles, flatbed trucks, and other more efficient cargo systems that it was not necessary to salvage, or sell, all of the tramway.

Additionally, the railroad enabled lumber to reach the mills from forest resources outside of Beaufort County. Eureka's logging headquarters, by 1901, was located near Fountain, NC. Timber cut there and beyond would be hauled by the East Carolina Railway to Tarboro, then floated downriver to Washington. There, it would be steered into Eureka's massive log boom to be processed later (May 1976:336).

Another perspective from which to understand the increasing importance of the railroad in port development is through cartographic sources. Focusing specifically along the waterfront, railroads slowly became more important in the context of port usage. In 1885, the only railroad presence at the waterfront was at the western extremity of town, removed from the bustling port. By 1892, however, the Atlantic Coast Line had acquired property on Gladden Street, adjacent to the Old Dominion Steamship Company warehouse (Ursula and Loy 1976:69). Their presence on the riverfront was first recorded in the 1896 Sanborn chart. Being situated at the river's edge made the loading and unloading of commercial goods more efficient, as well as firmly cementing the relationship between the traditional port and the railroad.

The three succeeding images display the evolution of Washington's waterfront over eleven years, specifically the addition of the Atlantic Coast Line terminal on Gladden Street. The first shows Washington's waterfront in 1885, with references to the familiar Fowle (1) and Havens Warehouses (3). The sole railroad connection at this time was located at the top of the image, noted with an arrow. This location corresponds to the historic E.M. Short Lumber Mill, an area not surveyed for this study. In 1891, the maps depict the same situation, the railroad remaining removed from the waterfront proper (FIGURE 113-114). In 1896, the Atlantic Coast Line Railroad was first recorded in Sanborn charts, indicated by (2) below (FIGURE 115).

FIGURE 113. Georeferenced Sanborn Insurance Maps, 1885. Arrow and numbers added by author. Red arrow indicates the location of the Washington Railroad terminal, the number 1 shows the location of the Fowle Warehouse, and the number 3 indicates the Havens Warehouse (Sanborn-Perris Map Co., Limited 1885)

FIGURE 114. Georeferenced Sanborn Insurance Maps, 1891. Arrow and numbers added by author. Red arrow indicates the location of the Washington Railroad terminal, the number 1 shows the location of the Fowle Warehouse, and the number 3 indicates the Havens Warehouse (Sanborn-Perris Map Co., Limited 1891)

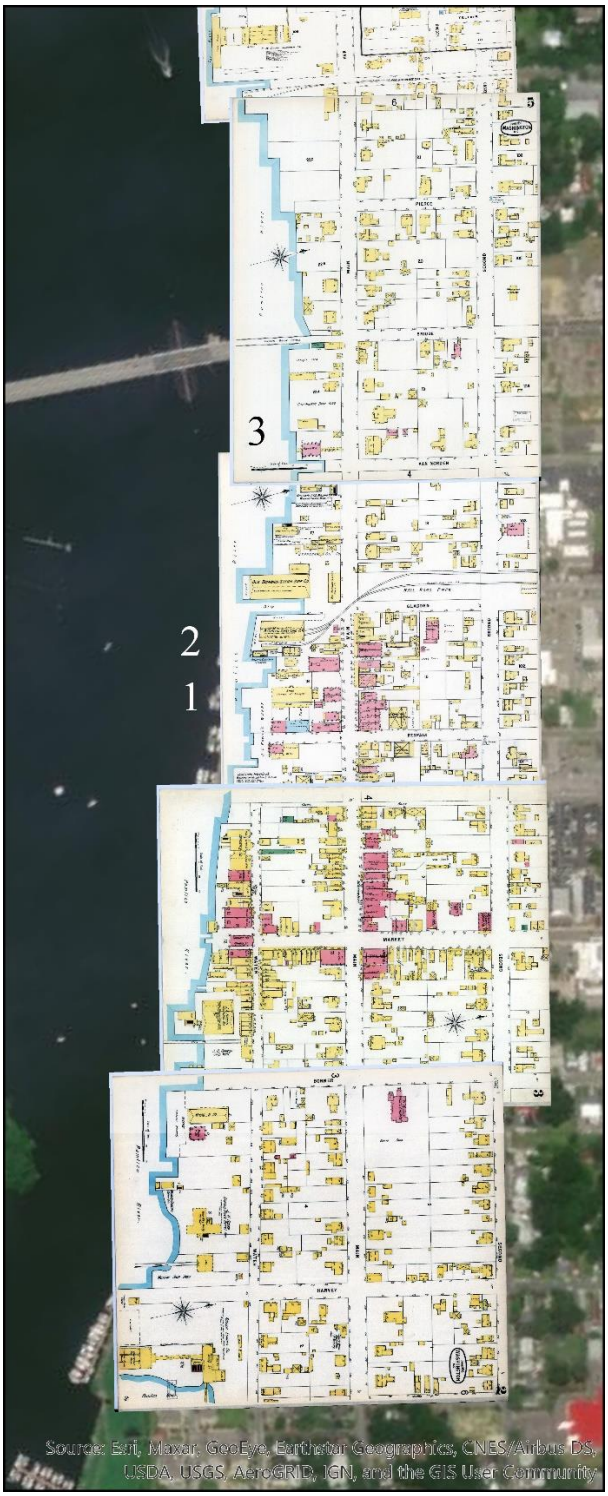


FIGURE 115. Georeferenced Sanborn Insurance Maps, 1891. Numbers added by author. Number 1 shows the location of the Fowle Warehouse, number 2 shows the Atlantic Coast Railroad terminal, and the number 3 indicates the Havens Warehouse (Sanborn-Perris Map Co., Limited 1891)

Industry Relationships-Specialization

Lastly, port industries, perhaps out of necessity, obtained a degree of specialization by the end of the nineteenth century. Obviously, specialization existed beforehand, but was not evident among the historical records consulted for this study. The S.R. Fowle & Son Sawmill developed specialized relationships with local planing mills, such as the Washington Planing Mill and the Moss Planing Mill. The latter placed approximately 10 percent of lumber orders from the Fowle Mill, composed of a variety of dimensional cuts and wood species, including pine and cypress (S.R. Fowle & Son 1894). Lumber lashed together into rafts was brought downriver, floated into the Fowle complex, processed, and sent further down the Pamlico to the Moss Mill (FIGURE 116).

FIGURE 116. Representation of S.R. Fowle & Son Company Sawmill and Moss Planing Mill supply chain, 1894-1897. (data from S.R. Fowle & Son Company 1894)

The intra-industry relationships transformed according to the level of technological innovation in Washington. Shipping interests, both sail and steam, survived if there was an exportable product. This remained true whether those products were agriculturally based or manufactured at the many sawmills which populated Washington's waterfront by the 1890s. Most importantly, the addition of the railroad to the waterfront brought dramatic change in terms of how industries interacted with one another, as well as how the port facilitated trade. Studying the great, historical European ports, Josef Konvitz remarked that;

> The eighteenth-century port city could survive the introduction of the speedboat, which put few additional burdens on it, but it could not survive the railroad. Business and government introduced the railroad onto the land between the waterfront and city, and then used it to extend new port facilities beyond the principal areas of urban growth to places where greater room made economies possible (Konvitz 1978:180).

The Atlantic Coast Line, the Norfolk & Southern, and the other small rails within Washington certainly encouraged greater efficiency in shipping and commerce for several years. Yet, their gradual appearance there signified the beginning of the end of regional river ports like Washington. Shortly after there arrival, transportation via rail and, later, automobile became the more efficient and economical option for freight transportation, making regional river ports like Washington obsolete.

Of Washington's once plentiful port infrastructure on the northern shore of the Pamlico River, little remains of it today. The addition of Stewart Parkway in 1969 provided parks, scenic walkways, and promoted tourism, at the expense of the many wharves, slips, and industries once present there. Therefore, a study of waterfront infrastructure had to consider the sites located on the periphery of the working port. These three sites are representative of the port's expansion through time, as industries found usable land further and further away from the port-city interface.

Beginning with the South Shore Landing Site, the structure resembled a wharf containing characteristics of both the cobb and crib construction methodologies which, according to the evidence, occupied a role in Washington's historic naval store industry. A wharf such as this, considering the river depth there, became an area which lighters and other shallow drafted vessels could berth alongside, load or unload cargo, and disembark to another destination in port. The solid fill structure could withstand the demands of industry, as well as vessels moored alongside. When naval stores dominated Washington's exports before the Civil War, this structure was integrated into an intricate trade network which provided merchants, like the Fowles, a substantial income (FIGURE 101).

After the Civil War, structures like the South Shore Landing Site still maintained their relevance in an economy struggling to discover a new identity. While there is no direct correlation to the site and the later Fowle shipping records, the construction methodology would have been repeated at other wharves throughout the rest of the port of Washington during this

period. As such, it can still be examined through the S.R. Fowle & Son shipments of the latter half of the century.

From 1877-1887, the S.R. Fowle & Son Company maintained and expanded upon the shipping routes they had generated a half-century earlier. In 1877, the business exported a total of 3,744 barrels of tar, 3,901 of rosin, and 668 of turpentine to many destinations. To New York, they shipped 3,731 barrels of tar, 3,848 of rosin, and 639 of turpentine. *Caroline* brought 13 barrels of tar, 10 of rosin, and 6 of turpentine to the island of St. Vincent, in addition to 32,000 ft. of lumber, 313,000 shingles, and 7,000 staves (FIGURE 117).

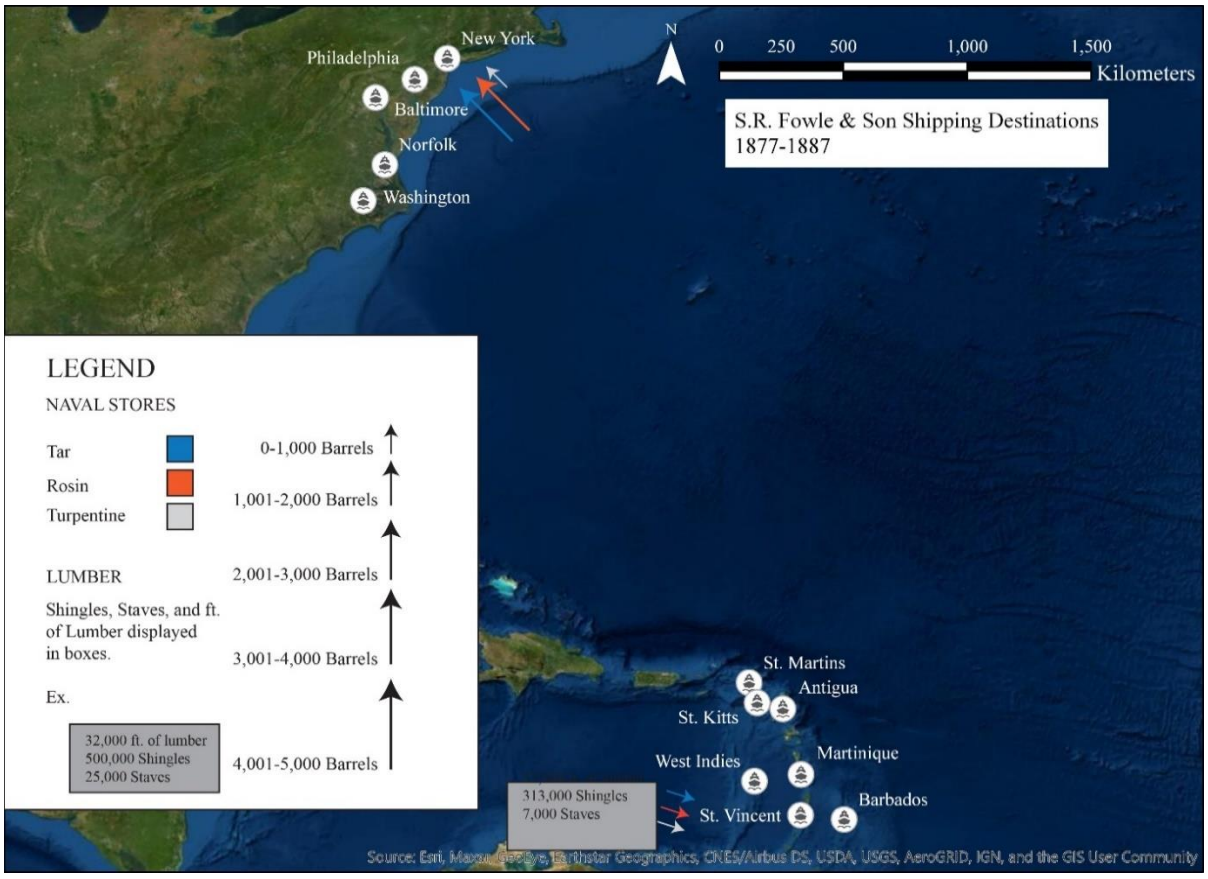


FIGURE 117. S.R. Fowle & Son Shipping Destinations, 1877. (data from S.R. Fowle & Son Company 1877).

By 1880, naval stores shipments to New York had started to decrease. The Fowle's business partner, W.K. Hinman & Co., only received 1,481 barrels of tar, 1,956 of rosin, and 230 of turpentine. St. Vincent again received quantities of naval stores, as well as shingles, staves, and lumber. Another Caribbean island, Barbados, also received a small shipment of naval stores and lumber products (FIGURE 118).

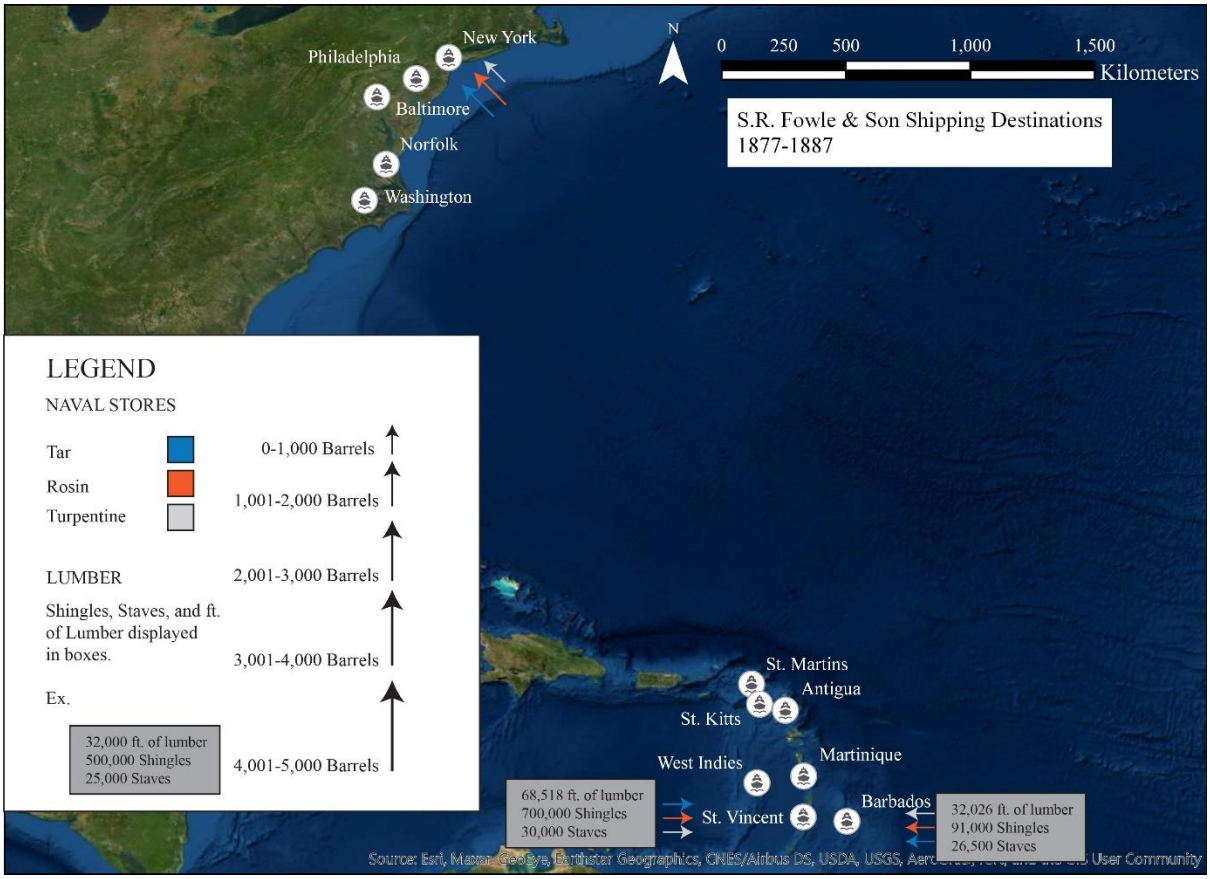


FIGURE 118. S.R. Fowle & Son Shipping Destinations, 1880. (data from S.R. Fowle & Son Company 1877)

In 1883, naval stores shipments continued to decrease. *Caroline* and *Nelly Porter* transported only 981 barrels of tar, 1,354 of rosin, and 138 of turpentine. St. Vincent received its

regular shipment of naval stores and lumber products. St. Kitts received a similar shipment as St. Vincent, except for turpentine. Interestingly, Philadelphia, Baltimore, and Norfolk appeared for the first time amongst the Fowle shipping records. Unnamed firms in Baltimore and Philadelphia imported small quantities of naval stores. Norfolk, conversely, imported 243 barrels of cotton (FIGURE 119).

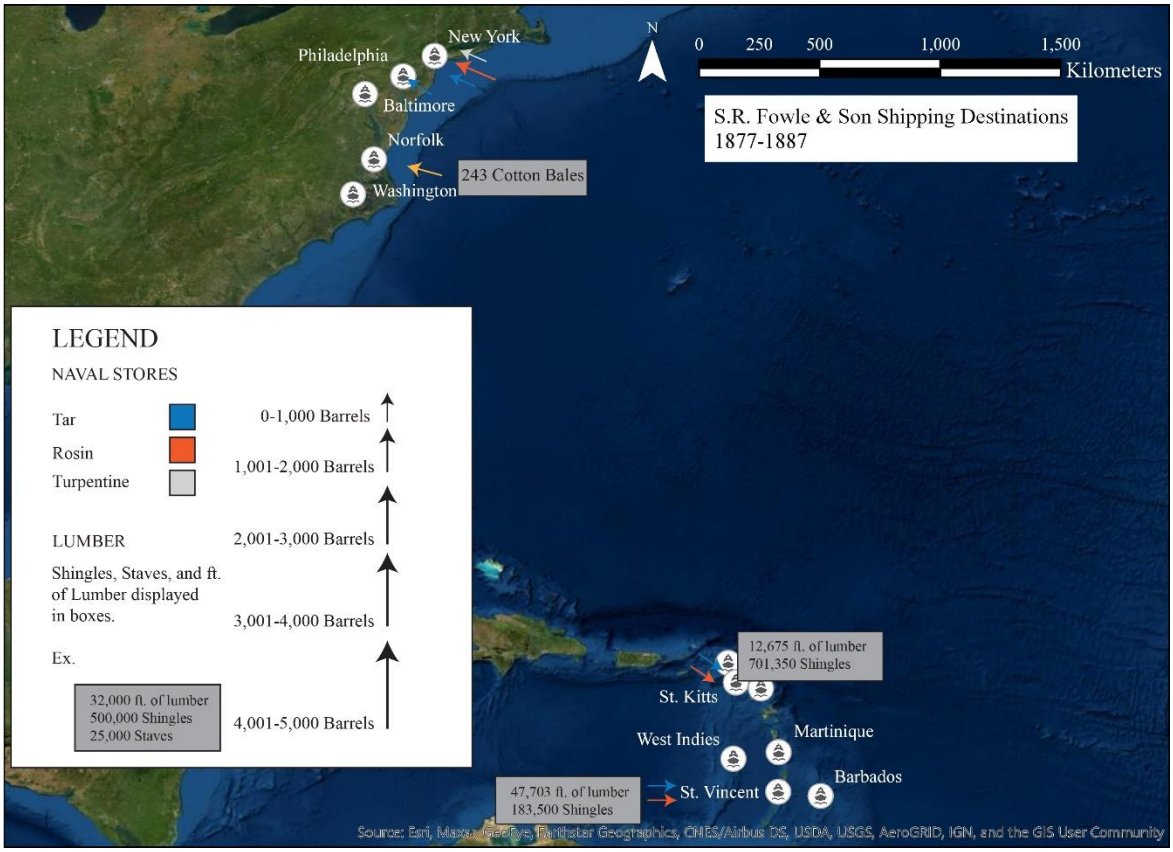


FIGURE 119. S.R. Fowle & Son Shipping Destinations, 1883. (data from S.R. Fowle & Son Company 1877)

By 1886-1887, the final two years sampled, shipments of rosin and turpentine remained relatively rebounded, although much less than 1877, while tar decreased to its lowest yearly

total. Between *Caroline*, *Nelly Potter*, and the Old Dominion Line, New York and W.K. Hinman Co. only imported 727 barrels of tar, 2,050 of rosin, and 215 of turpentine Tangentially, the islands of St. Vincent, St. Kitts, and Martinique received the largest combined total of lumber (FIGURE 120).

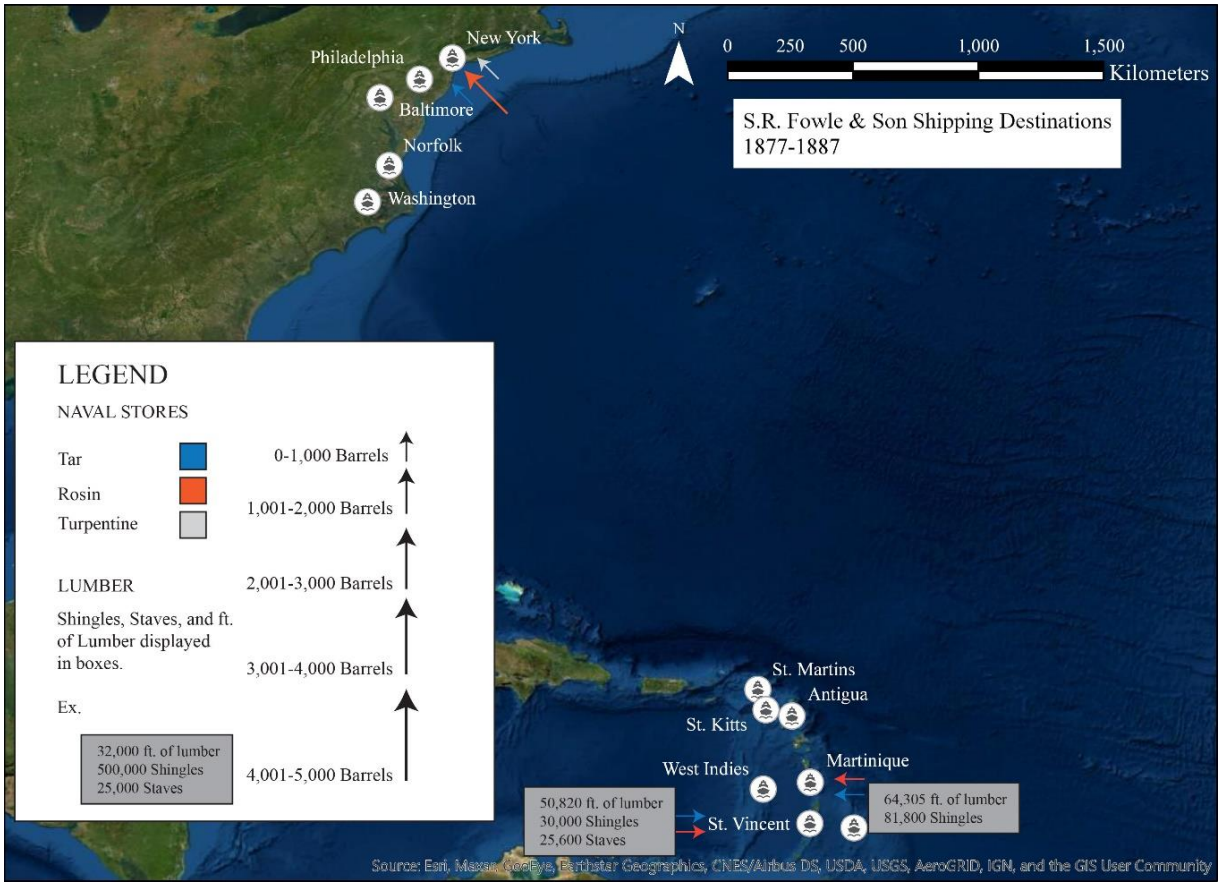


FIGURE 120. S.R. Fowle & Son Shipping Destinations, 1886-1887. (data from S.R. Fowle & Son Company 1877)

While these records are not entirely indicative of the entirety of Washington's shipping and naval stores production figures, the negative trend in naval stores exported observed through these ten years points towards Washington's evolving economy. The naval stores industry's decline aligns with the arguments proposed by Robert Outland in *Tapping the Pines: The Naval*

Stores Industry in the American South. He attributed many reasons to disappearance of the naval stores industry in North Carolina, including drought, insect damage, as well as forestry mismanagement (Outland 2004:121). He even stated that "producers migrated southward so rapidly in fact that by 1900 the industry was firmly centered in the Deep South states, with North Carolina and South Carolina responsible for only a fraction of the country's naval store production" (Outland 2004:122). Because of this, Washington's economy shifted away from their original export in favor of producing lumber. Therefore, the overall decay and abandonment of the South Shore Landing could be related to the gradual decline of naval stores production and necessitating entrepreneurs construct alternative waterfront structures.

The two lumber mill structures possessed many differences compared to the South Shore Landing. First, the structures were significantly larger than the potential turpentine distillery. Secondly, the S.R. Fowle & Son and Eureka Lumber Company structures were pile-platform structures which served multiple purposes. These pile platforms extended into the Pamlico River from the shoreline and had construction elements that allowed vessels to dock there. These two sites became emblematic of Washington's more lumber-oriented economy.

As evident through the S.R. Fowle & Son and the Eureka Lumber Company production values from 1892 and 1911-1916, firms which had done business in Washington for decades, as well as venture capitalists seeking new opportunities, recognized the excellent opportunity to construct sawmills along the Pamlico River. The Fowle piers and the Eureka island structure also were emblematic of a more modern, industrial economy. First, they enabled the construction of facilities on top of them, noted through the many structures noted on them in cartographic sources, like the Sanborn charts. The rail iron discovered at the Eureka island structure corresponded to the historic tramway that ran horizontally across it and connected to the

tramway that connected the structure to shore. Secondly, pile-platform construction, had tremendous advantages for lumber production. As mentioned in Chapter 6, pilings and piling structures were used to ensnare lumber awaiting processing or transportation elsewhere. Sanborn charts confirm that exact purpose for the S.R. Fowle & Son pier structures and the Eureka Lumber Company's island structure's location and one open-ended side additionally confirm the log boom hypothesis (Sanborn Insurance 1901:3).

Between the two construction methodologies, the two structures were essentially similar. Certainly, the physical layout of each waterfront facility differed tremendously. Yet, functionally, the Eureka and Fowle structures shared many similarities. The Eureka structure, however, possessed larger pilings on the river side of the structure. Pilings at the Fowle site and the land portion of the Eureka island shared a similar diameter of 20 cm., while the Eureka pilings fronting the Pamlico River had an average diameter close to 30 cm. This could be because large lumber barges, like *Minerva*, docked alongside the structure to load and unload product (The Messenger 1902).

Furthermore, the characteristics of the river bottom at each of these locations necessitated the construction of features which extended into the Tar/Pamlico River. Neither site is situated in areas of deep water, yet both industries depended upon the river for transporting lumber to and from their mills. NOAA Nautical Chart 11554 records depth soundings adjacent to both mills at five feet (National Oceanic and Atmospheric Administration Office of Coast Survey 2012). Historically, the river channel might have been significantly wider and deeper than today, thanks to the many efforts made to dredge on both sides of Washington Bridge. Regardless, it would be a significantly expensive endeavor to create solid-fill structures, like Site A and other Washington wharves, of a similar dimension as these. Especially during a time when seemingly

every contemporary venture capitalist attempted to erect their own riverside lumber facility, constructing inexpensive structures became commonplace.

The three sites surveyed for this study had direct links to Washington's commercial past. The S.R. Fowle & Son Lumber Mill, located adjacent to the Pamlico River Bridge, became one of the most important sawmills in Beaufort County during its short operational history. The Eureka Lumber Company supplanted the Fowle's productivity levels and continued operations up until World War II. Their waterfront structures, while similar in purpose, differed greatly in terms of construction style and functionality. Lastly, the South Shore Landing Site, Site A, has little historical information regarding ownership and function during its operational lifetime. Yet, the archaeological record, combined with cartographic information, indicates a waterfront structure much different than the two lumber mills.

Port Expansion

Several factors permitted growth outside of the confines of the traditional, downtown port. First, Washington had been arranged on a strip of land approximately 1 mile in length from the bridge to Jack's Creek on its eastern extremity. There was minimal available space to construct port structures and industrial buildings when the Eureka Lumber Company and the S.R. Fowle Mill began production. Secondly, the port needed greater space to accommodate a still thriving shipping industry in addition to the larger timber processing facilities. Those who had not already secured waterfront property had to survey and clear land elsewhere to accommodate their mills. Lastly, especially with Site A and the Fowle Mill, many who utilized the port lived south of the river. Ferry landings became places of importance, and contention in

the case of the former toll bridge spanning the Pamlico River (The Morning Star 1877c, 1879b). Each combined, often at different times, to encourage and facilitate port-related construction outside the confines of the traditional port landscape.

Spatially, the port of Washington provided little available avenues for expansion beyond the roughly one-mile riverfront. Slowly, homes began to be constructed west of the bridge and industries soon followed. B.S. Hoyle and D. Hilling describe the impact growing trade had on economic growth. They state that:

> While the relationship between trade and wider aspects of economic growth is not precisely understood there seems little doubt that trade is a crucial factor, not only for the initiation of economic growth but also for sustaining the broader socio-economic development process. Particularly, the strength of the export base is a main determinant of a region's capacity to finance development (Hilling and Hoyle 1984:4).

As Washington became more prosperous through its occupation as a shipping port, so too did the perimeter of the town. In turn, this would encourage business owners to leave their industrial footprint beyond Bridge St. and Jack's Creek. Not only that, but as soon as lumber became the predominant export of Washington, investors and developers spotted opportunity to make their own fortune.

In strictly economic terms, the expansion of the port occurred most dramatically during the period which lumber became the primary export. Established competitors and optimistic investors scrambled to acquire waterfront property to take advantage of the lumber transportation

facilitated by railroads and the river. Many scholars have gone further, some determining that the volume of trade encouraged larger port facilities. Gordon Jackson writes that "while the aggregate tonnage entering the ports…is likely to create overcrowding and therefore demand an extension of existing facilities, changes in the nature of trade and in the type and size of ships are more likely to demand new and more elaborate facilities" (Jackson 1983:115). Jackson's statement is evident when viewing the footprint of the Eureka log pool. No other waterfront structure rivalled the Eureka mill and its environs in size, or output (FIGURE 121-122). Their presence, as well as that of the Fowle mill, outside the traditional port boundaries is indicative of the growing importance of lumber.

Additionally, the lumber industry still heavily depended upon the Tar/Pamlico River to bring the raw product to mills for processing. It seemed reasonable, and economical, for those interests to house their operations at the location where the two rivers converged. Further, logic determined that these industries construct facilities at the water's edge away from the town's docks. Logs crowded the navigable waterways, meaning that log rafts from upriver and downriver could stall vital river traffic from steamers like *Aurora*. While Josef Konvitz argues that American port developers, especially in the nineteenth century, cared little for planning and functional benefits, the location of the Fowle and Eureka structures indicate the opposite (Konvitz 1978:177-180). Constructing on the opposite bank, or at the edge of town, allowed their business to continue despite the increasingly crowded waterfront. Similar logic can be applied to the addition of the two chemical plants two and a half miles downriver from the port (Sanborn 1924:15)

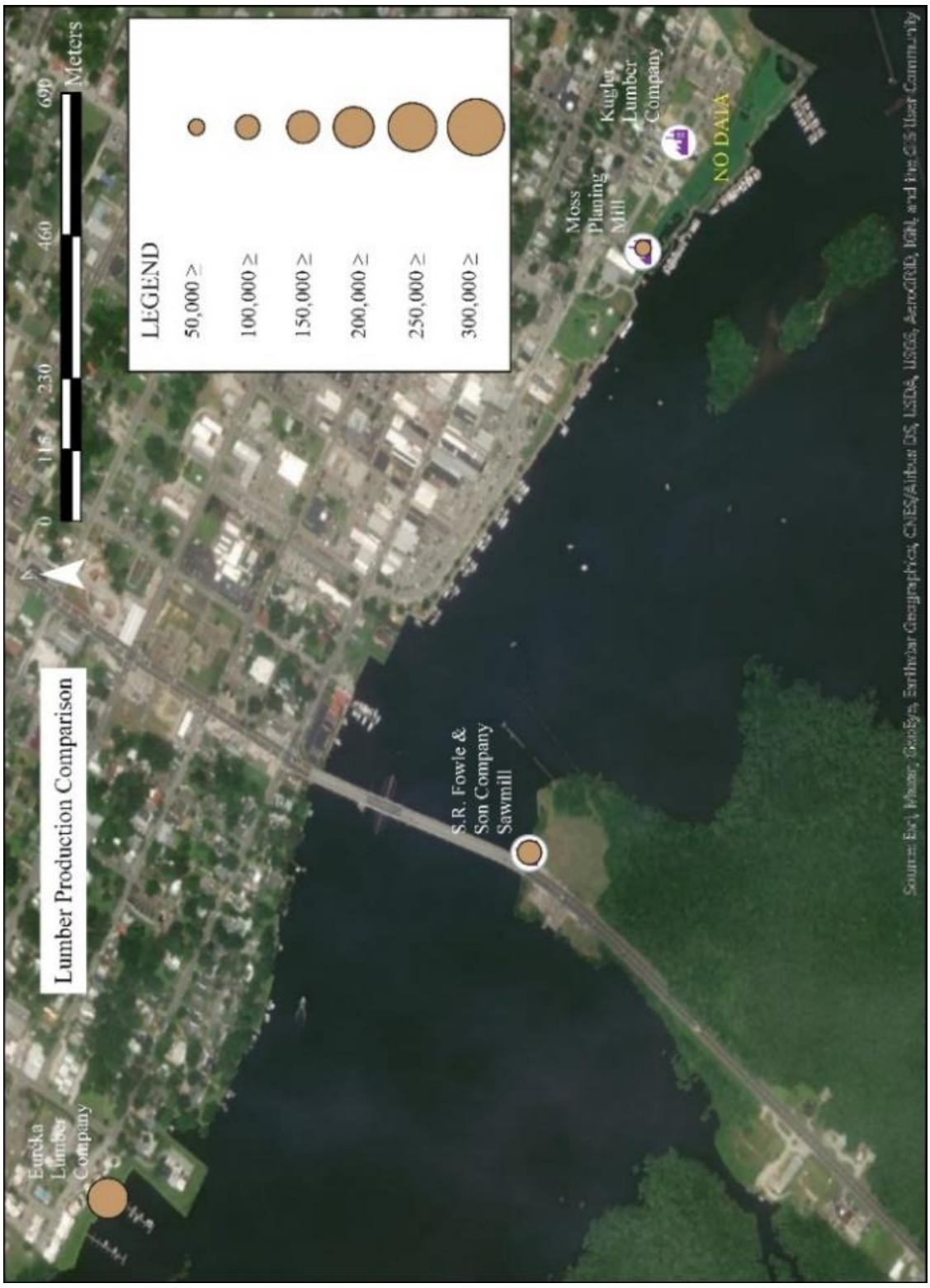


FIGURE 121. Production comparison between the Eureka Lumber Company, the S.R. Fowle & Son Company Sawmill, the Moss Planing Mill, and the Kugler Lumber Company, 1911. (data from Bureau of Labor Statistics 1911)

FIGURE 122. Production comparison between the Eureka Lumber Company, the S.R. Fowle & Son Company Sawmill, the Moss Planing Mill, and the Kugler Lumber Company, 1915. (data from Bureau of Labor Statistics 1915)

Lastly, in terms of placing landings and structures opposite town on the Pamlico River, fire remained a serious hazard for any port facility. Most had been constructed of wood and had warehouses situated upon them filled with incendiary materials, like lumber, naval stores, and cotton. Residents witnessed their town burned during the Civil War and at several locations along the waterfront in 1878, 1896, 1900, and 1905 (The Morning Star 1878a, 1900, 1905; Wilmington Messenger 1896). Since the earliest record of industry across the river was of turpentine distilleries, it appears that they were constructed there to mitigate the risk of fire damage. Once lumber took over, the safety of the town's infrastructures and dwellings again seemed to encourage port facility construction outside the traditional confines.

Intra-Harbor Logistics

Through the materials consulted, minimal evidence of logistical relationships between enterprises was discovered. Beyond manifests that recorded shipping arrangements and contracts between firms, little historical or archaeological data contained any evidence of logistical arrangements. Fowle shipping records from the antebellum period indicate some sort of collaboration between firms and individuals (Fowle 2016). *Aurora* manifests record many leading businesses and individuals using their service, including; the Old Dominion Line, S.R. Fowle & Son, and J. Farrow (Burgess 1967). It remains likely that, especially in the lumber industry, many made their living ferrying log rafts to Washington and, once cut, to a planing mill or center for shipping. Furthermore, the more intimate community fostered greater collaboration between industries and individuals than the larger ports of Norfolk and Wilmington.

Consumer Demand within the Archaeological Record

The archaeological record revealed very little about the changing consumer demand through the period of study. In fact, beyond the barrel stave and heads found at the South Shore Landing Site, no consumer goods or products were found amongst the archaeological record. Two glass fragments were found at the South Shore Landing and the Fowle Mill, but it is impossible to link them to either facility.

From a different perspective, the archaeological record is indicative of the change in consumer demand. The three sites, structures, surveyed correspond, and are historically dated, to two different periods in Washington's economic history. Site A appeared to be constructed and utilized for loading goods during the naval stores and agriculturally based economy of Washington during the middle of the nineteenth century. Conversely, the Fowle and Eureka piling-based structures enabled the two enterprises to become the leading lumber producers in Washington. Their construction methods and material differed significantly due to the fact they served different purposes and functions. Whereas the former resembles the traditional wharf, the lumber mills needed waterfront structures, platform piers, for a different function.

Conclusion

Employing theoretical principles from multiple perspectives and disciplines, combined with historical and archaeological data, permits an understanding of the factors which encouraged Washington's port development from the nineteenth to the twentieth century. After the town's formal incorporation in 1776, it expanded quickly as settlers, farmers, and merchants

saw the benefits of establishing their livelihood at the Pamlico River town. A flourishing shipping business became the focal point which the town's economy revolved around. Over time, vessels owned by the preeminent merchant families shipped the region's many exports abroad, returning with commodities which the community lacked.

The merchant class developed business relationships with each other which helped spur the local economy forward, as well as forming a symbiotic relationship which continued throughout the period of study. Merchants traded with one another, commissioned space on each other's vessels, and, later, formed dependent industries. As more people gained access to the waterfront, through general population growth and increased entrepreneurial opportunities, these relationships incorporated additional parties.

Most importantly, the changes along the Washington waterfront can be directly observed through the archaeological record. The three surveyed sites were vital components of waterborne commerce and industry, but to different degrees. The South Shore Landing indicates a more traditional waterfront structure, employed as a place to load and unload freight to vessels and lighters berthed there, potentially related to the historic naval stores industry. The S.R. Fowle & Son Sawmill and Eureka Lumber Company piling structures also included areas for such an activity yet were more rudimentary in their construction techniques. Additionally, the pile-based structures served as catches for lumber brought to them via the Tar-Pamlico River, an impossible activity at the South Shore Landing.

Blending several approaches together enables a more complete recreation of Washington's working waterfront. Archaeological perspectives provide the foundation from which site assessments were conducted, as well as artifact diagnoses. Furthermore, they help explain the construction of trade-specific facilities and how existing structures could be adapted

to facilitate new avenues of trade. Lastly, geographic perspectives clarify how contemporary Washingtonians adapted to the confined physical location of their town on the north shore of the Pamlico River. With only a small waterfront strip, certain industries needed to be forced to the periphery so that all aspects of the port remained in harmony.

CHAPTER EIGHT: CONCLUSION

To complete this work, it is necessary to revisit the questions posed in the introduction and address them thoroughly. The primary question being "What social and archaeological approaches can be applied to the port to provide a complete history of its development and decline during the nineteenth and early twentieth centuries?". The subject of this study was the port of Washington, North Carolina, a once thriving port community on the Pamlico River. Each of the secondary questions asked at the beginning of this work were to serve as possible avenues of assessment and each were within the context of the Washington waterfront. Some questions were successfully answered while others, ultimately, did not have enough historical or archaeological evidence available to appropriately answer them. These analytical questions will be addressed briefly in this chapter to determine their usefulness in assessing port development.

Primary:

- What social and archaeological approaches can be applied to the port to provide a complete history of to provide a complete history of its development and decline during the nineteenth and early twentieth centuries?

Secondary:

- How did the intra-harbor relationship change throughout the period of study?
- In what ways did the intra-industry relationships alter throughout the period of study?
- Is there any correlation between changes in infrastructure technology and economic developments?
- Did these changes affect the community in a positive or a negative way?

- What developments took place that fostered or detracted from industrial development on one side of the river over the other?
- What were the logistics of the intra-harbor relationships?
- How does the archaeological record reflect changing consumer demand for the principal exports?

- How did the intra-harbor relationship change throughout the period of study?

As seen in the last chapter, intra and inter-harbor relationships were best understood through historical datasets. Over the period of study, intra-harbor relationships between individuals and firms were largely defined by how each interacted with one another through their business transactions. Shipping magnates supported Beaufort County's agricultural sector throughout the period of study. Fowle shipping records from the antebellum period demonstrate their firm's ability to provide manufactured products, and other materials, to local consumers. Tangentially, their records also indicate their ability to provide a market for natural resources, especially naval stores, in Washington and abroad. They continued to propagate their relationship with local producers into the 1870s and 1880s.

Even when steamships had become more readily available, the relationship between producers and shippers remained the same. Several shipping firms, such as the Old Dominion Steamship Company, brought greater efficiency and speed to waterborne commerce. *Aurora* effectively expanded the intra-harbor network, increasing the connection between smaller communities around the Pamlico River and the port which served them. Even railroads provided a boon to waterborne commerce for a short period once terminals had been constructed along the

waterfront. Ultimately, the prevalence and proficiency of railroad networks, brought about the demise of regional ports like Washington.

- In what ways did the intra-industry relationship change throughout the period of study?

Like the previous question, industrial relationships mostly remained the same over the nineteenth and early twentieth centuries. Intra-industry relationships, such as shipping interests and commodity producers, competed to export the Tar-Pamlico's naval stores and lumber products throughout the period of study. Shipping magnates needed to redirect their focus towards the end of the nineteenth century more towards the exportation of lumber in lieu of naval stores. Steam navigation brought greater efficiency to the shipping industry and allowed many small-scale Washington shipbuilders and owners to participate in the harbor economy. Eventually, larger corporations, the Old Dominion Steamship Company, the Norfolk & Southern Railroad, and others, bought or remade smaller businesses to fill their own needs.

Additionally, once lumber became the predominant export of Washington, specialization became apparent through historical records. The S.R. Fowle mill routinely sent their product downriver to the Moss Planing Mill, amongst others, for further refinement. It is reasonable to assume that other lumber mills in Washington, such as Eureka or Kugler, did the same. Much like the shipping industry and the many exports Washington possessed, this created a symbiotic relationship between the mills. In fact, it led to competition between the Fowle and Eureka mill which could explain why the mill never reopened after the 1920s.

- Is there any correlation between changes in infrastructure technology and societal developments?

This question needed to be altered slightly for greater clarification. Rather than using the broad focus on social developments, the question became more an exercise in identifying how infrastructure transitioned through various economic developments. In fact, from the three archaeological sites, infrastructure technology did develop throughout the period of study.

At first, most of Washington's waterfront infrastructure needed to accommodate vessels of all size. This meant that the most common infrastructure installment along the waterfront took the form of either a crib or cobb filled wharf. An example of this was found at the South Shore Landing Site. These provided berths for vessels which could anchor alongside to load and unload cargo with ease.

For a variety of reasons, economic developments necessitated a change towards the pile-platform structures at the S.R. Fowle & Son and Eureka lumber mills. First, these methods of construction made it possible to trap log rafts and cut lumber within them. Secondly, these represented significantly cheaper alternative to erecting wharves for the required distance each structure needed to extend into the waterfront. Lastly, being at the periphery of the port made it necessary for those located there to create extended structures into the navigable channel which had been extensively dredged after the Civil War to improve shipping.

- Did these changes affect the community in a positive or negative way?

From the research conducted, it was very difficult to formulate an answer this question. When viewing from a strictly economic viewpoint, the community surely benefited from better access to the waterfront, especially in terms of the expanding lumber industry. Washington experienced economic advances from the construction of more waterfront structures which, in turn, facilitated more industry and trade. After the construction of the S.R. Fowle & Son lumber mill, the town, and society at large, greatly benefitted from their capabilities. They provided the materials which went towards renovating the Washington bridge, the First Baptist Church, the Presbyterian Church, and many homes. Their vessels carrying shipments of lumber to the West Indies and beyond returned home with products which could not be obtained locally.

Yet, of the records consulted, they do not indicate the overall sentiment of Washingtonians towards these industrial and economic developments. Transitioning from an agricultural economy to a one centered on manufacturing surely negatively impacted the town for a period. The resilient town rebounded and fully embraced manufacturing and, in turn, the structures which were the byproducts of a new economic paradigm.

- What developments took place that fostered or detracted from industrial development on one side of the river over the other?

Washington proper, the area which downtown and most of the waterfront structures were located, occupied a quasi-peninsula slightly longer than one mile in length. Waterfront real estate, throughout the period of study, was at a premium. One of the main concerns of locating industry at the extremities of the port, the southern or western shores of the Pamlico River, was the prevention of fire and explosions, all of which are common amongst ports and industrial

components. In several instances, the town of Washington suffered from extreme fire damage from port structures which halted commerce tremendously while the necessary repairs were made. Furthermore, since space was limited, those that wished to participate in the harbor economy needed to look beyond already busy wharves of downtown.

Most importantly, the presence of industry dependent upon the Pamlico River meant that activity taking place there could become cluttered in the narrow confines of the river. Especially considering the two lumber mills, there presence amongst the proper waterfront might have severely hampered commercial shipping routinely. Also, since other lumber related industries were located further downriver, such as the Moss Planing Mill, they could utilize the natural current of the river to float their product downriver to that facility while minimizing the stagnant material in the water at any given time.

- What were the logistics of the intra-harbor relationships?

From the sources consulted, minimal information was revealed regarding the intra-harbor logistics. From the secondary literature, it is widely reported that log rafts from upriver were rowed, or towed behind a steamboat, into Washington. A similar process could have been used to transport cut logs from either the Fowle or Eureka mill to the planing mills.

- How does the archaeological record reflect changing consumer demand for the principal exports?

Little evidence of commercial products was discovered amongst the archaeological record. The barrel heads and staves, as well as the glass fragment, found at the South Shore Landing reveal little about any economic activity taking place there. Besides miscellaneous logs, debris from storms, and small sticks, no evidence of cut lumber was discovered. In terms of the construction record, each structure represents a transition away from the traditional shipping industry to an industrially oriented port economy. While each possessed the capability to have a vessel dock alongside, the two pile-platform structures also supported the hallmarks of the new economy in the forms of tramways and warehousing complexes.

Final Verdict

The last word of this thesis regards the proper methodology behind studying development and decline in historical ports. Ultimately, the methodology employed in this research proved fruitful in determining the reasons behind the growth of the port. While not a comprehensive evaluation of the total exports and imports clearing the port, the historical data consulted reflects the ways which the individuals employing the port utilized it, adjusted to it, and expanded it. The port grew according to its exports and those who had the ability to ship it. At first, these were tar, rosin, turpentine, shingles, staves, and, to an extent, lumber. After Reconstruction, the port began to transition towards the processing of lumber and exporting it. This process was enhanced by the nineteenth century technological innovations of the steamship and the railroad. Unfortunately, the latter, and Washington's inability to regularly accommodate larger drafted vessels made the port redundant. Commerce became dependent on the railroad, a more efficient

an inexpensive option when compared to shipping. Those that still depended upon exporting products to the Atlantic ports sent their products via rail to Wilmington or Norfolk.

Future Research

There are several avenues which future research should be directed towards. Future research into the port of Washington should, first and foremost, seek to identify the ownership and purpose of the South Shore Landing Site. The site has been cartographically and historically referenced as early as the 1830s, yet no conclusive determination has been made about any sort of definitive industrial presence there. Since this was a sample-based survey, in that not all records pertaining to a site were consulted, a deeper examination of the S.R. Fowle & Son Sawmill is warranted. Only one order book was consulted for this study. Perhaps a more comprehensive evaluation would reveal the factors behind their usage of waterfront structures and how they modified them over time. Lastly, an archaeological investigation of the Castle Island waterfront facilities is warranted. Since the South Shore Landing site fit within certain time parameters, historical research focused on obtaining a general sampling of economic data to reconstruct the early economy of Washington. Many of the Fowle data potentially corresponds to their wharf there. This last point is even more important due to the gradual erosion of Castle Island, from gradual as well as sudden phenomena, that could irreversibly damage the remains there.

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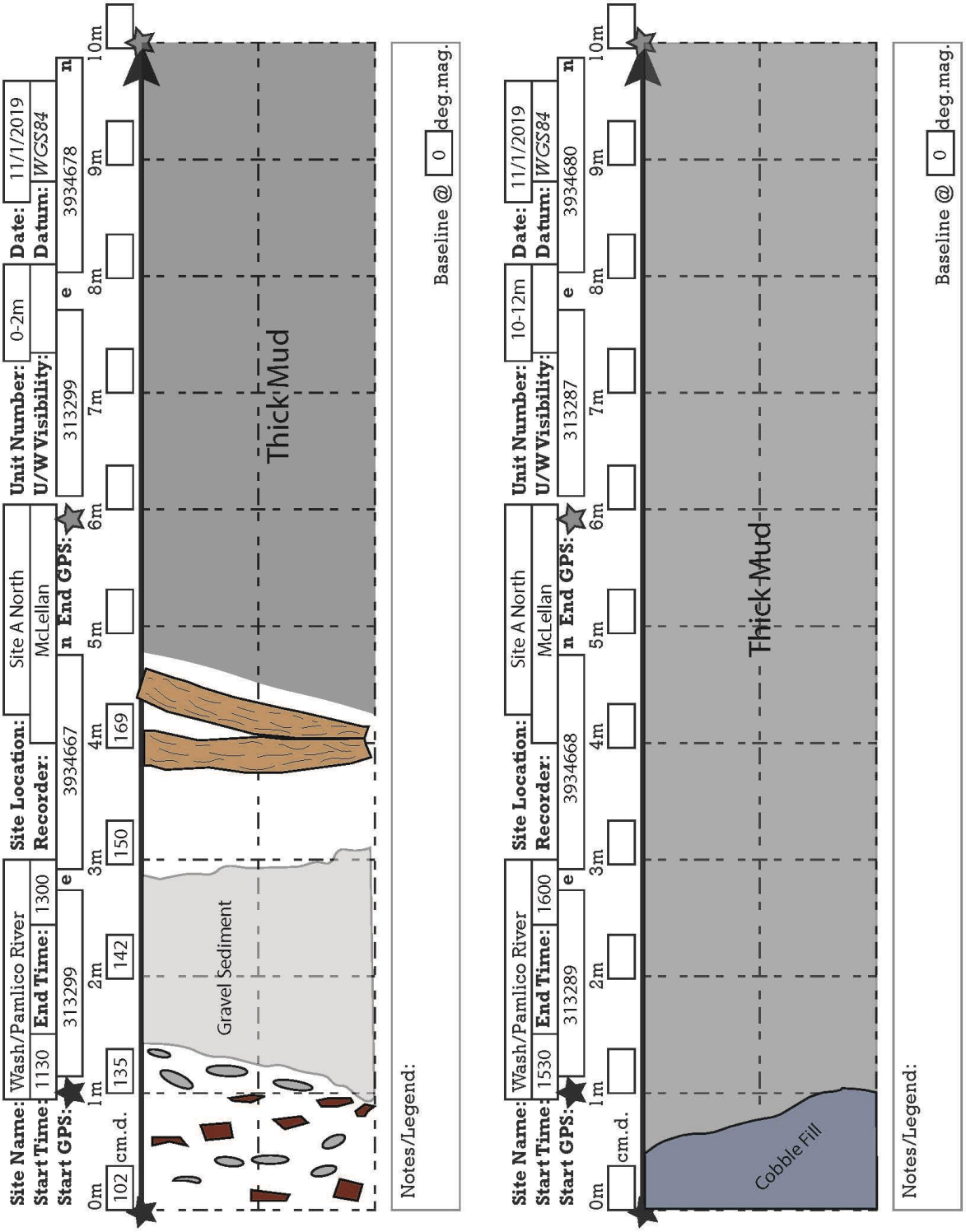
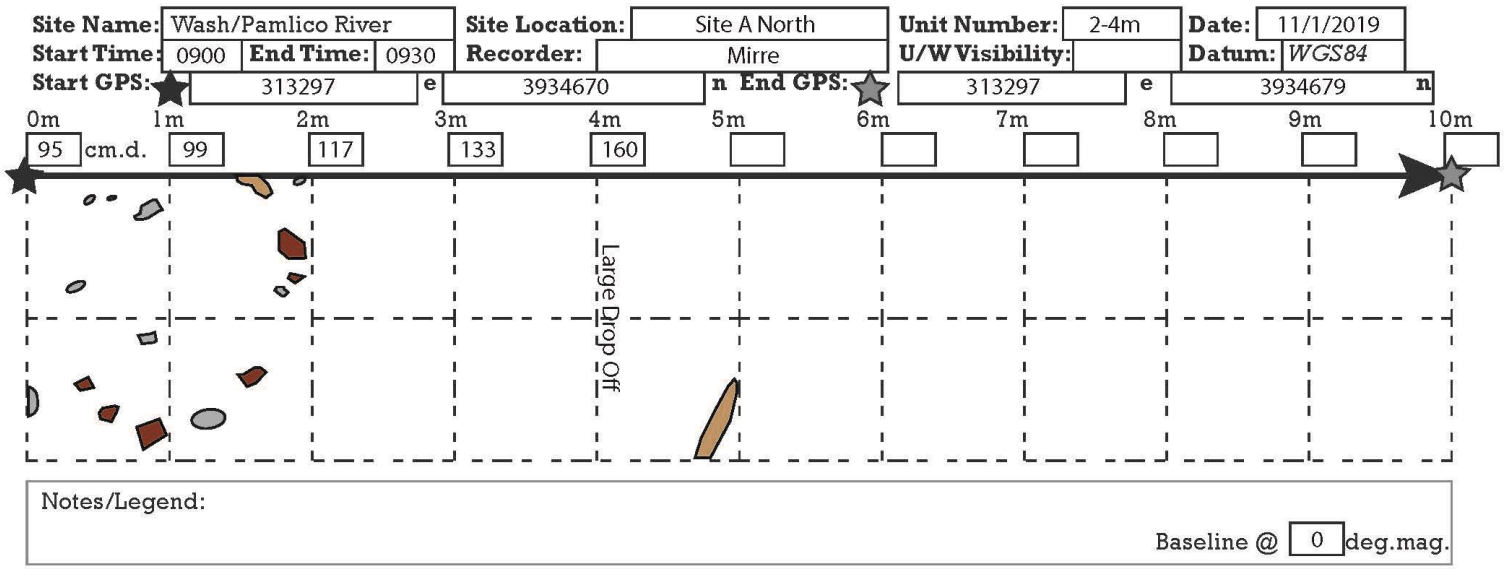
APPENDIX A-ILLUSTRATED PROFORMAS

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End Time: 0930
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U/W Visibility:
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End GPS: 313297 e 3934679 n
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Large Drop Off
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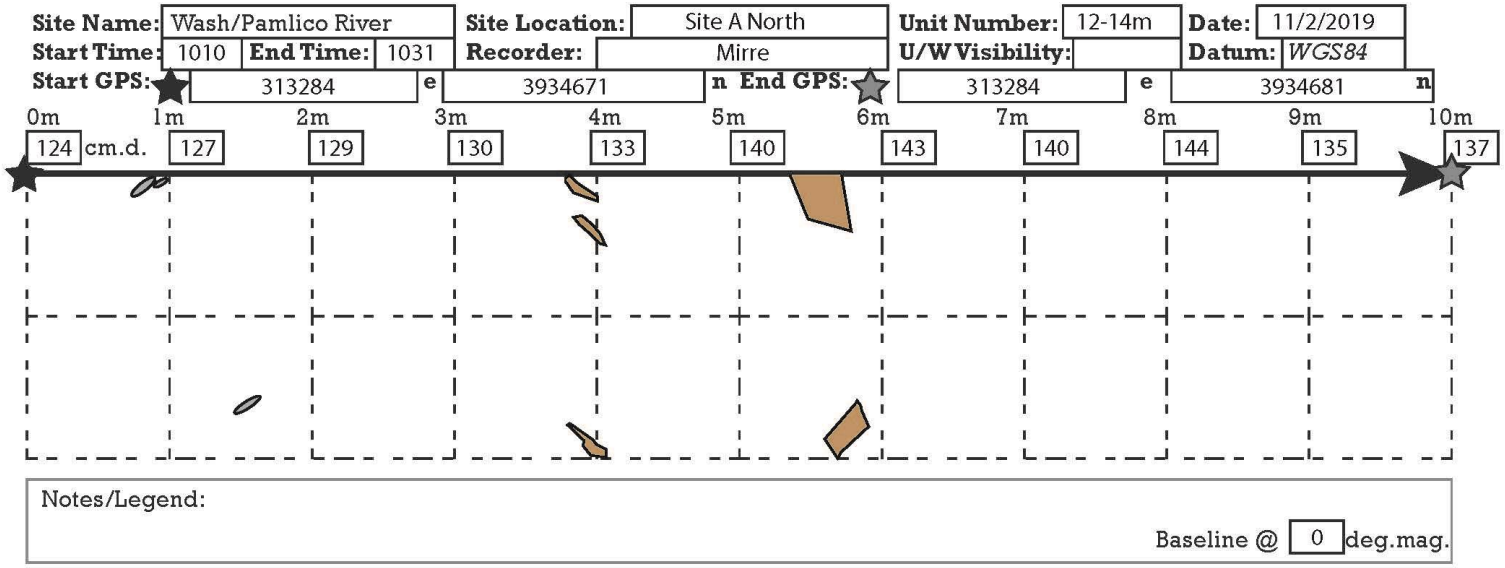
Baseline @ 0 deg.mag.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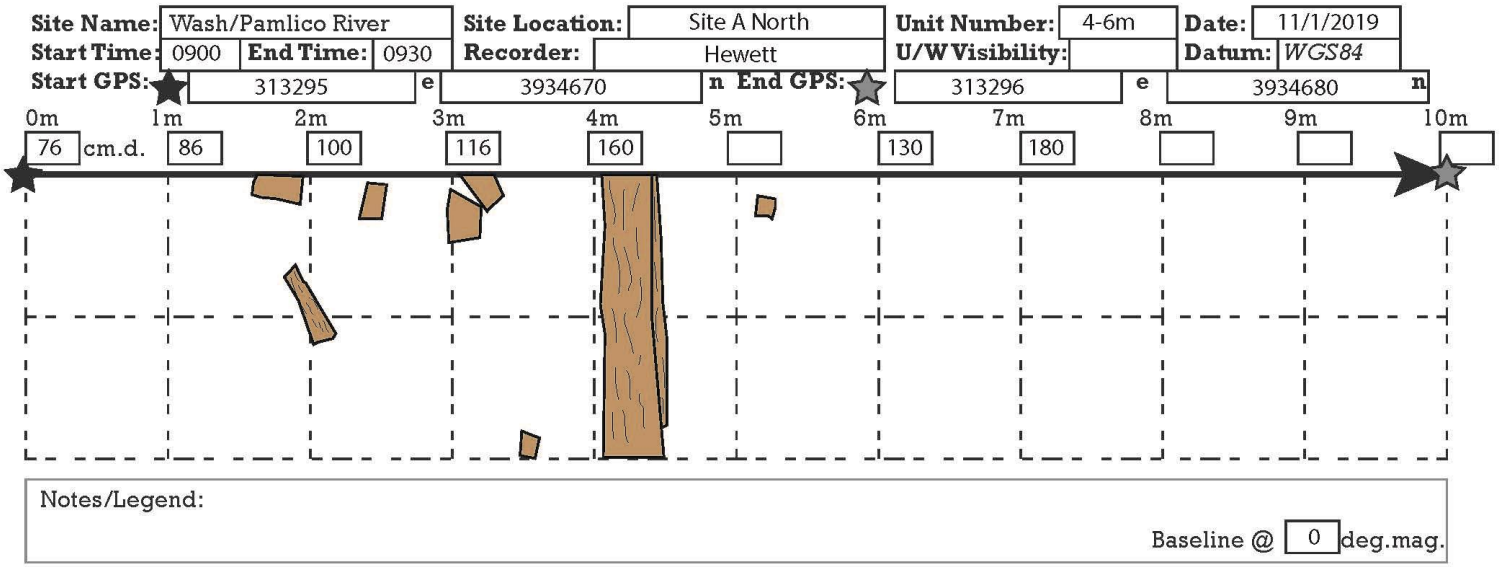
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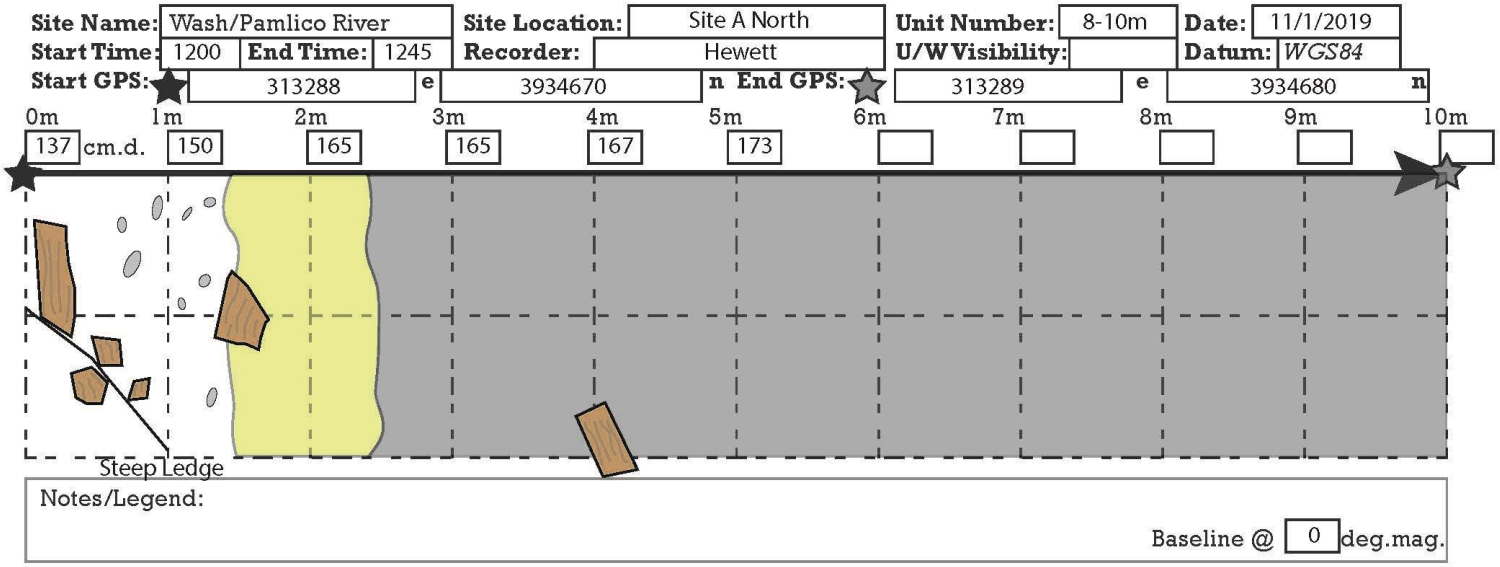
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End GPS: 313289 e 3934680 n
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Steep Ledge
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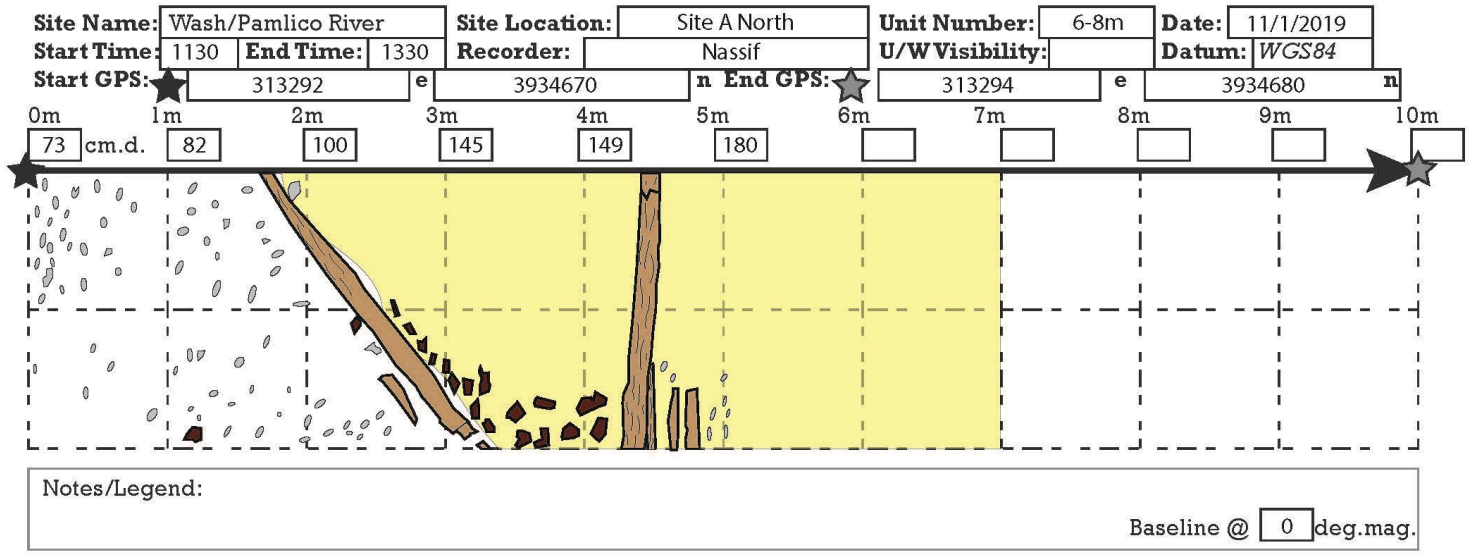
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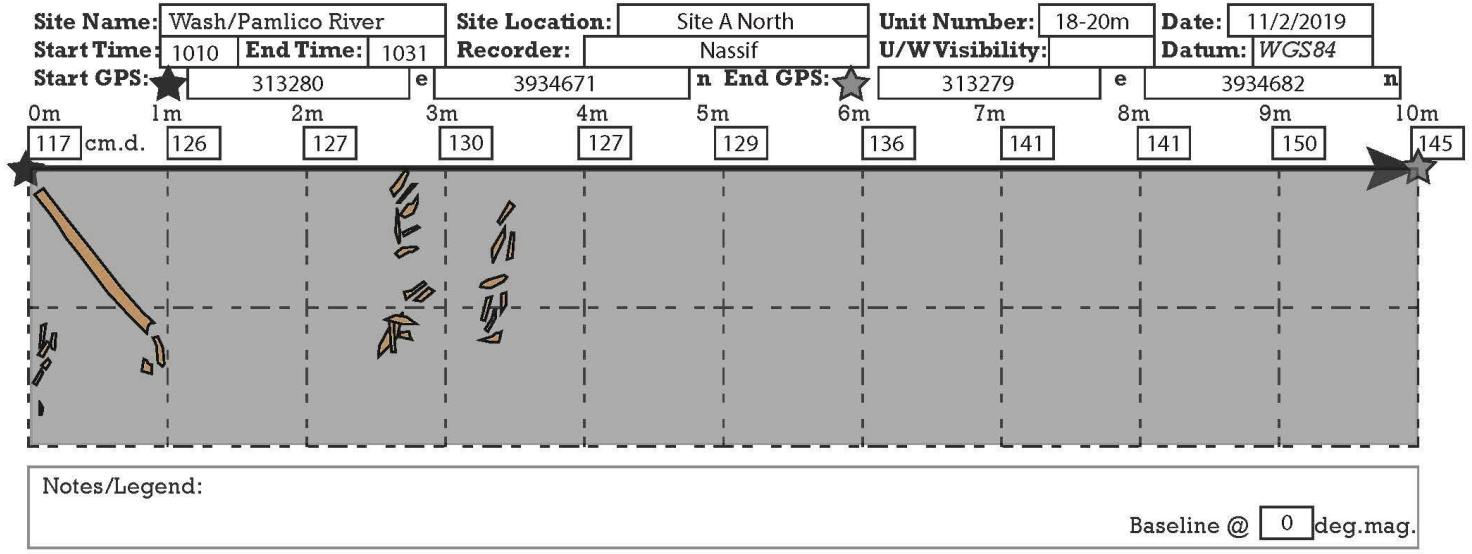
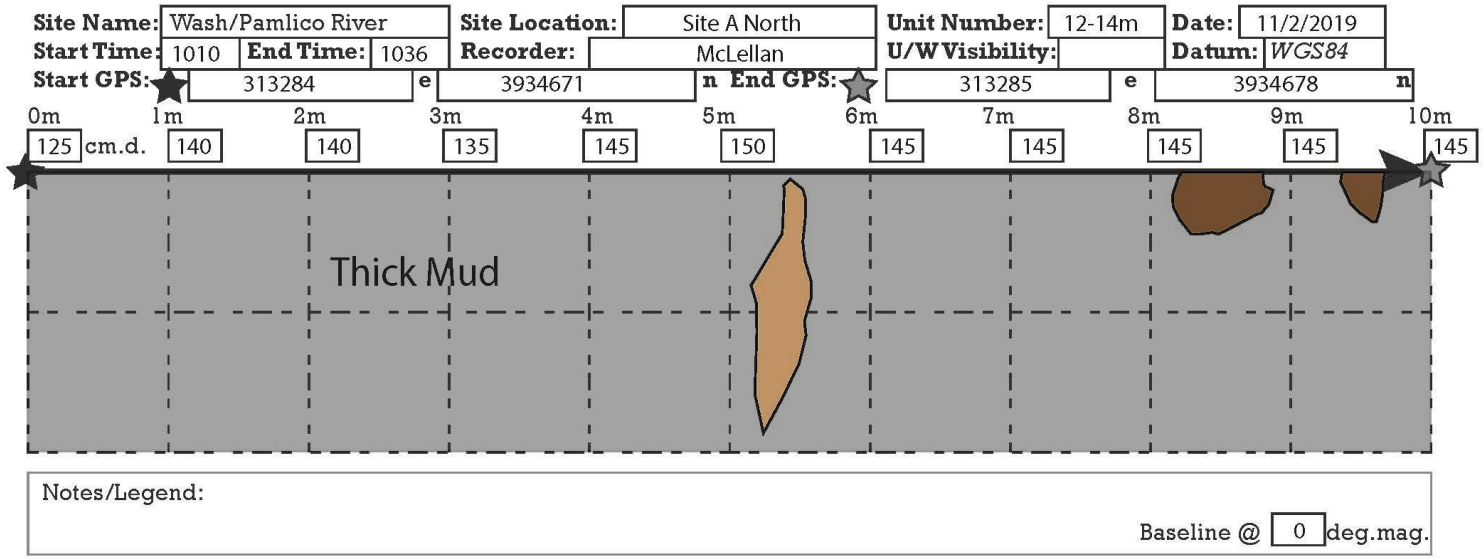
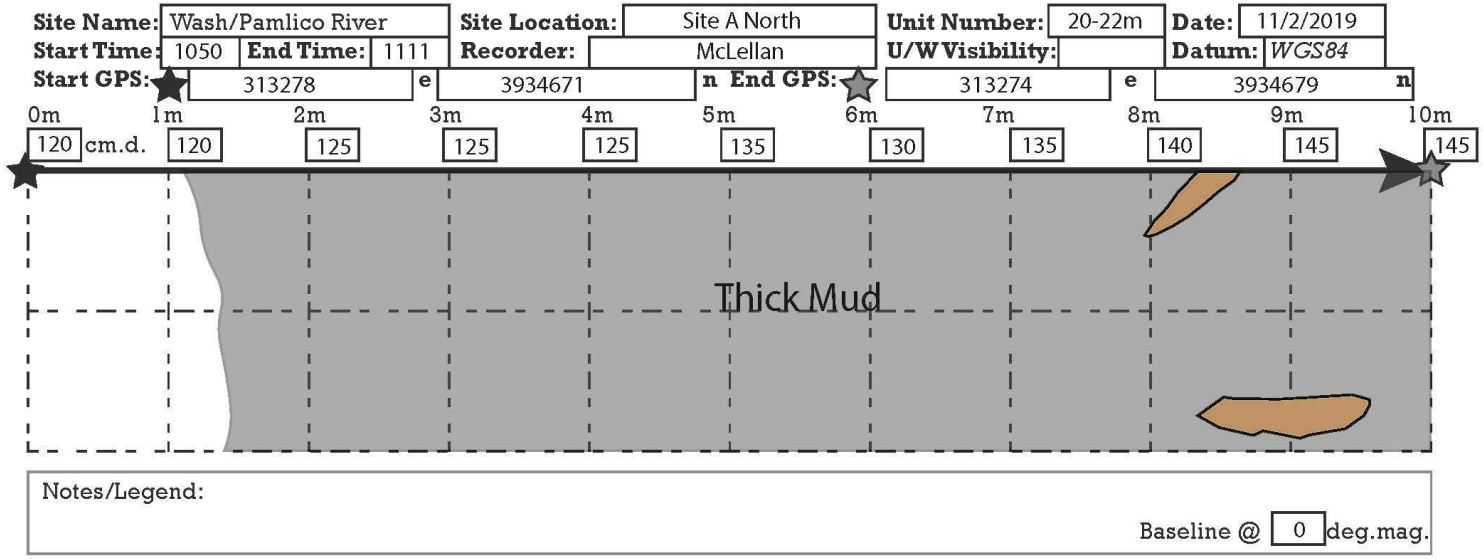
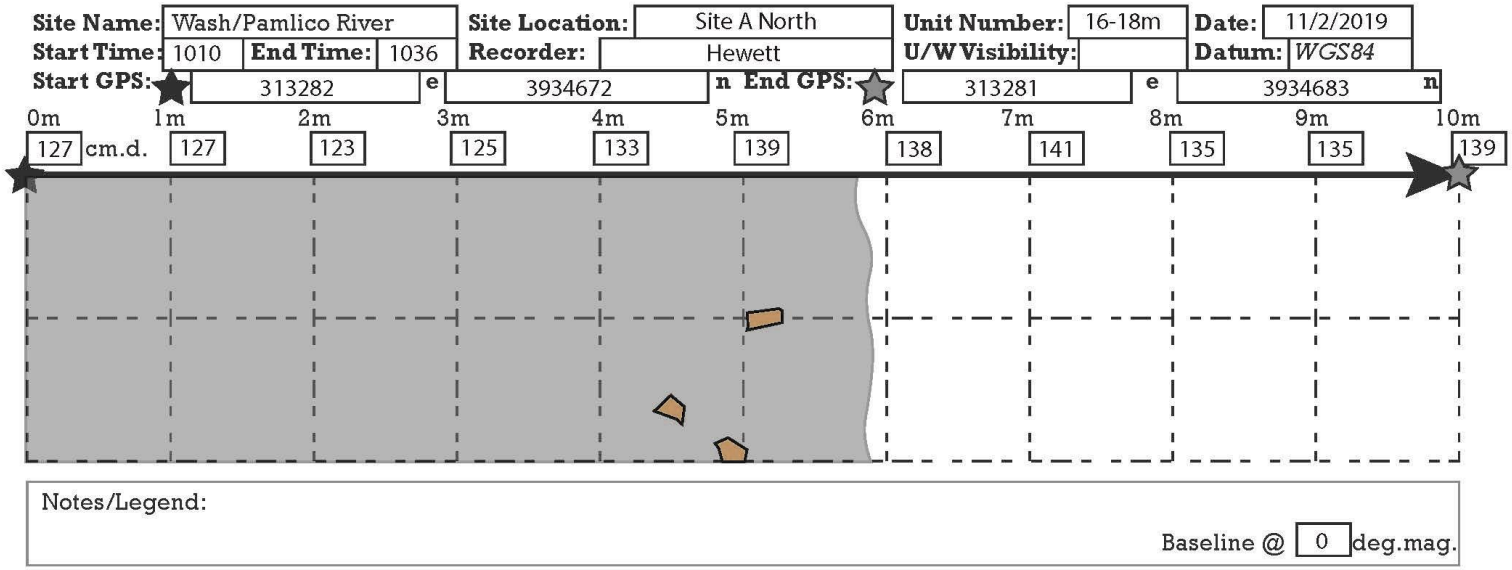
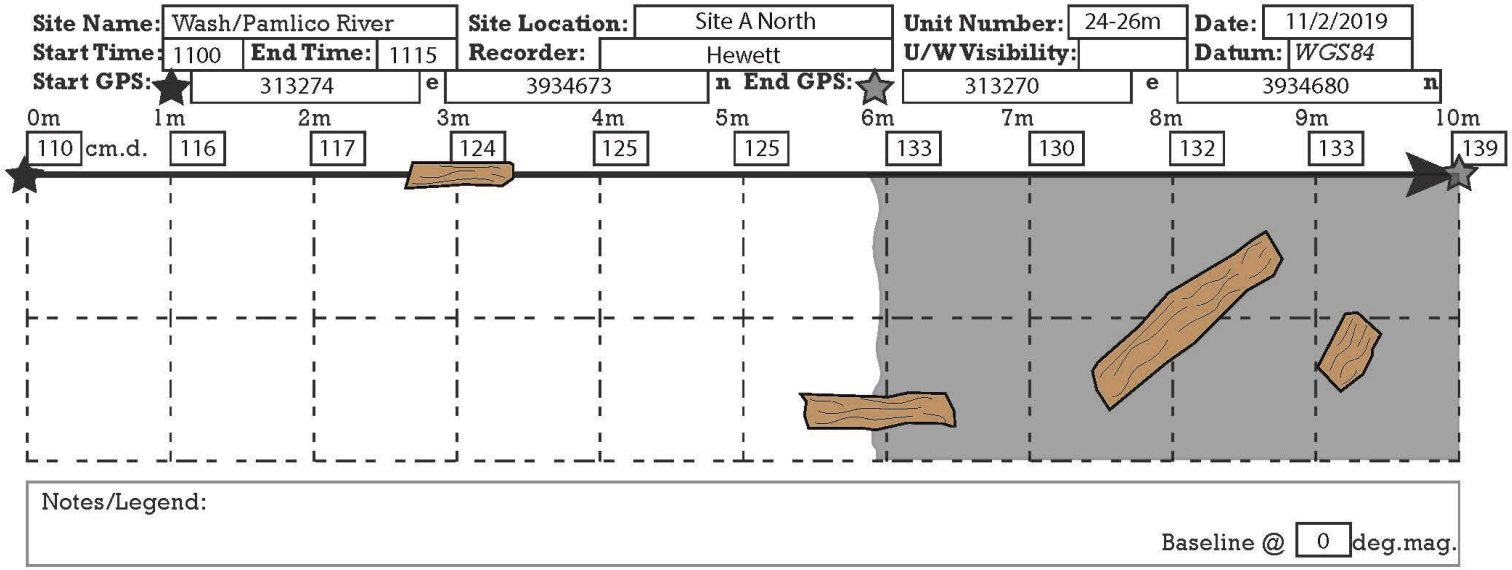
0m 1m 2m 3m 4m 5m 6m 7m 8m 9m 10m
73 cm.d. 82 100 145 149 180
Notes/Legend:
Baseline @ 0 deg.mag.

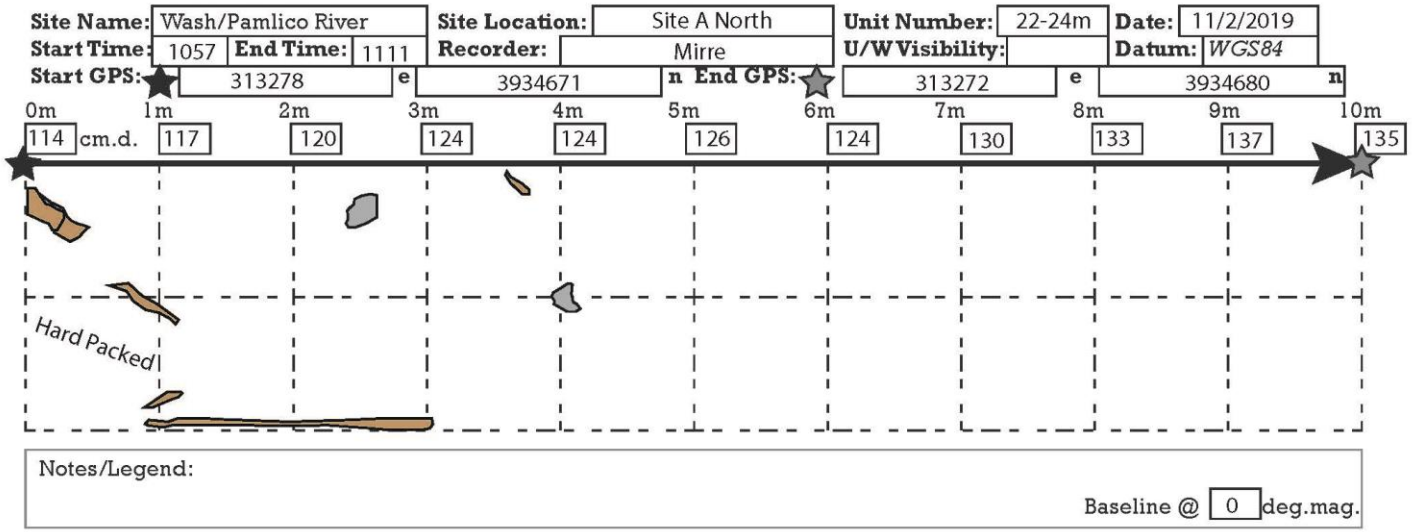

Site Name: Wash/Pamlico River
Site Location: Site A North
Unit Number: 18-20m
Date: 11/2/2019
Start Time: 1010
End Time: 1031
Recorder: Nassif
U/W Visibility:
Datum: WGS84
Start GPS: 313280 e 3934671 n
End GPS: 313279 e 3934682 n
0m 1m 2m 3m 4m 5m 6m 7m 8m 9m 10m
117 cm.d. 126 127 130 127 129 136 141 141 150 145
Notes/Legend:
Baseline @ 0 deg.mag.

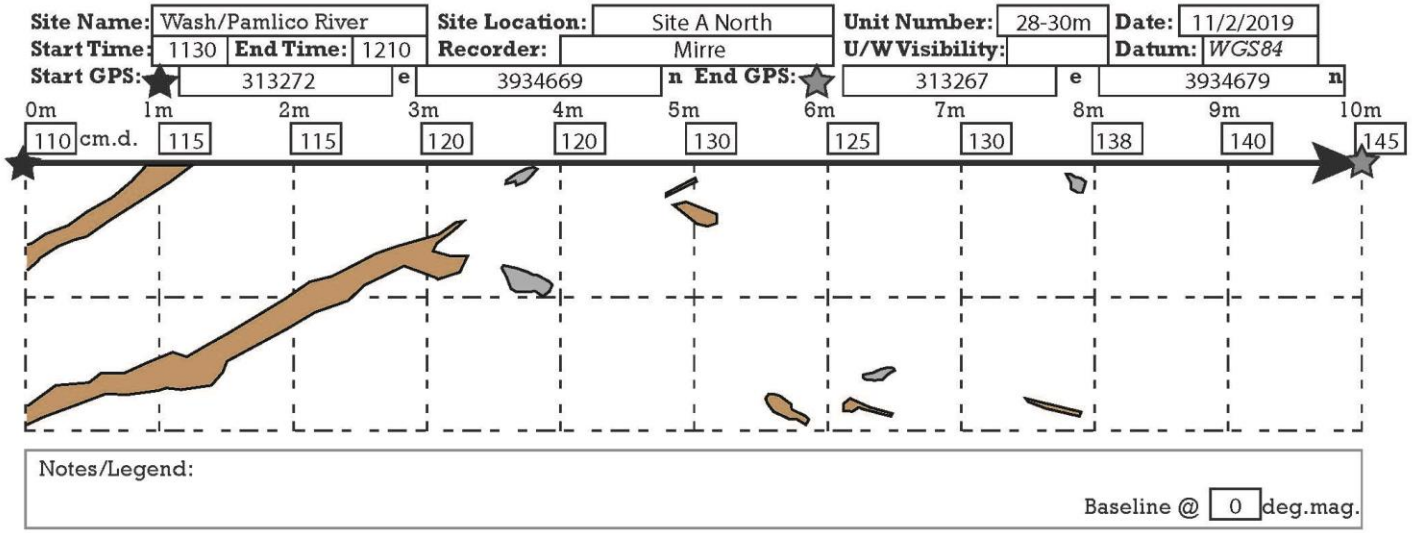

Site Name: Wash/Pamlico River
Site Location: Site A North
Unit Number: 12-14m
Date: 11/2/2019
Start Time: 1010
End Time: 1036
Recorder: McLellan
U/W Visibility:
Datum: WGS84
Start GPS: 313284 e 3934671 n
End GPS: 313285 e 3934678 n
0m 1m 2m 3m 4m 5m 6m 7m 8m 9m 10m
125 cm.d. 140 140 135 145 150 145 145 145 145 145
Thick Mud
Notes/Legend:
Baseline @ 0 deg.mag.


Site Name: Wash/Pamlico River
Site Location: Site A North
Unit Number: 20-22m
Date: 11/2/2019
Start Time: 1050
End Time: 1111
Recorder: McLellan
U/W Visibility:
Datum: WGS84
Start GPS: 313278 e 3934671 n
End GPS: 313274 e 3934679 n
0m 1m 2m 3m 4m 5m 6m 7m 8m 9m 10m
120 cm.d. 120 125 125 125 135 130 135 140 145 145
Thick Mud
Notes/Legend:
Baseline @ 0 deg.mag.


Site Name: Wash/Pamlico River
Site Location: Site A North
Unit Number: 16-18m
Date: 11/2/2019
Start Time: 1010
End Time: 1036
Recorder: Hewett
U/W Visibility:
Datum: WGS84
Start GPS: 313282 e 3934672 n
End GPS: 313281 e 3934683 n
0m 1m 2m 3m 4m 5m 6m 7m 8m 9m 10m
127 cm.d. 127 123 125 133 139 138 141 135 135 139
Notes/Legend:
Baseline @ 0 deg.mag.

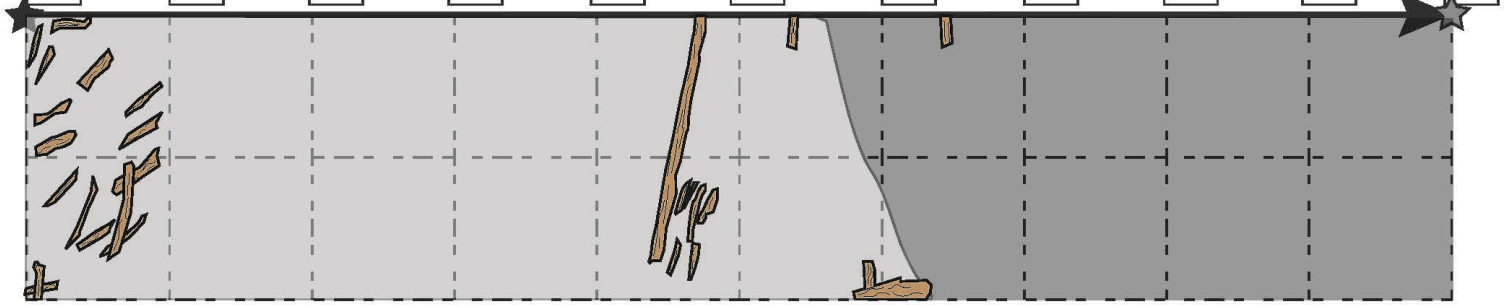

Site Name: Wash/Pamlico River
Site Location: Site A North
Unit Number: 24-26m
Date: 11/2/2019
Start Time: 1100
End Time: 1115
Recorder: Hewett
U/W Visibility:
Datum: WGS84
Start GPS: 313274 e 3934673 n
End GPS: 313270 e 3934680 n
0m 1m 2m 3m 4m 5m 6m 7m 8m 9m 10m
110 cm.d. 116 117 124 125 125 133 130 132 133 139
Notes/Legend:
Baseline @ 0 deg.mag.


Site Name: Wash/Pamlico River
Site Location: Site A North
Unit Number: 22-24m
Date: 11/2/2019
Start Time: 1057
End Time: 1111
Recorder: Mirre
U/W Visibility:
Datum: WGS84
Start GPS: 313278 e 3934671 n
End GPS: 313272 e 3934680 n
0m 1m 2m 3m 4m 5m 6m 7m 8m 9m 10m
114 cm.d. 117 120 124 124 126 124 130 133 137 135
Hard Packed
Notes/Legend:
Baseline @ 0 deg.mag.


Site Name: Wash/Pamlico River
Site Location: Site A North
Unit Number: 28-30m
Date: 11/2/2019
Start Time: 1130
End Time: 1210
Recorder: Mirre
U/W Visibility:
Datum: WGS84
Start GPS: 313272 e 3934669 n
End GPS: 313267 e 3934679 n
0m 1m 2m 3m 4m 5m 6m 7m 8m 9m 10m
110 cm.d. 115 115 120 120 130 125 130 138 140 145
Notes/Legend:
Baseline @ 0 deg.mag.

Site Name: Wash/Pamlico River | **Site Location:** Site A North | **Unit Number:** 26-28m | **Date:** 11/2/2019
Start Time: 1100 | **End Time:** 1130 | **Recorder:** Nassif | **U/W Visibility:** | **Datum:** *WGS84*
Start GPS: 313273 e 3934673 n **End GPS:** 313270 e 39334680 n

0m	1m	2m	3m	4m	5m	6m	7m	8m	9m	10m
110 cm.d.	119	117	124	122	126	131	134	140	131	140

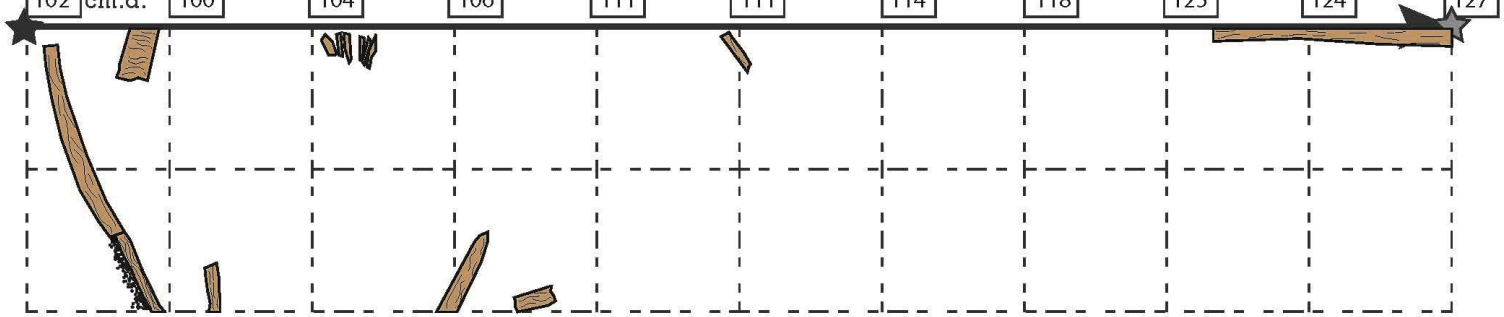


Notes/Legend:

Baseline @ 0 deg.mag.

Site Name: Wash/Pamlico River | **Site Location:** Site A North | **Unit Number:** 30-31.6m | **Date:** 11/2/2019
Start Time: 1130 | **End Time:** 1200 | **Recorder:** Nassif | **U/W Visibility:** | **Datum:** *WGS84*
Start GPS: 313269 e 3934669 n **End GPS:** 313266 e 3934678 n

0m	1m	2m	3m	4m	5m	6m	7m	8m	9m	10m
102 cm.d.	100	104	106	111	111	114	118	125	124	127

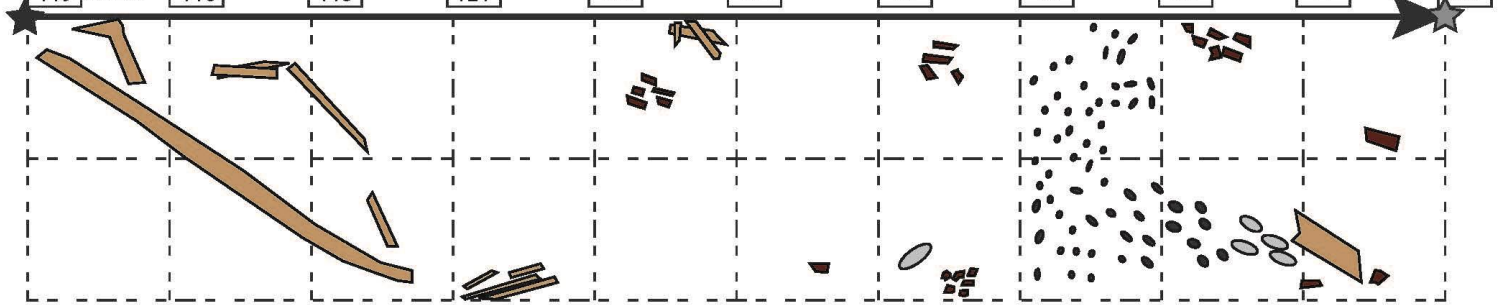


Notes/Legend:

Baseline @ 0 deg.mag.

Site Name: Wash/Pamlico River | **Site Location:** Site A South | **Unit Number:** 20-22m | **Date:** 11/2/2019
Start Time: 1330 | **End Time:** 1414 | **Recorder:** Nassif | **U/W Visibility:** | **Datum:** *WGS84*
Start GPS: 313277 e 3934669 n **End GPS:** 313279 e 3934658 n

0m	1m	2m	3m	4m	5m	6m	7m	8m	9m	10m
119 cm.d.	118	115	121	107	101	97	90	83	77	63

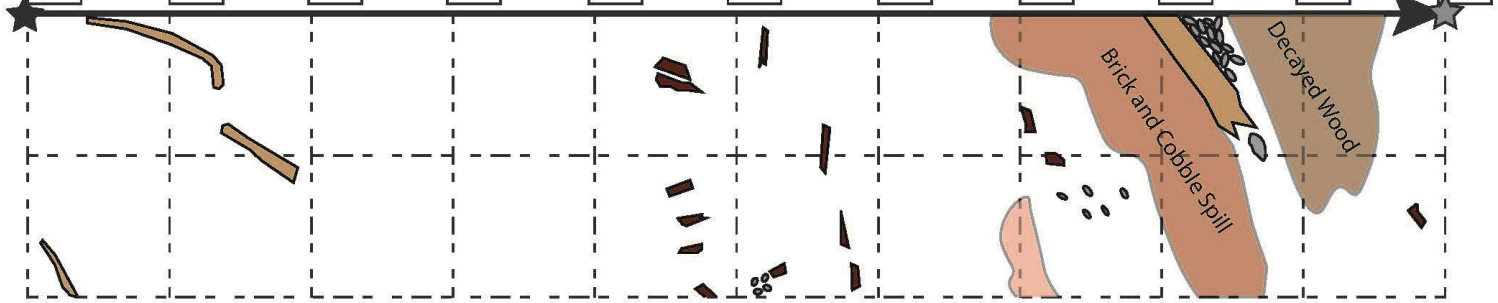


Notes/Legend:

Baseline @ 180 deg.mag.

Site Name: Wash/Pamlico River | **Site Location:** Site A South | **Unit Number:** 18-20m | **Date:** 11/2/2019
Start Time: 1436 | **End Time:** 1510 | **Recorder:** Nassif | **U/W Visibility:** | **Datum:** *WGS84*
Start GPS: 313281 e 3934669 n **End GPS:** 313279 e 3934657 n

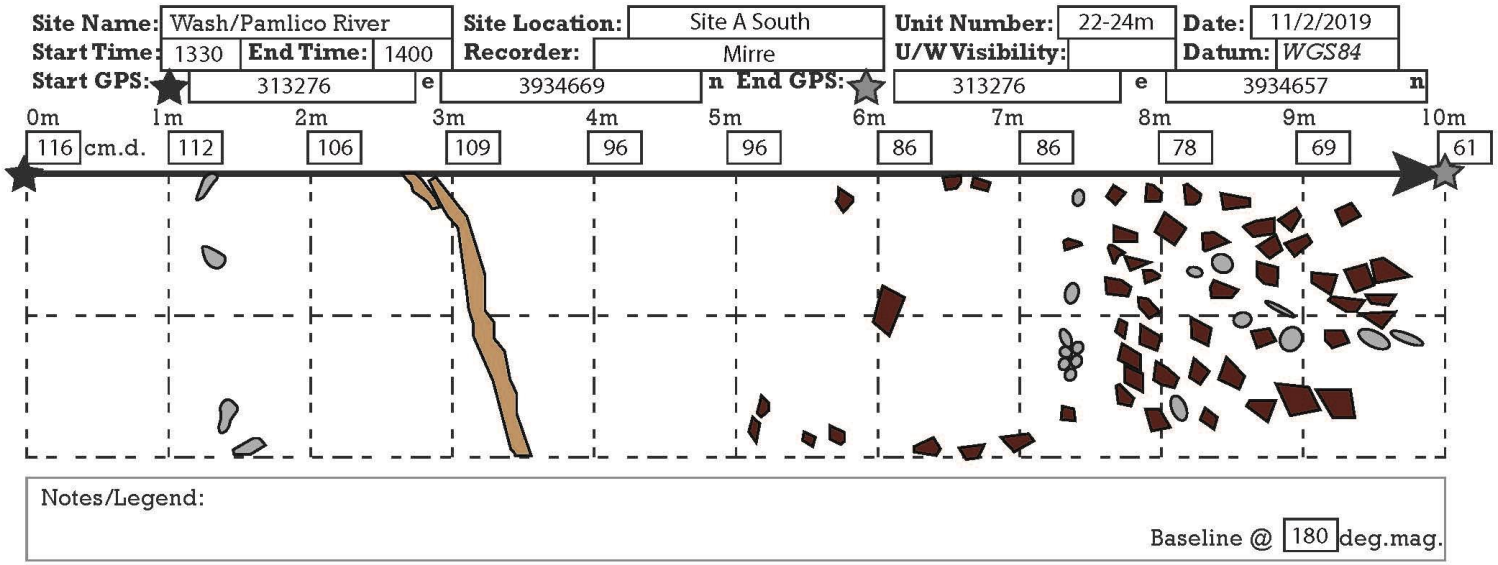
0m	1m	2m	3m	4m	5m	6m	7m	8m	9m	10m
108 cm.d.	118	115	111	110	102	99	94	82	62	55

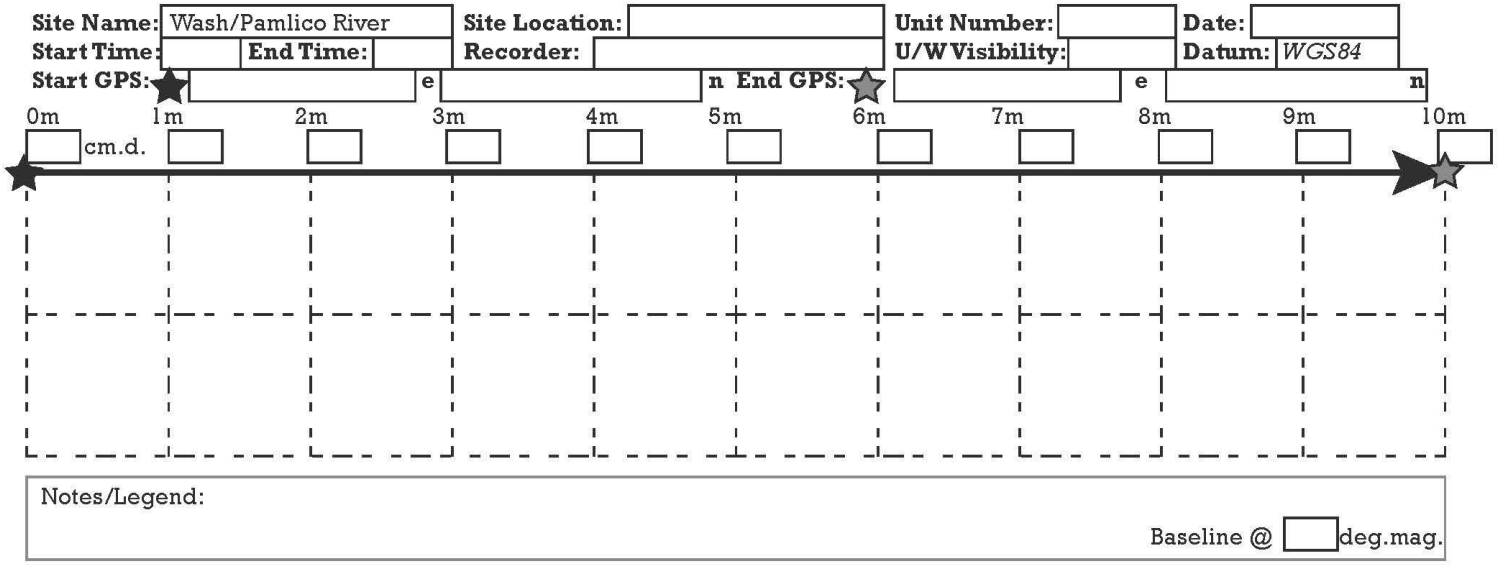


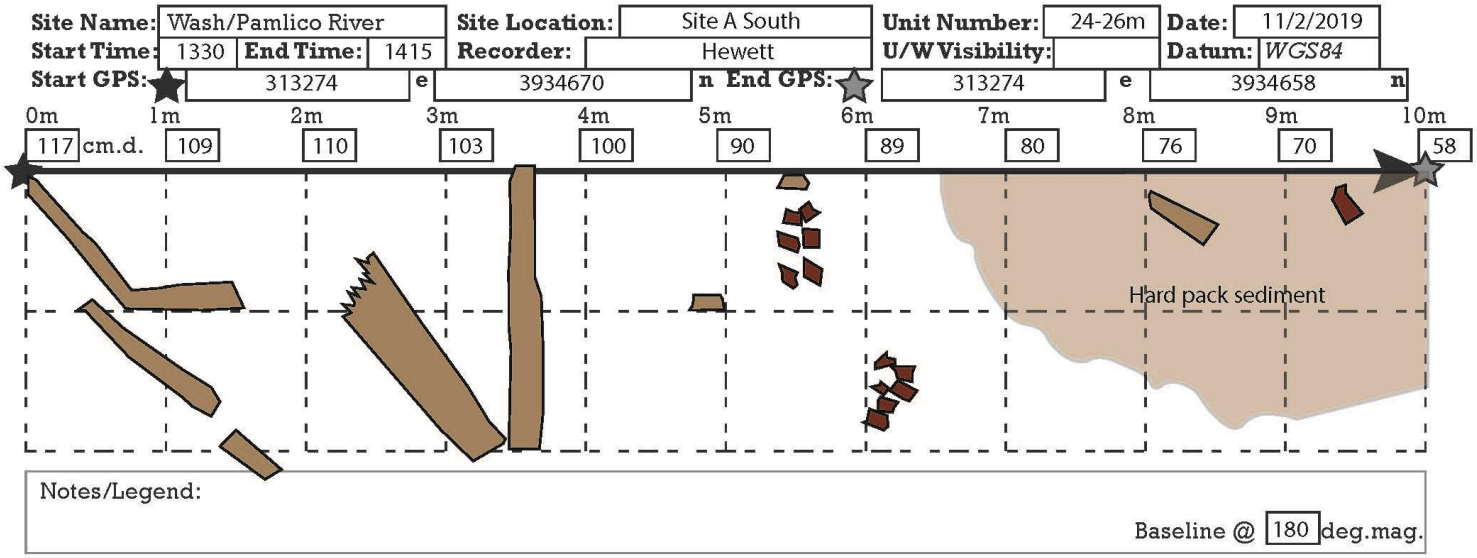
Notes/Legend:

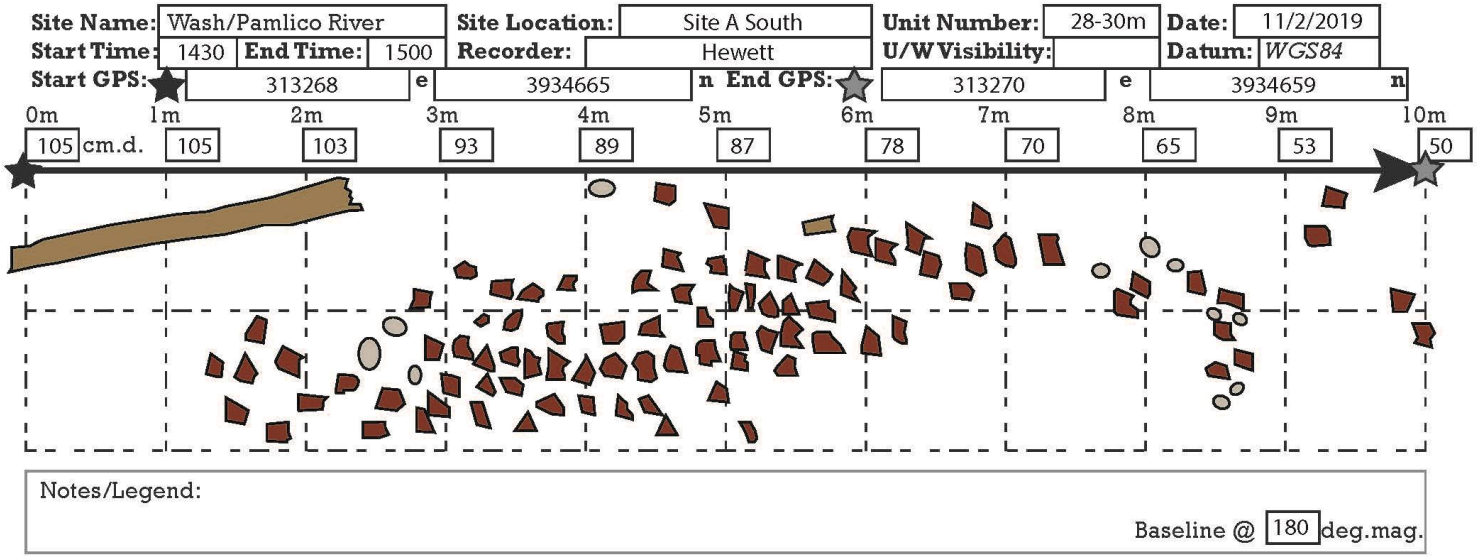
Brick and Rock Conglomerate

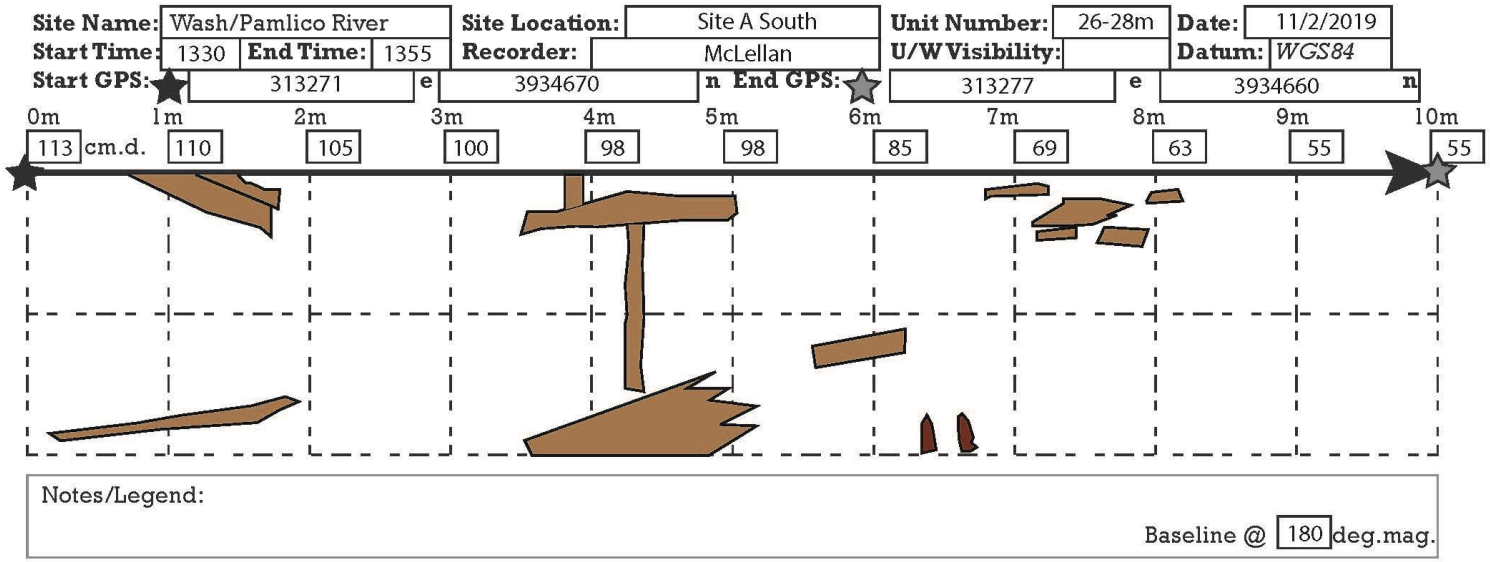
Baseline @ 180 deg.mag.

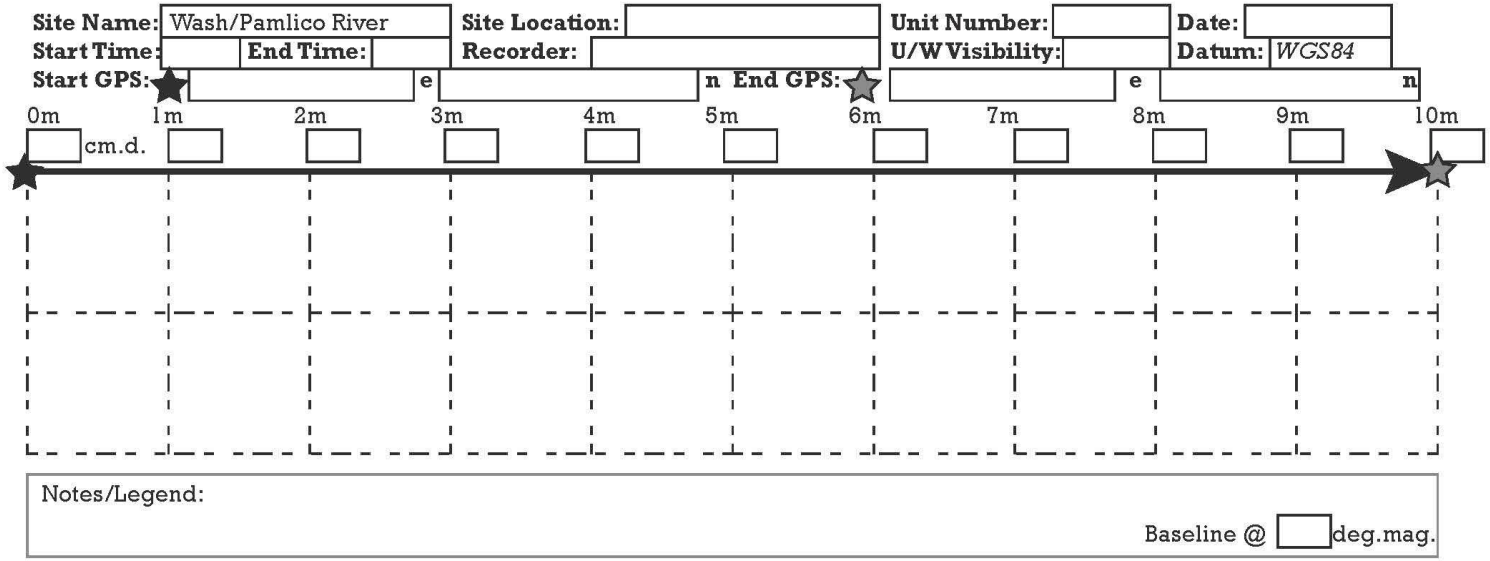

Site Name: Wash/Pamlico River
Site Location: Site A South
Unit Number: 22-24m
Date: 11/2/2019
Start Time: 1330
End Time: 1400
Recorder: Mirre
U/W Visibility:
Datum: WGS84
Start GPS: 313276 e 3934669 n
End GPS: 313276 e 3934657 n
0m 1m 2m 3m 4m 5m 6m 7m 8m 9m 10m
116 cm.d. 112 106 109 96 96 86 86 78 69 61
Notes/Legend:
Baseline @ 180 deg.mag.

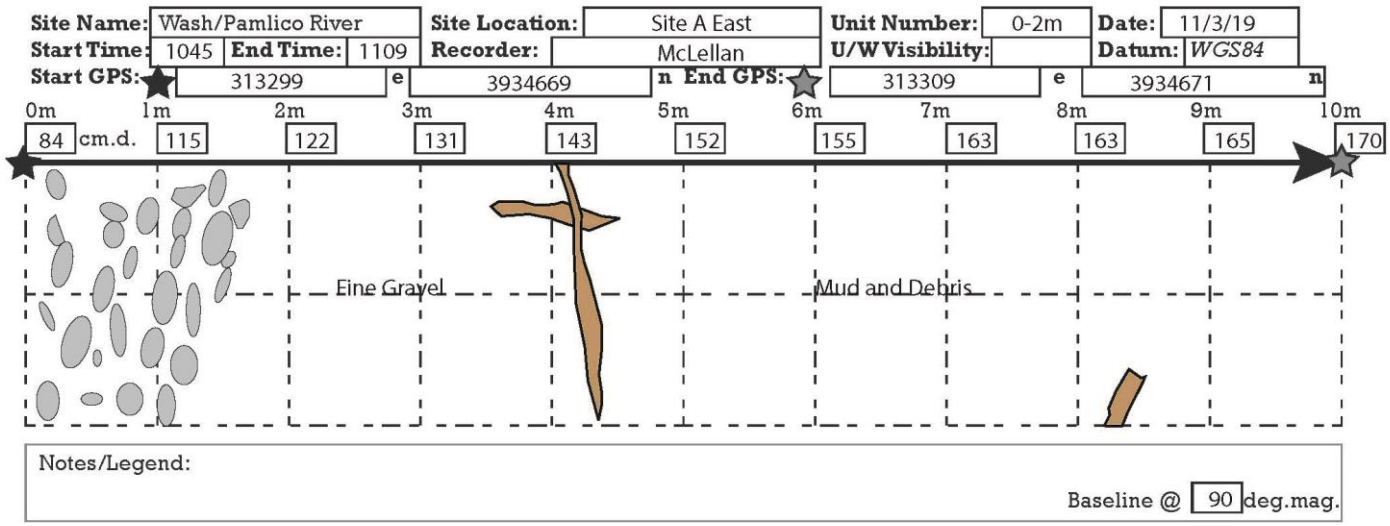

Site Name: Wash/Pamlico River
Site Location:
Unit Number:
Date:
Start Time:
End Time:
Recorder:
U/W Visibility:
Datum: WGS84
Start GPS: e n
End GPS: e n
0m 1m 2m 3m 4m 5m 6m 7m 8m 9m 10m
cm.d.
Notes/Legend:
Baseline @ deg.mag.

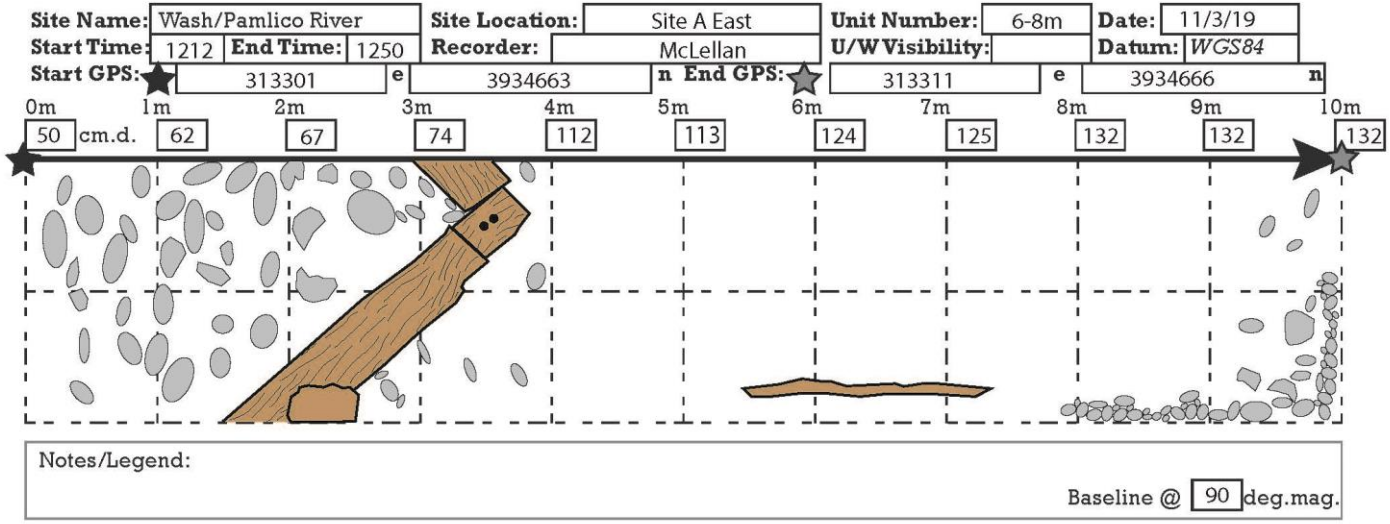

Site Name: Wash/Pamlico River
Site Location: Site A South
Unit Number: 24-26m
Date: 11/2/2019
Start Time: 1330
End Time: 1415
Recorder: Hewett
U/W Visibility:
Datum: WGS84
Start GPS: 313274 e 3934670 n
End GPS: 313274 e 3934658 n
0m 1m 2m 3m 4m 5m 6m 7m 8m 9m 10m
117 cm.d. 109 110 103 100 90 89 80 76 70 58
Hard pack sediment
Notes/Legend:
Baseline @ 180 deg.mag.


Site Name: Wash/Pamlico River
Site Location: Site A South
Unit Number: 28-30m
Date: 11/2/2019
Start Time: 1430
End Time: 1500
Recorder: Hewett
U/W Visibility:
Datum: WGS84
Start GPS: 313268 e 3934665 n
End GPS: 313270 e 3934659 n
0m 1m 2m 3m 4m 5m 6m 7m 8m 9m 10m
105 cm.d. 105 103 93 89 87 78 70 65 53 50
Notes/Legend:
Baseline @ 180 deg.mag.


Site Name: Wash/Pamlico River
Site Location: Site A South
Unit Number: 26-28m
Date: 11/2/2019
Start Time: 1330
End Time: 1355
Recorder: McLellan
U/W Visibility:
Datum: WGS84
Start GPS: 313271 e 3934670 n
End GPS: 313277 e 3934660 n
0m 1m 2m 3m 4m 5m 6m 7m 8m 9m 10m
113 cm.d. 110 105 100 98 98 85 69 63 55 55
Notes/Legend:
Baseline @ 180 deg.mag.

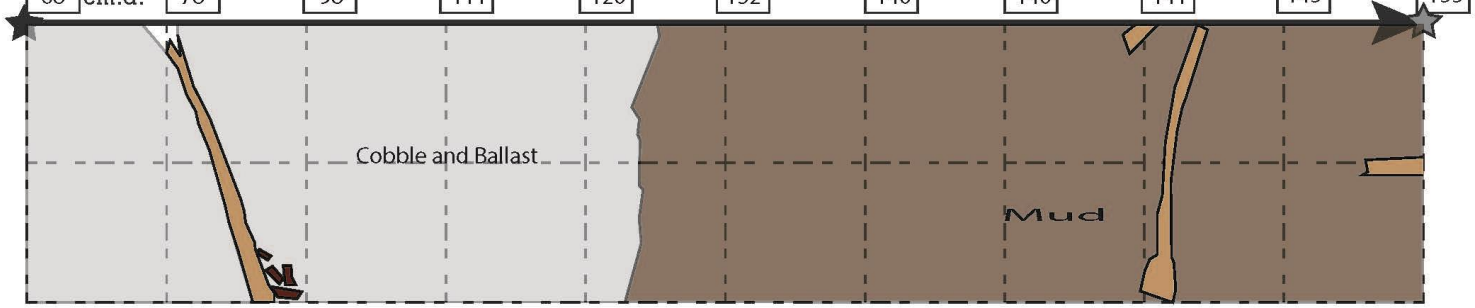

Site Name: Wash/Pamlico River
Site Location:
Unit Number:
Date:
Start Time:
End Time:
Recorder:
U/W Visibility:
Datum: WGS84
Start GPS:
e
n
End GPS:
e
n
0m 1m 2m 3m 4m 5m 6m 7m 8m 9m 10m
cm.d.
Notes/Legend:
Baseline @ deg.mag.


Site Name: Wash/Pamlico River
Site Location: Site A East
Unit Number: 0-2m
Date: 11/3/19
Start Time: 1045
End Time: 1109
Recorder: McLellan
U/W Visibility:
Datum: WGS84
Start GPS: 313299 e 3934669 n
End GPS: 313309 e 3934671 n
0m 1m 2m 3m 4m 5m 6m 7m 8m 9m 10m
84 cm.d. 115 122 131 143 152 155 163 163 165 170
Fine Gravel
Mud and Debris
Notes/Legend:
Baseline @ 90 deg.mag.


Site Name: Wash/Pamlico River
Site Location: Site A East
Unit Number: 6-8m
Date: 11/3/19
Start Time: 1212
End Time: 1250
Recorder: McLellan
U/W Visibility:
Datum: WGS84
Start GPS: 313301 e 3934663 n
End GPS: 313311 e 3934666 n
0m 1m 2m 3m 4m 5m 6m 7m 8m 9m 10m
50 cm.d. 62 67 74 112 113 124 125 132 132 132
Notes/Legend:
Baseline @ 90 deg.mag.

Site Name: Wash/Pamlico River | **Site Location:** Site A East | **Unit Number:** 2-4m | **Date:** 11/3/2019
Start Time: 1045 | **End Time:** 1115 | **Recorder:** Nassif | **U/W Visibility:** | **Datum:** *WGS84*
Start GPS: 313302 e 3934667 n **End GPS:** 313310 e 3934670 n

0m	1m	2m	3m	4m	5m	6m	7m	8m	9m	10m
68 cm.d.	78	98	111	120	132	140	140	141	145	155

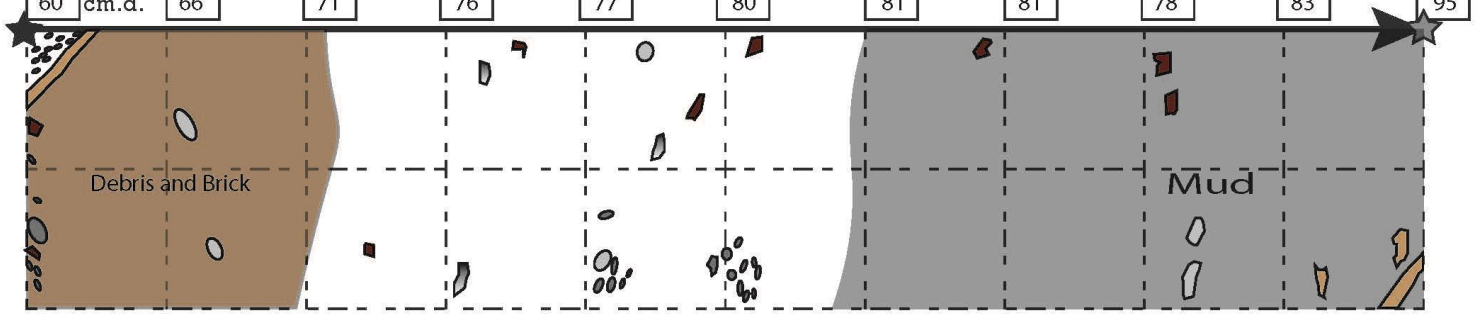


Notes/Legend:

Baseline @ 90 deg.mag.

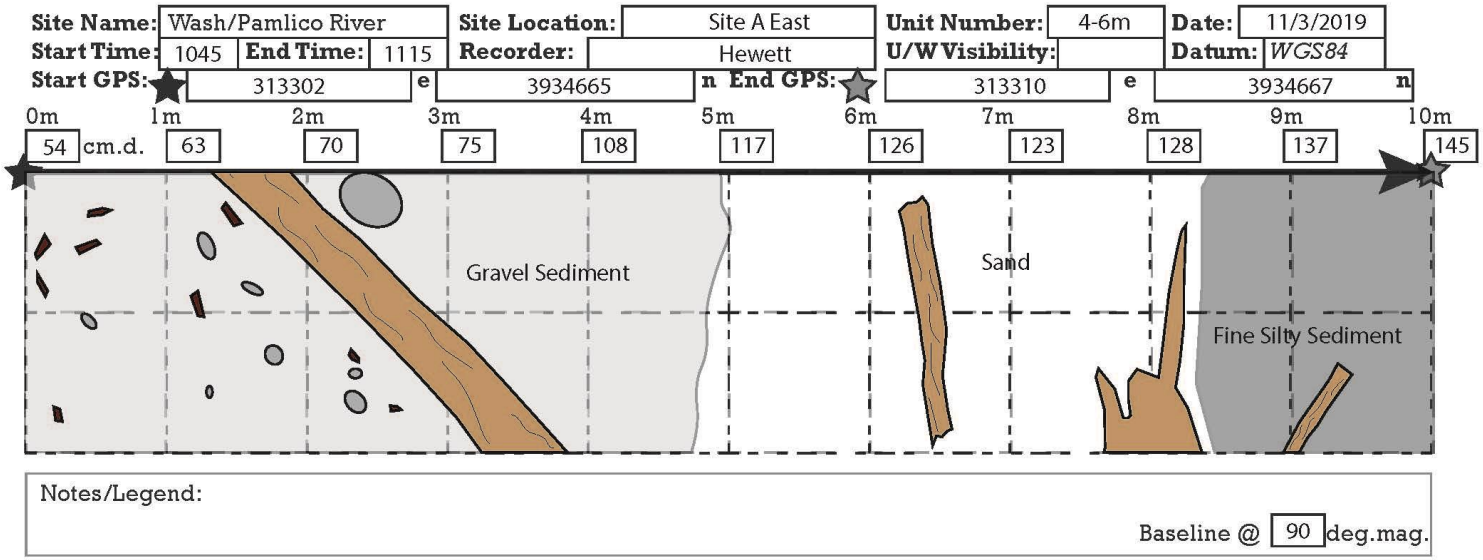
Site Name: Wash/Pamlico River | **Site Location:** Site A East | **Unit Number:** 10-12m | **Date:** 11/3/2019
Start Time: 1232 | **End Time:** 1315 | **Recorder:** Nassif | **U/W Visibility:** | **Datum:** *WGS84*
Start GPS: 313301 e 3934661 n **End GPS:** 313311 e 3934663 n

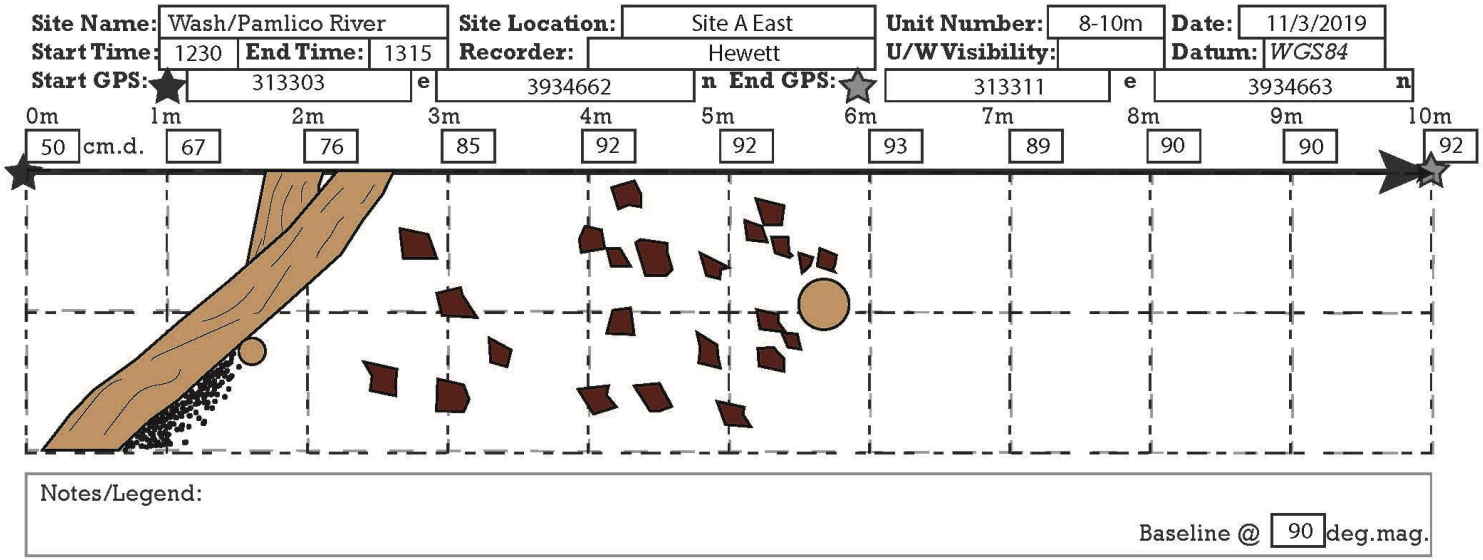
0m	1m	2m	3m	4m	5m	6m	7m	8m	9m	10m
60 cm.d.	66	71	76	77	80	81	81	78	83	95

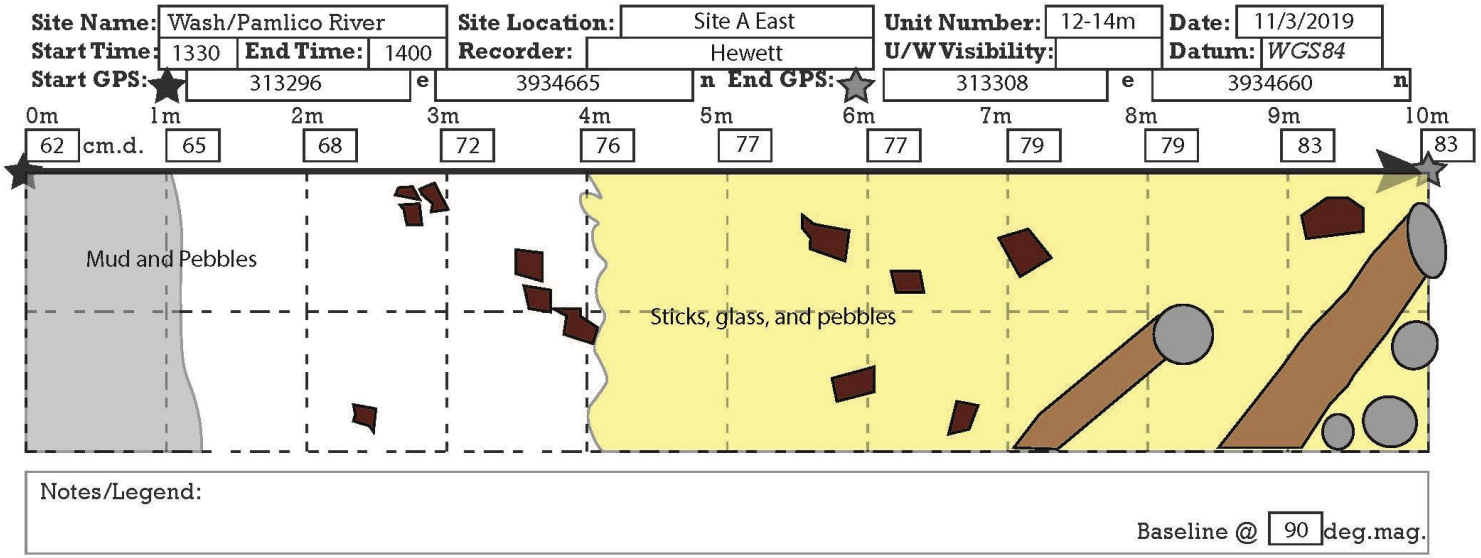


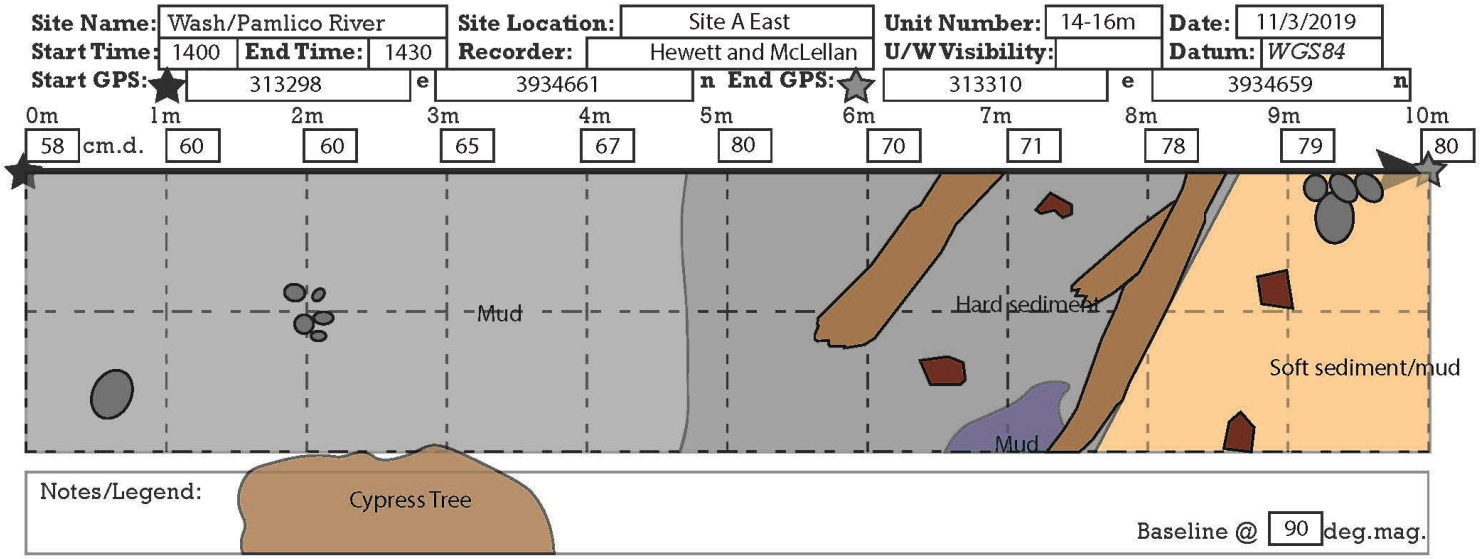
Notes/Legend:

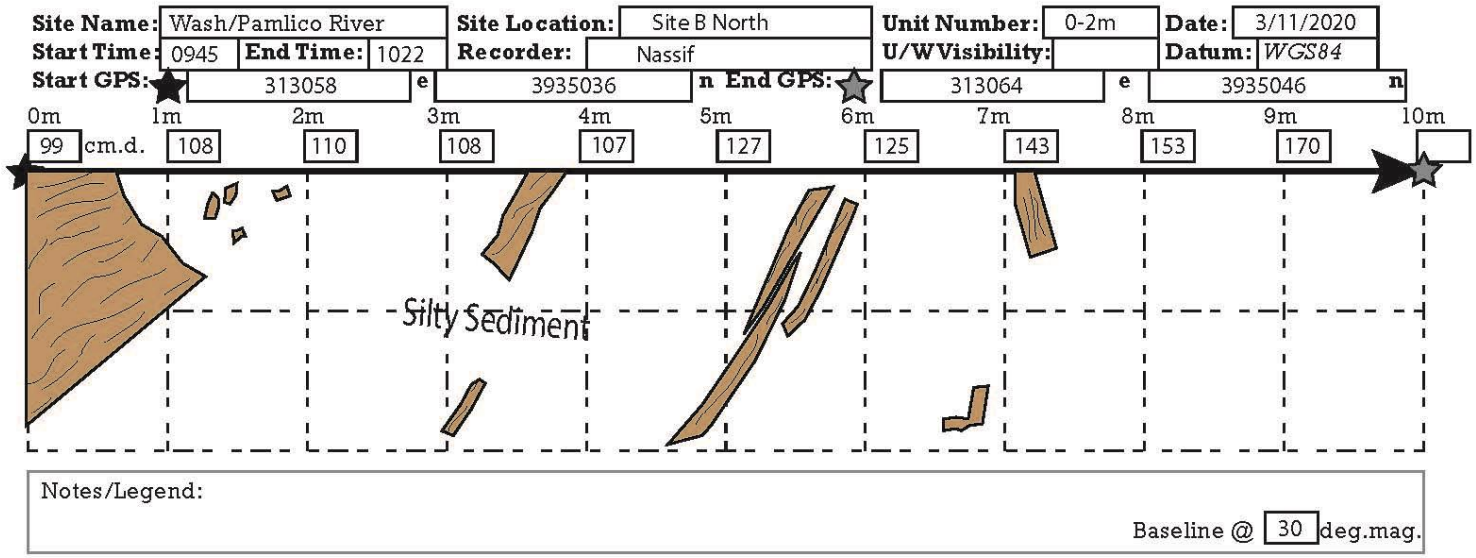
Baseline @ 90 deg.mag.

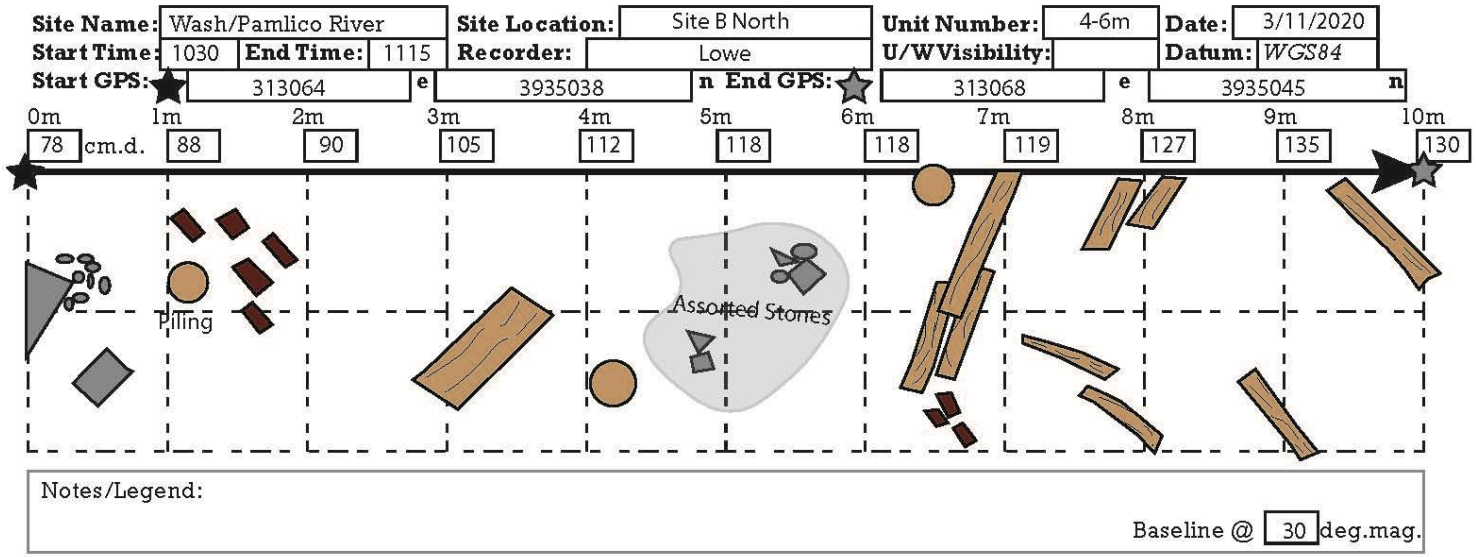

Site Name: Wash/Pamlico River
Site Location: Site A East
Unit Number: 4-6m
Date: 11/3/2019
Start Time: 1045
End Time: 1115
Recorder: Hewett
U/W Visibility:
Datum: WGS84
Start GPS: 313302 e 3934665 n
End GPS: 313310 e 3934667 n
0m 1m 2m 3m 4m 5m 6m 7m 8m 9m 10m
54 cm.d. 63 70 75 108 117 126 123 128 137 145
Gravel Sediment
Sand
Fine Silty Sediment
Notes/Legend:
Baseline @ 90 deg.mag.

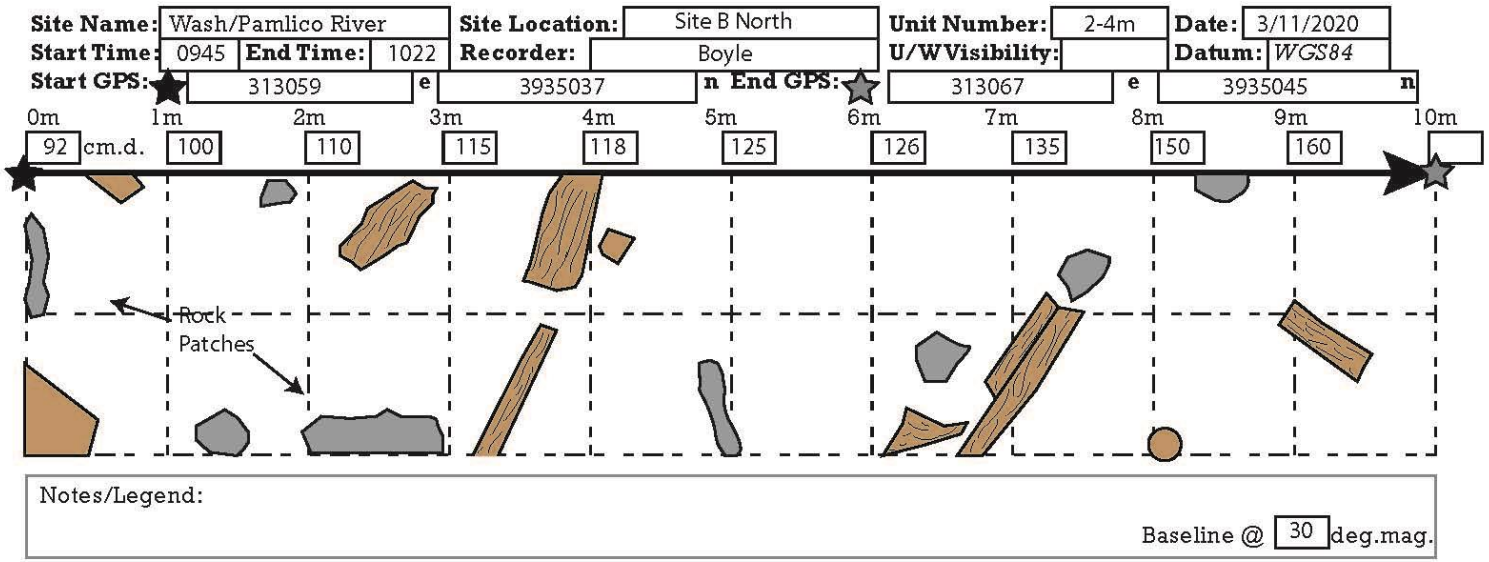

Site Name: Wash/Pamlico River
Site Location: Site A East
Unit Number: 8-10m
Date: 11/3/2019
Start Time: 1230
End Time: 1315
Recorder: Hewett
U/W Visibility:
Datum: WGS84
Start GPS: 313303 e 3934662 n
End GPS: 313311 e 3934663 n
0m 1m 2m 3m 4m 5m 6m 7m 8m 9m 10m
50 cm.d. 67 76 85 92 92 93 89 90 90 92
Notes/Legend:
Baseline @ 90 deg.mag.

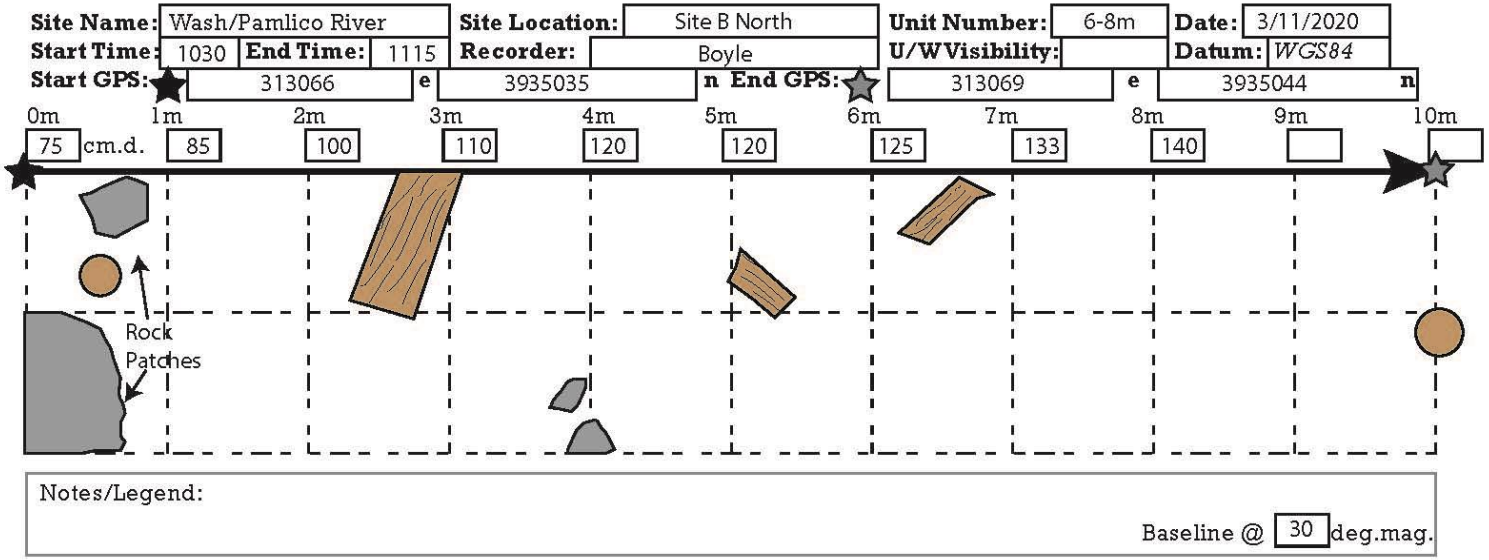

Site Name: Wash/Pamlico River
Site Location: Site A East
Unit Number: 12-14m
Date: 11/3/2019
Start Time: 1330
End Time: 1400
Recorder: Hewett
U/W Visibility:
Datum: WGS84
Start GPS: 313296 e 3934665 n
End GPS: 313308 e 3934660 n
0m 1m 2m 3m 4m 5m 6m 7m 8m 9m 10m
62 cm.d. 65 68 72 76 77 77 79 79 83 83
Mud and Pebbles
Sticks, glass, and pebbles
Notes/Legend:
Baseline @ 90 deg.mag.

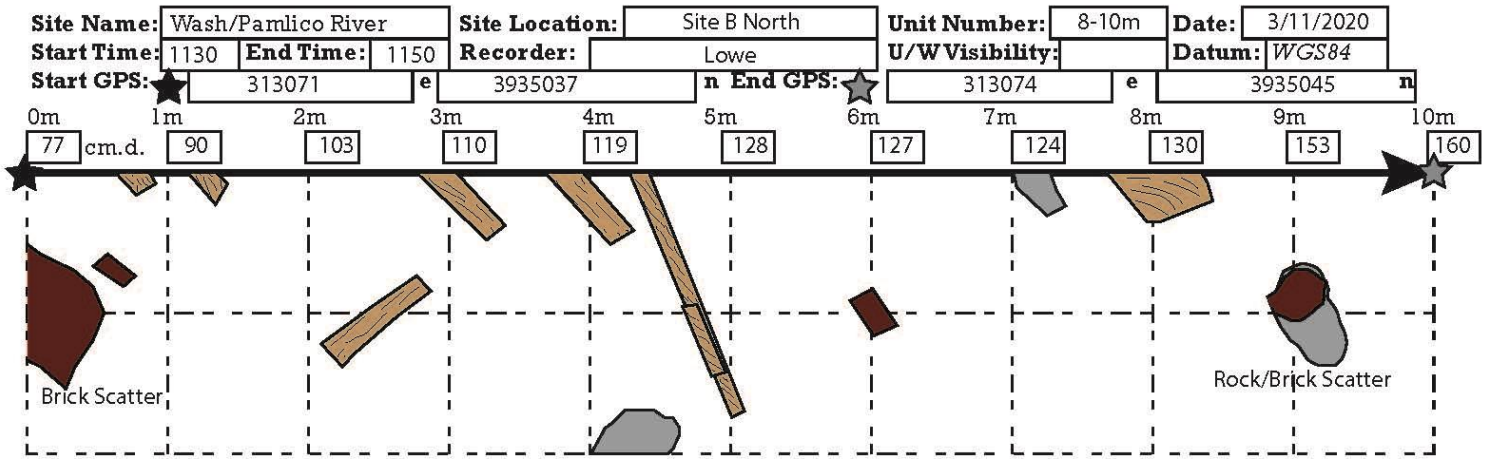

Site Name: Wash/Pamlico River
Site Location: Site A East
Unit Number: 14-16m
Date: 11/3/2019
Start Time: 1400
End Time: 1430
Recorder: Hewett and McLellan
U/W Visibility:
Datum: WGS84
Start GPS: 313298 e 3934661 n
End GPS: 313310 e 3934659 n
0m 1m 2m 3m 4m 5m 6m 7m 8m 9m 10m
58 cm.d. 60 60 65 67 80 70 71 78 79 80
Mud
Hard sediment
Soft sediment/mud
Mud
Notes/Legend:
Cypress Tree
Baseline @ 90 deg.mag.

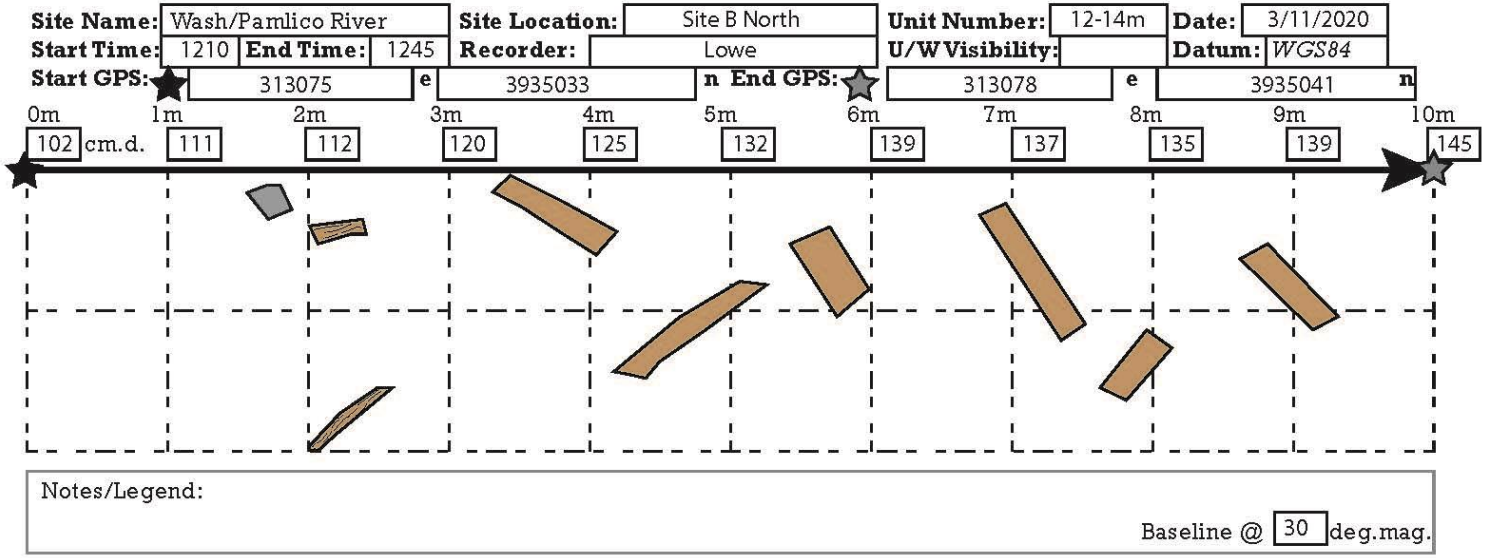

Site Name: Wash/Pamlico River
Site Location: Site B North
Unit Number: 0-2m
Date: 3/11/2020
Start Time: 0945
End Time: 1022
Recorder: Nassif
U/W Visibility:
Datum: WGS84
Start GPS: 313058 e 3935036 n
End GPS: 313064 e 3935046 n
0m 1m 2m 3m 4m 5m 6m 7m 8m 9m 10m
99 cm.d. 108 110 108 107 127 125 143 153 170
Silty Sediment
Notes/Legend:
Baseline @ 30 deg.mag.

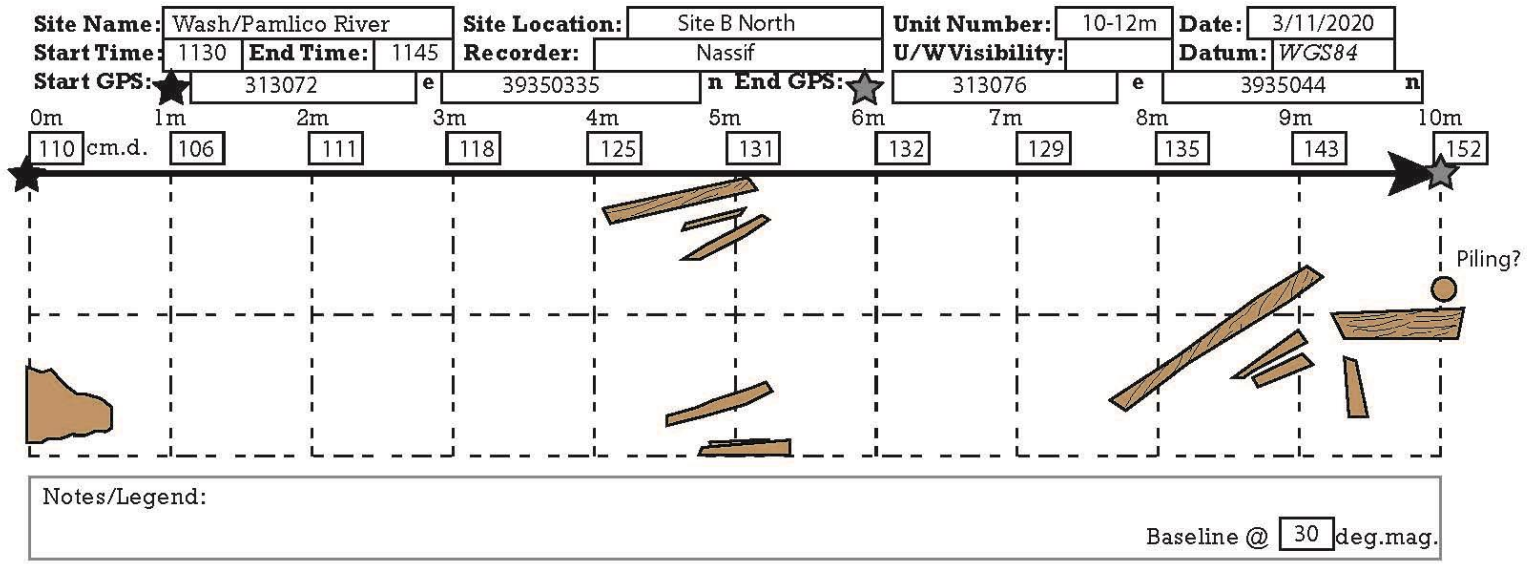

Site Name: Wash/Pamlico River
Site Location: Site B North
Unit Number: 4-6m
Date: 3/11/2020
Start Time: 1030
End Time: 1115
Recorder: Lowe
U/W Visibility:
Datum: WGS84
Start GPS: 313064 e 3935038 n
End GPS: 313068 e 3935045 n
0m 1m 2m 3m 4m 5m 6m 7m 8m 9m 10m
78 cm.d. 88 90 105 112 118 118 119 127 135 130
Piling
Assorted Stones
Notes/Legend:
Baseline @ 30 deg.mag.

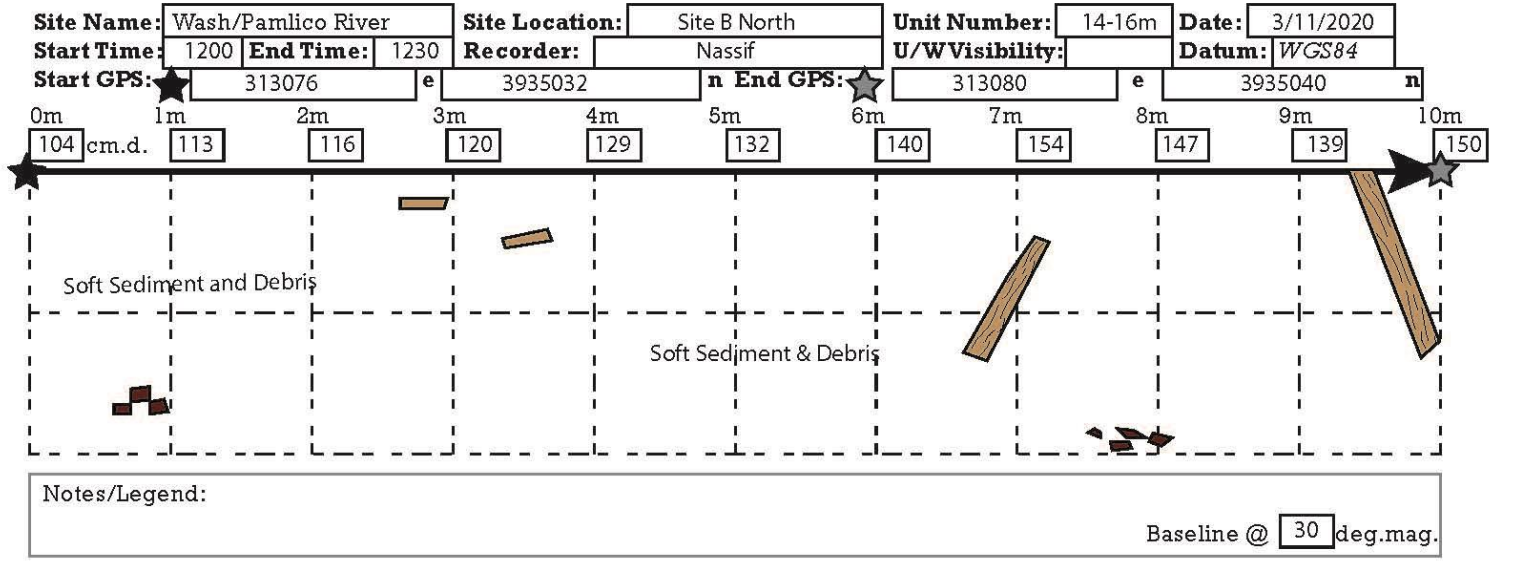

Site Name: Wash/Pamlico River
Site Location: Site B North
Unit Number: 2-4m
Date: 3/11/2020
Start Time: 0945
End Time: 1022
Recorder: Boyle
U/W Visibility:
Datum: WGS84
Start GPS: 313059 e 3935037 n
End GPS: 313067 e 3935045 n
0m 1m 2m 3m 4m 5m 6m 7m 8m 9m 10m
92 cm.d. 100 110 115 118 125 126 135 150 160
Rock Patches
Notes/Legend:
Baseline @ 30 deg.mag.

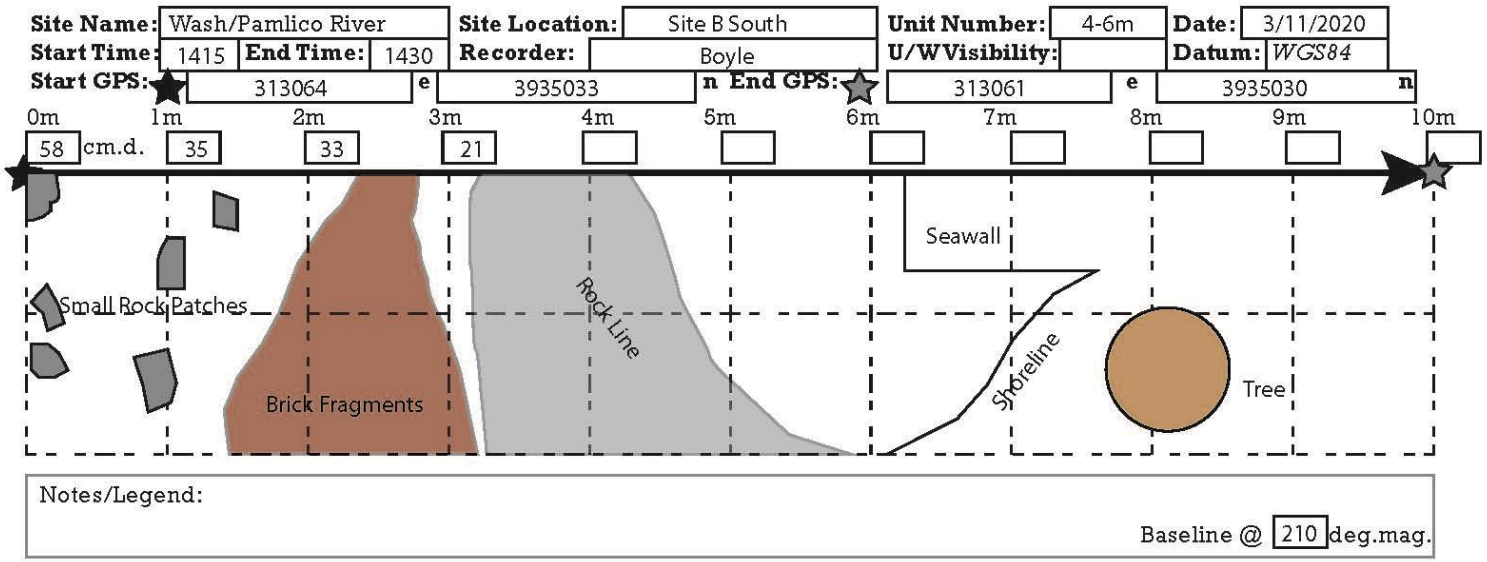

Site Name: Wash/Pamlico River
Site Location: Site B North
Unit Number: 6-8m
Date: 3/11/2020
Start Time: 1030
End Time: 1115
Recorder: Boyle
U/W Visibility:
Datum: WGS84
Start GPS: 313066 e 3935035 n
End GPS: 313069 e 3935044 n
0m 1m 2m 3m 4m 5m 6m 7m 8m 9m 10m
75 cm.d. 85 100 110 120 120 125 133 140
Rock Patches
Notes/Legend:
Baseline @ 30 deg.mag.

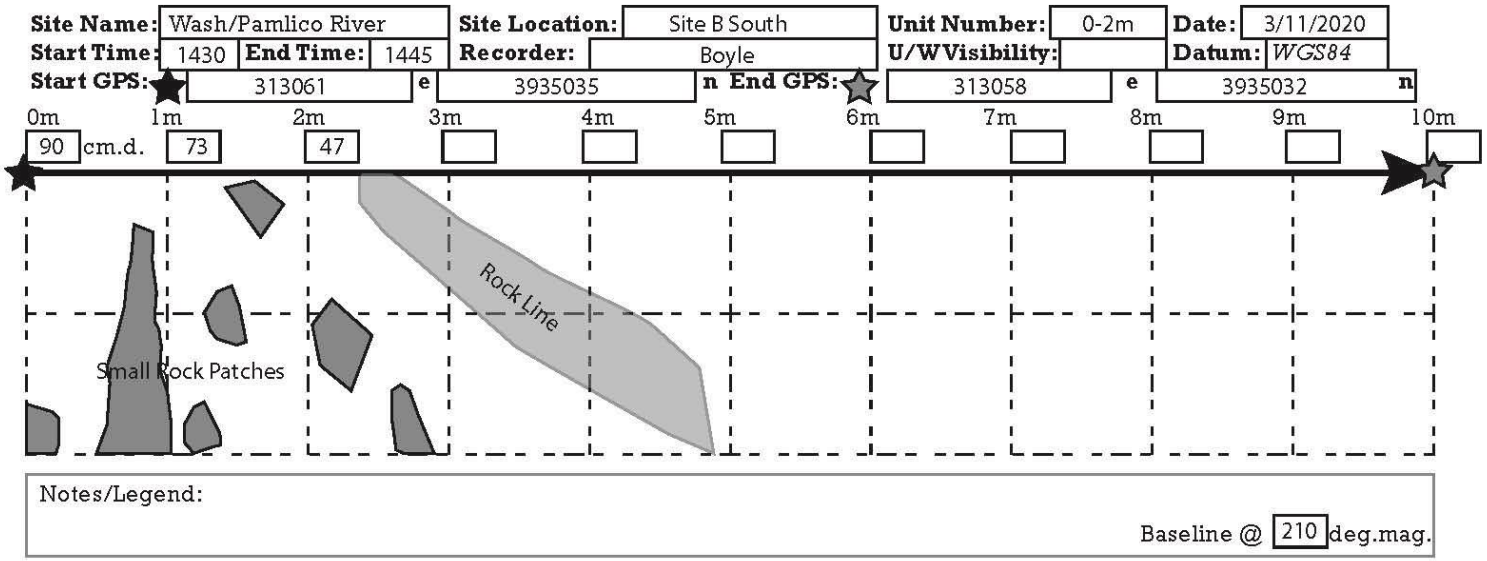

Site Name: Wash/Pamlico River
Site Location: Site B North
Unit Number: 8-10m
Date: 3/11/2020
Start Time: 1130
End Time: 1150
Recorder: Lowe
U/W Visibility:
Datum: WGS84
Start GPS: 313071 e 3935037 n
End GPS: 313074 e 3935045 n
0m 1m 2m 3m 4m 5m 6m 7m 8m 9m 10m
77 cm.d. 90 103 110 119 128 127 124 130 153 160
Brick Scatter
Rock/Brick Scatter
Notes/Legend:
Baseline @ 30 deg.mag.

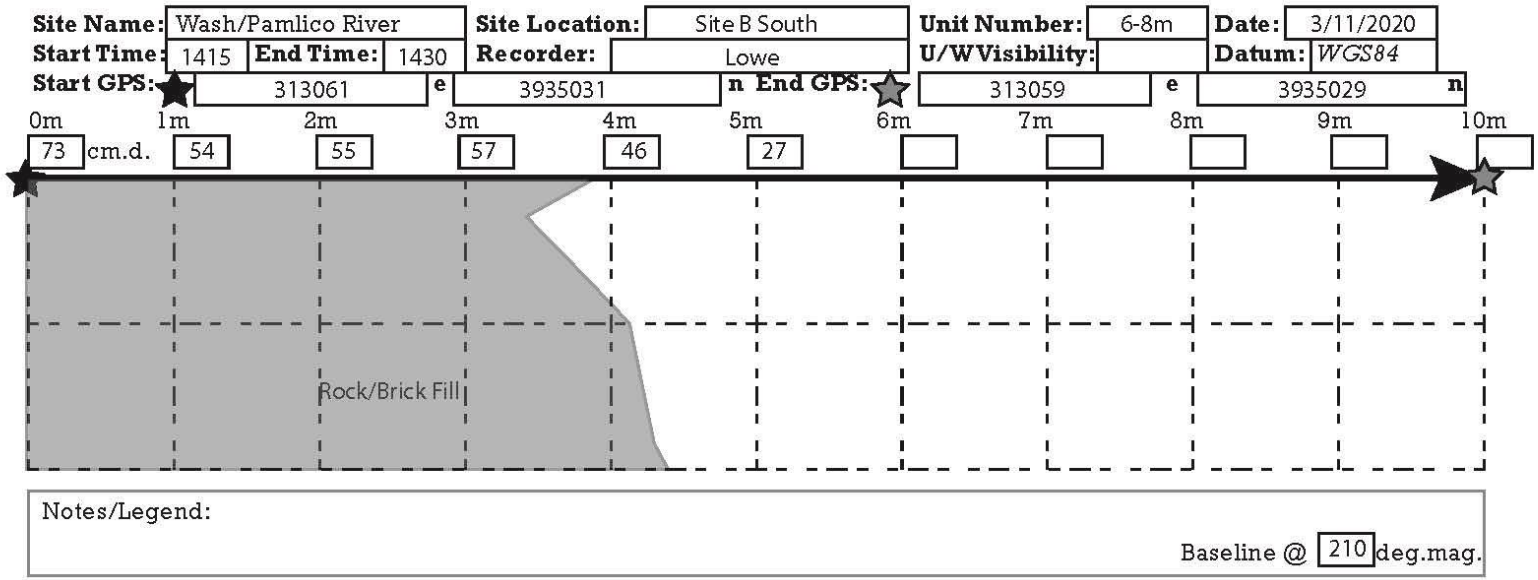

Site Name: Wash/Pamlico River
Site Location: Site B North
Unit Number: 12-14m
Date: 3/11/2020
Start Time: 1210
End Time: 1245
Recorder: Lowe
U/W Visibility:
Datum: WGS84
Start GPS: 313075 e 3935033 n
End GPS: 313078 e 3935041 n
0m 1m 2m 3m 4m 5m 6m 7m 8m 9m 10m
102 cm.d. 111 112 120 125 132 139 137 135 139 145
Notes/Legend:
Baseline @ 30 deg.mag.

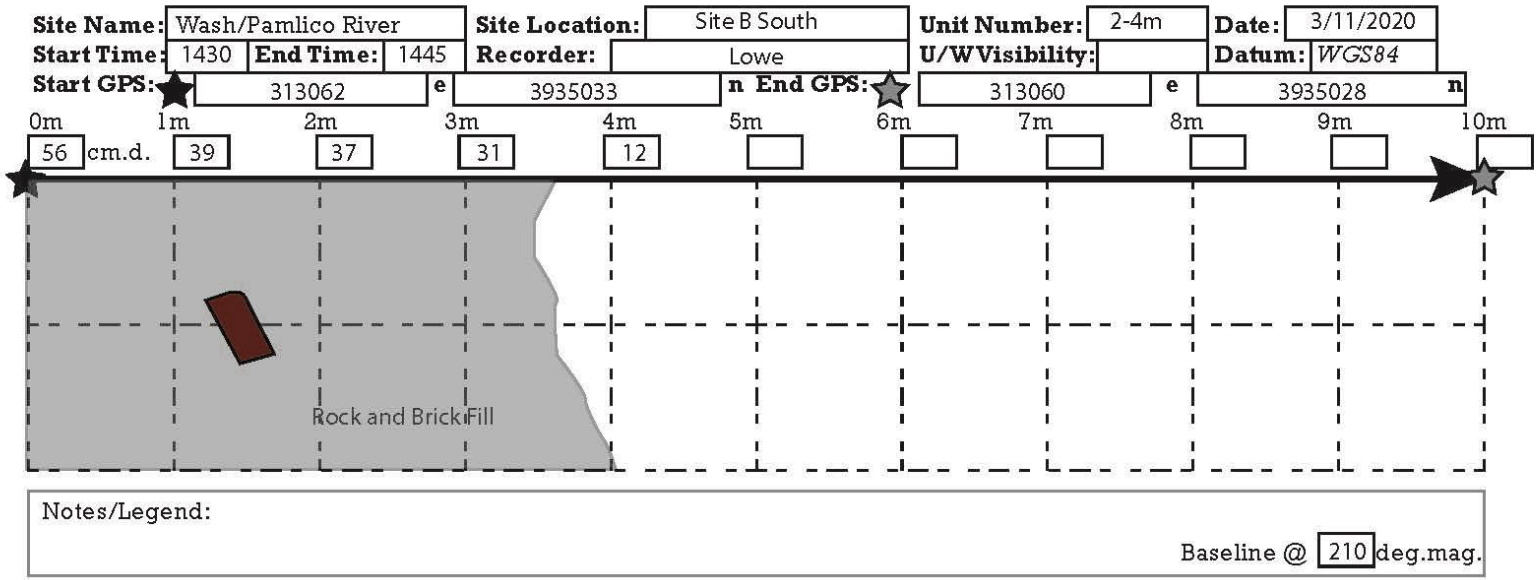

Site Name: Wash/Pamlico River
Site Location: Site B North
Unit Number: 10-12m
Date: 3/11/2020
Start Time: 1130
End Time: 1145
Recorder: Nassif
U/W Visibility:
Datum: WGS84
Start GPS: 313072 e 39350335 n
End GPS: 313076 e 3935044 n
0m 1m 2m 3m 4m 5m 6m 7m 8m 9m 10m
110 cm.d. 106 111 118 125 131 132 129 135 143 152
Piling?
Notes/Legend:
Baseline @ 30 deg.mag.

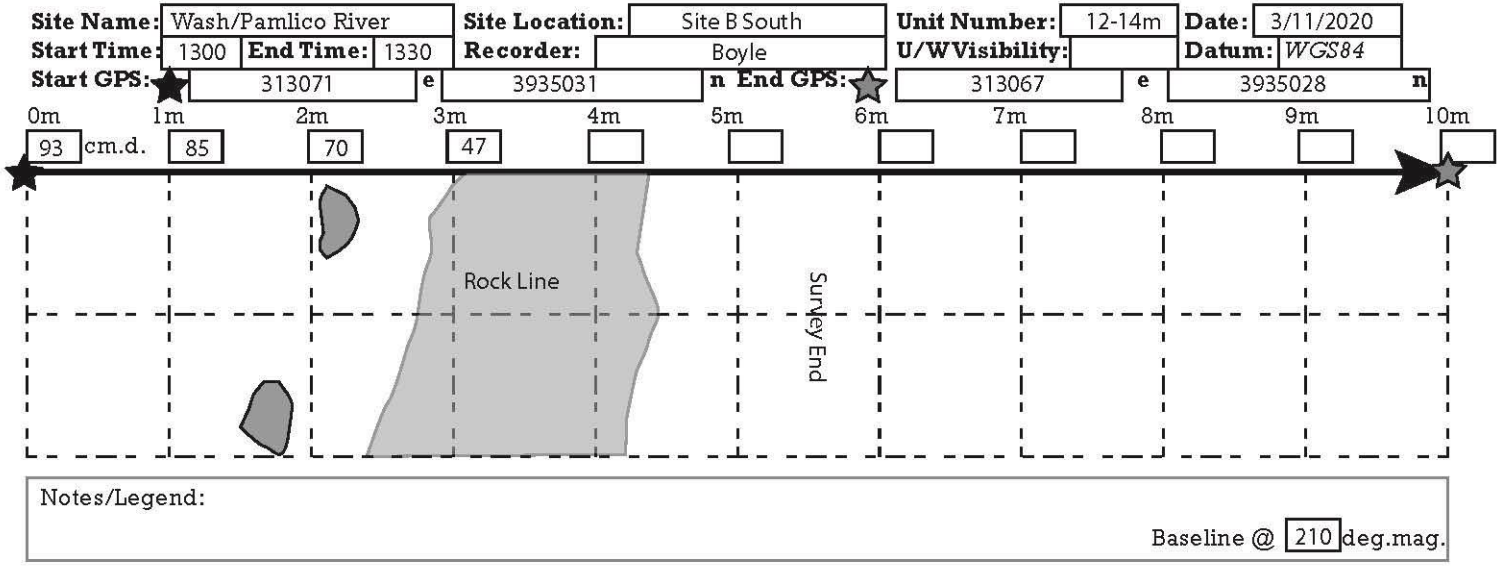

Site Name: Wash/Pamlico River
Site Location: Site B North
Unit Number: 14-16m
Date: 3/11/2020
Start Time: 1200
End Time: 1230
Recorder: Nassif
U/W Visibility:
Datum: WGS84
Start GPS: 313076 e 3935032 n
End GPS: 313080 e 3935040 n
0m 1m 2m 3m 4m 5m 6m 7m 8m 9m 10m
104 cm.d. 113 116 120 129 132 140 154 147 139 150
Soft Sediment and Debris
Soft Sediment & Debris
Notes/Legend:
Baseline @ 30 deg.mag.

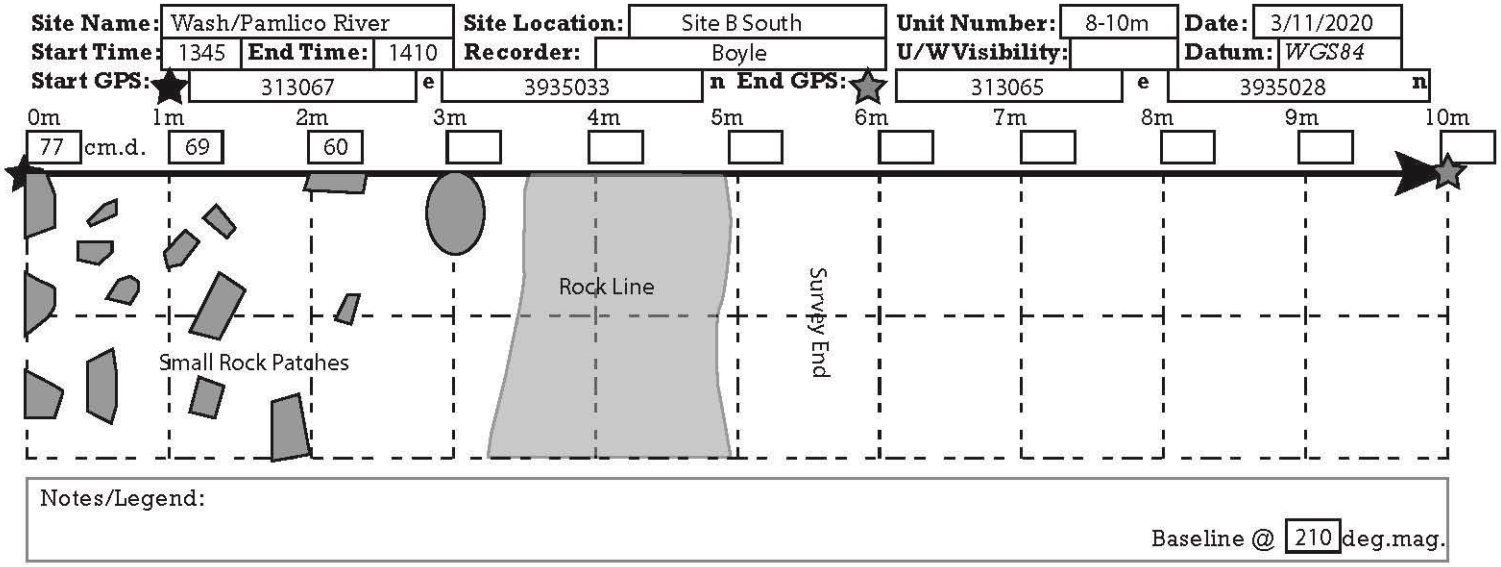

Site Name: Wash/Pamlico River
Site Location: Site B South
Unit Number: 4-6m
Date: 3/11/2020
Start Time: 1415
End Time: 1430
Recorder: Boyle
U/W Visibility:
Datum: WGS84
Start GPS: 313064 e 3935033 n
End GPS: 313061 e 3935030 n
0m 1m 2m 3m 4m 5m 6m 7m 8m 9m 10m
58 cm.d. 35 33 21
Small Rock Patches
Brick Fragments
Rock Line
Seawall
Shoreline
Tree
Notes/Legend:
Baseline @ 210 deg.mag.

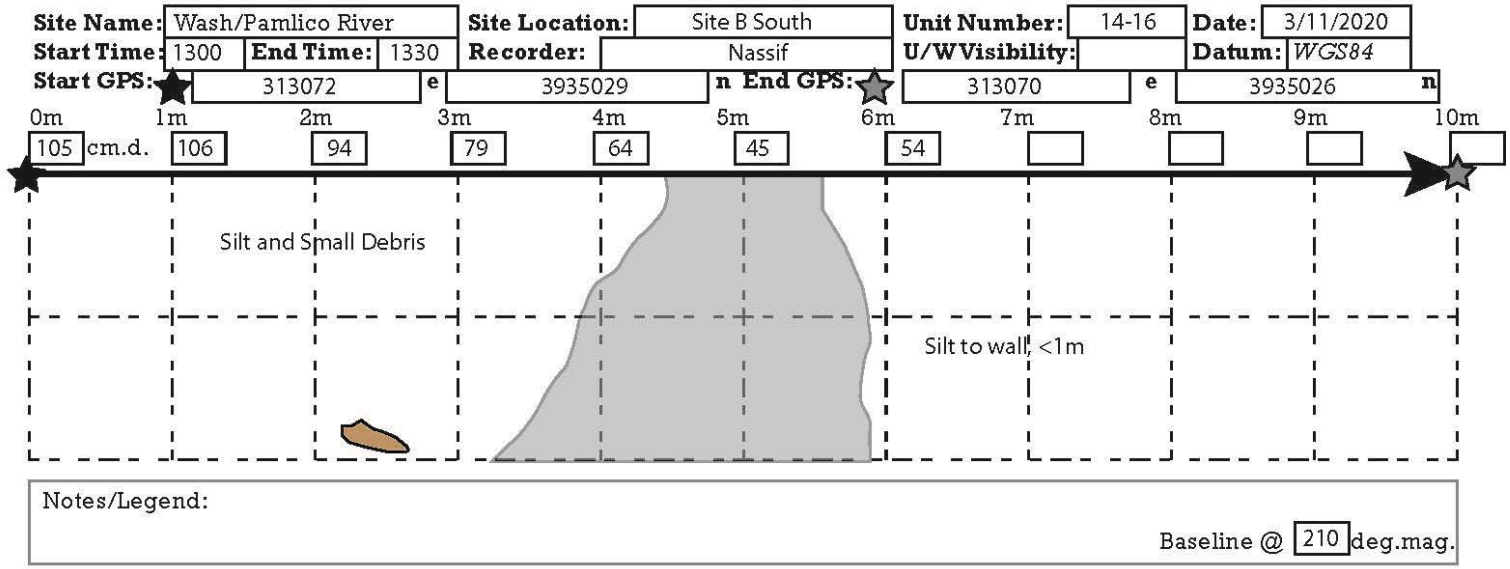

Site Name: Wash/Pamlico River
Site Location: Site B South
Unit Number: 0-2m
Date: 3/11/2020
Start Time: 1430
End Time: 1445
Recorder: Boyle
U/W Visibility:
Datum: WGS84
Start GPS: 313061 e 3935035 n
End GPS: 313058 e 3935032 n
0m 1m 2m 3m 4m 5m 6m 7m 8m 9m 10m
90 cm.d. 73 47
Small Rock Patches
Rock Line
Notes/Legend:
Baseline @ 210 deg.mag.

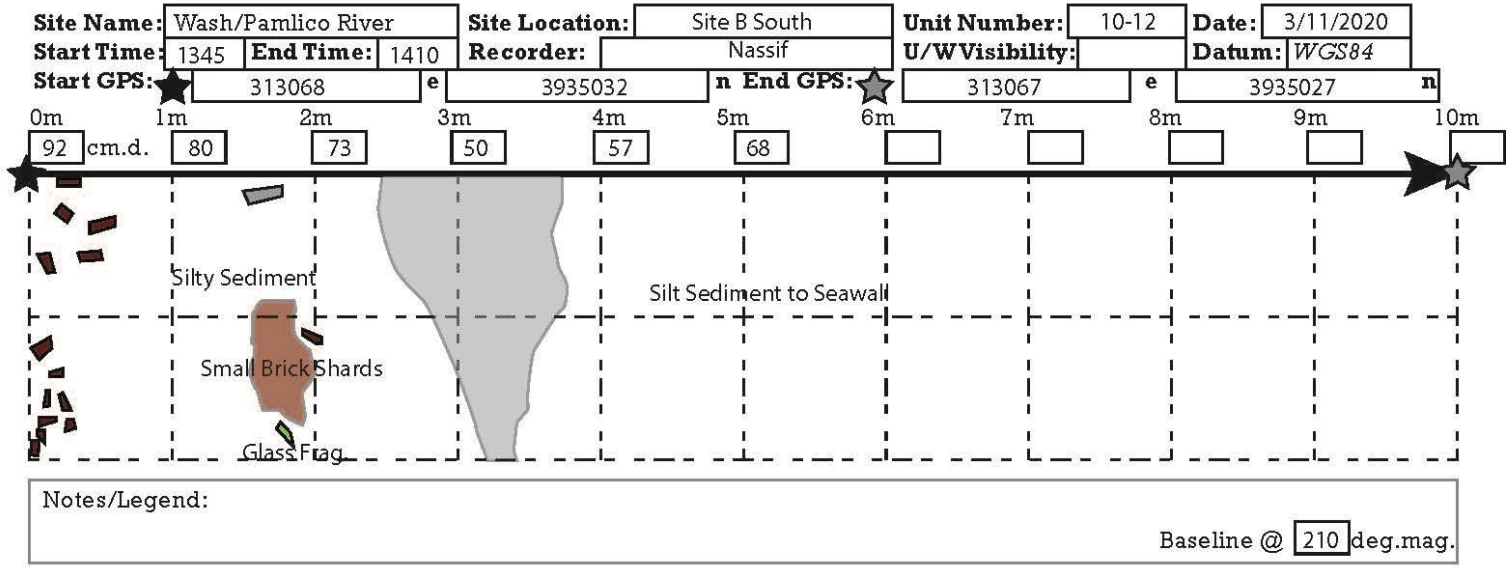

Site Name: Wash/Pamlico River
Site Location: Site B South
Unit Number: 6-8m
Date: 3/11/2020
Start Time: 1415
End Time: 1430
Recorder: Lowe
U/W Visibility:
Datum: WGS84
Start GPS: 313061 e 3935031 n
End GPS: 313059 e 3935029 n
0m 1m 2m 3m 4m 5m 6m 7m 8m 9m 10m
73 cm.d. 54 55 57 46 27
Rock/Brick Fill
Notes/Legend:
Baseline @ 210 deg.mag.


Site Name: Wash/Pamlico River
Site Location: Site B South
Unit Number: 2-4m
Date: 3/11/2020
Start Time: 1430
End Time: 1445
Recorder: Lowe
U/W Visibility:
Datum: WGS84
Start GPS: 313062 e 3935033 n
End GPS: 313060 e 3935028 n
0m 1m 2m 3m 4m 5m 6m 7m 8m 9m 10m
56 cm.d. 39 37 31 12
Rock and Brick Fill
Notes/Legend:
Baseline @ 210 deg.mag.


Site Name: Wash/Pamlico River
Site Location: Site B South
Unit Number: 12-14m
Date: 3/11/2020
Start Time: 1300
End Time: 1330
Recorder: Boyle
U/W Visibility:
Datum: WGS84
Start GPS: 313071 e 3935031 n
End GPS: 313067 e 3935028 n
0m 1m 2m 3m 4m 5m 6m 7m 8m 9m 10m
93 cm.d.
85
70
47
Rock Line
Survey End
Notes/Legend:
Baseline @ 210 deg.mag.


Site Name: Wash/Pamlico River
Site Location: Site B South
Unit Number: 8-10m
Date: 3/11/2020
Start Time: 1345
End Time: 1410
Recorder: Boyle
U/W Visibility:
Datum: WGS84
Start GPS: 313067 e 3935033 n
End GPS: 313065 e 3935028 n
0m 1m 2m 3m 4m 5m 6m 7m 8m 9m 10m
77 cm.d.
69
60
Rock Line
Survey End
Small Rock Patches
Notes/Legend:
Baseline @ 210 deg.mag.


Site Name: Wash/Pamlico River
Site Location: Site B South
Unit Number: 14-16
Date: 3/11/2020
Start Time: 1300
End Time: 1330
Recorder: Nassif
U/W Visibility:
Datum: WGS84
Start GPS: 313072 e 3935029 n
End GPS: 313070 e 3935026 n
0m 1m 2m 3m 4m 5m 6m 7m 8m 9m 10m
105 cm.d. 106 94 79 64 45 54
Silt and Small Debris
Silt to wall, <1m
Notes/Legend:
Baseline @ 210 deg.mag.


Site Name: Wash/Pamlico River
Site Location: Site B South
Unit Number: 10-12
Date: 3/11/2020
Start Time: 1345
End Time: 1410
Recorder: Nassif
U/W Visibility:
Datum: WGS84
Start GPS: 313068 e 3935032 n
End GPS: 313067 e 3935027 n
0m 1m 2m 3m 4m 5m 6m 7m 8m 9m 10m
92 cm.d. 80 73 50 57 68
Silty Sediment
Silt Sediment to Seawall
Small Brick Shards
Glass Frag.
Notes/Legend:
Baseline @ 210 deg.mag.