East Carolina University

Program in Maritime Studies

HIST6850 Fall Field School 2020

Washington, North Carolina

Report of Investigations

Editors: Jason T. Raupp, Ph.D., Jennifer McKinnon, Ph.D., Jeremy Borrelli, Mark Keusenkothen

Contributors: Dominic Bush, Patrick Boyle, Amber Cabading, Lily Kelley, Matt Lowe, Taylor Picard, Darby Robbins, Andrea Yoxsimer, Trenton Zylstra

Report Submitted to:

North Carolina Office of State Archaeology, Underwater Archaeology Branch

NCDCNR Permit # 660 PMR-TRR 2020

October 2021

Introduction

The port of Washington, North Carolina (NC), established at the confluence of the Pamlico and Tar Rivers, grew throughout the 19th century and played a vital role in the development of eastern NC. First known as a shipbuilding center, Washington slowly evolved into an entrepôt where goods harvested at local farms, fisheries, and timber operations were shipped in the Tar-Pamlico trade. Once a bustling area of turpentine stills and sawmills in the early to mid-19th century, the south shore of Washington's waterfront was later used for other commercial purposes. By the late 19th century, the industrial emphasis on this area declined, and it was eventually reclaimed by nature. The south shore's once essential facilities deteriorated to the extent that little remains above the surface of the water today. East Carolina University' Program in Maritime Studies (ECU PMS) initially documented maritime infrastructure (wharves and piers) and the remains of vessels wrecked or abandoned in 2004 (Rodgers et al 2006, 2016) ECU's 2020 fall field school revisited and investigated two such wrecked or abandoned vessels, the Copper Wreck Site and the Centerboard Wreck, and conducted site assessments to better understand how these sites have changed over time. From 12 August to 3 September, 2020, ECU PMS conducted an advanced maritime archaeology field school along the waterfront of Washington, NC, under the direction of Jason Raupp (PI), Jennifer McKinnon (Co-PI), Jeremy Borrelli (Field Director), and Mark Keusenkothen (Diving Safety Officer), along with the assistance of nine graduate students.

Under the conditions of a permit (660 PMR-TRR 2020) issued by the NC Office of State Archaeology Underwater Archaeology Branch (UAB), the investigations at the Copper Wreck Site and Centerboard Wreck included a full-scale survey and mapping of each site. The goals outlined in the permit application were as follows:

- Document the remains of historic infrastructure in portions of the Tar and Pamlico Rivers in Washington, NC, and Bath, NC
- Locate and document the submerged structures, watercraft, and artifacts
- Understand previous maritime commercial activities in the area
- Determine the vessel types, period, and cultural affiliation
- Study site distribution

- Examine the cultural and natural impacts on the sites
- Study the condition of the wooden structure and artifacts
- Examine artifact composition and context

This report outlines the archaeological investigations undertaken on the Copper Wreck Site and Centerboard Wreck sites and fulfills the reporting requirements of the permit. It should be noted, however, that due to the unexpected extent of the Copper Wreck Site and time constraints, the field school did not assess sites in Bath, NC.

Historical Background

The history of Washington, NC is inextricably tied to the Tar-Pamlico River system. Washington sits at the confluence of the two rivers, which made it a natural transit point for commerce. The town quickly grew to be an important center for eastern NC's economic development and an important center of shipbuilding. Although river-borne commerce and shipbuilding are no longer defining aspects of the city, their historical importance cannot be overstated and are reflected in the city's new focus on maritime tourism (Paschal 1976:2; Rodgers et al. 2006:20).

The settlement that is now known as Washington was first settled by Europeans in the second quarter of the 18th century and was known as "Forks of the Tar River" until around 1776, when it was renamed in honor of George Washington. The rivers were recognized as an advantageous position for bulk cargo-based commerce that gave easy access to rich sources of timber and naval stores. The easy transport afforded by rivers like the Tar-Pamlico made settlements like Washington the gateway to European colonization in NC (Cox 1989:1-9; Hill 1984:1; Litchfield 1976:229; Paschal 1976:2). Washington quickly supplanted the previous regional port, Bath, and grew as a center of shipbuilding and commerce (Cox 1989:13-16; Hill 1984:3-4). During the Revolutionary War, Washington supplied the Continental Army and was used as a base for privateers (Hill 1984:3; Paschal 1976:2-3). It served a similar role during the War of 1812 (Hill 1984:5). A recession in 1819 hit Washington hard, causing large declines in both commerce and shipbuilding (Cox 1989:35). By 1830, however, Washington's economy began to dramatically improve as demand for turpentine allowed for an increase in shipping and shipbuilding. This era also brought the first steamships to Washington. New wealth allowed for

investments into river clearing and roadways. This prosperity continued until just before the Civil War, when another recession hit Washington in 1857 (Cox 1989:34-36, 44-45, 50-55; Hill 1984:6; Litchfield 1976:233). By this time, Washington had grown from a small settlement of a few hundred to a few thousand. It was one of the most important ports in NC, shipping thousands of tons of goods in and out annually (Cox 1989:36-41; Hill 1984:7).

The Civil War was devastating for Washington. Union forces occupied the town, which was besieged by Confederate forces for years. During the Confederacy's efforts to recapture it, fires destroyed half the buildings in the town. Deliberate blockages rendered much of the river unsafe to navigate, and few workers were available in the years immediately following the war due to casualties and emancipation. For years after the war, little commerce or shipbuilding took place, causing the region to fall into a deep economic depression (Cox 1989:57, 100-103; Hill 1984:7). Lumber continued to dominate commerce at this time, however, turpentine exports began a drastic decline (Cox 1989:51; May 1976:331). In the decade between 1865 and 1875, no large watercraft were built, though two small yards continued to exist (Hill 1984:8).

Washington's fortunes took a dramatic turn for the better with massive clearing and dredging efforts undertaken by the Army Corps of Engineers starting in the 1870s (Cox 1989:67-85). River commerce boomed to tens of thousands of tons shipped from the port per year. Additionally, steamers traveled regularly upriver as far as Greenville, and shipbuilding returned in force along with several new riverine industries (Cox 1989:77-81, 148; Hill 1984:8-10).

The 1890s brought the arrival of the first common carrier railroad to Washington, as well as another recession (Cox 1989:81-85). In addition, Washington's long-standing trade with the West Indies dried up in this period (Cox 1989:120-139; Hill 1984:12). The railroad took over much of the transport that had once been conducted via river, though riverine transport remained important, particularly for the lumber industry which boomed in the 1880s (Cox 1989:81-85, 103, 142-146). Shipbuilding entered a decline at the turn of the century, as demand for wooden ships declined since the Civil War; furthermore, Washington was unable to compete with deeper and more industrialized ports producing iron and steel steamships. The waterfront of Washington was too congested for easy expansion, limiting the potential of the port (Hill 1984:12). Through this decline, however, riverine commerce remained an important part of the economy (Cox 1989:146).

During the decade between 1900 and 1910, Washington doubled in population from

5,000 to 10,000. Riverine trade, particularly by barge, continued through the first half of the 20th century, although dredging and clearing operations became less frequent. The steamer lines acquired and subsequently shut down by the railroads. The rise of the highway system and trucking during the New Deal era continued to diminish the importance of the port (Cox 1989:86-92, 148-149; Hill 1984:10-12). The population was growing away from the river, further reducing the primacy of riverine transport in the region in favor of rail and roads (Cox 1989:92). The last steamer built at Washington was launched in 1901, but some large watercraft were continued to be built during the economic boom brought by World War II. Small watercraft production, however, replaced the once large shipbuilding industry during the early 20th century (Cox 1989:91, 140-141; Hill 1984:12). Another depression hit Washington in 1919, causing a large decrease in commerce even before the Great Depression (Cox 1989:147). The first half of the 20th century prefaced the economic reorientation that would be completed by the end of the century, as the centrality of the river faded and the industries that once defined Washington declined.

Following the end of World War II, Washington experienced a reorientation of the economy as the lumber industry shrank, though it remains important to this day. The city also suffered a decline in population. Efforts began to attract new industries and create a diversified economy (Hill 1984:12-13; Morgan and Abeyounis 1976:510). Multiple new industries emerged to fill the vacuum left by the decline of old ones, including small watercraft manufacturing and phosphate mining. Both industries are notable for the continued connection to the water through boatbuilding and riverine shipping, respectively. Agriculture continues to be an important contributor to the economy, along with the development of a service economy revolving around waterborne tourism and recreation (Cox 1989:149; Morgan and Abeyounis 1976:511-12). Washington is also now home to a hospital and has undergone extensive urban renewal. The waterfront echos the busy port it once was since its transformation into a waterside recreational space (Hill 1984:13; Morgan and Abeyounis 1976:512-13).

From the beginning, Washington and the Tar-Pamlico River were inextricably linked. Washington's economy revolved around commerce on the river, and the ebbs and flows of that riverine commerce dictated the prosperity of the settlement. Washington was an important center for developing eastern NC through its heyday in the 19th century. The development of iron and steel steamships, which were difficult to build in Washington, the encroachment of rail and the

highway system, as well as the limits of the river itself, ultimately ended the settlement's reputation as an important port city, as well as the large shipbuilding industry it once hosted. However, Washington still retains many connections to its waterfront environment, even as its place has been redefined and new sources of prosperity have been sought (Rodgers et al. 2006:20).

Tar-Pamlico Lumber Industry

Lumbering is an old trade in North America that began quickly upon arrival of the first groups of colonists. England was experiencing a lumber shortage in the late sixteenth and early seventeenth centuries, which was meant to be partially remedied by exploiting lumber resources in North America (Rutkow 2012:11-14). Lumbering continued to be a popular and profitable business, providing wood for furniture, housing, and shipbuilding, among other things. In the 19th century, multiple migrations of lumber companies took place, from New England to the lake states, and from there to southern states, like NC (May 1976:330). The Tar-Pamlico River became a hub for lumbering due to the ease of transportation; logs would be sent down the Tar and processed at mills lining the Pamlico's banks.

Washington Lumber Industry

Washington's lumbering was mainly local production and demand, but prior to and during the Civil War, it transformed from smaller mills into larger, more well-funded mills (May 1976). One driving factor in this change was the increased demand for shipbuilding, as "between 1840 and 1860, 44 vessels were built in Beaufort County" (Snyder 2005:27). An additional factor that helped spur growth was the perfection of kiln-drying, a method for drying lumber that prevents mildew growth, and the subsequent blue tint that southern lumber had been known for (May 1976:331). A migration of lumber workers to the South, taking advantage of largely untouched forests, began in the mid-1880s. Several families, including the Camp Brothers, the Blades Brothers, the Moss family, and the Kugler family, arrived in Beaufort County, bringing with them sawmill operating experience from the North (May 1976:332-334). While they generally moved on after only a few years, some stayed permanently. Individuals also took up lumbering in Washington, such as Eugene Murry Short and George T. Leach.

The E. M. Short Lumber Company

In October of 1878, Eugene Murry Short purchased a small sawmill and property from E. G. Reade at the end of Short Drive, on the banks of the Tar River (May 1976:338). Short quickly began building a larger, more productive mill, focusing solely on lumber production during a time when other mills were starting to diversify. The kilns burned down three times, first in 1886, then in 1887, and again in 1895, but were rebuilt each time; the mill itself burnt down in 1905 and was rebuilt the same year (May 1976:339). In 1894, Short and six other employees were killed in a boiler explosion; cold water was poured into the steaming boiler which caused it, and the rest of the boilers, to explode, rocking the entire city of Washington. Bettie Lee Short, now a widow, became the sole owner of the business and rebuilt what was destroyed in the explosion (May 1976:338-339). Beginning in the late 1890s, the Short Lumber Company started contracting with the Wiley and Harker Company of New York City to sell their entire output and ship it north by barge. The lumber company was incorporated as the Short-Clark Lumber company in 1906, but only operated the mill for three more years before closing permanently.

The Eureka Lumber Company

George T. Leach initially moved to Scranton, NC from Pennsylvania in the late 1880s, seeking to enter the lumber business. He moved his business to Washington in 1894, incorporating the Eureka Lumber Company with George A. Phillips and W. T. Campen, which would become one of the longest-lasting single ownership sawmills in Washington (May 1976:336). Already involved in the coal industry, Leach and his associates opted to specialize their lumber company to make mine props and mine rollers along with the lumber. When they built their initial sawmill in Washington, the only way to receive logs was by them being "transported over the East Carolina Railway to Tarboro, then dumped into the Tar River and floated to Washington" (May 1976:336). By the same token, shipping lumber from the mill could only be done by barge until 1905. Thereafter George Leach was one of the main forces behind the organization of the Washington and Vandermere Railroad, which provided transportation and more access to fresh timberlands. The mill had a significant fire in 1903, and burned down in 1911, but was rebuilt almost the same in 1912 (May 1976:336). Eureka was one of few lumber companies that practiced conservation forestry, maintaining their timber source throughout its lifespan, and even having a surplus of timber in its final years. The North Carolina

Pulp Company purchased Eureka in 1956, operating the mill for only 90 days before closing it permanently.

Pamlico Sound Hydrography

The offshore beaches of the Outer Banks block the major rivers of eastern NC from immediately entering the ocean which "results in broad, shallow sounds quite different from the narrow lagoons usually formed behind such beaches" (Marshall 1951:3). The largest of these narrow lagoons is the Pamlico Sound, which is approximately 113 kilometers (km) long and 15 to 50 km wide with a maximum depth of approximately 6 meters (m) (Marshall 1951:5-6). The Pamlico Sound contains brackish water, but salinity fluctuates throughout (Marshall 1951:6). The bottom of the sound is a mixture of sand and mud and may contain some rock. (Marshall 1951:58).

There are multiple environmental influences that circulate the waters in the Pamlico Sound, including tide, rainfall, and river discharge (Marshall 1951:9). Wind, however, is one of the most noticeable influences on the circulation of the Pamlico Sound. The effects of wind can cause fluctuations in water height of "about 2 feet above and below normal in the open sounds, and the funneling of this water, such as may occur at Washington up the Pamlico River or at New Bern up the Neuse River behind an easterly wind, may give tides 3 or 4 feet above normal" (Marshall 1951:10-11). The effect of the winds is particularly noticeable near Washington when westerly winds force the tide out significantly, known locally as a "blow-out".

Pamlico Sound Historic Fisheries

The historic NC fishing industry can be defined as a seasonal "free fishery," which means that most fishers are only dependent on the specific species of marine life that generate the greatest profit (Chestnut 1951:156). As such, oyster fishers will not only catch oysters but will also "depend upon fishing, shrimping, clamming, crabbing, and farming for their income." (Chestnut 1951:156-157). North Carolina, however, is unique in that "there is no concentration of the industry in any one locality" (Chestnut 1951:157). Unlike the fisheries of the northern states which are focused around one major marketing and distribution center, such as Baltimore, MD for the Chesapeake Bay region, NC's fisheries developed in small, local coastal cities (Chestnut 1951:157). Many of these fisheries did not focus on one specific species year-round

but instead focused on seasonal fishing of different forms of aquatic life (Chestnut 1951:156-157). This is beneficial to a NC fisher because there are multiple opportunities to make a profit year-round.

The Pamlico Sound contains a biodiversity of aquatic life including fish, mollusks, and shrimp. Because of the prevalence of their species, many of these animals have been the focus of commercial fisheries. The Pamlico Sound, specifically, contains a variety of historic fisheries in many intercoastal towns.

Of the many marine animals within the Pamlico Sound, the menhaden fish is unique in that it is caught commercially, but not as a food source. The menhaden fish was often used in the colonial era as bait, oil, and fertilizer (Ellison, Jr. 1951:85). During the late 19th century, menhaden were canned and sold as "American sardines" but were quickly outsold by the superior herring from Maine (Ellison, Jr. 1951:85-86). The menhaden fishing industry was first established by former northern soldiers of the Civil War who settled in NC and were surprised to see the abundance of menhaden in the sounds (Ellison, Jr. 1951:89). Although many northern capitalists invested in the menhaden fishing industry, it was ultimately unsuccessful (Ellison, Jr. 1951:89). The only true value was the menhaden's use as fertilizer and "although prolific crops resulted for a season or two, the oil from the fish so 'burnt' the land that it was untillable for years to come." (Ellison, Jr. 1951:88).

The sounds and coasts of NC are home to a variety of different finfishes, around which multiple commercial fisheries developed. The Pamlico Sound, specifically, was home to historic fisheries focused on shad, striped bass, gray trout, spot, and butterfish (Roelofs 1951:124). Striped bass are known to inhabit both the Pamlico and Neuse rivers, however, there are not enough to develop an industry (Roelofs 1951:124-125). Gray trout, conversely, is found in the Pamlico Sound and was a common source used in the fishing industry (Roelofs 1951:126). Spot fish, also known as Yellowtail, are beneficial to the fishing industry when they migrate from the inner waters to the ocean in autumn (Roelofs 1951:129). Finally, the butterfish catch fluctuates, but the fish "is found from Massachusetts to North Carolina, and in North Carolina is taken in most of the sounds, Pamlico sound leading in production" (Roelofs 1951:132).

The eastern oyster of the Pamlico Sound is "one of nearly a hundred different species of oyster found throughout the world. It is distributed from the Gulf of St. Lawrence to Mexico and is the only species of commercial importance on the Atlantic and Gulf coasts" (Chestnut

1951:141). It is one of the most valuable fishing resources in NC and has an extensive history that began with Native American collection and use demonstrated through the many shell mounds that dot the coast of the southeaster US (Chestnut 1951:142). Oysters continued to be an important food source for the early coastal communities of NC. The mild winters and summers of NC help to create an ideal environment for oysters (Chestnut 1951:157). The Pamlico Sound, specifically, "has inlets from the Atlantic which make all its water, at least along its eastern half, thoroughly saline, and permits a luxuriant oyster-growth" (Ingersoll 1881:188). The cities of Beaufort and Wilmington were the main oyster market communities of the mid to late 19th century (Ingersoll 1881:188).

When compared to the prominent oyster industry of the Chesapeake Bay, the NC industry was significantly smaller. It is argued that this is because of a lack of quick shipping from the coastal markets to inner cities, which did not allow the industry to grow as large (Chestnut 1951:143). However, this changed in the late 19th century when the over-fishing of oysters in the Chesapeake Bay caused oyster fishers to travel to NC in search of better oystering areas (Chestnut 1951:143). The sudden increase in fishing vessels had a significant "influence on oyster production in Pamlico sound through the introduction of the more efficient dredging and tonging methods used in Maryland and Virginia" (Chestnut 1951:143). Unfortunately, the newly implemented methods caused the Pamlico Sounds to be over-fished and a decline in oyster population was noticeable after only a decade (Chestnut 1951:144).

Previous Archaeological Investigations

Due to the significance of maritime trade and development in the growth of Washington, NC, the areas of the Tar-Pamlico River closest to the town are known to contain numerous shipwrecks, abandoned and dilapidated dock structures, and other remnants of maritime trade and production that fell out of use as Washington's maritime economies shifted in the region. Residential and commercial development along the Tar-Pamlico waterfront within the past several decades, as well as general town development and waterway maintenance, has necessitated several surveys throughout the area to locate and manage culturally significant sites. Gordon Watts, a former ECU PMS professor and now contract archaeologist, conducted several surveys and investigations in the Washington area of the Tar-Pamlico River over the past several decades. An interim report submitted by Gordon Watts in 1997 detailing investigative work by a

joint team of volunteer ECU students and the nonprofit organization Institute for International Maritime Research, describes the relocation and mapping of several shipwrecks in the vicinity of the Washington, NC waterfront (Watts 1997:1). Another survey report by Watts (2004) describes work conducted in 2004 by his cultural resource management firm, Tidewater Atlantic Research, Inc., prior to the construction of a marina. In report he notes that at the time of publication 22 shipwrecks had been identified in the immediate vicinity of Washington, NC (Watts 2004:43-44).

Washington's rich maritime history, and proximity to ECU, has lent itself to numerous archaeological and historical research projects, field schools, and theses since the early days of the program's history, both on the Washington waterfront and in the surrounding bays and tributary rivers of the Tar-Pamlico River. Theses concerning historical and archaeological subjects relating to the town of Washington and the Tar-Pamlico River were written as early as the 1980s, ranging from broad historical investigations of the role of the Tar-Pamlico in the development of the eastern NC economy to overviews of shipbuilding in Washington, NC and detailed analyses of specific shipwrecks linked to the town's maritime economies (Cox 1989, Lawrence 2003, McCabe 2007, Merriman 1996, Snyder 2006). Ann Merriman's (1997) investigation of the Cypress Landing wreck on the south shore of Chocowinity Bay, just off the Tar-Pamlico River and near the town of Washington, surveyed and documented the remains of a sailing flat over the course of several months in 1995.

Investigations conducted by ECU field schools from 1998 to 2000 identified and conducted preliminary investigations of eleven vessels wrecked or abandoned in a ships' graveyard in the area surrounding Castle Island, a small island located just off the Washington waterfront that was the site of a sawmill during the 19th century (Rodgers & Richards 2006). Unfortunately, in the aftermath of Hurricane Floyd in 1999, many of the vessels initially surveyed were moved or destroyed, and only one could be relocated and reidentified as part of the previously investigated vessels (Rodgers et al. 2016). The fall 2004 field school, led by Nathan Richards, performed remote sensing surveys on submerged sites throughout the Tar-Pamlico River area around Washington, NC (Richards 2004). The fall 2006 field school, led by David Stewart, also investigated sites on the Washington, NC waterfront, including the Washington Park vessel located south of Washington as well as several sunken vessels and a wharf located on the south shore of the Tar-Pamlico River (Dodds & Stewart 2007).

Copper Wreck Site

Located in a small inlet surrounded by private residential properties, the Copper Wreck Site has not been the subject of any officially documented archaeological investigations prior to the fall 2020 field school. Washington residents living around the inlet in which the shipwreck is located have been aware of the wrecks' presence for years, most notably due to river blowouts that occasionally exposed the shipwreck to open air. In personal communication between Gordon Watts and Mark Wilde-Ramsing in preparation for ECU's summer 2004 field school, Watts provided a map of the Tar-Pamlico River and the Washington, NC waterfront, indicating the locations of numerous shipwrecks identified in the area (Figure 1). The Copper Wreck Site is included in this hand-drawn map, identified simply as "schooner" (Richards 2005:9). Personal communications with Gordon Watts prior to the fall 2020 field school indicate that there may have been some form of investigative work conducted on the Copper Wreck Site in the past, but no documentation is presently available.

Centerboard Wreck

Located on the south shore of the Tar-Pamlico River and within view of the present-day Washington waterfront, the Centerboard Wreck has been the subject of a few archaeological investigations over the past several decades. The previously mentioned summer 1996 resource survey reported on by Gordon Watts (1997) mentions the identification and relocation of several shipwrecks in the Tar-Pamlico River in the vicinity of Washington, NC. It is possible that one of the four vessels described in the report could have been the Centerboard Wreck. As in the case of the Copper Wreck Site, the presence of the Centerboard Wreck on Gordon Watts's maps that appear in Richards' (2005) report on the activities of ECU's summer 2004 field school indicates that it may have been investigated by Watts at some point prior, though no documentation is currently available (Figure 1). Work conducted on the Centerboard Wreck, at the time referred to as ECU04-UW-0002, during the 2004 field school was limited to a side-scan sonar reading of the site to determine the wreck's location and extent, as well as a two-hour investigation by a small group of students that resulted in a mud map and scaled drawings of the vessel's centerboard (Seltzer 2004:30). The data collected during the fall 2020 field school likely represents the most detailed investigation of the Centerboard Wreck.

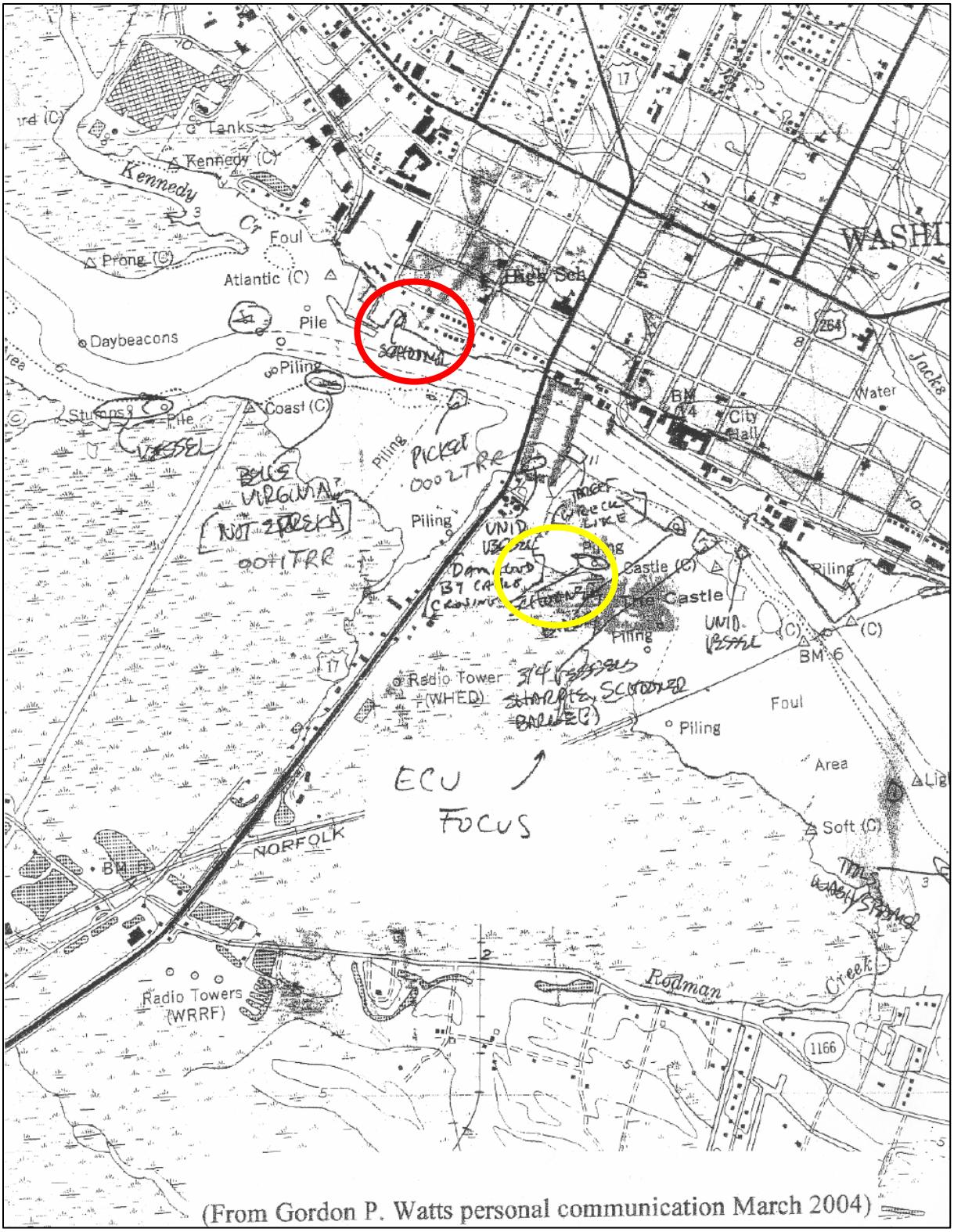


Figure 1. Map of cultural resources in Washington, NC Tar-Pamlico River area, as communicated to Mark Wilde-Ramsing by Gordon Watts. Note schooner circled in red is location of Copper Wreck Site; schooner circled in yellow is location of Centerboard Wreck (courtesy of Richards 2005).

Methodology

The overarching goal of the project was to record the wrecks at a level of detail that would allow for a basic site interpretation. The following are specific objectives that were intended to meet this goal: create a scaled site plan from both hand-recorded and GPS measurements, record scantling measurements of frames and planking, produce measured profile-view sketches of key features (e.g. bow and stern), and record artifact types and locations associated with each wreck.

Baseline Offsets

Surveys began with establishing a baseline set over the centerline of each vessel. The baseline consisted of a 30 m tape measure and polypropylene line of equal distance stretched between two fence posts. At the Copper Wreck Site, the baseline was oriented at 200/20º, while at the Centerboard Wreck the baseline was oriented at 350/170º. Each wreck was then divided into sections, typically comprised of areas that were 2-5 m along the baseline. Sections were on either the port or starboard side and extended out from the baseline to the site peripheries. Due to the blackwater conditions, pairs of divers would create a 'mud map' of their section by sketching what they felt on mylar. These rough sketches then served as a guide for baseline offset measurements.

Timber-Tagging

Timber-tagging was an essential way to catalog the numerous frames on the Copper Wreck Site. Although the term frame is used, the timbers tagged are most likely futtocks, which, together with floor timbers, make up individual frames. The designations assigned during this process not only aided with recording scantling measurements but were also used as identifiers for GPS points taken at each frame. Frames were marked using cattle tags labelled in permanent marker and attached to the frames with galvanized nails. This process began on the portside, running from bow to stern, and was later repeated for the starboard side. Upon the completion of the project, the nails, tags, and tape were all removed.

Scantling Measurements

With each frame identified, divers could then record the scantling (molded and sided) measurements of the frames, as well as the hull and ceiling planking at each framing station. Although frames were not tagged at the Centerboard Wreck, scantlings were still measured. Instances where frames or planking were either missing, buried, or otherwise incomplete were noted along with the measurements. The scantling list for both sites can be found in Appendix C and E.

Real-Time Kinematic (RTK)

In addition to the hand-recorded measurements and mapping from diving pairs, the project also utilized a Real-Time Kinematic or RTK, device to record the precise location of key features and artifacts. The RTK device is meant to improve the accuracy of data obtained from global navigation satellite systems through carrier-phase tracking (NovAtel Inc. 2015:55-56). The result is millimeter-level accuracy. The RTK device itself is comprised of a base, receiver, and tablet. The use of the RTK device began with the establishment of a permanent datum point. At the beginning of each day that the RTK device was used, its tripod base was centered over the datum. The base height was recorded before powering up the base and activating the tablet. The receiver is attached to a stadia rod and wirelessly connected to the tablet to instantaneously transfer locational data. Before GPS points are taken, a coding system that accords with the type of feature being measured (e.g. PFRAME7 for port side frame #7) is established within the tablet's recording application. The result was a list of GPS points for frames, planking, machinery, artifacts, other ship timbers, and pilings associated with the remains of an adjacent seawall. This data was downloaded into ArcGIS, georectified, and labelled.

Scaled Drawings

Drawings were represented at a 1:20 scale on 2mm graph paper. Each individual section was then combined to form a master site plan that was traced in pencil and then scanned and digitalized using Adobe Photoshop. Profile views of the stern and bow sections of the Copper Wreck Site were also hand drawn. These sections were chosen due to the possibility of diagnostic information that can be obtained by better understanding the shape of the stern and

stem and their assemblies. Much like the plan view drawings, a mud map and hand-recorded measurements preceded the final profile sketches.

Artifact Recording

Finally, the project goals called for a survey that extended beyond the physical ship structures. Potentially diagnostic artifacts, in terms of providing insights into vessel origin, function, and age, were noted throughout the duration of the project. After significant progress was made on delineating the boundaries of each wreck, artifact recording commenced. For the Copper Wreck Site, artifact locations were recorded using the RTK device, while at the Centerboard Wreck, artifact locations were recorded in relation to the baseline. Once locational data was obtained, artifacts were either transported onto land (Copper Wreck Site) or to the deck of the research vessel (Centerboard Wreck). A diver would stay in the exact location of the artifact to ensure it was properly returned. Artifacts were then photographed with a scale using a Nikon D3400 (automatic exposure setting). Photo numbers were then recorded in the photo log and artifacts were returned to their original location.

Copper Wreck Site

The Copper Wreck Site is situated on the private waterfront of Washington, NC lying in approximately 1-1.5 m of brackish water (Figure 2). The shipwreck is mostly buried in a layer of very fine silt and oriented along a bearing of 200/20º. The vessel lists slightly on its starboard side and lies adjacent to an historic seawall. The location of the site is moderately trafficked by residents via kayaks and private shallow water vessels. Although the site can be accessed by wading from the shore, the low visibility and historic seawall obstruction deter the general public from disturbing the wreck site.

Site Access and Conditions

The Copper Wreck Site is positioned about 15 m from a private dock. Each day, a temporary base was established along the grassy shore, and divers used the dock to enter and exit the water. Due to the shallow water and closeness to shore, divers were in constant communication with topside. Permission to work on the site was granted by the private waterfront properties.

Figure 2. General location of the Copper Wreck Site (Google Earth, 2020).

As stated previously, the site lies in approximately 1-1.5 m of water near a private waterfront. Visibility for the project ranged between 0-1 m depending on the tide and amount of disturbed sediment. Visibility was most clear in the early mornings or late in the afternoon when the tide went out. Chop came in the form of occasional daily boat wake and, apart from a couple of windy days, the water was calm.

Air temperatures ranged from 70-95º Fahrenheit. On-site work began at 0900 with the likelihood of afternoon showers. A typical daily schedule consisted of leaving the ECU campus in the Program's vehicles by 0830, conducting two diving rotations, one before and the other after lunch, and leaving the site by 1500 to process data and avoid afternoon storms. There were

a few days when divers were recalled as a result of the weather. Those days were used to organize data and complete paperwork.

Site Setup

A baseline consisting of 6-mm polypropylene line was anchored to two 1.5 m rebar driven into the silty mud. The baseline measured 25 m long and lay at 200/20º orientation along the center of the wreck. After installing the baseline, a tape was secured using clothespins, tags, and zip ties. Since the baseline ran long, the clothespins marked each meter, while number tags were zip-tied to replace missing clothes pins. This baseline remained in place for the duration of the project. Upon completion, the tape, line, and the rebar were removed Identification tags were removed upon completion of the project.

Vessel Construction Analysis

The Copper Wreck Site consists of the remains of a wrecked or abandoned vessel and those of a historic seawall. The seawall runs parallel to the length of the wreck. Evidence of submerged historic portions of the old seawall intersects the starboard side of the wreck. This may indicate that the vessel was used to extend the wharf, or it could simply come to rest alongside the original wharf. A large cypress tree is situated at the corner of the seawall closest to the wreck site, and evidence of cypress knees are obscuring the starboard side of the wreck. The wreck's primary structural timbers consist of the keel, bow, stern, ceiling planking, and hull planking, and the majority of the double frames. A possible donkey engine and/or other machinery remains were present on the site, along with several fasteners, a copper pipe, and lead tubing. There is also evidence of possible concrete and rock ballast located in the midships and stern sections at approximately 19-21 m on the baseline.

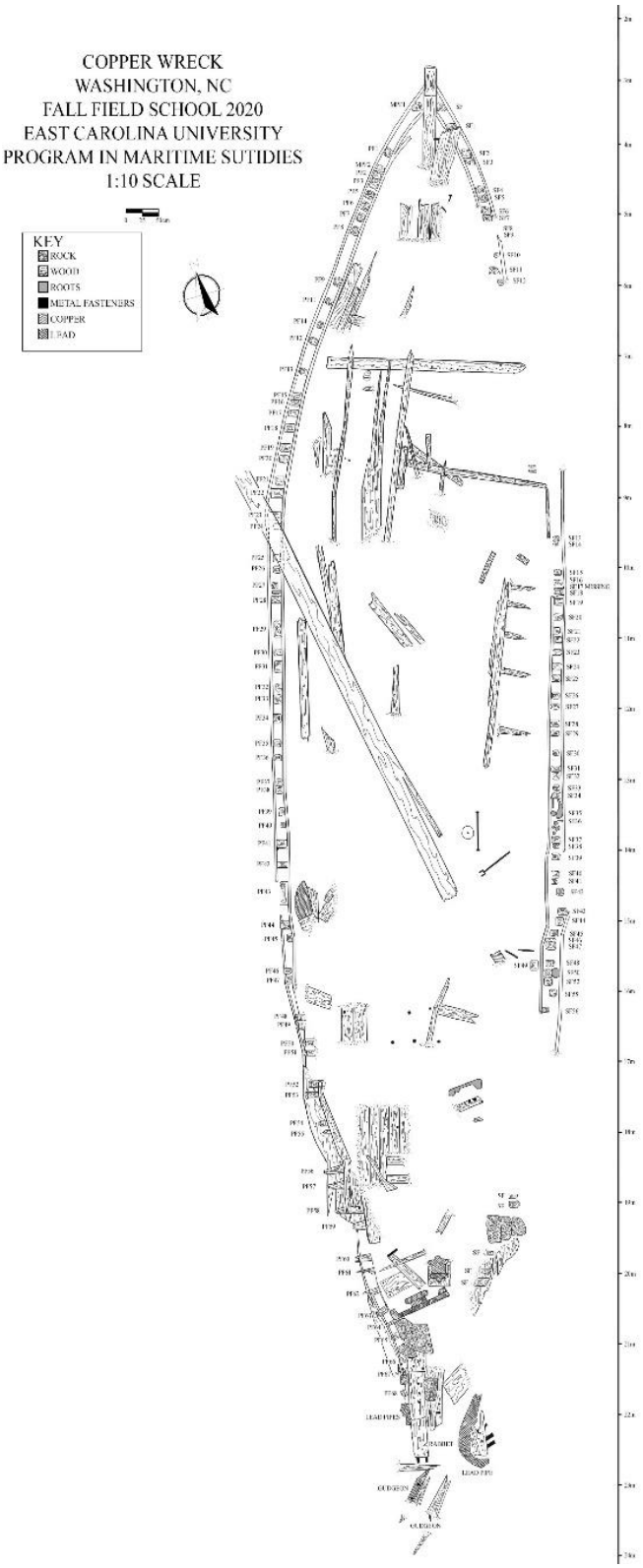


FIGURE 3. Digitized site plan of the Copper Wreck Site created during the 2020 ECU Fall Field School (Courtesy of A. Cabading 2020). From: ECU Collection.

Stem Assembly

The stem assembly of the Copper Wreck Site is one of the prominent features of the wreck. The assembly is 1.7 m in length and 80 cm in height. The forwardmost component of the vessel is the gripe, located roughly 30 cm in front of the stem. The gripe is heavily eroded and only a 20 cm portion remains extending vertically from the riverbed. The stem is located 30 cm aft of the gripe and extends 60 cm vertically from the riverbed. It is roughly 25 cm in length at its base from the fore to the aft end. No rabbet is discernable on the stem. The stem assembly is flanked on the port side by two large outer hull planks. The bottom plank extends from 20 cm fore of the stem all the way aft past the entire stem assembly. This outer plank is 10 to 15 cm in height out of the riverbed, though due to its position in the mud its molded dimension could be significantly larger. The second plank begins roughly 1 m aft of the front of the gripe and extends in a downward slope from 30 cm to 20 cm in height at the aft end of the stem assembly. These two planks appear to be two different strakes of the outer hull, but no fasteners were located that would have connected them to each other or the larger hull assembly. Aft of the stem, a large timber was found that has roughly the same shape of the stem. It is possibly a knee used to support the stem. This timber runs aft 40 cm until its measurements and recording are obstructed by the second top plank that is mentioned above. There is a second timber running at a 45º angle from its base at 70 cm aft of the stem towards the stem. It ends 30 cm from the top of the stem at a height of 60 cm from the riverbed. On top of this timber is a large apron timber that extends from the aft end of the stem assembly at the same 45-degree angle and runs towards the stem for 80 cm; it comes to a peak at 75 cm off of the riverbed. There are two horizontal iron fasteners extending out of the forward end of the apron. They are 1-2 cm in diameter and situated one on top of the other, with roughly 5 cm between them. They both extend about 8 cm from the apron. There is one large through bolt (approximately 4 cm in diameter) running at a 70-degree angle through the apron, the two timbers, and possibly into the stem.

Stern Assembly

The stern assembly consists of a sternpost, an inner sternpost and deadwood (Figure 4). The sternpost has two fasteners sticking horizontally out of the rearmost side and is rabbeted on top; remains of lead sheeting were also found on the top surface of the sternpost. A gudgeon fastened to a potential secondary piece of sternpost rests beyond the main one; the piece it is

fastened to extends deeper into the sand. The inner sternpost has one fastener and two lead pipes protruding horizontally toward the portside. The deadwood extends into the sand, beneath stones, and has multiple fasteners protruding vertically from it. Another lead pipe attached to timber rests on the starboard side of the stern, though it is possible these pieces are not related to the stern (Figure 4).

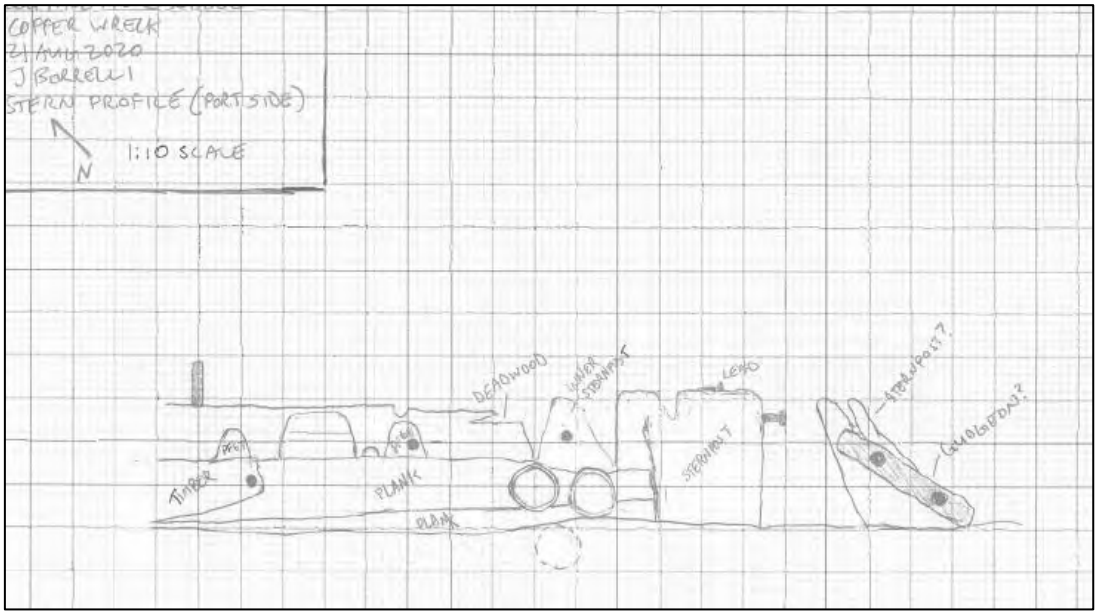


Figure 3. Profile drawing of the stern as seen from the portside (J. Borrelli, 2020).

Frames

The framing of the Copper Wreck consists of 52 starboard floor timbers or futtocks, 66 port floor timbers or futtocks, and 8 unidentified exposed timbers. Frames range from 3-14 cm sided and 2-20 cm molded, suggesting a high degree of erosion. Individual floor timbers and futtocks are paired as framing stations with square iron nails being driven from the outside through the outer hull planking into the frame stations. No lateral fasteners between frames were identified. The keel of the vessel was not excavated, so at this time it is unknown if these frames are floor timbers or futtocks; however, the positioning and angle of the exposed frames suggests that they are more likely to be futtocks than floor timbers. The total length measurements for the framing timbers are unknown because they extend into the riverbed.

Hull Planking

Hull planking of the Copper Wreck is identifiable and measurable on both the port and starboard sides of the wreck. The starboard side outer hull planking runs from the stem about 3 m before trailing off into the sand. At this point there is roughly a 2 m gap between where the planking disappears and where it picks back up again just forward of starboard frame 13. The planking then runs for another 6 m, where there is a 1 m gap in the planking aft of starboard frame 38. The hull planking then reappears at starboard frame 43 and continues towards the stern for another 2 m before it completely disappears into the sand. The outer hull planking on the port side extends continuously roughly 19 m from the stem towards the sternpost. At around 19 m aft, the port side outer hull planking seems to disappear, and is possibly covered by sand or is located underneath the machinery and rocks that are located at the stern of the ship. The sided and molded measurements for both the port and starboard outer hull planking were consistent. Sided measurements were within the 2-6 cm range with an average of 3 cm. Molded measurements ranged from 5-20 cm with an average of 10 cm, depending on the depth at which the planking is buried. The garboard strakes and rabbet are unidentifiable due to the sediment covering the lower sections of the hull. There is a small number of fasteners driven through the hull planking from the outside, possibly to help secure planks to the frames.

Ceiling Planking

The ceiling planking mirrors the outer hull planking on both the port and starboard sides of the hull. The ceiling planking is located, on both the port and starboard sides, approximately 20 cm from of the hull planking on the interior of the wreck. On the starboard side, the ceiling planking extends 2 m aft of the stem, then disappears into the sediment. It picks back up after 4 m and runs for 80 cm until reaching starboard frame 13, where it disappears again into the sand. It reappears at starboard frame 19, roughly 1 m aft of frame 13. From that point, it continues for another 5.5 m until disappearing once again at starboard frame 56. The port side is substantially more intact; from the stem, the ceiling planking extends aft 17 m until it gets buried under the large rocks and machinery that is located at the stern of the vessel. The sided dimensions range between 2 and 6 cm, though there is one significant outlier in these measurements. At port frame 68, located at the stern of the vessel, the ceiling planking measured 11 cm sided, considerably thicker than the median measurement of 4 cm. This is likely evidence of significant erosion of

the hull remains. Molded dimensions varied significantly, depending on how much of the planking was exposed from the riverbed. On both the port and starboard side, these measurements ranged from 2 and 3 cm to over 20 cm.

Fasteners

A variety of iron fasteners were found in and around the Copper Wreck. Four square iron nails approximately 10-12 cm in length and 2 cm in diameter were identified along the outer hull planking on the starboard and port sides. Two of these iron nails are located on either side of starboard frame 18 and were driven in from the outside based on the eroded head located on the outside of the outer hull planking. Another nail in the hull planking next to starboard frame 36 was also driven in from the outside. A similar nail was also located at port frame 41. A large through bolt was identified on the stem assembly. It extends from the apron, through the two timbers underneath and possibly continues through the stem. There is 20 cm of exposed length of this bolt that is 3 to 4 cm in diameter. There is a large, 2-3 cm diameter bolt extending from the aft section of the sternpost assembly. There are also multiple lateral bolts of 2 cm diameters extending athwartships from the assembly. Loose fasteners were also located throughout the interior of the hull as well. These nails and bolts ranged from small tacks of 1 cm diameter and 7 cm in length to larger bolts that were 3-4 cm in diameter and up to 50 cm in length. These fasteners being loose, however, makes it unclear where they were located on the Copper Wreck or if they even originated from the Copper Wreck at all.

Machinery Remains

In the stern portion of the vessel, remains of what appear to be the bed of a donkey engine were found. It would have been an auxiliary unit used for helping to get sails under way or to power a winch for loading and unloading cargo. The engine itself may have been salvaged before the vessel was abandoned.

Lead Tubing and Copper Pipe

Several lead tubes were found in the stern of the vessel. Two were inside a plank associated with the port side of the stern assembly. These pipes were not directly relocated on the starboard side. However, an additional pipe was found disassociated from the stern assembly on

the starboard side. Their usage is unclear, though they could be part of a common bilge pump system, despite their position so close to the sternpost (Oertling 1984:68-70). They could have also been used to provide raw water for the donkey engine, as they are positioned very close to its base.

A lone copper pipe, located aft of amidships on the starboard side, protrudes from the sand. The pipe appears to have been bent and compressed during the site formation process, leading to a more flattened appearance. This could be part of a bilge pump system, as according to Oertling (1984:57-58), copper had begun to be used more extensively beginning in the late 18th century. More evidence would be needed, however, to support this claim. Nevertheless, during an initial reconnaissance visit, this pipe was initially located and provided the name for the site (i.e. Copper Wreck).

Ballast

A cement-like substance was located in the stern area of the vessel and could have been permanent ballast (McKinnon and Scott-Ireton 2006:189-190). Future studies should consider sampling this material to determine composition. Additional stones were also located in the stern, indicating the presence of portable ballast (Lamb 1998:5-6).

Artifact Analysis

A variety of artifacts were recorded from the Copper Wreck site. Unfortunately, they do not provide a large amount of information relating to the wreck. All were loose artifacts and only the positions in which they were found were recorded. This has made definitive statements about original provenance impossible, as some are not related to the wreck or seawall at all.

Glass

An intact port bottle was recorded from the site. The words “FEDERAL LAW FORBIDS SALE OR REUSE OF THIS BOTTLE” embossed on the side of the bottle date it between 1935 and the 1960s (BLM & SHA 2020). Additional embossing reads “PEDRO LOPEZ & C°, VILA NOVA DE GAIA PORTUGAL” and “BOTTLE MADE IN PORTUGAL”. Pedro Lopez & Co was an obscure winery in Portugal and maker of port wine (Barata 2009, Index of Figures 6).

The labels on the bottle indicate that it was bottled specifically for import to the United States. This would put it outside of the timeframe of the wreck.

Three broken glass bottle fragments were recorded from the site. One appears to be a fragment of a Coca Cola bottle, while the other two appear to be the upper sections (finish, neck, and remains of shoulder sections) of two machine-made bottles. This puts them out of the time frame of the site.

A fragment of what was tentatively identified as deck glass was recorded from the wreck. This would have been used to let light into the interior of the ship through the deck

Bricks

Four fragments of red brick, two large fragments and two small, were recorded from the site. The two larger fragments were a plain brick and a brick with perforations and keyed edges. The plain brick has no distinguishing marks to date it, but the perforated brick seems to be a more modern design. They are likely discarded construction materials. They do not appear to be of the same 'Fowle brick' type found at a nearby site described by Will Nassif (2020, pers. comm.).

Iron

Several iron artifacts were identified at the Copper Wreck site. While most of these are the remains of fasteners and are similar to the varieties described above, it is important to note that the potential for cross-contamination between the seawall and the wreck makes the definitive identification of all fasteners difficult.

In addition to the fasteners, there was also a rove found on the site. It was square in shape and the hole in the center offset. The rove's corrosion pattern does not suggest that it was attached to anything. A large wrought iron turnbuckle was also recorded near the stern of the vessel and was possibly part of the machinery located in the stern of the vessel. Finally, a broken piece of unidentifiable wrought iron was recorded on the wreck site.

|Other Metal

A section of lead pipe was retrieved from the stern section of the ship. It was likely part of machinery functioning to transport water or steam.

A small rectangular piece of brass was recorded near the stern of the ship. It was possibly part of machinery situated in the stern of the vessel. As it did not appear to be broken, but instead cleanly cut with no means of fastening, it could be scrap material. It appears to be of low quality, and streaks of copper and possibly zinc are visible on its surface.

Coal

A small lump of coal was found in the stern section of the ship. It was possible that it intended as fuel for the boiler component of the steam machinery used for lifting purposes. There are indications of desalination equipment and an engine in the stern, which may be related.

Other Objects

A deteriorated brush without a handle was recorded from the site. It appeared to be an intrusive object of modern manufacture resembling a wide paintbrush.

An artifact that appears to be liner made of fiberglass was recovered in the seawall section of the site. It appears to have been part of the seawall construction and may have functioned as a waterproof liner. Fiberglass only became common in the mid-20th century, suggesting that the seawall dates to around that time (Encyclopedia Britannica 2020).

Modern and Historic Seawalls

The RTK data for the seawalls shows the change in shape through time, with the newest construction expanding the cove to the east. The historic seawall extends further out into the river than the modern one, a possible sign that more space was needed on the banks to provide loading areas for barges and schooners carrying lumber. The modern seawall on the western side of the site encompasses a humanmade spit that appears on maps after the E. M. Short mill was closed; to the west of the spit, the seawall returns to a more natural shape, and to the east of the cove the same occurs. The underwater historic seawall members intersect with those of the vessel, with frames and timbers intermingling on the starboard side. It is possible that as the vessel listed it fell onto the seawall, though it is also likely that the seawall was built on top of

the wreck. An additional prospect is that the vessel was used an extension to the docking space, thereby being combined with the seawall intentionally. Two additional points were taken extending from the northern portion of the modern seawall, where suspected historic seawall is located. A future study of the site may wish to consider exploring this possibility further.

Discussion

There has been no official research project carried out on the Copper Wreck prior to the ECU 2020 field school. Therefore, all discussion regarding site formation and identification is preliminary. Future research is scheduled to be conducted in conjunction with a thesis project related to the site. Further data will be collected that may aid in the specific identification of this vessel.

The location of this vessel may give some indication of its use and abandonment. The shipwreck is resting against the historic seawall that submerged adjacent to the modern seawall. The proximity of the vessel to the seawall in shallow water may indicate that the vessel was intentionally sunk to either help construct or support the wall. Another possibility, however, is that the vessel listed after it was abandoned and came into contact with the seawall at that point. The vessel rests in a small inlet on the Washington, NC shoreline with water levels that fluctuate from between approximately 1-2 m deep. The area also experiences river blowouts roughly once per year that fully expose the wreck. This shallow environment, as well as exposure to the elements, has potentially impacted the preservation of the wreck site. The identification of modern artifacts, as well as large logs and branches, indicate that there is still cultural and natural interaction with the site. Due to its location, the site will continue to be impacted by both cultural and natural forces. This is unfortunate because these factors will continue to damage the wreck.

No definitive identification of this vessel has yet been made; however, it could be a schooner type vessel. Historic photographs may provide some clues as to the identity. Figure 5 shows the inlet where the vessel is located. This image, taken in 1884, shows a ship, potentially a schooner, anchored next to the historic seawall. Though this vessel cannot be definitively identified as the Copper Wreck, it does provide more information regarding the use of this site. The image shows a well-constructed seawall that extends further than the modern wall. This, along with the presence of a vessel alongside it, demonstrates that this site was potentially used as a loading station for the lumber yard associated with the site at this time. Though more

photographs will need to be consulted to learn more about the specific vessel present at the site today, images such as this will aid further site identification.

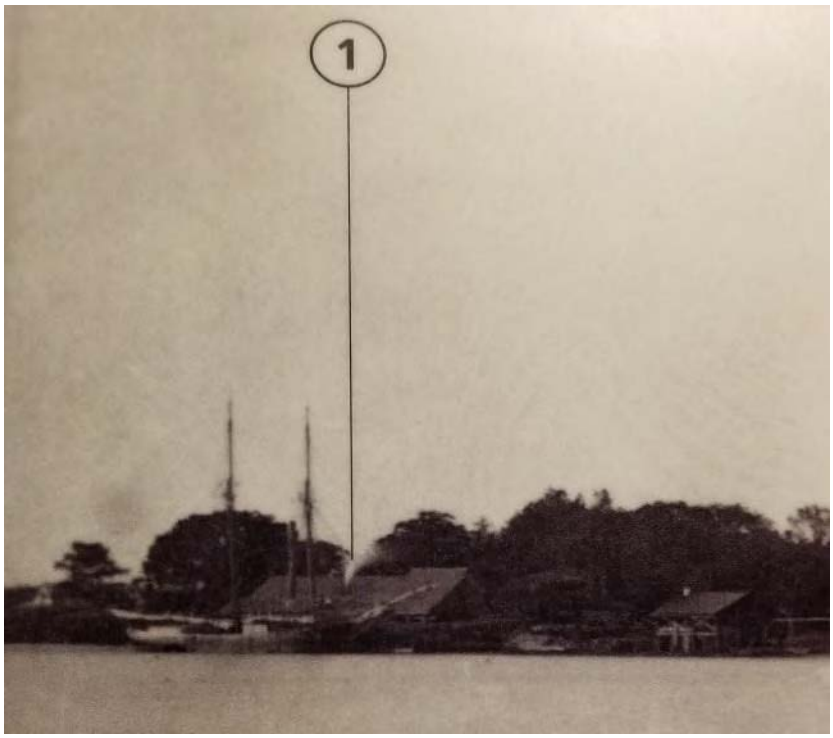


Figure 4. Photograph of Washington inlet circa. 1884 where the Copper Wreck would eventually come to rest (Courtesy of Craven County Digital History Exhibit, Craven County Public Library, New Bern, NC).

Centerboard Wreck

The Centerboard Wreck rests in the Pamlico River just downstream of the Tar River tributary and is located along the river's south edge across from historic downtown Washington, NC. The vessel is almost entirely submerged in approximately 1.5-2 m of brackish water, partially buried in a layer of very fine silt and mud, and oriented along a bearing of 170/340º. The site is moderately accessible to the general public by means of kayak, shallow water vessel, or wading from the south shore; however, the location of the site is concealed as only the top of the centerboard box fasteners are visible during low tide.

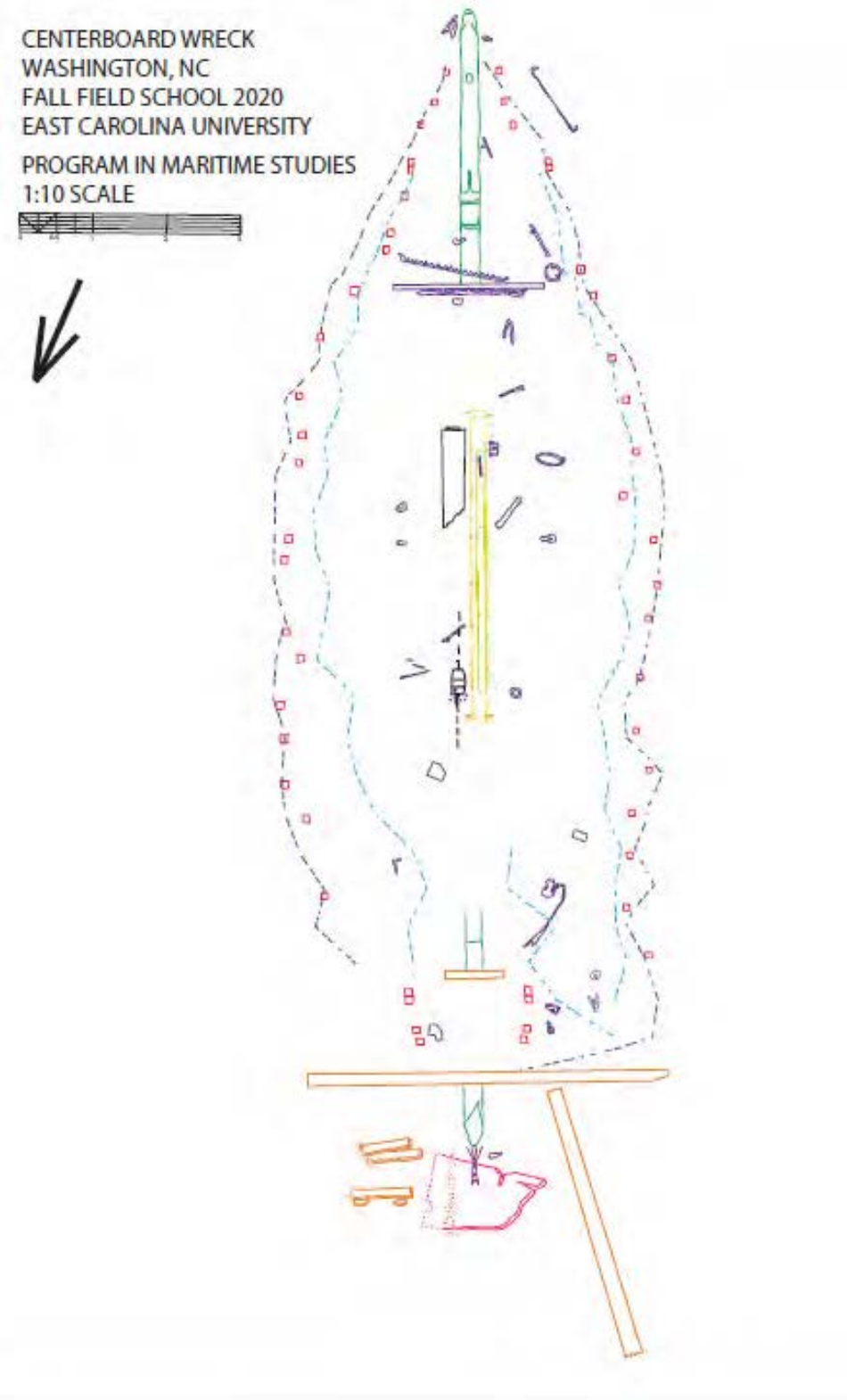


FIGURE 5. Digitized site plan of the Centerboard Wreck created during the 2020 ECU Fall Field School (Courtesy of P. Boyle 2020). From: ECU Collection.

Site Access and Conditions

The location of the Centerboard Wreck on the opposite side of the Pamlico River from Washington, NC, in addition to the thick vegetation of the south shoreline, required the divers to work from a boat to access the site. Divers were in constant contact with topside and each other due to the shallow waters of the site and the ability to anchor the boat nearby.

The site is covered by silty mud, which limited dive visibility to .3 to .6 m the surface to complete blackout visibility on the bottom. Visibility was generally unaffected by the tide but would become clearer during or after rains when fresh unsaturated water was introduced to the site. The water at the site was calm and did not experience much change from wind or wake.

Air temperature ranged from 70-95º Fahrenheit, with water temperature ranging from 65-75º Fahrenheit. The standard schedule consisted of loading the work boat at 0900, then heading to the site from the dock. Divers prepared their gear and briefed during the boat ride, often getting in the water by 0945. Two dives were conducted during the day, the first in the morning, and the second in the afternoon after a lunch break. Most days the crew left the site by 1500 and finished offloading the boat by 1530.

Site Setup

Each day, an approximately 20 m long baseline of 6 mm polypropylene measuring tape would be anchored over the top of the site to two 1.5 m rebar driven into the mud. The limited visibility conditions required the tape be higher in the water column to be legible. As the site is situated in the waterway, the baseline and anchors were removed each day after work was completed. This prevented any loosening or sway caused by long term use. Tags and other implements were not used on the site.

Vessel Construction Analysis

The site consists of a large partially buried hull sitting upright that is 15.6 m in length and approximately 5 m wide; however, due to the site's position in the waterway, a baseline was laid out during each visit. The remains of the vessel include the keel, keelson, the base of the stem and stern assembly, floor timbers, first futtocks, ceiling planking, the centerboard box containing the centerboard, a mast, a bulkhead timber, possible concrete/tabby ballast, and a rudder. Additionally, artifacts associated with the wreck in the site include an iron knee, and iron hoop,

cable, a rudder pintle, iron pulleys, a bobstay, wood with an iron eye, an iron ring, a loose fastener, an iron bar, a tongue and groove wood fragment, an oystering dredge rake, a gear piece, tongs, a stove (caboose), a glass pane, a shoe sole, and oyster shells. Many artifacts were unidentifiable, and some are intrusive.

Stem Assembly

There are two timbers that compose the outermost section of the vessel's stem. Though one has eroded, the two timbers are secured with one large bolt measuring approximately 60 cm long. Two more fasteners can be felt connecting the inner stem piece with the two outer pieces; however, the timbers are still intact, and the bolts could not be measured. Approximately 55 cm of the stem components were noted above the riverbed.

Stern Assembly

The stern of the vessel is composed of two large timbers connected with a through bolt. The two timbers protrude approximately 90 cm out of the sediment. The top timber has been tentatively identified as the vessel's sternpost. There is a much thinner strip of wood attached to the posterior of the sternpost by several fasteners. This component of the stern may be related to the attachment of the rudder (Steffy 1994). The sternpost and rabbet are secured by a large timber, potentially the keelson, as well as deadwood that sits atop it. The deadwood measures approximately 70 cm in length.

There are three main fasteners within the stern construction. Much like the stem, one long bolt connects the two large stern timbers. This bolt is unique, however, because it also connects the thinner strip of wood to the stern construction. There are two smaller fasteners positioned above the larger bolt that also connect the thin wooden component to the stern assembly. Due to the location and proximity to one another, these two smaller fasteners appear to have been a single bolt that eroded into the two separate pieces.

Frames

A total of 22 frame stations were identified and recorded. The frames measured approximately 8-9 cm sided and 10-11 cm molded. The distance between frames within the frame station are between 8-9 cm and the distance between frame stations is approximately 50

cm. The full length of the existing frames is unknown because the vessel is partially buried in the deep sediment. Frame stations 1-3 were identified as cant frames and framing pairs began at frame station 4 on both the port and starboard side of the vessel. Baseline offset measurements were taken from each frame station and midships of the remaining frames measured approximately 4.7 m wide. This does not, however, portray the original midships width, as much of upper hull has eroded.

The stern end of the vessel is notably less well preserved. This is potentially due to the amount of intrusive materials that are found in that area of the vessel. The lack of preservation made recording frame stations in this section of the vessel considerably more challenging. Most of the frame stations located and recorded are in the stem and midships of the vessel.

Hull Planking

Because the wreck is almost completely submerged in sediment, the outer hull planking can only be examined in a few areas around the wreck. The upper outer hull planks can be felt at most frame stations. The sided dimensions of these planks were 2 to 3 cm, whereas the molded dimensions ranged from 12.5 to 26 cm. The hull planking extends throughout the vessel and terminates at the rabbet of the stem and stern.

Ceiling Planking

The ceiling planking is present throughout the vessel. Seven individual ceiling planks were identified on the starboard side of the vessel and at least five ceiling planks were identified on the port side. These consistently measured 25 cm sided. The ceiling planks are broken and missing at the stem. The ceiling planking can be felt 50 cm from the stem on the starboard side and 1.5 m on the port side. The aft portion of the vessel has sustained heavy damage and it is difficult to determine which extant pieces are ceiling planking. However, it is possible to feel the planks terminate at the stern.

Centerboard Case and Fasteners

The centerboard case is the most exposed portion of the wreck. It is amidships and is offset to the starboard side of the keel, which was a common construction practice in the 19th century (Brewington 1963:45). It is approximately 4.15 m in length. The forward section of the

centerboard case is 1.15 m high while the aft height is 1.05 m. The port side consists of three planks while the starboard side has four. The aft sections of the uppermost planks are damaged on both sides.

The bottom portside plank ranges in height between 43 and 50 cm. The middle portside plank height is 30 cm. There is a 6 cm gap between the middle and upper plank. The upper portside plank ranges from 10-16 cm because of the damage aft. The bottom starboard plank height ranges from 25 to 30 cm. The height of the second plank ranges from 27 to 30 cm. There is a missing section in the uppermost aft piece of the second starboard plank, which causes a 6 cm gap between the second and third planks. The height of the third plank is between 13 and 30 cm because of damaged areas. The height of the uppermost starboard plank ranges from 22 to 24 cm. It is the only plank that does not fully reach the aft of the centerboard case and is approximately 3.65 m long.

Each side of the case has six exposed bolts protruding 12 to 14 cm beyond the planking. They are inconsistently spaced from 50 to 60 cm on both sides and have diameters ranging from 2 to 2.5 cm. The gap, where the centerboard is stored, between the portside and starboard side is approximately 20 cm wide and 3.8 m long. The centerboard remains present within the gap and is about 9 cm wide and 3.25 m long.

Mast

A small portion of a mast was observed laying on the portside of the centerboard case. It is 32 cm in diameter and is octagonal. The bottom portion of the mast contains a tenon that is approximately 30 cm long and 12 cm wide. The upper portion appears to have been broken off rather than cut off. The overall length is 1.32 m from the tenon to the uppermost extant edge. The lower portions of 19th century masts were either eight or sixteen sided, and the bottom was carved to produce a tenon (Greenhill 1988:166-167). The octagonal shape was created by squaring a timber, marking the eight sides with a squaring board, and trimming the corners with an adze (Greenhill 1988:166).

Bulkhead Timber

There was only one timber identified as a bulkhead on the wreck. It runs athwartships across the keelson and is 1.65 m forward from the centerboard case. The top and bottom are flat, and the sides are cut sharply to fit against the hull planking.

Ballast

Concrete or tabby ballast is present between frames in the aft part of the vessel. The substance appears to be formed to the dimensions of the frames, which means it is possible that it has been poured into the space. The concretion varied in size but is 24 cm long and contains an outline of a frame that measures 15 cm long and 6 cm wide.

Rudder

The rudder is present and lays slightly underneath the sternpost. It does not lay flat in the sediment and rises at an angle of approximately 15 degrees toward the starboard side of the vessel. The rudder consists of three different pieces which are fastened together. There are also remnants of one pintle fastened to the rudder by two bolts (Mott 1997:106). The pintle is 24 cm long and 5 cm wide, while the fasteners are both 3 cm in diameter. It is 166 cm long and 13 cm molded. The sided measurements of the rudder range from 101 cm at the base to 72 cm toward the top before it sharply curves inward to the top. The innermost piece is round at the top and is 10 cm sided.

Artifact Analysis

Artifacts were recovered and photographed before being replaced on the site. Due to the permits granted for this project, no artifacts were taken off the site for conservation. Artifact location was precisely recorded as the artifact was being brought up so that it could be returned to its proper location. There was a total of 36 artifacts recorded from the site.

Metal

A knee joint was found on the wreck and recorded in the photolog. This knee measures approximately 110 cm long and appears to be composed of iron. Knee joints are commonly used

in wooden vessels to provide support for the vessel in structurally vulnerable areas (Stammers 2001). Iron knees began to replace their wooden predecessors in the mid-18th century, though they were not often used in American shipbuilding due to the abundance of timber available to American shipwrights (Stammers 2001). This joint appears to be a right-angled joint which was a common joint type during this period (Stammers 2001).

An iron band was locateded and recorded near the centerboard case on the site. This band was substantial in size and weight. Iron bands such as this one are a common component of a vessel's mastcap (Mastini 1990). Mastcaps were used to secure two sections of a mast together and used two iron hoops welded together to secure the two masts into place (Mastini 1990).

Three sections of iron cable were recorded on the site. While they were heavily concreted, there were a few exposed sections that showed the twisted strands of cable. These pieces of cable ranged from thirteen to 52 cm long. Cable such as this was developed in Great Britain in the early 19th century and quickly replaced rope due to its higher tensile strength and versatility (Martin 1992). Strong cable like this was most likely used in the rigging of the vessel.

The rudder pintle was located near the stern of the vessel and recorded. This bronze pintle was well preserved with minimal concretions. It was most likely used in conjunction with a gudgeon to connect the rudder to the stern of the vessel (Steffy 1994).

Three possible iron pulleys were recorded on the site. Though all the artifacts were slightly corroded, the general structure of these pieces was still recognizable. One of the pulleys was found with wood attached to it. This wood most likely became concreted onto the pulley after the ship sank. These pulleys may have been mast blocks, which were an essential component of a vessel's mast rigging (Mastini 1990).

The bobstay was located on the site and photographed before it was returned. The piece is iron and eroded. One of the crossarms and rounded corners has already completely deteriorated. The bobstay was an integral component of the rigging system as it secured the bowsprit to the vessel's bow (Delgado et al. 2018; Steffy 1994).

A plank of wood with an iron eye bolted through one end was located on the site. Both the plank and iron eye were well preserved. The plank measured 67 cm long and the diameter of the iron eye was 19 cm.

An iron ring measuring 14 cm in diameter was found on the site.

An iron fastener was located resting inside the centerboard case which measured approximately 25 cm long. This fastener is believed to be one of the components holding the centerboard case together due to its location. The fastener appears to be a bolt that could be either a through or a fender bolt (McCarthy 1983). While a throughbolt is strictly used secure two timbers together, a fender bolt is used to minimize the effect of 'shock' on a vessel and its components (McCarthy 1983).

An iron bar with a curved piece of iron attached were located on the site. Both the iron bar and curved metal attachment were in good condition when recovered. The bar measured 33.5 cm. Though the artifacts were not be definitively identified, they are potentially a shackle attached to an iron bar with an eyebolt.

At least two iron pieces that appear to be the feet of a small cooking stove were found. A caboose was a term given to a compact iron stove used on smaller vessels (Hamersly 1884:101). One of the pieces was heavily concreted, while the other is fairly clean. Both pieces were broken at the top where they most likely connected to the base of the stove. There were no other identifiable pieces of a stove located.

Multiple artifacts recovered from the wreck are related to oystering. The most obvious are three iron rakes lined with sharp teeth. Two rakes were concreted together and all three were found just forward of the centerboard case. The individual rake has 20 teeth 4 to 6 cm in length and are spaced at 5 cm intervals. These rakes are most likely the bottom pieces of an oyster dredge. An oyster dredge was typically made of a metal frame covered by metal rings or netting. Most dredges contained a long metal rake with teeth that would aid in digging up buried oysters. Multiple variations of oyster dredges were used, but they all served the same purpose (Brewington 1963:93-94). The dredge was dragged along the sea floor behind a ship in order to pick up oysters. The oysters were caught within the metal frame and the dredge was lifted back onboard the boat by using a hand powered winch (Ingersoll 1881:244-247).

Multiple iron pieces varying in size were also found on the wreck and possibly are pieces of a dredge. The majority of these are broken and are unidentifiable, however, one is a small cylinder that resembles a gear. The gear piece is heavily worn but small grooves that were most likely the teeth of the gear are still visible. Since oyster fishers relied on using a hand powered winch to lift the heavy dredge back onboard the ship, it is possible that this gear was part of the winch system (Brewington 1963:94). The gear piece is 14 cm in diameter and has 21 teeth.

A set of iron tongs were located within the wreck. They are 46 cm in length. The tongs are missing handles, but the teeth are still intact. These tongs were most likely used to move blocks of ice for an icebox. Iceboxes were commonly used on oyster vessels in order to keep fish and oysters fresh (Ingersoll 1881:198).

Tongue and Groove Wood

A tongue and groove wood fragment was found on the site. The piece of wood measured 13.5 cm long. This piece would mostly likely have been used as planking for an interior bulkhead wall.

Glass

A small piece of plate glass was located on the wreck. One of the corners is broken off but it is approximately 20 cm by 22 cm. Thought to be a windowpane, it is molded on one side in diamond pattern commonly seen on metal deck plates and molded on the other to give a rough texture.

Shoe Sole

A small leather shoe sole was located next to the sternpost. The sole is incomplete and appears to be the remains of the heel. It is approximately 15cm long and equates to a modern size 7.5 in men's shoe and 9 in women's.

Oyster Shells

A small assortment of oyster shells was also found on the site near the centerboard case. They were found next to the centerboard case underneath the ceiling planking. The shells vary in size but at least 17 different shells were identified.

Intrusive and Unidentifiable Objects

Many of the artifacts that were recorded are currently unidentifiable. At least one intrusive object was found on the site. A plastic container, most likely a laundry detergent bottle, was attached to an iron bar by a piece of modern rope. Even though the iron bar and plastic bottle were found submerged on the site, it is likely that someone attached the bottle to the bar at some

point when the iron bar was above the waterline as some type of makeshift buoy marker, possibly to mark the site as an obstruction.

Discussion

Research on the Centerboard Wreck is ongoing, and a student thesis will conduct additional research. The events leading up to the abandonment of the Centerboard Wreck remain inconclusive, but it is likely that the vessel was simply abandoned. There is no obvious structural damage that would indicate a wrecking event that would necessitate the vessel's abandonment. Additionally, the vessel's location in a recess in the southern riverbank may indicate that it was intentionally left there where it would be out of the way of most of the Tar-Pamlico River's traffic. The abandonment of eleven vessels in a ships' graveyard at the nearby Castle Island suggests that it would not have been uncommon to leave vessels in the abandoned industrial areas around the waterfront at the time (Rodgers & Richards 2006). While some artifacts remain in the wreck and scattered around the site, others indicate that there was some salvaging of the vessel during or after the vessel's abandonment. Metal tools, such as the tongs and rakes, and rigging elements left on site may have been abandoned with the wreck following their exposure to the water or were simply forgotten or lost in the hull structure at the time of the potential salvage. However, the presence of artifacts like the stove legs and gears likely associated with a winch indicate that there was an effort to salvage the larger or more valuable parts of the ship when it was abandoned. While only one artifact recorded during the fall 2020 investigation was definitively identified as a modern intrusion, it should be assumed due to the vessel's easily accessible location and regular exposure on the river's surface that other artifacts have been added to and removed from the site since the time of the vessel's abandonment. Unfortunately, there is no way of knowing how much was removed at the time of the vessel's abandonment and how much has been removed in the years since.

The dynamic environment of the Tar-Pamlico River and Pamlico Sound lends itself to frequent changes in tidal levels and sediment accumulation. However, the Centerboard Wreck's position within a small indention in the riverbank affords it some protection from the elements. Furthermore, the fine muddy sediment the wreck rests in likely prevents significant amounts of movement due to hurricanes or other severe storm events. There have been relatively few hurricanes on the scale of Hurricane Floyd with the power to disturb the riverbed and shift the

positioning of archaeological sites in the river in recent years. The fact that the Centerboard Wreck has not been subject to any notable amount of movement since the ECU field school investigations in 2004 and 2006 suggests that it is resting in a stable and secure environment. However, gradual deterioration of the Centerboard Wreck can be observed in hull elements extending out of the sediment, particularly in the centerboard case, which is regularly exposed to air and surface conditions of the Tar-Pamlico River. Recording and illustrations of the centerboard case during ECU's 2004 field school suggest that the topmost plank of the centerboard case was in better condition than it was recorded to be during 2020 investigations (Seltzer 2004). Despite the Centerboard Wreck's partial exposure to the elements, it seems to currently be safe from any major deterioration or damage.

As of the conclusion of ECU's fall 2020 field season, the specifics of the Centerboard Wreck's construction and typology remain inconclusive. The wreck most likely represents one of many kinds of small vernacular craft used to ply the shallow waters of NC's sounds and rivers in the 19th century. Due to the vessel's size, general style, and amount of remaining hull structure, it is unlikely that the wreck will be able to be identified by name.

The construction of the Centerboard Wreck and the assemblage of artifacts located during investigations of the site, particularly oyster rakes and tongs often associated with the use of an on-board icebox, strongly suggest that the vessel was involved in the oyster fishing industry in the Pamlico Sound. Types of vernacular craft commonly associated with oyster fisheries along the east coast of the United States in the 19th century (the time of NC's oystering boom) were Chesapeake Bay bugeyes and various other types of centerboard schooners. Numerous centerboard schooners have been previously investigated within the intra-coastal waters of NC (Merriman 1997; Snyder 2006; Turner 1999). Further comparison of differences in vessel construction may assist in the positive identification of the Centerboard Wreck's typological identity.

Conclusions and Recommendations

By the end of the 19th century, Washington was a burgeoning hub of industry. Newspaper writer H.H. Hardy described Washington as "ideally situated and is rapidly forging to the front as one of the leading business and industrial centres [sic] of Eastern North Carolina" (*The News and Observer* 1897). The Tar-Pamlico River system operated as an aquatic highway,

facilitating the movement of goods from inland, upriver locations to the Atlantic Ocean. The wrecks described here represent the material manifestation of this development. Although the precise function and identification of either vessel is not yet discernable, there exists considerable evidence to suggest these boats were associated with the lumber and oystering industries, respectively. The exact nature of their deposition into the archaeological record also remains unclear. Without any indication of a violent wrecking event, it is likely each vessel was either abandoned and sunk at mooring, or intentionally sank when its owners deemed it no longer functional.

Ship abandonment was a popular practice within this industrious maritime landscape, as revealed in earlier investigation of Washington's underwater cultural heritage (Rodgers et al. 2006). The Centerboard Wreck, replete with its tongs, rakes, and gears, is conspicuously located near a concentration of abandoned wrecks that surround Castle Island, once the site of numerous limes kilns. The remains of historic pier and jetty pilings associated with the local turpentine and lumber industries that extend from the riverbank nearest the Centerboard Wreck are a further indication of the area's role in trade and business.

Upriver, the Copper Wreck is immediately adjacent to the property formerly owned by the E.M. Short Lumber Company. The vestiges of a historic seawall were uncovered during the Copper Wreck investigation, which further attests to Washington's industrial past. The orientation of the Copper Wreck with respect to the former lumber mill and seawall suggests that the vessel may have been internally positioned to function either permanent or floating dock. The latter is supported by the presence of machinery towards the vessel's stem, which may have been used to move timber from the log pond to the mill. A third possibility exists in which the vessel, like the Centerboard Wreck, was simply abandoned and allowed to sink. Schooners, often falling under the "ram schooner" designation, were used to transport lumber to railcars and distant coastal destinations (Mallinson 2017:181). Towing vessels were prevalent on the waters of the Tar-Pamlico River during Washington's industrious heyday, with many primarily used to tow floating timber and barges (Ellinson 1976:91-92). Numerous lumber companies, including E.M. Short, were reported to own and operate various types of tugs and barges (Bureau of Navigation, 1903).

Regardless of each vessel's function, it is apparent that they represent vernacular watercraft. These ordinary, everyday boats are likely to be representative of local construction

traditions. As such, field school participants attempted to thoroughly record the physical structure of the wrecks, as well as the associated artifact assemblages. By doing so, it may be possible one day to identify these or similar vessels based on compiled typologies. However, this investigation made it abundantly clear that the wrecks are situated within a dynamic environment and are routinely subjected to cultural and natural site formation processes. This likely began with salvage efforts at or around the time of sinking and continued to the present. Although shipwrecks are often likened to time capsules, the situation encountered by contemporary archaeologists is rarely reflective of an undisturbed context. For the Copper Wreck Site and Centerboard Wreck, this is evident by the presence of intrusive, modern debris and shifting environmental conditions noted in this report.

Based on the preceding discussions, the following recommendations are suggested for the management and study of both wrecks:

1. Continue archival research. Useful information on Washington's history and its industries, including specifics on lumber companies, has already been gleaned from historic newspapers and legal documents. Further archival research may help to definitively identify the wrecks documented during this field season.

2. Analyze construction and artifact assemblages on a finer scale. With the initial documentation of each wreck completed, it may be possible to analyze each vessel's layout and construction in further detail. This can be compared with other local, vernacular watercraft that exist in museums, personal collections, archival records, and archaeological reports. The same efforts can be extended to the artifacts associated with each wreck. The diverse array of metal fasteners, machinery, tubing and piping, rigging elements, and miscellaneous equipment could reveal vital information on vessel origin, age, or function if studied properly.

3. Work with local stakeholders. Field school participants have already talked with residents near the sites, the local Washington historian, and the great-grandson of E.M. Short, the former lumber mill owner. Doing so not only creates opportunities to incorporate local knowledge into studies of the wrecks, but also opens up a mutually

beneficial relationship between researchers and stakeholders. Community members consistently demonstrated a sense of pride and interest when discussing the nature of the archaeological work done at both sites. A continued discourse between archaeologists and stakeholders ensures a constant transfer of ideas, while helping to maintain the intangible qualities that makes investigating these wrecks worthwhile.

4. Capitalize on future opportunities to rerecord the wreck sites. Specifically, this refers to "blowouts," which occur when strong winds force water away from an area. This can, and has, resulted in the exposure of normally submerged sites, including the Copper Wreck Site. Without the visibility issues created by the Tar-Pamlico's blackwater conditions, archaeologists would be able to record the wrecks in a much more accurate and precise manner. This could be done with digital and photogrammetric methods that were not feasible during this field season. Being alerted of a blowout may result from the previously mentioned relationships with local stakeholders.

5. At the current time, there is no need for active methods of stabilization, such as reburial, for either wreck. Their immediate survival appears secure, with only large storms posing a significant risk. In case of such meteorological events, there is little site management can do to mitigate this largely unpreventable threat. For now, no intervention is recommended.

References

Barata, Magda Maria Soares
2009 *Identidade do Vinho do Porto, pela tradição da sua embalagem*. Doctoral dissertation, Departamento de Comunicação e Arte, Universidade de Aveiro, Portugal.

Brewington, M. V.
1963 *Chesapeake Bay Log Canoes and Bugeyes*. Second edition. Tidewater Publishing, Centreville, MD.

Bureau of Land Management and the Society for Historical Archaeology (BLM & SHA)
2020 Bottle Dating. Historic Glass Bottle Identification & Information Website, Bureau of Land Management and the Society for Historical Archaeology. <https://sha.org/bottle/machinemadedating.htm> Accessed 15 October 2020

Bureau of Navigation
1903. *List of Merchant Vessels of the United States* (*1903).* Government Printing Office: Washington, D.C.

Chestnut, Alphonse F.
1951 The Oyster and Other Mollusks in North Carolina. In *Survey of Marine Fisheries of North Carolina*, pp. 141–190. Chapel Hill, NC.

Cox, James M.
1989 The Tar-Pamlico River and Its Role in the Development of Eastern North Carolina. Master's thesis, Department of History, East Carolina University, Greenville, NC.

Delgado, James P., Kyle Lent, Joseph Grinnan, David W. Morgan, Stacye Hathorn, and David Conlin
2018 *Report on a Mid-to-Late Nineteenth-Century Wooden Shipwreck in the East Channel of the Mobile River Suggested as a Candidate for the 1855 Schoover Clotilda, Maldwin County, Alabama*. Final Report.

Dodds, Tricia and Dave Stewart
2007 Fall Field School 2006... Close to home in "The Original Washington". *Stem to Stern* 22(1):8-9.

Ellison, H.
1976. Recollections of Washington. In *Washington and the Pamlico*, U.F. Loy and P.M. Worthy (Eds.), Washington-Beaufort County Bicentennial Commission: Washington, N.C.

Ellison, Jr., William A.
1951 The Menhaden. In *Survey of Marine Fisheries of North Carolina*, pp. 85–107. Chapel Hill, NC.

Encyclopedia Britannica

2020 Fibreglass, Encyclopedia Britannica <https://www.britannica.com/technology/fiberglass> Accessed 15 October 2020

Greenhill, Basil
1988 *The Evolution of the Wooden Ship*. B.T. Batsford Ltd., UK.

Greenhill, Basil and Sam Manning
1995 *The Schooner Bertha L. Downs.* Conway Maritime Press, London, UK.

Hamersly, Lewis Randolph
2013 *A Naval Encyclopedia: Comprising a Dictionary of Nautical Words and Phrases; Biographical Notices, and Records of Naval Officers; Special Articles of Naval Art and Science*. Repressed Publishing LLC.

Hill, Michael R.
1984 *Historical Research Report: The Waterfront Area of Washington, North Carolina*. Microfilm, Historical Research Reports: Series 2, Number 34, North Carolina Division of Archives and History, Raleigh, NC.

Ingersoll, Ernest
1881 *The History and Present Condition of the Fishery Industries: The Oyster-Industry*. Forgotten Books.

Lamb, William Reginald
1998 The Provenance of the Stone Ballast from the Molasses Reef Wreck. Masters' Thesis, Department of Anthropology, Texas A&M, College Station, TX.

Litchfield, Ysobel DuPree
1976 Shipping, in Ursula Fogleman Loy and Pauline Marion Worthy, editors, pp. 225-247. *Washington and the Pamilco*. Washington-Beaufort County
Bicentennial Commission, Raleigh, NC, Edwards and Broughton.

Loy, Ursula and Pauline Worthy (Editors)
1976 *Washington and the Pamlico*. Washington-Beaufort County Bicentennial Commission, Raleigh, NC, Edwards and Broughton.

Mallison, F.M.
2017. *The Civil War on the Outer Banks: A History of the Late Rebellion Along the Coast of North Carolina from Carteret to Currituck, with Comments on Prewar Conditions and an Account of Postwar Recovery*. McFarland and Co., Inc.: Jefferson, N.C.

Marshall, Nelson
1951 Hydrography of North Carolina Marine Waters. In *Survey of Marine Fisheries of North Carolina*, pp. 2–76. Chapel Hill, NC.

Martin, Jay C.

1992 The Development of Wire Rope: An Innovation in Marine Technology Reaches the Great Lakes. *International Journal of Maritime History* 4(1):101–120.

Mastini, Frank
1990 Part III: Masting and Rigging. In *Ship Modeling Simplified*, pp. 58–107. McGraw-Hill Professional Publishing, New York, NY.

May, Louis G.
1976 Lumber, Part 1: The Story of Beaufort County's Lumber Industry. In *Washington and the Pamlico*, Ursula Loy and Pauline Worthy, editors, pp. 329-352. Washington-Beaufort County Bicentennial Commission, Washington, NC.

McCabe, Christopher P.
2007 The Development and Decline of Tar-Pamlico Maritime Commerce and its Impact upon Regional Settlement Patterns. Master's thesis, Department of History, East Carolina University, Greenville, NC.

McCarthy, Mike
1983 Ships Fastenings: A Preliminary Study. *Australasian Institute for Maritime Archaeology* 7(1):1–24.

McKinnon, Jennifer F. and Della A. Scott-Ireton
2006 Florida's Mystery Wreck. *The International Journal of Nautical Archaeology* 35(2): 187-194

Merriman, Ann M.
1996 North Carolina Schooners 1815-1902, and the S. R. Fowle & Son Company of NC. Master's thesis, Department of History, East Carolina University, Greenville, NC.

1997 The Cypress Landing Shipwreck of Chocowinity Bay: A North Carolina Sail Flat. ECU Research Report No. 9, Program in Maritime History and Nautical Archaeology, East Carolina University, Greenville, NC.

Morgan, John I. and Bill Abeyounis
1976 Since World War II, in Ursula Fogleman Loy and Pauline Marion Worthy, editors, pp. 510-513. *Washington and the Pamilco*. Washington-Beaufort County Bicentennial Commission, Raleigh, NC, Edwards and Broughton.

Mott, Lawrence V.
1997 *The Development of the Rudder: A Technical Tale*. Texas A&M University Press. College Station, TX.

The News and Observer
1897. Lumber, Truck, Tobacco. *The News and Observer*. 8 August 1897.

NovAtel Inc.
2015. *An Introduction to GNSS: GPS, GLONASS, BeiDou and other Global Navigation Satellite Systems* (2nd Ed.). NovAtel Inc: Calgary, Alberta, Canada.

Oertling, Thomas James
1984 The History and Development of Ships' Bilge Pumps, 1500-1840. Masters' Thesis, Department of Anthropology, Texas A&M, College Station, TX.

Paschal, Herbert.
1976 In the beginning, in Ursula Fogleman Loy and Pauline Marion Worthy, editors, pp. 1-6. *Washington and the Pamilco*. Washington-Beaufort County Bicentennial Commission, Raleigh, NC.

Richards, Nathan
2005 Remote Sensing & Site Inspection Survey: Tar and Pamlico Rivers, Fall 2004. Report Draft. East Carolina University, Greenville, NC.

Roelofs, Eugene W.
1951 The Edible Finfishes of North Carolina. In *Survey of Marine Fisheries of North Carolina*, pp. 109–139. Chapel Hill, NC.

Rodgers, Bradley A., Nathan Richards, Franklin H. Price, Brian Clayton, Andrew Pietruszka, and Heather White
2016 The Watercraft of Castle Island, Washington, North Carolina. In *The Archaeology of Vernacular Watercraft*, Amanda M. Evans, editor, pp.129-156. Springer, New York, NY.

Rodgers, Bradley A., Nathan Richards, Franklin H. Price, Brian Clayton, Drew Pietruszka, Heather White, and Steve Williams
2006 The Castle Island Ships' Graveyard: The History and Archaeology of Eleven Wrecked and Abandoned Watercraft. ECU Research Report No. 14, Program in Maritime Studies, East Carolina University, Greenville, NC.

Rutkow, E.
2012 *American Canopy: Trees, Forests, and the Making of a Nation*. Scribner, New York.

Seltzer, Erica
2004 Underwater Assessment – Site #: ECU04-UW-0002, Washington, North Carolina. Manuscript, East Carolina University, Greenville, NC.

Snyder, J. Travis
2006 Washington, North Carolina's 19th Century Coasting Trade and the Historical and Archaeological Investigation of the Schooner *Star*. Master's thesis, Program in History, East Carolina University, Greenville, NC.

Stammers, Michael K
2001 Iron Knees in Wooden Vessels-an Attempt at a Typology. *The International Journal of Nautical Archaeology* 30(1):115–121.

Staniforth, Mark
1985 The Introduction and Use of Copper Sheathing - A History *Bulletin of the Australian Institute of Maritime Archaeology*. 9(2): 21-48

Steffy, J. Richard
1994 Illustrated Glossary of Ship and Boat Terms. In *Wooden Ship Building and the Interpretation of of Shipwrecks*, pp. 266–298. Texas A&M Press.

Watts, Gordon P., Jr.
1997 Washington Tar-Pamlico Rivers Shipwreck Resource Survey Interim Report. Interim Project Report. Institute for International Maritime Research, Inc.

2004 An Underwater Archaeological Remote Sensing Survey Proposed Moss Property Marina Site on the Pamlico River Washington, North Carolina. Tidewater Atlantic Research, Inc.

Appendix A. Copper Wreck Site Artifact Inventory

Field Specimen #	Material	Object	Description	Measurements (cm)	Location	Northing (m)	Easting (m)	Ellipsoidal Hight (m)	Point #	Likely Approximate Date	Artifact Image
1	GREEN GLASS/LEAD /CORK	PORT BOTTLE	INTACT GREEN GLASS PORT BOTTLE, LEAD FOIL CAPSULE WITH POSSIBLE TIN COATING, REMAINS OF CORK INSIDE. WINE FINISH. MACHINE MOLD SEAM VISIBLE ON FINISH. MOLD MARK IN CENTER OF SHALLOW PUSH-UP BASE EMBOSSING ON SIDE READS: FEDERAL LAW FORBIDS SALE OR REUSE OF THIS BOTTLE, PEDRO LOPEZ & C°, VILA NOVA DE GAIA PORTUGAL. EMBOSSING ON BOTTOM READS: BOTTLE MADE IN PORTUGAL	28 TALL, 10 DIAMETER	PORT MIDDLE	3935554.835	312687.83	-40.481	26	20TH CENTURY	
2	FIBERGLASS	FIBERGLASS LINER	FIBERGLASS LINER CHUNK, IRON RUST STAINING. REVERSE SIDE: CIRCULAR FASTENER HEAD IMPRESSION, MARINE ANIMAL DAMAGE	44x20	SEAWALL	3935552.757	312692.518	-40.262	248	20TH CENTURY	
3	CLAY	BRICK FRAGMENT	PERFORATED AND KEYED RED BRICK FRAGMENT	9x9	SEAWALL	3935560.993	312698.905	-40.202	289	20TH CENTURY	
4	ROCK	BALLAST STONE	LARGE ROCK, NON-ERODED, NON-SEDIMENTARY	30x20	SEAWALL	3935556.544	312695.44	-40.195	290	UNKNOWN	
5	WOOD/IRON	TIMBER WITH IRON FASTNER	CIRCULAR IRON ROD WITH PEENED HEAD OVER DOMED ROVE STUCK INTO ERODED TIMBER	TIMBER: 5x10, FASTENER: 15 LONG, DIAMETER 2	SEAWALL	3935550.997	312692.874	-40.265	291	UNKNOWN	

6	WROUGHT IRON	SHEATHING NAIL	WROUGHT IRON CUT NAIL, NON-TAPERED SQUARE SHAFT, FLAT POINT, IRREGULAR ROUND HEAD	4 LONG, .25 DIAMETER	NEAR STERN POST	3935547.417	312684.331	-40.411	292	UNKNOWN	
7	ROCK	BALLAST STONE	ERODED LARGE ROCK	22x15	STERN	3935549.605	312686.619	-40.315	293	UNKNOWN	
8	COAL	COAL	NON-ERODED COAL CHUNK	4x4	STERN	3935549.344	312687.566	-40.358	294	UNKNOWN	
9	WROUGHT IRON	SQUARE ROVE	SQUARE WROUGHT IRON PIECE WITH OFF-CENTER HOLE	7.5x7.5, HOLE DIAMETER: 2	STERN	3935548.959	312685.844	-40.452	295	UNKNOWN	
10	WROUGHT IRON	IRON FASTENER	CIRCULAR WROUGHT IRON ROD, IRREGULAR HEAVILY ERRODED ENDS	31 LONG, 2.5 DIAMETER	STERN	3935549.153	312685.61	-40.402	296	UNKNOWN	
11	WROUGHT IRON	IRON BAR	ROUGHLY RECTANGULAR WROUGHT IRON PIECE, IRREGULAR SIZE, BROKEN FROM LARGER PIECE	29x4	STERN	3935550.426	312686.611	-40.326	297	UNKNOWN	
12	WROUGHT IRON	IRON PRONG TURNBUCKLE	WROUGHT IRON TURNBUCKLE, BROKEN COUPLER, ROVE, PEENED ENDS, CIRCULAR ROD WITH HEAVILY ERRODED CENTER	52 LONG, 2.5 DIAMETER		3935552.815	312689.7	-40.33	298	UNKNOWN	
13	CLEAR GLASS	DECKGLASS FRAGMENT	BROKEN CLEAR DECK GLASS	10x6	STERN	3935548.189	312685.373	-40.459	299	UNKNOWN	
14	WROUGHT IRON	IRON FASTENER	CIRCULAR WROUGHT IRON WROUGHT IRON, HEAVILY ERRODED BULBOUS END MAY BE WASHER AND PEENED HEAD	14 LONG, 1.25 DIAMETER	PORT MIDDLE	3935552.638	312689.47	-40.243	300	UNKNOWN	

15	CLEAR GLASS	BOTTLE FRAGMENT	BROKEN CIRCULAR CLEAR GLASS BOTTLE FINISH/NECK/SHOULDER WITH COLLAR AND CONTINUOUS EXTERNAL SCREW THREADS	7X4	PORT MIDDLE	3935558.874	312691.247	-40.208	304	20TH CENTURY	
16	CLEAR GLASS	BOTTLE FRAGMENT	BROKEN CIRCULAR CLEAR GLASS BOTTLE FINISH/NECK/SHOULDER WITH LONG COLLAR AND CONTINUOUS EXTERNAL SCREW THREADS. MACHINE MOLD SEAM VISIBLE. VERTICAL RIBS ON NECK CONTINUING ONTO SHOULDER	7X3	STARBOARD MIDDLE	3935554.061	312689.912	-40.365	302	20TH CENTURY	
17	CLEAR GLASS	BOTTLE FRAGMENT	GREEN TINTED GLASS COCA COLA BOTTLE BODY FRAGMENT	5X4	STARBOARD MIDDLE	3935557.095	312691.421	-40.328	303	20TH CENTURY	
18	WROUGHT IRON	THREADED THROUGH BOLT	WROUGHT IRON THREADED THROUGH BOLT. BENT CIRCULAR ROD WITH ERRODED CENTER, SQUARE HEAD ON ONE END WITH SQUARE NUT, AND ROVE, ON OTHER END	55 LONG, 2 DIAMETER	PORT MIDDLE	3935553.134	312689.578	-40.251	301	UNKNOWN	
19	BRASS	BRASS PIECE	THIN RECTANGULAR BRASS PIECE, STREAKS OF UNMIXED COPPER AND LIGHTER METAL, LIKLEY ZINC	4x2.5	STERN	3935547.969	312685.875	-40.448	305	UNKNOWN	
20	UNKNOWN COMPOSITE	BRUSH	MODERN BRUSH WITHOUT HANDLE, STAINED BLACK AND DETERIORATING	11x6	PORT MIDDLE	3935558.996	312689.107	-40.402	306	20TH CENTURY	
21	CLAY	BRICK FRAGMENT	RED BRICK FRAGMENT	4x5	STERN	3935548.838	312686.157	-40.409	308	UNKNOWN	

22	LEAD	LEAD PIPE FRAGMENT	THIN TWISTED LEAD PIPE FRAGMENT	12x6	STERN	3935547.079	312685.337	-40.548	307	UNKNOWN	
23	CLAY	BRICK FRAGMENT	ERODED RED BRICK FRAGMENT	8x5	STARBOARD MIDDLE	3935551.621	312688.929	-40.361	309	UNKNOWN	
24	CLAY	BRICK FRAGMENT	RED BRICK FRAGMENT	15x10.5	STERN	3935550.032	312684.486	-40.624	310	UNKNOWN	
25	WROUGHT IRON	IRON FASTENER	CIRCULAR WROUGHT IRON ROD, ONE END POSSIBLY BROKEN, OTHER SEEMS TO HAVE BEEN HAMMERED	30 LONG, 2 DIAMETER	BOW	3935562.565	312693.534	-40.465	311	UNKNOWN	
26	WROUGHT IRON	IRON FASTENER	SQUARE WROUGHT IRON ROD CHISEL POINT	13 LONG, 1 DIAMETER	BOW	3935561.055	312691.283	-40.393	312	UNKNOWN	

Copper Wreck
FS#1
Port Bottle
October 2020

0 cm 20 cm

Copper Wreck
FS#2
Fiberglass Liner
October 2020

0 cm 20 cm

Copper Wreck
FS#3
Brick Fragment
October 2020

CM

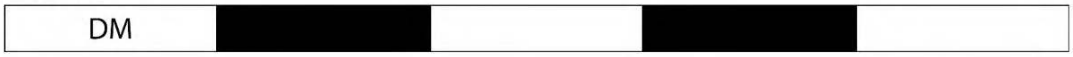
0 cm 10 cm

Copper Wreck
FS#5
Timber with Fastner
October 2020

DM

0 cm 50 cm

Copper Wreck
FS#4
Ballast Stone
October 2020

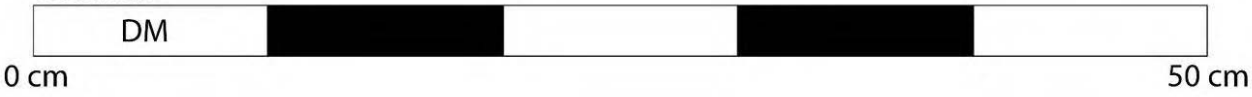


0 cm 50 cm

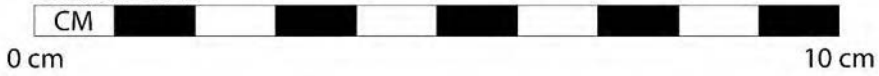
Copper Wreck
FS#6
Sheathing Nail
October 2020

0 cm 5 cm

Copper Wreck
FS#7
Ballast Stone
October 2020



Copper Wreck
FS#8
Coal
October 2020



Copper Wreck
FS#10
Fastener
October 2020

Copper Wreck
FS#9
Rove
October 2020

Copper Wreck
FS#11
Iron Bar
October 2020

Copper Wreck
FS#12
Deck Glass
October 2020

CM

Copper Wreck
FS#12
Turnbuckle
October 2020

DM

0 cm 50 cm

Copper Wreck
FS#13
Fastener
October 2020

CM

0 cm 10 cm

Copper Wreck
SF#14
Bottle Fragment
October 2020

Copper Wreck
FS#16
Bottle Fragment
October 2020

Copper Wreck
FS#15
Bottle Fragment
October 2020

Copper Wreck
FS#17
Threaded Through Bolt
October 2020

Copper Wreck
FS#18
Brass
October 2020

DM

0 cm 10 cm

Copper Wreck
FS#20
Brick Fragment
October 2020

CM

0 cm 10 cm

Copper Wreck
FS#19
Brush
October 2020

Copper Wreck
FS#21
Lead Pipe
October 2020

Copper Wreck
FS#22
Brick Fragment
October 2020

Copper Wreck
FS#23
Brick Fragment
October 2020

Copper Wreck
FS#23
Fastener
October 2020

Copper Wreck
FS#24
Fastener
October 2020

Appendix B. Copper Wreck Site RTK Data

Point	North (m)	East (m)	Ellipsoidal ht (m)	Code
Base1	3935561.604	312654.105	-38.805	BS
1	3935591.851	312713.445	-38.696	DOCK
2	3935594.467	312713.521	-38.68	DOCK
3	3935585.113	312707.201	-38.728	DOCK
4	3935583.528	312703.314	-38.752	DOCK
5	3935580.582	312706.543	-38.774	DOCK
6	3935583.258	312709.07	-38.719	DOCK
7	3935527.705	312730.718	-38.848	SEAWALL
8	3935538.258	312712.398	-38.772	SEAWALL
9	3935540.689	312712.796	-38.735	SEAWALL
10	3935545.287	312705.48	-38.731	SEAWALL
11	3935545.338	312700.633	-38.879	SEAWALL
12	3935546.646	312696.056	-38.907	SEAWALL
13	3935550.919	312693.492	-38.943	SEAWALL
14	3935554.639	312696.147	-39.121	SEAWALL
15	3935557.687	312702.414	-38.978	SEAWALL
16	3935561.065	312705.724	-38.911	SEAWALL
17	3935569.292	312710.935	-39.028	SEAWALL
18	3935574.234	312712.144	-39.068	SEAWALL
19	3935578.962	312712.75	-39.049	SEAWALL
20	3935602.032	312713.979	-38.796	SEAWALL
21	3935602.727	312714.571	-38.791	SEAWALL
22	3935615.311	312695.999	-38.601	SEAWALL
23	3935547.271	312647.114	-39.158	SEAWALL
24	3935550.494	312640.145	-39.036	SEAWALL
25	3935585.355	312582.374	-38.833	SEAWALL
26	3935554.835	312687.83	-40.481	BOTTLE
27	3935565.714	312695.662	-39.92	BASELINE
28	3935563.295	312694.043	-40.555	STEM
29	3935562.678	312693.846	-40.369	SFRAME1
30	3935562.162	312693.875	-40.271	SFRAME2
31	3935562.029	312693.831	-40.27	SFRAME3
32	3935561.675	312693.83	-40.237	SFRAME4
33	3935561.514	312693.788	-40.203	SFRAME5
34	3935561.42	312693.77	-40.217	SFRAME6
35	3935561.121	312693.767	-40.208	SFRAME7
36	3935560.998	312693.674	-40.24	SFRAME8
37	3935560.716	312693.749	-40.196	SFRAME9
38	3935560.553	312693.701	-40.214	SFRAME10

39	3935560.306	312693.576	-40.179	SFRAME11
40	3935560.088	312693.594	-40.18	SFRAME12
41	3935556.58	312692.498	-40.07	SFRAME13
42	3935556.4	312692.333	-40.064	SFRAME14
43	3935556.217	312692.221	-40.135	SFRAME15
44	3935556.115	312692.175	-40.154	SFRAME16
45	3935555.856	312692.055	-40.161	SFRAME19
46	3935555.995	312692.089	-40.179	SFRAME18
47	3935556.068	312692.115	-40.125	SFRAME17
48	3935555.598	312691.847	-40.134	SFRAME20
49	3935555.49	312691.764	-40.126	SFRAME21
50	3935555.402	312691.707	-40.148	SFRAME22
51	3935555.159	312691.543	-40.193	SFRAME23
52	3935555.025	312691.49	-40.188	SFRAME24
53	3935554.825	312691.373	-40.202	SFRAME25
54	3935554.726	312691.313	-40.188	SFRAME26
55	3935554.586	312691.248	-40.173	SFRAME27
56	3935554.409	312691.111	-40.143	SFRAME28
57	3935554.268	312691.039	-40.15	SFRAME29
58	3935554.141	312690.977	-40.209	SFRAME30
59	3935553.993	312690.833	-40.106	SFRAME31
60	3935553.883	312690.772	-40.18	SFRAME32
61	3935553.747	312690.716	-40.144	SFRAME33
62	3935553.644	312690.66	-40.124	SFRAME34
63	3935553.437	312690.528	-40.164	SFRAME35
64	3935553.263	312690.439	-40.187	SFRAME36
65	3935553.117	312690.322	-40.004	SFRAME37
66	3935553.021	312690.277	-40.129	SFRAME38
67	3935552.9	312690.172	-40.09	SFRAME39
68	3935552.688	312690.057	-39.967	SFRAME40
69	3935552.577	312690.013	-40.061	SFRAME41
70	3935552.415	312689.95	-39.984	SFRAME42
71	3935552.009	312689.703	-39.829	SFRAME43
72	3935552.029	312689.604	-40.16	SFRAME44
73	3935551.828	312689.64	-39.813	SFRAME45
74	3935551.791	312689.459	-40.192	SFRAME46
75	3935551.679	312689.421	-40.193	SFRAME47
76	3935551.559	312689.347	-40.202	SFRAME48
77	3935551.515	312689.131	-39.853	SFRAME49
78	3935551.371	312689.211	-40.082	SFRAME50
79	3935551.31	312689.126	-40.178	SFRAME51

80	3935551.254	312689.147	-40.166	SFRAME52
81	3935551.26	312689.086	-40.249	SFRAME53
82	3935551.153	312689.102	-40.266	SFRAME54
83	3935551.023	312689.077	-40.26	SFRAME55
84	3935550.885	312688.972	-40.256	SFRAME56
85	3935550.821	312688.823	-40.276	SFRAME57
86	3935552.026	312688.646	-40.176	PIPE
88	3935562.817	312693.518	-40.417	PFRAME1
89	3935562.828	312693.566	-40.398	PFRAME1
90	3935562.465	312693.046	-40.327	MPFRAME1
91	3935562.303	312692.882	-40.331	PFRAME2
92	3935562.241	312692.798	-40.383	PFRAME3
93	3935562.193	312692.632	-40.328	PFRAME5
94	3935562.068	312692.414	-40.341	PFRAME6
95	3935561.956	312692.272	-40.338	PFRAME7
96	3935561.874	312692.208	-40.321	PFRAME8
97	3935561.682	312691.872	-40.324	PFRAME9
98	3935561.439	312691.609	-40.269	MPFRAME2
99	3935561.325	312691.435	-40.378	MPFRAME3
100	3935561.2	312691.371	-40.368	PFRAME14
101	3935561.054	312691.161	-40.299	PFRAME12
102	3935560.938	312691.091	-40.395	MPFRAME4
103	3935560.645	312690.791	-40.283	PFRAME13
104	3935560.501	312690.492	-40.345	PFRAME15
105	3935560.164	312690.246	-40.318	MPFRAME5
106	3935560.07	312690.145	-40.347	PFRAME16
107	3935559.917	312690.002	-40.302	PFRAME17
108	3935559.82	312689.958	-40.272	MPFRAME6
109	3935559.762	312689.891	-40.309	MPFRAME7
110	3935559.657	312689.823	-40.266	PFRAME18
111	3935559.422	312689.58	-40.292	PFRAME19
112	3935559.312	312689.525	-40.295	PFRAME20
113	3935559.014	312689.289	-40.313	PFRAME21
114	3935558.862	312689.206	-40.324	PFRAME22
115	3935558.555	312689.061	-40.362	PFRAME23
116	3935558.453	312688.965	-40.354	PFRAME24
117	3935558.181	312688.638	-40.343	PFRAME25
118	3935558.074	312688.62	-40.368	PFRAME26
119	3935557.817	312688.479	-40.326	PFRAME27
120	3935557.664	312688.322	-40.364	PFRAME28
121	3935557.309	312688.099	-40.372	PFRAME29

122	3935557.159	312688.028	-40.337	PFRAME30
123	3935556.962	312687.918	-40.414	PFRAME31
124	3935556.889	312687.883	-40.419	MPFRAME8
125	3935556.75	312687.78	-40.366	PFRAME32
126	3935556.683	312687.772	-40.375	MPFRAME9
127	3935556.52	312687.675	-40.319	PFRAME33
128	3935556.359	312687.521	-40.321	PFRAME34
129	3935556.313	312687.514	-40.347	MPFRAME10
130	3935556.007	312687.342	-40.375	PFRAME35
131	3935555.863	312687.277	-40.411	PFRAME36
132	3935555.555	312687.094	-40.338	PFRAME37
133	3935555.489	312687.025	-40.36	PFRAME38
134	3935555.141	312686.873	-40.362	PFRAME39
135	3935555.017	312686.785	-40.374	PFRAME40
136	3935554.659	312686.58	-40.38	PFRAME41
137	3935554.552	312686.528	-40.346	PFRAME42
138	3935554.137	312686.297	-40.396	PFRAME43
139	3935553.726	312686.112	-40.327	PFRAME44
140	3935553.592	312686.031	-40.35	PFRAME45
141	3935553.274	312685.901	-40.497	PFRAME46
142	3935553.145	312685.823	-40.375	PFRAME47
143	3935552.836	312685.694	-40.467	PFRAME48
144	3935552.704	312685.629	-40.333	PFRAME49
145	3935552.327	312685.595	-40.395	PFRAME50
146	3935552.189	312685.426	-40.284	PFRAME51
147	3935551.835	312685.378	-40.312	PFRAME52
148	3935551.749	312685.232	-40.177	PFRAME53
149	3935551.344	312685.158	-40.242	PFRAME54
150	3935551.158	312685.163	-40.279	PFRAME55
151	3935550.855	312685.024	-40.247	PFRAME56
152	3935550.657	312685.002	-40.179	PFRAME57
153	3935550.303	312684.946	-40.238	PFRAME58
154	3935550.082	312685.002	-40.355	PFRAME59
155	3935549.711	312684.939	-40.344	PFRAME60
156	3935549.544	312684.926	-40.387	PFRAME61
157	3935549.111	312684.896	-40.372	PFRAME62
158	3935548.946	312684.872	-40.384	PFRAME63
159	3935548.595	312684.74	-40.412	PFRAME64
160	3935548.459	312684.709	-40.295	PFRAME65
161	3935548.11	312684.647	-40.272	PFRAME66
162	3935547.901	312684.626	-40.363	PFRAME67

163	3935547.942	312684.602	-40.299	PFRAME67
164	3935547.563	312684.475	-40.363	PFRAME68
165	3935546.955	312684.245	-40.341	STERNPOST
166	3935542.825	312682.815	-39.964	BASELINE
167	3935563.394	312694.057	-40.498	PHULL
168	3935563.274	312693.887	-40.512	PHULL
169	3935563.173	312693.824	-40.52	PHULL
170	3935563.029	312693.599	-40.518	PHULL
171	3935562.897	312693.415	-40.484	PHULL
172	3935562.647	312693.165	-40.466	PHULL
173	3935562.505	312692.913	-40.447	PHULL
174	3935562.322	312692.666	-40.453	PHULL
175	3935562.182	312692.453	-40.465	PHULL
176	3935561.974	312692.116	-40.464	PHULL
177	3935561.807	312691.923	-40.414	PHULL
178	3935561.657	312691.655	-40.438	PHULL
179	3935561.433	312691.404	-40.437	PHULL
180	3935560.95	312690.899	-40.392	PHULL
181	3935560.644	312690.531	-40.434	PHULL
182	3935560.232	312690.135	-40.444	PHULL
183	3935559.642	312689.657	-40.422	PHULL
184	3935559.248	312689.328	-40.436	PHULL
185	3935558.818	312689.018	-40.441	PHULL
186	3935558.324	312688.667	-40.426	PHULL
187	3935557.988	312688.46	-40.455	PHULL
188	3935557.579	312688.183	-40.463	PHULL
189	3935557.159	312687.917	-40.448	PHULL
190	3935556.674	312687.642	-40.437	PHULL
191	3935556.251	312687.353	-40.425	PHULL
192	3935555.808	312687.123	-40.417	PHULL
193	3935555.342	312686.846	-40.445	PHULL
194	3935554.473	312686.41	-40.444	PHULL
195	3935553.472	312685.956	-40.497	PHULL
196	3935552.898	312685.691	-40.552	PHULL
197	3935552.035	312685.379	-40.576	PHULL
198	3935551.548	312685.242	-40.563	PHULL
199	3935551.085	312685.039	-40.604	PHULL
200	3935550.544	312684.869	-40.551	PHULL
201	3935550.387	312685.018	-40.543	PHULL
202	3935550.401	312684.992	-40.581	PHULL
203	3935550.121	312685.049	-40.591	PHULL

204	3935549.885	312684.992	-40.575	PHULL
205	3935549.383	312684.881	-40.542	PHULL
206	3935548.832	312684.762	-40.55	PHULL
207	3935548.533	312684.707	-40.501	PHULL
208	3935548.039	312684.442	-40.594	PHULL
209	3935547.834	312684.498	-40.617	PHULL
210	3935547.523	312684.392	-40.691	PHULL
211	3935547.279	312684.247	-40.644	PHULL
212	3935546.97	312684.092	-40.587	PHULL
213	3935546.817	312684.35	-40.556	SHULL
214	3935547.077	312684.516	-40.599	SHULL
215	3935547.03	312684.618	-40.531	SHULL
216	3935547.094	312684.939	-40.544	SHULL
217	3935547.317	312685.274	-40.463	SHULL
218	3935547.934	312685.725	-40.465	SHULL
219	3935548.431	312686.406	-40.362	SHULL
220	3935548.449	312686.186	-40.35	MSFRAME3
221	3935548.336	312686.107	-40.265	MSFRAME4
222	3935548.224	312686.049	-40.272	MSFRAME5
223	3935563.33	312694.065	-40.518	SHULL
224	3935563.119	312694.018	-40.503	SHULL
225	3935562.953	312693.988	-40.499	SHULL
226	3935562.779	312693.978	-40.438	SHULL
227	3935562.441	312693.935	-40.375	SHULL
228	3935562.223	312693.946	-40.399	SHULL
229	3935561.817	312693.845	-40.338	SHULL
230	3935561.497	312693.826	-40.291	SHULL
231	3935561.199	312693.851	-40.248	SHULL
232	3935561.012	312693.856	-40.255	SHULL
233	3935560.402	312693.833	-40.206	SHULL
234	3935560.133	312693.748	-40.254	SHULL
235	3935565.772	312695.684	-39.931	BASELINE082820
236	3935561.796	312695.282	-40.085	SEAWALLFRAMEUW
237	3935561.414	312696.138	-40.099	SEAWALLFRAMEUW
238	3935560.93	312695.039	-39.957	SEAWALLFRAMEUW
239	3935560.06	312694.753	-39.886	SEAWALLFRAMEUW
240	3935559.159	312694.484	-39.808	SEAWALLFRAMEUW
241	3935558.29	312694.197	-40.022	SEAWALLFRAMEUW
242	3935557.427	312693.947	-40.008	SEAWALLFRAMEUW
243	3935556.553	312693.684	-40.015	SEAWALLFRAMEUW
244	3935555.67	312693.419	-40.06	SEAWALLFRAMEUW

245	3935554.821	312693.107	-40.005	SEAWALLFRAMEUW
246	3935553.918	312692.866	-40.013	SEAWALLFRAMEUW
247	3935553.049	312692.578	-39.773	SEAWALLFRAMEUW
248	3935552.757	312692.518	-40.262	CAULKING
249	3935552.13	312692.325	-40.041	SEAWALLFRAMEUW
250	3935551.273	312692.041	-39.94	SEAWALLFRAMEUW
251	3935551.218	312692.063	-39.952	SEAWALLFRAMEUW
252	3935550.409	312691.804	-40.057	SEAWALLFRAMEUW
253	3935549.492	312691.549	-40.157	SEAWALLFRAMEUW
254	3935546.85	312690.722	-40.323	SEAWALLFRAMEUW
255	3935544.824	312691.254	-40.351	SEAWALLFRAMEUW
256	3935548.941	312692.789	-40.25	SEAWALLFRAMEUW
257	3935552.584	312693.406	-40.112	SEAWALLFRAMEUW
258	3935617.546	312696.555	-38.701	SEAWALLHISTLAND
259	3935618.395	312695.501	-38.729	SEAWALLHISTLAND
260	3935667.859	312650.08	-38.342	SEAWALL
261	3935677.013	312641.042	-38.335	SEAWALL
262	3935678.424	312639.356	-38.35	SEAWALL
263	3935695.267	312614.002	-38.512	SEAWALL
264	3935551.923	312692.914	-40.109	SEAWALLLONGUW
265	3935554.613	312693.826	-40.054	SEAWALLLONGUW
266	3935556.119	312694.211	-39.999	SEAWALLLONGUW
267	3935557.848	312694.873	-40.025	SEAWALLLONGUW
268	3935559.339	312695.497	-40.051	SEAWALLLONGUW
269	3935559.706	312695.658	-40.111	SEAWALLLONGUW
270	3935557.907	312696.063	-40.132	SEAWALLLONGUW
271	3935558.814	312696.372	-40.216	SEAWALLLONGUW
272	3935556.722	312695.688	-40.122	SEAWALLLONGUW
273	3935555.139	312695.166	-40.027	SEAWALLLONGUW
274	3935554.834	312695.07	-40.107	SEAWALLLONGUW
275	3935559.697	312695.718	-39.927	SEAWALLTRANSUW
276	3935558.751	312698.187	-40.04	SEAWALLTRANSUW
277	3935560.605	312698.528	-40.048	SEAWALLTRANSUW
278	3935560.123	312699.786	-40.162	SEAWALLTRANSUW
279	3935561.286	312699.563	-40.129	SEAWALLTRANSUW
280	3935561.606	312698.383	-40.044	SEAWALLTRANSUW
281	3935561.687	312699.341	-39.994	SEAWALLTRANSUW
282	3935561.298	312700.312	-40.157	SEAWALLTRANSUW
283	3935562.824	312697.615	-39.987	SEAWALLTRANSUW
284	3935562.093	312699.847	-40.184	SEAWALLTRANSUW
285	3935564.067	312696.169	-40.118	SEAWALLTRANSUW

286	3935562.746	312699.827	-40.164	SEAWALLTRANSUW
287	3935564.895	312696.1	-40.13	SEAWALLPLANKUW
288	3935564.135	312698.219	-40.303	SEAWALLPLANKUW
289	3935560.993	312698.905	-40.202	BRICK
290	3935556.544	312695.44	-40.195	BALLAST
291	3935550.997	312692.874	-40.265	SEAWALLFASTENER
292	3935547.417	312684.331	-40.411	SHEATHINGNAIL
293	3935549.605	312686.619	-40.315	BALLAST
294	3935549.344	312687.566	-40.358	COAL
295	3935548.959	312685.844	-40.452	WASHER
296	3935549.153	312685.61	-40.402	FASTENER
297	3935550.426	312686.611	-40.326	IRONBAR
298	3935552.815	312689.7	-40.33	IRONPRONG
299	3935548.189	312685.373	-40.459	GLASS
300	3935552.638	312689.47	-40.243	FASTENER
301	3935553.134	312689.578	-40.251	FASTENER
302	3935554.061	312689.912	-40.365	BOTTLENECK
303	3935557.095	312691.421	-40.328	COKEBOTTLE
304	3935558.874	312691.247	-40.208	BOTTLENECK
305	3935547.969	312685.875	-40.448	UIDCUPREOUSMETAL
306	3935558.996	312689.107	-40.402	BRUSH
307	3935547.079	312685.337	-40.548	LEAD
308	3935548.838	312686.157	-40.409	BRICK
309	3935551.621	312688.929	-40.361	CLAY
310	3935550.032	312684.486	-40.624	BRICK
311	3935562.565	312693.534	-40.465	FASTENER
312	3935561.055	312691.283	-40.393	FASTENER
313	3935543.394	312695.668	-40.107	SEAWALLFRAMEUW
314	3935543.506	312695.672	-40.269	SEAWALLTRANSUW
315	3935545.946	312696.436	-40.377	SEAWALLTRANSUW
316	3935546.077	312696.301	-40.224	SEAWALLFRAMEUW
317	3935545.073	312698.91	-40.278	SEAWALLTRANSUW
318	3935543.609	312698.574	-40.142	SEAWALLTRANSUW
319	3935543.968	312697.415	-40.299	SEAWALLTRANSUW
320	3935544.774	312697.576	-40.368	SEAWALLTRANSUW
321	3935544.041	312696.655	-40.317	IRONSTRAP
322	3935543.515	312698.556	-40.109	SEAWALLTRANSUW
323	3935545.371	312699.004	-40.344	SEAWALLTRANSUW
324	3935543.458	312698.924	-40.27	SEAWALLTRANSUW
325	3935544.871	312699.746	-40.272	SEAWALLTRANSUW
326	3935543.352	312698.672	-40.187	SEAWALLLONGUW

327	3935542.578	312701.105	-40.402	SEAWALLLONGUW
328	3935542.51	312695.592	-40.169	SEAWALLFRAMEUW
329	3935555.124	312696.188	-40.088	SEAWALLLONGUW
330	3935555.508	312696.231	-39.969	SEAWALLLONGUW
331	3935557.231	312696.852	-40.054	SEAWALLLONGUW
332	3935559.689	312697.557	-40.124	SEAWALLLONGUW
333	3935560.334	312697.783	-40.053	SEAWALLLONGUW
334	3935561.738	312698.176	-40.059	SEAWALLLONGUW
335	3935563.447	312698.71	-40.204	SEAWALLLONGUW
336	3935560.27	312691.202	-40.294	TRANSBEAM
337	3935560.364	312690.89	-40.275	TRANSBEAM
338	3935558.695	312693.195	-40.137	TRANSBEAM
339	3935559.077	312692.792	-40.177	TRANSBEAM
340	3935559.302	312689.021	-40.214	LONGBEAM
341	3935559.335	312688.827	-40.227	LONGBEAM
342	3935553.102	312688.4	-40.08	LONGBEAM
343	3935553.612	312688.528	-40.111	LONGBEAM
344	3935550.831	312686.896	-40.073	MACHINEBOLT
345	3935550.921	312687.022	-40.051	MACHINEBOLT
346	3935550.853	312687.068	-40.052	MACHINEBOLT
347	3935549.087	312685.961	-40.334	MACHINE
348	3935548.984	312686.062	-40.337	MACHINE
349	3935548.521	312685.789	-40.344	MACHINE
350	3935548.611	312685.637	-40.31	MACHINE
351	3935548.462	312685.673	-40.254	MACHINE2
352	3935548.733	312685.517	-40.302	MACHINE2
353	3935548.875	312685.271	-40.33	MACHINE2
354	3935548.864	312684.985	-40.31	MACHINE2
355	3935552.05	312688.673	-40.229	COPPERPIPE
356	3935562.776	312693.396	-40.1	PCEILINGPLANKING
357	3935562.493	312693.176	-40.183	PCEILINGPLANKING
358	3935562.301	312693.01	-40.258	PCEILINGPLANKING
359	3935562.171	312692.876	-40.275	PCEILINGPLANKING
360	3935562.089	312692.802	-40.311	PCEILINGPLANKING
361	3935561.99	312692.526	-40.253	PCEILINGPLANKING
362	3935561.882	312692.426	-40.28	PCEILINGPLANKING
363	3935561.783	312692.314	-40.315	PCEILINGPLANKING
364	3935561.682	312692.073	-40.306	PCEILINGPLANKING
365	3935561.605	312691.908	-40.247	PCEILINGPLANKING
366	3935561.46	312691.795	-40.261	PCEILINGPLANKING
367	3935561.259	312691.634	-40.304	PCEILINGPLANKING

368	3935561.162	312691.495	-40.315	PCEILINGPLANKING
369	3935561.007	312691.383	-40.305	PCEILINGPLANKING
370	3935560.816	312691.157	-40.267	PCEILINGPLANKING
371	3935560.65	312690.965	-40.239	PCEILINGPLANKING
372	3935560.553	312690.652	-40.104	PCEILINGPLANKING
373	3935560.318	312690.488	-40.152	PCEILINGPLANKING
374	3935560.126	312690.332	-40.184	PCEILINGPLANKING
375	3935559.907	312690.156	-40.225	PCEILINGPLANKING
376	3935559.697	312690	-40.233	PCEILINGPLANKING
377	3935559.509	312689.875	-40.252	PCEILINGPLANKING
378	3935559.291	312689.679	-40.282	PCEILINGPLANKING
379	3935559.026	312689.489	-40.31	PCEILINGPLANKING
380	3935558.67	312689.249	-40.348	PCEILINGPLANKING
381	3935558.423	312689.049	-40.395	PCEILINGPLANKING
382	3935557.571	312688.597	-40.323	PCEILINGPLANKING
383	3935557.345	312688.496	-40.339	PCEILINGPLANKING
384	3935557.025	312688.282	-40.359	PCEILINGPLANKING
385	3935556.843	312688.2	-40.342	PCEILINGPLANKING
386	3935556.689	312688.104	-40.346	PCEILINGPLANKING
387	3935556.483	312688.018	-40.33	PCEILINGPLANKING
388	3935556.248	312687.917	-40.307	PCEILINGPLANKING
389	3935555.979	312687.756	-40.333	PCEILINGPLANKING
390	3935555.857	312687.353	-40.407	PCEILINGPLANKING
391	3935555.738	312687.264	-40.4	PCEILINGPLANKING
392	3935555.437	312687.119	-40.413	PCEILINGPLANKING
393	3935555.287	312687.027	-40.409	PCEILINGPLANKING
394	3935555.158	312687.018	-40.403	PCEILINGPLANKING
395	3935554.943	312686.89	-40.411	PCEILINGPLANKING
396	3935554.749	312686.778	-40.412	PCEILINGPLANKING
397	3935554.388	312686.607	-40.402	PCEILINGPLANKING
398	3935554.236	312686.534	-40.372	PCEILINGPLANKING
399	3935554.057	312686.437	-40.36	PCEILINGPLANKING
400	3935553.85	312686.329	-40.337	PCEILINGPLANKING
401	3935553.337	312686.044	-40.247	PCEILINGPLANKING
402	3935552.996	312685.862	-40.25	PCEILINGPLANKING
403	3935552.746	312685.774	-40.243	PCEILINGPLANKING
404	3935552.494	312685.664	-40.21	PCEILINGPLANKING
405	3935552.267	312685.551	-40.203	PCEILINGPLANKING
406	3935551.732	312685.509	-40.284	PCEILINGPLANKING
407	3935551.44	312685.345	-40.196	PCEILINGPLANKING
408	3935550.841	312685.301	-40.326	PCEILINGPLANKING

409	3935550.495	312685.181	-40.279	PCEILINGPLANKING
410	3935550.325	312685.154	-40.283	PCEILINGPLANKING
411	3935549.875	312685.157	-40.388	PCEILINGPLANKING
412	3935549.24	312685.122	-40.433	PCEILINGPLANKING
413	3935548.968	312685.032	-40.416	PCEILINGPLANKING
414	3935548.644	312684.978	-40.309	PCEILINGPLANKING
415	3935561.98	312693.715	-40.129	SCEILINGPLANKING
416	3935561.824	312693.681	-40.167	SCEILINGPLANKING
417	3935561.628	312693.629	-40.219	SCEILINGPLANKING
418	3935561.493	312693.562	-40.259	SCEILINGPLANKING
419	3935561.371	312693.518	-40.298	SCEILINGPLANKING
420	3935557.274	312692.726	-40.158	SCEILINGPLANKING
421	3935556.927	312692.528	-40.174	SCEILINGPLANKING
422	3935556.738	312692.396	-40.183	SCEILINGPLANKING
423	3935555.998	312691.984	-40.171	SCEILINGPLANKING
424	3935555.778	312691.869	-40.176	SCEILINGPLANKING
425	3935555.441	312691.642	-40.167	SCEILINGPLANKING
426	3935555.438	312691.649	-40.169	SCEILINGPLANKING
427	3935555.177	312691.481	-40.175	SCEILINGPLANKING
428	3935555.033	312691.402	-40.183	SCEILINGPLANKING
429	3935554.783	312691.24	-40.198	SCEILINGPLANKING
430	3935554.568	312691.117	-40.198	SCEILINGPLANKING
431	3935554.331	312690.944	-40.223	SCEILINGPLANKING
432	3935554.171	312690.849	-40.231	SCEILINGPLANKING
433	3935553.952	312690.709	-40.211	SCEILINGPLANKING
434	3935553.661	312690.561	-40.218	SCEILINGPLANKING
435	3935553.417	312690.361	-40.198	SCEILINGPLANKING
436	3935553.271	312690.295	-40.223	SCEILINGPLANKING
437	3935553.051	312690.015	-40.155	SCEILINGPLANKING
438	3935552.751	312689.924	-40.115	SCEILINGPLANKING
439	3935552.495	312689.731	-40.134	SCEILINGPLANKING
440	3935552.297	312689.642	-40.126	SCEILINGPLANKING
441	3935551.972	312689.429	-40.14	SCEILINGPLANKING
442	3935551.74	312689.27	-40.206	SCEILINGPLANKING
443	3935551.264	312688.984	-40.252	SCEILINGPLANKING
444	3935551.076	312688.83	-40.256	SCEILINGPLANKING
445	3935550.887	312688.696	-40.292	SCEILINGPLANKING

Appendix C. Copper Wreck Site Scantling List

Timber		Sided (cm)	Molded (cm)	Notes
Type	ID			
Starboard Cant Frame	1	14	12	
Starboard Ceiling Plank	1	-	-	Buried/Missing
Starboard Hull Plank	1	9	4	Partially Buried
Starboard Frame	1	14	12	
Starboard Ceiling Plank	1	-	3	Partially Buried
Starboard Hull Plank	1	9	4	Partially Buried
Starboard Frame	2	12	12	
Starboard Ceiling Plank	2	14	4	Broken/Incomplete
Starboard Hull Plank	2	-	3	Partially Buried
Starboard Frame	3	12	12	
Starboard Ceiling Plank	3	-	4	Partially Buried
Starboard Hull Plank	3	-	3	Partially Buried
Starboard Frame	4	13	13	
Starboard Ceiling Plank	4	16	3	
Starboard Hull Plank	4	15	3	
Starboard Frame	5	11	12	
Starboard Ceiling Plank	5	17	4	
Starboard Hull Plank	5	-	-	Buried
Starboard Frame	6	14	12	
Starboard Ceiling Plank	6	19	4	
Starboard Hull Plank	6	6	2	Broken/Incomplete
Starboard Frame	7	14	12	
Starboard Ceiling Plank	7	-	-	Buried
Starboard Hull Plank	7	14	3	
Starboard Frame	8	-	-	Buried
Starboard Ceiling Plank	8	16	3	
Starboard Hull Plank	8	-	-	Buried/Missing
Starboard Frame	9	-	-	Buried
Starboard Ceiling Plank	9	-	-	Buried/Missing
Starboard Hull Plank	9	-	-	Buried/Missing
Starboard Frame	10	5	5	Broken/Incomplete
Starboard Ceiling Plank	10	-	-	Buried/Missing
Starboard Hull Plank	10	17	3	
Starboard Frame	11	10	7	
Starboard Ceiling Plank	11	-	-	Buried/Missing
Starboard Hull Plank	11	15	4	
Starboard Frame	12	9	7	
Starboard Ceiling Plank	12	-	-	Buried/Missing
Starboard Hull Plank	12	-	-	Buried/Missing
Starboard Frame	13	7	8	

Starboard Ceiling Plank	13	-	-	Buried/Missing
Starboard Hull Plank	13	5	3	Broken/Incomplete
Starboard Frame	14	8	7	
Starboard Ceiling Plank	14	-	-	Buried/Missing
Starboard Hull Plank	14	5	3	Broken/Incomplete
Starboard Frame	15	5.5	5	Broken/Incomplete
Starboard Ceiling Plank	15	-	-	Buried/Missing
Starboard Hull Plank	15	7.5	3	Broken/Incomplete
Starboard Frame	16	-	-	Buried/Missing
Starboard Ceiling Plank	16	-	-	Buried/Missing
Starboard Hull Plank	16	9	3	
Starboard Frame	17	-	-	Buried/Missing
Starboard Ceiling Plank	17	-	-	Buried/Missing
Starboard Hull Plank	17	-	-	Buried/Missing
Starboard Frame	18	2	1	Broken/Incomplete
Starboard Ceiling Plank	18	-	-	Buried/Missing
Starboard Hull Plank	18	7	3	Broken/Incomplete
Starboard Frame	19	1	3	Broken/Incomplete
Starboard Ceiling Plank	19	4	2	Broken/Incomplete
Starboard Hull Plank	19	6	3	Broken/Incomplete
Starboard Frame	20	4	4	Broken/Incomplete
Starboard Ceiling Plank	20	3	3	Broken/Incomplete
Starboard Hull Plank	20	6	2	Broken/Incomplete
Starboard Frame	21	11	10	
Starboard Ceiling Plank	21	3	2	Broken/Incomplete
Starboard Hull Plank	21	4	2	Broken/Incomplete
Starboard Frame	22	12	11	
Starboard Ceiling Plank	22	3	2	Broken/Incomplete
Starboard Hull Plank	22	4	2	Broken/Incomplete
Starboard Frame	23	9	13	
Starboard Ceiling Plank	23	6	2	Broken/Incomplete
Starboard Hull Plank	23	1	2	Broken/Incomplete
Starboard Frame	24	11	14	
Starboard Ceiling Plank	24	5	1	Broken/Incomplete
Starboard Hull Plank	24	3.5	1.5	Broken/Incomplete
Starboard Frame	25	10	14	
Starboard Ceiling Plank	25	4	1.5	Broken/Incomplete
Starboard Hull Plank	25	5	2	Broken/Incomplete
Starboard Frame	26	6	11	
Starboard Ceiling Plank	26	4	2	Broken/Incomplete
Starboard Hull Plank	26	4	2	Broken/Incomplete
Starboard Frame	27	7	9	
Starboard Ceiling Plank	27	4	2.5	Broken/Incomplete
Starboard Hull Plank	27	4	2	Broken/Incomplete

Starboard Frame	28	10	11	
Starboard Ceiling Plank	28	4	3	Broken/Incomplete
Starboard Hull Plank	28	3	2	Broken/Incomplete
Starboard Frame	29	8	12	
Starboard Ceiling Plank	29	-	2	Broken/Incomplete
Starboard Hull Plank	29	2	3	Broken/Incomplete
Starboard Frame	30	6	7	Broken/Incomplete
Starboard Ceiling Plank	30	-	2.7	Partially Buried
Starboard Hull Plank	30	-	4	Partially Buried
Starboard Frame	31	8	10	
Starboard Ceiling Plank	31	-	3.5	Partially Buried
Starboard Hull Plank	31	-	6	Partially Buried
Starboard Frame	32	7	8	Broken/Incomplete
Starboard Ceiling Plank	32	-	3.5	Partially Buried
Starboard Hull Plank	32	-	6	Partially Buried
Starboard Frame	33	6	7	Broken/Incomplete
Starboard Ceiling Plank	33	11	3	
Starboard Hull Plank	33	-	5	Partially Buried
Starboard Frame	34	7.5	11	
Starboard Ceiling Plank	34	11	3	
Starboard Hull Plank	34	-	5	Partially Buried
Starboard Frame	35	4	6.5	Broken/Incomplete
Starboard Ceiling Plank	35	-	3	Partially Buried
Starboard Hull Plank	35	-	4	Partially Buried
Starboard Frame	36	5	4	Broken/Incomplete
Starboard Ceiling Plank	36	9	3	
Starboard Hull Plank	36	9	5	
Starboard Frame	37	9	11	
Starboard Ceiling Plank	37	8.5	4	
Starboard Hull Plank	37	10	3.5	
Starboard Frame	38	3.5	10	Broken/Incomplete
Starboard Ceiling Plank	38	8.5	4	
Starboard Hull Plank	38	10	3.5	
Starboard Frame	39	8	11	
Starboard Ceiling Plank	39	13	3	
Starboard Hull Plank	39	-	-	Buried/Missing
Starboard Frame	40	7	10	
Starboard Ceiling Plank	40	12	4	
Starboard Hull Plank	40	-	-	Buried/Missing
Starboard Frame	41	6.5	7	Broken/Incomplete
Starboard Ceiling Plank	41	12	4	
Starboard Hull Plank	41	-	-	Buried/Missing
Starboard Frame	42	8	9	
Starboard Ceiling Plank	42	12	2	

Starboard Hull Plank	42	-	-	Buried/Missing
Starboard Frame	43	11	10	
Starboard Ceiling Plank	43	15	1	
Starboard Hull Plank	43	-	4	Partially Buried
Starboard Frame	44	9	11	
Starboard Ceiling Plank	44	15	1	
Starboard Hull Plank	44	-	4	Partially Buried
Starboard Frame	45	10	9	
Starboard Ceiling Plank	45	9	4	
Starboard Hull Plank	45	-	5	Partially Buried
Starboard Frame	46	15	3	Broken/Incomplete
Starboard Ceiling Plank	46	18	3	
Starboard Hull Plank	46	-	5	Partially Buried
Starboard Frame	47	13	11	
Starboard Ceiling Plank	47	9	4	
Starboard Hull Plank	47	-	5	Partially Buried
Starboard Frame	48	11	7	
Starboard Ceiling Plank	48	-	3	Partially Buried
Starboard Hull Plank	48	-	5	Partially Buried
Starboard Frame	49	10	13	
Starboard Ceiling Plank	49	-	4	Partially Buried
Starboard Hull Plank	49	-	5	Partially Buried
Starboard Frame	50	13	10	
Starboard Ceiling Plank	50	-	5	Partially Buried
Starboard Hull Plank	50	-	5	Partially Buried
Starboard Frame	52	10	11	
Starboard Ceiling Plank	52	-	4	Partially Buried
Starboard Hull Plank	52	-	5	Partially Buried
Starboard Frame	55	9	8	
Starboard Ceiling Plank	55	-	4	Partially Buried
Starboard Hull Plank	55	20	5	
Starboard Frame	56	10	5	
Starboard Ceiling Plank	56	19	6	
Starboard Hull Plank	56	21	6	
Starboard Frame	57	10	9	
Starboard Ceiling Plank	57	-	-	Buried/Missing
Starboard Hull Plank	57	21	4	
Starboard Frame	58	12	9	
Starboard Ceiling Plank	58	-	-	Buried/Missing
Starboard Hull Plank	58	21	4	
Port Cant Frame	1	14	12	
Port Ceiling Plank	1	-	-	Buried/Missing
Port Hull Plank	1	-	3	Partially Buried
Port Frame	1	14	12	

Port Ceiling Plank	1	-	4	Partially Buried
Port Hull Plank	1	-	4	Partially Buried
Port Frame	2	12	10	
Port Ceiling Plank	2	-	4	Partially Buried
Port Hull Plank	2	-	3	Partially Buried
Port Frame	3	12	11	
Port Ceiling Plank	3	-	4	
Port Hull Plank	3	-	3	
Port Frame	4	-	-	Buried/Missing
Port Ceiling Plank	4	-	-	Buried/Missing
Port Hull Plank	4	-	-	Buried/Missing
Port Frame	5	13	12	
Port Ceiling Plank	5	-	3	Partially Buried
Port Hull Plank	5	-	3	Partially Buried
Port Frame	6	12	13	
Port Ceiling Plank	6	4	2	Broken/Incomplete
Port Hull Plank	6	8	3	
Port Frame	7	8	12	
Port Ceiling Plank	7	4	2	Broken/Incomplete
Port Hull Plank	7	8	3	
Port Frame	8	10	12	
Port Ceiling Plank	8	5	3	Broken/Incomplete
Port Hull Plank	8	5	3	Broken/Incomplete
Port Frame	9	12	7	Broken/Incomplete
Port Ceiling Plank	9	21	2	
Port Hull Plank	9	7	2	Broken/Incomplete
Port Frame	11	6	10	Broken/Incomplete
Port Ceiling Plank	11	9	3	
Port Hull Plank	11	5	2	Broken/Incomplete
Port Frame	12	7	14	Broken/Incomplete
Port Ceiling Plank	12	9	2	
Port Hull Plank	12	6	3	Broken/Incomplete
Port Frame	13	6	10	Broken/Incomplete
Port Ceiling Plank	13	6	4	Broken/Incomplete
Port Hull Plank	13	2	2	Broken/Incomplete
Port Frame	14	3	5	Broken/Incomplete
Port Ceiling Plank	14	6	3	Broken/Incomplete
Port Hull Plank	14	8	2	Broken/Incomplete
Port Frame	15	8	8	Broken/Incomplete
Port Ceiling Plank	15	6	5	Broken/Incomplete
Port Hull Plank	15	20	2	
Port Frame	16	10	8	
Port Ceiling Plank	16	16	3	
Port Hull Plank	16	17	2	

Port Frame	17	8	13	
Port Ceiling Plank	17	14	3	
Port Hull Plank	17	14	3	
Port Frame	18	11	17	
Port Ceiling Plank	18	14	3	
Port Hull Plank	18	14	2	
Port Frame	19	10	14	
Port Ceiling Plank	19	9	3	
Port Hull Plank	19	10	3	
Port Frame	20	10	10	
Port Ceiling Plank	20	18	3	
Port Hull Plank	20	9	3	
Port Frame	21	11	10	
Port Ceiling Plank	21	12	2	
Port Hull Plank	21	10	4	
Port Frame	22	12	19	
Port Ceiling Plank	22	3	-	Broken/Incomplete
Port Hull Plank	22	8	3	Broken/Incomplete
Port Frame	23	11	17	
Port Ceiling Plank	23	3	-	Broken/Incomplete
Port Hull Plank	23	5	3	Broken/Incomplete
Port Frame	24	7	10	
Port Ceiling Plank	24	3	-	Broken/Incomplete
Port Hull Plank	24	5	3	Broken/Incomplete
Port Frame	25	10	11	
Port Ceiling Plank	25	2	-	Broken/Incomplete
Port Hull Plank	25	4	3	Broken/Incomplete
Port Frame	26	8	12	
Port Ceiling Plank	26	2	2	Broken/Incomplete
Port Hull Plank	26	4	3	Broken/Incomplete
Port Frame	27	7	10	
Port Ceiling Plank	27	3	2	Broken/Incomplete
Port Hull Plank	27	4	3	Broken/Incomplete
Port Frame	28	11	14	
Port Ceiling Plank	28	4	1	Broken/Incomplete
Port Hull Plank	28	3	3	Broken/Incomplete
Port Frame	29	17	12	
Port Ceiling Plank	29	1	2	Broken/Incomplete
Port Hull Plank	29	6	3	Broken/Incomplete
Port Frame	30	6	12	
Port Ceiling Plank	30	1	3	Broken/Incomplete
Port Hull Plank	30	6	4	Broken/Incomplete
Port Frame	31	15	12	

Port Ceiling Plank	31	1	3	Broken/Incomplete
Port Hull Plank	31	7	3	Broken/Incomplete
Port Frame	32	10	11	
Port Ceiling Plank	32	3	3	Broken/Incomplete
Port Hull Plank	32	4	6	Broken/Incomplete
Port Frame	33	11	13	
Port Ceiling Plank	33	2	3	Broken/Incomplete
Port Hull Plank	33	6	3	Broken/Incomplete
Port Frame	34	12	11	
Port Ceiling Plank	34	1	2	Broken/Incomplete
Port Hull Plank	34	6	5	Broken/Incomplete
Port Frame	35	9	11	
Port Ceiling Plank	35	3	4	Broken/Incomplete
Port Hull Plank	35	8	3	Broken/Incomplete
Port Frame	36	8	10	
Port Ceiling Plank	36	3	3	Broken/Incomplete
Port Hull Plank	36	8	2	Broken/Incomplete
Port Frame	37	8	10	
Port Ceiling Plank	37	3	4	Broken/Incomplete
Port Hull Plank	37	7	2	Broken/Incomplete
Port Frame	38	10	11	
Port Ceiling Plank	38	2	4	Broken/Incomplete
Port Hull Plank	38	6	1.5	Broken/Incomplete
Port Frame	39	11	7	
Port Ceiling Plank	39	3	4	Broken/Incomplete
Port Hull Plank	39	3	2	Broken/Incomplete
Port Frame	40	5	10	
Port Ceiling Plank	40	-	4	Partially Buried
Port Hull Plank	40	4	-	Partially Buried
Port Frame	41	9	17	
Port Ceiling Plank	41	-	4	Partially Buried
Port Hull Plank	41	4	4	Broken/Incomplete
Port Frame	42	6	14	
Port Ceiling Plank	42	-	5	Partially Buried
Port Hull Plank	42	2	2	Broken/Incomplete
Port Frame	43	31	12	
Port Ceiling Plank	43	3	4	Broken/Incomplete
Port Hull Plank	43	-	-	Buried/Missing
Port Frame	44	10	12	
Port Ceiling Plank	44	12	3	
Port Hull Plank	44	3	2	Broken/Incomplete
Port Frame	45	11	7	
Port Ceiling Plank	45	16	4	
Port Hull Plank	45	3	2	Broken/Incomplete

Port Frame	46	7	12	
Port Ceiling Plank	46	14	4	
Port Hull Plank	46	4	3	Broken/Incomplete
Port Frame	47	15	11	
Port Ceiling Plank	47	21	4	
Port Hull Plank	47	7	2	Broken/Incomplete
Port Frame	48	9	5	
Port Ceiling Plank	48	15	4	
Port Hull Plank	48	10	5	
Port Frame	49	8	8	
Port Ceiling Plank	49	15	4	
Port Hull Plank	49	11	2	
Port Frame	50	9	7	
Port Ceiling Plank	50	10	5	
Port Hull Plank	50	10	2	
Port Frame	51	9	10	
Port Ceiling Plank	51	7	4	Broken/Incomplete
Port Hull Plank	51	13	1	Broken/Incomplete
Port Frame	52	7	8	
Port Ceiling Plank	52	10	4	
Port Hull Plank	52	8	1	Broken/Incomplete
Port Frame	53	7	6	Broken/Incomplete
Port Ceiling Plank	53	15	5	
Port Hull Plank	53	17	5	
Port Frame	54	7	9	
Port Ceiling Plank	54	20	7	
Port Hull Plank	54	23	3	
Port Frame	55	7	8	
Port Ceiling Plank	55	5	3	Broken/Incomplete
Port Hull Plank	55	23	5	
Port Frame	56	8	11	
Port Ceiling Plank	56	11	3	
Port Hull Plank	56	20	3	
Port Frame	57	9	8	
Port Ceiling Plank	57	18	3	
Port Hull Plank	57	16	3	
Port Frame	58	8	10	
Port Ceiling Plank	58	20	3	
Port Hull Plank	58	4	3	Broken/Incomplete
Port Frame	59	9	10	
Port Ceiling Plank	59	8	3	
Port Hull Plank	59	7	2	
Port Frame	60	9	10	
Port Ceiling Plank	60	13	4	

Port Hull Plank	60	6	2	Broken/Incomplete
Port Frame	61	7	10	
Port Ceiling Plank	61	-	-	Buried/Missing
Port Hull Plank	61	3	3	Broken/Incomplete
Port Frame	62	8	14	
Port Ceiling Plank	62	10	3	
Port Hull Plank	62	9	3	
Port Frame	63	10	10	
Port Ceiling Plank	63	10	2	
Port Hull Plank	63	6	3	Broken/Incomplete
Port Frame	64	10	10	
Port Ceiling Plank	64	-	-	Buried/Missing
Port Hull Plank	64	12	2	
Port Frame	65	7	6	Broken/Incomplete
Port Ceiling Plank	65	-	-	Buried/Missing
Port Hull Plank	65	15	4	
Port Frame	66	8	9	
Port Ceiling Plank	66	7	3	Broken/Incomplete
Port Hull Plank	66	9	2	
Port Frame	67	7	9	
Port Ceiling Plank	67	9	3	
Port Hull Plank	67	25	2	
Port Frame	68	7	8	
Port Ceiling Plank	68	13	11	
Port Hull Plank	68	17	3	

Frames	Room (cm)	Space (cm)	Notes
SF2 - SF3	25		
SF3 - SF 4		35	
SF4	12		
SF4 - SF5		25	
SF5 - SF6	22		
SF6 - SF7		22	
SF7 - SF8	25		
SF8 -SF9		23	
SF9 - SF10	28		
SF10 - SF11		18	
SF11 - SF12	30		
SF12 - SF13		361	SF12 and SF13 separated by large gap
SF13	10		
SF13 - SF15		41	

SF15 - SF16	23		
SF16 - SF18		13	
SF18 - SF19	25		
SF19 - SF20		23	
SF20	4		
SF20 - SF21		12	
SF21 - SF22	24		
SF22 - SF23		24	
SF23 - SF24	18		
SF24 - SF25		23	
SF25 - SF26	20		
SF26 - SF28		35	
SF28 - SF29	22		
SF29 - SF31		32	
SF31 - SF32	22		
SF32 - SF33		13	
SF33 - SF34	23		
SF34 - SF35		21	
SF35 - SF36	26		
SF36 - SF37		10	
SF37	12		
SF37 - SF38		11	
SF38 - SF39	24		
SF39 - SF40		21	
SF40 - SF41	21		
SF41 - SF42		10	
SF42	12		
SF42 - SF44		46	
SF44	12		
SF44 - SF46		27	
SF46 - SF47	23		
SF47 - SF48		14	
SF48	12		
SF48 - SF50		17	
SF50 - SF51	11		
SF51 - SF52		9	
SF52 - SF53	14		
SF53 - SF54		17	
SF54 - SF55	20		
SF55 - SF56		23	
SF56 - SF57	21		
PF2/PF3	16		
PF2/PF3 - PF5		7	PF5 is unpaired

PF5 - PF6/PF7		18	
PF6/PF7	22		
PF6/PF7 - PF8		5	PF8 is unpaired
PF8 - PF9		30	PF9 is unpaired
PF9 - PF11		24	PF11 is unpaired
PF11 - PF14		27	PF14 is unpaired
PF14 - PF12		30	
PF12	19		PF12 is a paired frame station
PF12 - PF13		38	
PF13	19		PF13 is a paired frame station
PF13 - PF15		23	PF15 is unpaired
PF15 - PF16		44	PF16 is unpaired
PF16 - PF17/PF18		20	
PF17/PF18	34		
PF17/PF18 - PF19/PF20		26	
PF19/PF20	23		
PF19/PF20 - PF21/PF22		29	
PF21/PF22	25		
PF21/PF22 - PF23/PF24		25	
PF23/PF24	25		
PF23/PF24 - PF25/PF26		28	
PF25/PF26	23		
PF25/PF26 - PF27/PF28		15	
PF27/PF28	30		
PF27/PF28 - PF29/PF30		29	
PF29/PF30	26		
PF29/PF30 - PF31/PF32		13	
PF31/PF32	38		
PF31/PF32 - PF33/PF34		13	
PF33/PF34	37		
PF33/PF34 - PF35/PF36		25	
PF35/PF36	24		
PF35/PF36 - PF37/PF38		25	
PF37/PF38	24		
PF37/PF38 - PF39/PF40		29	
PF39/PF40	22		
PF39/PF40 - PF41/PF42		31	
PF41/PF42	25		
PF41/PF42 - PF43		25	
PF43	31		PF43 is a paired frame station
PF43 - PF44/PF45		23	
PF44/PF45	24		
PF44/PF45 - PF46/PF47		24	

PF46/PF47	20		
PF46/PF47 - PF48/PF49		23	
PF48/PF49	27		
PF48/PF49 - PF50/PF51		28	
PF50/PF51	27		
PF50/PF51 - PF52/PF53		29	
PF52/PF53	27		
PF52/PF53 - PF54/PF55		33	
PF54/PF55	26		
PF54/PF55 - PF56/PF57		30	
PF56/PF57	23		
PF56/PF57 - PF58/PF59		31	
PF58/PF59	27		
PF58/PF59 - PF60/PF61		30	
PF60/PF61	24		
PF60/PF61 - PF62/PF63		32	
PF62/PF63	31		
PF62/PF63 - PF64/PF65		23	
PF64/PF65	25		
PF64/PF65 - PF66/PF67		32	
PF66/PF67	23		
PF66/PF67 - PF68		31	PF68 is the last port frame

Appendix D. Centerboard Wreck Artifact Inventory

Field Specimen #	Material	Object	Description	Measurements (cm)	Location	Northing (m)	Easting (m)	Ellipsoidal Hight (m)	Point #	Approximate Date	Artifact Image
62.20.001	WROUGHT IRON	BOWSPRIT STAY	WROUGHT IRON BOWSPRIT STAY, SOME CONCRETION AND BARNICLES, EYEBOLT AT ONE END, CENTER THROUGH-BOLT IS BROKEN, END THROUGH-BOLT INTACT	LENGTH OF SIDES: 24.5, 22, SPACE BETWEEN ENDS: 15, WIDTH: 1.5-2, EYEBOLT OUTER DIAMETER: 7.5, EYEBOLT INNER DIAMETER: 2.5, CENTER BOLT DIAMETER: 1, 2.5, LENGTH: 7, END BOLT: 10X9X1.5	N/A	N/A	N/A	N/A	N/A	UNKNOWN	
62.20.002	WOOD	WOODEN TACKLE HALF	IRREGULAR SHAPED WOODEN TACKLE, CONCAVE IN CENTER, GRAIN RUNS LONGITUDINALLY	12 X 11 X 7	N/A	N/A	N/A	N/A	N/A	UNKNOWN	
62.20.003	PLASTIC/ ROPE/IRON	IRON BAR WITH DETERGENT BOTTLE	PLASTIC LAUNDRY DETERGENT CONTAINER TIED TO IRON BAR VIA MODERN ROPE	N/A	N/A	N/A	N/A	N/A	N/A	20TH CENTURY	
62.20.004	WROUGHT IRON/ WOOD	BENT IRON BAR	BENT IRON BAR WITH SMALL EYEBOLT ON ONE END, EXPOSED CONCRETED WOOD ON OTHER END	LENGTH: 33, 24, WIDTH: 5, THICKNESS: 0.5, CURVE AT BASE: 6, CURVE AT ENDS 13, EYEBOLT DIAMETER: 2	N/A	N/A	N/A	N/A	N/A	UNKNOWN	
62.20.005	WROUGHT IRON	IRON CYLANDER (HEAVY)	DENCE WROUGHT IRON CLANDER, CONCRETION AT THE INTERSECTION OF NECK AND LONGITUDINAL BASE	OVERALL LENGTH: 45, 44, WIDTH: 6,5, CONCRETION: 11X9X2	N/A	N/A	N/A	N/A	N/A	UNKNOWN	
62.20.006	WROUGHT IRON	IRON PULLEY	WROUGHT IRON PULLEY WITH IRON BOLT CONCRETED THROUGH AT ONE END	OVERALL LENGTH: 22, OVERALL WIDTH: 5-14 BOLT: 9X2X2.5, SIDE WIDTH: 2	N/A	N/A	N/A	N/A	N/A	UNKNOWN	

62.20.007	WROUGHT IRON	IRON RING	IRON RING WITH A CONCRETION AND OPPOSITE IT, A DENT	OUTER DIAMETER:14, INNER DIAMETER: 10, OVERALL WIDTH: 2, CONCRETION: 4X3, DENT WIDTH: 1.5	N/A	N/A	N/A	N/A	N/A	UNKNOWN	
62.20.008	WROUGHT IRON/ WOOD	PULLEY WITH WOOD	ERODED PULLEY CONCRETED TO FLAT PIECE OF WOOD, SMALL HOLE AT TIP OF PULLEY, VISIBLE CONCRETED THROUGH-BOLT	OVERALL DIMENTIONS: 22X23X8, PULLEY WIDTH AT END: 6, PULLEY WIDTH AT DIP: 8, PULLEY WIDTH AT THICKEST PART: 15, WOOD PIECE: 6X6	N/A	N/A	N/A	N/A	N/A	UNKNOWN	
62.20.009	IRON	OYSTER DREDGE RAKE	IRON OYSTER RAKE, 20 IRREGULAR SHAPED TEETH	TOTAL: 144X12, TEETH 4-6, SPACE BETWEEN TEETH: 5	N/A	N/A	N/A	N/A	N/A	UNKNOWN	
62.20.010	CLAY	BRICK	RED BRICK, DISCOLORATION DUE TO SILT	20.5X9.5	N/A	N/A	N/A	N/A	N/A	UNKNOWN	
62.20.011	WROUGHT IRON	CIRCULAR GEAR	HEAVILY WORN WITH SMALL GROOVES OR TEETH AROUND THE OUTER EDGE	OUTER DIAMETER: 14, INNER DIAMETER: 5, GEAR GROOVES: 2	N/A	N/A	N/A	N/A	N/A	UNKNOWN	
62.20.012	WROUGNT IRON	MOTOR	IRREGULAR SHAPED METAL MECHANISM, HEAVILY CONCRETED, VISIBLE THROUGH-BOLT DOWN CENTER	8X8, INNER BOLT DIAMETER: 2, CONCRETED SIDE: 6X3, OTHER SIDE: 5X2	N/A	N/A	N/A	N/A	N/A	UNKNOWN	

62.20.013	WROUGHT IRON/WOOD	IRON BARS WITH EYES	IRON BAR, SLIGHTLY CURVED WITH TWO EYEBOLTS AT EITHER END, POSSIBLE WOOD CONCRETED TO IT, WOOD PIECE JUTTS OUT AT ONE END CREATING A Y-SHAPE	45X3, EYEBOLT SIDE WITHOUT WOOD PIECE OUTER DIAMETER: 4, INNER: 2.5, EYEBOLT SIDE WITH WOOD DIAMETER: 6, INNER: 2.5, WOOD PIECE: 6X3	N/A	N/A	N/A	N/A	N/A	UNKNOWN	
62.20.014	WOOD	TONGUE AND GROOVE WOOD PIECE	IRREGULAR SHAPPED WOOD FRAGMENT, TOUNGE AND GROOVES RUN LONGITUDINALLY WITH THE GRAIN	LENGTH: 12, SHORT SIDE: 6, LONGER SIDE: 8.5, STEPPED SIDE: 6, 5	N/A	N/A	N/A	N/A	N/A	UNKNOWN	
62.20.015	WROUGHT IRON	IRON RIGGING BARS	WROUGHT IRON EYEBOLT, CONCRETED U-SHAPED SHACKLE, WOOD PIECE WEDGED BETWEEN EYEBOLT ROD AND SHACKLE, EYEBOLT ON EITHER END	LENGTH: 33.5, WIDTH: 2-3, OUTER DIAMETER OF EYEBOLT: 5, INNER DIAMETER OF EYEBOLT: 2, U-SHAPED SHACKLE WIDTH: 3, WOOD PIECE: 1.5	N/A	N/A	N/A	N/A	N/A	UNKNOWN	
62.20.016	IRON	PULLEY	CIRCULAR IRON PULLEY, CONCRETED AND ERODED	OVERALL DIMENTIONS: 18X13X7	N/A	N/A	N/A	N/A	N/A	UNKNOWN	
62.20.017	UNKNOWN COMPSITION	CABLE PIECES	ASSORTMENT OF CABLE FRAGMENTS	SMALL CABLE: 13X3, MEDIUM CABLE: 25X 2.5, LARGE CABLE: 52X3	N/A	N/A	N/A	N/A	N/A	UNKNOWN	
62.20.018	WOOD/IRON	RUDDER PINTLE	THREE SEPARATE PIECES FASTENED TOGETHER, PINTLE FASTENED TO RUDDER VIA TWO BOLTS	PINTLE: 24X5, FASTENER DIAMETER: 3, RUDDER SIDED: 101-72, INNERMOST PIECE SIDED: 10	N/A	N/A	N/A	N/A	N/A	UNKNOWN	

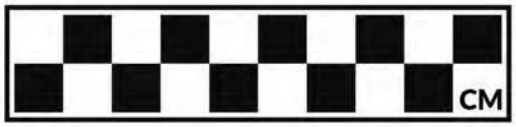
62.20.019	WROUGHT IRON	CONCRETED THREADED PIPE	HALLOW THREADED IRON PIPE SURROUNDED BY CONCRETION	CONCRETION LENGTH: 13, OVERALL DIAMETER: 5.5, EXPOSED PIPE LENGTH: 2.5	N/A	N/A	N/A	N/A	N/A	UNKNOWN	
62.20.020	IRON	DOUBLE RAKES	TWO SEPARATE RAKES CONCRETED TOGTHER, ONE RAKE RETAINS 21 TEETH, THE OTHER IS MISSING ITS TEETH	N/A	N/A	N/A	N/A	N/A	N/A	UNKNOWN	
62.20.021	ORGANIC	OYSTER SHELLS	ASSORTMENT OF OYSTER SHELLS, VARIOUS SIZES	VARIOUS DIMENTIONS, RANGE ABOUT: 9X5	N/A	N/A	N/A	N/A	N/A	UNKNOWN	
62.20.022	CAST IRON	CAST IRON BOLT	THIN, ROUND, CAST IRON BOLT, SLIGHT CONCREATION AT ONE END	36X3X1.5	N/A	N/A	N/A	N/A	N/A	UNKNOWN	
62.20.023	IRON	CHAIN LINKS	TWO CHUNKY LINKS CONCRETED TOGETHER, WIDEST AT THEIR INTERSECTION,	OVERALL LENGTH: 16, TOP LINK LENGTH: 10, TOP CHAIN WIDTH: 6, 8, BOTTOM CHAIN LENGTH: 7, 10, BOTTOM CHAIN WIDTH: 7.5, 2.2, 3	N/A	N/A	N/A	N/A	N/A	UNKNOWN	
62.20.024	IRON	SQUARE FASTENER HEAD	IRREGULAR SQUARE-SHAPED FASTENER HEAD, CONCRETED	LENGTH OF SIDES: 8X8X6, WIDTH: 3-2	N/A	N/A	N/A	N/A	N/A	UNKNOWN	
62.20.025	IRON	CURVED IRON BAR	LARGE, IRREGULARLY CURVED IRON BAR	LENGH: 103 X 16 X 21, WIDTH: 2	N/A	N/A	N/A	N/A	N/A	UNKNOWN	

62.20.026	GLASS	GLASS PANEL	LARGE, CLEAR GLASS PANEL, SHARP CUT EDGES, BROKEN ON ONE CORNER	20X22X14X10	N/A	N/A	N/A	N/A	N/A	UNKNOWN	
62.20.027	LEATHER	SHOE SOLE	INNER LEATHER SOLE OF SHOE, SMALL STICHING HOLES ROUND THE HEEL, THE TOE-END IS ERODED, SLIGHT ETCHING OF THE NUMBER 2883 IN CENTER BEFORE THE HEEL	16.5 X 6.5 X 2	N/A	N/A	N/A	N/A	N/A	UNKNOWN	
62.20.028	IRON	IRON STOVE LEG	CURVED IRON STOVE LEG, TOP IS BROKEN, BASE IS THICKER WITH CONCRETIONS, SLIGHT S-CURVE TO TOP	LENGTH: 19, WIDTH AT BASE: 9X7, WIDTH AT TIP, 4X3	N/A	N/A	N/A	N/A	N/A	UNKNOWN	
62.20.029	IRON	IRON ELBOW JOINT	RIGHT ANGLE IRON ELBOW JOINT, TWO DIGAONALLY PLACED NAIL HOLES ON ONE ARM	LENGTH OF ARMS: 8, 7, WIDTH: 1, DIAMETER OF NAIL HOLES: 1-1.5	N/A	N/A	N/A	N/A	N/A	UNKNOWN	
62.20.030	COPPER	COPPER CENTERBOARD CASE FASTENER	BENT ROD WITH CONCRETED WASHER BEFORE THE BEND	LENGTH: 25, WIDTH: 2, LENGTH TO BEND: 17.5, LENGTH WITH WASHER: 8, WASHER OUTER DIAMETER:4, WASHER INNER DIAMETER: 2	N/A	N/A	N/A	N/A	N/A	UNKNOWN	

62.20.031	IRON	IRON TONGS (ICE/LUMBER)	IRON TONGS OVERLAPPING ON EITHER SIDE, MISSING HANDLES, TEETH INTACT	LENGTH: 46X19X12, WIDTH: 7	N/A	N/A	N/A	N/A	N/A	UNKNOWN	
62.20.032	IRON	IRON BAND	THIN CIRCULAR IRON BAND, THREE NOTCHES JUT OUT TOWARDS CENTER	DIAMETER: 32, THICK: 3, NOTCHES: 6X3	N/A	N/A	N/A	N/A	N/A	UNKNOWN	
62.20.033	WOOD AND IRON	WOOD WITH IRON EYE	WOOD FRAGMENT WITH IRON EYBOLT AND NAIL AT ONE END	LENGTH: 93.5, WIDTH: 2-4.5, EYEBOLT DIAMETER: 2	N/A	N/A	N/A	N/A	N/A	UNKNOWN	
62.20.034	UNKNOWN COMPOSITION	GRANEL	FORMED GRANEL, CONCRETION OUTLINES THE SHAPE OF FRAME	LENGTH: 24, FRAME IMPRESSION: 15X6	N/A	N/A	N/A	N/A	N/A	UNKNOWN	
62.20.035	WOOD	BULKHEAD TIMBER	TOP AND BOTTOM OF TIMBER IS FLAT, SIDES CUT SHARPLY	N/A	N/A	N/A	N/A	N/A	N/A	UNKNOWN	
62.20.036	IRON	DECK ATTACHMENT	IRON DECK ATTACHMENT WITH BOLTS	LENGTH: 18	N/A	N/A	N/A	N/A	N/A	UNKNOWN	

10 CM

Centerboard Wreck
FS# 62.20.001
Bowsprit Stay
October 2020



10 CM

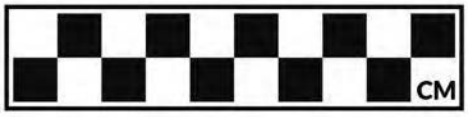
Centerboard Wreck
FS# 62.20.002
Wood Tackle Half
October 2020

Centerboard Wreck
FS# 62.20.003
Iron bar with Detergent Bottle
October 2020

Centerboard Wreck
FS# 62.20.004
Bent Iron Bar
October 2020

Centerboard Wreck
FS# 62.20.005
Iron Cylinder (Heavy)
October 2020

Centerboard Wreck
FS# 62.20.006
Iron Pulley
October 2020

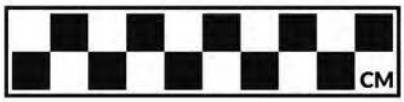


10 CM

Centerboard Wreck
FS# 62.20.007
Iron Ring
October 2020

Centerboard Wreck
FS# 62.20.008
Pulley with Wood
October 2020

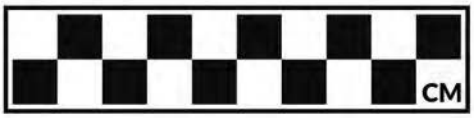
Centerboard Wreck
FS# 62.20.009
Oyster Dredge Rake
October 2020



10 CM

Centerboard Wreck
FS# 62.20.010
Brick
October 2020

Centerboard Wreck
FS# 62.20.011
Circular Gear
October 2020

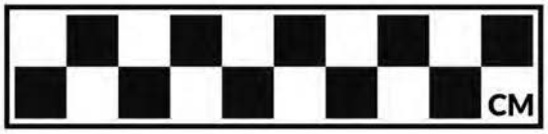


10 CM

Centerboard Wreck
FS# 62.20.012
Motor
October 2020

26 CM

Centerboard Wreck
FS# 62.20.013
Iron Bars with Eyes
October 2020

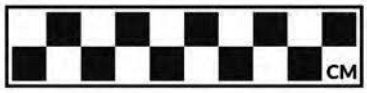


10 CM

Centerboard Wreck
FS# 62.20.014
Tongue and Groove
Wood Piece
October 2020

10 CM

Centerboard Wreck
FS# 62.20.015
Iron Rigging Bars
October 2020



10 CM

Centerboard Wreck
FS# 62.20.016
Pulley
October 2020

Centerboard Wreck
FS# 62.20.017
Cable Pieces
October 2020

10 CM

Centerboard Wreck
FS# 62.20.018
Rudder Pintle
October 2020

10 CM

Centerboard Wreck
FS# 62.20.019
Concreted Iron Pipe
October 2020

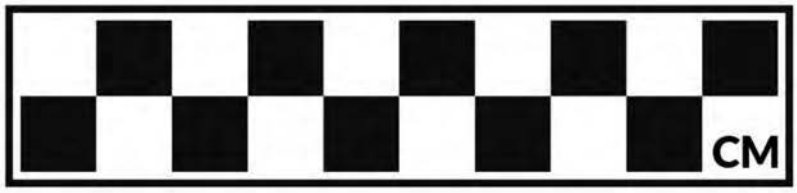
Centerboard Wreck
FS# 62.20.020
Double Rakes
October 2020

10 CM

Centerboard Wreck
FS# 62.20.021
Oyster Shells
October 2020

10 CM

Centerboard Wreck
FS# 62.20.022
Cast Iron Bolt
October 2020



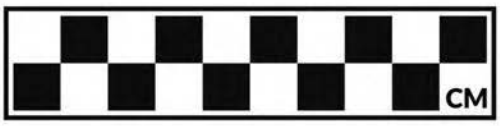
10 CM

Centerboard Wreck
FS# 62.20.023
Chain Links
October 2020

10 CM

Centerboard Wreck
FS# 62.20.024
Square Fastener Head
October 2020

Centerboard Wreck
FS# 62.20.025
Curved Iron Bar
October 2020



10 CM

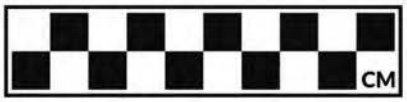
Centerboard Wreck
FS# 62.20.026
Glass Panel
October 2020

Centerboard Wreck
FS# 62.20.027
Shoe Sole
October 2020

10 CM

Centerboard Wreck
FS# 62.20.028
Iron Stove Leg
October 2020

Centerboard Wreck
FS# 62.20.029
Iron Elbow Joint
October 2020



10 CM

Centerboard Wreck
FS# 62.20.030
Copper Centerboard Case Fastener
October 2020

10 CM

Centerboard Wreck
FS# 62.20.031
Iron Tongs
October 2020

26 CM

Centerboard Wreck
FS# 62.20.032
Iron Band
October 2020

Centerboard Wreck
FS# 62.20.033
Wood with Iron Eye
October 2020

10 CM

Centerboard Wreck
FS# 62.20.034
Granel
October 2020

Centerboard Wreck
FS# 62.20.035
Bulkhead Timber
October 2020

Centerboard Wreck
FS# 62.20.036
Deck Attachment
October 2020

Appendix E. Centerboard Wreck Scantling List

Timber		Sided (cm)	Molded (cm)
Type	**ID**		
Port Frame	1	6	12
Port Frame	2	11	11
Port Frame	3	10.5	9
Port Frame(s)	4 & 5	5	19
Port Frame	6	10	8
Port Frame	10	11	8
Port Frame	11	13	8
Port Frame	12	11.5	8.5
Port Frame	13	11.5	7.5
Port Frame	14	11	7.5
Port Frame	15	12	7.5
Port Frame	27	11	7
Port Frame	28	10	7
Port Frame	29	9.5	7
Port Frame	30	11	7.5
Starboard Frame	1	22	3
Starboard Frame	2	17	3
Starboard Frame	3	11	8
Starboard Frame(s)	4 & 5	13	23
Starboard Frame	6	11	5
Starboard Frame	7	11	8
Starboard Frame	10	11	11
Starboard Frame	11	10	9
Starboard Frame	12	9	8
Starboard Frame	13	9	8.5
Starboard Frame	14	10	8.5
Starboard Frame	15	9	10
Starboard Frame	16	10.5	8
Starboard Frame	25	8	8
Starboard Frame	26	9	8
Starboard Frame	27	8	15
Starboard Frame	28	10	9
Starboard Frame	29	9	10
Starboard Frame	30	11	9

Appendix F. Diving Data

Date/Time/ Location	Name	PSI (In)	PSI (Out)	Time (In)	Time (Out)	Dive Time	Depth
8/12/2020 – Afternoon Dive							
-	Amber	-	-	-	-	-	-
-	Dominic	-	-	-	-	-	-
-	Matt	-	-	-	-	-	-
-	Trenton	-	-	-	-	-	-
Copper Wreck Site	Darby	3100	2400	1:52	2:30	38min	4ft
"	Taylor	2900	2400	1:52	2:30	38min	4ft
"	Andi	2800	2000	1:45	2:30	45min	4ft
"	Patrick	3200	2300	1:45	2:30	45min	4ft
"	Jeremy	3000	-	-	-	-	-
-	Jason R.	-	-	-	-	-	-
"	Jennifer M.	3000	-	-	-	-	-
8/13/2020 - Morning Dive							
-	Amber	-	-	-	-	-	-
-	Dominic	-	-	-	-	-	-
-	Matt	-	-	-	-	-	-
-	Trenton	-	-	-	-	-	-
Copper Wreck Site	Darby	2800	2150	10:25	11:54	1:29hrs	5ft
"	Taylor	2750	2400	10:25	11:54	1:29hrs	5ft
"	Andi	2800	2200	10:29	11:11	42min	5ft
"	Patrick	2800	2200	10:29	11:11	42min	5ft
"	Jeremy	2700	1600	10:39	12:16	1:35hrs	5ft
-	Jason R.	-	-	-	-	-	-
"	Jennifer M.	3000	2200	10:15	12:16	2:01hrs	5ft
8/13/2020 - Afternoon Dive							
-	Amber	-	-	-	-	-	-
-	Dominic	-	-	-	-	-	-
-	Matt	-	-	-	-	-	-
-	Trenton	-	-	-	-	-	-
Copper Wreck Site	Darby	2150	2000	12:57	2:11	1:14hrs	5ft
"	Taylor	2300	1700	12:57	2:11	1:14hrs	5ft
"	Andi	2200	1800	12:06	12:37	29min	5ft
"	Andi(2)	1800	1200	1:24	2:20	56min	5ft
"	Patrick	2200	1800	12:06	12:37	29min	5ft
"	Patrick(2)	1800	1200	1:24	2:20	56min	5ft
"	Jeremy	-	-	-	-	-	-
-	Jason R.	-	-	-	-	-	-
"	Jennifer M.	-	-	-	-	-	-

8/14/2020 – Morning Dive							
Copper Wreck Site	Amber	2700	2000	10:30	12:30	2hrs	4ft
"	Dominic	3000	2200	10:30	12:30	2hrs	4ft
"	Matt	2735	2400	10:30	12:30	2hrs	4ft
"	Trenton	2800	1800	10:30	12:30	2hrs	4ft
"	Darby	2450	2000	10:17	12:30	2:13hrs	4ft
"	Taylor	2800	2000	10:17	12:30	2:13hrs	4ft
"	Andi	2600	2000	10:30	12:25	1:55hrs	4ft
"	Patrick	2700	2000	10:30	12:25	1:55hrs	4ft
"	Jeremy	2700	-	10:33	12:42	2:09hrs	4ft
"	Jason R.	2900	-	10:33	12:42	2:09hrs	4ft
"	Jennifer M.	-	-	-	-	-	-
8/17/2020 – Afternoon Dive							
Centerboard Wreck	Amber	2800	2000	1:08	2:45	1:37hrs	4ft
"	Dominic	2800	2600	1:08	2:45	1:37hrs	4ft
"	Matt	2700	2200	1:15	2:45	1:30hrs	4ft
"	Trenton	3000	2250	1:15	2:45	1:30hrs	4ft
-	Darby	-	-	-	-	-	-
-	Taylor	-	-	-	-	-	-
-	Andi	-	-	-	-	-	-
-	Patrick	-	-	-	-	-	-
-	Jeremy	-	-	-	-	-	-
-	Jason R.	-	-	-	-	-	-
-	Jennifer M.	-	-	-	-	-	-
8/18/2020 - Morning Dive							
Copper Wreck Site	Amber	2600		10:00	11:15	1:15hrs	4ft
"	Dominic	2700		10:00	11:30	1:30hrs	4ft
"	Matt	2628		10:10	11:30	1:20hrs	4ft
"	Trenton	2700		10:00	11:30	1:30hrs	4ft
"	Darby	2775		10:03	11:45	1:42hrs	4ft
"	Taylor	2900		10:05	11:45	1:40hrs	4ft
"	Andi	2600		10:03	11:35	1:32hrs	4ft
"	Patrick	2600		10:00	11:35	1:35hrs	4ft
"	Jeremy	-	-	-	-	-	-
"	Jason R.	-	-	-	-	-	-
"	Jennifer M.	-	-	-	-	-	-
8/18/2020 - Afternoon Dive							
"	Amber	2500	2200	12:30	1:40	1:10hrs	4ft
"	Dominic	2160	1700	12:30	1:40	1:10hrs	4ft
"	Matt	1953	1620	12:38	1:30	52min	4ft
"	Trenton	2900	2700	12:45	1:30	45min	4ft

"	Darby	2400	2175	12:35	1:45	1:10hrs	4ft
"	Taylor	2300	2100	12:35	1:45	1:10hrs	4ft
"	Andi	2300	-	12:33	1:10	37min	4ft
"	Patrick	2000	2000	12:33	1:10	37min	4ft
"	Jeremy	2600	-	12:45	1:30	45min	4ft
"	Jason R.	-	-	-	-	-	-
"	Jennifer M.	-	-	-	-	-	-
8/19/2020 - Morning Dive							
Copper Wreck Site	Amber	2000	1500	9:50	11:28	1:38hrs	4ft
"	Dominic	2000	1500	9:47	11:28	1:41hrs	4ft
"	Matt	1670	880	9:53	11:28	1:35hrs	4ft
"	Trenton	2100	2000	10:30	11:28	58min	4ft
"	Darby	2100	1600	10:00	11:35	1:35hrs	4ft
"	Taylor	1500	1000	9:47	11:31	1:44hrs	4ft
"	Andi	1800	1200	9:51	11:28	1:37hrs	4ft
"	Patrick	2500	1900	9:51	11:28	1:37hrs	4ft
"	Jeremy	2000	600	9:52	11:35	1:43hrs	4ft
"	Jason R.	-	-	-	-	-	-
"	Jennifer M.	-	-	-	-	-	-
8/19/2020 - Afternoon Dive							
"	Amber	1500	-	12:30	12:55	25min	4ft
"	Dominic	1500	-	12:30	12:55	25min	4ft
"	Matt	980	-	12:33	12:55	22min	4ft
"	Trenton	2000	-	12:35	12:55	20min	4ft
"	Darby	1600	1200	12:30	12:55	25min	4ft
"	Taylor	1000	800	12:30	12:55	25min	4ft
"	Andi	1200	-	12:25	12:55	30min	4ft
"	Patrick	1900	-	12:25	12:55	30min	4ft
"	Jeremy	2700	-	12:30	12:55	25min	4ft
"	Jason R.	2800	-	12:39	12:55	16min	4ft
"	Jennifer M.	-	-	-	-	-	-
8/20/2020 - Morning Dive							
Copper Wreck Site	Amber	2400	1600	9:47	10:45	58min	4ft
"	Dominic	2400	1300	9:47	11:45	1:58hrs	4ft
"	Matt	2700	1935	9:49	11:30	1:41hrs	4ft
"	Trenton	2200	1500	9:54	11:30	1:36hrs	4ft
"	Darby	2800	1400	9:50	11:50	2hrs	4ft
"	Taylor	2200	1800	9:37	10:45	1:08hrs	4ft
"	Andi	2400	1600	9:50	11:30	1:40hrs	4ft
"	Patrick	2200	1600	9:50	11:30	1:40hrs	4ft
"	Jeremy	2300	500	9:25	11:30	2:05hrs	4ft

"	Jason R.	2300	700	9:35	11:30	1:55hrs	4ft
"	Jennifer M.	2300	2100	9:49	10:20	31min	4ft
8/20/2020 - Afternoon Dive							
"	Amber	1600	300	12:50	2:30	1:40hrs	4ft
"	Dominic	1300	600	12:31	2:30	1:59hrs	4ft
"	Matt	1900	1080	12:29	2:41	1:48hrs	4ft
"	Trenton	1500	800	12:28	2:30	2:02hrs	4ft
"	Darby	1400	1000	12:28	2:50	2:22hrs	4ft
"	Taylor	1800	700	12:25	2:50	2:25hrs	4ft
"	Andi	1600	1200	12:50	2:45	1:55hrs	4ft
"	Patrick	1600	1000	12:30	2:30	2hrs	4ft
"	Jeremy	2700	1000	12:30	2:30	2hrs	4ft
"	Jason R.	2000	-	12:45	2:50	1:45hrs	4ft
"	Jennifer M.	-	-	-	-	-	-
8/21/2020 - Morning Dive							
Copper Wreck Site	Amber	2600	1200	9:38	11:35	1:57hrs	4ft
"	Dominic	1900	980	9:38	11:35	1:57hrs	4ft
"	Matt	1930	1145	10:00	11:35	1:35hrs	4ft
"	Trenton	2000	1100	10:00	11:35	1:35hrs	4ft
"	Darby	2600	1800	9:38	11:45	2:07hrs	4ft
"	Taylor	2800	1600	9:43	11:45	2:02hrs	4ft
"	Andi	1800	1300	9:35	11:35	2hrs	4ft
"	Patrick	2600	2200	9:38	11:35	1:57hrs	4ft
"	Jeremy	-	-	-	-	-	-
"	Jason R.	2800	1600	10:50	12:05	1:15hrs	4ft
"	Jennifer M.	-	-	-	-	-	-
8/21/2020 - Afternoon Dive							
"	Amber	1200	430	12:38	1:50	1:12hrs	4ft
"	Dominic	970	500	12:58	1:10	12min	4ft
"	Matt	1480	1000	12:44	2:25	1:41hrs	4ft
"	Trenton	1100	500	12:38	1:50	1:48hrs	4ft
"	Darby	1800	1200	12:44	2:25	1:41hrs	4ft
"	Taylor	1600	800	12:44	2:25	1:41hrs	4ft
"	Andi	1300	1100	12:50	2:25	1:35hrs	4ft
"	Patrick	2200	1600	12:30	2:25	1:55hrs	4ft
"	Jeremy	1400	800	1:48	2:42	1:56hrs	4ft
"	Jason R.	1600	1100	2:18	2:42	24min	4ft
"	Jennifer M.	-	-	-	-	-	-
8/24/2020 - Morning Dive							
Copper Wreck Site	Amber	2100	1400	9:40	11:40	2hrs	4ft
"	Dominic	2650	500	9:37	11:40	2:03hrs	4ft

"	Matt	2650	2200	9:37	11:40	2:03hrs	4ft
"	Trenton	2750	2300	11:35	11:53	18min	4ft
"	Darby	2700	2000	10:10	11:40	1:30hrs	4ft
"	Taylor	2000	2000	9:40	11:40	2hrs	4ft
"	Andi	2200	2000	10:34	11:40	1:06hrs	4ft
"	Patrick	2000	1400	9:41	11:52	2:11hrs	4ft
"	Jeremy	2700	-	11:20	11:31	11min	4ft
"	Jason R.	2700	2000	10:25	11:25	1hr	4ft
"	Jennifer M.	-	-	-	-	-	-
8/24/2020 - Afternoon Dive							
"	Amber	1400	500	12:45	1:25	40min	4ft
"	Amber (2)	2600	-	1:35	2:28	53min	4ft
"	Dominic	2600	-	12:45	2:25	1:40hrs	4ft
"	Matt	2000	1800	12:43	2:25	1:42hrs	4ft
"	Trenton	2300	2000	12:55	1:30	35min	4ft
"	Darby	2000	1500	12:50	2:35	1:45hrs	4ft
"	Taylor	2000	1000	12:55	2:35	1:40hrs	4ft
"	Andi	1000	1400	1:10	2:25	1:15hrs	4ft
"	Patrick	1400	-	12:45	1:30	45min	4ft
"	Jeremy	-	-	-	-	-	-
"	Jason R.	2400	1100	12:12	1:57	1:45hrs	4ft
"	Jennifer M.	-	-	-	-	-	-
8/25/2020 - Morning Dive							
Copper Wreck Site	Amber	2400	1200	9:43	11:20	1:37hrs	4ft
"	Dominic	2500	1200	9:43	11:20	1:37hrs	4ft
"	Matt	2475	1950	9:46	11:10	1:24hrs	4ft
"	Trenton	2300	1300	10:07	11:45	1:38hrs	4ft
"	Darby	2600	1200	9:50	11:52	2:02hrs	4ft
"	Taylor	2500	1900	9:45	11:52	2:07hrs	4ft
"	Andi	2400	2400	10:05	11:10	1:05hrs	4ft
"	Patrick	2700	1900	9:41	11:45	2:04hrs	4ft
"	Jeremy	2600	2400	11:53	12:12	21min	4ft
"	Jason R.	2700	-	11:53	12:30	37min	4ft
"	Jennifer M.	-	-	-	-	-	-
8/25/2020 - Afternoon Dive							
"	Amber	1200	300	12:45	1:35	50min	4ft
"	Amber (2)	2500	-	1:52	2:45	53min	4ft
"	Dominic	1000	750	12:45	1:35	50min	4ft
"	Dominic (2)	2600	-	1:52	2:45	53min	4ft
"	Matt	1950	-	12:40	2:48	2:08hrs	4ft
"	Trenton	1300	750	12:40	1:20	40min	4ft

"	Darby	2000	1900	12:40	1:40	1hr	4ft
"	Darby (2)	1900	1500	2:17	2:48	31min	4ft
"	Taylor	1900	1200	12:40	1:40	1hr	4ft
"	Taylor (2)	1200	1000	2:17	2:48	31min	4ft
"	Andi	2400	-	12:55	2:48	1:53hrs	4ft
"	Patrick	1900	1400	12:40	1:20	40min	4ft
"	Jeremy	2400	-	1:33	1:55	22min	4ft
"	Jason R.	2100	-	1:33	3:00	1:27hrs	4ft
"	Jennifer M.	-	-	-	-	-	-
8/26/2020 - Morning Dive							
Copper Wreck Site	Amber	2500	1500	9:59	11:54	1:55hrs	5ft
"	Dominic	2600	2300	9:45	11:56	2:11hrs	5ft
"	Matt	2500	1700	9:45	11:56	2:11hrs	5ft
"	Trenton	2700	2200	9:59	11:54	1:55hrs	5ft
Centerboard Wreck	Darby	2700	2200	10:25	11:30	1:05hrs	4ft
"	Taylor	2800	2350	10:25	11:30	1:05hrs	4ft
"	Andi	2600	2200	10:20	11:30	1:10hrs	4ft
"	Patrick	2800	2200	10:22	11:30	1:08hrs	4ft
Copper Wreck Site	Jeremy	2000	800	10:10	11:58	1:48hrs	5ft
Centerboard Wreck	Jason R.	-	-	-	-	-	-
Copper Wreck Site	Jennifer M.	-	-	-	-	-	-
8/26/2020 - Afternoon Dive							
"	Amber	1400	300	12:52	2:04	1:12hrs	5ft
"	Amber (2)	900	500	2:04	2:37	33min	5ft
"	Dominic	2300	1500	12:53	2:29	1:36hrs	5ft
"	Matt	1700	1500	12:53	2:29	1:36hrs	5ft
"	Trenton	2200	1500	12:52	2:37	1:45hrs	5ft
"	Darby	2200	1800	12:55	2:45	1:50hrs	4ft
"	Taylor	2350	2200	12:55	2:45	1:50hrs	4ft
"	Andi	2200	1900	12:55	2:45	1:50hrs	4ft
"	Patrick	2200	-	12:55	2:45	1:50hrs	4ft
"	Jeremy	-	-	-	-	-	-
"	Jason R.	-	-	-	-	-	-
"	Jennifer M.	-	-	-	-	-	-
8/27/2020 - Morning Dive							
Copper Wreck Site	Amber	2500	1300	9:49	12:02	2:13hrs	5ft
"	Dominic	2300	1400	9:48	11:57	2:09hrs	5ft
"	Matt	2600	2000	9:48	11:57	2:09hrs	5ft
"	Trenton	2700	1900	9:49	12:02	2:13hrs	5ft
Centerboard Wreck	Darby	2200	-	10:15	12:00	1:45hrs	4ft
"	Taylor	1200	500	10:15	12:00	1:45hrs	4ft

"	Andi	2400	-	10:20	12:00	1:40hrs	4ft
"	Patrick	2200	-	10:15	12:00	1:45hrs	4ft
Copper Wreck Site	Jeremy	2700	1200	10:36	12:50	2:14hrs	5ft
Centerboard Wreck	Jason R.	-	-	-	-	-	-
Copper Wreck Site	Jennifer M.	-	-	-	-	-	-
8/27/2020 - Afternoon Dive							
Copper Wreck Site	Amber	1300	500	1:00	2:33	1:33hrs	5ft
"	Dominic	1400	400	1:06	2:30	1:24hrs	5ft
"	Matt	2000	1200	1:00	2:45	1:45hrs	5ft
"	Trenton	1900	1600	1:00	2:45	1:45hrs	5ft
Centerboard Wreck	Darby	2200	-	12:15	2:00	1:45hrs	4ft
"	Taylor	800	-	12:30	2:00	1:30hrs	4ft
"	Andi	2000	-	12:30	2:00	1:30hrs	4ft
"	Patrick	1800	-	12:30	2:00	1:30hrs	4ft
Copper Wreck Site	Jeremy	1200	500	2:01	2:48	47min	5ft
Centerboard Wreck	Jason R.	-	-	-	-	-	-
Copper Wreck Site	Jennifer M.	-	-	-	-	-	-
8/28/2020 - Morning Dive							
Copper Wreck	Amber	2600	1380	9:53	12:00	2:07hrs	4ft
"	Dominic	2600	1100	9:53	12:00	2:07hrs	4ft
"	Matt	2565	-	9:54	12:00	2:06hrs	4ft
"	Trenton	2800	2000	9:56	12:00	2:04hrs	4ft
"	Darby	-	-	-	-	-	-
"	Taylor	2600	1600	9:56	12:00	2:04hrs	4ft
"	Andi	2600	2500	9:54	12:00	2:06hrs	4ft
"	Patrick	2700	1600	9:57	12:00	2:03hrs	4ft
"	Jeremy	2700	1600	10:55	12:15	1:20hrs	4ft
"	Jason R.	2700	1000	10:30	12:15	1:45hrs	4ft
"	Jennifer M.	-	-	-	-	-	-
08/28/2020 - Afternoon Dive							
"	Amber	1300	500	1:00	1:45	45min	4ft
"	Dominic	1100	400	1:00	2:10	1:10hrs	4ft
"	Matt	1600	700	1:00	2:10	1:10hrs	4ft
"	Trenton	2000	500	1:00	1:45	45min	4ft
"	Darby	-	-	-	-	-	-
"	Taylor	1600	1100	12:56	2:17	1:21hrs	4ft
"	Andi	2400	2000	12:58	2:38	1:40hrs	4ft
"	Patrick	1600	1000	12:58	2:38	1:40hrs	4ft
"	Jeremy	1600	700	2:00	2:41	41min	4ft
"	Jason R.	-	-	-	-	-	-
"	Jennifer M.	-	-	-	-	-	-

8/31/2020 - Morning Dive							
Copper Wreck Site	Amber	2500	2400	9:53	10:10	17min	5ft
"	Dominic	2600	1500	9:51	12:00	2:09hrs	5ft
"	Matt	-	-	-	-	-	-
"	Trenton	-	-	-	-	-	-
"	Darby	-	-	-	-	-	-
"	Taylor	-	-	-	-	-	-
"	Andi	2800	-	10:05	12:00	1:55hrs	5ft
"	Patrick	2800	1800	10:05	12:00	1:55hrs	5ft
"	Jeremy	-	-	-	-	-	-
"	Jason R.	-	-	-	-	-	-
"	Jennifer M.	-	-	-	-	-	-
8/31/2020 - Afternoon Dive							
"	Amber	2400	1650	12:40	1:40	1hr	5ft
"	Amber (2)	1600	1000	1:48	2:34	46min	5ft
"	Dominic	1500	650	12:40	1:40	1hr	5ft
"	Dominic (2)	3000	2200	1:48	2:34	46min	5ft
"	Matt	2800	2400	1:40	2:10	30min	5ft
"	Trenton	-	-	-	-	-	-
"	Darby	2700	1600	12:45	2:35	1:50hrs	5ft
"	Taylor	2900	2500	1:30	2:35	1:05hrs	5ft
"	Andi	-	-	-	-	-	-
"	Patrick	-	-	-	-	-	-
"	Jeremy	3000	2000	12:47	1:55	1:18hrs	5ft
"	Jason R.	2500	2000	12:49	2:19	1:30hrs	5ft
"	Jennifer M.	-	-	-	-	-	-
9/1/2020 - Morning Dive							
Copper Wreck Site	Amber	2700	1200	9:43	11:53	2:10hrs	5ft
"	Dominic	-	-	-	-	-	-
"	Matt	2780	1100	9:50	12:16	2:26hrs	5ft
"	Trenton	-	-	-	-	-	-
Centerboard Wreck	Darby	2700	2700	10:08	10:28	20min	4ft
"	Taylor	2800	700	10:08	12:37	2:29hrs	4ft
"	Andi	2500	-	10:28	10:35	7min	4ft
"	Patrick	3000	1700	9:45	12:57	3:13hrs	4ft
Copper Wreck Site	Jeremy	2000	380	9:43	11:53	2:10hrs	5ft
Centerboard Wreck	Jason R.	-	-	-	-	-	-
Copper Wreck Site	Jennifer M.	-	-	-	-	-	-
9/1/2020 - Afternoon Dive							
"	Amber	-	-	-	-	-	-
"	Dominic	-	-	-	-	-	-

"	Matt	-	-	-	-	-	-
"	Trenton	-	-	-	-	-	-
Centerboard Wreck	Darby	2700	2400	1:10	3:00	1:50hrs	4ft
"	Taylor	2800	-	1:10	3:00	1:50hrs	4ft
"	Andi	2800	2200	1:10	3:00	1:50hrs	4ft
"	Patrick	1700	-	1:10	3:00	1:50hrs	4ft
Copper Wreck Site	Jeremy	-	-	-	-	-	-
Centerboard Wreck	Jason R.	-	-	-	-	-	-
Copper Wreck Site	Jennifer M.	-	-	-	-	-	-
9/3/2020 - Morning Dive (No afternoon dive)							
Centerboard Wreck	Amber	2600	2000	9:30	12:10	2:40hrs	4ft
"	Dominic	1800	-	9:22	12:50	3:28hrs	4ft
-	Matt	-	-	-	-	-	-
-	Trenton	-	-	-	-	-	-
-	Darby	-	-	-	-	-	-
-	Taylor	-	-	-	-	-	-
"	Andi	2400	2000	9:23	12:10	2:47hrs	4ft
"	Patrick	2400	-	9:00	12:40	3:40hrs	4ft
-	Jeremy	-	-	-	-	-	-
"	Jason R.	2800	-	9:00	12:40	3:40hrs	4ft
-	Jennifer M.	-	-	-	-	-	-
9/17/2020 – Morning Dive (No afternoon dive)							
Centerboard Wreck	Amber						
"	Dominic	2900	2000	10:30	1:15	2:45hrs	4ft
-	Matt	-	-	-	-	-	-
-	Trenton	-	-	-	-	-	-
-	Darby	-	-	-	-	-	-
"	Taylor	2800	2000	10:30	1:15	2:45hrs	4ft
-	Andi	-	-	-	-	-	-
"	Patrick	2800	-	10:26	1:15	2:49hrs	4ft
"	Jeremy	2800	1800	11:20	1:15	1:55hrs	4ft
"	Jason R.	2900	500	10:30	1:00	2:30hrs	4ft
-	Jennifer M.	-	-	-	-	-	-
"	Will Nassif	2600	1300	10:26	1:15	2:49hrs	4ft

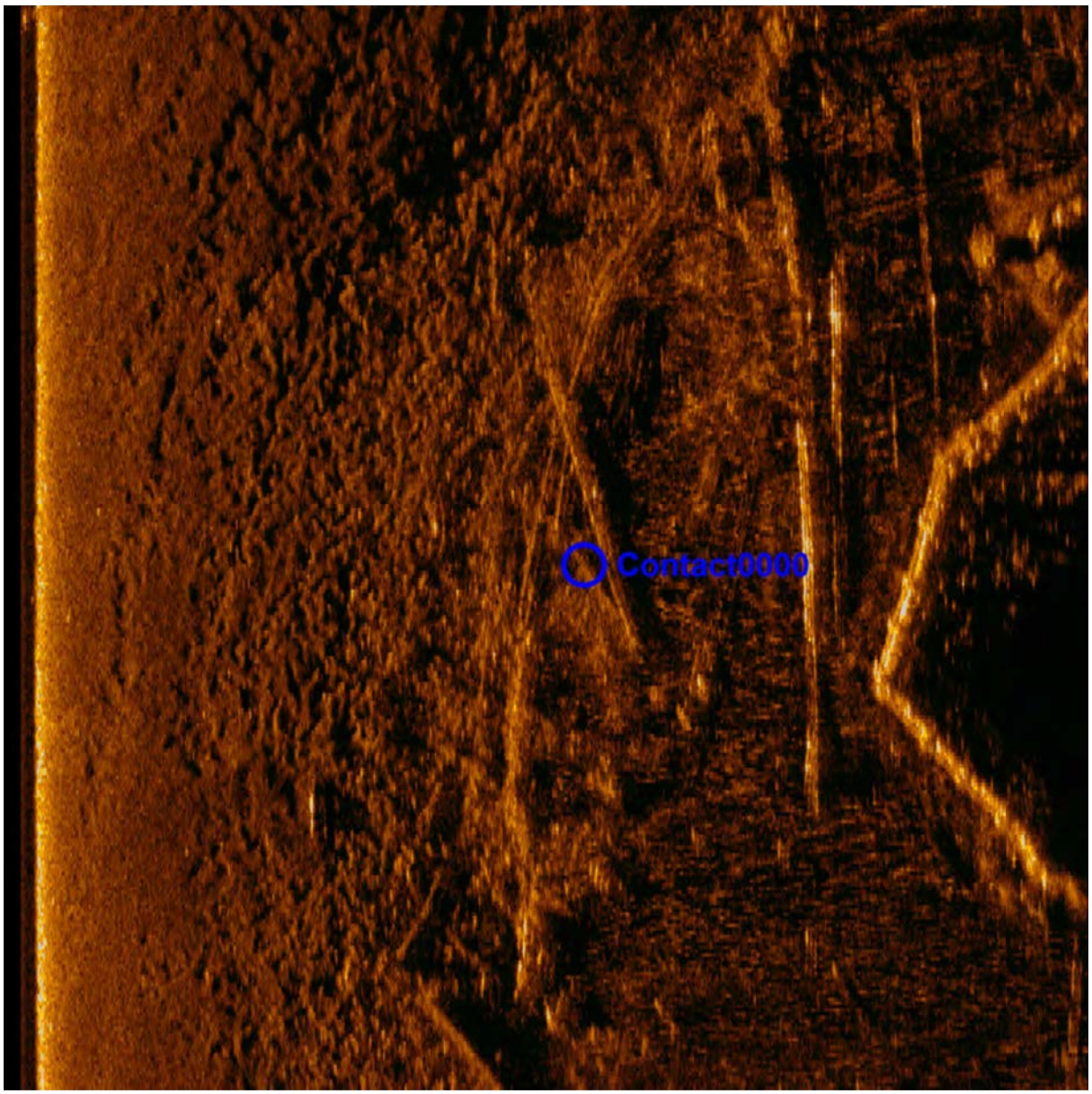
Appendix F. Remote Sensing Survey Results

In April of 2021 students from ARCH6835 (Advanced Methods in Maritime Archaeology) conducted side scan sonar surveys in the Tar/Pamlico River near Washington, NC and Bath Creek near Bath, NC. As these surveys were focused on instruction in remote sensing methods, no attempt was made to cover complete survey blocks. Instead, areas were selected in an effort to obtain imagery of sites that had previously not been surveyed or to inspect areas thought to have been impacted by the effects of storm activity over decades. Surveys were undertaken using an EdgeTech 4125 Side Scan Sonar and processed using Chesapeake Technologies SonarWiz software. Due to the rapidly changing bathymetry in these areas, the sonar was not towed during these surveys; instead, it was hung over the port side of the vessel and its height was adjusted as necessary.

While conducting surveys of the waters surrounding Washington, NC efforts were made to image both the Copper Wreck Site and Centerboard Wreck. A number previously located wrecks were imaged including well known sites such as USS *Pickett* (TRR0002) and others that have been investigated by ECU PMS in the past. Of particular interest were the wrecks located around Castle Island since they are hypothesized to have been negatively impacted by hurricanes and major flooding events in the decades since they were last recorded.

Surveys of Bath Creek focused mainly on the shallow areas surrounding the modern waterfront. Efforts were made to image the oyster fishing vessel *Whitewing* (BAR0002), however, it appears to be largely buried. Surveys of the shoreline in Creek and along the southern and northern produced no results aside from previously known sites (e.g. BAR0003).

The following target lists provide images obtained during the survey. The names of particular wrecks, sites, and/or other possible interpretations are added in “Dimensions and Attributes – Description:”.

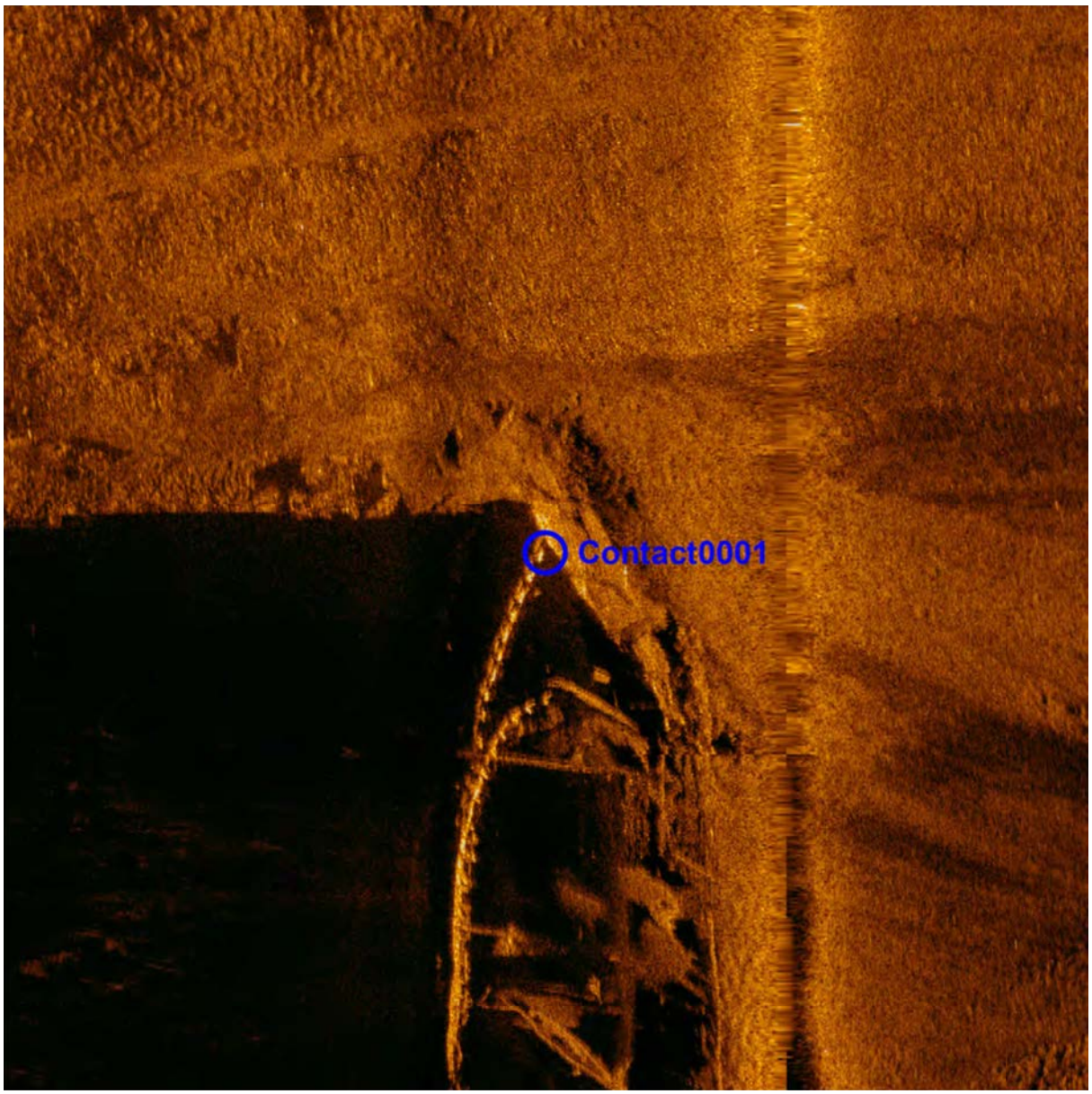


Contact0000

- Sonar Time at Target: 4/17/2021 2:55:30 PM
- Click Position
  35.5459517567 -77.0663658188 (WGS84)
  35.5457889838 -77.0666910432 (NAD27LL)
  35.5459517567 -77.0663658188 (LocalLL)
  (X) 312688.40 (Y) 3935553.91 (Projected Coordinates)
- Map Projection: UTM84-18N
- Acoustic Source File: U:\20210417_EdgeTech_Washington\20210417145331.jsf
- Ping Number: 49580
- Range to target: 12.85 Meters
- Fish Height: 0.00 Meters
- Heading: 26.790 Degrees
- Event Number: (-1)
- Line Name: 20210417145331
- Water Depth: 0.81 Meters

Dimensions and attributes

- Target Width: 4.59 Meters
- Target Height: 0.00 Meters
- Target Length: 20.01 Meters
- Target Shadow: 0.59 Meters
- Mag Anomaly:
- Avoidance Area:
- Classification1: wreck
- Classification2:
- Area:
- Block:
- Description: Copper Wreck - probable 19th century schooner likely associated with lumber industry

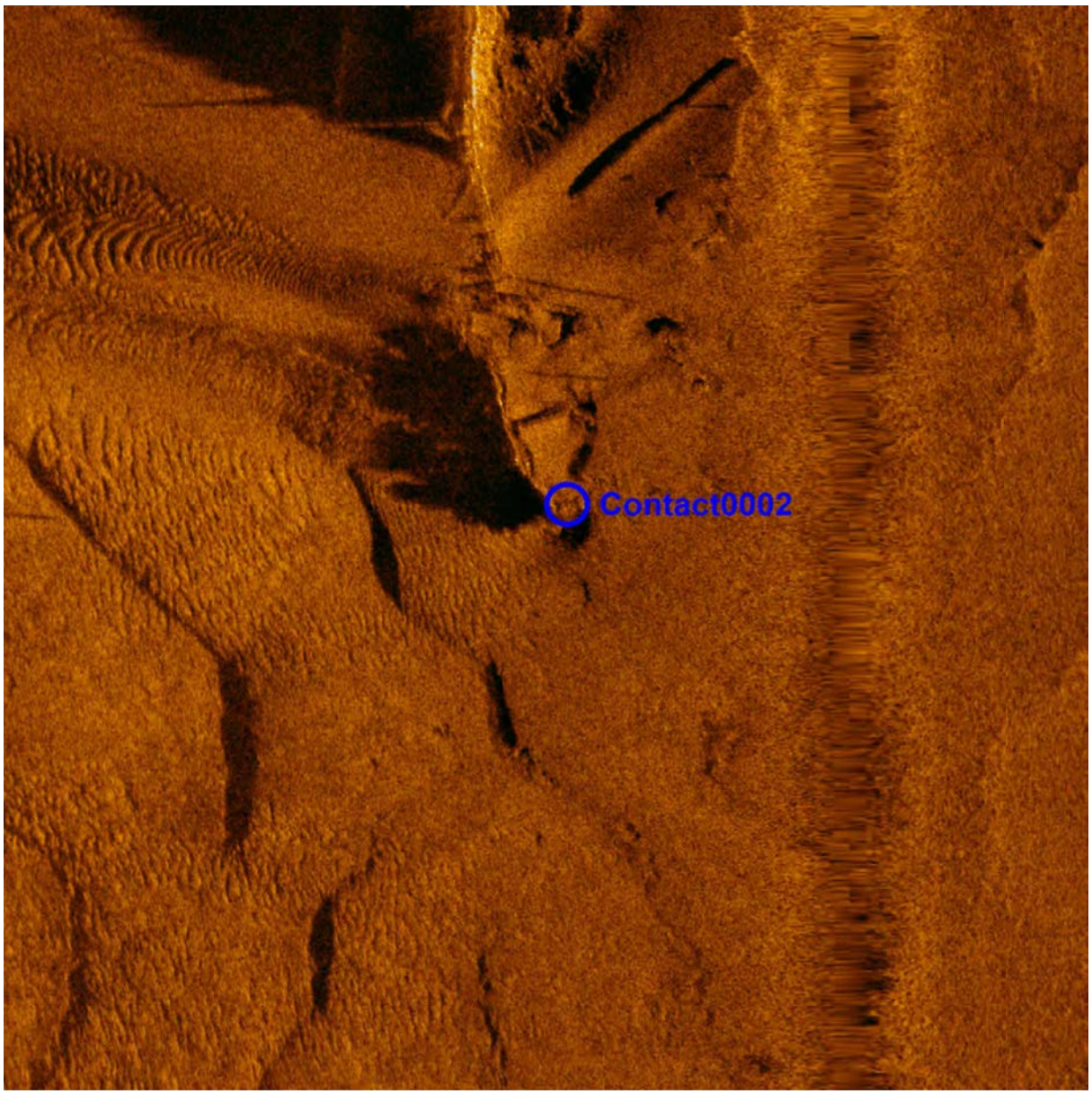


Contact0001

- Sonar Time at Target: 4/17/2021 3:43:11 PM
- Click Position
  35.5436336930 -77.0645912518 (WGS84)
  35.5434708873 -77.0649165907 (NAD27LL)
  35.5436336930 -77.0645912518 (LocalLL)
  (X) 312843.89 (Y) 3935293.39 (Projected Coordinates)
- Map Projection: UTM84-18N
- Acoustic Source File:
U:\20210417_EdgeTech_Washington\20210417153247.jsf
- Ping Number: 161212
- Range to target: 5.56 Meters
- Fish Height: 2.20 Meters
- Heading: 205.890 Degrees
- Event Number: (-1)
- Line Name: 20210417153247
- Water Depth: 0.82 Meters

Dimensions and attributes

- Target Width: 0.00 Meters
- Target Height: 0.00 Meters
- Target Length: 0.00 Meters
- Target Shadow: 0.00 Meters
- Mag Anomaly:
- Avoidance Area:
- Classification1: wreck
- Classification2:
- Area:
- Block:
- Description: USS Pickett - bow



Contact0002

- Sonar Time at Target: 4/17/2021 3:42:43 PM
- Click Position
  35.5439491781 -77.0644395052 (WGS84)
  35.5437863762 -77.0647648460 (NAD27LL)
  35.5439491781 -77.0644395052 (LocalLL)
  (X) 312858.38 (Y) 3935328.10 (Projected Coordinates)
- Map Projection: UTM84-18N
- Acoustic Source File:
U:\20210417_EdgeTech_Washington\20210417153247.jsf
- Ping Number: 160415
- Range to target: 6.25 Meters
- Fish Height: 3.67 Meters
- Heading: 202.690 Degrees
- Event Number: (-1)
- Line Name: 20210417153247
- Water Depth: 0.85 Meters

Dimensions and attributes

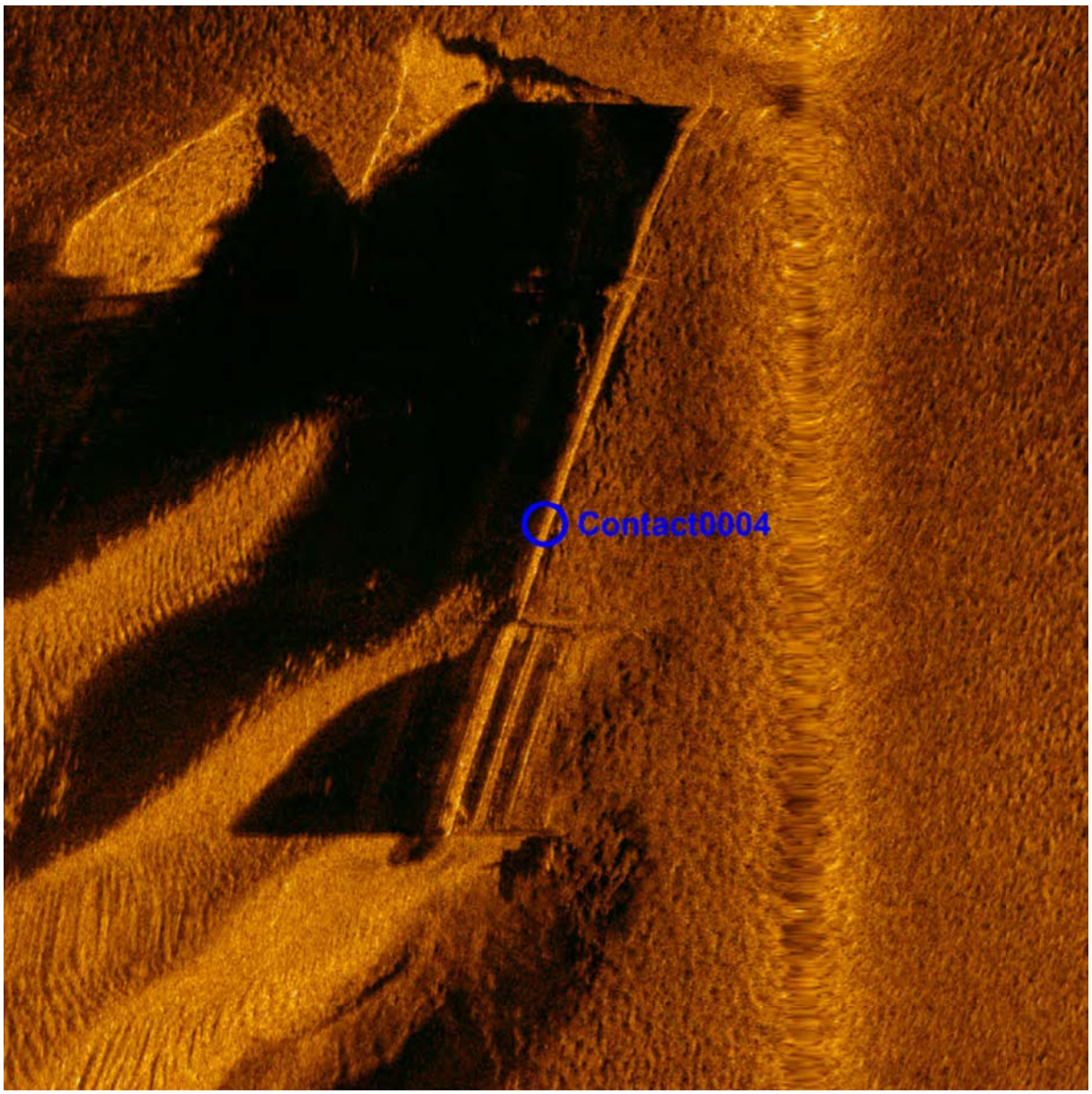
- Target Width: 0.00 Meters
- Target Height: 0.00 Meters
- Target Length: 0.00 Meters
- Target Shadow: 0.00 Meters
- Mag Anomaly:
- Avoidance Area:
- Classification1: wreck
- Classification2:
- Area:
- Block:
- Description: USS Pickett - stern

Contact0003

- Sonar Time at Target: 4/17/2021 4:26:52 PM
- Click Position
  35.5444606375 -77.0692372884 (WGS84)
  35.5442978509 -77.0695624084 (NAD27LL)
  35.5444606375 -77.0692372884 (LocalLL)
  (X) 312424.59 (Y) 3935393.96 (Projected Coordinates)
- Map Projection: UTM84-18N
- Acoustic Source File:
U:\20210417_EdgeTech_Washington\20210417162512.jsf
- Ping Number: 173505
- Range to target: 16.56 Meters
- Fish Height: 1.27 Meters
- Heading: 307.790 Degrees
- Event Number: (-1)
- Line Name: 20210417162512
- Water Depth: 0.83 Meters

Dimensions and attributes

- Target Width: 6.13 Meters
- Target Height: 0.00 Meters
- Target Length: 18.70 Meters
- Target Shadow: 0.00 Meters
- Mag Anomaly:
- Avoidance Area:
- Classification1: wreck
- Classification2:
- Area:
- Block:
- Description: UAB 0011TRR - Composite Wreck

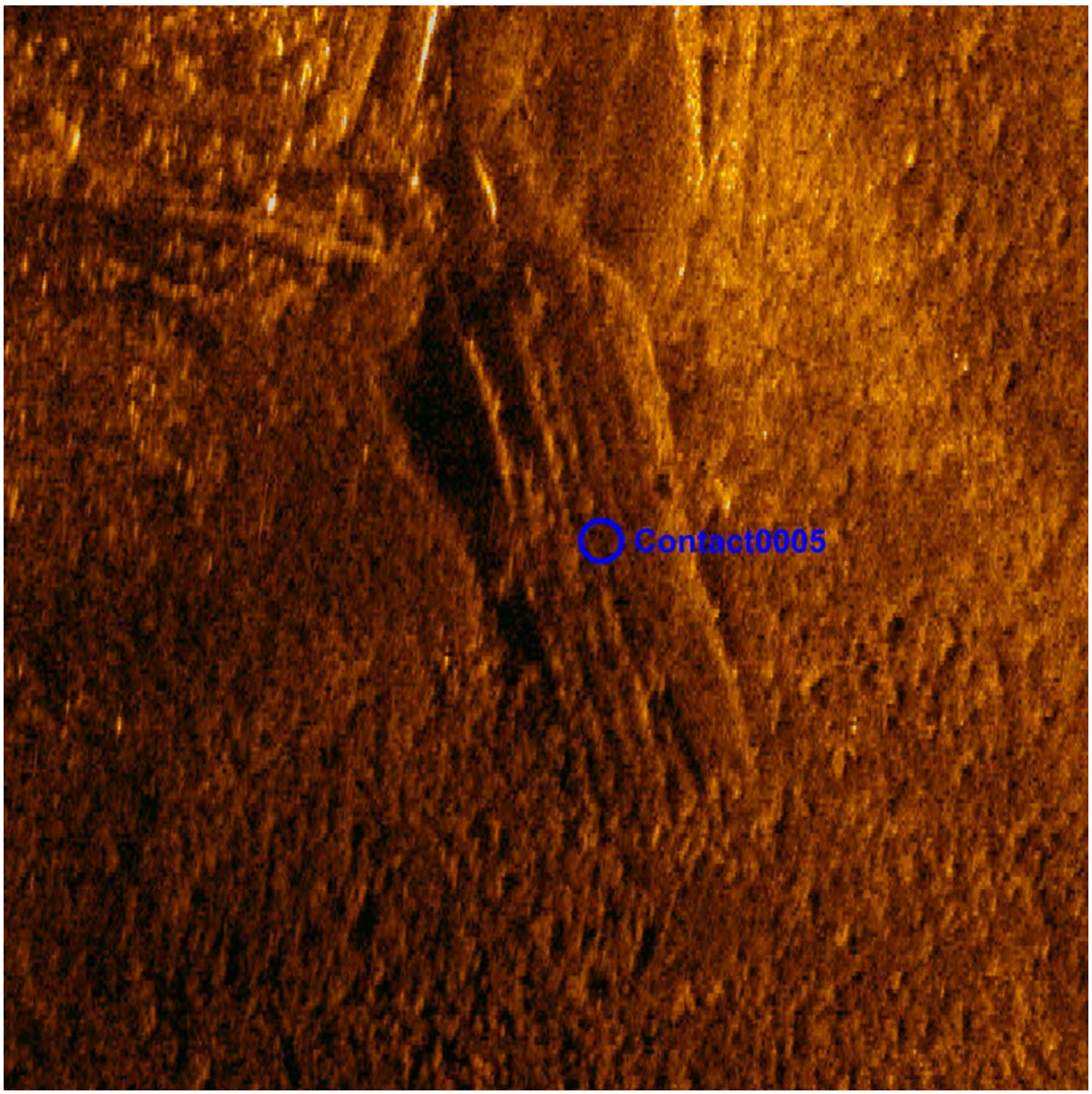


Contact0004

- Sonar Time at Target: 4/17/2021 6:39:45 PM
- Click Position
  35.5389052251 -77.0557625754 (WGS84)
  35.5387423434 -77.0560883803 (NAD27LL)
  35.5389052251 -77.0557625754 (LocalLL)
  (X) 313633.38 (Y) 3934752.13 (Projected Coordinates)
- Map Projection: UTM84-18N
- Acoustic Source File:
U:\20210417_EdgeTech_Washington\20210417183525.jsf
- Ping Number: 360458
- Range to target: 5.95 Meters
- Fish Height: 2.34 Meters
- Heading: 243.500 Degrees
- Event Number: (-1)
- Line Name: 20210417183525
- Water Depth: 0.58 Meters

Dimensions and attributes

- Target Width: 3.21 Meters
- Target Height: 0.86 Meters
- Target Length: 17.84 Meters
- Target Shadow: 3.44 Meters
- Mag Anomaly:
- Avoidance Area:
- Classification1: wreck
- Classification2:
- Area:
- Block:
- Description: UAB PMR0058 - ECU Castle Island Barge Wreck #7

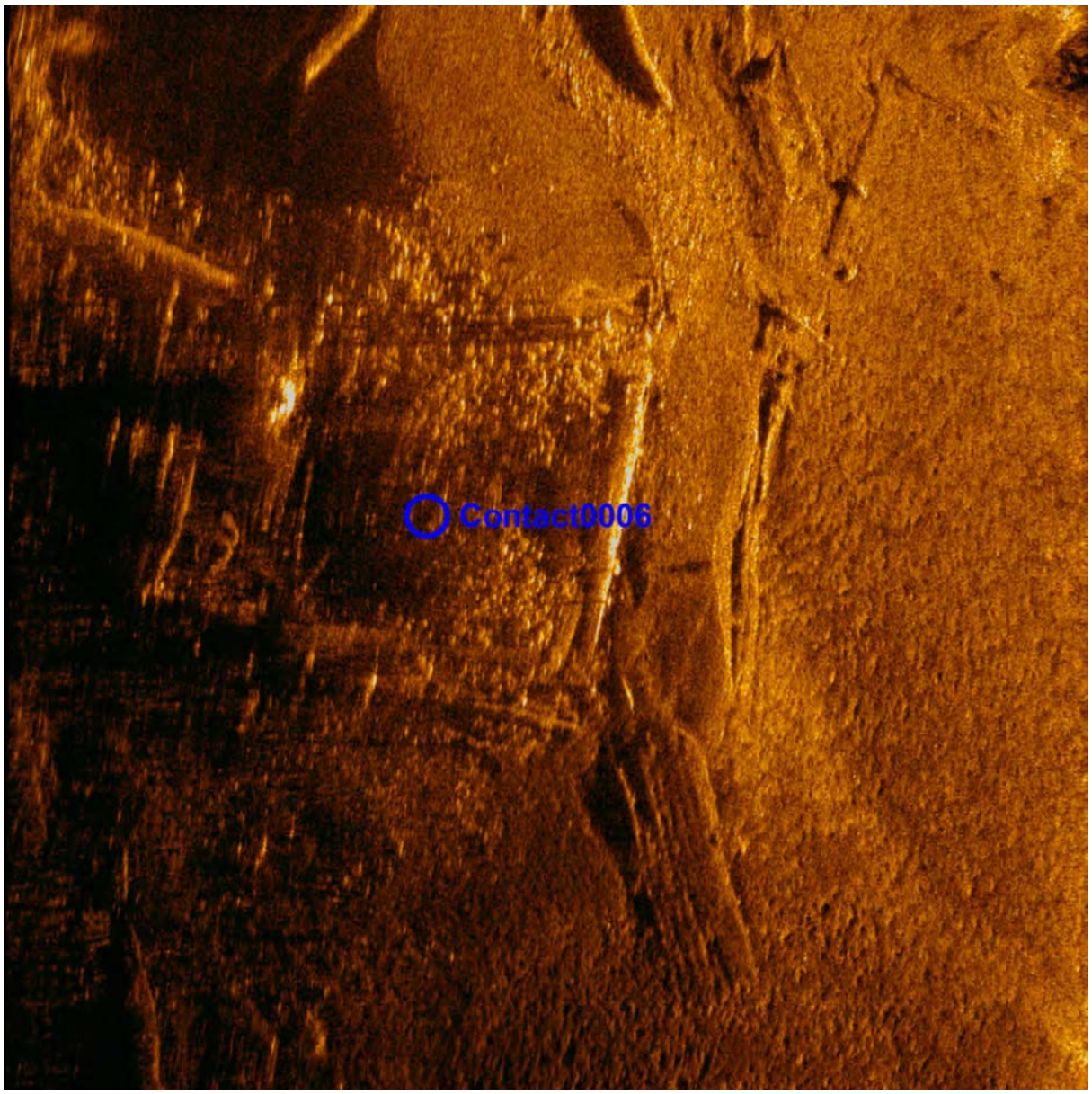


Contact0005

- Sonar Time at Target: 4/17/2021 6:40:12 PM
- Click Position
  35.5386559981 -77.0559733361 (WGS84)
  35.5384931137 -77.0562991356 (NAD27LL)
  35.5386559981 -77.0559733361 (LocalLL)
  (X) 313613.70 (Y) 3934724.88 (Projected Coordinates)
- Map Projection: UTM84-18N
- Acoustic Source File:
U:\20210417_EdgeTech_Washington\20210417183525.jsf
- Ping Number: 361219
- Range to target: 9.92 Meters
- Fish Height: 1.97 Meters
- Heading: 235.890 Degrees
- Event Number: (-1)
- Line Name: 20210417183525
- Water Depth: 0.58 Meters

Dimensions and attributes

- Target Width: 1.94 Meters
- Target Height: 0.15 Meters
- Target Length: 5.94 Meters
- Target Shadow: 0.84 Meters
- Mag Anomaly:
- Avoidance Area:
- Classification1: wreck
- Classification2:
- Area:
- Block:
- Description: Possible barge wreck

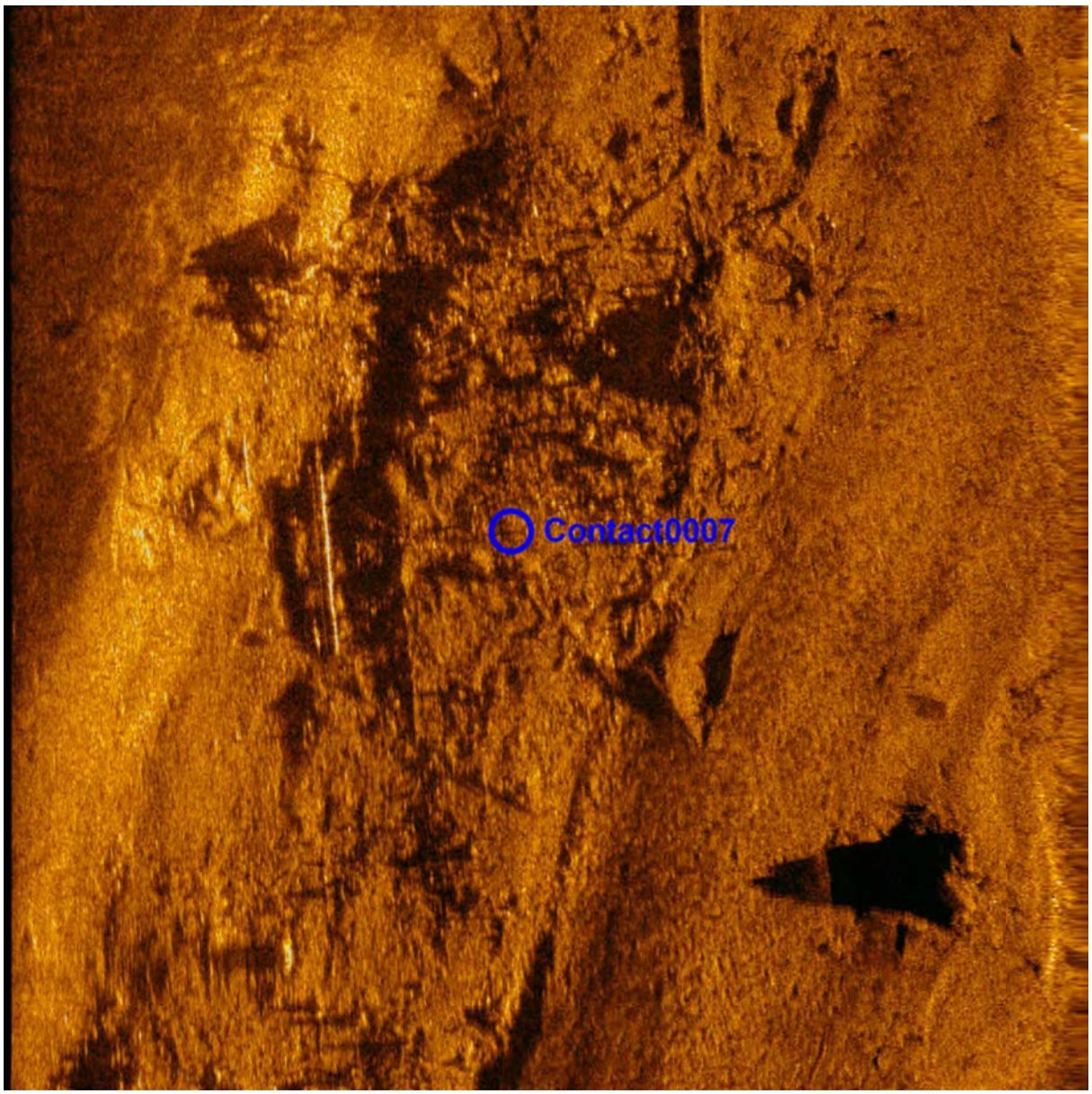


Contact0006

- Sonar Time at Target: 4/17/2021 6:40:18 PM
- Click Position
  35.5385750355 -77.0559686883 (WGS84)
  35.5384121501 -77.0562944892 (NAD27LL)
  35.5385750355 -77.0559686883 (LocalLL)
  (X) 313613.93 (Y) 3934715.89 (Projected Coordinates)
- Map Projection: UTM84-18N
- Acoustic Source File:
U:\20210417_EdgeTech_Washington\20210417183525.jsf
- Ping Number: 361385
- Range to target: 15.63 Meters
- Fish Height: 2.44 Meters
- Heading: 234.100 Degrees
- Event Number: (-1)
- Line Name: 20210417183525
- Water Depth: 0.58 Meters

Dimensions and attributes

- Target Width: 8.91 Meters
- Target Height: 0.00 Meters
- Target Length: 14.67 Meters
- Target Shadow: 0.00 Meters
- Mag Anomaly:
- Avoidance Area:
- Classification1: historic structure
- Classification2:
- Area:
- Block:
- Description: Castle Island wharf

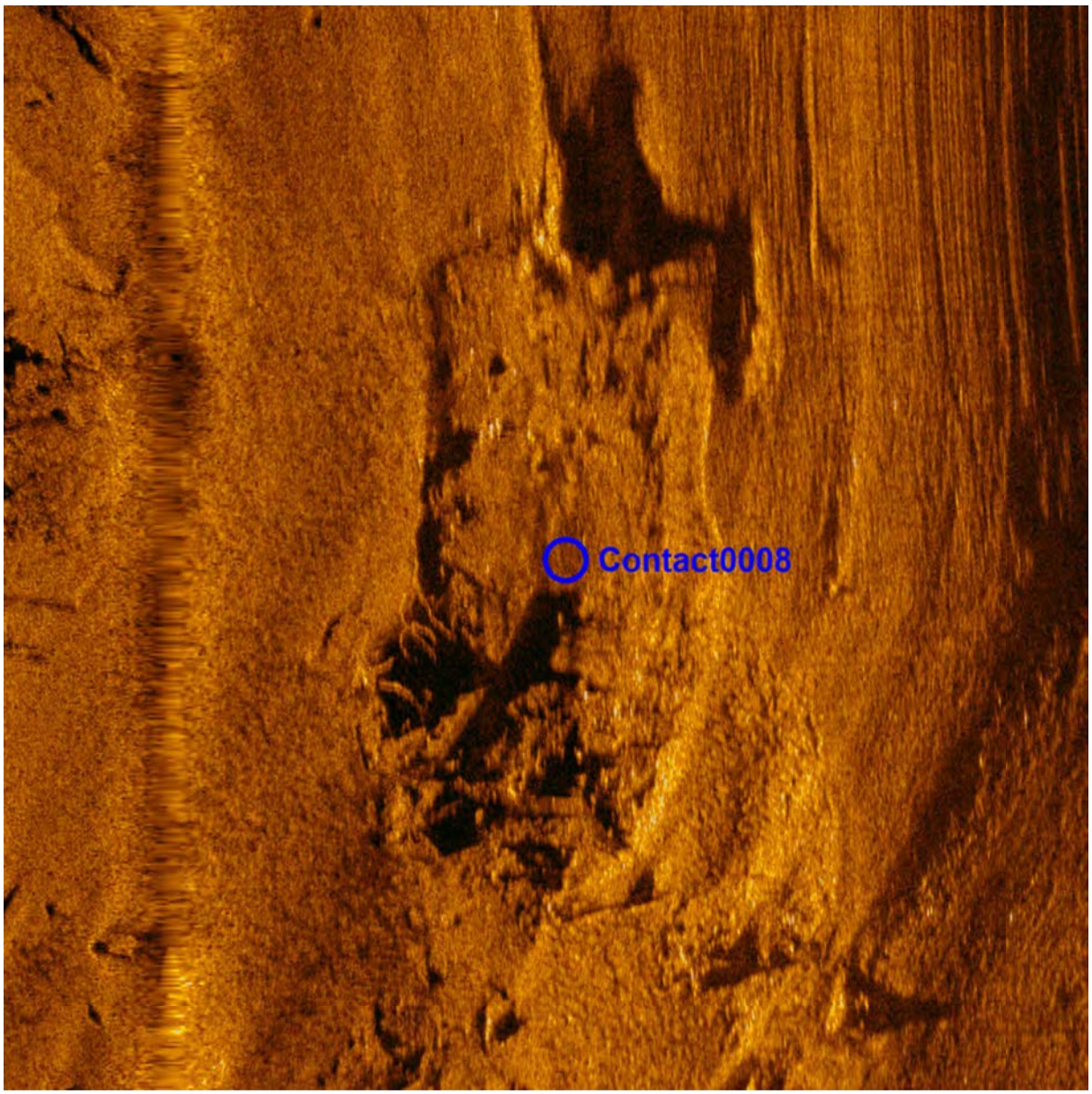


Contact0007

- Sonar Time at Target: 4/17/2021 6:41:02 PM
- Click Position
  35.5382567967 -77.0559575430 (WGS84)
  35.5380939072 -77.0562833494 (NAD27LL)
  35.5382567967 -77.0559575430 (LocalLL)
  (X) 313614.21 (Y) 3934680.57 (Projected Coordinates)
- Map Projection: UTM84-18N
- Acoustic Source File:
U:\20210417_EdgeTech_Washington\20210417183525.jsf
- Ping Number: 362667
- Range to target: 13.30 Meters
- Fish Height: 3.03 Meters
- Heading: 139.890 Degrees
- Event Number: (-1)
- Line Name: 20210417183525
- Water Depth: 0.58 Meters

Dimensions and attributes

- Target Width: 7.18 Meters
- Target Height: 0.24 Meters
- Target Length: 18.72 Meters
- Target Shadow: 1.13 Meters
- Mag Anomaly:
- Avoidance Area:
- Classification1: wreck
- Classification2:
- Area:
- Block:
- Description: Possible wreck scatter

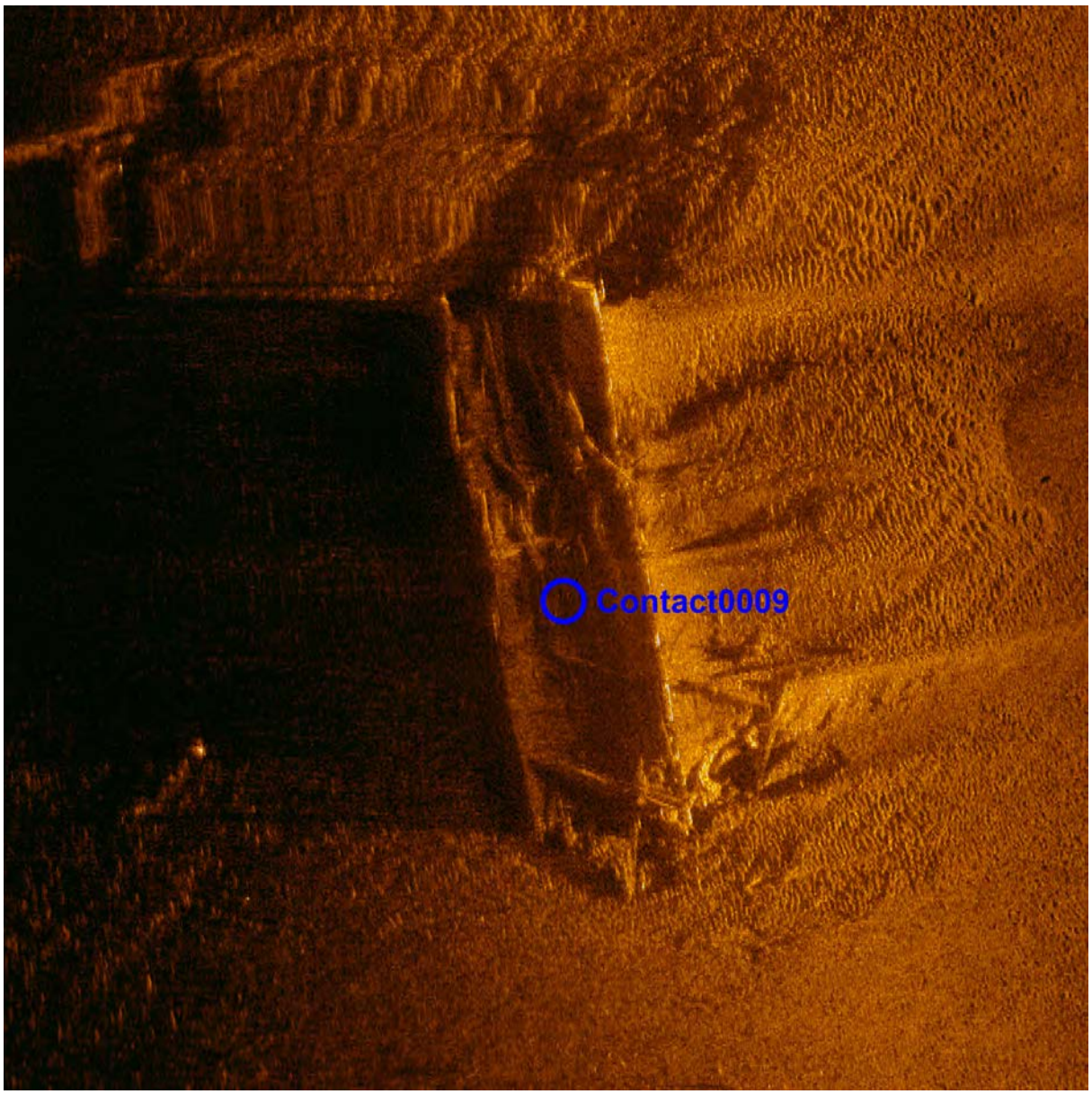


Contact0008

- Sonar Time at Target: 4/17/2021 6:41:17 PM
- Click Position
  35.5379826755 -77.0559912701 (WGS84)
  35.5378197826 -77.0563170792 (NAD27LL)
  35.5379826755 -77.0559912701 (LocalLL)
  (X) 313610.51 (Y) 3934650.22 (Projected Coordinates)
- Map Projection: UTM84-18N
- Acoustic Source File:
U:\20210417_EdgeTech_Washington\20210417183525.jsf
- Ping Number: 363099
- Range to target: 8.83 Meters
- Fish Height: 2.69 Meters
- Heading: 143.890 Degrees
- Event Number: (-1)
- Line Name: 20210417183525
- Water Depth: 0.58 Meters

Dimensions and attributes

- Target Width: 6.63 Meters
- Target Height: 0.40 Meters
- Target Length: 16.92 Meters
- Target Shadow: 1.52 Meters
- Mag Anomaly:
- Avoidance Area:
- Classification1: wreck
- Classification2:
- Area:
- Block:
- Description: Possible wreck scatter

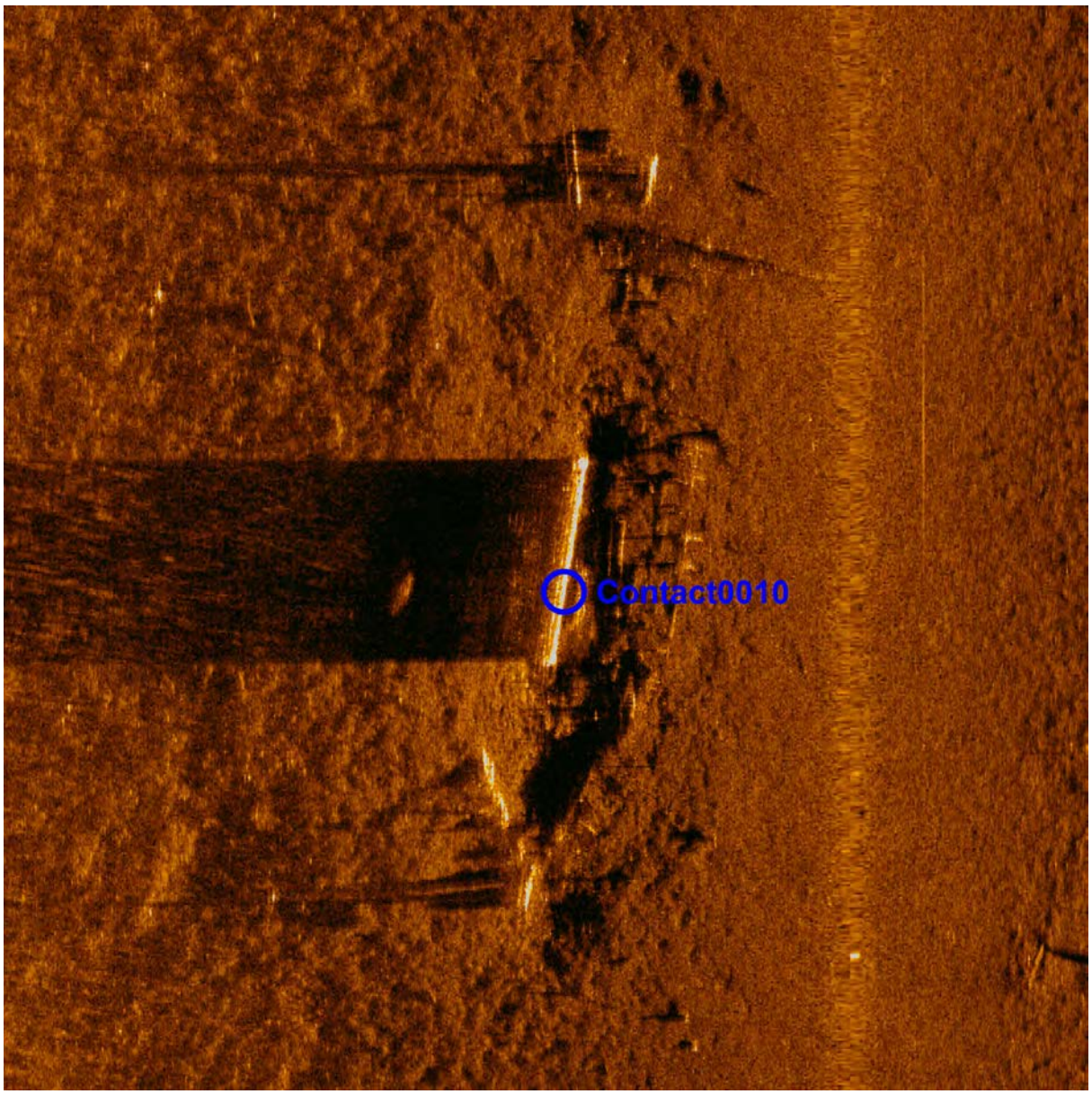


Contact0009

- Sonar Time at Target: 4/17/2021 6:15:02 PM
- Click Position
  35.5396657396 -77.0578843542 (WGS84)
  35.5395028714 -77.0582100528 (NAD27LL)
  35.5396657396 -77.0578843542 (LocalLL)
  (X) 313442.77 (Y) 3934840.51 (Projected Coordinates)
- Map Projection: UTM84-18N
- Acoustic Source File: U:\20210417_EdgeTech_Washington\20210417180153.jsf
- Ping Number: 318578
- Range to target: 23.61 Meters
- Fish Height: 1.39 Meters
- Heading: 90.900 Degrees
- Event Number: (-1)
- Line Name: 20210417180153
- Water Depth: 0.59 Meters

Dimensions and attributes

- Target Width: 6.64 Meters
- Target Height: 0.00 Meters
- Target Length: 24.89 Meters
- Target Shadow: 0.00 Meters
- Mag Anomaly:
- Avoidance Area:
- Classification1: wreck
- Classification2:
- Area:
- Block:
- Description: UAB 0061PMR - ECU Castle Island Wreck #11, probable ferry flat

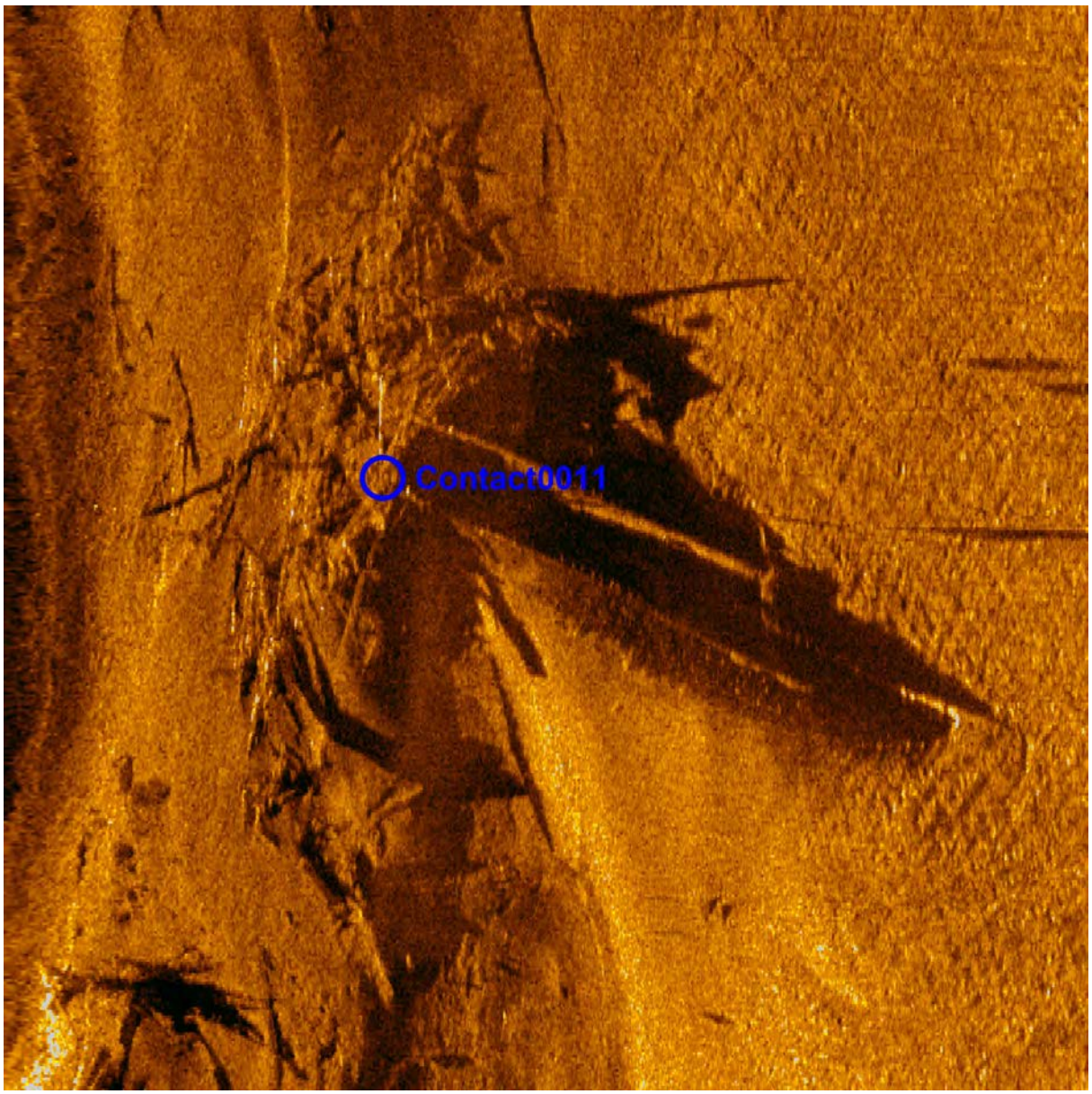


Contact0010

- Sonar Time at Target: 4/17/2021 5:34:53 PM
- Click Position
  35.5384813445 -77.0598246783 (WGS84)
  35.5383184648 -77.0601503090 (NAD27LL)
  35.5384813445 -77.0598246783 (LocalLL)
  (X) 313264.10 (Y) 3934712.80 (Projected Coordinates)
- Map Projection: UTM84-18N
- Acoustic Source File:
U:\20210417_EdgeTech_Washington\20210417172147.jsf
- Ping Number: 246554
- Range to target: 6.00 Meters
- Fish Height: 0.99 Meters
- Heading: 339.390 Degrees
- Event Number: (-1)
- Line Name: 20210417172147
- Water Depth: 0.48 Meters

Dimensions and attributes

- Target Width: 4.53 Meters
- Target Height: 0.22 Meters
- Target Length: 16.14 Meters
- Target Shadow: 1.75 Meters
- Mag Anomaly:
- Avoidance Area:
- Classification1: wreck
- Classification2:
- Area:
- Block:
- Description: Centerboard Wreck - probable bugeye oyster fishing vessel

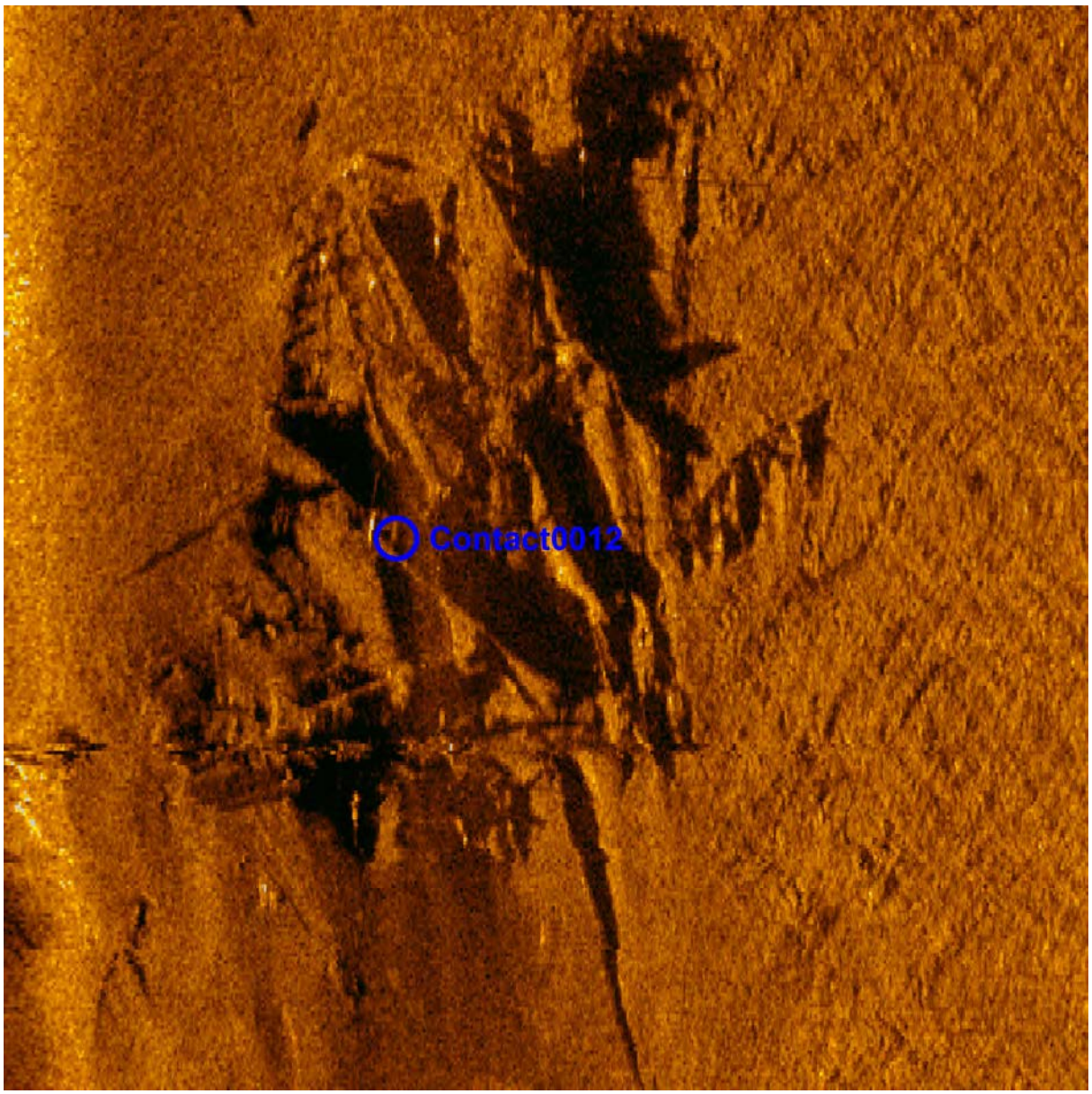


Contact0011

- Sonar Time at Target: 4/17/2021 5:08:31 PM
- Click Position
  35.5388737084 -77.0547807736 (WGS84)
  35.5387108246 -77.0551066227 (NAD27LL)
  35.5388737084 -77.0547807736 (LocalLL)
  (X) 313722.33 (Y) 3934746.78 (Projected Coordinates)
- Map Projection: UTM84-18N
- Acoustic Source File:
U:\20210417_EdgeTech_Washington\20210417170226.jsf
- Ping Number: 209116
- Range to target: 11.90 Meters
- Fish Height: 5.25 Meters
- Heading: 304.200 Degrees
- Event Number: (-1)
- Line Name: 20210417170226
- Water Depth: 0.78 Meters

Dimensions and attributes

- Target Width: 6.76 Meters
- Target Height: 0.00 Meters
- Target Length: 25.18 Meters
- Target Shadow: 0.00 Meters
- Mag Anomaly:
- Avoidance Area:
- Classification1: wreck
- Classification2:
- Area:
- Block:
- Description: Possibly UAB 0014PMR - ECU Castle Island Wrecks #1 and 2 - seem to be very disarticulated

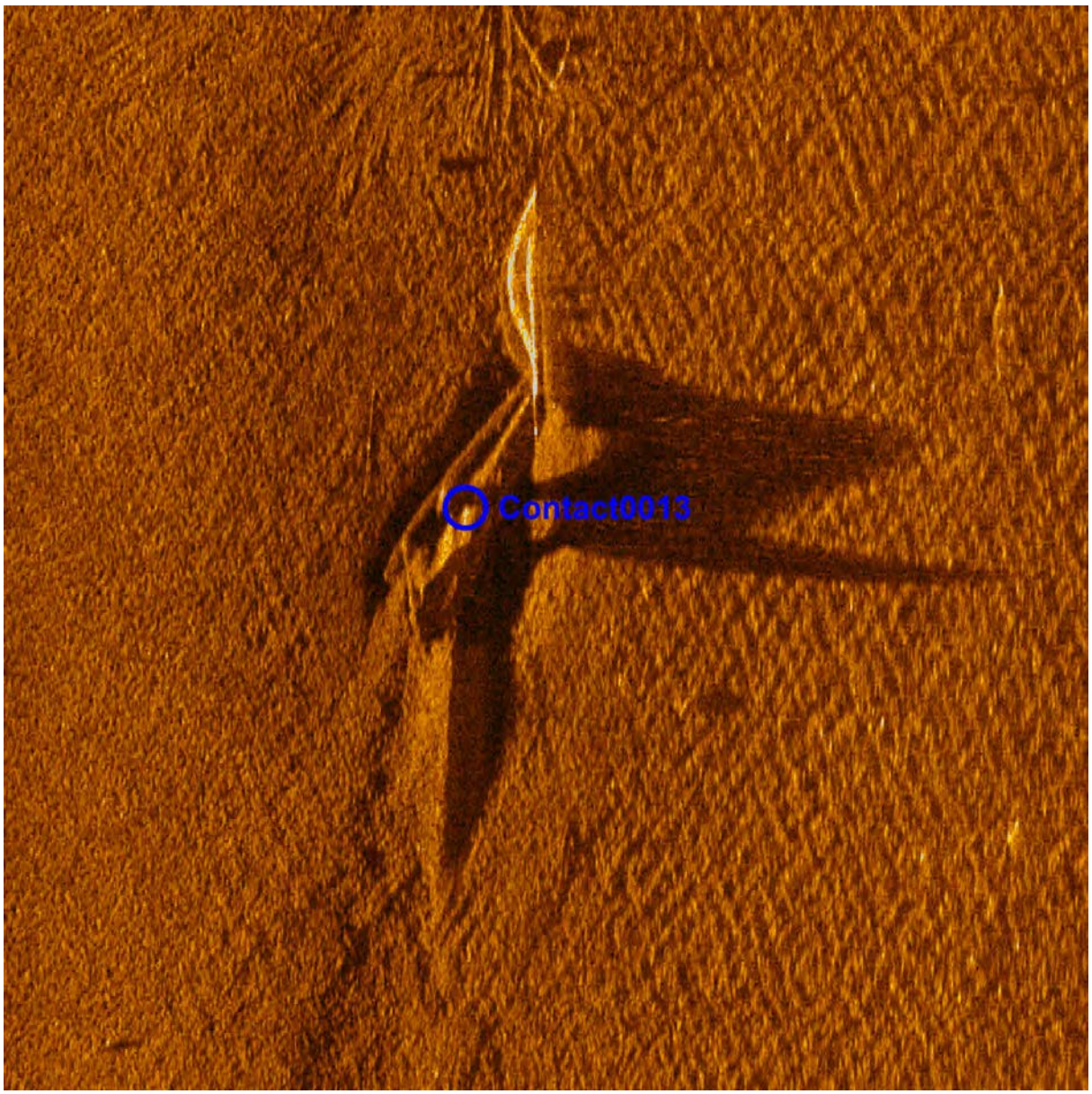


Contact0012

- Sonar Time at Target: 4/17/2021 5:08:51 PM
- Click Position
  35.5389487056 -77.0550282732 (WGS84)
  35.5387858232 -77.0553541101 (NAD27LL)
  35.5389487056 -77.0550282732 (LocalLL)
  (X) 313700.06 (Y) 3934755.56 (Projected Coordinates)
- Map Projection: UTM84-18N
- Acoustic Source File:
U:\20210417_EdgeTech_Washington\20210417170226.jsf
- Ping Number: 209401
- Range to target: 11.21 Meters
- Fish Height: 5.57 Meters
- Heading: 299.000 Degrees
- Event Number: (-1)
- Line Name: 20210417170226
- Water Depth: 0.81 Meters

Dimensions and attributes

- Target Width: 8.70 Meters
- Target Height: 0.00 Meters
- Target Length: 15.64 Meters
- Target Shadow: 0.00 Meters
- Mag Anomaly:
- Avoidance Area:
- Classification1: wreck
- Classification2:
- Area:
- Block:
- Description: Possibly UAB 0055PMR - ECU Castle Island Wreck #4

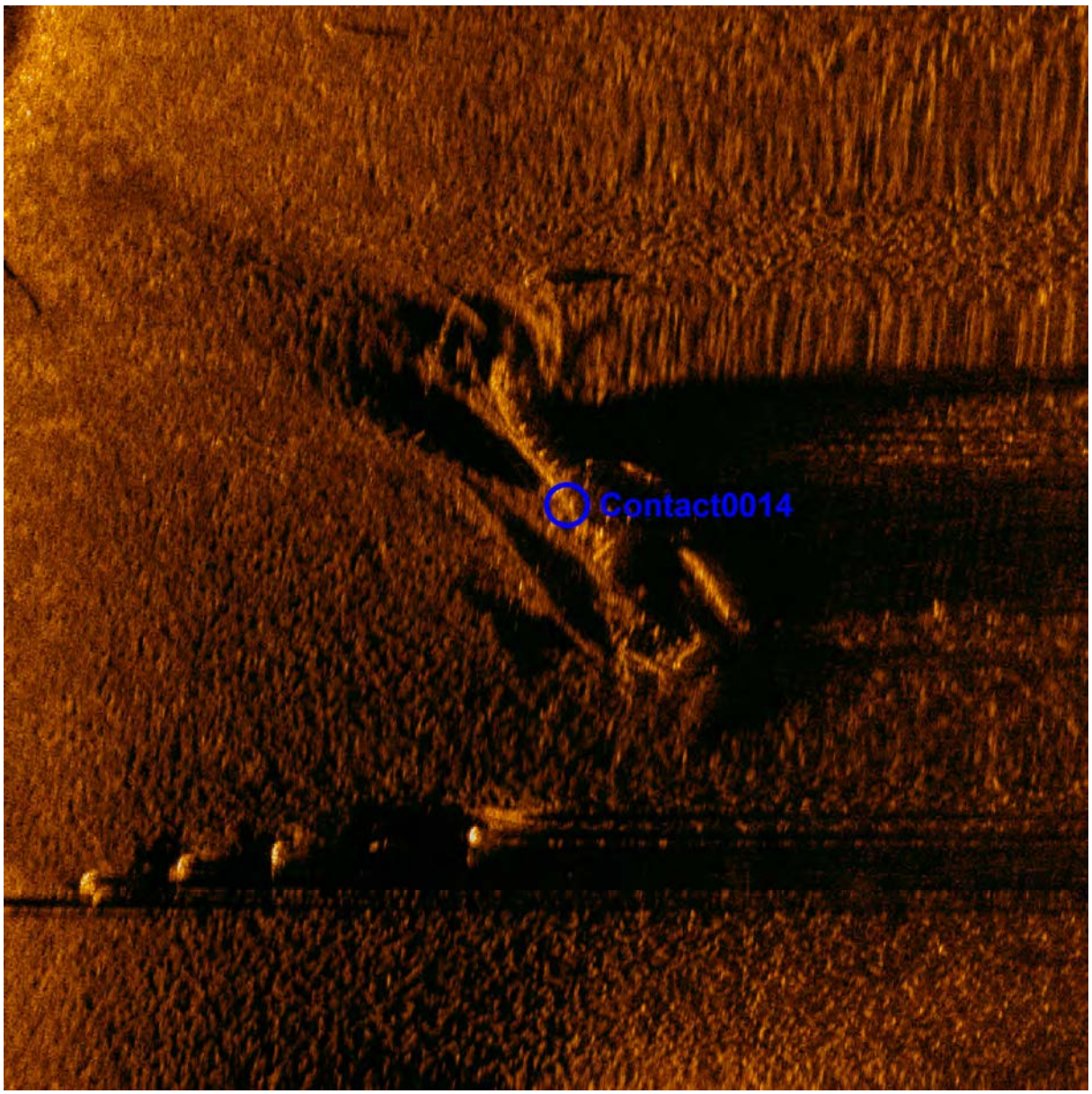


Contact0013

- Sonar Time at Target: 4/17/2021 5:09:45 PM
- Click Position
  35.5392356969 -77.0556503996 (WGS84)
  35.5390728192 -77.0559762043 (NAD27LL)
  35.5392356969 -77.0556503996 (LocalLL)
  (X) 313644.32 (Y) 3934788.58 (Projected Coordinates)
- Map Projection: UTM84-18N
- Acoustic Source File:
U:\20210417_EdgeTech_Washington\20210417170226.jsf
- Ping Number: 210181
- Range to target: 23.51 Meters
- Fish Height: 2.42 Meters
- Heading: 305.290 Degrees
- Event Number: (-1)
- Line Name: 20210417170226
- Water Depth: 0.80 Meters

Dimensions and attributes

- Target Width: 0.00 Meters
- Target Height: 0.00 Meters
- Target Length: 0.00 Meters
- Target Shadow: 0.00 Meters
- Mag Anomaly:
- Avoidance Area:
- Classification1: wreck
- Classification2:
- Area:
- Block:
- Description: Possibly UAB 0056PMR - ECU Castle Island Wreck #5

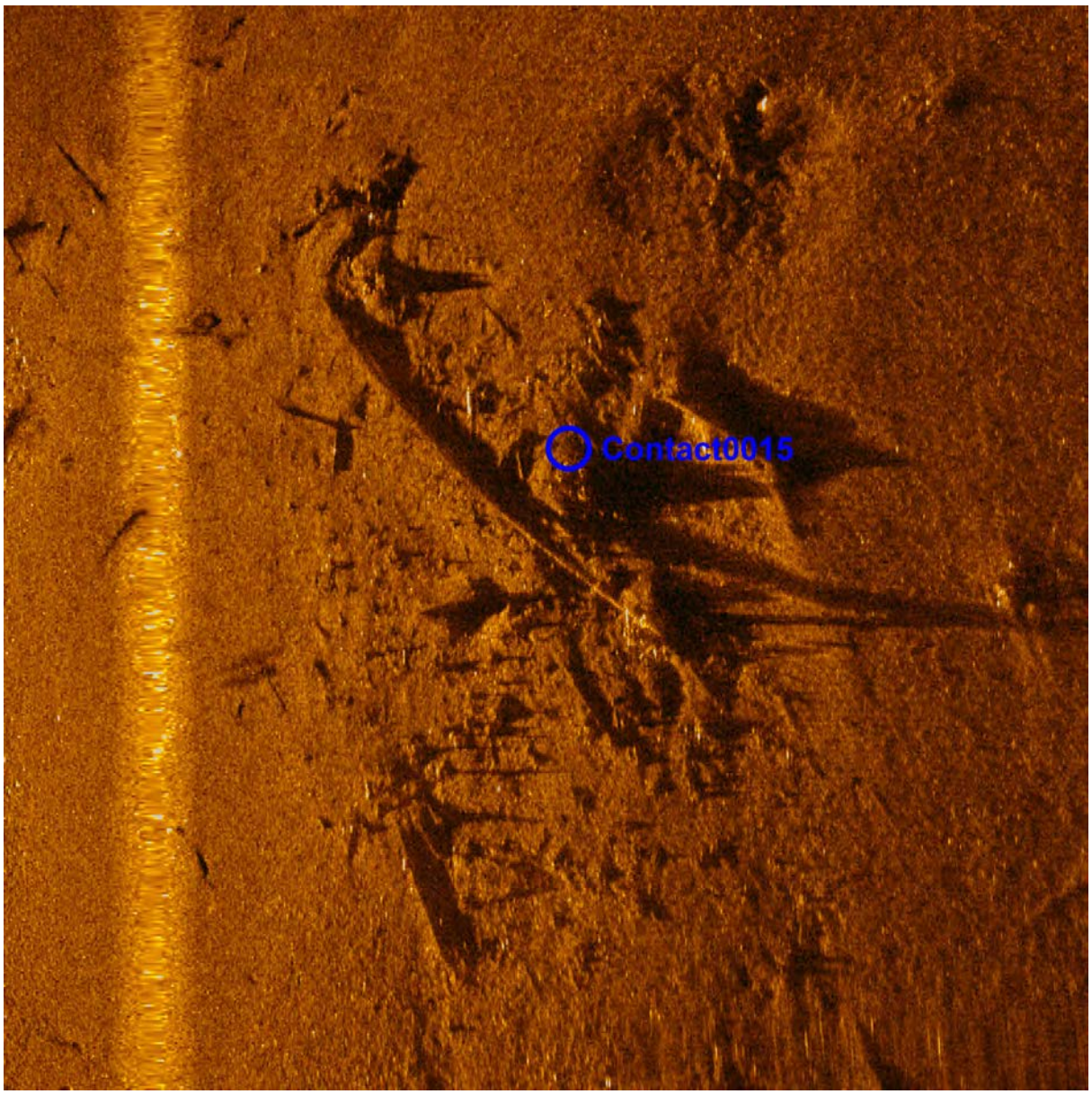


Contact0014

- Sonar Time at Target: 4/17/2021 6:24:35 PM
- Click Position
  35.5387694252 -77.0560105171 (WGS84)
  35.5386065423 -77.0563363131 (NAD27LL)
  35.5387694252 -77.0560105171 (LocalLL)
  (X) 313610.59 (Y) 3934737.53 (Projected Coordinates)
- Map Projection: UTM84-18N
- Acoustic Source File:
U:\20210417_EdgeTech_Washington\20210417182002.jsf
- Ping Number: 334339
- Range to target: 11.76 Meters
- Fish Height: 1.18 Meters
- Heading: 244.100 Degrees
- Event Number: (-1)
- Line Name: 20210417182002
- Water Depth: 0.57 Meters

Dimensions and attributes

- Target Width: 3.15 Meters
- Target Height: 0.00 Meters
- Target Length: 8.35 Meters
- Target Shadow: 0.00 Meters
- Mag Anomaly:
- Avoidance Area:
- Classification1: wreck
- Classification2:
- Area:
- Block:
- Description: Possibly UAB 0015PMR - ECU Castle Island Wreck #10

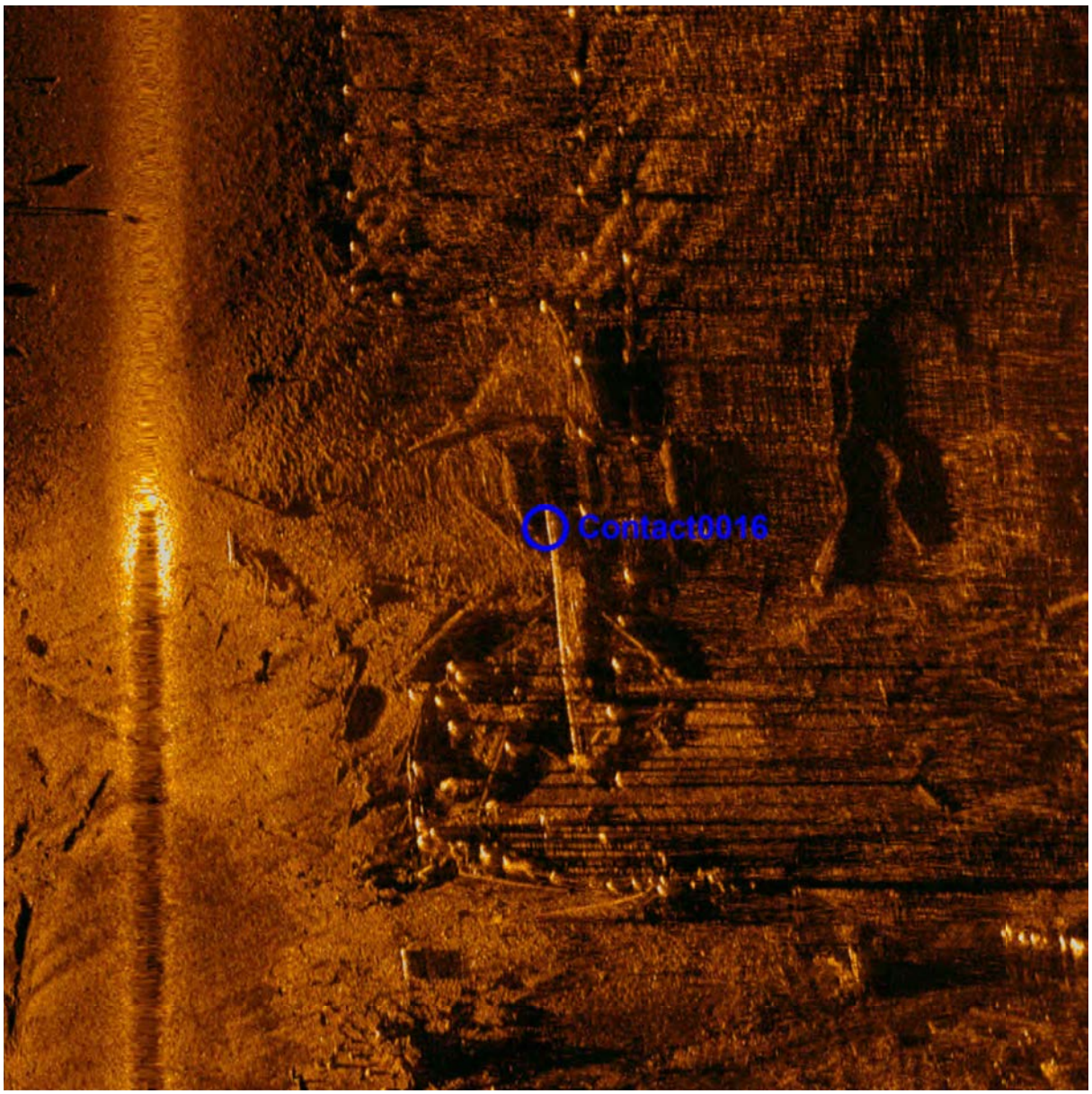


Contact0015

- Sonar Time at Target: 4/17/2021 5:15:53 PM
- Click Position
  35.5381067899 -77.0589600435 (WGS84)
  35.5379439039 -77.0592857185 (NAD27LL)
  35.5381067899 -77.0589600435 (LocalLL)
  (X) 313341.62 (Y) 3934669.61 (Projected Coordinates)
- Map Projection: UTM84-18N
- Acoustic Source File:
U:\20210417_EdgeTech_Washington\20210417170226.jsf
- Ping Number: 215416
- Range to target: 14.38 Meters
- Fish Height: 1.93 Meters
- Heading: 354.600 Degrees
- Event Number: (-1)
- Line Name: 20210417170226
- Water Depth: 0.78 Meters

Dimensions and attributes

- Target Width: 6.29 Meters
- Target Height: 0.36 Meters
- Target Length: 19.35 Meters
- Target Shadow: 3.27 Meters
- Mag Anomaly:
- Avoidance Area:
- Classification1: wreck
- Classification2:
- Area:
- Block:
- Description: Possible wreck scatter

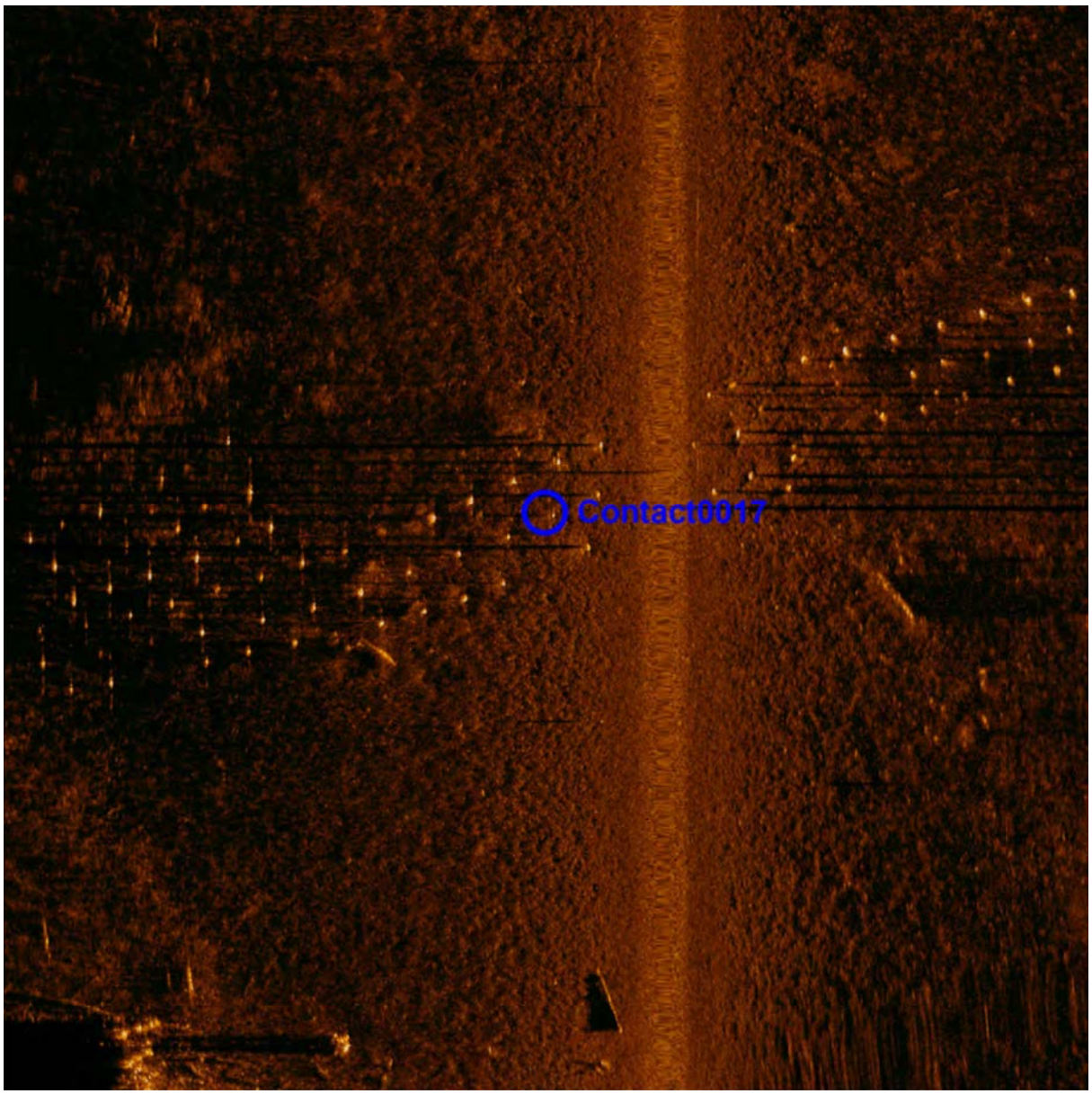


Contact0016

- Sonar Time at Target: 4/17/2021 4:57:56 PM
- Click Position
  35.5368763749 -77.0504128740 (WGS84)
  35.5367134582 -77.0507389490 (NAD27LL)
  35.5368763749 -77.0504128740 (LocalLL)
  (X) 314113.75 (Y) 3934516.96 (Projected Coordinates)
- Map Projection: UTM84-18N
- Acoustic Source File: U:\20210417_EdgeTech_Washington\20210417164558.jsf
- Ping Number: 200066
- Range to target: 18.35 Meters
- Fish Height: 1.07 Meters
- Heading: 27.890 Degrees
- Event Number: (-1)
- Line Name: 20210417164558
- Water Depth: 0.77 Meters

Dimensions and attributes

- Target Width: 0.00 Meters
- Target Height: 0.00 Meters
- Target Length: 0.00 Meters
- Target Shadow: 0.00 Meters
- Mag Anomaly:
- Avoidance Area:
- Classification1: historic structure
- Classification2:
- Area:
- Block:
- Description: Submerged infrastructure - possible marine railway or old bridge

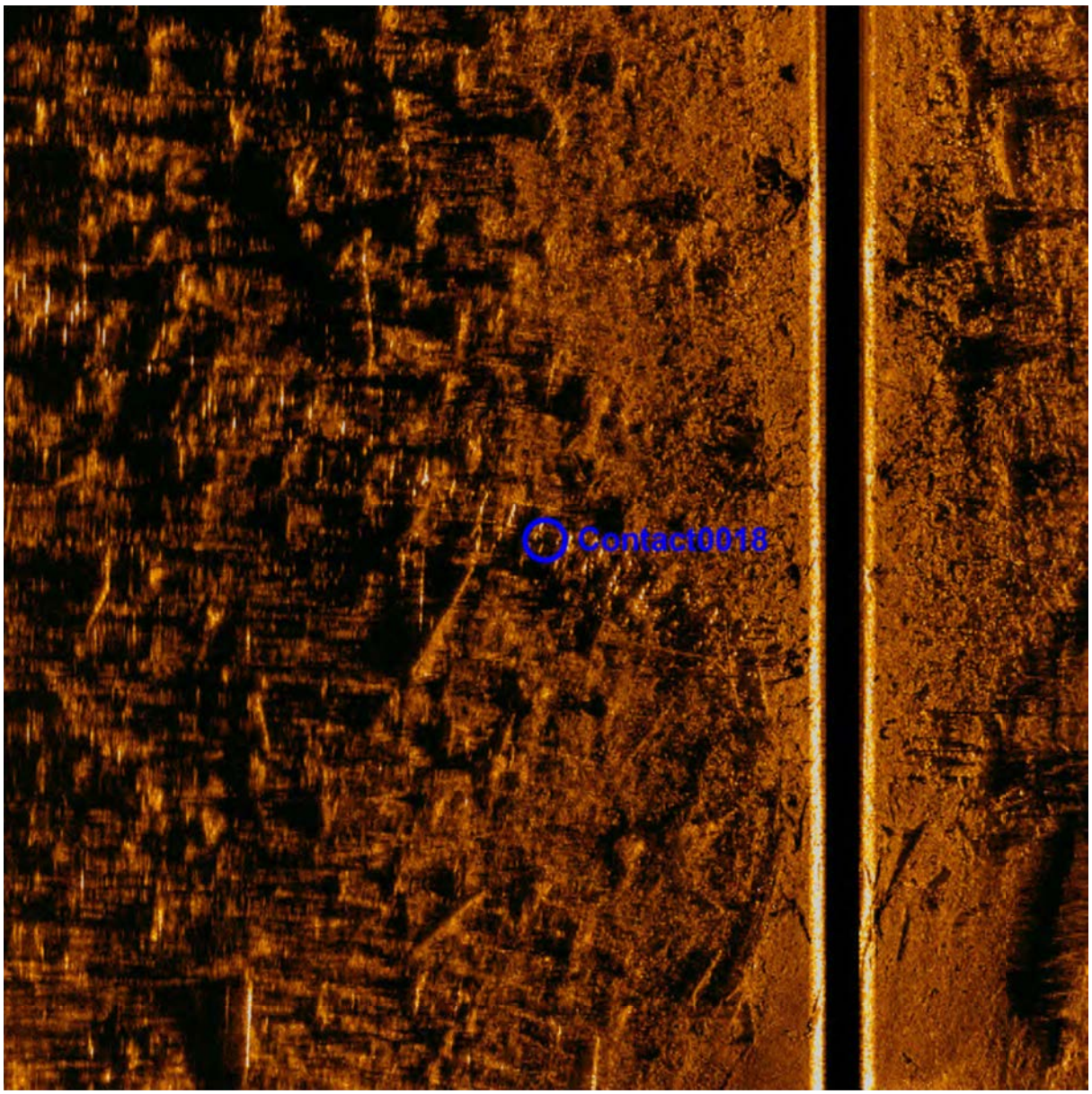


Contact0017

- Sonar Time at Target: 4/17/2021 5:46:48 PM
- Click Position
  35.5384237023 -77.0604372918 (WGS84)
  35.5382608230 -77.0607628960 (NAD27LL)
  35.5384237023 -77.0604372918 (LocalLL)
  (X) 313208.42 (Y) 3934707.57 (Projected Coordinates)
- Map Projection: UTM84-18N
- Acoustic Source File:
U:\20210417_EdgeTech_Washington\20210417174329.jsf
- Ping Number: 270738
- Range to target: 5.46 Meters
- Fish Height: 0.98 Meters
- Heading: 337.000 Degrees
- Event Number: (-1)
- Line Name: 20210417174329
- Water Depth: 0.52 Meters

Dimensions and attributes

- Target Width: 0.00 Meters
- Target Height: 0.00 Meters
- Target Length: 0.00 Meters
- Target Shadow: 0.00 Meters
- Mag Anomaly:
- Avoidance Area:
- Classification1: historic structure
- Classification2:
- Area:
- Block:
- Description: Submerged pilings

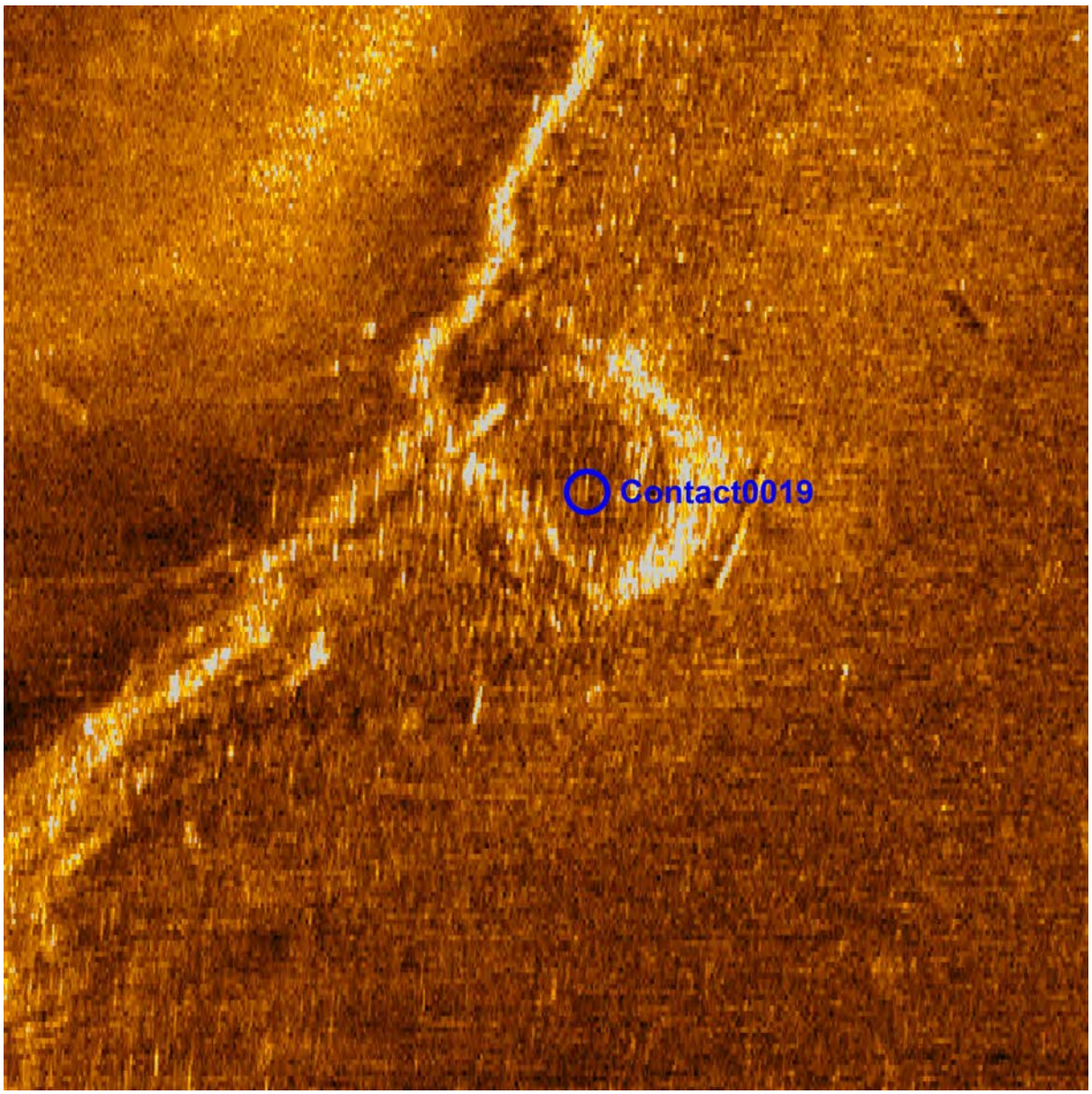


Contact0018

- Sonar Time at Target: 4/17/2021 4:16:33 PM
- Click Position
  35.5445854876 -77.0713663949 (WGS84)
  35.5444227066 -77.0716914185 (NAD27LL)
  35.5445854876 -77.0713663949 (LocalLL)
  (X) 312231.86 (Y) 3935411.87 (Projected Coordinates)
- Map Projection: UTM84-18N
- Acoustic Source File:
U:\20210417_EdgeTech_Washington\20210417154818.jsf
- Ping Number: 36442
- Range to target: 27.38 Meters
- Fish Height: 0.00 Meters
- Heading: 286.600 Degrees
- Event Number: (-1)
- Line Name: 20210417154818
- Water Depth: 0.92 Meters

Dimensions and attributes

- Target Width: 0.00 Meters
- Target Height: 0.00 Meters
- Target Length: 0.00 Meters
- Target Shadow: 0.00 Meters
- Mag Anomaly:
- Avoidance Area:
- Classification1: historic structure
- Classification2:
- Area:
- Block:
- Description: Submerged pilings - possible Civil War obstructions

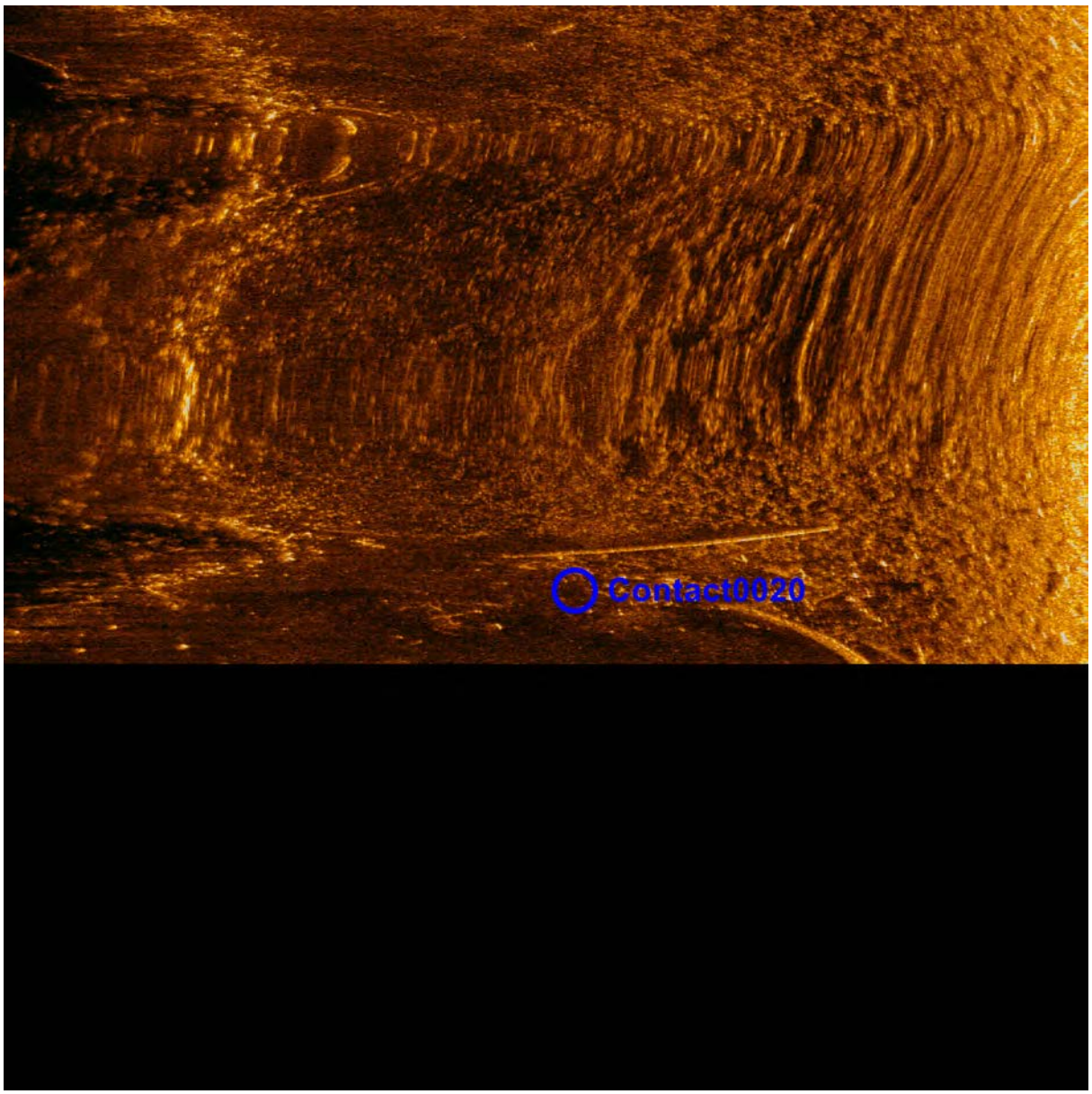


Contact0019

- Sonar Time at Target: 4/18/2021 3:10:46 PM
- Click Position
  35.4570298233 -76.8226223928 (WGS84)
  35.4568645635 -76.8229621993 (NAD27LL)
  35.4570298233 -76.8226223928 (LocalLL)
  (X) 334603.54 (Y) 3925254.20 (Projected Coordinates)
- Map Projection: UTM84-18N
- Acoustic Source File: U:\20210418_EdgeTech_Bath\20210418145716.jsf
- Ping Number: 24843
- Range to target: 48.36 Meters
- Fish Height: 2.16 Meters
- Heading: 30.890 Degrees
- Event Number: (-1)
- Line Name: 20210418145716
- Water Depth: 0.65 Meters

Dimensions and attributes

- Target Width: 7.46 Meters
- Target Height: 0.00 Meters
- Target Length: 11.76 Meters
- Target Shadow: 0.00 Meters
- Mag Anomaly:
- Avoidance Area:
- Classification1: debris
- Classification2:
- Area:
- Block:
- Description: Debris in possible location of prior UAB identified ballast pile



Contact0020

- Sonar Time at Target: 4/18/2021 5:10:12 PM
- Click Position
  35.4768229888 -76.8147486659 (WGS84)
  35.4766579993 -76.8150884264 (NAD27LL)
  35.4768229888 -76.8147486659 (LocalLL)
  (X) 335358.49 (Y) 3927436.55 (Projected Coordinates)
- Map Projection: UTM84-18N
- Acoustic Source File: U:\20210418_EdgeTech_Bath\20210418170654.jsf
- Ping Number: 99618
- Range to target: 8.04 Meters
- Fish Height: 0.54 Meters
- Heading: 137.800 Degrees
- Event Number: (-1)
- Line Name: 20210418170654
- Water Depth: 0.73 Meters

Dimensions and attributes

- Target Width: 1.33 Meters
- Target Height: 0.00 Meters
- Target Length: 9.81 Meters
- Target Shadow: 0.00 Meters
- Mag Anomaly:
- Avoidance Area:
- Classification1: historic structure
- Classification2:
- Area:
- Block:
- Description: Possible historic wharf