The Scuppernong River Project:
Volume 2
An Exploration of Tyrrell County Maritime Cultural Resources

Nathan Richards, Daniel Mark Brown, and Saxon Bisbee

Program in Maritime Studies
East Carolina University
Greenville, North Carolina

East Carolina University

Research Report No. 22 (2014)

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AN EXPLORATION OF TYRRELL COUNTY
MARITIME CULTURAL RESOURCES

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By

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Cover: ECU research vessel *Viper* and research team at the Columbia Town Docks, fall 2011 (Photo: John McCord, UNC-Coastal Studies Institute)

Cover design concept: Nadine Kopp.

DEDICATION

This publication is dedicated to the side scan sonar sensor lost due to the unfortunate error of an unnamed individual (who may or may not be a co-author of this report). Your sacrifice wasn't in vain. Rest in peace, little buddy. Thanks to the other participants on the "Scuppernong Voyages" for upholding their end of our "Spartacus agreement."

ACKNOWLEDGEMENTS

This project and the products that have emerged from it would not have been possible without the assistance of a congregation of people from a host of institutions across Eastern North Carolina. From the outset, this project was designed with collaboration at its core. In investigating the history and archaeology of Tyrrell County, we wanted this to be a project that left something for the people of the area to have once we packed up and returned from where we came. We hope that our work lives up to their expectations.

First and foremost, we owe our thanks to the team of people who conducted the survey and were co-authors of the first Scuppernong Project report: Daniel Bera, John Bright, Dan Brown, David Buttaro, Jeff O'Neill, and William Schilling. Thanks also to Priscilla Delano and Bill Smyth for their proof reading efforts.

At the UNC-Coastal Studies Institute, John McCord and David Sybert were involved in every facet of the project; not only did they coordinate local outreach and education events and film activities for a short documentary, but they also "took the plunge" when instrumentation disappeared into the tea-stained Scuppernong. Though not co-authors, they were an integral a part of the team and were there with us every step of the way. Nancy White, whose discussions with the Program in Maritime Studies (Larry Babits) and Pocosin Arts Folk School (Feather Phillips) created the incentive to undertake this program, helped with funding and catering, and supported us at each step in the process. Robert McClendon was pivotal early in the project in helping guide community discussions that set the themes of historical investigation and formed our research framework. Additionally, the UNC-Coastal Studies Institute Foundation (in particular, Bill Massey) is owed our thanks for providing the funding to gather the community of Columbia for a half day symposium and reception to celebrate the end of the data collection phase. Lauren Rotsted and Bran Mims (both graduate students at East Carolina University) also provided much appreciated research assistance. Bran in particular delved deep into archival sources pertaining to the operational life of the ship *Estelle Randall.*

As well as providing us with lodging for the twelve days of the project, the Pocosin Arts Folk School provided us with access to knowledge, people, and resources that meant we could work and teach efficiently. Feather Phillips was at the core of this project in every way – literally nothing could have happened without her knowledge and expertise. So too Karen Clough repeatedly went out of her way to assist us with anything we needed. The hallmark of a great partnership is when a project goes off without a hitch. A new word should be invented for when project partners anticipate and enhance your labors. The good humor and laughter that was omnipresent at Pocosin was something that infected our effort.

The Town of Columbia was equally gracious in their support of our work. Without access to the town dock and a power supply to recharge our batteries, none of the archaeological work could have occurred. Mayor Michael Griffin and Town Manager Rhett White are owed our thanks. Additionally, a number of other organizations were critical in assisting with our data collection. Their local knowledge was always offered without hesitation, and we hope this work does their expertise justice. This included individuals at the Tyrrell County Public Library (Debbie Davenport and Linda Markham) and the Tyrrell County Register of Deeds (Melanie Armstrong and Gene Reynolds).

One of the special components of this project was the significant investment of the local community. This came in many ways – offers of lodging, and donations of meals at local restaurants, and numerous home cooked meals – and, so important to research: *overflowing local knowledge*. These generous community partners included Clay Causey, Pebble Causey, Ray Davenport, Walter Davenport, Mike Griffin, Sue Griffin, Charlie Ogletree, Midge Ogletree, Dot Redford, Bill Smyth, Frances Smyth, Debbye Utz, Dwight Utz, Doris VanDorpe, Sonny VanDorpe, and Lauren Heesemann. Willy Phillips and Feather Phillips, owners of the Full Circle Crab Company need to be singled out for taking project meals to new decadent heights.

Last but not least we must also acknowledge the assistance of the Partnership for the Sounds and the Pocosin Lakes National Wildlife Refuge who provided us with access to the classrooms and lecture hall of the Walter B. Jones, Sr. Center for the Sounds for our periodic outreach and education programs over the semester. Here Howard Phillips and Tami Phillips in particular are due our heartfelt thanks.

It should be noted that this project was planned well before Hurricane Irene visited Eastern North Carolina, and it happened in its wake. Despite Irene's ravages, the residents of Tyrrell County still welcomed us with open arms and embraced the project and its participants. This is a testament to their character and resilience. It cannot be overstated – this support will never be forgotten.

Funding for this project was provided by ECU's division of Academic Affairs (for boat fees accrued during instruction), the Program in Maritime Studies at East Carolina University (equipment and car fuel), and the UNC-Coastal Studies Institute (boat fuel).

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INTRODUCTION

As outlined in a previous report (Richards et al. 2012), in the fall of 2011, students and personnel affiliated with the Program in Maritime Studies (East Carolina University) and the UNC-Coastal Studies Institute commenced the process of collating a submerged cultural resources inventory of the Scuppernong River and adjacent Bull Bay. This area was of interest because of its long history of settlement and the prominent role of maritime industries in Tyrrell County. Researchers hoped that this resource inventory would serve a number of purposes. First, as a record of the area, it could be used to ensure future land and waterway modification or use does not inadvertently have a negative impact upon archaeological sites in the area (i.e. advertising their existence would allow for their avoidance or may prioritize a need to examine the sites in depth). Second, it could provide a reevaluation of presently known cultural resources that had not been inspected by archaeologists since the early 1990s. Third, it was felt that these resources represent education and tourism opportunities and if better understood may provide for social, cultural, and economic benefit to the region. Last, but not least, we hoped to open the area up to other research initiatives.

The study area chosen for the project (Figure 1) covered the entirety of the Scuppernong River (about 9 miles from Lake Phelps to Creswell, 12 miles from Creswell to Columbia, and about 4.5 miles to the mouth of Bull Bay), Bull Bay (about 3 miles by 7 miles in maximum extent, approximating to 13 square miles), including a number of tributaries (Bull Creek, Deep Creek, Bunton Creek, Mauls Creek, Riders Creek, and Second Creek) and canals (Moccasin Canal, Mountain Canal, Thirty Foot Canal, Transportation (or Collins, or Old) Canal, Bonarva Canal, Bee Tree Canal, and Somerset Plantation Canal). This area encompasses a number of towns and settlements within Tyrrell County, such as Columbia (previously known as "Shallops Landing" and "Elizabeth Town"), River Neck, Colonial Beach, Norman Smith Legion Beach, Mill Point, and Travis; and to a smaller degree, Washington County (the town of Creswell). The survey area also included shorelines which are a part of Pettigrew State Park (part of the 112,000 acre Pocosin Lakes National Wildlife Refuge). While outside of the study area, adjacent Lake Phelps is noteworthy due to the location of the Somerset Place Plantation along its shores (an important destination connected to the Scuppernong River in the 1700s) and also the location of almost thirty buried canoes, five of which have been recovered, and are now located at the North Carolina Museum of History, Pettigrew State Park, the North Carolina Estuarium (Washington, NC), and the Port O' Plymouth Maritime Museum (see Curci 2006). While Lake Phelps was not a part of the 2011 study area, the environmental conditions noted by Curci (2006:76) regarding Lake Phelps may indicate that cultural resources residing in the Scuppernong River and Bull Bay exist in environmental conditions conducive for the preservation of submerged maritime archaeological sites.

Figure 1. Portion of Tyrrell County studied in 2011, including the location of the study area within North Carolina. (Image by Nathan Richards, 2011).

Maritime archaeological research in the study area commenced in 1988 with a collaboration between Tyrrell County and the North Carolina Underwater Archaeology Branch (NCUAB) focused on impending impacts to cultural resources in Columbia – in particular potential alterations to historic shipwreck 0001SCR (*Estelle Randall,* 1898-1910) and other abandoned or wrecked watercraft (0002-0006SCR) along the historic waterfront (Figure 2). The inspection, recording, and in some cases, recovery and conservation of artifacts, machinery, and ship's timbers within the context of this collaboration continued until at least 1992.

After the NCUAB's investigations, there is no other record of other maritime archaeological research occurring in the area, although there was preparation for such. In particular, East Carolina University used the Scuppernong River and Bull Bay in field training exercises ("desktop surveys") emulating the project planning process for a comprehensive submerged cultural resources inventory of the area. In 2002, students enrolled in Dr. Lawrence E. Babits' HIST6805*: History and Theory of Nautical Archaeology* class were tasked with researching the history and potential cultural resources of coastal North Carolina counties. One assignment by Matthew Brenkle commenced the task of assembling information on the maritime history and potential maritime archaeological resources of the entirety of Tyrrell County, the area within which this present study resides (Brenkle 2003).

In 2004, students enrolled in Dr. Nathan Richards' *HIST6820: Research Methods in Nautical Archaeology* were similarly tasked with compiling a synopsis of the maritime history and archaeology of waterways and embayments within North Carolina. These assignments were not county-based, but were waterway-focused. Two assignments by Erica Seltzer (Bull Bay) and Chris McCabe (Scuppernong River) outlined some of the potential cultural resources of the two main waterways within the study area (McCabe 2004; Seltzer 2004). These became useful starting points for planning additional maritime historical and archaeological research.

Other than these sources, the design of the remote sensing survey (side scan sonar and magnetometer survey) to occur in September of 2011 began in the archives of the North Carolina Underwater Archaeology Branch, and then extended into primary and secondary historical sources housed at East Carolina University's Joyner Library, Columbia's Pettigrew Library, and Manteo's Outer Banks History Center. This initial search of the literature informed the research team regarding the potential types of cultural resources that could constitute the maritime archaeological record of the Scuppernong River and Bull Bay. This in turn assisted researchers in the design of a remote sensing methodology where site types, wreck dimensions, and other details could be matched to sensor trawling depths and lane spacing--allowing for the maximum potential for site discovery and characterization.

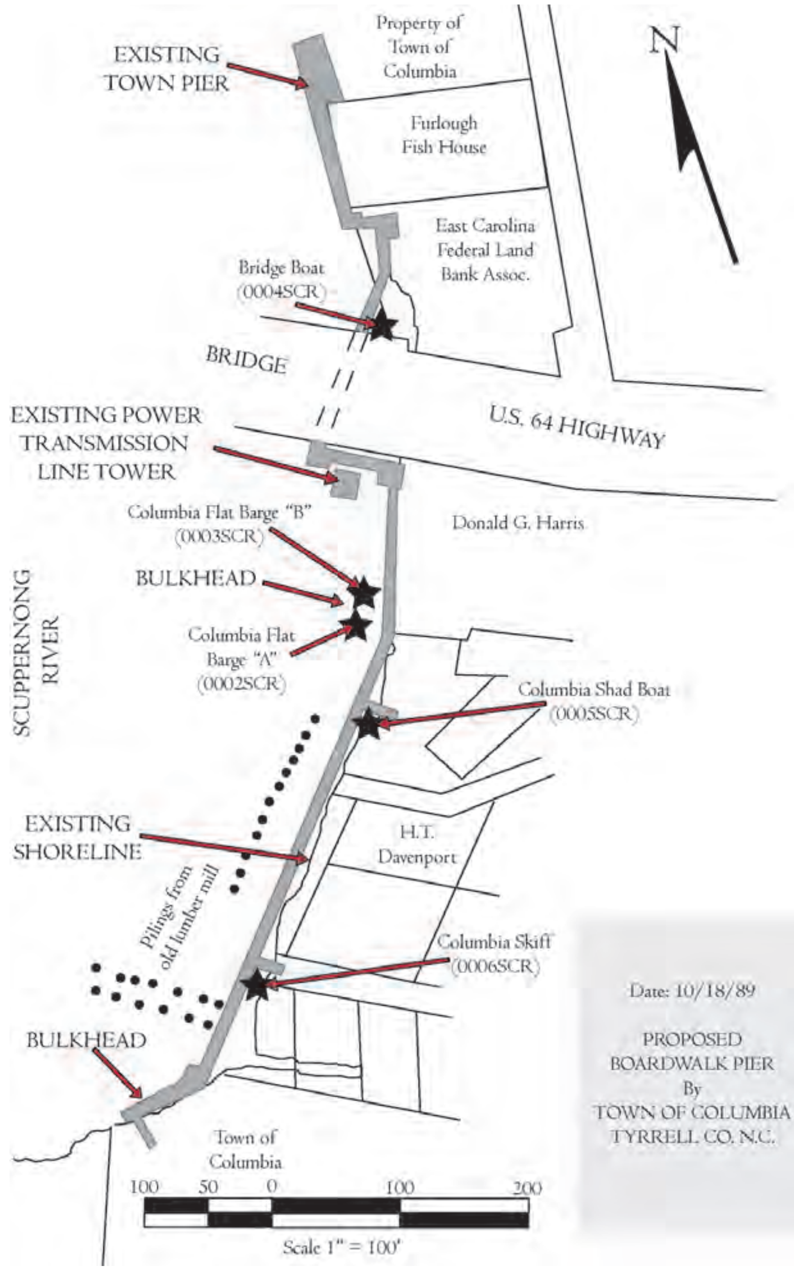

Figure 2. Adaptation of image of historic waterfront, showing location of known wrecked and abandoned watercraft, 18 October 1989. (Image by Nathan Richards, 2011, after North Carolina Department of Cultural Resources).

The following sections outline the research and remote sensing methodology followed by the results of site-specific historical research and side scan sonar and magnetometer survey. The report ends with a conclusion which assesses the results of the project and points to future potential projects in the area.

PROJECT METHODOLOGY

Following a review of previous research undertaken by members of the NC Underwater Archaeology Branch and students at East Carolina University's Program in Maritime Studies, 2011 project participants followed a multi-phase research methodology covering initial research, fieldwork, analysis, dissemination of results, and extension. Each of these phases is outlined in chronological order below.

Phase 1: Preliminary Research (Spring 2011)

An initial examination of historical sources was conducted to familiarize and extend the research team's understanding of the history and maritime archaeology of the region. The main sources of information came from available cartographic sources (maps and charts), local and state newspapers, Federal government reports (from agencies such as the Army Corps of Engineers, US Life Saving Service, and the Department of Commerce) as well as archival sources located at Elizabeth City's Museum of the Albermarle (Meekins Collection), Manteo's Outer Banks History Center, the NC Underwater Archaeology Branch at Kure Beach, and Joyner Library at East Carolina University in Greenville. Information with spatial information was integrated into a Geographical Information System which would later assist with prioritizing remote sensing operations (see Figure 3). The results of this research has been presented in *The Scuppernong River Project, Volume 1: Explorations of Tyrrell County Maritime History* (Richards et al. 2012), with further results communicated later in this volume.

Phase 2: Fieldwork Planning

Fieldwork focused on the deployment of two remote sensing technologies – side scan sonar and magnetometry. The pairing of these two tools occurred for didactic purposes (i.e. allowing for one instructor to teach two technologies simultaneously) but also allowed for the detection of cultural resources which may be lying on the riverbed, and also buried in sediment or obscured by other natural features (such as sunken logs).

Side scan sonar is a remote sensing technology that utilizes the properties of acoustic energy and water. Sound requires a medium through which to travel and is affected by the characteristics of that medium. A side scan sonar sensor creates and emits an acoustic wave at a particular frequency (called a "ping"). Objects underwater absorb only a portion of the energy of an acoustic wave depending on the object's density; the remaining energy is reflected back to its source at the same frequency. Denser objects such as iron will reflect more of this energy and will give a stronger "return." Even differences in the density of submerged wood can be interpreted from the strength of the return. Oak, for example, because it is a hardwood will register a more intense signal than soft woods such as cypress or pine (Fish and Carr 1990:22-24).

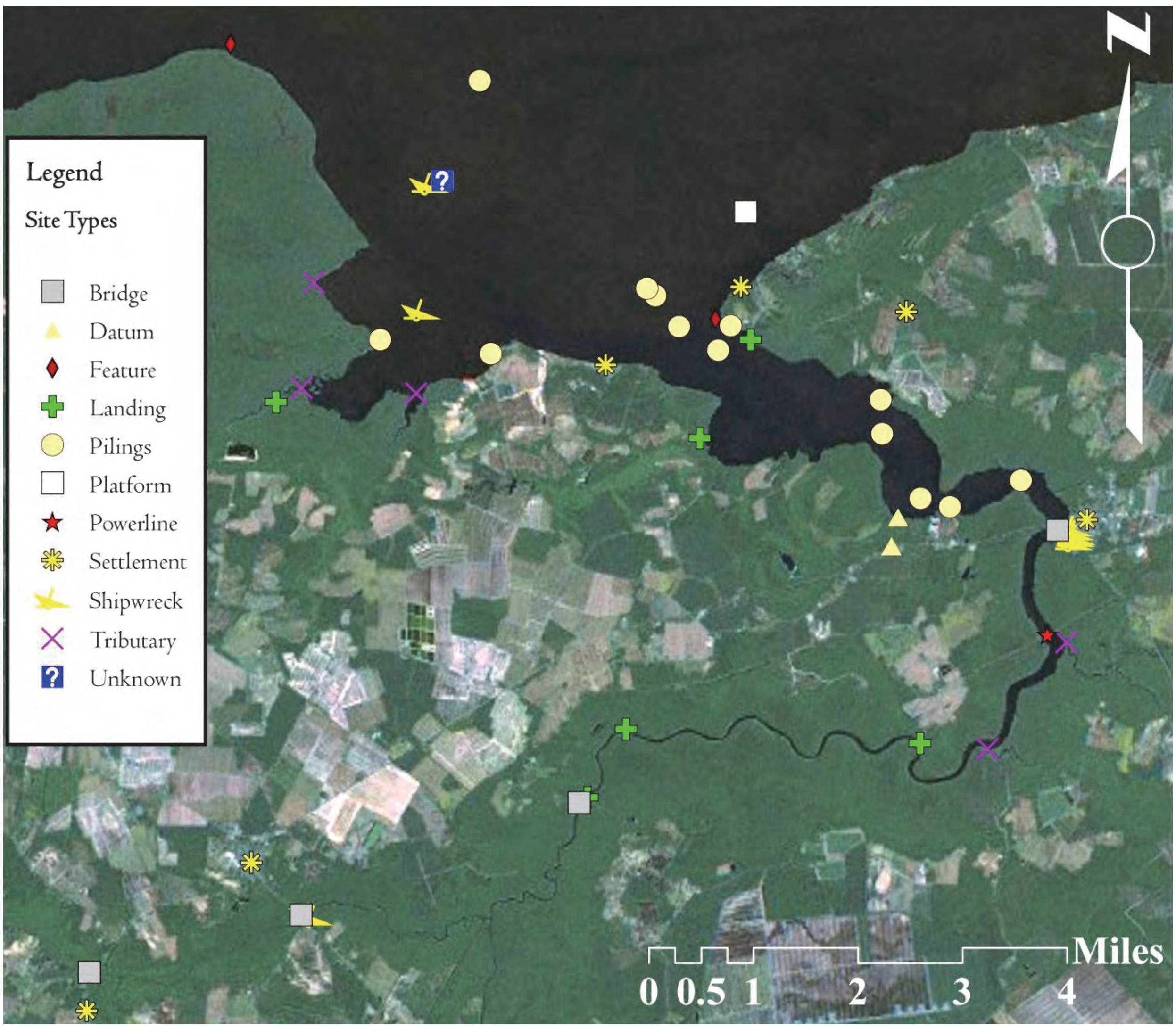

Figure 3. Bull Bay and the Scuppernong River, area and potential targets designated for survey by Nathan Richards. (Image by Nathan Richards, 2011).

The sonar technology used in the survey of the Scuppernong River is considered active sonar because an acoustic wave of known characteristics is created and emitted into the water column (passive sonars detect sounds produced in the water without sending out any acoustic signals of their own). Active sonars are in essence echo sounders with projectors and hydrophones integrated into what is called a transducer. Acoustic waves are emitted into the water column according to a "ping cycle," made up of four stages: ping generation, dissemination of the sound wave through the water column, echo of the wave off the bottom or object, and reception of the wave echo. The resulting image is usually known as a sonogram or a sonar tile (Figure 4).

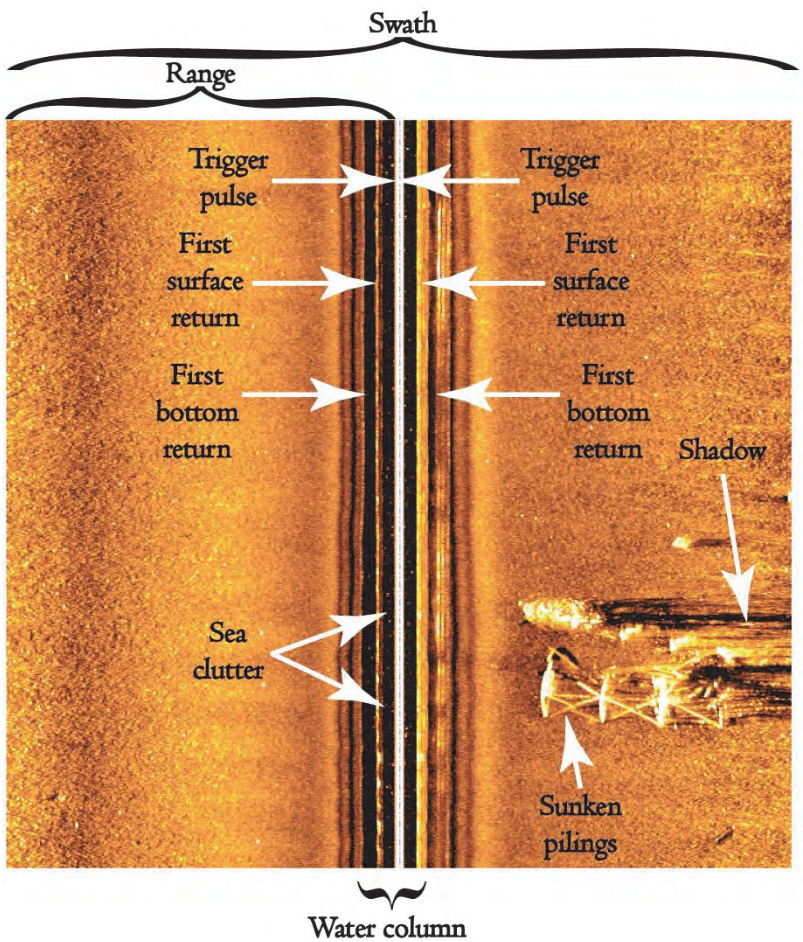

Figure 4. Example of unprocessed sonar data, showing the components of a representative sonogram. In this case, the sonogram shows the remains of the Laurel Point Lighthouse (Marine Sonics 500kHz, 50 meter swath). (Image by Nathan Richards, 2014).

Magnetometry, on the other hand is passive remote sensing technology that maps the local disturbances in the earth's magnetic field patterns. This is done with an instrument called a magnetometer. While there are many different types of magnetometers they work on the same basic principles. Planet Earth essentially acts as a giant bar magnet, with field lines (the strength of which are measured in gammas, abbreviated as γ, or nanoTeslas abbreviated as nT) passing between the North and South poles. The magnetism of the planet is created by the rotation of the different layers within the Earth, including the almost purely iron core. Iron is one of the most magnetic materials, although many metals exhibit magnetic properties to a lesser extent. Because pure metals are rarely found in nature (and especially in areas with very little rock such as Eastern North Carolina), magnetometers can read the disturbances created by large concentrations of magnetic material. These materials usually originate due to human activity (see Breiner 1999).

Magnetometers can pick up any local disruption in the planet's magnetic field caused by a nearby mass of metal. Coupled with a global positioning system (GPS), the spatial locations of the disturbances can be mapped, the field between readings interpolated, and the resulting data contoured (see Figure 5). This makes them extremely useful for helping to find buried ferrous (iron and steel) objects submerged beneath the rivers and oceans, such as sunken ships. Even wooden vessels can be found in this manner due to the abundance of metal fasteners. When coupled with another remote sensing tool such as side-scan sonar, magnetometry becomes a very reliable process for discovering human-made materials. It is for this reason that sonar and magnetometer devices are the two technologies most commonly used by maritime archaeologists during a remote sensing survey of any water body of interest.

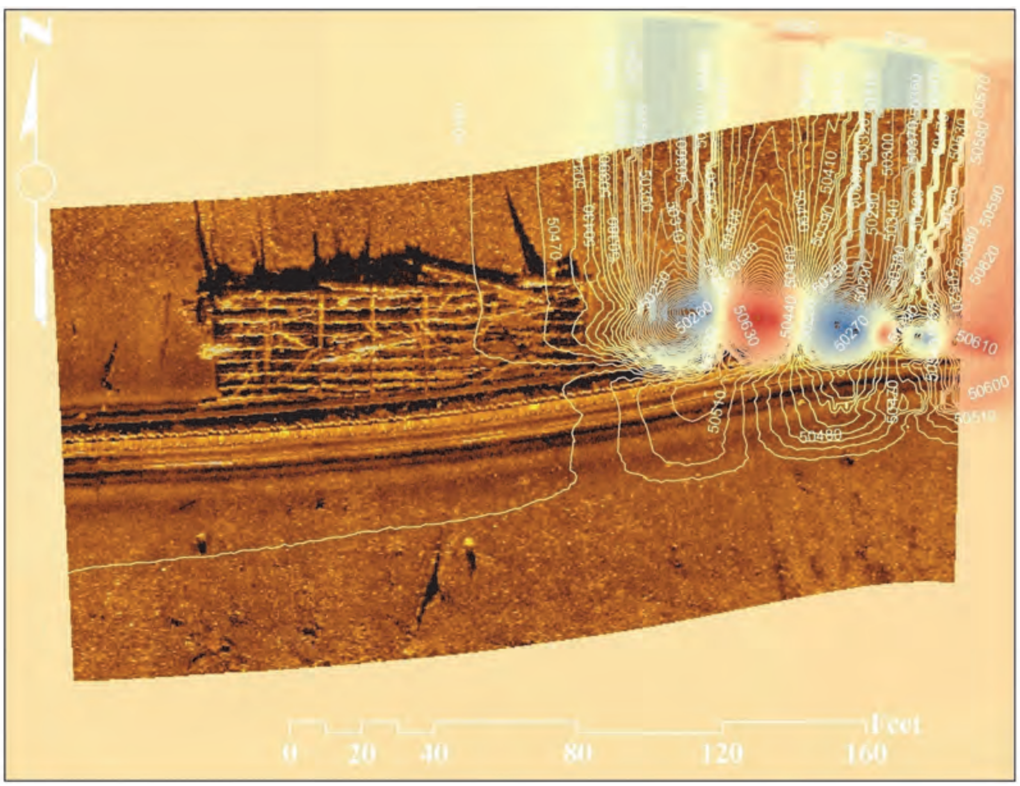

Figure 5. Example of contoured magnetometer information superimposed on a georectified side scan image. Contours have been offset to show alignment with sonar target. (Image by Nathan Richards, 2011).

The added benefit of deploying these tools simultaneously is that it significantly boosts the archaeologist's ability to interpret underwater features. In rivers, for example, a shipwreck may become a submerged obstacle as it settles on the river bed, accumulating sunken logs over time and becoming a "log jam" (a large concentration of submerged trees in one location). This log jam, obscuring the shipwreck underneath it might be noticed by a researcher on a sonar image, but without a corresponding magnetic signature from a magnetometer may be interpreted as a naturally-occurring pile of submerged trees, and not seen as a significant cultural anomaly. Likewise, a magnetic signature recorded during a magnetometer survey, while potentially an object constructed by humans may not be a site of relevance to a targeted search and may belong to some kind of modern debris (or trash) unless a sonogram accompanying the signature can give some kind of visual context by which the magnetic readings are interpreted.

With preliminary historical information from Phase 1 giving an impression of what cultural resources might be encountered under the waters of the Scuppernong River and Bull Bay, a remote sensing survey was designed in a software program *Sonar.Wiz 5* (by Chesapeake Technology) to determine coverage, operations, and costs (see Figure 6). Due to the sampling rates of the instrumentation, the two remote sensing techniques that were used (side scan sonar and magnetometry) required different operational procedures. As the acquisition of high resolution sonar imagery required much slower boat speeds (an approximate maximum speed of 2.5 knots/2.87miles per hour/4.63 kms per hour), and because the research team deployed side scan and magnetometry instrumentation simultaneously, the magnetometer was used in accordance with lane spacing designed with the needs of the side scan sonar in mind. The design also aimed to ensure a minimum of 50% overlap of sonar data (each sonar image would overlap at least this much with any parallel sonogram) – ensuring no gaps in coverage, and allowing for any mid-channel sites to be seen from two perspectives. Two main areas within the Scuppernong-Bull Bay environment were defined in this way:

Area 1: The Scuppernong River (below Mill Point to below Spruills Bridge) was the first priority area for comprehensive coverage. The survey of this area was constrained by the narrow waterways of around 10 feet (3 m) water depth which could be insonified with few passes at a high resolution of 20 meters range (40 meters swath).

Area 2: The much larger expanse of Bull Bay (above Mill Point to Albemarle Sound), was the second priority area for comprehensive coverage. This much wider area with water depths up to 18 feet (5.4 m) required multiple parallel passes. As the time allotted for survey made it unlikely that the entire area would be covered, and because there were fewer resources mentioned in historical records to be lying in the area, the range of the sonar was opened up to a 50 meter range (100 meter swath). Cultural resources discovered in the area upon post-processing were re-imaged at 10 or 20 meter range (20 and 40 meter swath, respectively). In the case that creeks of Bull Bay were to be surveyed, they would be recorded in a single pass at a 10 or 20 meter swath – but this never occurred due to time limitations.

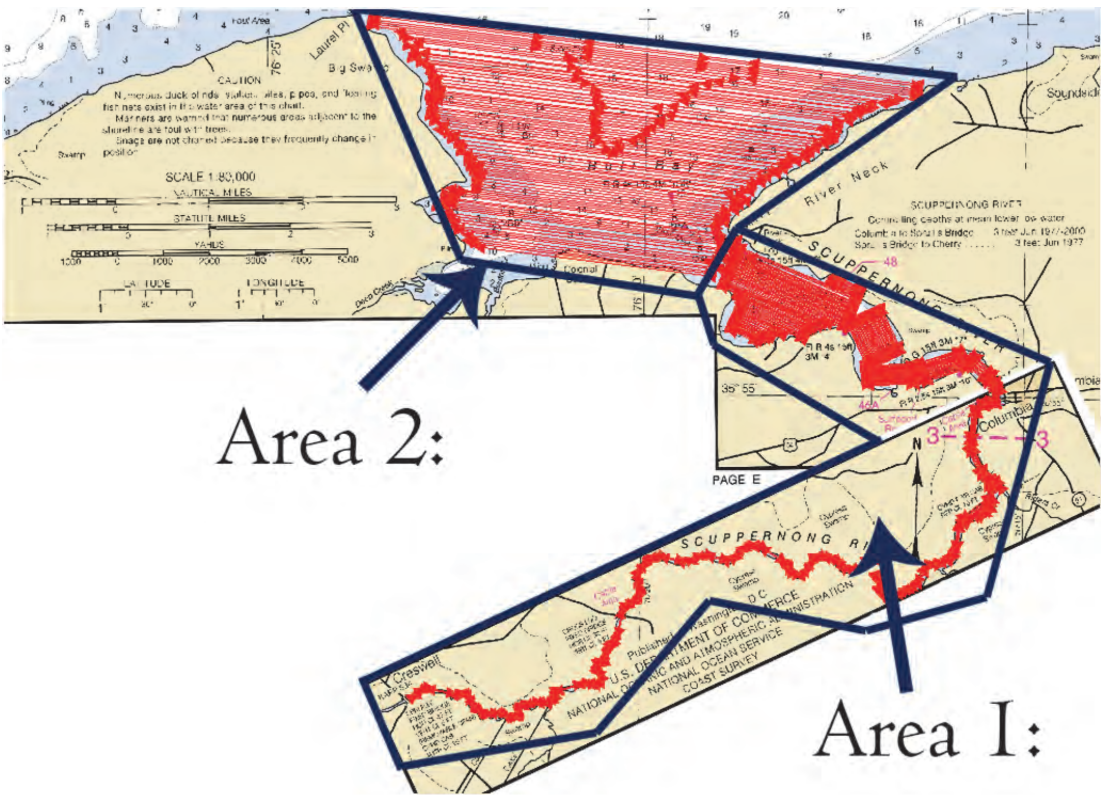

Figure 6. Image of planned survey lines for remote sensing. Lane spacing is at 20m intervals in areas south of Mill Point (Area I) and 50m intervals above Mill Point (Area 2). (Image by Nathan Richards, 2011 using NOAA digital chart 12205_6).

This project was designed with the intention of collating an archaeological baseline (an inventory). There was no intention to ground-truth (i.e. dive and identify or investigate) discovered anomalies. Due to the educational goals of the HIST6835 class (instruction in remote sensing techniques), the lack of extensive research in the region, and the fact that research questions requiring diver-based site inspection or artifact retrieval had not been identified, it was hoped that the inventory might serve to spur additional ground-truthing of anomalies or other site-based investigations which could involve the excavation of sites, or the appropriate recovery of artifacts in the future.

Phase 3: Fieldwork (Fall 2011)

Fieldwork occurred in the fall semester of 2011 in conjunction with *HIST6835: Advanced Research Methods for Maritime Archaeology* class. During this time researchers carried out a series of tasks. The main activities were a side scan sonar survey (using 600 kHz Marine Sonics and 500 kHz Klein 531UT sonar systems with data acquired and post-processed with *Sonar.Wiz* software) and a magnetometer survey (using a Geometrics 882 cesium vapor magnetometer with data acquired, edited, sorted, and gridded in *Hypack Max* software (by Hypack, Inc.), and final interpolated images created in *ArcGIS* (by ESRI, Inc.). Students completed additional assignments not covered in this report, including three-dimensional modeling of historic watercraft and waterfronts, geo-statistical analyses, digital cartography and geo-rectification of images, and ship reconstruction.

Side scan sonar and magnetometer data were collected simultaneously unless equipment malfunction or operating environment precluded one instrument from being deployed. Sonar was frequently operated without accompanying magnetometer data collection due to the magnetometer's operating constraints. Whereas the side scan sonar could be deployed by being lashed to the gunwale of the research vessel, the magnetometer towfish had to be towed behind the boat at a distance of 2-3 boat lengths so that the vessel's magnetic signature was not picked up by the sensor. Because of this, in very shallow water, areas with significant river-bed obstructions, or "tight spaces," magnetometer data could not be recorded. In all cases, geospatial data was acquired with a Trimble AgGPS332 differential global positioning system which geo-coded all side scan and magnetometer data (all positions in this report are recorded as UTM positions in Zone 18, Band S with a datum WGS1984) .

The total accumulated distance of all survey lines of the survey area was calculated in the planning phase as amounting to 940,516.2 meters (940.52kms or 584.41 miles). With a maximum survey time per day of 7 hours and the maximum boat speed of 2.5 knots, the team estimated a maximum coverage of 20.14 linear miles (32.41 linear km) per day. Unfortunately, this calculated to approximately 29 full days on the water – 19 more days than available. Consequently, the research team prioritized the following areas:

- Columbia waterfront (to see if there were additional sites adjacent to known shipwrecks);
- Spruills Bridge (to discover the remains of two purported shipwrecks, *Lawrence* and *Marguerite*);

- Bull Bay (to gather diagnostic information pertaining to wreck symbols marked on nautical charts; and,
- Areas adjacent to known infrastructure sites (in order to ascertain their extent, but also to see whether ship remains reside adjacent to pilings and other debris).

If time remained after searches of these priority areas were completed, other unexplored stretches of water would be investigated.

The participants conducted the survey using the research vessel *Viper,* a 25-foot Parker-brand boat owned by East Carolina University. The vessel has three lead-acid batteries dedicated to research equipment and a true sine wave inverter to convert direct current (DC) to alternating current (AC) and to provide "clean power" for computers and other electronic instruments. The cabin housed a desktop computer, two laptops, and two additional monitors utilized to review and process the side scan sonar and magnetometer data as it was collected. The field work ran from 6 September 2011 to 29 September 2011, Tuesday through Thursday of each week.

Fieldwork began on 6 September 2011 with a visual inspection and familiarization of Bull Bay and the northern leg of the Scuppernong River (done in conjunction with equipment orientation and testing). Remote sensing began in earnest on the next day (7 September) with a morning side scan sonar and magnetometer scan of the waterway adjacent to the Columbia town dock. Afternoon scanning took place in Bull Bay in an attempt to locate a wreck designated on nautical charts for the area. Power supply issues limited scanning to only two passes and the exact position of the wreck remained unknown. On 8 September scanning continued in the area.

On 13 September survey work continued down the Scuppernong River toward Bull Bay. In the afternoon several passes of the well-known wreck site of *Estelle Randall* were conducted, testing the Marine Sonics sonar at 20 and 50 meter ranges. High resolution scanning of the waterfront continued until battery power was depleted.

The next day (14 September) saw a successful attempt to locate an unidentified wreck in Bull Bay. The target was recorded in both 20 and 50 meter ranges to record as much detail as possible in several passes. With scanning of the wreck completed, researchers made several passes on the remains of the Laurel Point Lighthouse – recording articulated structures and an adjacent debris field which included isolated pilings.

On 15 September the crew was joined by local historian Dorothy Redford. Her knowledge of local plantations and canals helped determine where to survey that morning. The research vessel was piloted approximately 13 kilometers (8 miles) from Columbia to a low bridge just 2 kilometers (1.24 miles) downstream of the town of Creswell. A return pass of scanning was completed down river from the low bridge back to the town dock.

On 20 September the crew took the research vessel out of the water and put in near Creswell to scan the upmost reaches of the Scuppernong River. Scanning continued until a large log jam of downed trees from Hurricane Irene prevented the investigation of approximately 2.5 kilometers of river bed.

On 21 September scanning was thwarted by a connection failure during deployment and the Marine Sonics side scan sonar fish was lost. The survey was halted to conduct recovery operations of the sonar sensor. Efforts including diving for the fish proved unsuccessful.

The following day, 22 September, recovery efforts continued utilizing two back up side scan units (Klein 531UT 500kHz and Tritech Starfish 455kHz systems) and the magnetometer. Two possible anomalies recorded with the Klein 531UT side scan sonar system were investigated by a dive team; however, the sensor remained lost. Efforts at recovery were suspended in order to continue the survey. In the afternoon, the aforementioned Klein side scan unit became the primary instrument for river floor inspection, and scanning continued down river, locating a large structure. Side scan imagery reflected what appeared to be a dock or barge which also registered a significant magnetic disturbance on the magnetometer.

In the afternoon of Tuesday 27 and the entirety of 28 September, scanning continued utilizing the Klein system and magnetometer toward Albemarle Sound. No scanning occurred on the last day of field work, 29 September, as the crew packed up all equipment and loaded the research vessel to return to Greenville.

Phase 4: Analysis (Fall 2011)

The analysis of the collected remote sensing data split into two main activities – processing collected side scan sonar data and the analysis of magnetometer data. Processing occurred on two levels – creating coverage maps of the areas searched and creating detailed georectified images of anomalies from side scan sonograms and contoured magnetometer data.

Side Scan Sonar Data Analysis

Side scan sonar data were processed using the following methodology. Imagery saved as MST-files (from Marine Sonics sonar system) and XTF data (from the Klein 531UT sonar system) were imported into *Sonar.Wiz* for geo-rectification (the process whereby individual sonar tiles are displayed in their correct spatial location and mosaicked together, Figure 7) and processing. Once imported and georectified, the raw data underwent a process of: 1) deleting bad data (such as where data was recorded while the boat was undergoing a turn); 2) trimming (removing unwanted data from the edges of sonar tiles), and 3) bottom tracking (whereby the bottom of the river bed is defined so that the water column can be removed from sonograms). Following this process, anomalies (known as "contacts") were identified across the dataset.

Figure 7. Total area covered during side scan surveys of the Scuppernong River and Bull Bay in 2011. Brown color indicate areas covered with the Marine Sonics 600 kHz system and white colors showing coverage with the Klein 531UT 500kHz system (Image by Nathan Richards, 2011).

Over the 11-day span of remote sensing on the project, over one thousand sonar images were recorded. On these individual tiles of sonar data, 163 targets were identified, labeled, measured, categorized, and given descriptions. Nine categories were assigned (see Table 1):

Table 1. Sonar contact categories by number, description, number of contacts and percentage of contact dataset.

Category	Description	Contacts	Percentage
1	Confirmed shipwreck	9	5.5
2	Debris adjacent to shipwreck	14	8.6
3	Structure – piling complex	13	8.0
4	Structure – isolated piling	4	2.5
5	Structure – other	15	9.2
6	Debris associated with structure	3	1.8
7	Potential shipwreck	14	8.6
8	Crabpot	6	3.7
9	Isolated object (unknown identification)	85	52.1
TOTAL	**All categories**	**163**	100

The sites were distributed across the search area and were predominantly located adjacent to known sites (for example, known shipwrecks, the remains of Laurel Point Lighthouse, and heavily used shorelines), but were also concentrated in the areas up- and down-stream of Columbia (Figure 8). It should be kept in mind that the actual number of targets identified in the sonar imagery is less than 163, because, in some cases, sites were insonified from two or more perspectives in numerous parallel passes over similar areas of the river bed. For example, the wreck of *Estelle Randall* was tagged on two separate tiles (as Contacts 0035 and 0140, see Figure 9), and the shipwreck known as "Bulls Bay B" by the researchers was tagged in four separate tiles during processing (Contacts 0129, 0130, 0136 and 162). In other cases, large debris fields made up of an array of articulated structures (e.g. pilings) and other disarticulated elements (such as timbers) were tagged as a single contact (see Figure 10).

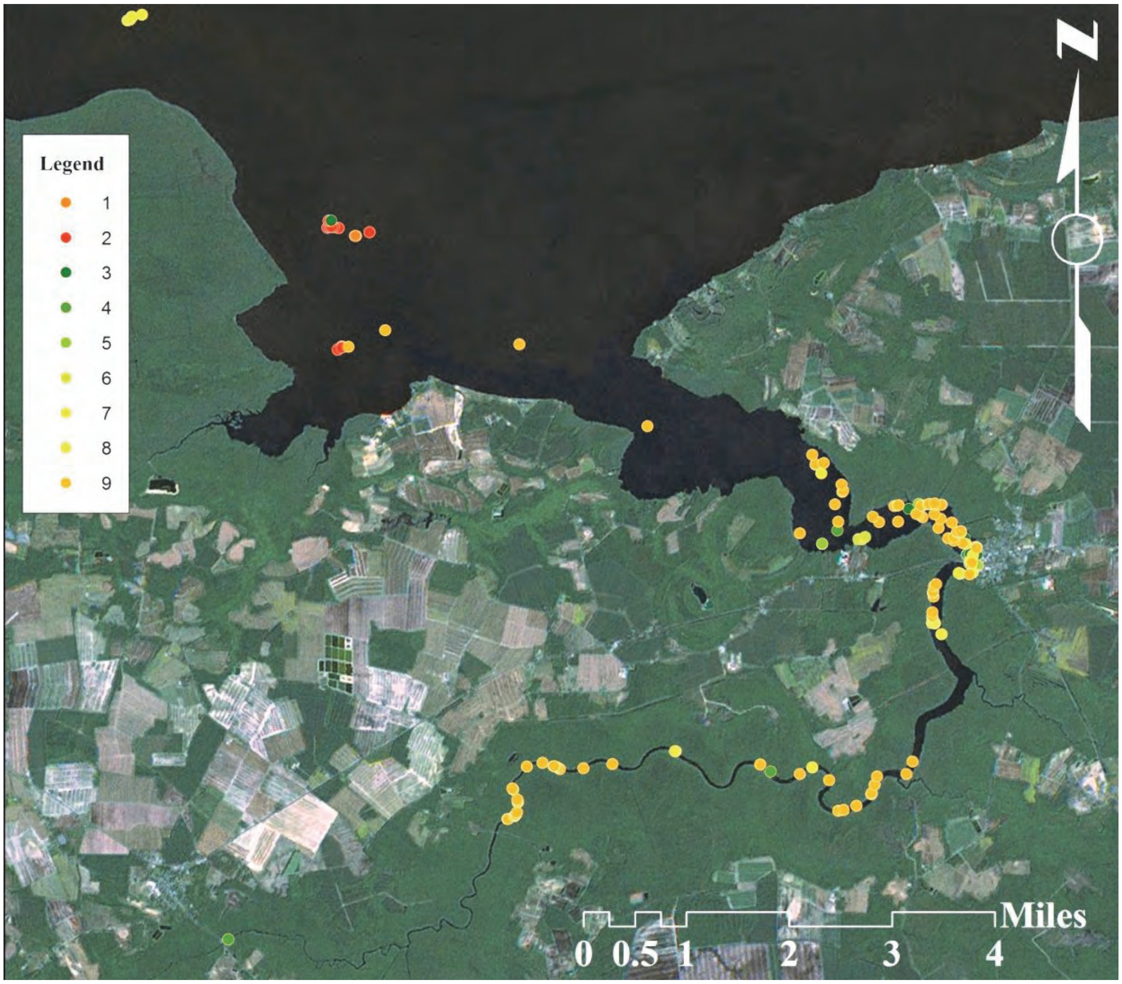

Figure 8. The distribution of Categories 1-9 sonar contacts across the study area (Image by Nathan Richards, 2014).

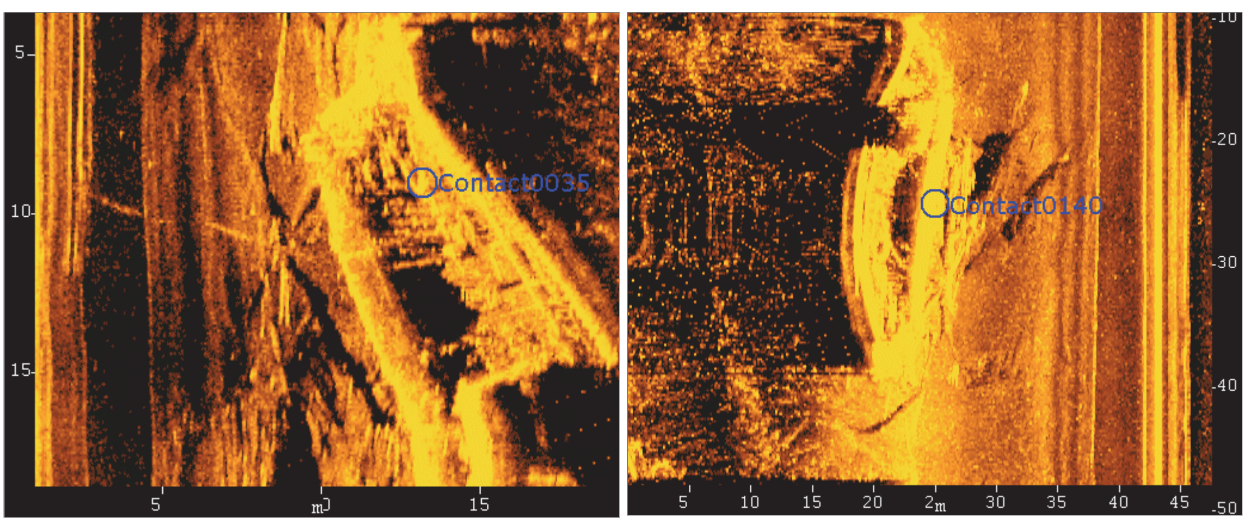

Figure 9. Two views of the shipwreck *Estelle Randall*. The left image (Contact 0035) shows a portion of the stern of the vessel captured at a 20m range; the right image (Contact 0140) shows the entirety of the shipwreck captured at a 50m range. Sonar images are not geo-rectified (Images by Dan Brown, 2011).

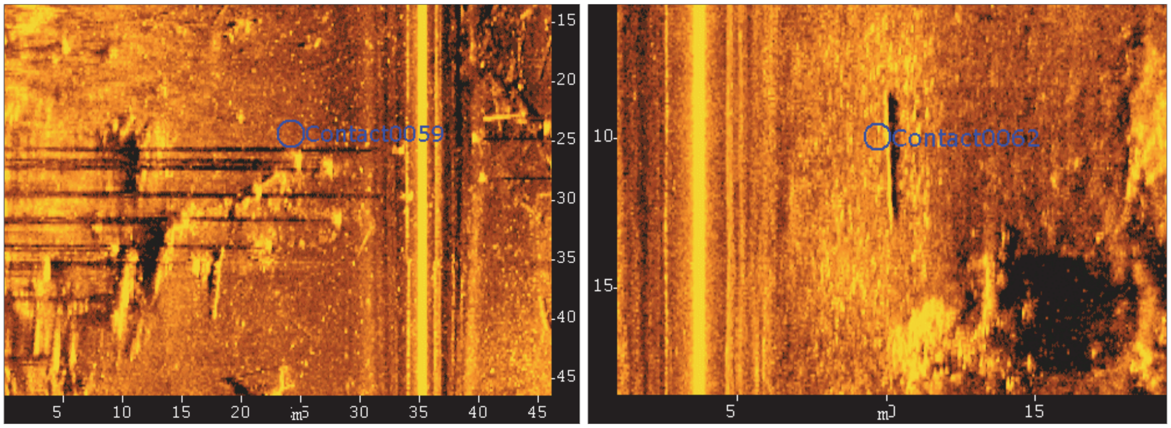

Figure 10. Two views of unrectified contacts with multiple elements. The image on the left (Contact 59) shows an area where many in situ piles emerge from the water, but also where other disarticulated (likely timber) elements lay alongside the piles. The image on the right (Contact 0062) shows an area of a few isolated objects (cultural or natural) captured as a single contact. (Images by Dan Brown, 2011).

Category 1 sites (confirmed shipwrecks), characterized by recognizable features and shapes on the river bed and marked by a high-degree of articulation (as seen in Figure 9), will be discussed at length in the following section of the report. Three wrecks were confirmed on the sonar images – *Estelle Randall,* "Bulls Bay A," and "Bulls Bay B." Category 2 sites (debris adjacent to confirmed shipwrecks) constituted images with a density of linear and sometimes articulated features, scattered objects on the seabed, or larger prominent isolated objects, which when geo-rectified could be seen to lie adjacent to Category 1 sites (Figure 11). The differentiation was created in order to show potential site formation process (for example the process of deterioration). Debris fields were noted in association with all of the aforementioned Category 1 sites.

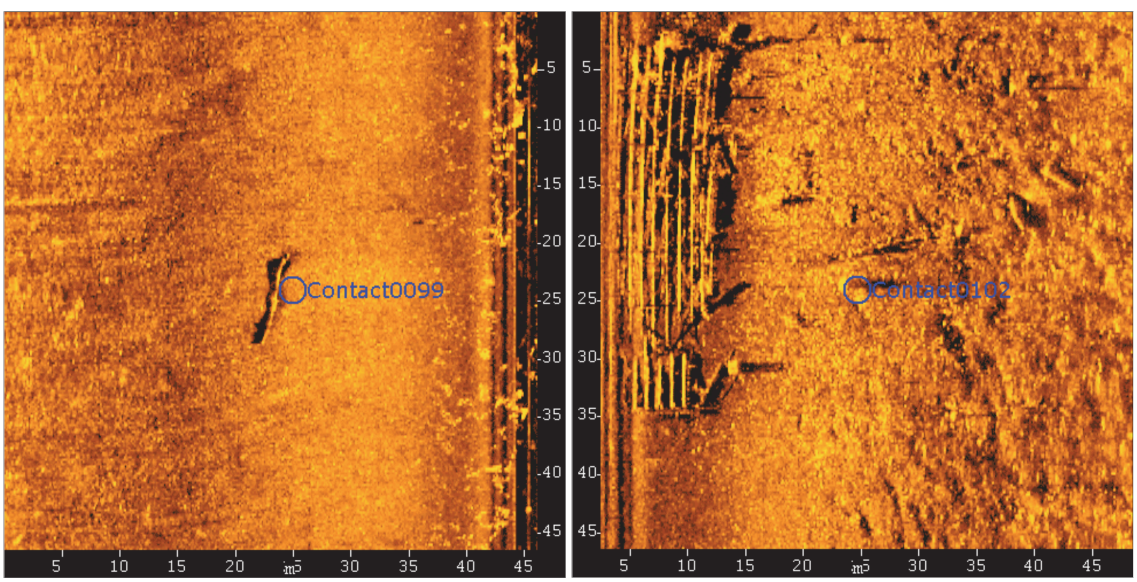

Figure 11. Two examples of Category 2 unrectified sonograms. The image on the left (Contact 99) shows a large isolated object (of unknown material) lying adjacent to the "Bull Bay B" site. The image on the right (Contact 102) shows an area of debris scattered alongside and in closer proximity to the same site. (Images by Dan Brown, 2011).

Category 3 sites (structures representing complexes of pilings) were characterized by sonograms where more than one piling could be seen to protrude from the river bed (and sometimes out of the water). In some cases these were piling complexes representing structures such as piers that are still in use. In other cases these are the remains of sub-surface pile-stumps or piles lying on their sides which are indicative of potential relict structures that may have once been in use and hence may represent past commercial activities in the area. In some cases, the structures could be identified (as in the case of the Laurel Point Lighthouse), and in one instance a series of pilings could be seen adjacent to a shipwreck (Bulls Bay B). At the Bulls Bay B site, multiple pilings over time appear to have been had been placed over time to indicate that the submerged remains are a navigation hazard (Figure 12).

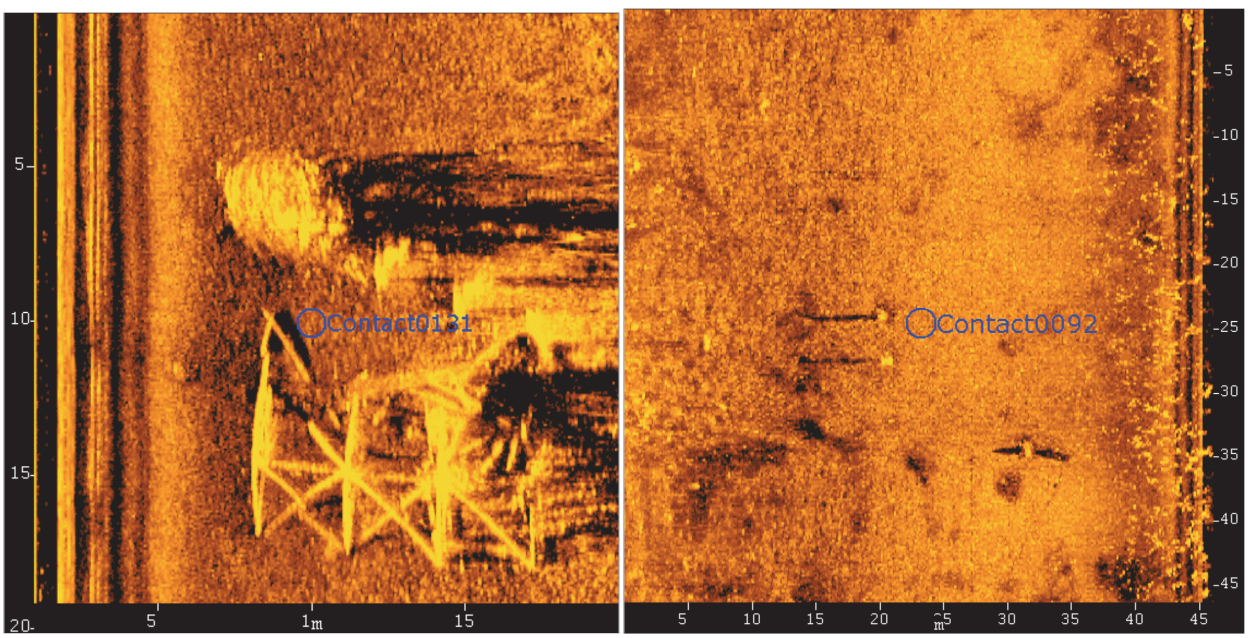

Figure 12. Two examples of Category 3 unrectified sonograms. The image on the left (Contact 131) shows the remains of the highly articulated remains (pilings and cross-bracing) of the Laurel Point Lighthouse (also note the school of fish). The image on the right (Contact 0092) shows submerged pile stumps lying adjacent to the Bulls Bay B site. (Images by Dan Brown, 2011).

Category 4 sonograms, representing potential isolated pilings (but not ground-truthed as such) were marked in four instances. Pilings were found in a number of contexts. Most pilings are indicated by a "bright spot" associated with a long shadow that extends to the edge of the sonogram (indicating a vertical pile protruding from the water), but in some instances, relict channel markers were also found. In one instance, a lone piling adjacent to a location near Creswell may be an indication that a submerged wreck lies nearby (Figure 13).

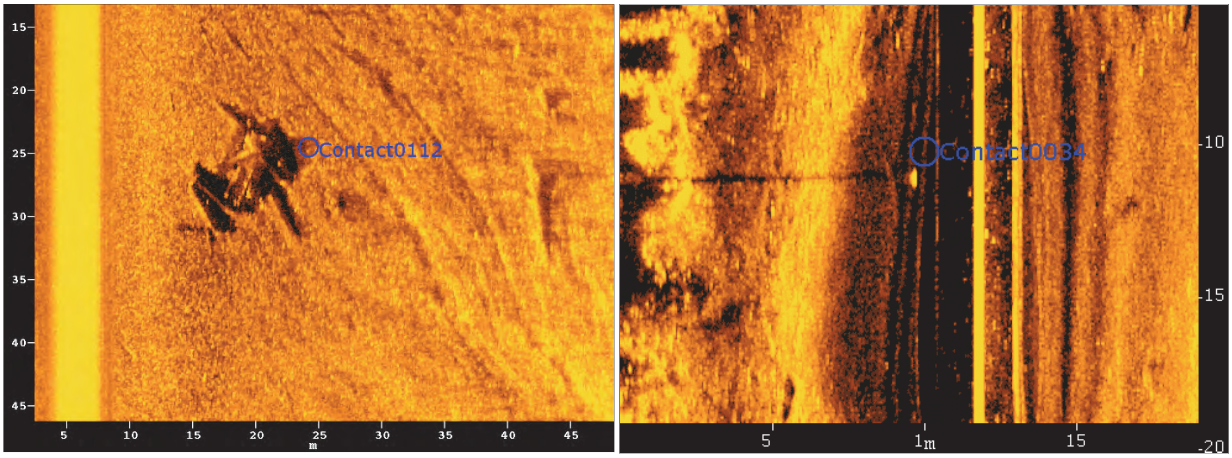

Figure 13. Two examples of Category 4 unrectified sonograms. The image on the left (Contact 112) shows the remains of a relict channel marker foundation structure that lies in the Scuppernong River. The image on the right (Contact 0034) shows a pile along the shore of the Scuppernong near Creswell that almost emerges from the water and is found adjacent to a large submerged timber pile with a magnetic signature. It is hoped that this pile might have been an old navigation hazard marker which points to the wreck of *Lawrence* or *Marguerite*. (Images by Dan Brown, 2011).

Category 5 sonograms represented other kinds of identifiable structures. These may be structures still in use (such as bridge foundations), or sunken structures that had been lost, or were yet to be recovered (such as in the case of a sunken floating dock) (Figure 14).

Category 6 contacts were the equivalent of Category 2 contacts, but instead of representing objects within debris fields adjacent to Category 1 contacts (shipwrecks), they represented debris fields adjacent to shoreline infrastructure sites classified as Category 3 targets. As such, Category 6 contacts and Category 2 contacts look much the same, but are adjacent to different kinds of river bed features (Figure 15).

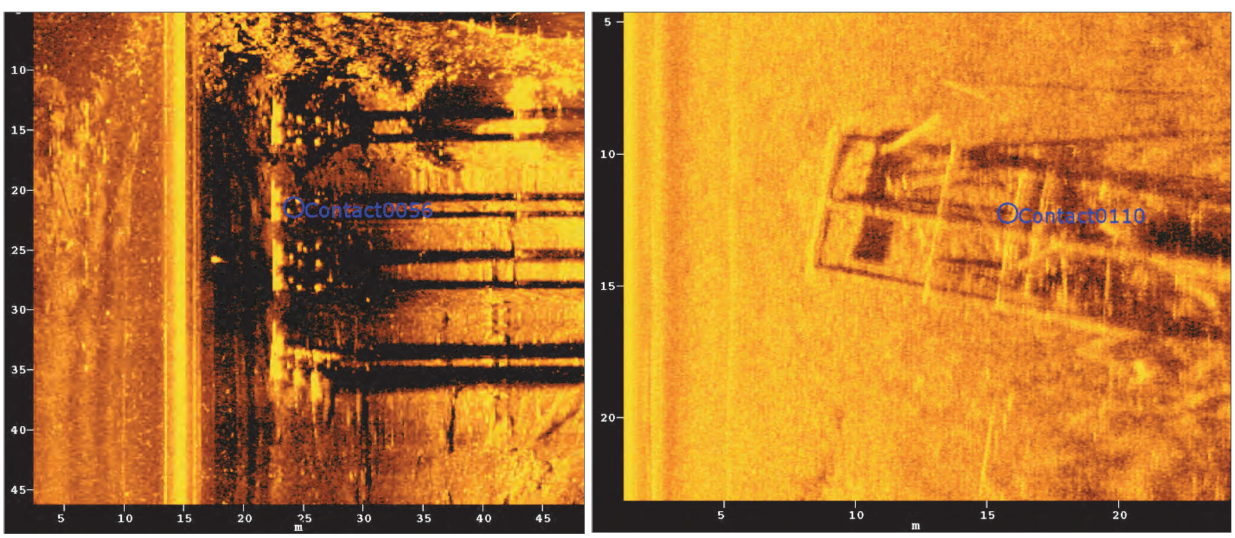

Figure 14. Two examples of Category 5 unrectified sonograms. The image on the left (Contact 0056) shows the structure of the Highway 64 bridge which traverses the Scuppernong River at Columbia. The image on the right (Contact 0110) shows the remains of a sunken floating dock. (Images by Dan Brown, 2011).

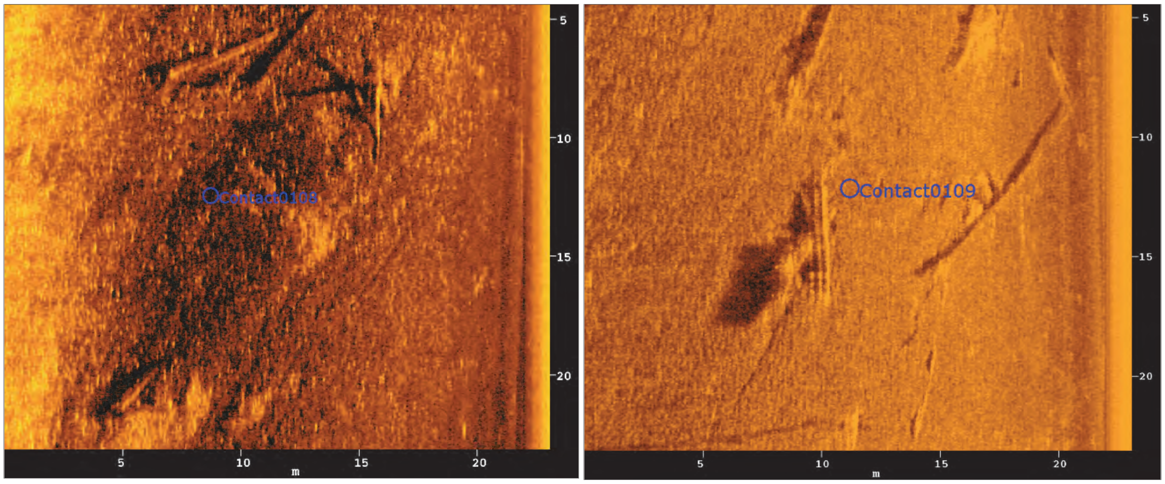

Figure 15. Two examples of Category 6 unrectified sonograms. The images on the left and right (Contacts 0108 and 0109, respectively) show areas of potential remnant pilings and objects adjacent to complexes of pilings and other structures. (Images by Dan Brown, 2011).

Category 7 contacts represent sites tagged as potential shipwrecks because of degrees of symmetry and linearity and the appearance of a complexity sometimes interpreted as the articulation of a structure. The classification of these contacts is highly subjective, and the final determination as to whether these are likely shipwrecks or not is strengthened with an association with a magnetic signature (to be discussed) but ultimately must be determined via archaeological inspection by divers. The 14 sonograms tagged as representing "potential shipwrecks" range from large linear objects within mounded areas (Contact 0022), areas with a number of parallel linear features (Contact 0019, 0106, 0066, 0067, 0068, 0141, 0142, 0139) or crossing elements (0042, 0072), to a combination of all elements (0058). However, these sites could end up being geological features, pound nets, or non-shipwreck sites with some archaeological value like "log-dogs" (unprocessed logs, lashed together) (Figure 16).

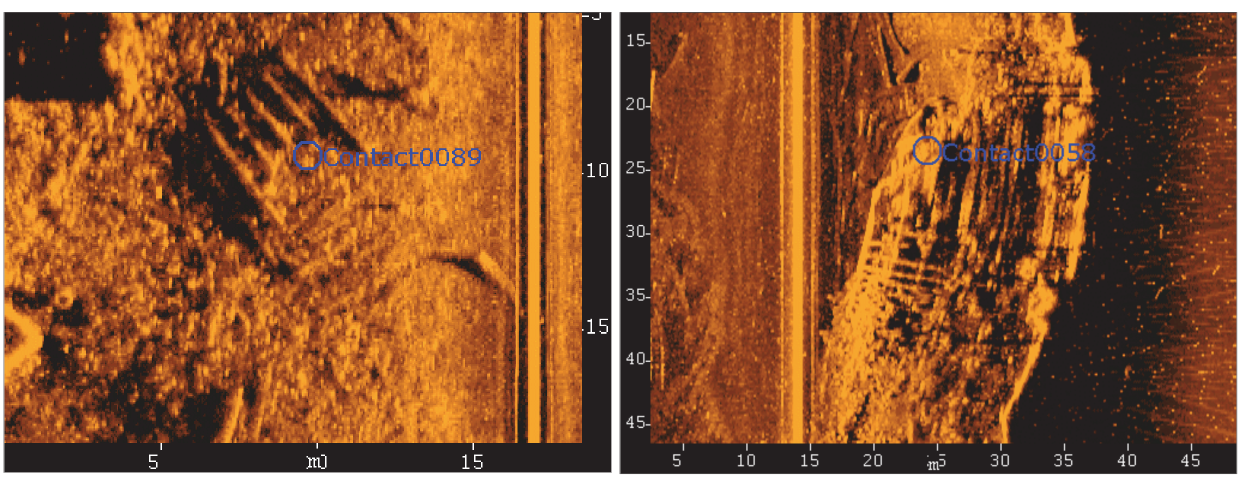

Figure 16. Two examples of Category 7 unrectified sonograms. The image on the left (Contact 0089) shows a feature embedded in the river bank where there are a series of parallel lines suggesting an artificial structure. The image on the right (Contact 0058) shows a feature lying alongside a river bank where parallel lines as well as perpendicular lines merge with the appearance of a hull shape and other potential debris to suggest a sunken watercraft. (Images by Dan Brown, 2011).

Category 8 sonograms are areas where crab pots are evident. These objects are easily identifiable because of their square appearance and characteristic acoustic shadow, often with additional lines indicating that the line and buoy are still attached (Figure 17).

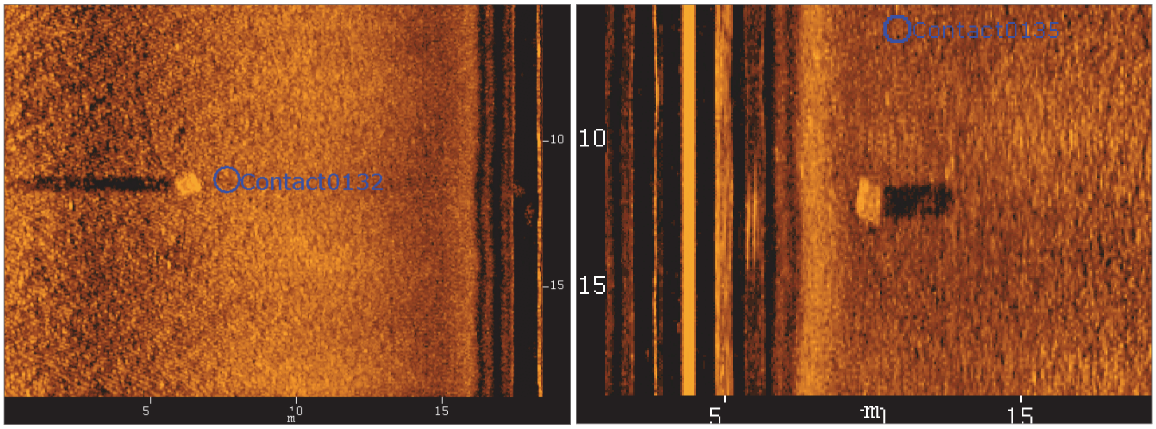

Figure 17. Two examples of Category 8 unrectified sonograms. The images on the left and right (Contacts 0132 and 0135, respectively) show the square crab pots as they sit on the river bed adjacent to the remains of the Laurel Point Lighthouse. The slight appearance of a line (left) indicates the presence of a partial line that floats in the water. (Images by Dan Brown, 2011).

The majority of the 163 targets, however, fell under Category 9 (unidentified objects), comprising over 52% of identified targets. Many of these may be felled trees or log piles (which in some cases could be evidence of past timber industry activities). In other instances, large areas of unknown objects were seen to lie within, or adjacent to areas marked on bathymetric charts as "foul areas" which denote regions with significant numbers of river bed "snags." Rarely, some object types could be identified – such as the existence of tires (perhaps discarded, perhaps the location of an old mooring). While these targets may not appear to be important according to a standard interpretation of the sonar evidence, correspondence with a magnetic signature may indicate that a significant cultural site such as a shipwreck could lie underneath (Figure 18).

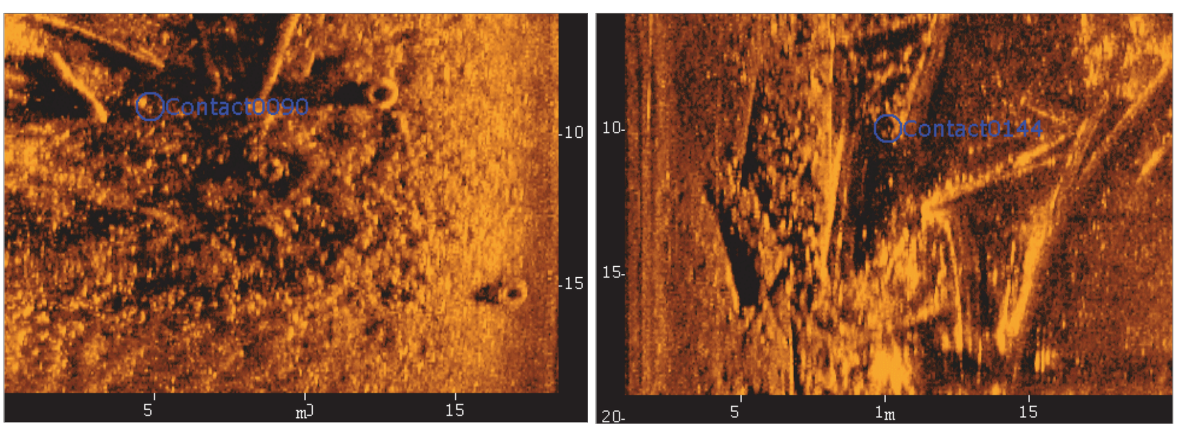

Figure 18. Two examples of Category 9 unrectified sonograms. The image on the left (Contact 0090) shows an area of discarded tires and other objects tire lying adjacent to a reinforced shoreline. The image on the right shows an area of isolated disarticulated timbers within one of the "foul areas" indicated on nautical charts of the area (Contact 0144). (Images by Dan Brown, 2011).

Magnetometer Data Analysis

Acquisition of magnetometer data was facilitated with the computer program *Hypack 2011* (by Hypack, Inc). This software carries the control interface for the magnetometer as well as all the options and settings for accurately gathering data. The data was stored by date, resulting in 12 separate groupings of files ranging from 6 September to 27 September 2011. Hypack sorts the data files into "raw files" and "edited files," meaning the initial, unedited readouts directly from the magnetometer are kept unmodified even after edited versions are made of them. This redundancy allows for any possible errors to be corrected by simply going back to the raw files. Initial editing of magnetometer data is done within *Hypack* using a "Single Beam Editor."

Processing of the magnetometer readouts, once the Single Beam Editor option has been chosen, is quite simple. First, the files for each day are chosen in a group. Depending on the conditions in the field at the time the measurements were taken, the number of magnetometer readouts for each date can range from just one to 10 or more (representing different survey lanes traversed by the research vessel). Once the appropriate files are chosen, a number of dialogue boxes open within the program. These are for determining outside factors in adjusting the readouts, such as variables due to tides or currents. The only option of concern here is that the interface option lists "Magnetometer Interface." When this is selected, the editing process can begin.

Hypack will bring up three new dialogue boxes: the first is a toolbar for functions such as saving or exiting; the second is a chart of the data; and the third is a single-beam readout of the magnetometer data. Figure 19 shows an example beam readout, which, when lacking errors should look like a rising or falling undulating line (increases and decreases represent changing magnetic readings along a survey path). Areas of the line where a large peak and trough occur over a short period of time delineate what is commonly referred to as a "magnetic dipole," which represents a significant magnetic disturbance picked up by the instrument and is likely an artificial object. In other instances, the magnetic data will need editing or interpolation. Figure 20 shows a magnetic profile where tolerances in time or spatial location have been defined. Sharp, one second-or-less spikes in the line are shown with an "x" along the trace, and vertical lines show to where "smoothing" of the data will take the line back to an averaged location. This may be either due to a temporary malfunction of some sort (in the GPS or magnetometer) or where powerful electro-magnetic signatures from objects such as bridges, power lines, and underwater piping obscure any smaller magnetic signatures that may be in the area. These areas must be edited in order to look like Figure

19 as they to do not represent an accurate reading of the background magnetic field and tend to obscure the real data being gathered. The example in Figure 20 is an extreme case: the x marks dominate the line, and the readout itself varies widely in a range of a few thousands gammas (nT). Besides the sharp, nearly exponential jumps in the line, the range in gammas is one of the most direct ways of telling when the readout is inaccurate: the local magnetic field on any area of the Earth in North Carolina is usually around 48,000-50,000 nT.

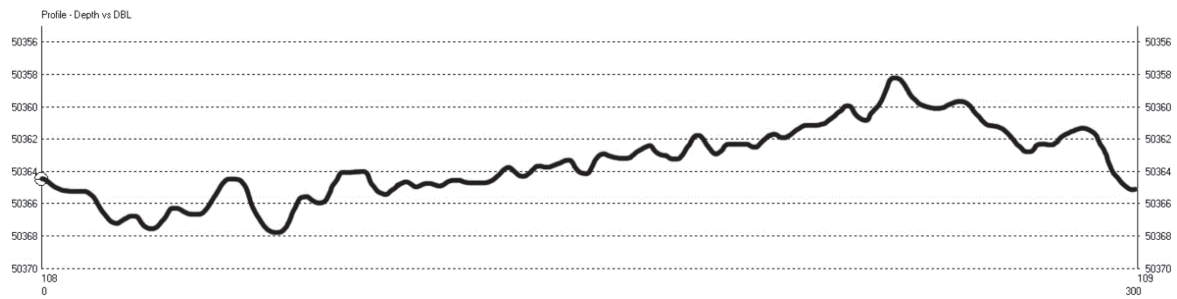

Figure 19. Typical correct magnetometer readout from Hypack 2011©. Y-axis is gammas (nT), x-axis is time. (Image by Nathan Richards 2014).

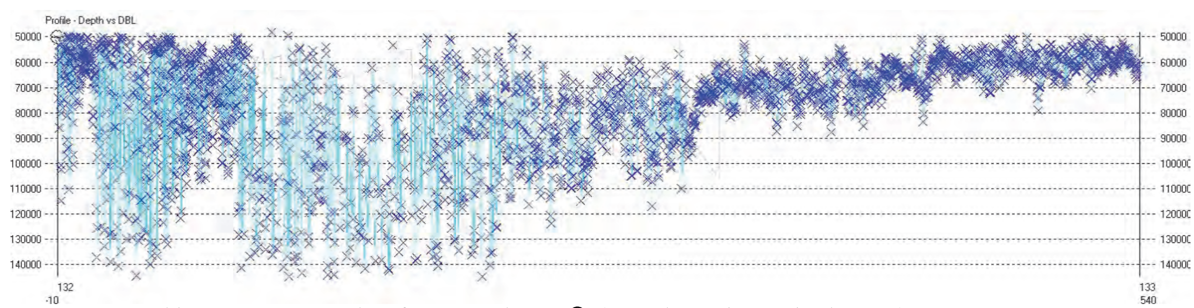

Figure 20. Unacceptable magnetometer readout from Hypack 2011©. (Image by Nathan Richards, 2014).

The editing process for the magnetometer readouts itself is also quite simple. Once the desired file is open, it must be visually inspected in the manner described above to determine where any problem areas may be. If the line is not cohesive and undulating, but instead is marked by sharp spikes it must be interpolated. Interpolation in this case means adjusting the data until it better fits with the whole. This is done by selecting any trouble area of the chart and deleting it. The delete function itself has two settings: "Interpolate" or "Remove"—the former is the one to use for proper editing. By utilizing this function, the selected area will gradually be interpolated by the removal of the more extreme outliers and the averaging of the remaining data into an improved readout. In this manner, many of the magnetometer files which appear to be incorrect at first glance can be edited into useful visual data.

The editing process for adjusting raw data into a suitable form is made simple by the Hypack 2011 program. In the manner described above, several days' worth of data can be processed simply and effectively. The tools for editing the magnetometer data are relatively straightforward. An especially ideal feature of the program is the continual retention of the original raw files for possible future refinement.

When the magnetometry data has been processed a series of tabulated data files were created that had the latitude and longitude of a magnetic reading associated with a time and a magnetic reading (nT). These data files can be imported into ArcGIS for display and for further interpolation. In this case, ArcGIS 10 was used to open the GIS file made during Phase I. Within the ArcMap program, a satellite view of the river was used for display, and the raw magnetometer data imported. At this stage, the values of the magnetometer reading could also be color-coded by their nanoTesla value. This gives us an impression of the passage of the boat and the values that the magnetometer was giving at particular parts of the river. This can be used as a pseudo-coverage map to show where magnetometer readings were taken, and can be compared with the coverage map created during sonar recording (see Figure 21). Following processing, coverage maps indicate the creation of a parallel coverage of bottomlands with the side scan sonar and magnetometer (compare Figures 7 and 21). As noted before, side scan sonar coverage is greater within the survey area because the sonar was not deployed off the stern of the research vessel. Consequently portions of the survey area, while comprehensively covered by side scan sonar do not have magnetometer data, and some areas below the Town of Columbia were not comprehensively surveyed with the magnetometer because of a lack of the multiple parallel survey lines needed to plot, interpolate, and contour magnetic readings.

Figure 21. Survey lines traveled during magnetometer survey of the Scuppernong River and Bull Bay in 2011 (an estimation of area coverage). Colors represent nanoTesla (nT) readings from Geometrics G882 cesium magnetometer. (Image by Nathan Richards, 2011).

A conspicuous absence is a gap in the coverage of the Scuppernong River between the Spruills Landing Bridge and the aforementioned tree-fall created in the wake of Hurricane Irene. This is unfortunate because within this stretch lies the potential for underwater and sub-surface archaeological sites and signatures associated with the digging of the Somerset Canal (which flows to the Somerset Place Plantation). Nevertheless, the coverage maps show which sections were covered by what technology and also which sections were not explored in this study.

Further manipulation of the magnetometer data was done using the *3D Analyst* program function within ArcGIS. Separate areas were designated for further interpolation. Polygons were drawn within ArcGIS to delineate the areas where detailed interpolation was to occur. For example, one area may cover the stretch of the Scuppernong immediately below Spruills Bridge, which was the upriver termination point of data collection during the project. Once a boundary was defined, 3D Analyst was used to do a "Raster Interpolation." Three of these methods are popularly used: inverse distance weighting (IDW), kriging, and spline interpolation. All of the methods allow for the processing of data from a few known points.

The IDW technique is useful for river surveys because it allows for irregularly-shaped areas of data to be defined in the calculations (Shepard 1968:517-524). Inverse distance weighting is used to assign values to unknown points to produce a representative surface. The IDW method works by producing a weighted sum of the values of the total number of known points for any unknown point, thereby producing a reasonable interpretation of the areas between the scattered data actually collected. IDW has a unique parameter, termed the power parameter (p), which allows the user to manipulate the weight of values closer to the given points.

Once the area around the data points is defined, and the raster interpolation is completed, magnetometer anomalies may be seen because the "dipole" (the swing from high to low magnetic values over a relatively short distance) will appear in two distinct, contrasting colors adjacent to one another. The resulting raster image can then be contoured with what are essentially "magnetic topography lines" to further assist in the identification of potential ferrous objects underwater. Once defined, georectified side scan sonar imagery may be placed above the raster image and the contour lines placed on top. This image may strongly indicate that a site previously seen as a natural feature on the side scan sonar is actually a cultural feature with an exposed or buried ferrous component (Figure 22). This is one way that highly disarticulated wooden shipwrecks with iron or steel fasteners may be discovered hidden under piles of branches or buried under river sediments.

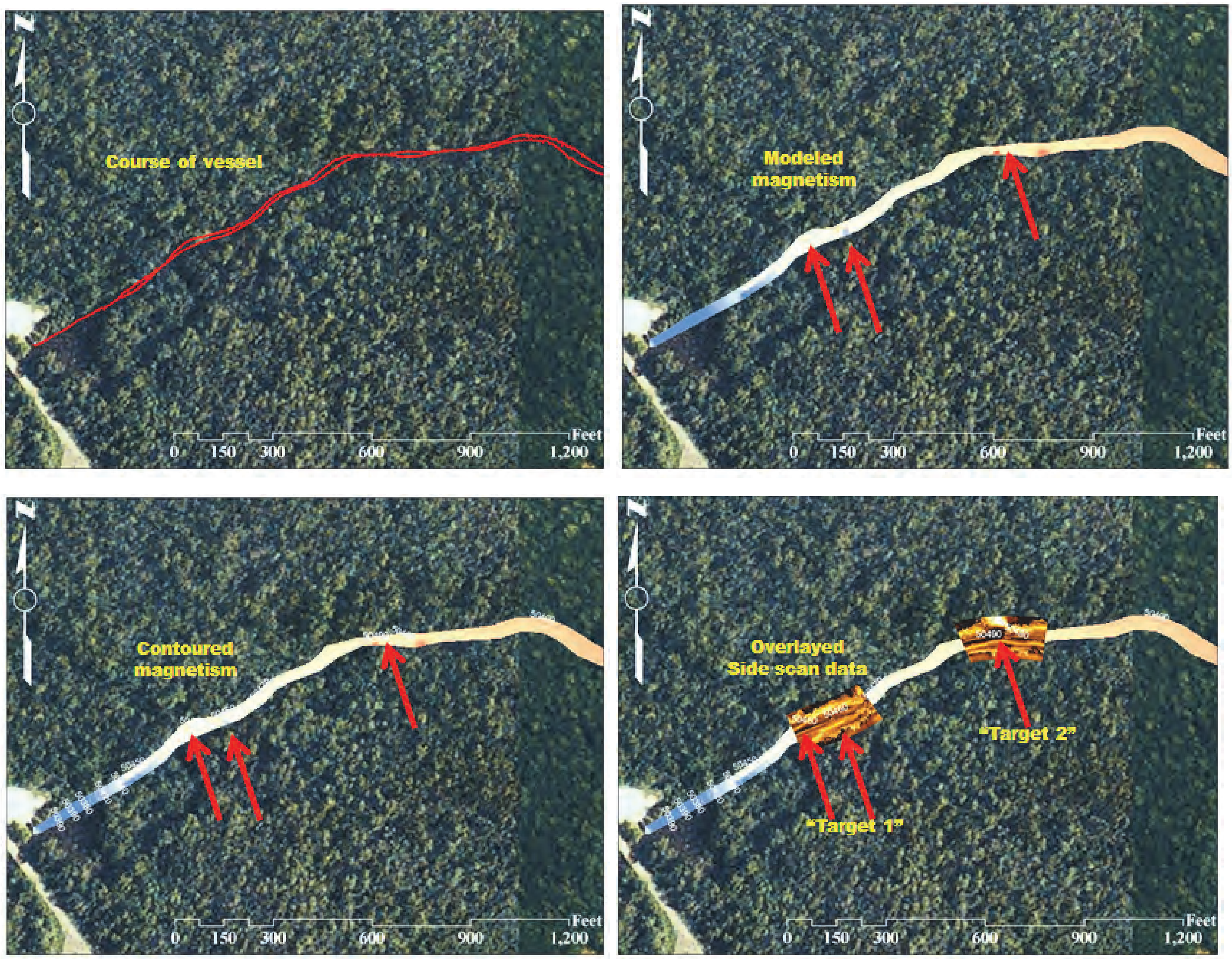

Figure 22. Workflow for interpolating magnetometer data: A. Area is selected (red lines show path of magnetometer and vessel); B. Area is bounded with polygon and "raster interpolation" occurs within the polygon. Areas where colors of high contrast are adjacent to one another suggest a magnetic anomaly; C. Raster is contoured to show the values of the magnetic signatures; D. Georectified sonar images may be superimposed on the interpolated image. (Image by Nathan Richards, 2011).

Phase 5: Dissemination (Fall 2011 to Spring 2012)

Emerging from Phases 1 and 2 in 2011, three sources of dissemination occurred. A sequence of presentations and public programs were conducted. Additionally, a series of public outreach events in conjunction with the Columbia High School occurred. Following the conclusion of the fieldwork, ECU students also began to work on a series of 16 assignments, 8 on local historical subjects, and 8 on technological subjects using Tyrrell County resources. The project methodology and eight historical assignments were merged and expanded upon to create Volume 1 of this report series (Richards et al. 2012), and select portions of the technological reports (Bisbee 2011; Brown 2011) were used in this report. What follows are the results of the remote sensing project. According to the structure outlined at the beginning of this volume, the following section looks at the submerged cultural resources of the surveyed Scuppernong River and Bull Bay, where possible connecting the archaeological sites found during magnetometer and side scan sonar surveys with historical records.

SUBMERGED CULTURAL RESOURCES OF TYRRELL COUNTY

Following the collation of information from historical records and previous archaeological research, five categories of cultural resources were defined in order to guide remote sensing of Scuppernong River and Bull Bay. These were categorized in Volume I (Richards et al. 2012:5-6) as: 1) discovered watercraft (location known and identity confirmed); 2) undiscovered watercraft (vessels noted in historical sources, but not yet found); 3) currently unidentified wrecks on nautical charts (known cultural resources recorded but not yet identified); 4) other potential shipwrecks (vessels potentially in the area); and 5) terrestrial maritime cultural resources (non-shipwreck sites). The following sections discuss cultural material falling into the above categories and outline current knowledge from pre-survey historical research as well as post-survey discoveries in archival sources. It should be noted that each listed site is worthy of extended study on its own.

Previously Discovered Watercraft

There are six abandoned or wrecked watercraft currently known in the waters of the Scuppernong River (Figure 23). There are no shipwrecks or abandoned watercraft identified (i.e. with a known name and history) in the waters of Bull Bay. Of the six previously discovered and reported shipwrecks, one was definitively relocated during side scan sonar and magnetometer operations, another was potentially recorded, one was found to have been removed, and the others had either been removed, obscured, or were not found. A synopsis of each of them follows, ordered by their state designated number.

Estelle Randall (UAB#0001SCR)

Estelle Randall (Official Number 136664) was launched in Baltimore, Maryland in December of 1897 (apparently ready for use as of February of 1898, according to insurance registers) by William E. Woodall and Company. Owned by the E.S. Randall Company and named after the owner Captain Ephraim S. Randall's oldest daughter, it was used as an inland passenger steamer and US mail carrier along the Potomac River traveling between Washington, DC and Glymont, Maryland (Figures 24-25). For a time it was a mainstay of a rotating lineup of steamers in E.S. Randall's fleet, which included *Harry Randall,*

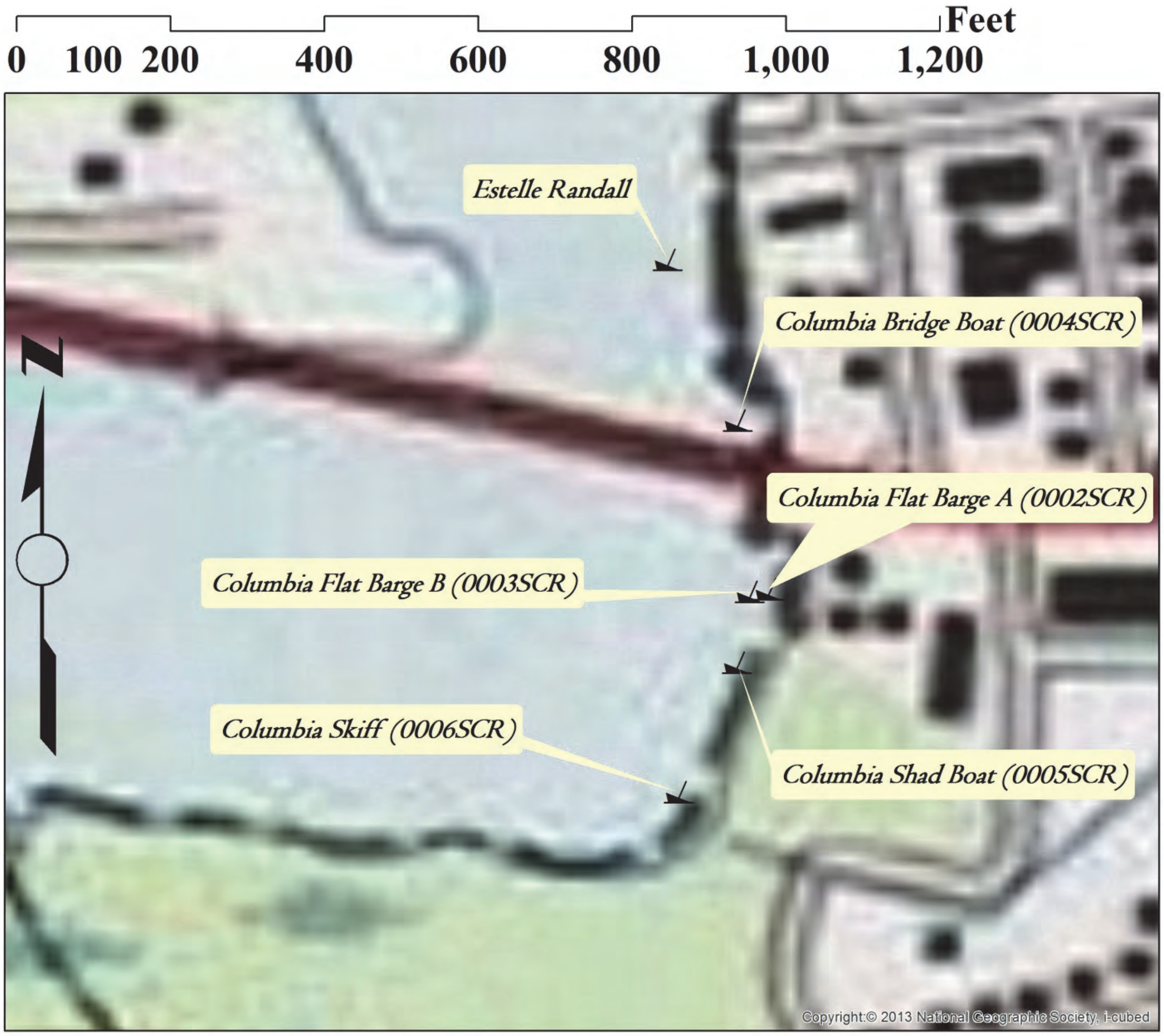

Figure 23. Distribution of known shipwrecks before 2011 remote sensing (Image by Nathan Richards, 2014).

Wakefield, T.V. Arrowsmith, Kent, Samuel J. Pentz, and *Lovie Randall.* Built in a composite form (iron frames, wooden planks, single steel deck) and weighing 144 net tons (212 gross tons), the vessel was of dimensions 118 feet length, 24 feet width and 8 feet draft. *Estelle Randall* was completely illuminated via electricity and also carried a powerful search light. The steamer's original engine was built by Campbell and Zell of Canton (Baltimore), Maryland. Details of its engine are given as being a 2-cylinder compounded engine (high pressure cylinder 13"diameter, low pressure cylinder 26" diameter, 16" stroke). The working pressure of the engine was 150 lbs (Figure 26). The boiler had a 39 square foot heating surface and a 1200 square foot grate surface (Figure 27) (*Times* 1897a:5; American Shipmaster's Association 1899:464, 1900:453; *Nautical Gazette* 1898:217; Boyd 1903:807, 1906:936). According to a treatise from the time concerned with the use of boilers in buildings, the ratio of heating surface to grate surface in a return-tube boiler reflects the type of fuel used – this being "45 to 1 with bituminous coal, and 36 to 1 with anthracite" (The Colliery Engineer Company 1899:88-89). Consequently, this information likely points to the tendency to use fuel sources closer to anthracite coal (as 39 x 45 = 1755 ft^2 and 39 x 36 = 1404 ft^2) in *Estelle Randall*. A comprehensive picture of the original machinery is communicated in the *Nautical Gazette* (1898:217):

> The engine is of the vertical, direct acting, fore and aft compound type, having cylinders 13 and 26 in. in diameter, with a common stroke of 16 in., and is designed for a piston speed of 600 ft. per minute. The engine is fitted with surface condenser bolted to and forming part of the bed plate, the cylinders being carried on two cast iron columns bolted to condenser with three finished steel columns on front. The bed plate is of box type with three main bearings of ample size, lined with Parsons' white metal, this metal also being used in crank pin brasses, thrust and spring bearings.
>
> The high pressure valve is of the piston type, the low pressure being a double-ported trick valve. The valves are operated by Stevenson link motion, having links of the double bar type, and are reversed by hand screw gear. The crank shaft is built up of steel, having the crank webs and pins cast together with shafts of open hearth steel forgings, shrunk into same and keyed. The piston rods, connecting rods, valve stems, line and propeller shaft are all of mild open hearth steel. The air pump is a 6x10x12 in. vertival [sic] double acting pump furnished by George F. Blake Mfg. Co., and is bolted to brackets cast on back of condenser to receive same. Feed pump is of the Blake "duplex" pattern, and is arranged to work automatically by a float in filter box. The circulating pump is of the centrifugal type, operated by direct connected engine, and was furnished by the Morris Machine Works. Steam is supplied by a boiler of the locomotive type, 16 ½ ft. long by 7 ft. wide, having 39 square feet grate surface; working pressure 150 pounds.

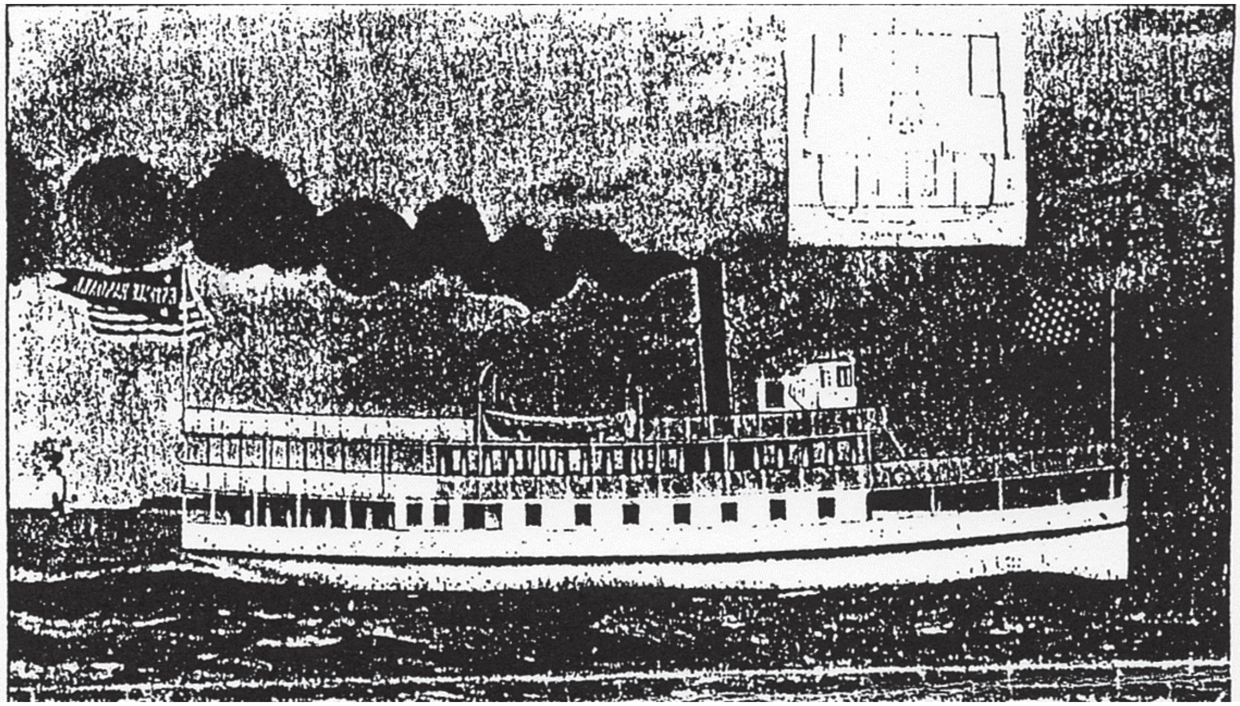

Figure 24. "New Potomac River passenger propeller Estelle Randall, built by William E. Woodall & Co., at Baltimore." (*Nautical Gazette* 1898: 217).

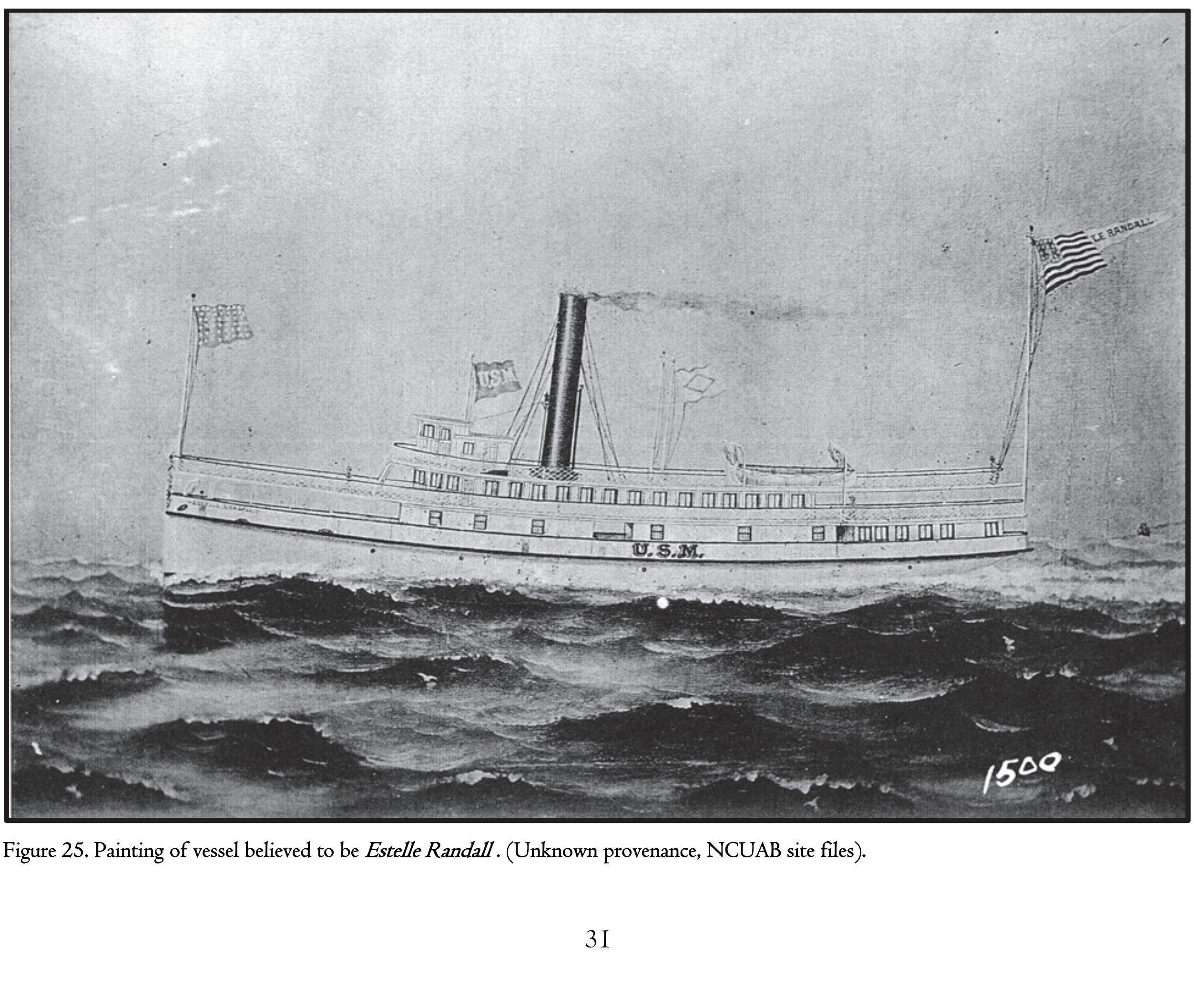

Figure 25. Painting of vessel believed to be *Estelle Randall*. (Unknown provenance, NCUAB site files).

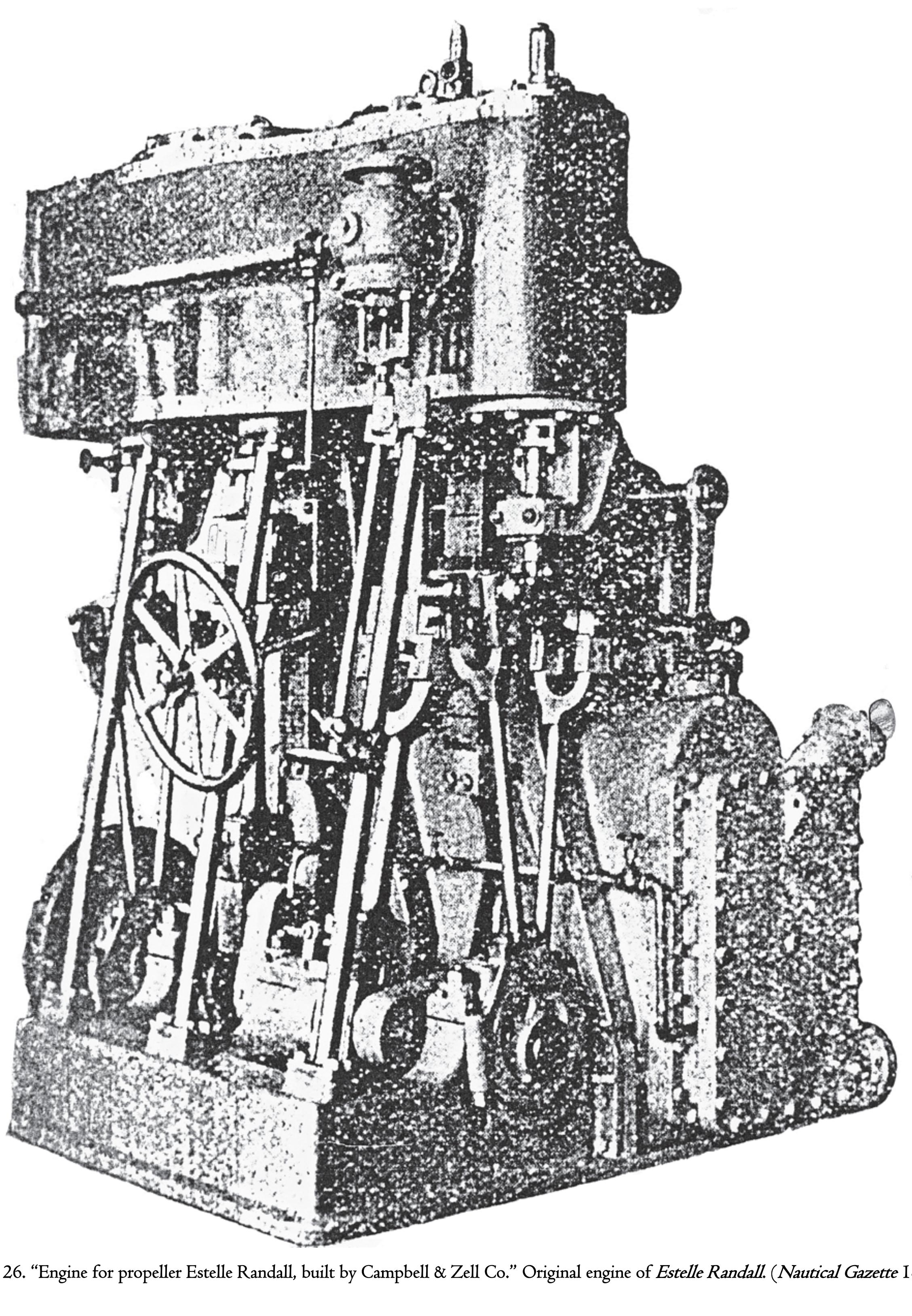

Figure 26. "Engine for propeller Estelle Randall, built by Campbell & Zell Co." Original engine of *Estelle Randall*. (*Nautical Gazette* 1898: 217).

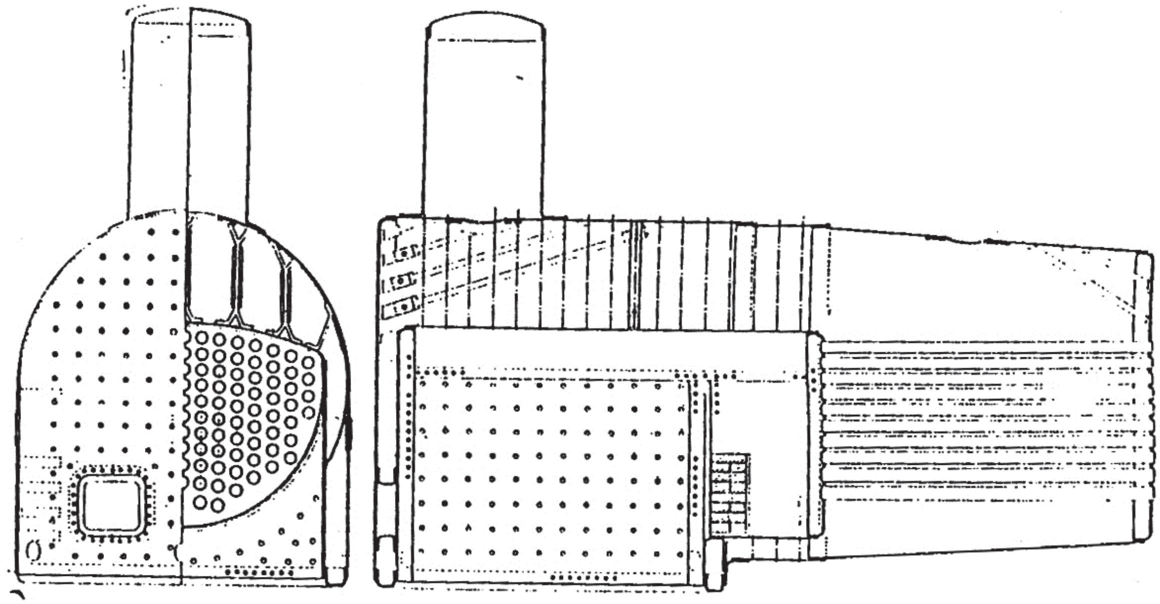

Figure 27. "Marine boiler, of locomotive type, built by Campbell & Zell Co., for propeller Estelle Randall." (*Nautical Gazette* 1898:217).

The launching of the vessel featured in the Washington DC newspaper, The *Times*, under the title "Glymont Steamer Launched: Miss Estelle Randall Sponsor for Her Namesake,"

> The new Washington and Glymont mail route steamer, the Estelle Randall, was launched at the yard of William E. Wordall [sic] and Co., in Baltimore yesterday morning, and in spite of the downpour of rain a crowd numbering several hundred witnessed the ceremony.
>
> Miss Estelle Randall, of this city, after whom the steamer is named, acted as her sponsor, and as the new boat slid gracefully from the stocks into the water she broke a bottle of champagne, which had been handsomely decorated with red, white and blue ribbons by Mr. James E. Wordall [sic], upon the steamer's bow, saying "I christen thee the Estelle Randall."
>
> After the ceremony the launching party were entertained at dinner by Capt. E.S. Randall, the proprietor of the Randall line.
>
> Those who attended the launching from this city were Mrs. E.S. Randall, Mrs. Harry S. Randall, Miss Estelle Randall, Miss Lovie Randall, Captain. E. S. Randall, the proprietor

> of the Randall line; Mr. William S. Moore, chief engineer; Mr. Nat Berry, Mr. Will F. Carne, general agent, River View, and Mr. Frank Carlin of Alexandria (*Times* 1897b:8).

Extant marine insurance registers suggest that *Estelle Randall* was surveyed once in its life, in Baltimore soon after its construction (in March of 1898), and never received an insurance classification. This may be because, as an intended mail and passenger steamer, the importance of carrying hull insurance was not as important to its owners, and they sought to self-insure the vessel (American Shipmaster's Association 1899, 1900). The *Annual List of Merchant Vessels of the United States* (US Department of Treasury 1901:237, 1904:223) gives slightly different measurements of 143 net tons, and dimensions 111.5 feet length by 24.9 feet beam by 7.2 feet draft and stipulates the vessel's home port as Washington, D.C. The *Nautical Gazette* of 20 January 1898 gives us additional details:

> The hull is of composite build, having steel frames and yellow pine planking. The combination gives great strength and has many advantages over the old style of hulls built entirely of wood … the steel frames are 3x2 ½ in. and the outside planking is 3 in. in thickness. The keel is of oak, 8 in. wide by 6 in. deep.
>
> There are two saloons, one being located on the main deck, after, and the other on the second deck. This latter is a very commodious and airy apartment, beautifully finished and furnished, and affords a delightful retreat for passengers in stormy or wintry weather.

The original owner of the steamer (also its Captain, Ephraim S. Randall) was a well-known ship owner, who operated "several large excursion and passenger steamers on the Potomac" and was "one of the most successful steamboat men in the South" (*Nautical Gazette* 1898:217).

The regular schedule of the steamer appears to have been a mail route "… for Glymont and intermediate points …" during the week for at least the first six years of its existence (*Evening Star* 1899:16, 1904a:16, 1904b:16, 1904c:16, 1904d:16, 1904e:16; Miller 1904:468; *Sunday Morning Globe* 1902a:8, 1902b:8). However, in addition to being a mail boat, *Estelle Randall* was used extensively for pleasure excursions, as reported in Washington D.C. newspapers, such as the *Evening Times*,

> Excursions. Sunday at River View. The usual Sunday trips of the steamers Samuel J. Pentz and Estelle Randall will be made to River View tomorrow, and those who wish to spend a delightful day in the shade of the trees, where the cool breezes blow from the river,

> should not fail to visit the resort. These Sunday trips to the View are taken advantage of by many of Washington's business men, who spend the day there in order to rest for the next week's work. The concerts by the View orchestra, under the leadership of Prof. Chris Arth, jr., will be a feature of the day's entertainment, and there are dozens of other amusements to entertain the visitors. Tomorrow, in order to avoid crowding, trips will be made at 11 a.m, 2:45, 3:45, and 6:15 p.m.; and the return trips will be made at 1, 5, 7:30, and 9:30 p.m. (*Evening Times* 1898:3).

Indeed, these weekend excursions appeared to have been exceedingly popular, and during the earliest years of its career, the steamer was extensively advertised for its trips to locations around the Chesapeake. One regularly advertised service was a Sunday route from River View Wharf (Washington, DC) and Alexandria (Virginia) to Chapel Point (Maryland) for the purposes of "Fine Bathing, Crabbing, and Fishing." A round-trip ticket was 50 cents (*Evening Times* 1900a:5, 1900b:5, 1900c:5, 1900d:5, 1900e:5, 1900f:5, 1900g:5, 1900h:5; *Times* 14 July 1900b:5).

Estelle Randall, by all accounts one of the "prettiest boats" in the area, was also often the venue for special events, as noted in an 1898 *Times* article,

> Italian Sailors Feasted. The shad bake given by Captain E.S. Randall and the Jolly Fat Men's Club at River View yesterday was one of the most enjoyable affairs that has been given by the club for some time. The guests of the day were Engineer Meechia Leonardo and Lieutenants Gughilmo Fiorante, E.V. Volpe and G. Marcucci of the Italian cruiser Amerigo Vespucci. The trip to the View was made on the steamer Estelle Randall and the dinner under the direction of Mr. Chas. Beverage, caterer, was served in the refreshment hall and was voted a great success. The Italian officers were well entertained by Captain Randall and Mr. J.H. Buscher of the club, and thoroughly enjoyed the American outing. The steamer started for home shortly after six o'clock, and stopping at Alexandria to Land the guests reached home before seven" (*Times* 1898:2).

Due to its pleasing looks, *Estelle Randall* periodically found itself with *Samuel L. Pentz* on high-profile excursions, such as one reported on 1 May 1899 as the "Saengerbund Outing,"

> The first big Sunday excursion of the season was held yesterday at River View. It was a red-letter occasion in the history of the United Singing Societies, and fully 3,000 members

> of the Saengerbund and Arion Societies, which compose the united organization, took advantage of the beautiful spring day for an outing down the river. The weather was ideal and beautiful the lawns or River View were thronged with the crowds of German-Americans who thoroughly enjoyed their brief vacation (*Times* 1899b:2).

The large social gathering, with a big orchestra, rides, and many other amusements such as shooting galleries and merry-go-rounds greeted thousands of excursionists Similarly the *Times* advertised that *Estelle Randall* and *Samuel J. Pentz* were used for Independence Day music and dancing events in 1900. The steamer departed at 10:00am, 2:15pm, 4:15pm, and 6:45pm. Adult tickets were 25 cents and children's tickets were 15 cents (*Times* 1900a:5).

However, *Estelle Randall* was not just a recreational craft and often found itself pressed into services that were not a part of its regular function. One particularly important series of events in its life occurred during the winter of 1899 when it was used to cut channels through the frozen-over Potomac River. On 17 December the Commissioners of the District of Columbia, convened a meeting due to the increased risk of flooding created by the frozen river (which in places was 6" thick). Also in attendance were a number of influential people, including the City Harbormaster (Commodore J.R. Sutton) and Captain E.S. Randall (*Evening Times* 1899a:1). The following agreement was reached;

> The various phases of the flood problem were thoroughly considered and steps taken to remedy this situation. An agreement was reached whereby the steamer Estelle Randall will be used to break the ice in the river at the price of $100 per day. The steamer started out on its first trip about 1 o'clock and was accompanied by several tug boats. She proceeded up the Washington channel as far as the first section of the Long Bridge and turning started down stream for Alexandria. The object is to open up the river channel as far as Alexandria today and to continue the work below that point tomorrow. Small tugs which have already been engaged by the District will be used to keep the channel open and to push the broken ice down stream (*Evening Times* 1899a:1).

Because of this action, the harbormaster believed that the risk of flooding to Washington D.C. had been significantly reduced, but that continued icebreaking needed to occur. A continuing agreement was forged between the Commissioners and Captain Randall:

> Captain Randall informed the Commissioners that he would be willing to allow the steamer Estelle Randall to be used as long as she would last, at the rate of $100 per day. The Commissioners agreed to this proposition, and Mr. Randall proceeded to the wharves immediately and directed his men to prepare the vessel for service. The steamer is well equipped for battling with the ice, as it has a heavy ice plow on its prow and is propelled by powerful compound cylinders, which are capable of sending the boat through the thickest ice. The Commissioners were gratified at the offer of Captain Randall in view of the difficulty of obtaining other large vessels and the high prices sought by other steamship companies (*Evening Times* 1899a:1).

This agreement implies that other companies in the area charged exorbitant rates for similar activities and perhaps were not as committed to the greater welfare of trade in the area. The article explains that the Norfolk Steamboat Company, which owned two very suitable steel-hulled vessels that could be used for ice-breaking, refused to make its watercraft available for icebreaking at a price within the Board's budget of $5,000 (a sum it had received from the US Congress). This forced the use of much smaller craft despite the apparent emergency (*Evening Times* 1899a:1).

Work on icebreaking continued for the next few days, with *Estelle Randall* (the largest of the icebreakers) accompanied by the smaller tug boats *Edith Winship*, *Minerva, Hugh McFadden*, *Fannie Gilbert, William H. Mohler,* and *J.C. Carter*. The vessels broke channels in the ice under the command of Commodore Sutton from Alexandria (Virginia) to Indian Head (Maryland) and along the Washington Channel to the Aqueduct Bridge with an eye to opening up channels further away in the following days. This freed up many ships that were icebound at their wharves, allowing them to continue their business. In places ice was reported to be 15 inches thick (*Evening Times* 1899b:1; *Times* 1899a:2). Many people were surprised at the effectiveness of *Estelle Randall* as an ice breaker:

> The Randall proved a very successful ice breaker, and surprised many of the river men, who were watching her movements. The opinion was generally expressed that she could break the ice nearly as well as the larger and heavier Norfolk boats. This was in a large measure due to the heavy steel and wood plows, which Captain Randall, the owner of the boat, had constructed when the ice first became troublesome in the river. His boat experienced scarcely any difficulty in making her way through the fields of ice, notwithstanding the fact that below the forks of the Georgetown and Washington

> channels the ice had gorged to a considerable extent, making it in many places several inches thick. She was not brought to a full stop except in one or two instances. The plan of attack was to run each boat far enough into the ice from the edge of the channel already cut by the steamer last night to allow the prow of the boat to gain sufficient hold to keep her nose in the ice. If the boat ran too close to the channel the edges of the ice would keep her in the part where the ice was already broken and no headway could be made (*Times* 1899a:2).

Estelle Randall continued to serve with distinction until the threat of flooding and any impediment to navigation along the Potomac River was cleared, earning itself a reputation as a sturdy multi-functional vessel. The steamer was called upon to serve a similar role at least twice more in 1901 and 1902 (*Evening Star* 1901a:8, 1902:8).

Estelle Randall was pressed into other uncharacteristic activities, including the May 1902 rescue of an incapacitated, passenger-laden, and drifting *Samuel J. Pentz* following the breaking of a crank pin (*Evening Times* 1902:1) and the May 1903 refloating of the sunken wreck of *Columbia* (*Washington Times* 1903:12).

The steamer also made special deliveries. On 11 March, 1901, the *Evening Star* reported, "Along the River Front: Fire-Fighting Force Organized at Fort Hunt—Provided with Hook and Ladder Truck—Condition of Market for Oysters and Fish," and the following article,

> A fire-fighting force has been organized among the soldiers at the United States artillery station, Fort Hunt, Virginia, and today the steamer Estelle Randall carried down a handsome little hook and ladder truck to the fort for use of the fire fighters there if it shall be necessary. The truck is a handsome one, and is equipped with thirty-foot ladder, pike for shoving down burning walls and fences, axes, &c. It is intended to be drawn to the scene of the fire by hand, and has a hand-steering tongue and long rope by which to haul it (*Evening Star* 1901a:8).

The same year, *Estelle Randall* made special deliveries of gunpowder to Fort Washington and Fort Hunt (*Evening Star* 1901b:8), and the following year was shipping "large quantities of hay and mill feed" to Fort Washington (*Evening Star* 1902:8).

However, the life of *Estelle Randall* was not one of uninterrupted triumphs and successes. According to the *Annual Report of the Supervising Inspector General, Steamboat Inspection Service*, on 3 September 1899, "The steamer *Estelle Randall* collided with the steamer *Kent* [also owned by Captain E.S. Randall] in Port Tobacco Creek. The case was investigated 22 November 1899, and the license of Harry S. Randall, master of the steamer *Estelle Randall*, was suspended for a period of fifteen days" (US Steamboat-Inspection Service 1900:53). Other unspecified damage was repaired during the latter part of July 1901 (*Alexandria Gazette and Virginia Advertiser* 1901:3). In 1905, tragedy occurred on board *Estelle Randall*. The *Washington Times* of 17 July 1905 reported that Captain Harry Randall was in custody regarding the death of William Crowley, who drowned while Captain Randall was captain of the steamer *Estelle Randall*. The man had jumped overboard "while in fear of, or to escape punishment at the hands of, Captain Harry S. Randall…" and Captain Randall was held responsible for the death (*Washington Times* 1905:1). This was also reported in a section of the 1906 *Report of the Secretary of Commerce and Labor and Reports of Bureaus* that reports on "Casualties, violations of the law, and investigations" up to December 31, 1905,

> July 14.—William Crowley, a member of the crew of steamer *Estelle Randall*, was drowned in the harbor of Washington. Case investigated October 12, and found that no licensed officer was responsible for said drowning while acting under the authority of his license (US Secretary of Commerce and Labor 1906:361).

No further details regarding this event and its aftermath have to date been located.

Estelle Randall appears to have been in continuous service throughout 1908 as a part of the Washington and Potomac Steamboat Company (*Alexandria Gazette and Virginia Advertiser* 1908a:4, 1908b:4, 1908c:4, 1908d:4, 1904e:4). Other than advertisements for service in newspapers historical research currently tells very little else about the life of the steamer up until the following report in the *Washington Herald* of 1 May, 1909, under the title "River Steamers Rechristened,"

> The steamer Harry Randall, which has been undergoing repairs in Baltimore, will reach Washington to-day, to take the place of the Wakefield on the river route. The Randall has been rechristened the Capital City. The propeller, the Estelle Randall, has been

> rechristened Alexandria, Both vessels belong to the fleet of the Potomac and Chesapeake Steamboat Company (*Washington Herald* 1909:7).

Despite this report, there is no evidence in the historical record that *Estelle Randall* was ever renamed, nor does any vessel named *Alexandria* matching these specifications (or associated with the Official Number 136664) show up in American insurance registers or merchant shipping lists after 1909. Indeed, the steamer continues to be listed as in service as a part of the Potomac and Chesapeake Steamboat Company throughout August and September 1909 (*Alexandria Gazette and Virginia Advertiser* 1909a:4, 1909b:4). Likewise, the name *Estelle Randall* continues to be registered in the *Record of American and Foreign Shipping* until at least 1919 – almost a decade after its sinking (see American Shipmaster's Association 1917:Est, 1918:Esp, 1919:Esp)! One can only conclude that the name change did not go ahead or was not made official and that any plans reported by the *Washington Herald* must have changed soon after.

Sometime between September 1909 and January 1910, *Estelle Randall* was purchased by the Farmers' and Merchants' Line of North Carolina (Currituck County), and began making trips to Columbia, North Carolina (*Raleigh News and Observer* 1910:1c). *Estelle Randall* would not be in such service long, as on 18 January 1910, the *Raleigh News and Observer* reports the burning of the steamer the night before (at 10:30pm) while alongside a Columbia waterfront wharf. The accident is described:

> The steamer left here yesterday afternoon for Columbia and had unloaded her cargo at the port and was moored at the wharf. When the flames were first discovered the entire forward deck was enveloped until there was no way to check the flames. The crew, most of whom had retired, rushed out of their berths scantily clad and frightened. All reached safety except Exley who turned into the cabin to help others, and perished. The second engineer had a narrow escape, but jumped overboard and swam ashore (*Raleigh News and Observer* 1910:1c).

On 19 January 1910 the *Daily Press*, elaborated upon the loss of Exley under the title "Trys to Help Others; He Burns To Death"

> Steamer Estelle Randall Destroyed By Fire at Columbia—Narrow Escapes. ELIZABETH CITY, N.C., Jan. 18 – The steamer Estelle Randall, of the Farmers & Merchants North Carolina Line, plying between here and Norfolk, Va., via Columbia, was destroyed by fire and William Exley, the cook, was burned to death last night while the vessel was at dock at Columbia.
>
> The vessel has unloaded her cargo and the forward deck was enveloped in flames when the fire was discovered. The crew, most of whom had retired, rushed from their berths scantily clad to safety, except Exley, who returned to help others and perished The second engineer had a narrow escape, but jumped overboard and swam ashore. The steamer was a total loss, but was partially covered by insurance (*Daily Press* 1910:1).

William Exley, the cook on board the vessel, described as a "white man, about 60 years old," who was from Coinjock, Currituck County and considered "a highly respected citizen," was the only fatality (*Raleigh News and Observer* 1910:1c). This report also provides us other insights into the reputation, operation, and consequences of the complete loss of the steamer:

> The Estelle Randall was one of the largest and most magnificent passenger freight steamers in North Carolina and plied between this port and Norfolk, via Columbia. She had just resumed her route after having undergone extensive repairs on the railways. The loss of this costly steamer falls heavily on the stockholders, most of whom are merchants and farmers of Currituck county. There is no clue as to the origin of the fire (*Raleigh News and Observer* 1910:1c).

These details are corroborated by the *Annual Report of the United States Life Saving Service* (USLSS 1911:219) which described the total loss of *Estelle Randall* and its merchandise due to a fire. The source also notes that the vessel had 14 crewmembers. Other than the strange continuation of *Estelle Randall's* registration in marine insurance registers up until 1919, no other records concerning human interactions with the shipwreck have been located after its wrecking and the late 1980s, though one undated photograph found in the Tyrrell County Public Library remind us that the wreckage, sticking up out of the water for decades was difficult to forget (Figure 28).

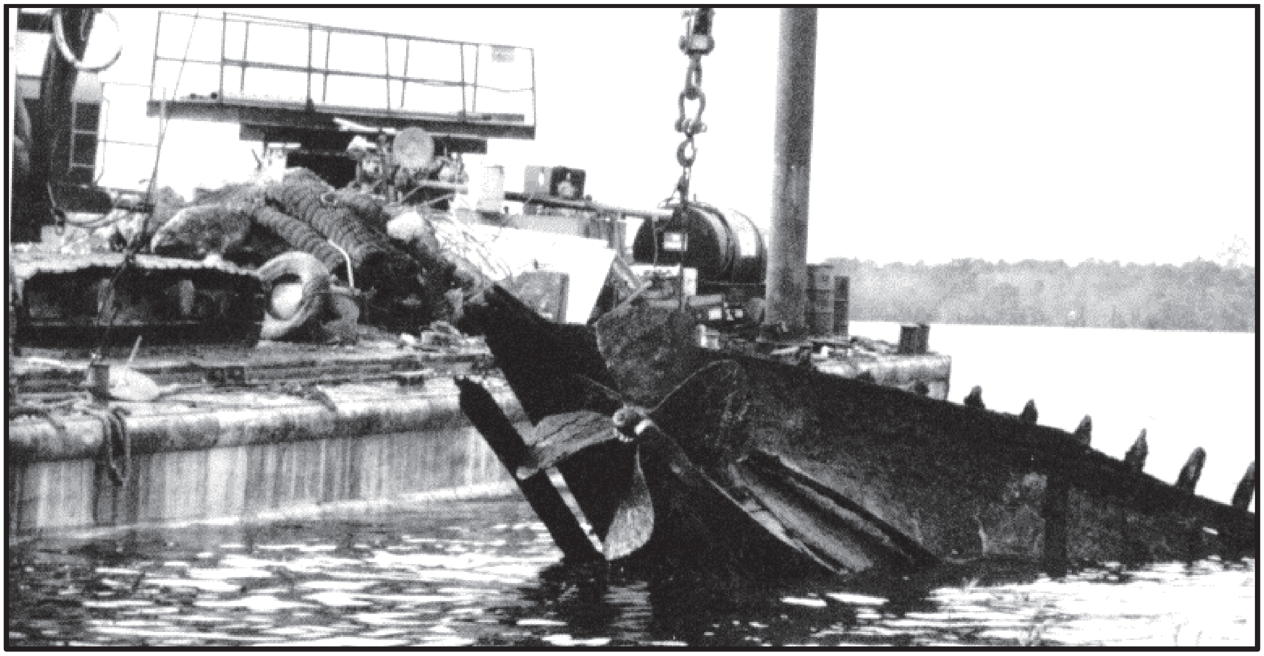

Figure 28. Remains of *Estelle Randall*, date unknown. (Image from Peggy Griffin Collection, Tyrrell County Public Library).

In May 1988 an initial archaeological inspection of the site was carried out by Gerald N. Dunn. This culminated in measurements of the hull and engine (see Figure 29), as well as an inspection report (Dunn 1988). A memo dated 20 May 1988 from the Underwater Archaeology Branch to Renee Gledhill-Early notes, "The vessel remains are in a good condition with a well-preserved structure and machinery. Artifacts within the hull can shed light on ship board life of the period" (NCUAB 1988:1).

In May 1989 an additional report was completed by Jerry Dunn and Mark Wilde-Ramsing. This report was a synopsis of the 15 April 1988 diving inspection of *Estelle Randall* by the NCUAB. It expanded upon Dunn's previous writing, and gives us the first complete assessment of the site (Dunn and Wilde-Ramsing 1989). Dunn and Wilde-Ramsing's site description reads:

> A small portion of the top of the wreck's steam engine can be seen sticking above the water off the northwest corner of the former Exxon property … The wreck itself is situated parallel to shore, headed downstream and rests in 10 feet of water with a 30 degree list to port. Its starboard side is, on an average, 2 feet below the water's surface. Considerable in-filling of sediments had brought the bottom surface up to deck level thus encasing the hull. Because of the list, the upper portions of the port side are approximately 4 feet below the water surface, however sediments have not surrounded this side and

therefore greater deterioration has taken place. Within the hull itself sediments range from 1-4 feet in thickness.

Although the wood planking on iron frame sides are intact nearly up to the main deck level, especially on the starboard side, most of the deck and supporting beams have fallen in. Forward of the boiler some deck beams may be in place, however it was difficult to discern articulated timbers in the jumble of debris

Very little salvage of the major portions of the vessel appears to have taken place. Besides a well-preserved engine and boiler, the rudder and three-bladed (though Figure 28 suggests the ship had a four-bladed propeller), 6-foot diameter propeller were in place at the time of writing (Dunn and Wilde-Ramsing 1989:1-2).

The dimensions of the wreckage conform to those of the historical *Estelle Randall,* although Dunn and Wilde-Ramsing noted that the engine specifications were considerably different, and surmised that the engine had been replaced when the vessel was overhauled at Elizabeth City, NC prior to 1909-1910 (Dunn and Wilde-Ramsing 1989:5).

On May 6, 1991 a memorandum sent to William S. Price, Jr., by David Brook (NC Department of Cultural Resources) noted that work commenced in 1988 was driven by "the Coastal Initiative Redevelopment/Master Plan" which

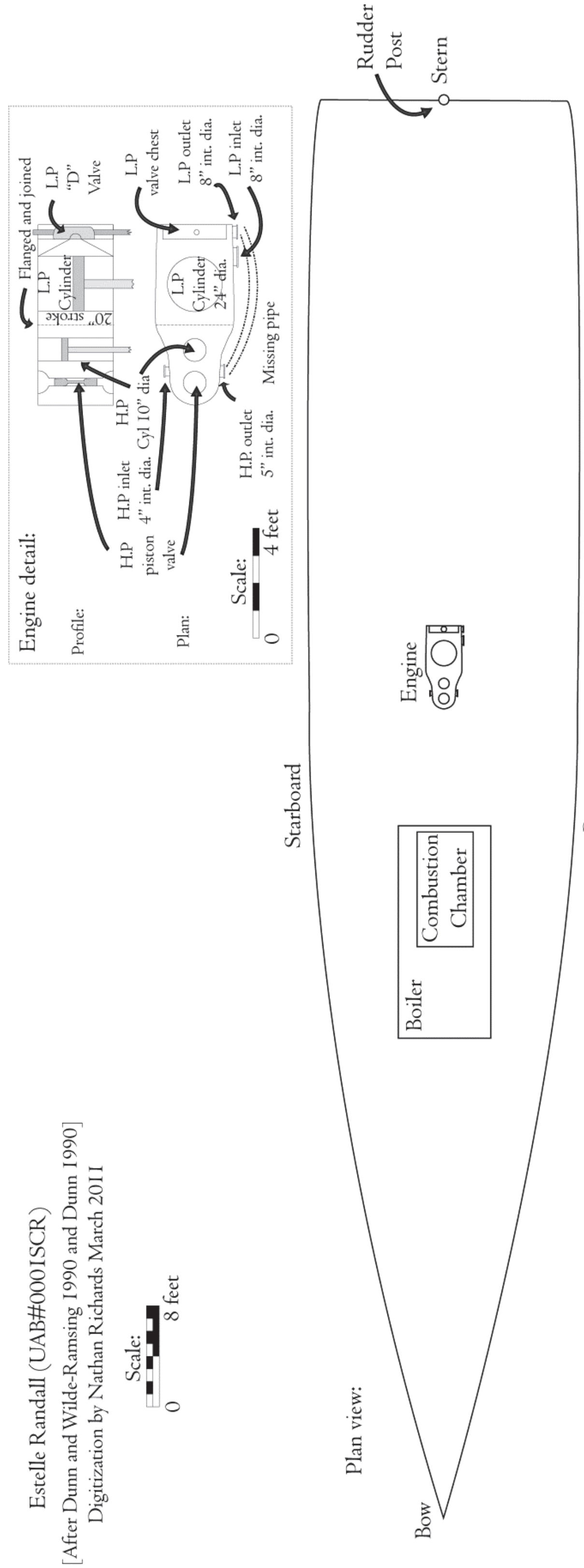

Figure 29. Results of 1988 inspection of 0001SCR by Gerald N. Dunn. (From Dunn 1988; Dunn and Wilde-Ramsing 1989, drawing by Nathan Richards, 2011).

included $25,000-30,000 for the transformation of the Columbia waterfront (Brook 1991).

Subsequently, on 16 October 1991, a Memorandum of Agreement (MOA) was signed between Tyrrell County and the NC Department of Cultural Resources (NCDCR) pertaining to the remains of *Estelle Randall*. The agreement related to long range plans to develop the waterfront of Columbia and the fact that *Estelle Randall*'s remains were in the way of the development. The county entered into an agreement whereby they could remove "the remains of the *Estelle Randall* while preserving the information and artifacts contained within the shipwreck site" (NCDCR 1991:2). The MOA also outlined the NCDCR's desire to systematically recover small artifacts, create an inventory of them, and store them. They also agreed to recover "steam machinery (including the engine, condenser, associated pumps and valves, and the propeller and propeller shaft)" (NCDCR 1991:2), which they would also store. In return, the county was to "refrain from disturbing the … site, except in the pursuit of the activities outlined … until these activities are completed, or October 1, 1992, whichever comes first" (NCDCR 1991:3).

Mark Wilde-Ramsing (1992:1) reported on the recovery of artifacts and machinery (see Figure 30) from the shipwreck in the Winter 1992 edition of the *Newsletter of the North Carolina Archaeological Society*. The article notes,

> The majority of the excavation, which was necessary for the recovery of the machinery, has been conducted by volunteer divers Eddie Congleton, Mitch Moore and Kenneth Bland. During this work they recovered a large variety of shipboard implements, personal effects, and machinery accessories such as steam gauges and grease lubricators. With the help of heavy equipment and operators donated by Waff Contracting Inc. of Edenton, the machinery from the *Estelle Randall* was recovered in November 1992. The major items retrieved were a vertical, direct-acting, compound steam engine fitted with a surface condenser; a double-acting, vertical air pump; a duplex feed-water pump; an early Westinghouse generator housing and a ship's rudder.
>
> The Unit is in the process of inventorying and stabilizing the many small artifacts. Within the next year restoration will begin on the machinery. A collection of small artifacts is now on display in Columbia and it is hoped that the interest generated will lead to a local museum that deals with the area's maritime history and features the *Estelle Randall* (Wilde-Ramsing 1992:1).

On June 22, 1992 a memorandum sent to David Brook by Richard Lawrence indicates that:

> A permit was issued last fall to Eddie Congleton and Kenny Bland to systematically excavate and recover small artifacts from the wreck site. They have already recovered several hundred artifacts from the wreck including tools, personal effects, and ship stores and equipment. These artifacts have been transported to our laboratory at Fort Fisher for storage. They are currently working every other weekend on the site, and will continue their efforts throughout the summer (Lawrence 1992:1).

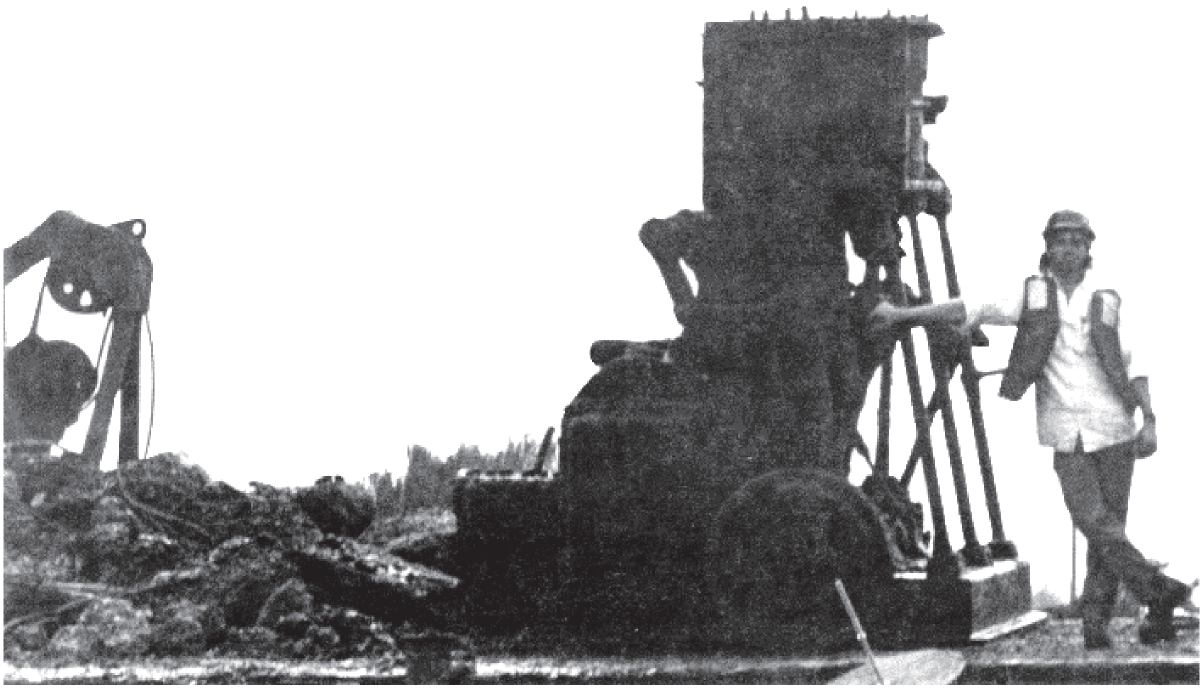

Figure 30. *Estelle Randall* engine and workman c.1992. (From Wilde-Ramsing 1992:1).

The machinery salvaged from the site by the Underwater Archaeology Branch included (NCUAB n.d.):

- Steam engine. The entirety of the vessel's steam engine (minus a cylinder head and steam manifold) was recovered in 1991.
- Horizontal water pump. A high pressure pump with a slide valve and trunk pistons was salvaged in 1991. The pump had a 5.25" pump, 3.5" water end, and 5" steam end.
- Steam gauges. Four steam gauges were retrieved in 1991. Each gauge notes the name and place of manufacturer:
    1. "Smith & McCoy Dry Dock, Norfolk, VA."

2. High pressure gauge: "The Ashcroft Mfg. Co., New York."
3. "Campbell and Zell Co., Baltimore, MD."
4. Vacuum/pressure gauge: "Star Brass Mfg. Co., Boston."

- A brass lubricator constructed by Powell.
- Gould "challenge" hand pump.

A subsequent letter from Richard Lawrence to Ellen Cassilly dated 11 October 1995 outlines that additional pieces of machinery and some other parts of the vessel were recovered during the steam engine's retrieval (Lawrence 1995). This included:

- Duplex steam pump – 5' long x 20" wide by 16" wide.
- Dynamo (Steam powered generator) – 28" long x 33" wide by 28" high.
- Auxiliary Steam Engine – 2' long x 18" wide by 4' high.
- Rudder – 45" side x 15" thick by 12' high.
- Windlass – 40" long x 26" thick by 16" high (Figure 9).
- Two sections of propeller shaft – (1) 20'6" long, and (2) 8'10" long.

Much of this machinery has been conserved by the NCUAB and resides adjacent to their facility at Kure Beach where it is on display (see Figure 31).

Figure 31. Windlass from *Estelle Randall* now on display at the Underwater Archaeology Branch headquarters, Kure Beach (Image by Danny Bera, 2011).

Additionally, a short list of artifacts recorded as retrieved by J.D. Brickhouse in September 1991 includes bottles (mostly clear glass), glass containers, and stoneware jugs. The aforementioned correspondence between Richard Lawrence and Ellen Cassilly also notes a collection "including ships fittings, steam gauges, bottles, ceramics, cutlery, and early-twentieth-century electrical fittings" (Lawrence 1995:1). At the time these and other items from *Estelle Randall* were identified as good opportunities for museum display.

Such a museum display was considered in a summary of the "Coastal Initiative" from 16 September 1992 (Columbia/Tyrrell County 1992:1-2) which noted that the NCUAB's investigations of *Estelle Randall*, the removal of artifacts (at a cost to the town and county of $3,700), and the donation of a house to the town by a local church (which could be relocated to the waterfront) could culminate as a dual visitor center and museum for the shipwreck artifacts. The plan never eventuated, though shipwreck artifacts were eventually put on display elsewhere.

A recent comprehensive inventory of *Estelle Randall* material once held by the NCUAB indicated that shipwreck artifacts are dispersed across four collections located at State and locally-run museums and interpretive centers – the Columbia Theater Cultural Resource Center (65 objects), the North Carolina Transportation Museum at Spencer (154 objects), the Museum of the Albemarle at Elizabeth City (25 objects), and the Underwater Archaeology Branch at Kure Beach (the rudder of a small boat). Additionally, the location of six objects is currently unknown, and one (a bracket) was de-accessioned due to advanced corrosion.

The wreckage of *Estelle Randall* has never been lost – it is still very much in the memory of Tyrrell County's people. Today the wreck of *Estelle* Randall is easily found – as it lies close to shore and is buoyed with a hazard to navigation buoy. On 13 September 2011, the remains of *Estelle Randall* were easily imaged via sonar (Figures 32 and 33). A high-resolution pass of the wreckage in 20m swath clearly shows the contiguous hull of the vessel as well as the bow, stern, and some remnant machinery or structural elements within the hull. Additionally, the area is surrounded by other debris likely from the wreck itself. Magnetometer passes were not attempted due to its proximity to the shore and nearby residences and infrastructure (which would likely mask the magnetic signatures of the wreck) as well as the chance of getting the magnetometer sensor embedded within the wreckage which lies just below the water surface. The image clearly shows remaining hull structure intact on port and starboard sides, from bow to stern as well as some unidentified structures within the hull itself.

The remains of *Estelle Randall* represent an opportunity to interpret the Scuppernong River's maritime heritage close to the shore, and future maritime archaeological work may seek to look at the submerged structures now lying under the water or the artifacts from the wreck, whether residing on the river floor or in museum collections.

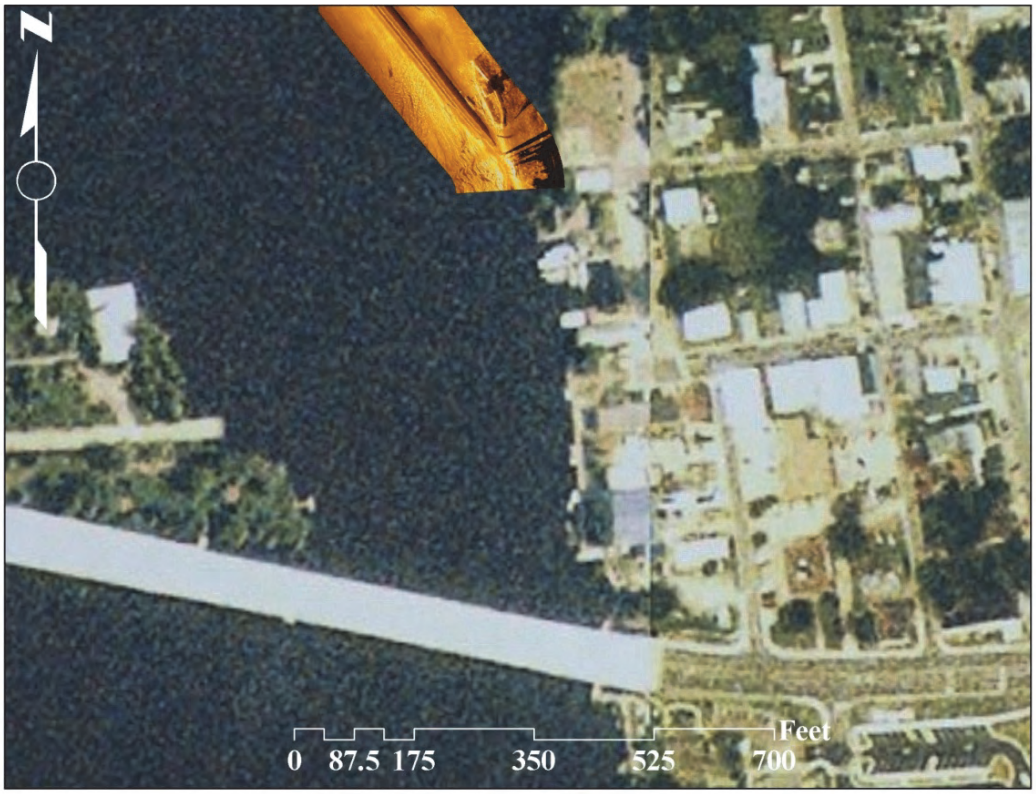

Figure 32. Georectified tile of sonar showing the location and orientation of the remains of *Estelle Randall* adjacent to the eastern bank of the Scuppernong River in the heart of Columbia, NC. (Image by Nathan Richards, 2011).

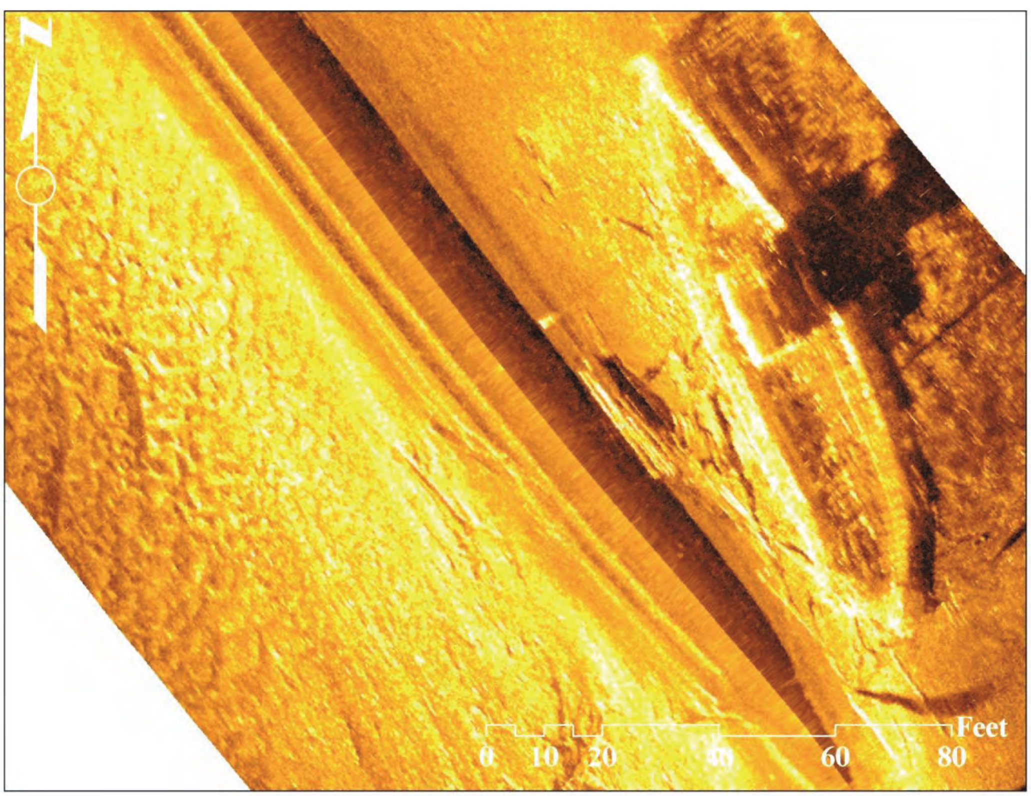

Figure 33. Georectified sonar imagery (20m resolution) of the remains of *Estelle Randall*. (Image by Nathan Richards, 2011).

Columbia Flat Barge A (UAB# 0002SCR)

In April 1990, the Underwater Archaeology Branch inspected 0002SCR, also known as "Columbia Flat Barge A," and provided the following information:

> The remains of this barge lie inshore next to and inshore of Barge B. Portions of the decking, most of the deck supports, and all of the sides and hull bottom exist. Barge A is rectangular in shape and measures 54'6" long, 12' wide, and 4'6" deep. Its ends are squared off with no rake or angle, which suggests it served as a work platform rather than for transporting goods.
>
> Barge A is entirely constructed of wood and is fastened using iron bolts (1/2" d.; 16" length), washers and nuts. Its sides are edge-fastened with iron drift pins of one inch diameter stock are placed on 4 foot centers. Athwartship timbers brace longitudinal deck beams which in turn support transversely laid decking. The interior and lower portions of the hull are inaccessible due to sedimentation and vegetative growth.
>
> One local account reports that this barge was abandoned and later reclaimed by a resident of Columbia. His death soon after precluded the refurbishment of the barge and it eventually passed the point of repair. J.D. Brickhouse, the town's comptroller, relayed this information to the UAU and indicated this took place during the late 1940's and 1950's (Wilde-Ramsing 1990:2).

The results of the 2 April 1990 NCUAB site inspection, depicted in field observations and site sketches, allowed us to create an initial site reconstruction (see Figure 34).

At the time of the 2011 remote sensing survey it was uncertain if the wreckage from this vessel would still be in situ. A document from the town of Columbia dating to 16 September 1992 notes "Removal of approximately 1,000 old pilings and miscellaneous large debris such as *old barge hulls*, huge cement anchors from an old draw bridge, and tree stumps …" (Columbia/Tyrrell County 1992:1, author's emphasis), suggesting a possible extraction event. Following a survey of the area on 6 September 2011, no sonogram data showed a feature in the area adjacent to the original location. However, the lack of imagery from side scan sonar cannot be considered a definitive answer to the question of the site's continued existence because the survey boat's draft precluded survey of the shallowest parts of the submerged bottomlands of the area.

Magnetometer data was not collected for this part of the river due to the proximity to metal bridge pilings and power transmission lines (sources of large magnetic disturbances) as well as obstructions (precluding the deployment of the magnetometer sensor off the stern of the survey boat). Hence, the possibility that some portions of the wreckage may lie below in the area or may be obscured by silt must be left open until a diver-based inspection occurs or local informants tell us about the removal of 0002SCR.

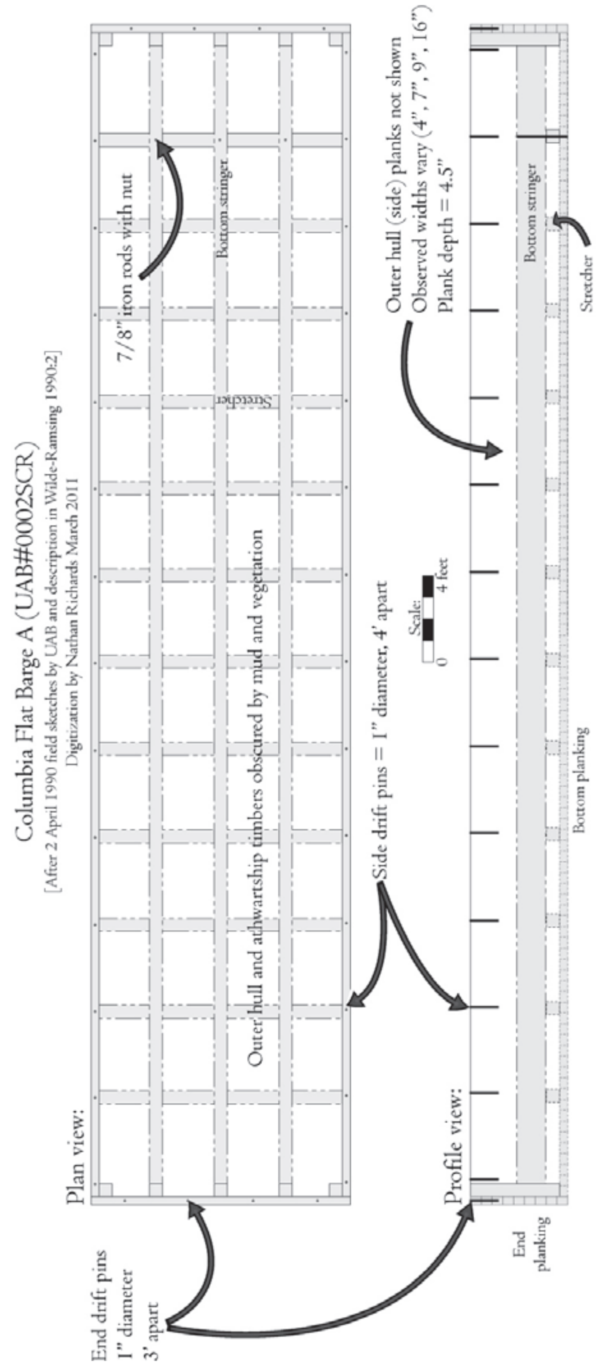

Figure 34. Reconstruction of Columbia Flat Barge A (0002SCR) from 2 April 1990 field sketches and descriptions from Wilde-Ramsing (1990:2). Some additional features interpreted. (Drawing by Nathan Richards, 2011).

Columbia Flat Barge B (0003SCR)

In April 1990, the Underwater Archaeology Branch inspected 0003SCR, also known as "Columbia Flat Barge B," and provided the following information:

> Although slightly larger than the other barge, Barge B is also a rectangular, wood flat barge once completely decked over. Overall measurements are 62' in length and 20' 6" in width; both ends are raked. Stanchions have been employed to fasten the side planks and to support longitudinal deck beams. The decking is constructed of 2 ½" x 8" planks lying transversely and is fastened with galvanized, cast iron spikes. Most of the wood is permeated with creosote.
>
> Barge B survives nearly intact missing only a portion of its original decking. It supports a heavy growth of brush and reeds. According to J.D. Brickhouse's inquiries within the community of Columbia, the barge was used during the construction of the US 64 bypass bridge. It was abandoned after work was completed about the year 1959 (Wilde-Ramsing 1990:2-3).

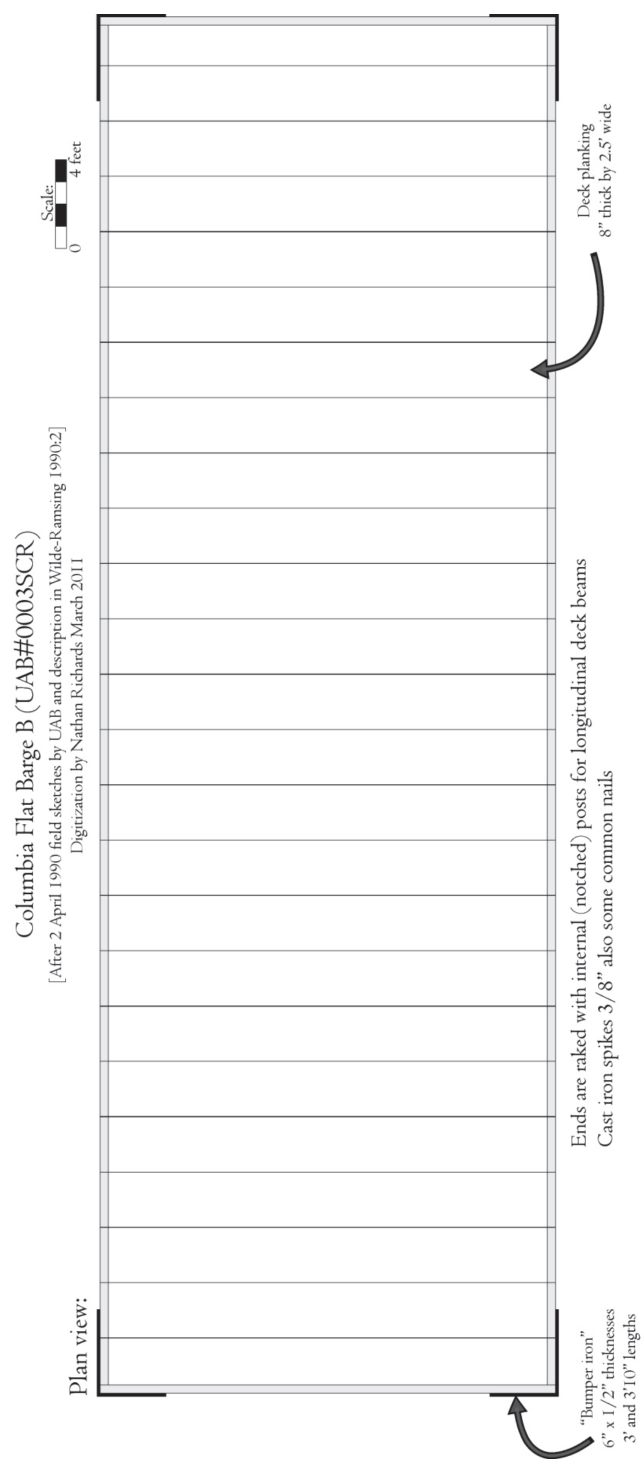

Figure 35. Reconstruction of Columbia Flat Barge B (0003SCR) from 2 April 1990 field sketches and descriptions from Wilde-Ramsing (1990:2). (Drawing by Nathan Richards, 2011).

The results of the 2 April 1990 NCUAB site inspection, depicted in field observations and site sketches, allow us to undertake an initial site reconstruction (see Figure 35).

As with 0002SCR the disposition of this site is currently unknown due to its potential removal in 1992 as a part of the Coastal Initiative Redevelopment (Columbia/Tyrrell County 1992:1). While no sonar data were collected that show the continued existence of the site, the 6 September 2011 survey cannot be considered comprehensive for the same reasons as noted before with 0002SCR.

Columbia Bridge Boat (0004SCR)

In April 1990, the Underwater Archaeology Branch inspected 0004SCR, also known as "Columbia Bridge Boat" and provided the following information:

> This wood plank on wood frame boat is located along the shoreline on the northwest end of the US 64 Bypass bridge. It measures 25'2" X 8'7" X 3'6", has a pointed bow and still retains an internal combustion engine. The stern of the vessel is buried in the sediment and indiscernible. Planks are fastened with countersunk brass screws and wood plugs on frames, 1 ½" X 1 ½", which are spaced on 11" centers. Five frames amidship are considerably stronger, measuring 1 ½" X 4 ½". Wood was judged to be either pine or cypress and marine grey paint coated the interior (Wilde-Ramsing 1990:2-3).

The results of the 2 April 1990 NCUAB site inspection, depicted in field observations and site sketches allows us to undertake a preliminary site reconstruction (see Figure 36). No other details regarding this vessel are currently known.

A sonar survey of this area on 6 September 2011 found no traces of in situ structural remains. As stated with 0002SCR and 0003SCR, a survey of this area cannot be considered comprehensive and diver-based survey of the river bed would be the best way to determine if the vessel or parts of it continue to lie intact in the area.

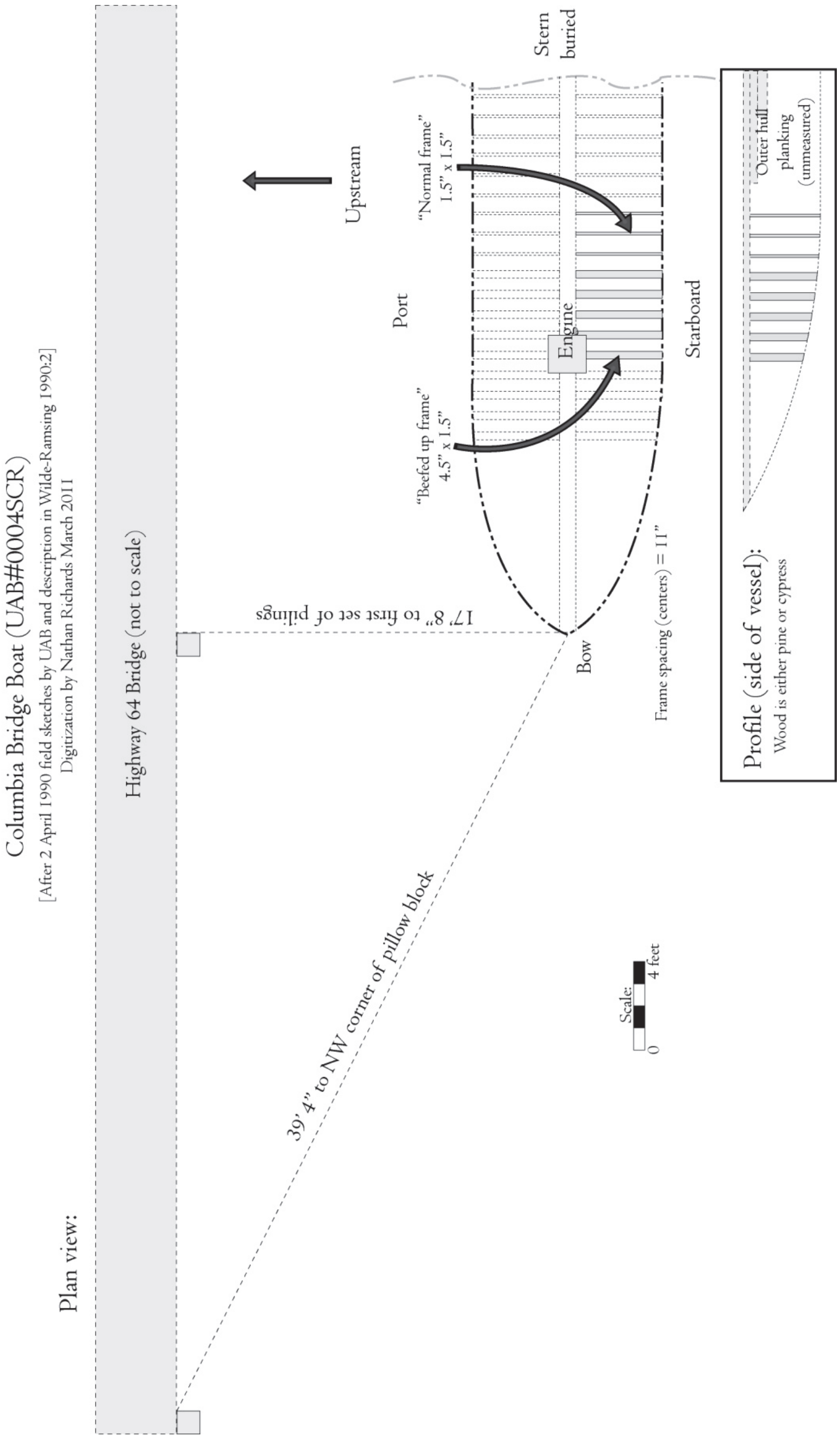

Figure 36. Reconstruction of Columbia Bridge Boat (0004SCR) from 2 April 1990 field sketches and descriptions from Wilde-Ramsing (1990:2). (Drawing by Nathan Richards, 2011).

Columbia Shad Boat (0005SCR)

On 12 April 1990, the Underwater Archaeology Branch inspected 0005SCR, also known as "Columbia River Shad Boat," and on 2 May 1990 recovered it with the help of maritime historian Michael Alford (Wilde-Ramsing 1990:1). Their report provides the following information:

> The stem and port frames of an Albemarle shad boat were seen partially exposed along the shoreline south of the developed waterfront of Columbia. Upon investigation it was determined that the vessel's keel piece, stem and stern, and much of its port side remained in a well-preserved state. Disarticulated from the main body of the wreck lying nearby was the remaining, upper portion of the port side. Therefore, the whole port side from the garboard to the upper strake and washboard survives.
>
> During the examination of the site, a large amount of broken glass, dating to the last forty years, was found within the hull. Over the years the shad boat apparently served as the target for bottle tossers. Very little sediment had accumulated inside the vessels since wave action kept it cleaned out. While the starboard side weakened, broke off and washed away, the port side rested on the bottom creating a suction that kept it in place. Eventually, the upper port side broke lose [sic] and lodged on the shore nearby, an event that must have taken place rather recently since it still survived.
>
> The vessel is short for a typical shad boat measuring only 20 feet in length. However, there is evidence in the stern of extensive repairs, indicating it was most likely shortened. Once a sail boat, as revealed by a <u>mast step</u> and the remnants of a plugged centerboard slot, it was later powered by an inboard engine that has since been salvaged. Several floor timbers have been added to help support the engine and counter new stresses demanded by the conversion. A long life for the boat is implied by the variety of fastenings employed to secure the planking to the frames: copper rivets with square roves, copper spikes with round roves, clinched copper wire nails and miscellaneous manufactured iron nails.

> The Columbia shad boat and associated materials were systematically recovered and removed from the site, where they would have been destroyed during boardwalk construction. These remains now lie in a UAU holding tank at Fort Fisher, awaiting complete documentation (Wilde-Ramsing 1990:3-5, original emphasis).

Since its retrieval the shad boat has been removed from the holding tank. The NCUAB site file regarding this boat contains extensive descriptions of the construction of the vessel as well as many photographs which could be used to create detailed drawings and three-dimensional models (physical or computer generated) of the vessel.

Columbia Skiff (0006SCR)

In April 1990, the Underwater Archaeology Branch inspected 0006SCR, also known as "Columbia Skiff" and provided the following information:

> A lightly built boat is located at the upstream end of the boardwalk project close to shore. Designated the Columbia Skiff, it is nearly awash with very little sediment accumulation implying its recent deposition.
>
> The boat is a punt design with a swim head and squared stern. It measures approximately 17' in length and has a very shallow draft. The sides are constructed of a single 12 inch plank, while the bottom is most likely a single piece of plywood since seams were not detected (Wilde-Ramsing 1989:5).

An initial site reconstruction was created from the field observations and site sketches from the 2 April 1990 NCUAB site inspection (see Figure 37).

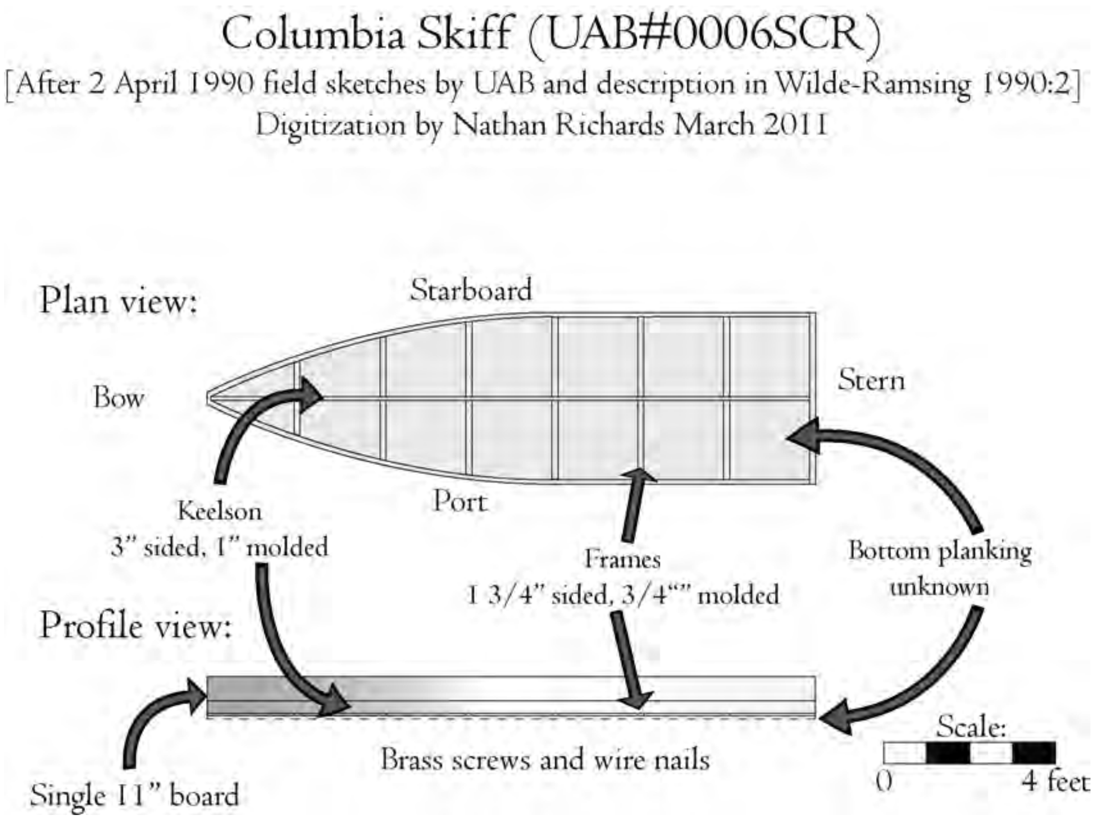

Figure 37. Reconstruction of Columbia Skiff (0006SCR) from 2 April 1990 field sketches and descriptions from Wilde-Ramsing (1990:2). (Drawing by Nathan Richards, 2011).

A survey of this area on 6 September 2011 culminated in sonar imagery of a feature in the same approximate area as 0006SCR (386743.72m east, 3975283.25m north). The sonar contact (0042, Figure 38) shows linear parallel features, but at about 5 meters long (approximately 16.4 feet), it is larger than, but close to, the dimensions of the vessel. Only archaeological inspection by divers could ascertain if the sonar contact represents the remains of 0006SCR or is something else lying on the river bed.

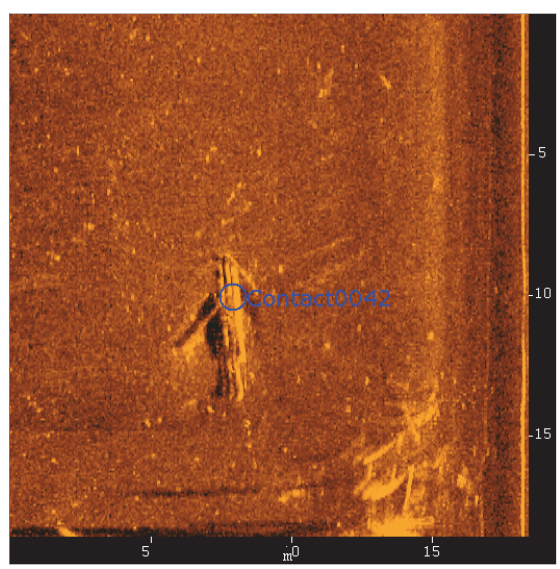

Figure 38. Contact 0042, found in estimated proximity to previous location of 0006SCR. (By Dan Brown, 2011).

A single pass of the magnetometer over this site did not indicate the presence of significant ferro-magnetism.

Historical research indicates two shipwrecks lost in the upper reaches of the Scuppernong River near Creswell have not been relocated (Figure 39). These were deemed to be prime candidates for discovery by remote sensing.

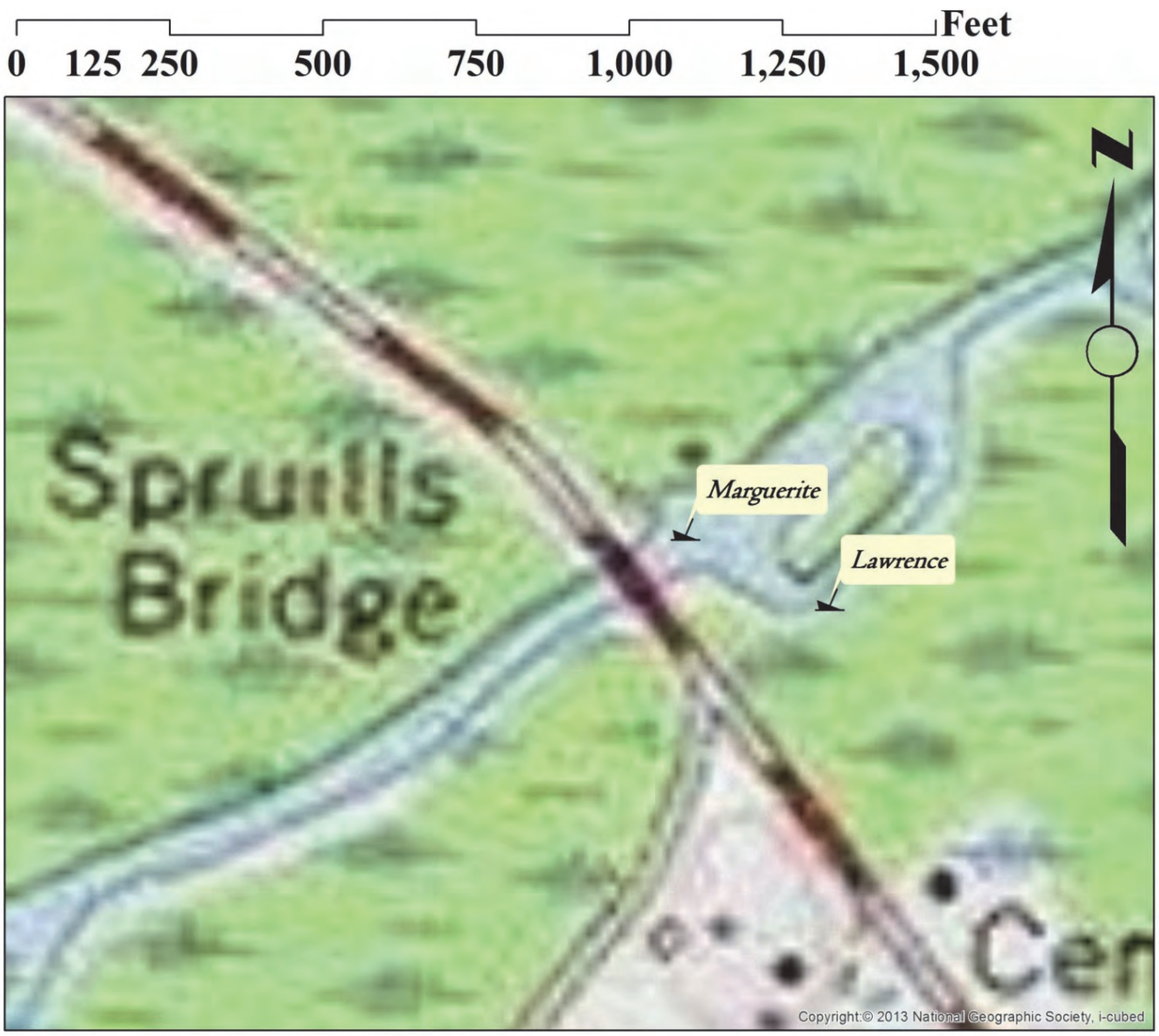

Figure 39. Estimated locations of *Marguerite* and *Lawrence* (used as starting points for remote sensing searches). (By Nathan Richards, 2014).

Marguerite (UAB# SCR-1903)

An 86-ton oil steamer *Marguerite* (built 1903) is listed in Bruce Berman's *Encyclopaedia of American Shipwrecks* (Berman 1972:132) as having burnt at "Spruell's [sic] Bridge, N.C." on April 5 1933. Berman likely got this information from *The Annual List of Merchant Vessels of the United States* in 1933, which lists all of this information but notes that four crew were on board at the time (none perished) in the section "Vessels Lost" (US Treasury Department 1933: 990).

The *Annual List of Merchant Vessels* in 1932 (US Treasury Department 1932:422-433) lists *Marguerite* (Official Number 200370) as an oil-fired steamer of 86 gross tons and 49 net tons and dimensions 99 feet long, 20.5 feet wide, and 6.8 feet depth, built in 1903 at South Rondout, New York. The vessel was engaged in the transport of freight with four crew and a 110 horsepower engine. In 1932 the owner was R.W. Gatewood (Sixteen and One-half streets, Ocean View, Virginia), and its home port was Wilmington, Delaware. *Marguerite's* previous names were *Augustus J. Phillips* and *Willoughby.* From here, an entirely different history of the wreck emerges.

First, the *Rockland County Times* (2 May 1903:2b) featured an article concerning the launch of *Augustus J. Phillips*:

THE AUGUSTUS J. PHILLIPS.

An Innovation In Vessel Launching— The "Favorite Remedy" Used Instead of the Traditional Wine When the Johnson Brothers' Handsome New Steam Yacht Kissed the Waves on Saturday Last.

A great business and social event on the Rondout creek last Saturday was the launching of the large new steam yacht of the Johnson Brothers which will take the place of the pretty steamer Robert Main recently burned to the water's edge. The new steamer was built at the well known boat yard of C. Hiltebrant, at South Rondout and is one of the prettiest and most staunch boats ever built at that yard. It will be licensed to carry 360 passengers. Its length over all is 105 feet, breadth of beam 20 feet 6 inches. It will have compound engines of 350 horse power and will be expected to make 18 miles and [sic] hour. It will be fitted up in most modern style.

There were two excursions to South Rondout this forenoon. One was composed of Mr. Augustus J. Phillips, President of the Dr. David Kennedy Corporation and a party of his friends and the other was arranged by the Johnson brothers, the owners of the new steamer. Mr. Phillips and his invited guests went on the tug Harry and the Johnson party, which was composed largely of the older students of Ulster Academy, boys and girls, chaperoned by Mrs. F. B. Dennis, went on the Glenerie.

The new steamer was in a cradle on the ways and the invited guests were grouped on its bow. As the vessel glided toward the waters of the Rondout creek amid the cheers of the hundreds of spectators at the yard and on board, Miss Cecile Kissam Phillips the charming and graceful young daughter of the gentleman in whose honor the new steamer is named, took in her hand a bottle in a pretty package and broke of the bow with these words:

"Noble vessel in behalf of thy builders and owners I christen thee Augustus J. Phillips and wish thee good luck."

The bottle did not contain the wine usually associated with such events but instead the dark color of Dr. David Kennedy's Favorite Remedy stained the white paint of the bow.

Perhaps this is the first time in the country's history that a boat has been christened with a "Patent Medicine." Messrs. Johnson brothers, as a delicate compliment to Mr. Phillips, who is President of the Dr. David Kennedy Corporation who manufacture that world famous kidney and liver medicine, Dr. David Kennedy's Favorite Remedy, suggestion that the time honored custom of christening a boat with wine be departed from in this instance and that a bottle of "Favorite Remedy" be substituted. It was in this that the new yacht had its first dose of medicine along with its first plunge in the waters of a tributary of the Hudson river.

As the boat reached the water John Roark was seen perched on a high spile displaying one of the new "Favorite Remedy" signs.

The launch was in every way a successful and pleasant event and was witnessed by hundreds of people from the Rondout hills and the new steamer has the best wishes of a host of friends of the owners.

After the launch and when the Glenerie returned to Rondout the Johnson party of young people were transferred to the C.H. Evans and given an excursion to Poughkeepsie.

Taken all in all the launching of the Augustus J. Phillips will be long and pleasantly remembered.

Built at South Rondout, New York in 1903, *Augustus J. Phillips* (Official Number 200370) was first a wooden hulled screw steamer of 129 gross tons, 88 net tons, dimensions 104.5 feet length by 22 feet breadth by 6.8 feet draft with an engine of 325 ihp (indicated horsepower). Between 1903 and 1912, the vessel was engaged in the inland passenger trade out of Albany, New York carrying a crew of four to eight people (US Treasury Department 1904:195, 1905:195, 1906:185, 1907:169, 1908:160, 1909:155, 1910:144, 1911:135, 1912:126, 1913:119, 1914:114, 1915:93). Sometime around 1916, the vessel's name was changed to *Willoughby*. In this year, some of its dimensions are relisted as 147 gross tons, 95 net tons, dimensions of 101.5 feet long (after 1919 listed as 104.5 feet) by 220 feet wide by 6.8 feet draft with a 250 ihp engine. The vessel's home port became Norfolk, Virginia, and it was engaged as a freighter employing a crew of one person. It would continue in this role until 1923 (US Treasury Department 1916:184, 1918:178, 1919:182, 1920:182, 1921:183, 1922:178, 1923:126). It should also be noted that search of a sample of marine insurance registers of this time period (American Shipmaster's Association 1904, 1905, 1906, 1917, 1918, 1919) failed to find an entry for the vessel under the names *Augustus J. Phillips* or *Willoughby*, indicating that perhaps it was not insured during operation.

In 1924, *Willoughby* was placed back in the passenger trade (crew of six) and was based out of Baltimore, Maryland (US Treasury Department 1924:119). In 1925 the format of the *Annual List of Merchant Vessels* was altered. It, and registers until 1927, maintain the previous specifications but now communicate that the owner was the Rock Hall & Baltimore Transportation Company, located at Pier 4, Pratt Street in Baltimore, Maryland (US Treasury Department 1925:232-233, 1926:234-235, 1927:218-219). In 1928, *Willoughby* was purchased by R.W. Gatewood (of previously mentioned address) and was converted into the oil-powered motor screw vessel *Marguerite* for use as a freighter (crew of four). This came with new technical specification of 86 gross tons, 49 net tons and listed dimensions of 99 feet length, 20.5 feet breadth, and 6.8 feet breadth – specifications which it would keep until its eventual demise (US Treasury Department 1928:412-413, 1929:416-417, 1930:412-413, 1931:406-407, 1932:422-433).

What is missing in the above narrative, however, is the vessel's wartime service. This is because the ship as USS *Willoughby* was only in service for a very short time (about 19 months), and its use as a yard ferry boat appears to have been uneventful. An entry in *The Dictionary of American Naval Fighting Ships* gives us details regarding its wartime service, but also fills in some gaps regarding pre- and post-war ownership:

(ScStr: t. 147 (gross); l. 104'5"; b. 22'0"; dph. 6'8"; cpl. 17)

The first *Willoughby* (SP-2129)—a wooden-hulled ferry—was originally built in 1903 at South Rondout, N.Y., as *Augustus J. Phillips.* Chartered by the Navy from the Chesapeake Ferry Co. of Portsmouth, Va., for local district patrol duties in World War I, *Willoughby* was assigned the classification SP-2129 and commissioned on 8 February 1918. She operated in the 5th Naval District for the duration of World War I and was ultimately decommissioned and returned to her pre-war owners, the Chesapeake Ferry Co., on 26 September 1919 (Mooney 1981:384)

The brief military career of USS *Willoughby* while in naval service is also outlined in *The New Navy, 1883-1922* (Silverstone 2006:155-156). Three images from Willoughby's wartime service are held by the Naval Historical Center (Figures 40-42).

Figure 40. USS *Willoughby* in port, circa 1918. (US Navy photograph MH 99589).

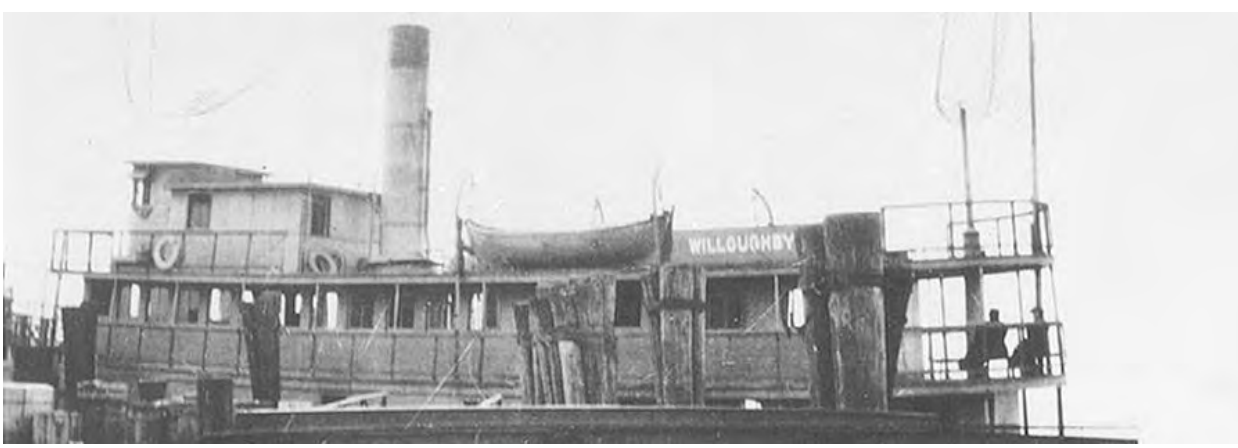

Figure 41. USS *Willoughby* in port, circa 1918 probably in the vicinity of Norfolk, Virginia. (US Navy photograph NH 102567).

Figure 42. USS *Willoughby* circa 1918, probably in the vicinity of Hampton Roads, Virginia. (US Navy photograph NH 202568).

Side scan sonar and magnetometer searches of the area around Spruills Bridge at Creswell have identified two areas that could potentially equate to the remains of *Marguerite*, or a potential nearby vessel *Lawrence* (discussed below), both vessels, or some other cultural anomaly. Information regarding these potential side scan sonar and magnetometer anomalies will be outlined in the next section.

Lawrence (UAB# SCR-1885)

The existence of a schooner named *Lawrence* is mentioned in the annual reports of the US Army Corps of Engineers in 1885 and 1886. The records report the work of Captain F.A. Hinman (US Army Corps of Engineers) in the removal of the vessel from Spruills Bridge. The 1885 entry (Appendix L) notes:

> A recent examination of the Scuppernong River, North Carolina disclosed the fact that navigation was seriously obstructed by the wreck of the schooner Lawrence, lying in a narrow bend near Spruills Bridge. She had sunk from neglect to pump her out; had been there for over a year, and no one seemed inclined to remove her, although it could have been done easily. All the steamboat men greatly desired her removal, but did not know how to effect it. It is understood that the authorities of Washington County, North Carolina, were asked to do it but declined.
>
> As the ownership of her could not be ascertained, she was duly advertised under the law.
>
> S.S. Simmons, esq., of Creswell, N.C., claims some interest in her, and has promised to pay for the advertising and to remove her very soon without expense to the United States (US Army Corps of Engineers 1885:1044-1045).

The following year, Captain F.A. Hinman makes mention of the vessel in two parts of the annual report. The reports conflict significantly. The first section under the section "River and Harbor Improvements" and the title "Removing sunken vessels or draft obstructing or endangering navigation" tells us:

> *The schooner Lawrence.*-This wreck, referred to in the last annual report, was sunk in the Scuppernong River, North Carolina, and was removed by the Government, after due advertisement, as the owner did not do so, at a cost of $100 (US Army Corps of Engineers 1886: 159).

However, a subsequent section under the same name ("removing sunken vessels or craft obstructing or endangering navigation"), but in Appendix K notes:

> *The schooner Lawrence*. – This wreck (referred to in the last Annual Report) lay in the Scuppernong River near Spruill's Bridge, North Carolina (see accompanying map). Not being removed by the owner thereof after lawful notice, she was accordingly raised and floated on August 26 last, by the Government. Her dimensions were 60 feet by 16 feet. An attempt was made to keep her afloat in order to sell her according to the law, **but it has been ascertained that the cost thereof would be greatly excess of her value, being old, rotten, and almost worthless, the schooner was accordingly moved a short distance and allowed to sink where she would be out of the way.** This has finally disposed of her very effectually and cheaply, the cost thereof being $100, which is the estimate (US Army Corps of Engineers 1886:970, author's emphasis).

The map on page 968 of the 1886 report (Figure 43 and 44), shows the original location of the vessel and provides clues as to where it may now rest on the river floor. Once geo-rectified, the original location of the schooner *Lawrence* appears to be in the vicinity of present day position 375110.052m east 3969473.889m north. When comparing the USAC map to a present day USGS map, we notice that the original location of *Lawrence* as marked is now out of the way of navigation, and would today be on the other side of an artificial island.

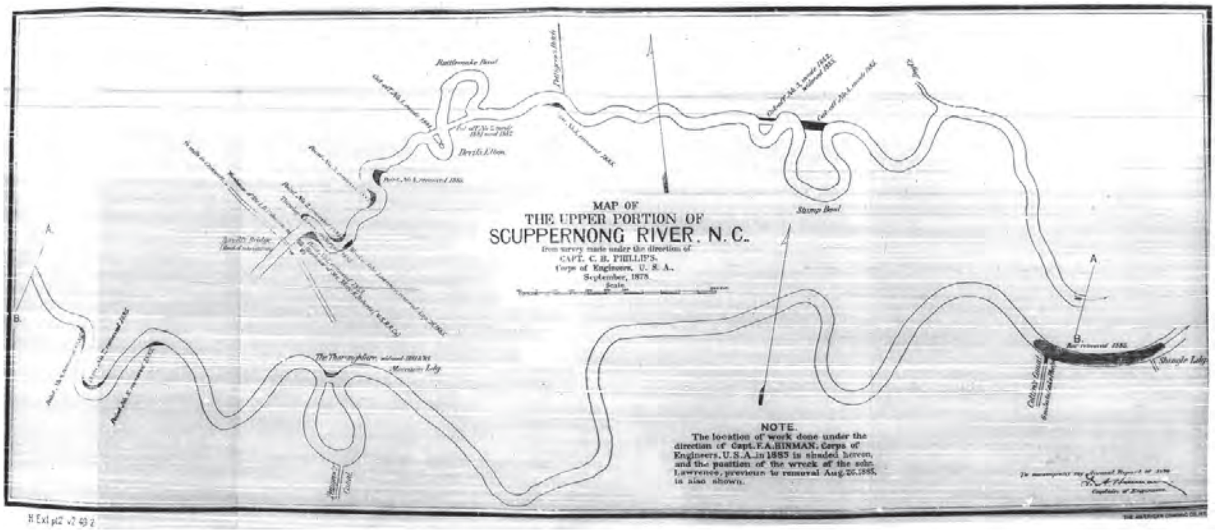

Figure 43. Map of the Upper Portion of the Scuppernong River, N.C. from survey made under the direction of Captain C.B. Phillips. (From US Army Corps of Engineers 1886:968).

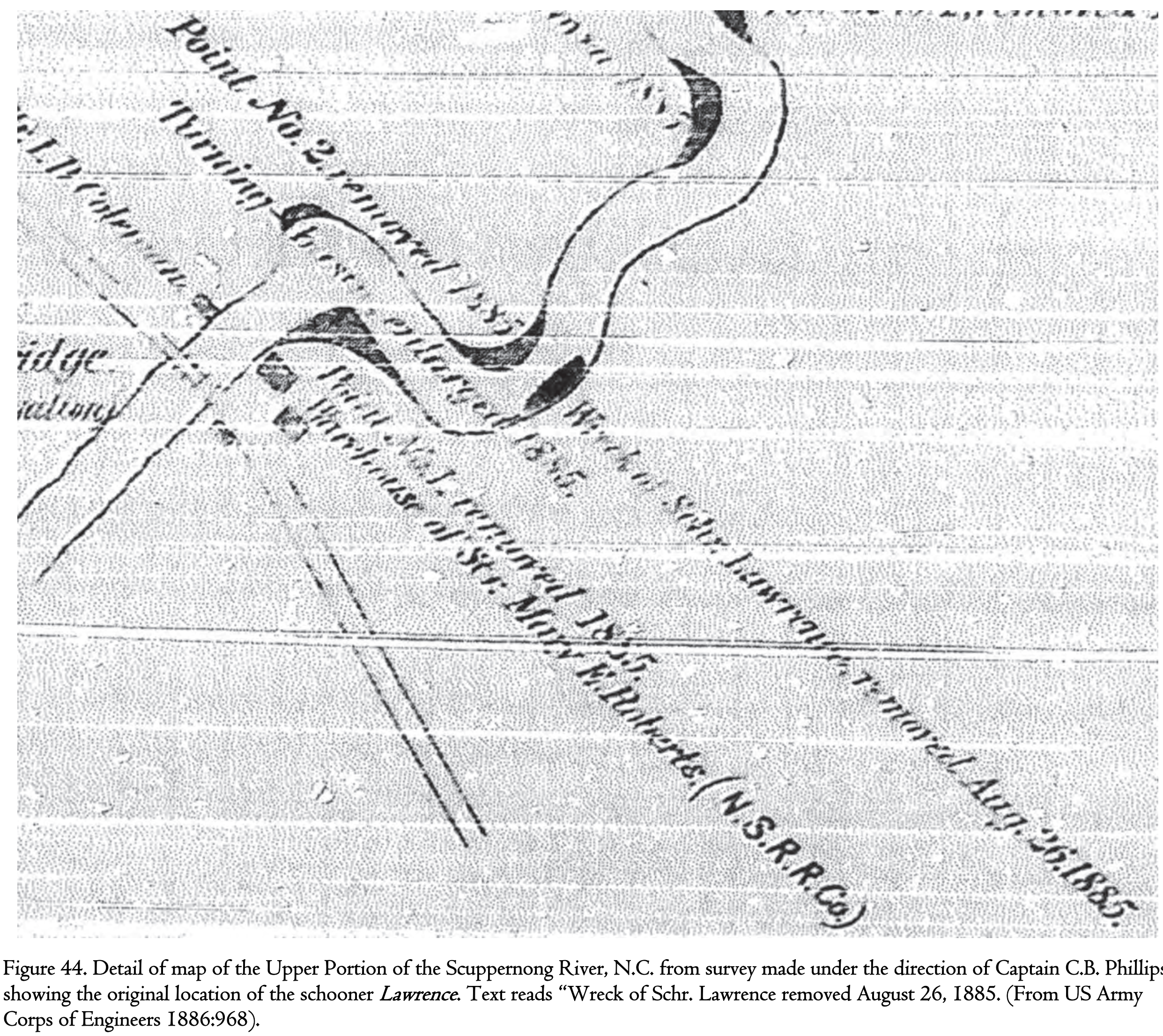

Figure 44. Detail of map of the Upper Portion of the Scuppernong River, N.C. from survey made under the direction of Captain C.B. Phillips showing the original location of the schooner *Lawrence*. Text reads "Wreck of Schr. Lawrence removed August 26, 1885. (From US Army Corps of Engineers 1886:968).

The database of North Carolina-built ships compiled by Richard Stephenson and William Still indicates there was a *Lawrence* built in Columbia in 1849 of 49 tons burden and dimensions 66 long by 20 feet beam by 4 feet draft (Still and Stephenson 2009). The vessel is listed as a wooden schooner built of white oak and pine. A vessel named *Lawrence* matching those general characteristics first appears in the *New York Marine Register* in 1858 and is then present in the *American Lloyds Register of American and Foreign Shipping* in 1859 and 1861-1867. The vessel disappears from all American marine insurance registers after this time until it reappears in *The Record of American and Foreign Shipping* in 1881 and 1882 (which note an Official Number of 14502). It is not found in marine insurance registers after 1882 (*New York Marine Register* 1858:276; *American Lloyds* 1859:373, 1861:450, 1862:469, 1863:478, 1864:525, 1865:515, 1866:552, 1867:134; American Shipmaster's Association 1881:649, 1882:626). The *Annual List of Merchant Vessels of the United States* (US Treasury Department 1874:183) also includes a listing of the schooner *Lawrence* (Official Number 14502), noting a net tonnage of 34 tons, and a gross tonnage of 37 tons.

These records tell us much about the ship's construction and use. The registers identify the vessel as built by an unknown/unnamed builder in Columbia, NC in 1849. The schooner-rigged vessel was constructed according to a "full model," had a wooden (oak and pine) hull, was fastened with iron, and carried a centerboard (later registers do not mention this feature.) From 1858-1867 the only dimension listed is its draft (5 feet). In 1881, the dimensions are recorded as being 64 feet long, 15.5 feet wide, with a 4.9 foot draft. The vessel is never rated highly for insurance, being variously described as "A3" or "3" denoting that it did not meet the highest specifications according to the rules of its registry (synonymous with "confidence of safe passage"), determined during its surveys in New York in September of 1853 and in Baltimore in September of 1860. Indeed, the 1858 *New York Marine Register* (1858:11) denotes Class A3 as being of the "fifth" (and lowest) defined in the register and described as, "The degrees of 4th and 5th class will not imply confidence for the conveyance of cargoes in their nature subject to sea damage." Other pertinent details include the names of the vessel's masters - "Craddick" (1858-1859), "Mann" (1861-1867), and O.L. Merritt (1881-1882). The owners are also listed as "Bowen & O." (1858-1859), "Owens" (1861-1867), and "D. Woodley" (1881-1882). Edenton, NC appears to have served as *Lawrence*'s initial port, though Plymouth, NC is noted as the home port in its 1869 and 1874 listing of the *Annual List of Merchant Vessels of the United States* (US Treasury Department 1869: 142; 1874:183). By 1882, Edenton, NC is again listed as *Lawrence's* home port (US Treasury Department

1882:122). Nothing more is currently known about the vessel's trade or the circumstances leading to its loss.

A search for the potential wrecks of *Lawrence* and *Marguerite* was carried out on 20 September 2011 in the vicinity of Spruills Bridge near Creswell. Two candidates for shipwreck sites were found (outlined in Figure 22). Target 1 (Figure 45) was located closest to the Creswell boat ramp (approximately 600 feet east) on the northern side of the narrow stream of the Scuppernong. It shows a single 80nT magnetic dipole within 20 feet of a small non-descript feature emerging from the sloping bank of the river. Target 2 (Figure 46) was located on the same side of the river another 600 feet east (approximately 1,200 feet from the boat ramp) and is composed of a 100 nT magnetic dipole in close proximity to a large collection of trees, branches, and logs protruding from the bank. A smaller 20nT dipole and corresponding river bed feature is about 125 feet to the east.

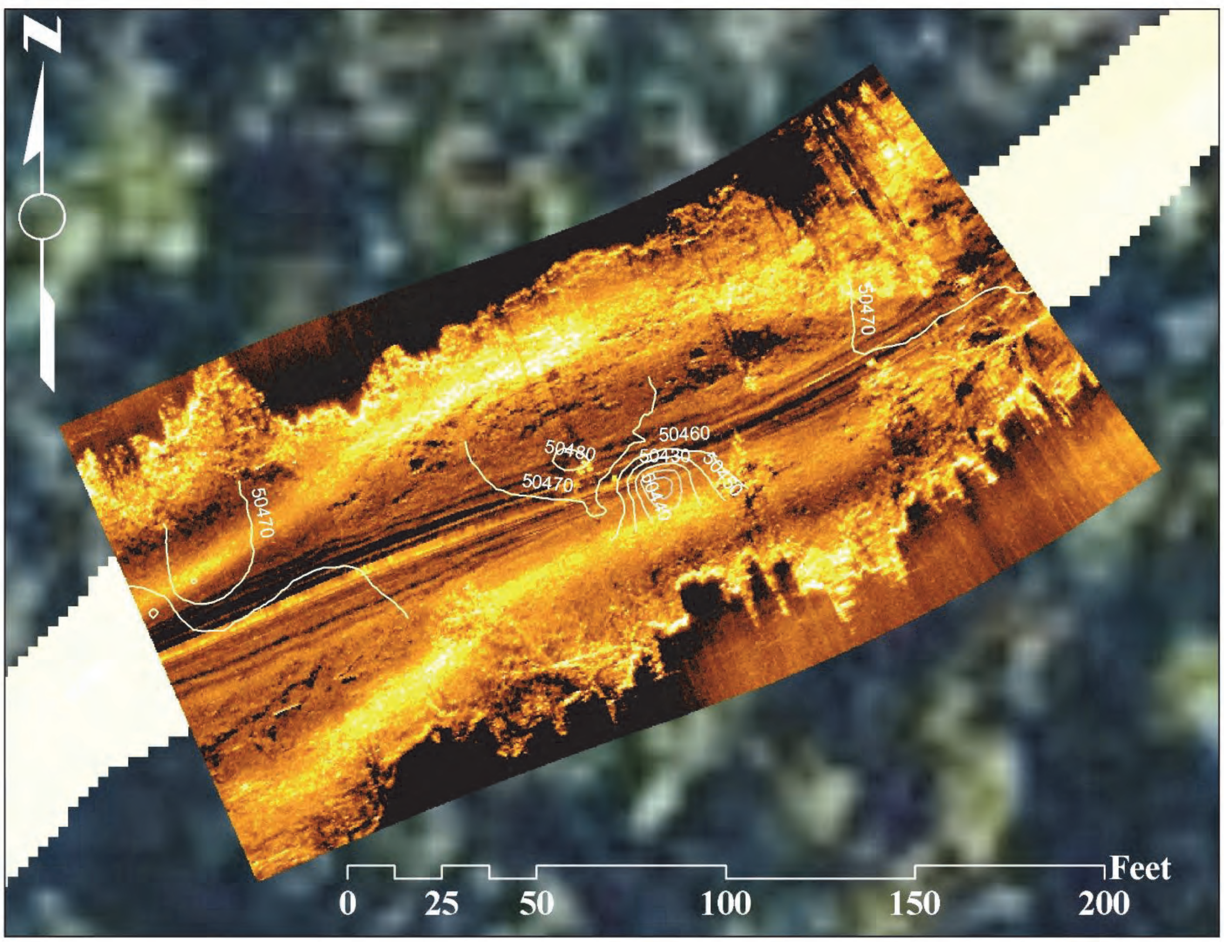

Figure 45. Area of coincident sonar and magnetometer anomalies known as "Target 1" during 2011 search for *Lawrence* and *Marguerite*. (By Nathan Richards, 2011).

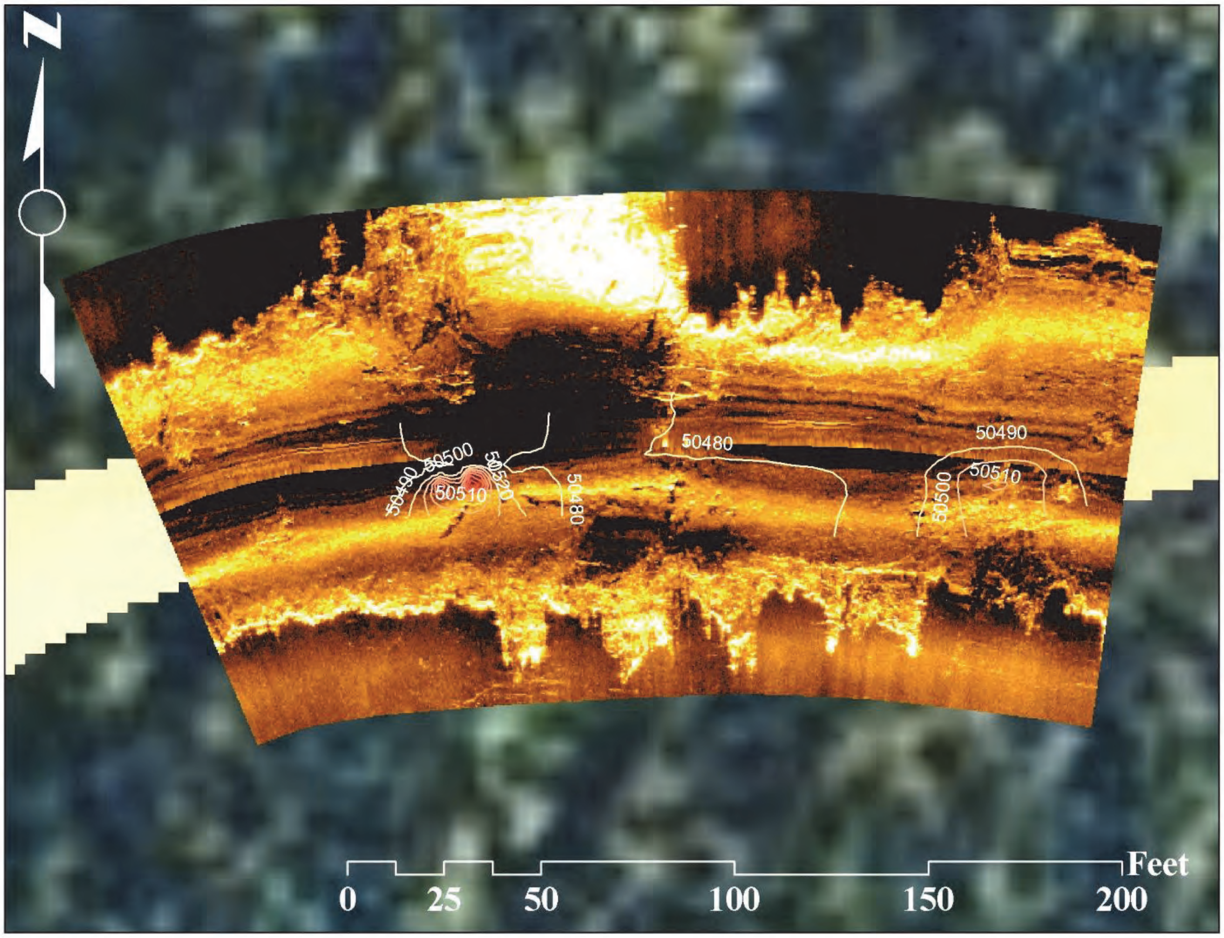

Figure 46. Area of coincident sonar and magnetometer anomalies known as "Target 2" during 2011 search for *Lawrence* and *Marguerite*. (By Nathan Richards, 2011).

Unfortunately, the trees downed by Hurricane Irene thwarted efforts to extend the survey area in search of the shipwrecks *Lawrence* and *Marguerite* and other sites close to Creswell. While there are two shipwreck sites unaccounted for, and two magnetic and sonar anomalies, it cannot be certain that these are the shipwrecks in question – only site inspection of potential underwater structures by diver inspection may ascertain this. The answer as to whether the remains of these two ships continue to lie within the Scuppernong River and their exact locations are currently unknown and will only be determined with supplementary historical research, additional remote sensing in the area, as well as diving operations on the locations characterized during the 2011 fieldwork.

Currently Unidentified Wrecks on Nautical Charts

The locations of two unidentified wrecks are noted on nautical charts of Bull Bay (Figure 47). These two sites were the subject of targeted side scan sonar and magnetometer searches in 2011. Researchers currently do not have extensive historical information or local testimony that may indicate the identity of the shipwrecks, and their status as unidentified wrecks has not changed since they were investigated, though their characteristics and potential functions are now better known. The two sites are described below.

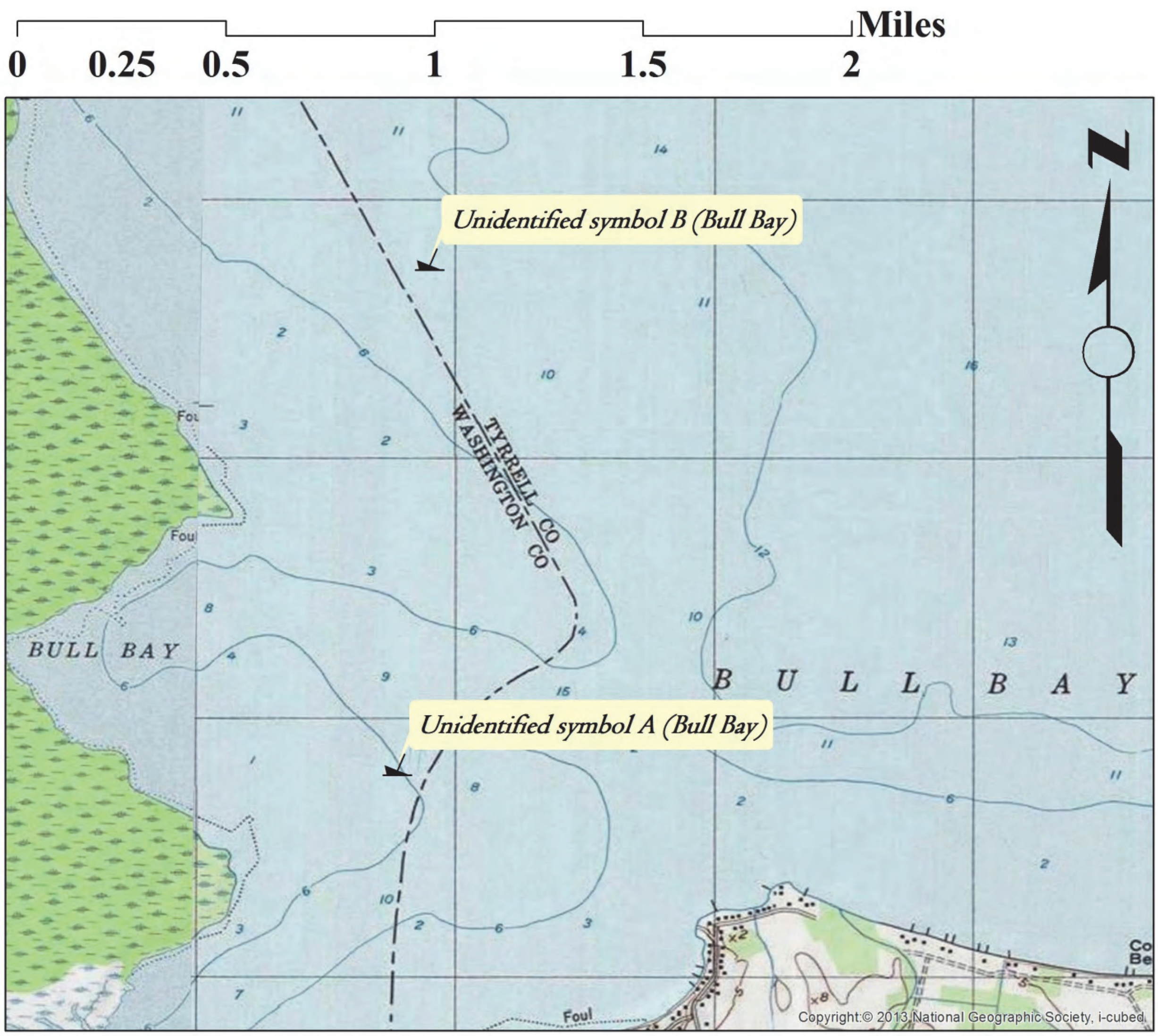

Figure 47. Located, unidentified wrecks within Bull Bay. (By Nathan Richards, 2014).

Unidentified Symbol A (Bull Bay)

An unidentified wreck is located on NOAA chart 12205_6 (December 2009) at approximate UTM position 376773.514m east, 3978821.687m north (Figure 48). The wreck appears to lie adjacent to red navigation aid "2BB" in a water depth of 3-9 feet. The earliest chart currently known to show the wreck's location is the 1957 US Coast Guard Service (CGS) nautical chart of Albemarle Sound (1228-09-1957, 1:80000 scale). It remains on nautical charts of similar scale to the most recent charts. According to NOAA and Department of Defense literature the wreck symbol (K28) indicates a "dangerous wreck, depth unknown" (NOAA and DoD 2001:44). Symbol K28 is further defined as:

> Dangerous wrecks lacking precise depth information and those where the depth over the wreck is unknown are charted with the center cross lines of the dangerous wreck symbol (K 28) marking the published position of the wreck. The symbol is rotated so that it is coincident with the known alignment of the wreck. If the alignment of the wreck is unknown, the symbol is aligned with the baseline of the chart. A blue tint is added for emphasis within the enclosing danger curve (US Department of Commerce 1997:4-28).

The symbol may indicate that the remains of the vessel have been inspected due to the angle of the symbol which is not oriented to the baseline of the chart.

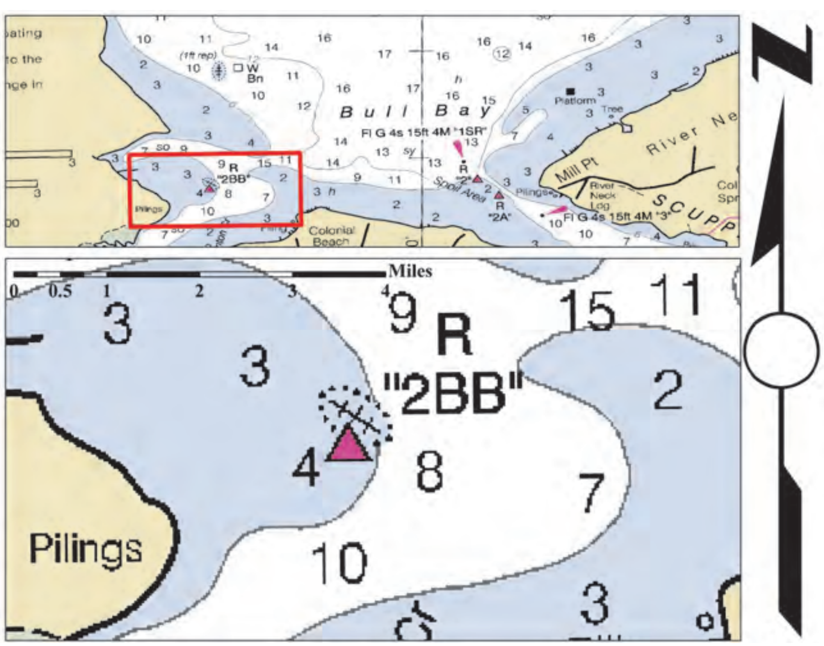

Figure 48. Detail of unidentified symbol A (Bull Bay), located on NOAA chart 12205_6. (By Nathan Richards, 2011).

The wreck was easily located by both side scan sonar (Figure 49) and magnetometer (Figures 5 and 50), though the actual location of the wreck (at 376885.06m east, 3978806.75m north) differs significantly from its location on the navigation chart, being some 287 meters approximately southeast of the center of the wreck symbol marked on NOAA chart 12205. The shipwreck represents the remains of a square barge of approximate dimensions 90 feet by 40 feet. What can be interpreted as longitudinal and athwartships beams and knees can be seen to checkerboard across it in a similar construction method to the shipwrecks previously described as lying in the Downtown Columbia stretches of the Scuppernong River (i.e. 0002SCR and 003SCR). Some other timbers appear to sit on the top of the structure, with acoustic shadows suggesting that some of these timbers may protrude significantly above where decking may have once been located. The modeled magnetic data suggests that there is a significant ferrous component to the submerged remains with a magnetic anomaly around 935 nT recorded.

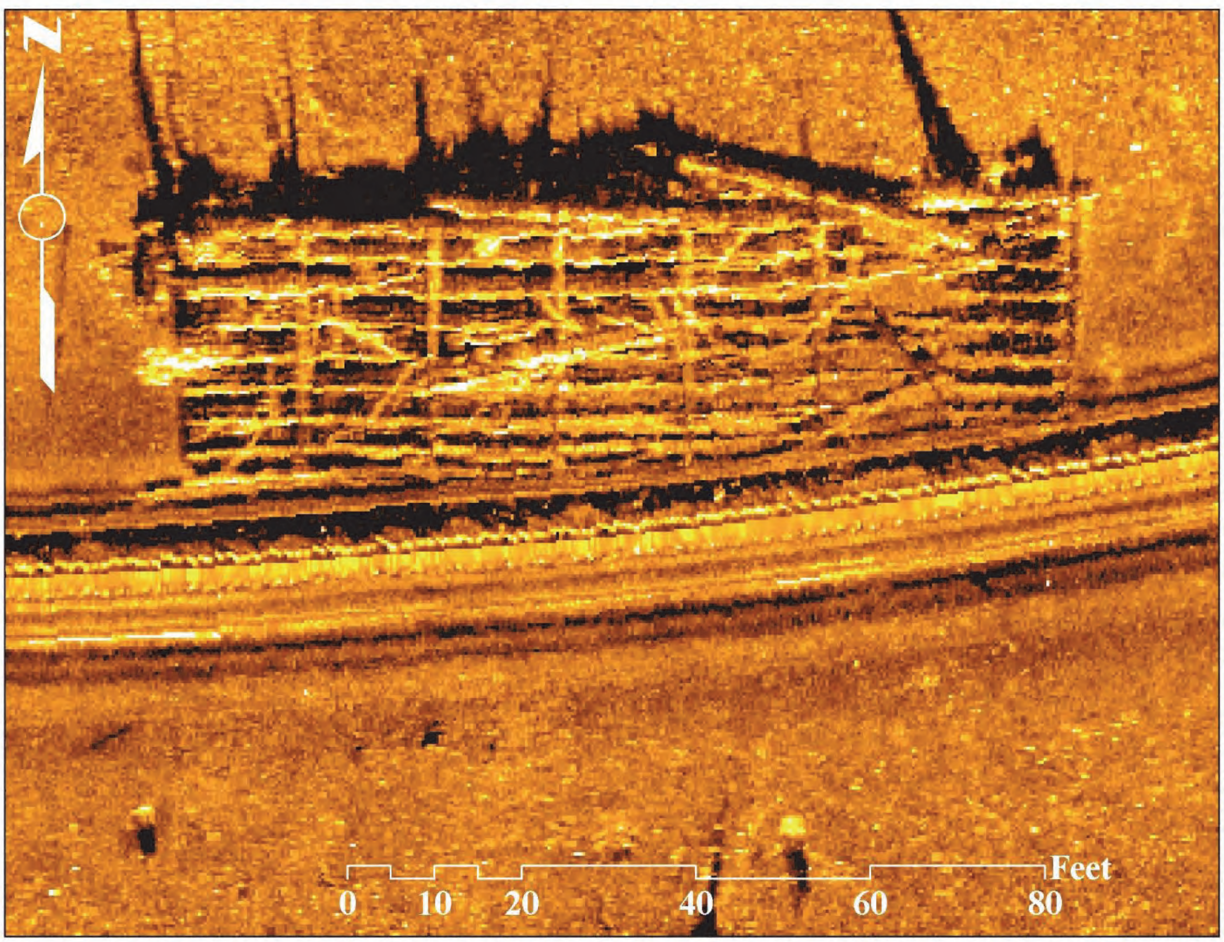

Figure 49. Geo-rectified sonogram of submerged wreckage at Unidentified Symbol A in Bull Bay. (Image by Nathan Richards, 2011).

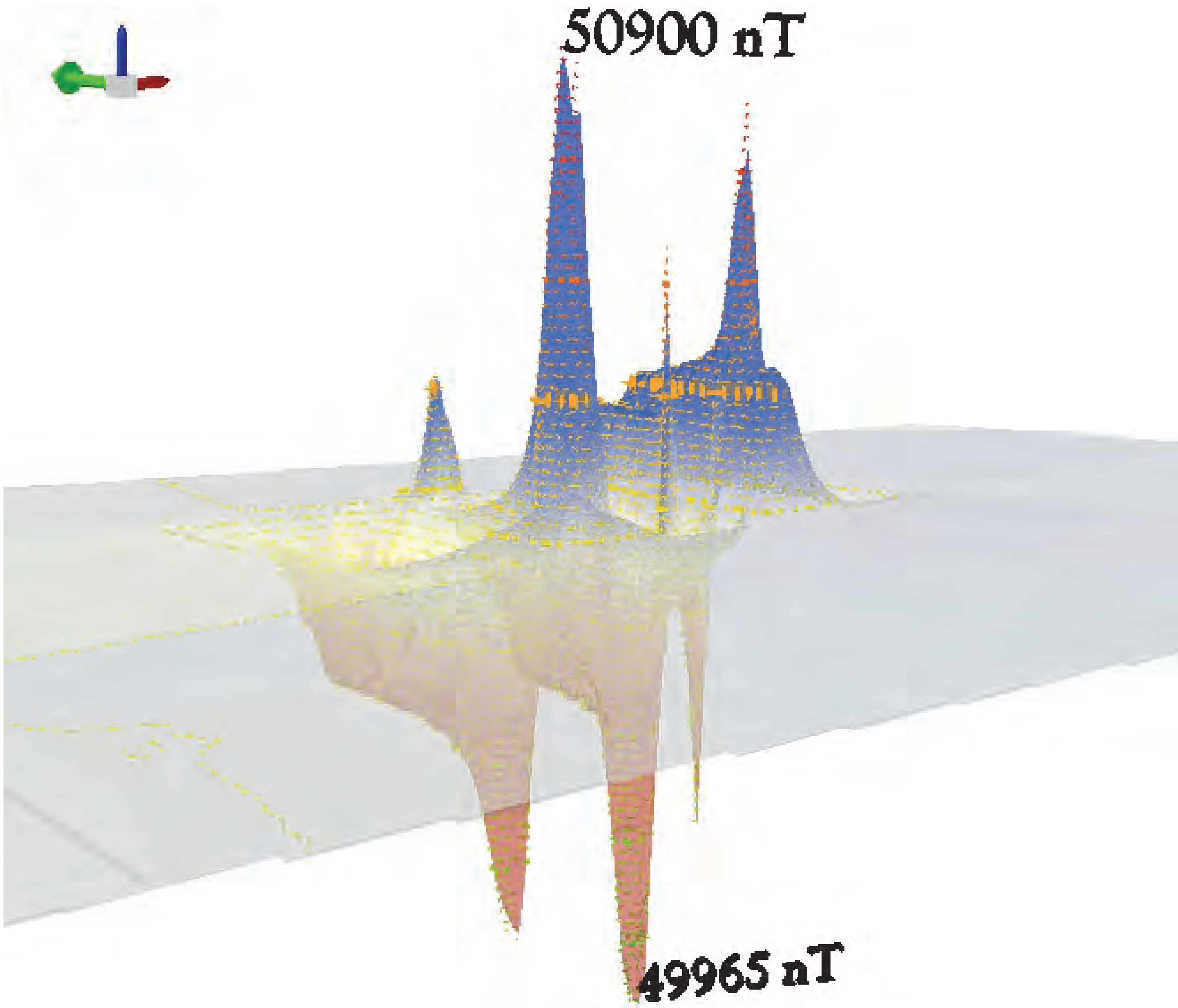

Figure 50. Three-dimensional representation of the Bull Bay A site. (By Nathan Richards, 2014).

Unidentified Symbol B (Bull Bay)

An unidentified wreck is located on NOAA chart 12205_6 (December 2009) at approximate UTM position 376898.529m east 3980770.195m north (Figure 51). The wreck is in approximately 10-11 feet of water. The earliest chart currently identified with the wreck symbol marked on it is NOAA-NOS nautical chart of Albemarle Sound (12205-06-1996, 1:80000 scale) dating to 1996. It remains on nautical charts of similar scale to the most recent charts. The definition of this wreck symbol is the same as that used for Unidentified Symbol A, although the North-South orientation of the symbol suggests that the orientation of the wreck is not known.

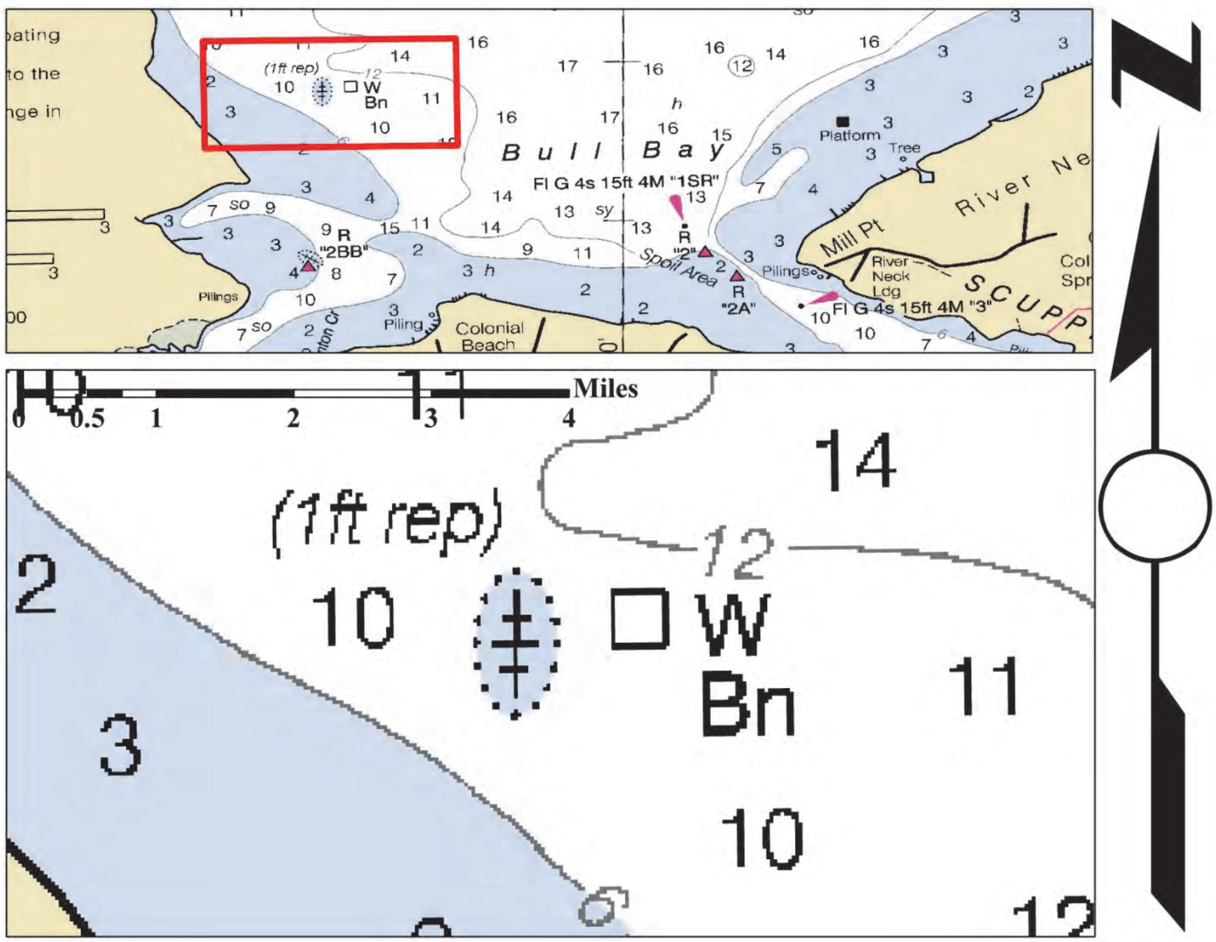

Figure 51. Detail of unidentified symbol B (Bull Bay), located on NOAA chart 12205_6. (By Nathan Richards, 2011).

This wreck, about 80 feet long and 20 feet wide, was also easily located with both side scan sonar (Figure 52) and magnetometer (Figure 53). In comparison to Bull Bay A, this vessel also appears to have the characteristic "box-shape" of a barge – but it is much more disarticulated, and perhaps partially buried in bay sediments. The contoured magnetic data (Figure 54) shows the presence of ferrous material at the site with a multi-component anomaly in the 164 nT range. One feature in the sonogram suggests the presence of a set of double bitts (paired iron posts used for securing lines) on one side of the submerged remains.

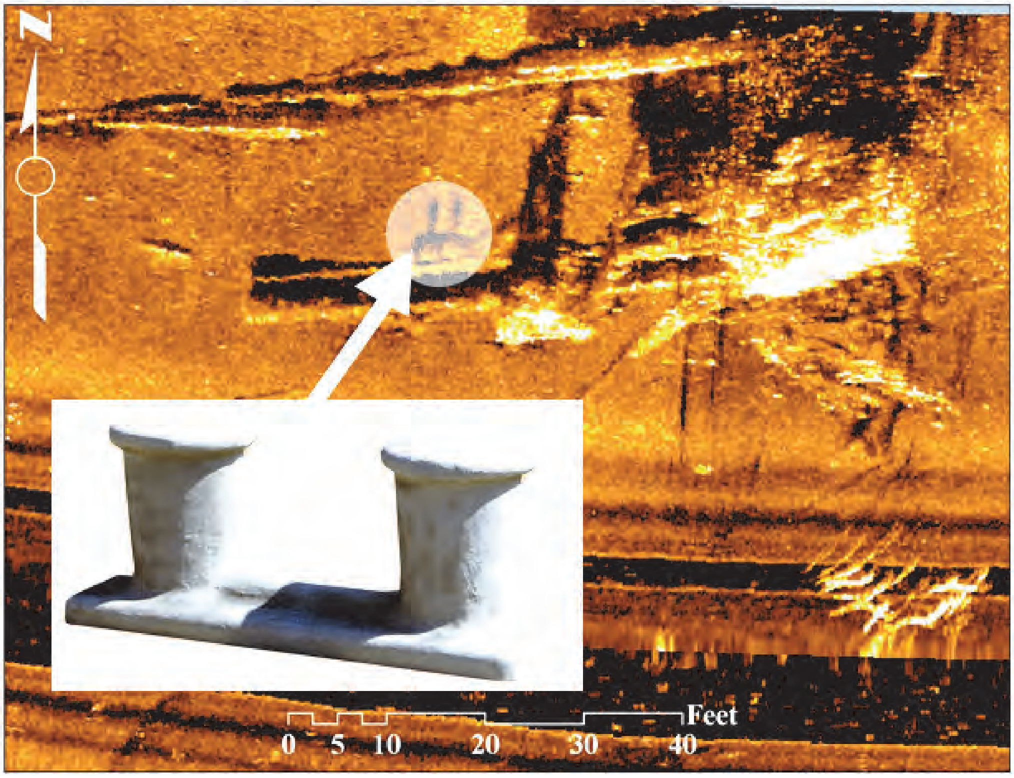

Figure 52. Geo-rectified sonogram of submerged wreckage at Unidentified Symbol B in Bull Bay. Highlighted area shows where potential bitts sit on the structure (with a photograph of bitts, inset). (Image by Nathan Richards, 2011).

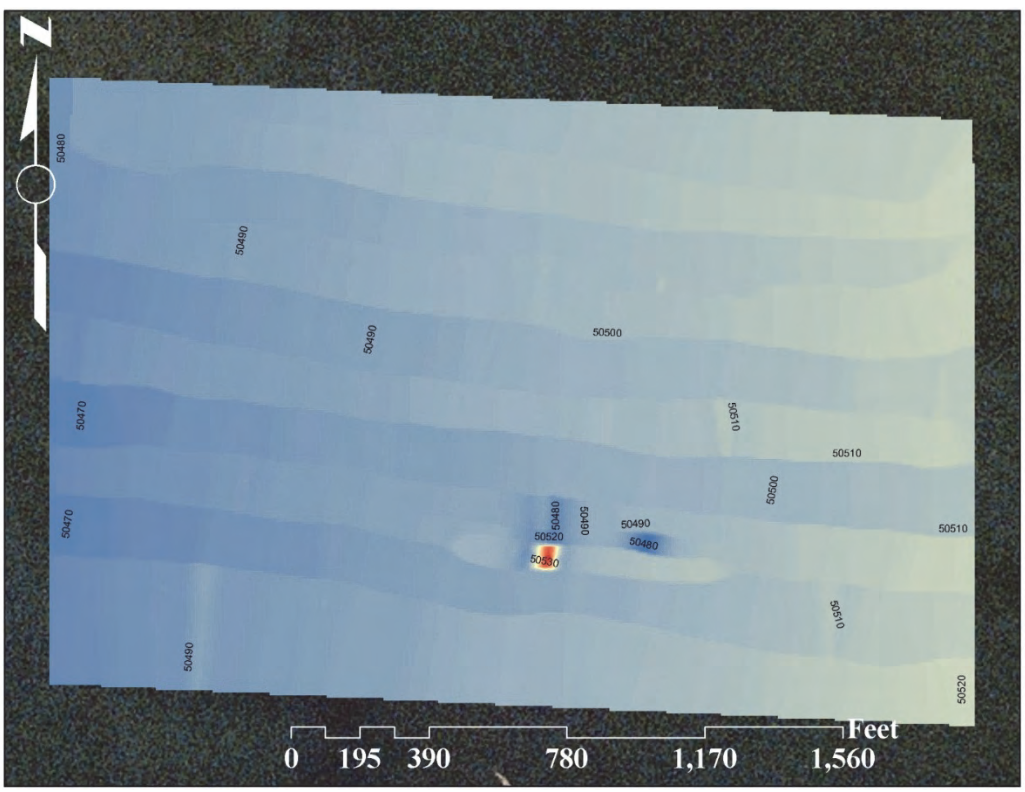

Figure 53. Interpolated magnetometer data of submerged wreckage at Unidentified Symbol B in Bull Bay. (Image by Nathan Richards, 2011).

Other Potential Shipwrecks

Due to absence of a comprehensive remote sensing record of both Bull Bay and the Scuppernong River at the commencement of the project, there was some chance that unrecorded shipwrecks or abandoned watercraft were yet to be discovered. This assertion is strengthened by the fact that there are a large number of shipwrecks listed as "lost somewhere in the Albemarle Sound" within archival sources – with loss locations in Bull Bay, or the lower reaches of the Scuppernong River being close enough in geographical location to be conceivable. For example, the NCUAB database lists almost 60 vessels lost within Albemarle Sound. Of these, 26 have generic "Albemarle Sound" locations of loss. Examples of these include:

- The schooner *Collector* lost at Scuppernong Point, Albemarle Sound on 24 August 1829;
- An unknown schooner lost "between Pear Point and the mouth of the Scuppernong River" on 29 July 1846; and,
- The screw steamer *Tourist* lost "In Albemarle Sound between Elizabeth City, NC and Columbia, NC" on 4 June 1907.

All of the historical examples found to date represent a significant investment in research time to ascertain a more specific location of loss, and there is also the potential that shipwrecks not identified in these known archival sources may also exist. During the 2011 remote sensing activities, a number of locations were identified during the side scan and magnetometer surveys that were deemed to be significant enough to warrant further investigation, with the potential that they may link to other previously reported shipwrecks (Figure 54). These are described below in order of their Contact number.

Contacts 0019 and 0106

These two related or duplicate acoustic targets are located in the middle section of the Scuppernong River adjacent to a north-facing bank (Figure 55). They are positioned some distance from currently identified historic landings and infrastructure on the river. The sonar target, which appears as multiple linear features sitting parallel to one another adjacent to the bank is approximately 16.58 meters long and 3.43 meters wide and sits about 0.31m off the river floor. A solitary magnetometer sweep passed within 15 meters of these targets, meaning that no magnetic interpolation is possible. An examination of the single-beam of data does not indicate any ferro-magnetism. The area should be revisited for comprehensive magnetometer survey and sub-surface investigation. It is currently unknown what this target may be.

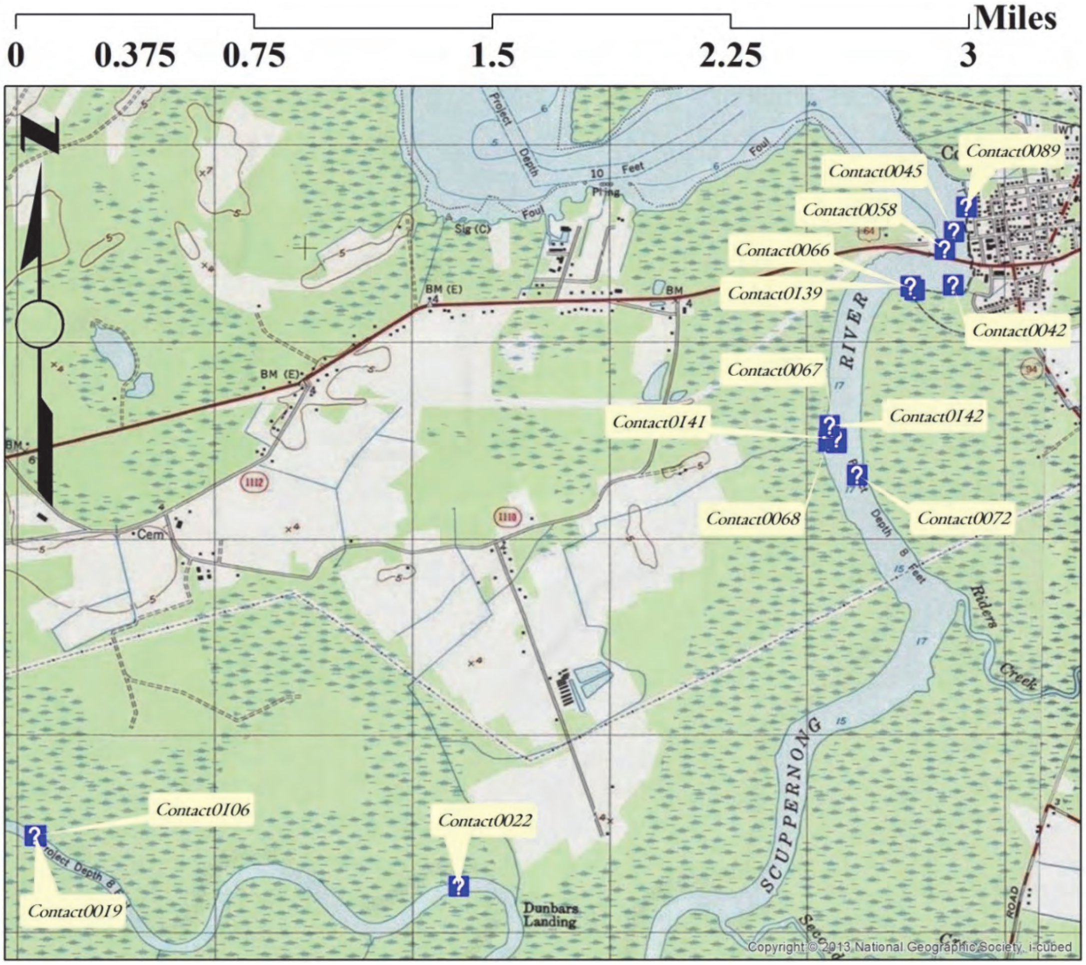

Figure 54. Locations of acoustic targets classified as potential shipwrecks following 2011 remote sensing survey. (By Nathan Richards, 2014).

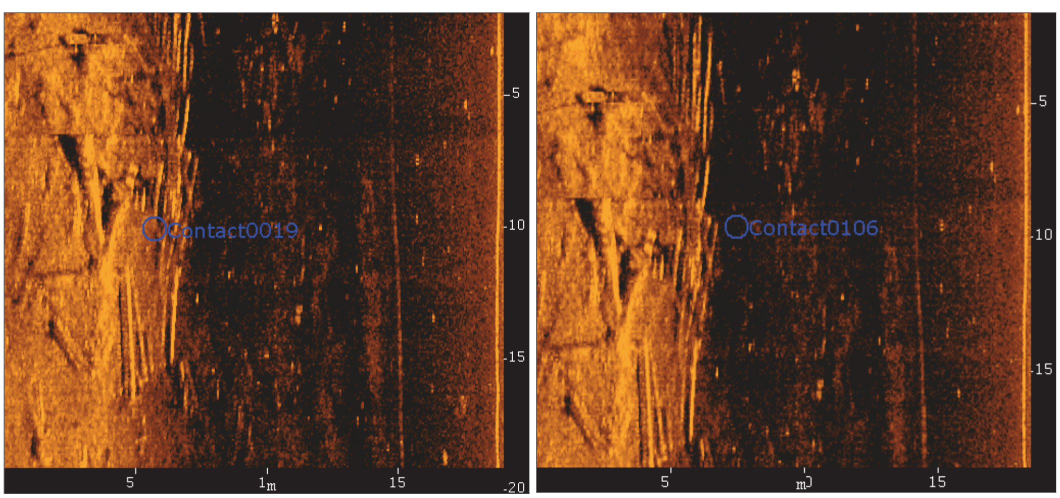

Figure 55. Sonograms of Contacts 0019 and 0106 (left to right), lying in the Scuppernong River (Images by Dan Brown, 2011).

Contact 0022

Contact 0022 (384237.94m east, 3972235.75m north) is located in a middle section of the Scuppernong River, about 400 meters above Dunbar's Landing (Figure 56). The main feature of the isolated target is a linear element some 14.09 meters long and 0.41m wide, but embedded within a possible mound of debris. Other objects litter the adjacent areas. It is not associated with a significant ferro-magnetic signature. Diver inspection is required to ascertain what this anomaly may be.

Contact 0045

Located in the middle of the Scuppernong River, adjacent the Town of Columbia waterfront, is Contact 0045 (Figure 57). The acoustic target is located at 386747.78m east 3975554.50m north within an area of intense magnetism due to its proximity to live power lines, the Highway 64 bridge, and numerous other structures made out of iron which make characterizing its specific magnetic signature impossible. The target is about 7.32m long and 5.40m wide, and it sits proud of the river floor about 0.19m. The target has the appearance of a series of parallel elements arranged adjacent to other linear features giving it the appearance of a degree of articulation. Numerous other bottom features surround the main part of the anomaly. Diver inspection is the next step to properly classify this feature.

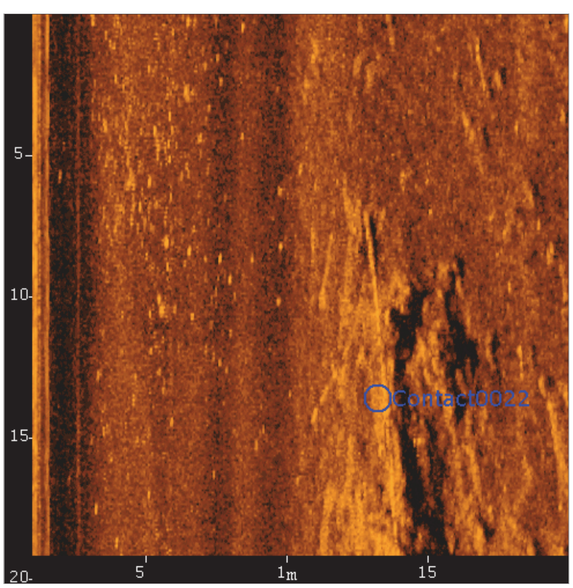

Figure 56. Sonogram of Contact 0022, lying in the Scuppernong River. (Images by Dan Brown, 2011).

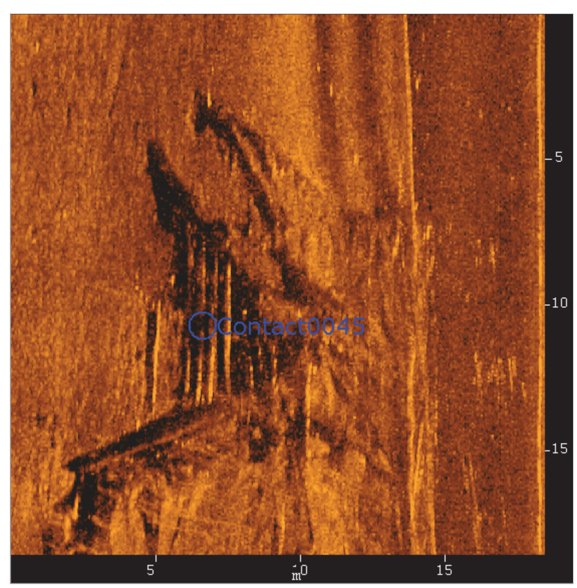

Figure 57. Sonogram of Contact 0045, lying in the Scuppernong River. (Images by Dan Brown, 2011).

Contact 0058

Located in the western-facing back of the Scuppernong River directly opposite the Town of Columbia waterfront is Contact 0058 (386701.94m east 3975466.50m north). As with Contact 0045, the acoustic target is located within an area of intense magnetism due to its proximity to live power lines, the Highway 64 Bridge, and numerous other ferrous structures which make characterizing its specific magnetic signature impossible to isolate. The acoustic target is quite large, at around 24.26 meters long and 7.51 meters wide, and it protrudes at least 0.66m off the river floor (Figure 58). The target lies parallel with the shore just north of the Highway 64 bridge, adjacent to where the old Columbia Bridge would have been located, and sits near relict buildings (the general location corresponds with the approximate location of the West Virginia Pulp and Paper Company property, see Richards et al. 2012:104). The target is composed of a number of parallel and perpendicular elements and has the appearance of a rounded end at its south end. Numerous additional linear features and rocky debris (likely rip rap from the adjacent bridge and adjacent reinforced shoreline) surround it.

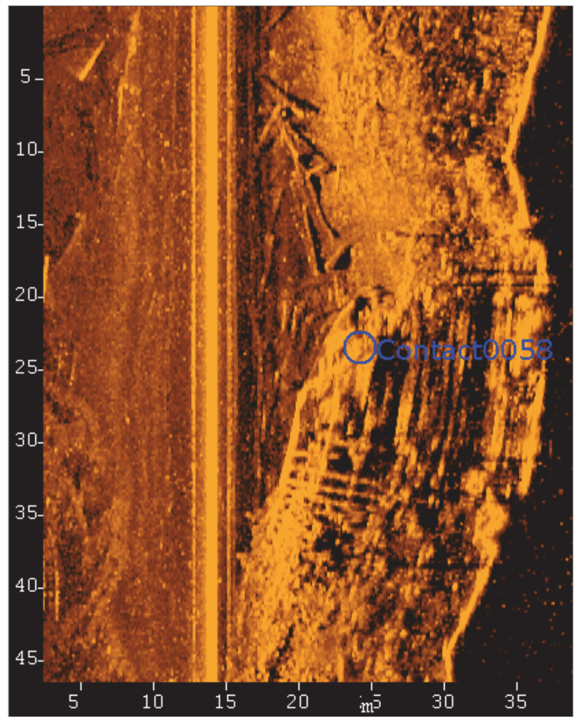

Figure 58. Sonogram of Contact 0058, lying in the Scuppernong River. (Images by Dan Brown, 2011).

This target is one of the most promising sites for further investigation, though it may also belong to some other structure that has spilled into the water, be associated with the development of the adjacent bridge, or is perhaps remnant fishing infrastructure.

Contacts 0066 and 0139

Contacts 0066 (386549.47m east 3975260.00m north) and 0139 (386528.97m east 3975277.50m north) are two targets that lie in the same general area adjacent to a piling (Contact 0041) and are located on south-facing bank south of the Columbia waterfront, not far from the structure of the Pocosin Lakes

National Wildlife Refuge boardwalk area (Figure 59). Contact 0066 has approximate dimensions of 15.64m long by 0.75m wide (0.39m above river bed) and Contact 0139 of 6.94 meters long by 0.44 meters wide (0.05 above river bed). Both targets are composed of multiple parallel elements, though 0066 is surrounded by natural looking debris (roots, branches and other tree debris). Neither contact is associated with significant ferro-magnetic disturbance and may be associated with building debris of old collapsed sections (or debris from Hurricane Irene) of the boardwalk nearby.

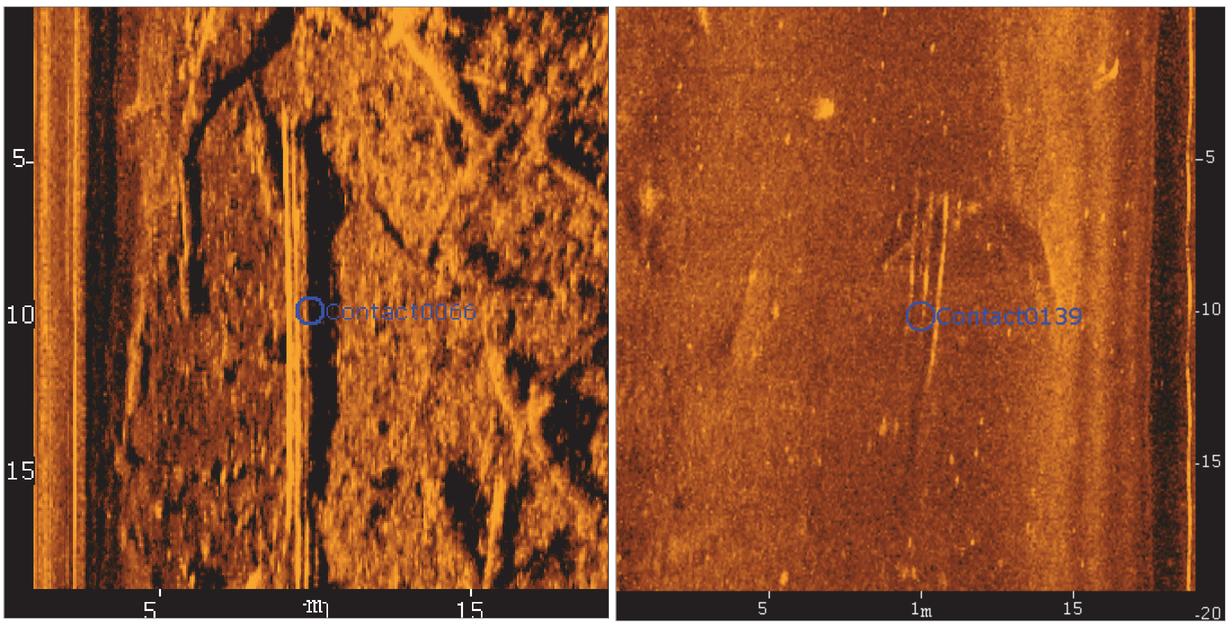

Figure 59. Sonograms of Contacts 0066 and 0139 (left to right). (Images by Dan Brown, 2011).

Contacts 0067, 0068, 0141, and 0142

This series of acoustic targets are a cluster of river floor objects not far south of Columbia on a western bank facing the Scuppernong River (Figure 60). They lie adjacent to a number of Category 9 contacts (Contacts 0065 and 0069). This area is also marked by a large area of intense magnetism that at the time of writing cannot be explained, but may be due to abandoned industrial debris, or perhaps live electric transmission wires. The four similar looking anomalies are of various dimensions:

- 0067 = 7.95 m long, by 1.56 m wide, sitting 0.21 m off the river bed at 386153.66 m east 3974485.25m north;
- 0068 = 17.71 m long, by 1.90 m wide, sitting 0.11 m off the river bed at 386112.41 m east 3974492.00m north;

- 0141 = 5.63 m long, by 1.16 m wide, sitting 0.13 m off the river bed at 386152.00m east 3974505.00 north; and,
- 0142 = 4.54 m long, by 0.60 m wide, sitting 0.29 m off the river bed at 386118.25m east 3974572.00m north.

The acoustic images bear a resemblance to other Category 7 sonar anomalies (Contact 0019, 0066, 0106).

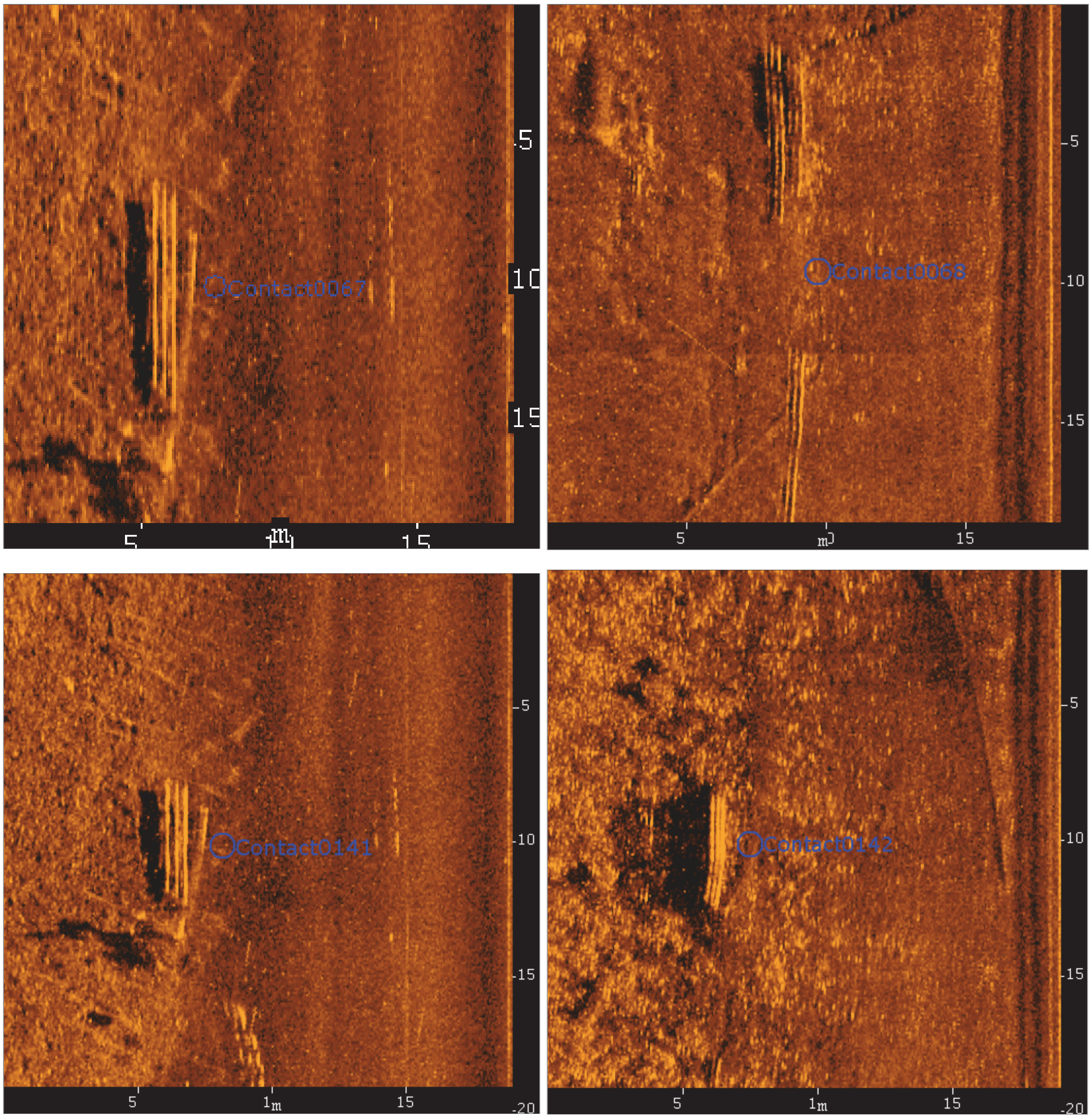

Figure 60. Sonograms of Contacts 0067, 0068 (top, left to right), 0141 and 0142 (bottom, left to right), lying in the Scuppernong River (Images by Dan Brown, 2011).

Contact 0072

Lying by itself in the Scuppernong River, not far south of Columbia on an eastern bank (at 386258.16m east, 3974320.50m north), Contact 0072 is a linear feature is of approximate length 12.32 meters in length by 5.21 meters width (sitting 1.19m off the river bed). The feature takes the appearance of articulated linear features forming a triangle (Figure 61). It is not associated with a ferro-magnetic signature.

Contact 0089

Acoustic Contact 0089 (Figure 62) lies north of the remains of *Estelle Randall* at position 386810.25m east 3975679.25m north. No magnetic readings adjacent to the area were taken due to the shallow water and the restrictive shape of the cove which precluded the use of the magnetometer. The main feature of the target is of approximate dimensions 5.07m long by 5.34m wide. The feature is composed of a series of parallel elements lying close proximity to the shoreline that may represent non-shipwreck debris or a portion of *Estelle Randall* itself.

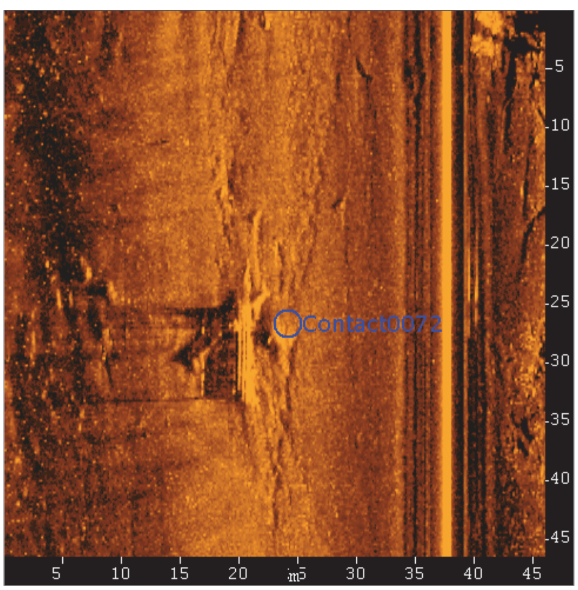

Figure 61. Sonogram of Contact 0072, lying in the Scuppernong River. (Images by Dan Brown, 2011).

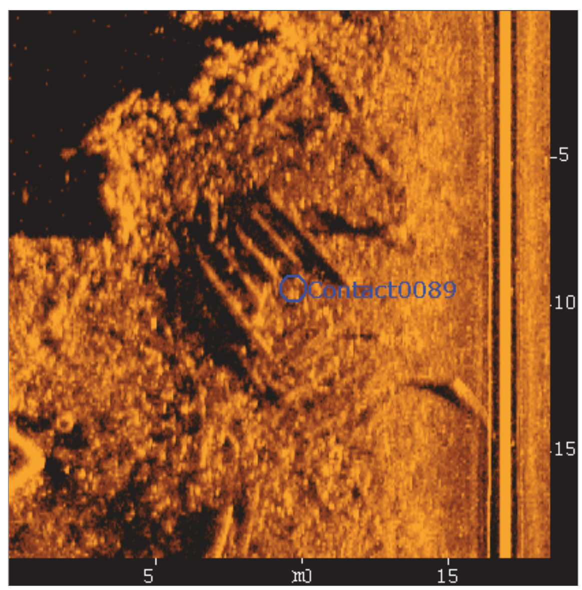

Figure 62. Sonogram of Contact 0089, lying in the Scuppernong River. (Images by Dan Brown, 2011).

Terrestrial Maritime Cultural Resources

Initial cartographic and secondary source historical research indicates that there are a large number of maritime infrastructure sites either known to or suspected to lie within the study area. It should also be acknowledged that there is a likelihood of a number of prehistoric sites within the study area, but this study's short duration, the researcher's dependency on historical records, and the type of remote sensing equipment being used meant it was unlikely that any would be discovered or investigated.

These terrestrial maritime cultural resources have been briefly described in this report and were initially focused on landings and pilings noted in cartographic and archival sources (see Figure 63), were later defined as Category 3-6 sonar targets (see Figure 64) but can also be described as the remains of lighthouses, shipyards, landings, pilings, bridges and the potential remains of other extant commercial and industrial sites within the study area.

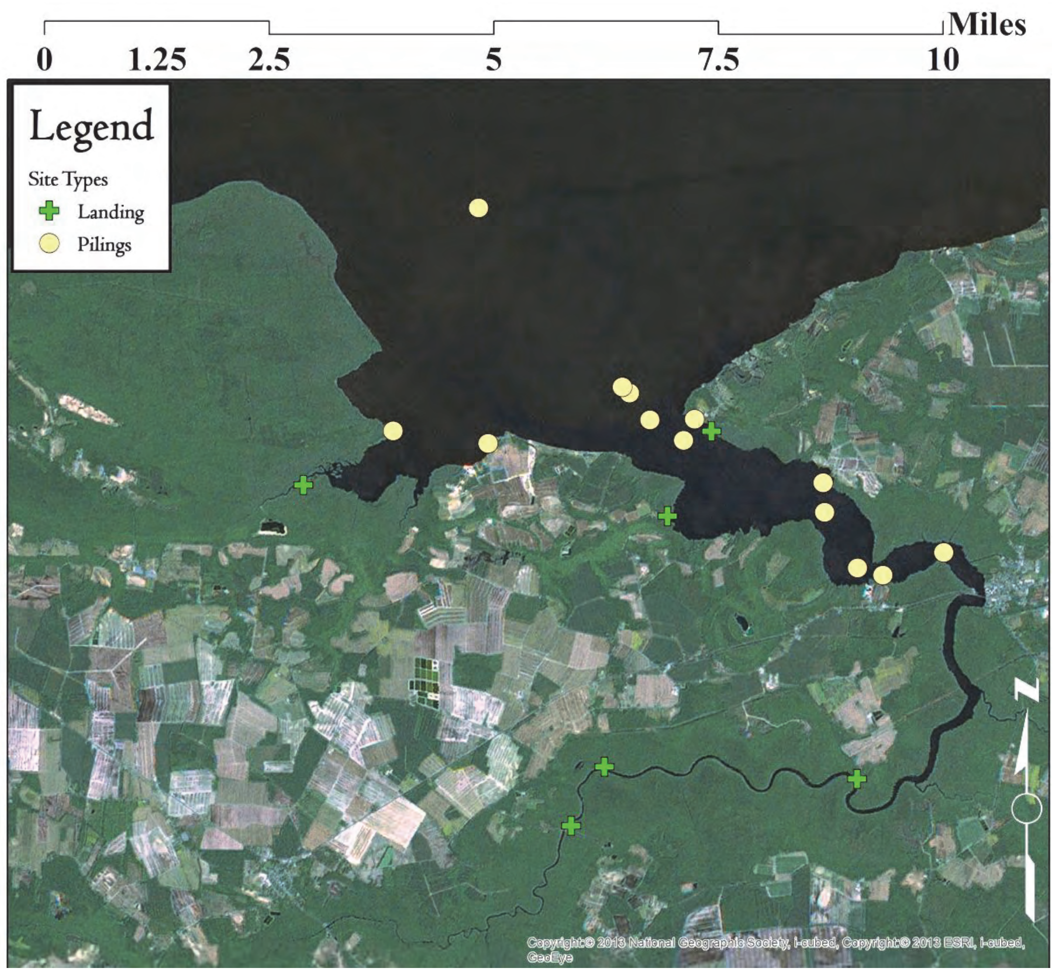

Figure 63. Locations of landings and pilings from cartographic sources. (By Nathan Richards, 2011).

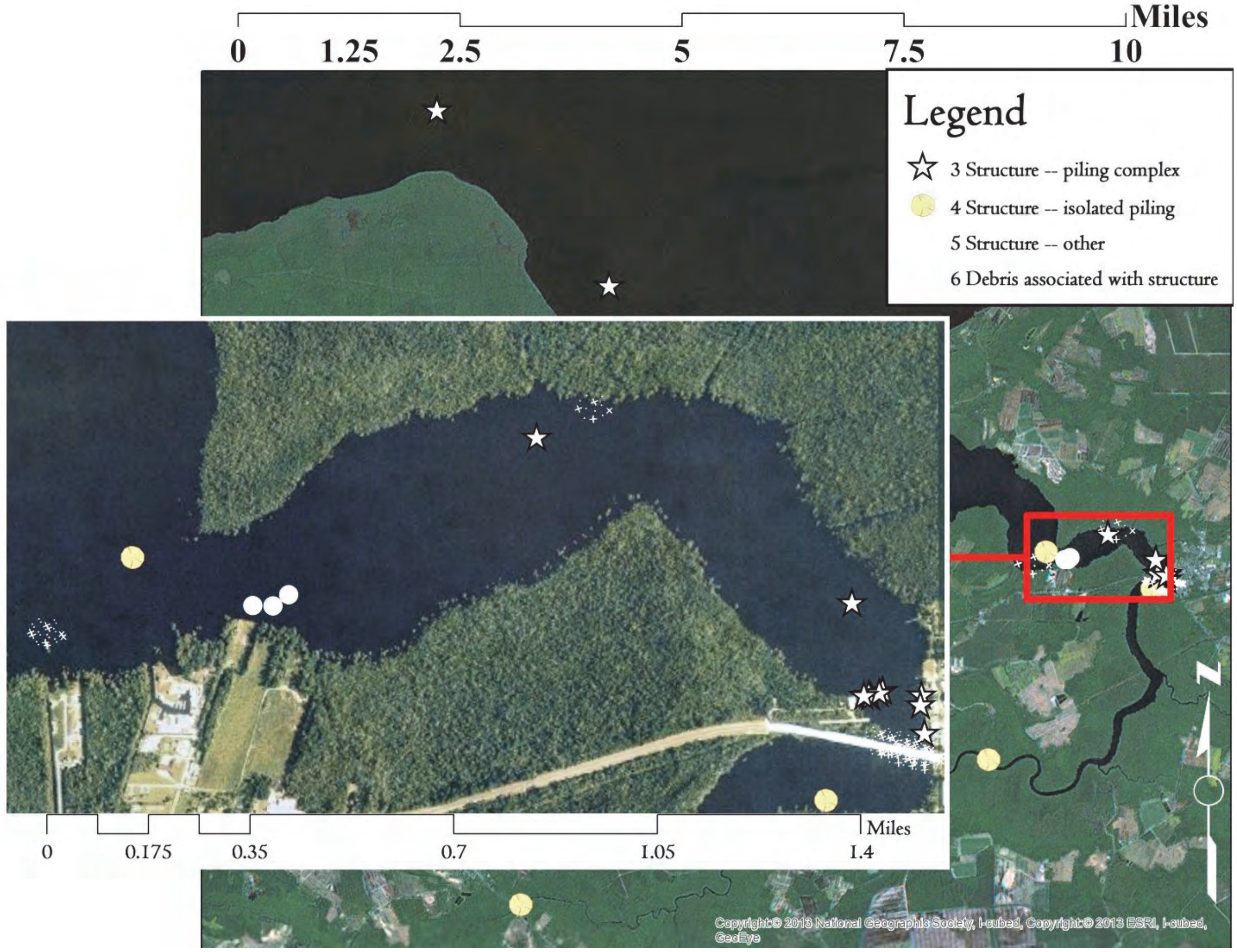

Figure 64. Locations of Category 3-6 acoustic targets identified during 2011 remote sensing. (Image by Nathan Richards, 2014).

Lighthouses

The Laurel Point Lighthouse was built in Albemarle Sound adjacent to Bull Bay in 1880 and was destroyed by weather in the 1950s (Figure 65). Present-day nautical charts indicate "platform – ruins" at location 373586.230m east 3983963.939m north adjacent to Laurel Point which coincide with the old lighthouse location (Figure 66). No additional historical research regarding this lighthouse was sought before or after survey, though sonar data indicates that much of the sub-surface remains of the lighthouse still remain (Figure 67). As the sonogram shows, quite a lot of framework still survives protruding from the surface as well as underneath the water. The site is mainly an articulated structure showing individual piles and cross-bracing with a few areas of disarticulated structural features lying close by.

Figure 65. Portion of a photograph of the Laurel Point/Shoal Lighthouse, date unknown (US Coast Guard image).

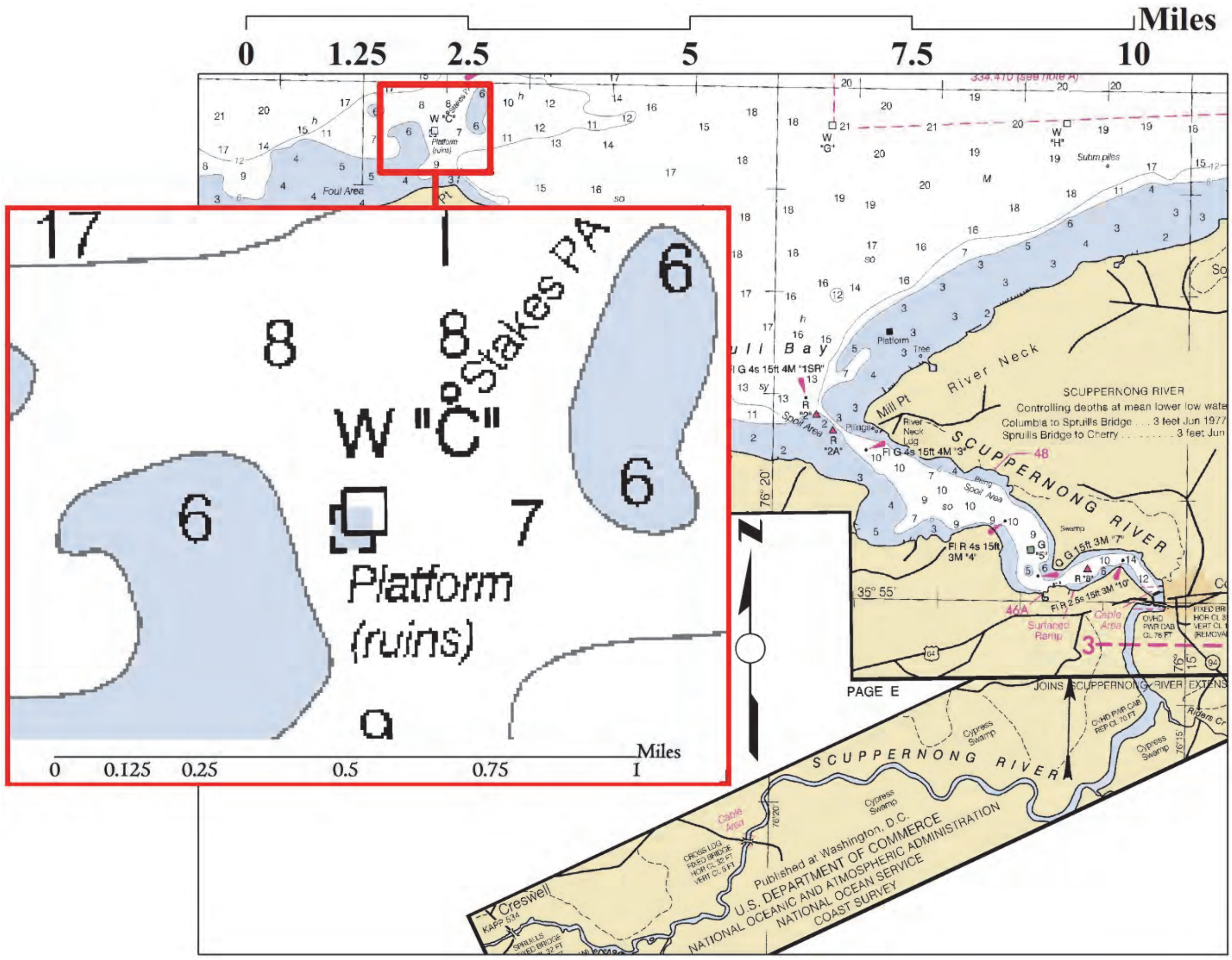

Figure 66. Location of Laurel Point Lighthouse remains as marked on present-day nautical charts (Image by Nathan Richards, 2014 using NOAA digital chart 12205_6).

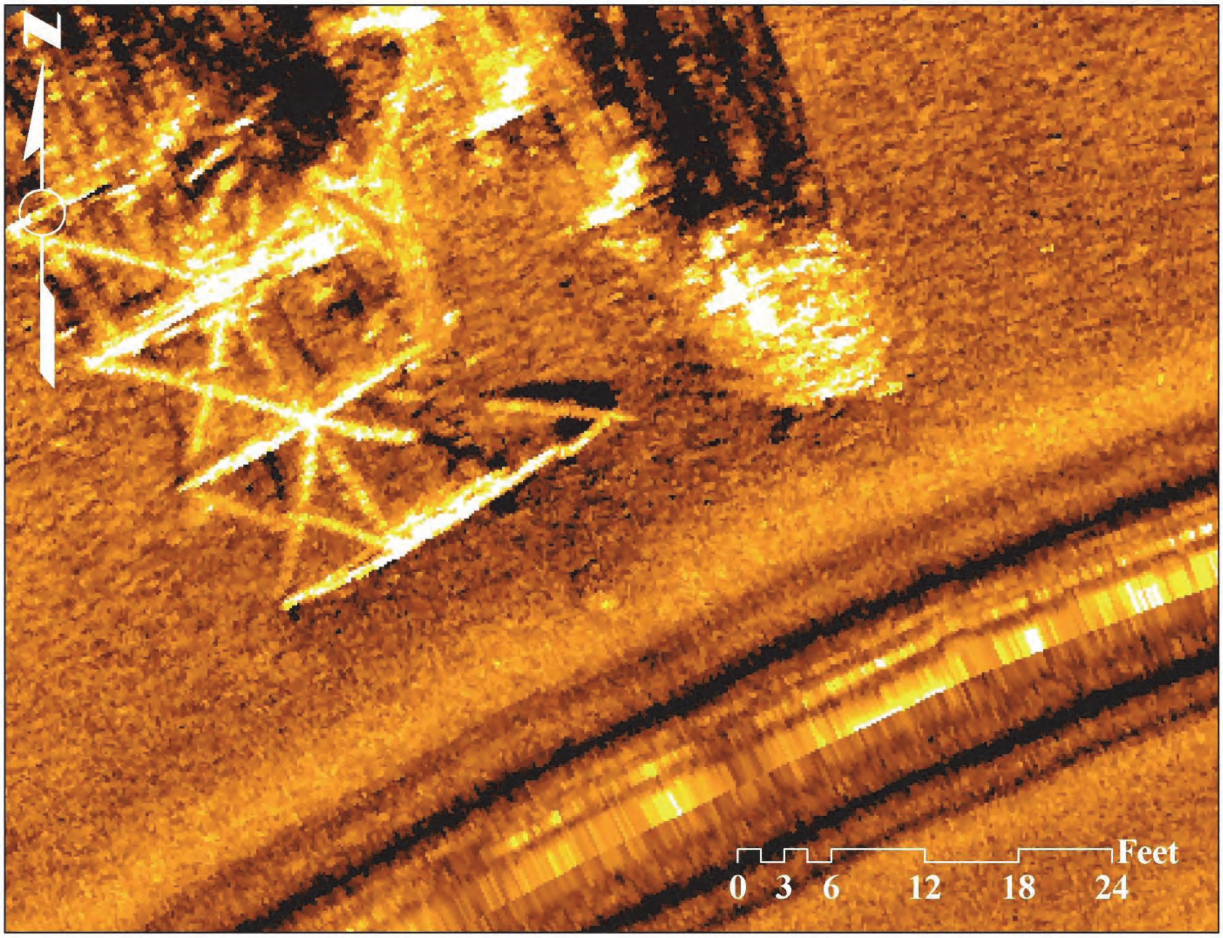

Figure 67. Georectified side scan sonar image of Laurel Point Lighthouse remains. (Image by Nathan Richards, 2011).

Shipyards

As noted in Volume 1, Tyrrell County has been the home to a number of shipbuilders since at least the time that James Wimble's 1738 map shows the text "Bateman Shipyard" on the Scuppernong River's east bank (Figure 68) (Richards et al. 2012:72-82). According to Cummings (1969:164), James Wimble's vessel, *Rebecca*, may have been constructed at this shipyard in 1738. Due to the map's large scale and the drafting conventions used in creating it, it was impossible to ascertain from this source where exactly along the Scuppernong River (or in Bull Bay) the Bateman Shipyard was once located. Similarly, very few details about Tyrrell County shipbuilders have been located, and the locations of their various shipbuilding establishments are presently unknown.

The remains of colonial shipbuilding in the area are likely very ephemeral, and no data from side scan sonar or magnetometer could assist in pinpointing the exact position of potential archaeological remains associated with the Wimble shipyard, or any other establishment.

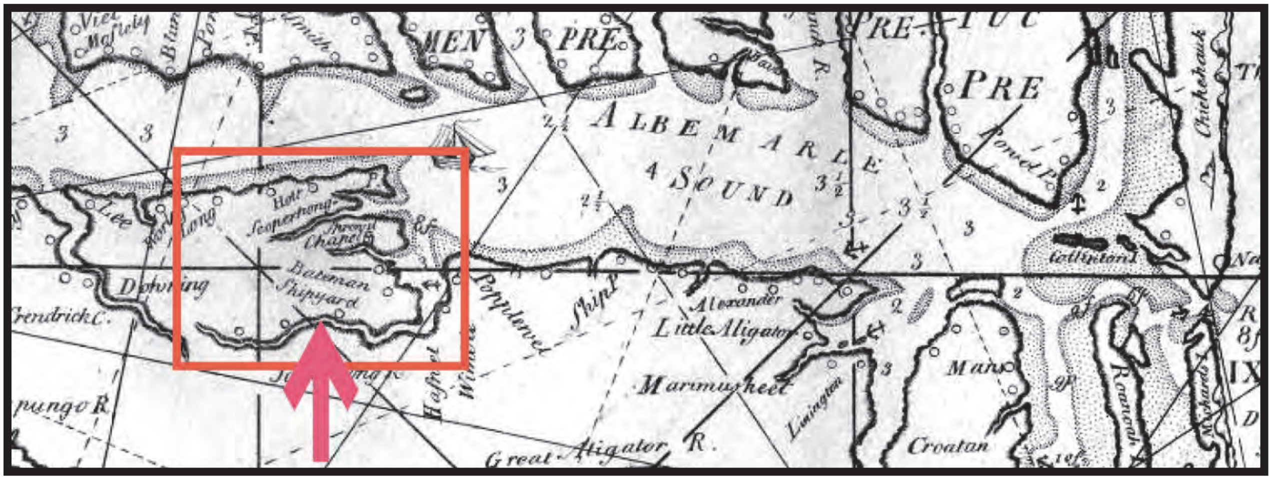

Figure 68. A portion of James Wimble's 1738 map showing the study area (within box) and the location of the Bateman Shipyard (denoted with arrow) (Image from North Carolina State Archives).

Landings

Landings have been noted at the numerous locations on nautical charts and in historical records (Table 2). These are of interest because of their potential as remnants of the transshipment points of the region's main industries, such as naval stores, agricultural crops (wheat, soybeans, peanuts, potatoes, rice, cotton, and tobacco), commercial fishing (herring, shad, mullet, and bass), and lumber. The areas adjacent to many of these landings were surveyed, but other than the clustering of some sonar targets adjacent to locations such as Dunbar's landing and at presently utilized areas, no side scan sonar or magnetometer data indicates the presence of large structures at any of these sites.

Table 2. Approximate location of known landings within the study area (positions taken from NOAA nautical charts).

Name	Easting	Northing
First Landing	374616.00	3977407.01
River Neck Landing	381920.73	3978365.51
Back Landing	381140.49	3976852.10
Dunbar's Landing	384530.53	3972147.07
Simmons Landing	380003.75	3972365.67
Cross Landing	379408.47	3971309.65

This is not a surprise as vessel-based remote sensing can be considered a poor method for characterizing any potential archaeological structures or assemblages that may lie in the area, and only direct inspection by archaeologists or the utilization of terrestrial-based remote sensing technologies are likely to tell us what activities occurred at these important points where land-based and river-based activities merged. It should also be kept in mind that the techniques employed in this research are not adapted to maximize the potential discovery of pre-European and Colonial archaeological remains (as outlined in Richards et al. 2012:8-26), and that these landings, perhaps utilized for hundreds of years, are worth close examination for older archaeological deposits. Similarly, these landings may in some cases have served as ferry landings (see Richards et al. 2012:31-32) into the twentieth century and would therefore represent activities there.

Pilings

The previous report touched upon some of the improvements to navigation that occurred along the Scuppernong over time – the sinking of pilings to denote channels being one of the most obvious methods of delineating safe navigation (Richards et al. 2012:39-43). Pilings have been noted at numerous locations on present day NOAA nautical charts – whether associated with present-day navigation or depicted as hazards (Table 3).

While pilings are not usually thought to be significant archaeological sites, as with landings, these may represent the infrastructure supporting the region's maritime industries and transshipment points – or may point toward areas where other archaeological remains lie *in situ*. They may also give us insight into the changing nature of navigation in the Scuppernong River and Bull Bay. Volume 1 of the Scuppernong research touched upon the evolving utilization of the Columbia waterfront which would have seen the installation of new water-based structures, their expansion, and perhaps their reuse for other functions (see Richards et al. 2012:50-62). An examination of historical records also tells us that many organizations periodically removed pilings from the area. One case is during 1992 when "1,000 old pilings and miscellaneous large debris" (Columbia/Tyrrell County 1992:1) were removed during the "Coastal Initiative." The installation and removal of pilings are hence potential signatures of evolving waterway and shoreline utilization. The following pilings were identified from historical and cartographic sources as being areas where structures and navigation aids exist, or once existed (Table 3).

Table 3. Approximate location of remnant pilings within the study area (positions taken from NOAA nautical charts).

Name	Easting	Northing
Pilings site A	384989.34	3975792.52
Pilings site B	383922.16	3977444.57
Pilings site C	381617.33	3978582.43
Channel marker	380819.03	3978571.34
Channel marker	380454.52	3979049.49
Piling site D	377919.79	3978151.55
Marker	381421.84	3978205.00
Marker	380324.90	3979159.41
Marker	383946.57	3976917.18
Marker	384537.04	3975922.05
Marker	386081.91	3976199.47
Piling site E	376217.12	3978370.43
Submerged piles (bombing target)	377749.27	3982363.69

Additionally, the following remnants of piling complexes (excluding pilings associated with the Laurel Point Lighthouse) were detected during sonar survey.

Table 4. Sonar contacts representing pilings or complexes of pilings identified during 2011 sonar survey.

Name	Easting	Northing
Contact0001	373584.56	3983968.00
Contact0037	386812.94	3975563.00
Contact0038	386820.56	3975457.00
Contact0051	386705.50	3975575.25
Contact0052	386672.41	3975559.25
Contact0059	386666.97	3975565.25
Contact0060	386695.69	3975568.75
Contact0061	386652.91	3975561.50
Contact0080	385747.66	3976276.50
Contact0086	386809.16	3975536.25
Contact0092	376707.88	3980781.25
Contact0131	373581.50	3983959.00
Contact0151	386620.38	3975818.50

The potential for these pilings to be associated with the fishing, lumber, and shipbuilding industries also exists – but significant work would need to occur to definitively link them to these activities.

In the case of the areas adjacent to Columbia, the lumber industry in particular is likely the source of many of the pilings, and some complexes may relate directly to businesses such as the Branning Manufacturing Lumber Yard, John L. Roper Lumber Company, Richmond Cedar Works, Magnolia Land and Lumber Company and West Virginia Pulp and Paper Company (see Richards et al. 2012:92-107).

Another way of thinking about these in-water structures is that they were the causes and consequences of economic activities—and that their dispersal and age are both indicators of the commodities traded throughout of economic fortunes for Columbia. In order to determine the true extent of maritime industry in the study area, a detailed examination of US Army Corps records is one potential historical source which may better establish where pilings were placed and removed.

Bridges

As noted previously (see Richards et al. 2012:32-33), bridge locations are important to note within the context of Tyrrell County history not only because they represent the changing transportation networks of the area but because they are often on top of, or adjacent to old ferry landings, and conceivably may also be sites where wrecked and abandoned watercraft lie. Examining modern maps indicates that four main bridge locations exist in the present-day landscape (Table 5).

Table 5. Approximate location of bridges within study area (positions taken from NOAA nautical charts).

Name	Easting	Northing
Spruills Bridge	374999.40	3969493.55
Phelps Bridge	371737.15	3968612.41
Columbia Bridge	386645.63	3975426.54
Cross Landing Bridge	379282.58	3971226.71

As noted in the previous report a greater number of bridges have been built in the area over time – in some cases bridges now reside on the location of earlier bridges, and in other cases, bridges have since been demolished (Richards et al. 2012:32-34). Additionally, some potential shipwreck sites do appear to lie adjacent to the Highway 64 Bridge near the Columbia waterfront. Otherwise, remote sensing did not detect other potential cultural resources adjacent to or underneath these bridges.

CONCLUSION

The two reports which represent the 2011-2012 research and fieldwork may be seen as the starting points for further archaeological and historical research in Tyrrell County. The cooperation and support from the town and cooperative partners made the ten days of on-water survey and many more days of research a fruitful endeavor. After our work, major sections of Bull Bay and the Scuppernong River remain prime areas for future remote sensing operations. The survey area was more comprehensive in the Scuppernong River, yet significant sections, such as the area adjacent to where the Somerset Plantation Canal meets the river are yet to be inspected. Bull Bay, a second priority area during 2011, remains largely unexplored. Furthermore, some areas covered by side scan sonar survey during the 2011 fieldwork could not be accessed for comprehensive magnetometer survey due to restrictions imposed by the operating environment and the research vessel. In some cases, these areas, clustered in and around Columbia, are the prime locations for the future potential discovery of significant cultural resources.

Moreover, there are a large number of river floor targets that may represent significant archaeological sites. The targets near Creswell, in particular, are worth inspecting. If any anomalies are identified as *Lawrence* or *Marguerite* (or both), they may be worth further in-depth analysis. Questions regarding the construction methods employed in the locally-built schooner *Lawrence* may warrant survey and excavation. Should *Marguerite* still lie in the Scuppernong there may also be similar questions. Both vessels could have their historical research significantly expanded. So too, a number of the potential shipwreck targets across the study area deserve ground truthing – while it is expected that most will turn out to be insignificant, there is the potential for brand new shipwreck or abandoned watercraft discoveries in the area.

This is not to say that the previously known wrecked and abandoned watercraft of the Columbia waterfront area do not deserve additional attention. The remains of *Estelle Randall* may be a particularly good site for a future survey or excavation as a part of a project or field school. Its location adjacent to the shoreline also makes it a perfect opportunity for near shore cultural tourism. The vessels in Bull Bay may also be worth examining in greater detail to better determine their function and connect them to local histories and industries. Likewise, it is uncertain whether the abandoned watercraft that once littered the waterfront still lie *in situ*. Further research, collection of oral histories, or site inspection (via remote sensing or divers) may better ascertain their disposition on the river floor. Likewise, the landings scattered across the study area are also potential hotspots for the discovery of terrestrial archaeological deposits which would further illuminate the utilization of the Scuppernong River and Bull Bay in the past few centuries. Close inspection and alternative remote sensing techniques may expose the evolving use of these landings as trade changed along these waterways. Additionally, our remote sensing techniques had little hope of finding any archaeological remains pertaining to the Native American activities in the area – and perhaps close inspection of areas adjacent to landings (which may have been used for hundreds of years) may hold some promise for illuminating this neglected subject.

Hence it is clear that further work in the Scuppernong River will continue to expose the history of Tyrrell County. This inventory needs to be further expanded to better determine all of the elements within the Scuppernong's landscape. Once a better handle on the historical and archaeological potential of these sites is attained, a next potential step is to proceed to a full maritime cultural landscape study which can look at charting the human-structured use of the environment, and the cultural meanings encoded within land- and river-forms. Major gaps in knowledge persist regarding many of the industries of Tyrrell County, especially early shipbuilding and fishing.

Despite the loss of one sonar fish, the side scan sonar component of the survey was successful. With 160 targets, several of them verifiable shipwrecks, future researchers have plenty of material to disseminate and investigate. Also successful was the amount of hours logged by students using the side scan software, both collecting data in the field and in post processing sessions during the project and after. Future survey of the Chowan, Pasquotank, Little Alligator, and Alligator Rivers would further broaden our understanding of the Albemarle Sound's complex economic past. Survey of the Alligator River in particular would link the research conducted on Tyrrell County with neighboring Dare County's rich past. The 160 targets reveal the Scuppernong River once teemed with economic activity, especially fishing and lumber. To broaden the scope of investigation beyond the Scuppernong River and Columbia is the next logical step in conducting further research on the Albemarle Sound and its historical communities.

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This volume represents the second volume of a series of reports dedicated to deepening our understanding of the maritime history and archaeology of Tyrrell County, North Carolina.

In the fall of 2011, students and personnel affiliated with the Program in Maritime Studies (East Carolina University) and the UNC-Coastal Studies Institute, with the assistance of the organizations and individuals associated with the town of Columbia, and Tyrrell County commenced the process of collating a submerged cultural resources inventory of the Scuppernong River and adjacent Bull Bay.

While the process of documenting the maritime archaeological resources of the area is ongoing, this report contains the results of remote sensing surveys (side scan sonar and magnetometry) of a portion of the the bottomlands of these bodies of water.

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