North Carolina Coastal Heritage at Risk

Interdisciplinary Grant Report
July 1, 2015






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Dissertation: Fishing Cultural Heritage

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Dissertation: Management of Beached Shipwrecks

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Introduction

The main objective of this initiative was to select diverse examples of coastal cultural heritage (on land or underwater) in Hanover and Brunswick County, which are either vulnerable (eroding shorelines, disintegrating structures) or have potential to be highlighted and utilized for sustainable tourism. The plan was to consult with stakeholders (cultural resource managers, property owners, community groups) to identify these sites, discuss needs and options, and then to document each site using technology like laser scanning, remote sensing, photography and video footage for a period of one to three days. This is a collaborative interdisciplinary East Carolina University research team. It included 5 faculty members (geography, geology, anthropology, maritime history and sustainable tourism) and their graduate students. The project started at the end of September 2014 and will continue to November 2015. During this first phase of the project the data will be shared and compiled in a team drop box. Most of the information is digital data (Laser scans, GPS points) recorded interviews; video and photographic data of historic structures and feature. The project has a face book site to connect with project partners outside East Carolina University with a view to future collaborations https://www.facebook.com/pages/North-Carolina-Coastal-Heritage-At-Risk-Project/294230697427842.

The team will then proceed to acquire grants for further work on the sites or an extension into other NC counties in southern eastern NC. The end products, with more substantive grant funds, will include interdisciplinary research data compilation, an up-to-date site report, and creation of websites, brochures, GIS inventory and recommendations to resource managers for preservation or sustainable tourism. The sites currently serve, and may potentially also continue to serve as MA or PhD. topics for ECU students in the future. ECU is committed to a vision that includes not only scholarly endeavors for faculty, but also productive partnerships and

engagement with NC communities in private, public, state and federal sectors. Maritime Studies Program worked with ECU partners in Geography, Geology, Anthropology and Sustainable Tourism, plus local managers and stakeholders. Eight coastal heritage sites were selected as case studies in the Wilmington area although only six where completed in the available time. Brunswick Wharves and Eagles Island will be studied with a follow up grant.

Figure 1. Map showing location of sites (Adapted from *Google Earth*)

Table 1. Sites

Site	Manager
1. Old Baldhead Lighthouse	Old Bald head Foundation
2. Old Baldhead Boat house	Old Bald head Foundation
3. Fort Fisher Historic Earthworks	North Carolina Department of Cultural Resources
4. Rose Hill Plantation Shipwreck	River Bluffs Development/ Underwater Archaeology Unit
5. Surf City Beach Wrecks	Public beach/ Underwater Archaeology Unit, NC
6. Varnamtown Fish Houses	Private Owners
7. Brunswick Wharves	North Carolina Department of Cultural Resources
8. Eagles Island Shipwrecks	City of Wilmington/ Underwater Archaeology Unit, NC

Site 1. Bald Head Island Lighthouse and Boat House

ECU conducted preliminary digital documentation of the Old Baldy Lighthouse and boathouse and held several interview sessions and a workshop with Bald Island stakeholders.

Figure 2. Map of Bald Head Island (Adapted from website map coastalurge.com)

Lighthouse

"Old Baldy," was built in 1817 farther inland to protect it from erosion. Both sites are listed on the National Register of Historic Places and are popular tourist attractions. This brick octagonal lighthouse remains the oldest standing lighthouse in North Carolina today and is maintained by the Old Baldy Foundation. Early mariners complained that Old Baldy's light was not bright enough, was located too far inland, and was too short. Although the lamp and lens were upgraded several times, the Lighthouse Board eventually decided to replace it. As early as 1761, a hurricane

caused a drastic change in the Cape Fear River channel, opening a new inlet about eight miles to the north of Bald Head Island, providing a more direct connection between the Cape Fear and the Atlantic Ocean.

Figure 3. The old Lighthouse with lighthouse keeper's cottage
(Adapted From Website OldBaldy.Org)

A significant number of mariners began using the new inlet in preference to the meandering channel at the mouth of the river for which the original Bald Head lighthouse had been built. It was decided that a tower should be built closer to the new inlet and in 1866 a framed structure with a watchtower on top was erected at Federal Point. In addition, two range lights were built on Oak Island, located on the west side of the mouth of the river. First lit on September 7, 1848, these lights were often referred to as the "Caswell Lights" because of their nearness to Fort Caswell. The Caswell lights were freestanding brick towers, with a separate one-and-one-half-story cottage for the keeper. The original brick beacons were in use only a few years before

the Confederate Army extinguished all the lights on the Carolina coast including both the Bald Head Island lighthouse and the Federal Point tower, to prevent the Union Army from using them. Both of the Oak Island range lights were destroyed by retreating Confederate troops, who preferred to blow up the structures rather than see them fall into Union hands. After the Civil War, only the Federal Point lighthouse was relit.

Figure 4. Geography Students Laser Scanning the Historic Lighthouse
(Photograph by Lynn Harris)

Figure 5. The ECU team engages with the public as they work on the interior recording of the Lighthouse (Photo by Lynn Harris)

Figure 6. Deterioration in the Interior of the lighthouse structure is clearly visible (Photo by Lynn Harris)

Creating an accurate baseline record of deterioration will facilitate monitoring and managing structural damage in the future. The scans will also provide highly detailed data sets to reconstruct portions of the building that may need to be repaired or replaced in the future.

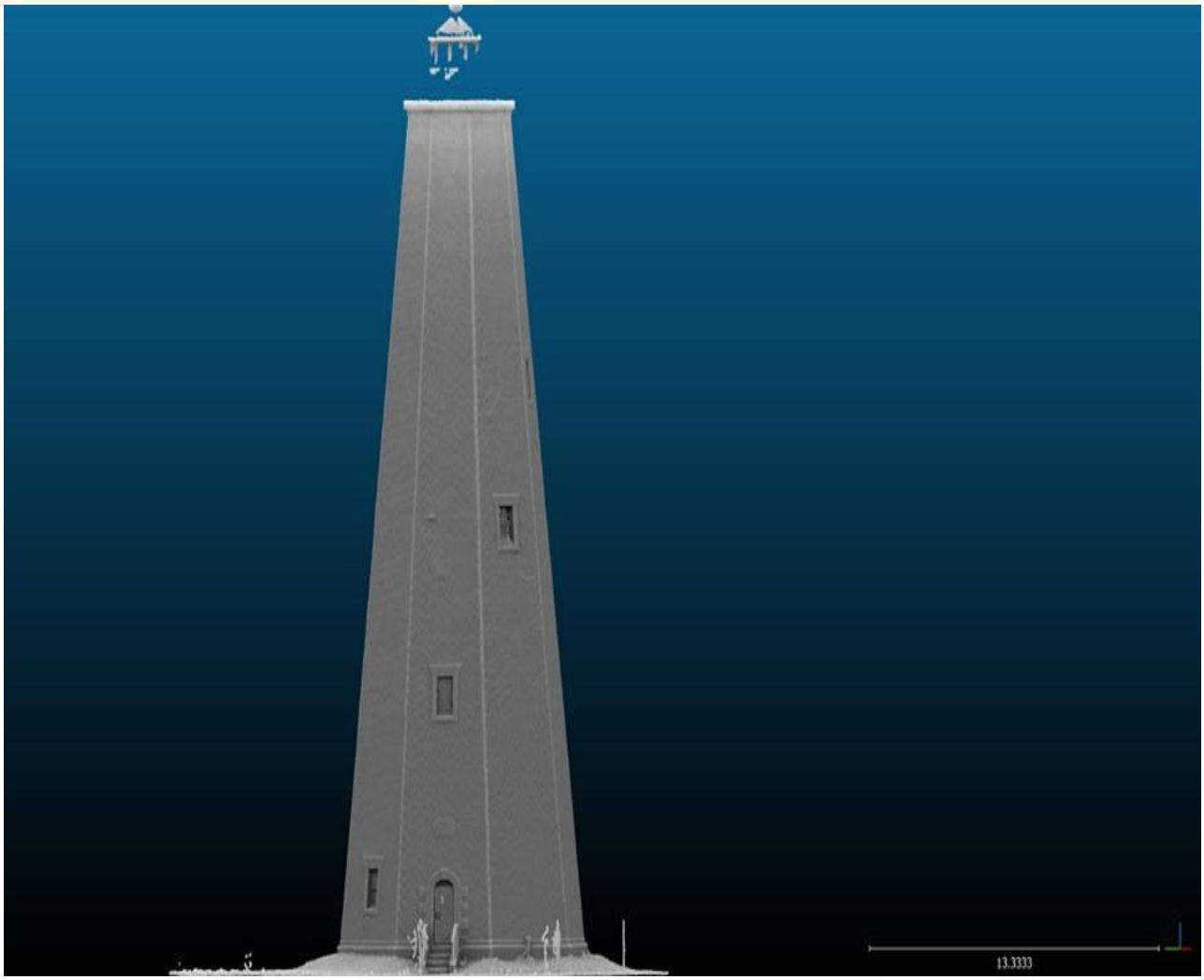

Figure 7. 3-D Image of Old Baldy Lighthouse created from Laser Scans
(Image by Thad Wasklewicz)

The Terrain Analysis Laboratory in the Department of Geography, Planning, and Environment participated in the North Carolina Coastal Heritage at Risk Project at East Carolina University by using Leica HDS terrestrial laser scanners to record and preserve the current condition of features at the Bald Head Island and Fort Fisher sites. A terrestrial laser scanner is a tripod mounted instrument and emits laser light at a specified vertical and horizontal spacing. For example, we recorded the interior of the Bald Head Island Lighthouse at a point spacing of 6.3 mm. Any

surface in the lighthouse reflecting the laser light back to the scanner will be recorded as a point at every 6.3 mm across the entire surface. Each point records the location of the surface, its height, the surface intensity (amount of energy reflected from each object), and an rgb value (from a photo taken with the laser scanner). This information can be used to: measure features; assess structural changes over time, assist in restoration of the sites by identifying features that are decaying, preserve the current condition of the site, develop educational and research-educational experiences, and visualize the features by a variety of media including 3D models printed from 3d printers

Figure 8. Maritime Studies students conduct aerial photography and video surveys (Photo by Lynn Harris)

Using a Phantom 2 Flying Drone and a GoPro Hero 3+ camera, East Carolina University maritime studies students documented the Bald Head Island Lighthouse and a local boathouse. The Phantom 2 and GoPro are both controlled by a remote control in the hands of a student. Maximum flying altitude is 6000 ft. Operators manipulate the camera's shooting angle to ensure they get best shot. A gyroscopic gimbal guarantees a stable shooting platform. As the video shows, even the drone's automatic wind adjustments do not affect the shot. Each operator practiced with the drone prior to the project and quickly mastered the controls. Flight time is limited to maximum of 20 minutes, however, so proper flight planning is essential.

Prior to a flight, the operator constructs a basic flight path and set shooting objectives for the camera. In the case of Bald Head Island Lighthouse, each face of the structure was recorded along with the roof and 360° landscape view of the surrounding area. Each side of the boathouse was recorded. Special attention was paid to the roof and the surrounding landscape. Both locations presented their own set of difficulties. Trees planted around the lighthouse made accurate shooting problematic at times. Higher altitude winds also caused problems. At the boathouse, the drone was flown over water. As such practical limitation were placed on flight time to leave enough battery power to allow a safe return of the drone. Neither the drone nor camera are waterproofed when operating together.

After each flight, the GoPro footage is transferred to a computer and reviewed. If each objective is met, the next flight is planned while the drone's battery is recharged. Depending on the previous flight, the battery is usually fully operational in about one hour. If objectives are not met, another flight is scheduled to meet them. Once all recording objectives are met, a final video can be edited for public presentation.

Boat House

A symbol of the past presence of light keepers and lifesaving servicemen on Bald Head island is the Old Boat House on Bald Head Creek. It was built in 1903 to store supplies and boats. A dramatic change in the shape of the creek channel over the last ninety years resulted in the boathouse location changing to the other side of the creek. The boat house is currently deteriorating rapidly and needs to be stabilized and possibly moved to a location with more tourism viewing access. It is one of the most popular paintings and photographic scenes on the island and is currently listed on the National Register of Historic Places

Figure 9. Faculty and students of the Geography and History Departments document and investigate the boat house using tradtional methods like GPS referencing, in water mapping on snorkle and laser scanning (Photos by Lynn Harris)

Figure 10. Aerial image showing deterioration of the roof structure of the boat house (Photo by Lynn Harris)

Figure 11. Geography team scanning the boat house (Photo by Lynn Harris)

Site 2. Historic Fort Fisher

The site is located18 miles south of Wilmington on U.S. 421. It is National Register Number: 66000595 defense – fortification. It was classified as threatened in 2008. Current use is a state park. Today, its significance is as an earthen Confederate stronghold which created an impassable barrier for the blockading Union fleet. Its fall, in January 1865, helped spell the collapse of the Confederacy. The earthen fortifications of Fort Fisher have suffered due proximity to the Atlantic shoreline. Beachfront erosion destroyed most of the fort by the 1950s. Fortunately, this tidal erosion was arrested in 1996 with installation of a stone revetment wall. However, the erosion caused by wind and rain continues to damage the remaining earthworks. The ground cover is inadequate for preservation, and past maintenance practices emphasizing curb appeal have been detrimental. Without appropriate ground cover and a proper maintenance plan, erosion will continue to adversely impact the remnants of the fort.

Figure 12. Location of the Earthworks, revetment and submerged fortification (Adapted from Google Earth)

In addition to fortifications the world's largest concentration of Civil War shipwrecks are submerged in the waters of Cape Fear. These vessels represent the evolution of ship architecture and construction during the revolutionary transition of ship propulsion from sail to steam, and wood to iron hulls. The material culture remains are evidence of the economic and social impacts to the South during this conflict and their deposition patterns closely reflects the naval boundaries established by Union blockade strategists. The shipwrecks contribute to the history of Fort Fisher, deepening our understanding of the fort as a Confederate stronghold and highlighting the pivotal role it played in the Civil War. There are six wrecks in the New Inlet area of the Cape Fear Civil War Discontiguous Shipwreck District: the *Arabian*, *Condor*, *Modern Greece*, *Stormy Petrel*, USS *Aster*, and USS *Peterhoff*. Others are located further offshore or on adjacent beaches like blockade runner *CSS Beauregard* scuttled in 1863 is still visible at low tide about 100 yards off shore. These wrecks were part of a thesis project for a student participating in the grant initiative. The grant team attempted a reconnaissance snorkel on the site of the shipwreck.

Figure13. Location of *CSS Beauregard* (Adapted from Google Earth)

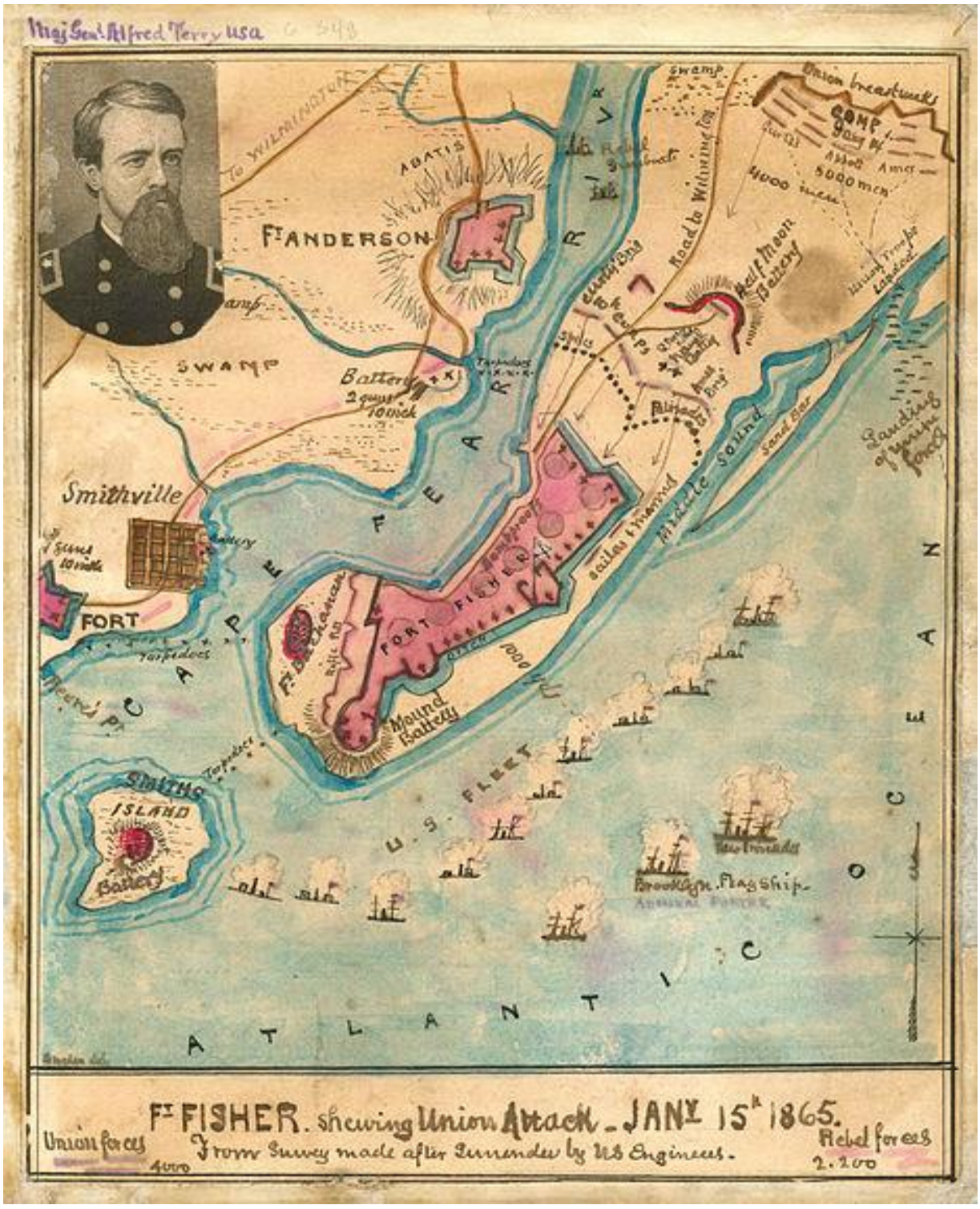

Figure 14. Historic Map of Fort Fisher Union Attack

Figure15. Geography team scanning the earthworks at Fort Fisher (photo by Lynn Harris)

Until its capture by the Union army in 1865, Fort Fisher was the largest earthwork fortification in the world. The "Gibraltar of the South" protected the port of Wilmington and ensured that the Confederacy had at least one "lifeline" until the last few months of the Civil War.

Figure 16.The geography team laser scans the earthworks and history team maps the outline with Hand held GPS units. (Photo by Lynn Harris)

Figure 17. The ECU Geologists with help of students set up a seisometer at Fort Fisher State Historic Park to measure wave action and ultimately to assess erosion rates. Seismometers are instruments that measure motions of the ground, including those generated by wave action (Photo by Lynn Harris)

Figure 18. Testing the ground vibration calibrations of the seismometer (Photo by Lynn Harris)

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The Department of Geological Sciences installed a seismometer at Fort Fisher. The unit measures ground vibrations and can record the energy of the breaking waves. The objective here is to assess the possibility of using an array to monitor wave breaking, which can enhance an understanding of sediment transport and erosion processes along the coast. A seismic refraction survey was also performed to provide information on the geological framework, which partially controls the vulnerability of a site to erosion processes.

Figure 19. Geology team conducting Ground Penetrating Radar operations at Fort Fisher (Photo by Lynn Harris)

The Department of Geological Sciences assisted the North Carolina Coastal Heritage at Risk Project using ground penetrating radar (GPR) to find buried cultural sites and to assess the geological framework which partially controls the vulnerability of a site to erosion processes. A GPR images the subsurface by projecting radio waves into the ground using an antenna (the big orange box in the photographs). These reflect off of subsurface layers or objects where there is a change in electrical properties. Reflected energy is received by the antenna and recorded and displayed. Data can be processed to understand the depth scale. Here we are using a 200MHz antenna with a GSSI SIR-3000 system.

Site 3. Rose Hill Plantation Shipwreck

The Rose Hill wreck is located on the bottom of the Northeast Cape Fear River, 6.4 miles from the river's mouth, in approximately 18 feet of water. The entire river basin is situated within the coastal plain. The Program in Maritime Studies dive team worked in collaboration with the NC Underwater Archaeology Branch to assess the Rose Hill Plantation shipwreck in the Cape Fear River 6 miles upriver from Wilmington. The shipwreck is located adjacent to the development River bluff near a planned boat ramp. The team assessed the condition of the shipwreck's structural integrity, stability and riverine site formation processes. It was also noted that the frames had transverse fastenings (not previously observed), a possible disarticulated saddle mast step, and apron in the bow area.

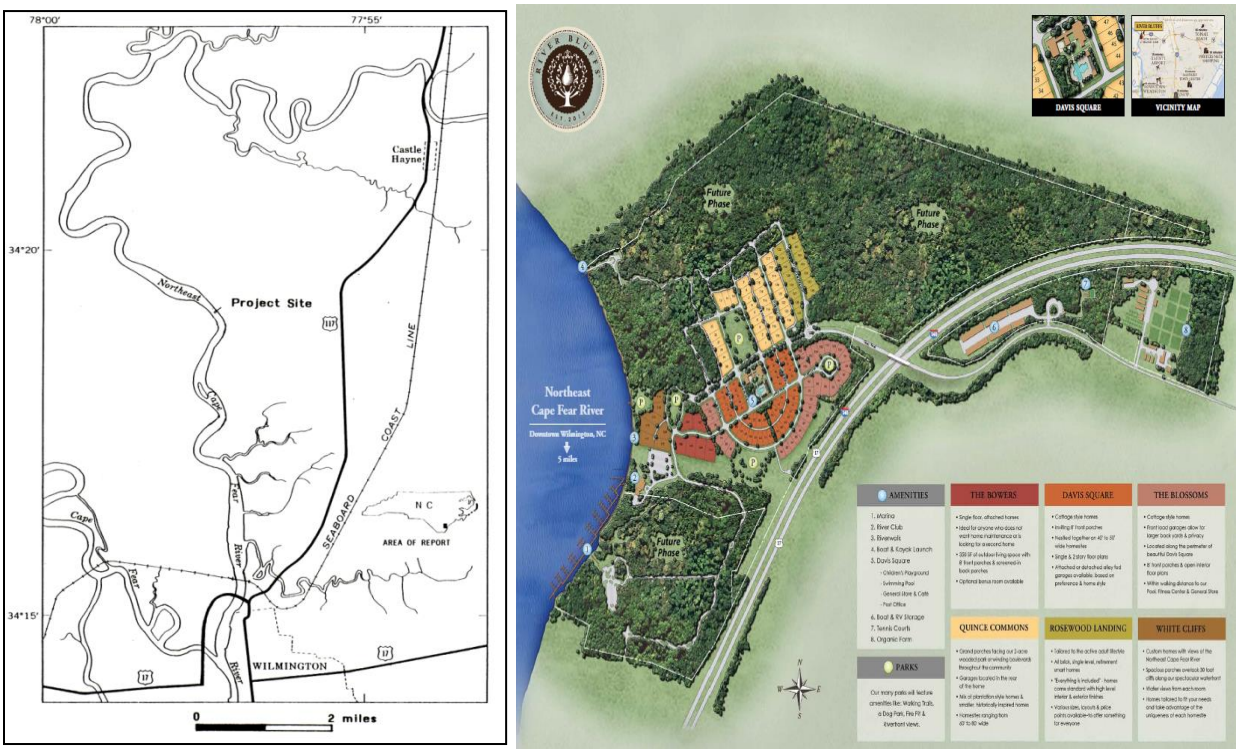


Figure 20. Location of Shipwreck and the River Bluff Development (NC UAB Report)

Figure 21. Boat Ramp in progress that may impact the shipwreck site with boat traffic and wake (Photo Lynn Harris)

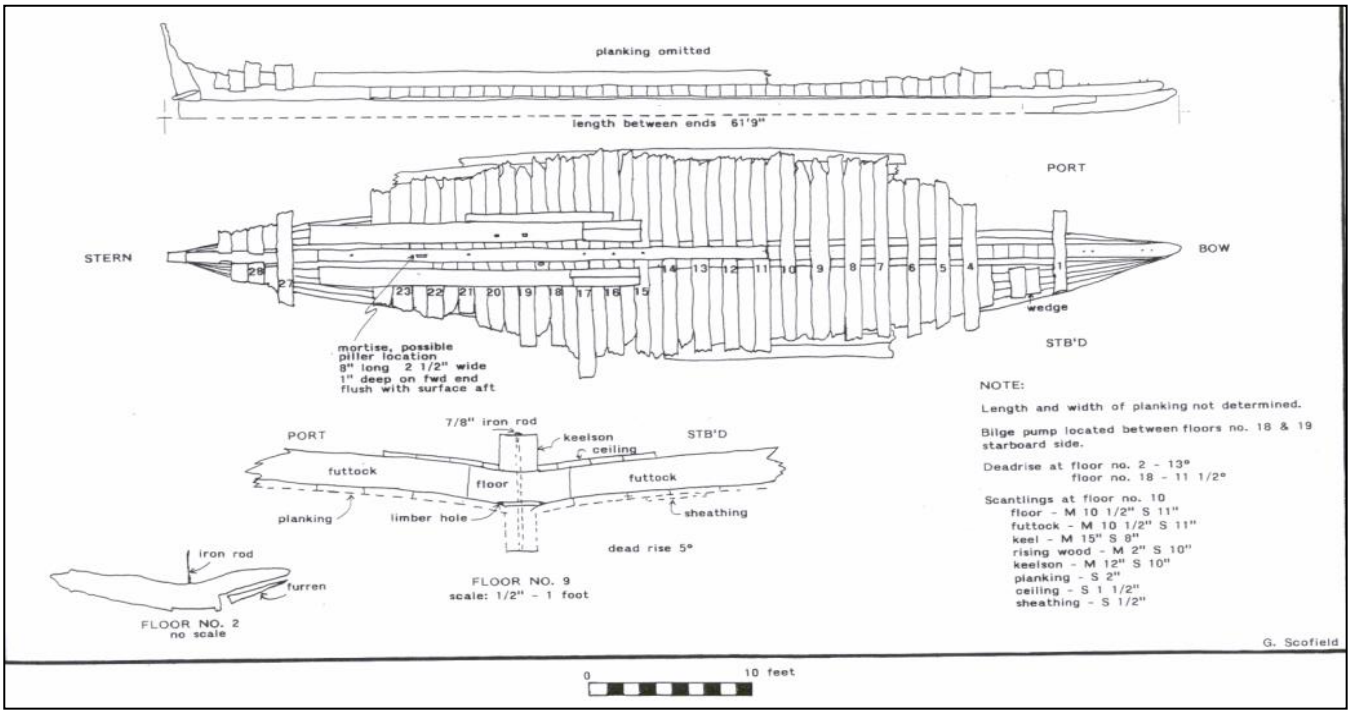


Figure 22. Rose Hill Shipwreck Plan at the River Bluff Development (NC UAB Report)

Figure 23. History Department Dive team works with NC UAB to relocate the Rosehill shipwreck and to give a status report on the condition of the hull structure (photo by Lynn Harris)

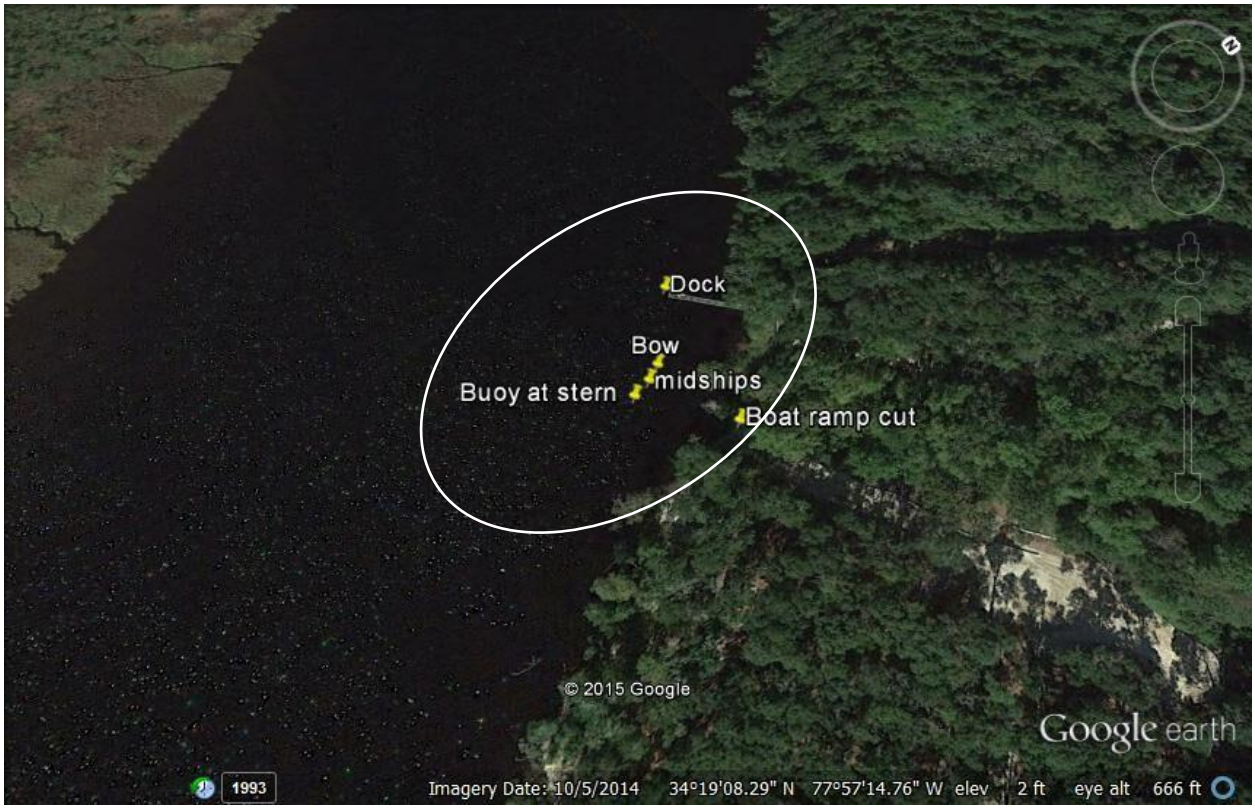


Figure 24. Map showing location of the shipwreck orientation plus the proposed boat ramp and nearby dock (Adapted from Google maps)

Co-ordinates are:
Buoy at stern 34°19'8.31"N 77°57'14.72"W
Bow 34°19'8.66"N 77°57'14.93"W
Modern Dock 34°19'9.26"N 77°57'15.77"W
Boat ramp cut 34°19'8.81"N 77°57'13.8"W

The Geology Department team conducted a side scan sonar survey of the wreck area showing the bathymetry and signature of the hull. Side-scan uses a sonar device that emits conical or fan-shaped pulses down toward the seafloor across a wide angle perpendicular to the path of the sensor through the water, which may be towed from a surface vessel or mounted on the ship' hull.. The intensity of acoustic reflections from the seafloor of this fan-shaped beam is recorded in a series of cross-track slices. When stitched together along the direction of motion, these slices form an image of the sea bottom within the swath (coverage width) of the beam

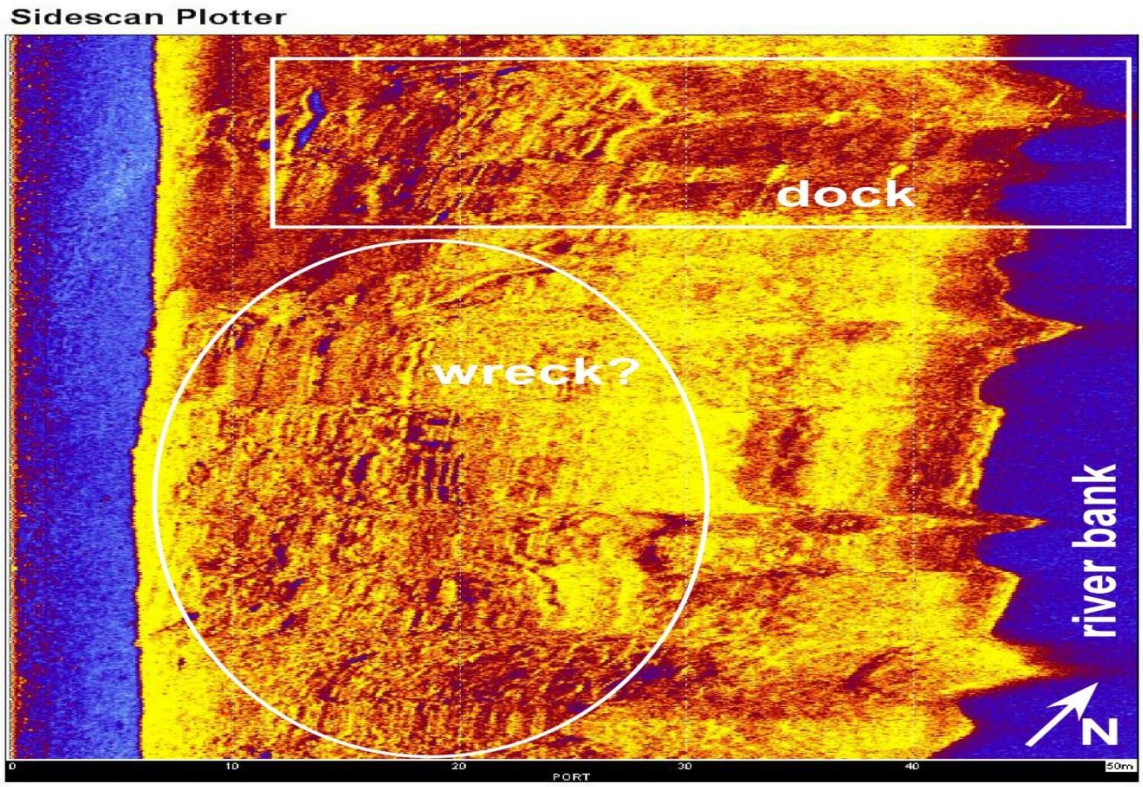


Figure 25. Side Scan image of the wreck and dock (Image by David Mallinson)

8. DIVE PLAN

PROJECT: Rose Hill Shipwreck, Cape Fear River
DATES: April 30 - May 1, 2015
SCIENTIFIC SUPERVISOR: Lynn Harris
DIVE MASTER: Nathaniel King, Nelson de Long
PURPOSE: ☑ Scientific ☐ Proficiency ☐ Training ☐ Recreational
MODE: ☑ SCUBA ☐ Surface Supplied Other: _____
BREATHING GAS: ☑ Air ☐ Nitrox (mix _____) Other: _____
DIVE SITE(s): Rose Hill Shipwreck (NER0031), River Bluffs Development, 2000 Chair Road. Cape Fear River, 6 miles from Wilmington.
MAXIMUM DEPTH(s) & BOTTOM TIME(s) ANTICIPATED: _____
APPROXIMATED NUMBER OF PROPOSED DIVES: Three dives per diver over two days
INDIVIDUAL REPETITIVE DIVE SCHEDULE: Daily: Two dives per day. One hour intervals between dives.
Weekly: _____

SUMMARY OF PROPOSED WORK (List equipment & boats to be employed, a description of site conditions, and details of any hazardous conditions anticipated. Use additional paper as needed.):
OPERATION:Dive reconnaissance to determine condition of the wreck and take measurements , photographs and video footage.
DIVE CONDITIONS: 20 feet depth, Cold (70 degrees) and low visibility (1 -2 foot) requiring flashlights, no obstructions

REQUIRED CONTACT INFORMATION (List location, telephone number and, if prudent, detailed directions):
Hospital: [illegible]
Ambulance: _____
Law Enforcement: 911 U.S. Coast Guard: VHF 16/22
Recompression Chamber: [illegible]
Divers Alert Network: (919)684-8111

EQUIPMENT OR SUPPORT REQUESTED FROM THE DIVING SAFETY OFFICE:
SCUBA tanks, dive flag as operations will take place from river bank at Rose Hill subdivision.

PARTICIPANTS: Nathaniel King, Nelson de Long, Mateusz Polakowski,

PREPARED BY: Lynn Harris APPROVED BY: _____ DATE: 29 April, 2015

DSMP6
East Carolina University

Figure 26. Maritime Studies Dive Safety Plan for Rose Hill Shipwreck operation. This is a black water dive and a speciality of the ECU Scientific Diver Training Program
(Plan and Photo by Lynn Harris)

Site 5. Beached Shipwrecks

This project included archival research on beached shipwreck sites at the Underwater Archaeology Branch (UAB) in Kure Beach, NC. Archival records, which typically included previous site drawings, pictures, historical records and personal accounts, were available for scanning and were provided to researchers digitally. While at the UAB, they also spoke with Nathan Henry, the archaeologist in charge of all beached sites under this branch, about specific beached wreck sites and issues with management. During the time at the UAB, a call came in about a wreck that had been uncovered on the beach at Surf City.

NC State Underwater archaeologist William Morris, other staff members and Jennifer Jones (a member of the ECU NC Grant Team) went to inspect the site and look for specific construction techniques on this known shipwreck, *William Sumner*. The team took measurements of the visible (above sand/water) wreckage to compare with previous recordings of the site, as well as photographs. They spoke with many curious public beach goers about the wreck's history and significance, as well as issues with removing pieces from it given state law and regulations. We also surveyed Sunset Beach, Long Beach and Caswell Beach (on Oak Island) with a metal detector, using coordinates for known beach sites which may now be covered. At Sunset Beach researchers took waypoints on detected targets.

Figure 27. Surf City beach wreck (Photos by Jennifer Jones)

On May 20-23 Jones returned to Surf City with the NC UAB team to examine *William Sumner* wreckage for any movement and to see the wreck at low tide. While on Topsail Island they visited Topsail Island Historical Society/Missiles and More Museum after hearing that they may have pieces of the Sumner wreckage. The staff at the Museum were interested in the possibility of a potential exhibit to be developed on the wreck given its history and continual exposure on the Island. The team also surveyed the southern spit of Topsail Island where additional pieces are reported to be located along with the wreck of the Phantom. However, they were limited in how far they could pursue this objective given development and private property on the island. Additionally, they conducted did magnetic surveys for previously recorded beached wrecks and wreckage at Masonboro Island, Wrightsville Beach, Carolina Beach, and Kure Beach. We found numerous small metal pieces on Masonboro but got no definitive signals on any of the other beaches. The wreckage and magnetic hits at Surf City, Sunset Beach, and Long Beach warrant further investigation and continued research. The wreck of the *William Sumner* at Surf City would be an excellent opportunity to discuss with town managers their intentions with the wreckage, given its popularity when exposed, as well as develop some tourism related exhibits and/or signage.

Figure 28. Site Assessment of William Sumner *(Photo by Jennifer Jones)*

Site 6. Varnamtown and Fishing Heritage

Southeastern areas of North Carolina have a large number of fishing communities, as presented in the beginning of this research, which have been fishing there for centuries and are still living there. Fishermen with their boats, fish houses, ship yards, crafts, traditions and other elements related to fishing (Barrett, 1992), not only have intervened in the natural environment over centuries in the coastal areas of North Carolina, but also established a kind of identity and place attachment. They are a part of an existing maritime cultural landscape, which assists in understanding the specific culture of fishermen and the meaning of this heritage in fishermen's' today life (Ford 2011).The initial outcome of this part of the project will be an inventory of valuable commercial fishing cultural heritage in the southeastern NC.

In each of the two fishing communities in Varnamtown and Shallotte, the remains of fishermen and people involved in commercial fishing were interviewed. These two communities showed very different levels in the state of the community integrity and amount of cultural heritage related to commercial fishing. The study comprised two sections: 1) The interviews were conducted in open ended and close ended structure. The unit of analyses is fishermen and their family members in fishing communities in the selected cultural communities. Elements such as type of boats at the ducks, building type, presence of fishing gear and facilities were recorded; 2) A visual inventory of the physical characteristic of fishing places and a photographic database, semi-structured in-depth interviews, in addition to residents employed photography method, followed by Varnamtown is relatively rural town surrounded by farmlands. There are at least three active fish houses. Most fishermen who dock and sell at local fish houses live near the town itself. A large percentage of locals make some kind of a living off the water – harvesting fish,

clams, or oysters according to those interviewed. Some fish year-round, but many have other jobs such as carpentry and work on dredge boats.

For Varnamtown in the census of 2012 two fishing related establishments have been recorded.

Table 2.1.3.2 Employment in Fishing Related Industry for Varnamtown, North Carolina (Zip code Business Patterns, U.S. Census Bureau 1998)

Category	NAIC Code	Number Employed
Fishing	114100	16
Seafood Canning	311711	0
Seafood Processing	311712	0
Boat Building	336612	0
Fish and Seafoods	422460	36
Fish and Seafood Markets	445220	8
Marinas	713930	8
Total Fishing Employment		52

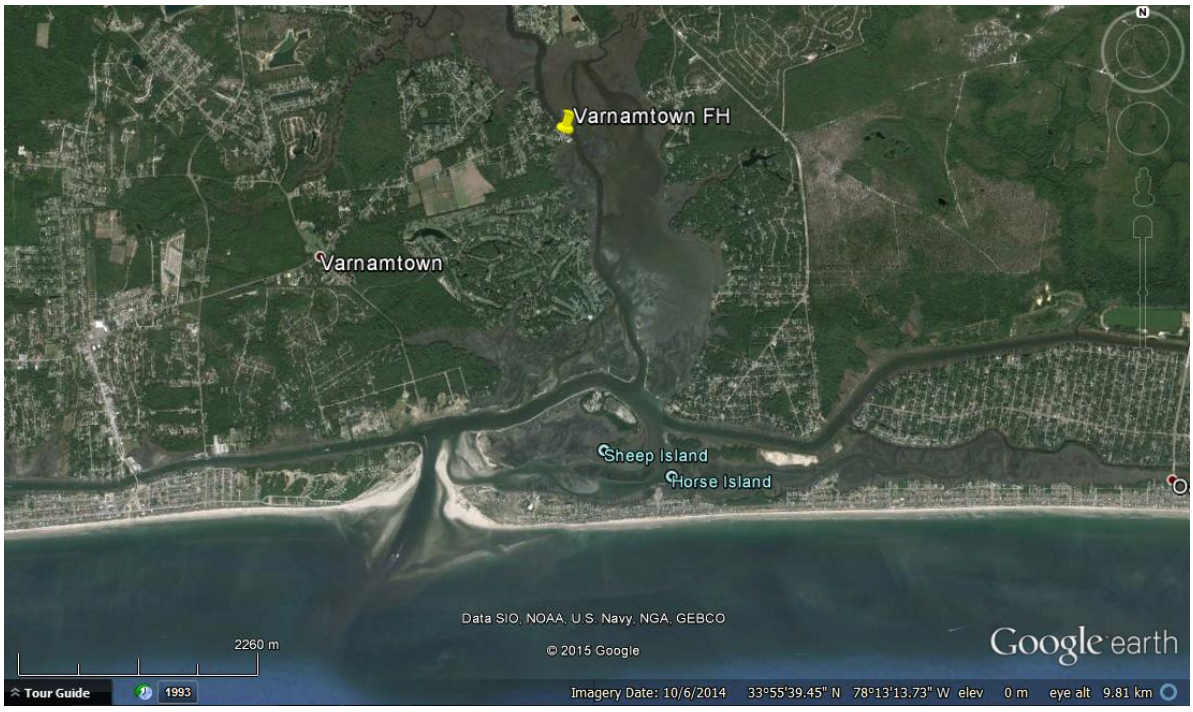


Figure 29. The three active fish houses are located near each other. 15 interviews were conducted in Varnamtown with fishermen, pickers and fish house owners (Adapted from Google Earth).

of being out on the ocean and because of the connection with water. A few indicated that since it is an independent job, they like it.

Due to the changes in regulations, seasonal and natural factors some of them have changed their gears or adapted their boats for new fishing conditions. They usually sell their catch locally at certain fish houses. Fishing is their livelihood, has been in their families for generation and is a part of their life, therefore it is important to them. All people who were interviewed in Varnamtown strongly stated that it is a fishing community where everybody in it is connected to fishing in a way or another, although outsider might not completely understand the hardship of commercial fishing. For them the interaction with the wider community is no issue, and they believe that they usually receive the respect and attention that they deserve. The Oyster Fest is a social activity for them that every year is held. In addition, fishermen in Varnamtown, usually, gather at the three fish houses at the duck and there is one pick nick area and Garlands Seafood that many stated they gather there. They stated that fishermen are well connected through phones and radios and they enjoy a sense of solidarity that exist among them.

Commercial fishing contributes strongly to the character of Varnamtown. It is obvious from the existing fish houses, fishing boats at the duck, laying around fishing gears as well as decoration motives at houses in the town. People believe that if there is no fishing in Varnamtown anymore, developers will take over and the area will lose its identity as a fishing community. For them, the existence of fish house is a sign that there is a fishing community here. They mostly believe that the fish houses and some structures associated with fishing should be preserved, even if the fishing stops completely, because these waterfronts show parts of the history of this area and its people. Their good memories are from the locations that existed in the past and now are

gone, and from their boats that a few still exist. One particular site in Varnamtown is the Boar rail that is the only one remained in this area.

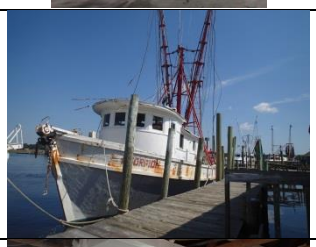
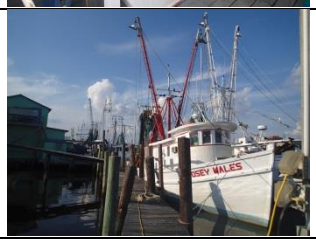
They believe that tourism helps to promote their job, and are willing to consider involving tourism. They are willing to explain their work to visitors; some stated that they can arrange for short fishing trips. But the two young fishermen were against the idea of getting involved in tourism. Although people from this community would prefer to continue fishing as their main career, and are not willing to switch to other jobs, even if they found it more profitable, they would not encourage younger generation to get into fishing. In addition, the two younger people were willing to start something different, if fishing goes down.

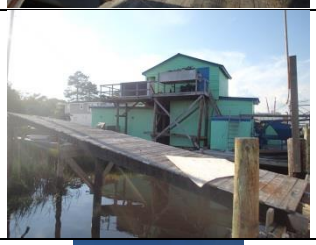
They had different views about the character of the area. Some stated that fishing played a great role in shaping the character of the aarea before, but now is gone now specially in the area around Holden's Fish house, but the ones around the resstaurant and lloyd's fish house believe that still the character exist and can be seen in fish houses, docks, boats net shop. They belive if fishing stops, people would leave and development would take over. They think that at least some of these building and items should be preserved and/or become part of museums, as a part of the history and past. Their good memories are from the past waterfronts with a lot of boats, docks and fish houses. They have a sense of nostalgia to the past.Most of them prefer to keep their job, but some not and some combine it with other employment. Some think that tourism can bring some benefit to them, and are ready to consider the options. But mainly, see no future in fishing and they would not encourage younger generation to pursue fishing. The river in Shallot is not deep enough for the bigger boats to get to the two fish houses that were studied here. Some of the fishermen stated that even the inlet is not suitable to pass through either.

Photo inventory and residents employed photography data

This section illustrates the fishing related buildings and elements that culturally are important for fishing communities in the two areas. The interviewees also explained why these elements are significant to them.

1. Shane	Fish hanging: Because people take picture with it. It shows that here everything is about fishing. It is a sign.	
	My boat. I have a lot of memories with it. I had it for one year. It is my work vessel.	
2. Matthew	Dock. All dock with boats and restaurants. They are all important to work here. It shows the visitors what we do. It shows the boats that I work on them.	
	Boat. Because I work on it. The boat with my boss. Because I am happy with my work.	
3. Jackie	Our fish house. It is money, it is work. Tourists come, commercial fishermen come, and everybody comes here. It is our business and life.	

	Boat. The boats that come from the sea. That's my income. When it comes in, in the end of the day, they bring the shrimp. It shows if there is no fishermen, no seafood.	
4. Alex (Beacon)	Boat. The wooden boat that come in full of shrimp. That shows the whole industry. They are reminder of the old fishing and shrimping that fading away, showing the work and tradition.	
	The seafood market here (Fish house). Because I work here. Any of them is history. All of them are the same to me. All we have the same occupation. It shows hard work and a lot of fun, talking while working, telling a lot of lies. Hahaha.	
5. Ronald Galloway (Beacon)	All the boats tied up here. They are interesting, to show people where we work, what we do. In future they will see where we were one day. Keep it for keep sake. Everything has been changed and all will be changed in 50 years. It will remind to what it was before.	
	Aerial photo of all the area around here. You could see the general area, you could look what is happening, and you could see everything.	(Imaginary photo)
6. Jesse Butterbaugh	Here, the whole thing here. It is beautiful. Shows the work and active people.	
	The beach, with shrimp boats off the beach. It is beautiful. It is just when boats come from the see through the river, it is amazing. Shows the activity here.	

7. Mr. Garland	Picnic tables at our fish house. Everybody gathers here. We have a lot of memory here.	
	My wife and I at our fish house. We work here all our life together. It is full of memory.	
8. Donald Bollinger (Beacon)	The boats. Docked at the dock from the river. It is nice to come back after a good catch.	
	The dock and the shrimp boats. Shows our work. Our work place, our life.	
9. Elwood Cheers (Beacon)	Beacon fish house. I work here. I love it here.	
	My boat. I work on it. It provides for me. I spend a lot of time on it.	
10. Denny Galloway (Beacon)	Docks, buildings and boats. Shows the whole area. Everything.	

	People on the docks with buckets heading in and of boats.	
11. Jay Robinson (Beacon)	My building (fish house). It is the only thing that has not been changed in my life. I spend 90% of my time. I am very satisfied with my life and career.	
	My house. It is where I was born and my father bought it from the fishing money. It is very close to here.	(He did not send any picture of his house.)

Appendix 1. Dissertations and Theses Data generated from the Grant

A. *Public Outreach and the New Inlet Civil War Shipwrecks*
Jeneva Wright, MA Maritime Studies Program (Completed)

The world's largest concentration of Civil War shipwrecks are submerged in the waters of Cape Fear. These vessels represent the evolution of ship architecture and construction during the revolutionary transition of ship propulsion from sail to steam, and wood to iron hulls (Price 1948). The material culture remains are evidence of the economic and social impacts to the South during this conflict and their deposition patterns closely reflects the naval boundaries established by Union blockade strategists (Wilde-Ramsing and Angley 1985). The shipwrecks contribute to the history of Fort Fisher, deepening our understanding of the fort as a Confederate stronghold and highlighting the pivotal role it played in the Civil War (Gragg 1991).

The connection of these wrecks to Cape Fear residents' local identity does not end with the Civil War. All but one of these wrecks ran aground, and now rest in shallow water (<30 feet). With close proximity to the shore and relative ease of access, these sites have long been prized as prime fishing and swimming spots to area locals (Wilmington Morning Star, 1891 & 1895). Additionally, Fort Fisher itself, touted as "N.C.'s most visited historic site" (North Carolina Department of Commerce 2013), attracts locals and visitors alike to learn and experience Civil War history. Thus, the traffic, interest, and value placed on the battlefield and surrounding shipwrecks by members of the public offers an immense opportunity for public engagement. The potential for managing some of these wreck sites as interpretation and outreach vehicles has been repeatedly mentioned in their archaeological reports (NC UAB 2012, Watts and Lawrence 2001, Wilde-Ramsing and Angley 1985), but to date, no action has been taken to provide a construct for the public to interact with these sites.

The importance of developing public outreach for underwater heritage management is widely acknowledged within the discipline of underwater archaeology and emphasized in guidelines set forth in the Abandoned Shipwreck Act (1987). Thus, the goal of this thesis is to research the formulation of a management plan that balances archaeological preservation with public access and educational interpretation, focusing on six wrecks in the New Inlet area of the Cape Fear Civil War Discontiguous Shipwreck District: the *Arabian*, *Condor*, *Modern Greece*, *Stormy Petrel*, USS *Aster*, and USS *Peterhoff*. This project will offer an assessment of these sites as archaeological resources and the potential impact of increased public access on their preservation, explore both innovative and practical ways to develop public outreach and education strategies and evaluate the array of historical narratives the New Inlet wreck sites represent to both locals and visitors to the Cape Fear region.

Research Objectives and Questions:

The primary purpose of this thesis is to explore the components of a management plan for the New Inlet wrecks within the Cape Fear Civil War Discontiguous Shipwreck District that balances public outreach and education about the role of these ships in the Civil War with archaeological preservation.

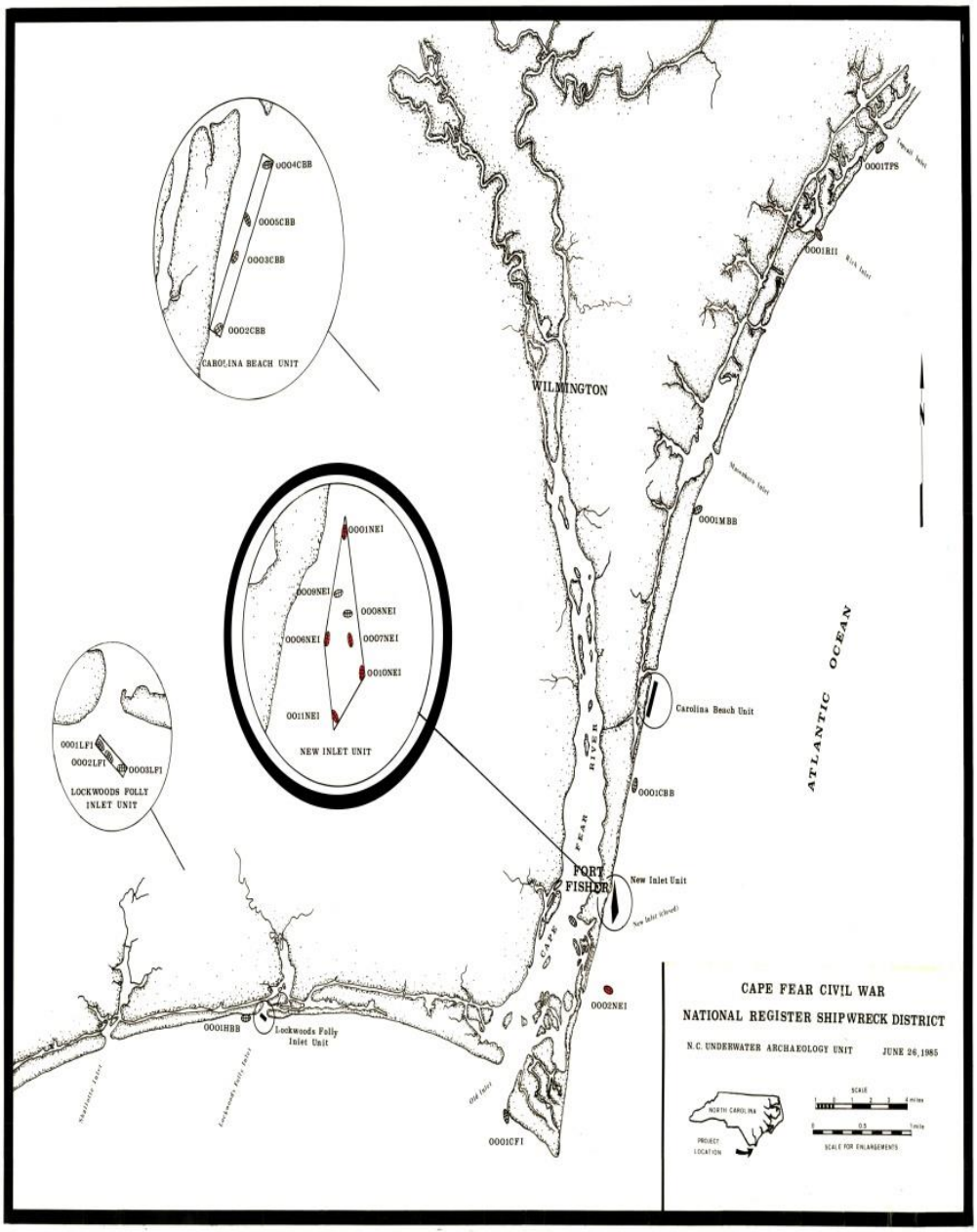
Primary:

- What appropriate management plan options exist for the New Inlet shipwrecks based on investigations of archaeological, historical, and management data of similar successful initiatives elsewhere in the USA, taking into account the unique North Carolina context of these sites?

Secondary:

- What archaeological resources are present and what are the potential connections to broader Civil War research questions and narratives?
- What are potential impacts/threats to the resources?

- What are the challenges: for these specific wreck sites and those identified by other agencies in their outreach efforts?
- How has this been done by other cultural resource managers beyond North Carolina?
- Who are the stakeholders and audience, and what historical narratives could be highlighted?



North Carolina Civil War Dive Trail

What is your level of interest in a dive trail on the Civil War shipwrecks of New Inlet off Fort Fisher, NC?

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Not at all Extremely

How much would you enjoy kayaking or swimming to a buoyed dive site?

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Not at all Extremely

Would you be interested in...

Frequently (1x per month) diving a wreck site? ☐ Yes | ☐ No
Receiving history on wreck sites? ☐ Yes | ☐ No
Monitoring or cleaning a wreck site? ☐ Yes | ☐ No

Circle, in order of importance, your factors for choosing a wreck to dive. (3 is most important, 1 is least).

Cost?	1	2	3
High volume of marine life?	1	2	3
Good diving conditions all year?	1	2	3
Considerable shipwreck structure on seabed?	1	2	3
Visibility?	1	2	3

What is your level of training?

☐ Snorkel

☐ Basic SCUBA

☐ Advanced SCUBA or higher

What other shipwrecks do you think might be excellent options for a dive trail?

What are your concerns?

Please circle one:

Where do you primarily dive?

North Carolina Out of state International

Do you usually dive as a:

Club Store Certifying agency Individual Instructor

B. On a Sea of Sand: A Comparative Analysis of the Challenges to Beached Ship Wreck Site Stability and Management

Jennifer E. Jones, Ph.D. Coastal Resources Program (In Progress)

PROBLEM STATEMENT:

Stranded ships on beaches—vessels and timbers left to the effects of time and change, are the remnants of a long and varied history of maritime activities on coastlines along the eastern seaboard. The archaeological remains of ships in the beach zone are part of a complex and dynamic system (Reynolds 2004); being periodically exposed and reburied, they vary between being both visible and frequently forgotten features of the physical and cultural coastal landscape. These limited and nonrenewable resources play an important informational role as tangible pieces of maritime heritage that document dynamic coastal processes, but the characteristics that make them valuable also render them highly exposed to destructive forces (Nickens 1991:73). Shipwreck remains in the beach zone are highly susceptible to variations in stability (natural and anthropogenic) within the landscape, these variations in turn affecting decisions regarding importance and management strategies. The challenges to certain management strategies may result in these resources being damaged, ignored or forgotten, leading to a potential loss of pertinent social, economic, and physical formation. Although little can be done to prevent natural coastal processes, a better understanding of them allows for their mitigation and management. At the same time, an understanding of values and attitudes toward the beached wreck resource and associated management practices may guide practitioner decision making and allow for the development of appropriate and innovative strategies of management.

PURPOSE:

The purpose of this dissertation research is to examine the variables that contribute to beach zone wreck stability by placing them in a socio-natural context, and examining how compromises to the cultural resource stability, in turn, creates management challenges. This dissertation will provide a comparative analysis of sites along the eastern seaboard of the United States, in order to facilitate discussion of challenges and changes to resource stability and preservation leading to short- and long-term management strategies. Additionally, the purpose of this research will be to determine how maritime/underwater archaeological practitioners' attitudes toward the beached wreck resource and specific management practices changes according to professional considerations, resource values, and site characteristics.

RESEARCH OBJECTIVES AND QUESTIONS:

This research has several objectives with underlying research questions:

Objective 1: To identify challenges to site preservation and stability within the landscape

a. What physical processes act on beach sites?
b. What are the socio-cultural processes that are present at beach sites?

Objective 2: To examine the differences and commonalities among case study sites of vessel remains in the beach zone

a. What are the challenges to management at each site?
b. What is the socio-cultural context of each site?
c. How do managers define site stability?
d. How do managers measure site stability?
e. What types of management practices are utilized (i.e. active v. passive, rescue, in situ versus ex situ)?

f. What factors affect current management at each site?

g. Is there a geographical relationship to management approach and resource value?

Objective 3: To assess the applicability of certain techniques for visualizing conditions and processes at each site, and aiding in management decisions

a. What are the appropriate scales of stability measurement at each site?

b. What conclusions, if any, can we draw from their documentation?

c. What technological strategies are appropriate for each site given their socio-natural context?

Objective 4: To determine how attitudes (support/oppose) toward specific management practices change according to site stability

a. Is there a difference between the characteristics of site stability and attitudes toward specific management practices?

H_0: there is no difference between the population means of characteristics of site stability and attitudes toward specific management practices

H_1: there is a difference between the population means of characteristics of site stability and attitudes toward specific management practices

Objective 5: To determine how attitudes (important/not important) toward the beached wreck resource change according to professional considerations such as years in the field, level of education, level of employment, governing body, etc.

a. Is there is a relationship between professional considerations and attitudes towards the beached wreck resource?

H_0: there is no relationship between professional considerations and attitudes toward the beached wreck resource

H_1: there is a relationship between professional considerations and attitudes toward the beached wreck resource

b. Is there a bias in how beached resources versus underwater resources are valued?

Objective 6: To determine how attitudes (important/not important) toward the beached wreck resource change according to site characteristics?

a. Is there is a relationship between site characteristics and attitudes toward the beached wreck resource?

H_0: there is no relationship between site characteristics and attitudes toward the beached wreck resource

H_1: there is a relationship between site characteristics and attitudes toward the beached wreck resource

Objective 7: To identify potential strategies for management

a. Can these resources be used as indexes for larger landscape change?

b. In what ways can these resources be incorporated in existing management plans/missions?

C. A Valorization of Coastal Fishing Heritage in Brunswick County

Sorna Khakzad, Ph.D. Coastal Resources Program (In progress)

Proposal summary:

Heritage is "that part of the past which we select in the present for contemporary purposes, be they economic, cultural, political, or social" (Graham et al. 2000: 17). According to the anthropologists, cultural heritage is the sum total of ways of living built up by a group of human beings and transmitted from one generation to another. Currently, world cultural heritage experts are discussing and exploring the role of cultural heritage in sustainable development (UNESCO, the World Bank, European Union and NOAA). 'Sustainable development means ensuring dignified living conditions with regard to human rights by creating and maintaining the widest possible range of options for freely defining life plans. The principle of fairness among and between present and future generations should be taken into account in the use of environmental, cultural, economic and social resources (Hardi et al, 1997, Keiner, 2004). The present study takes the concept of sustainable development, and investigates how coastal cultural heritage of the southeastern NC can be valorized within the premises of sustainable development. Our coastal cultural heritage, when valorized, recaptured and aligned with sustainable development (Campbell, 2000) goals, can play significant role in poverty reduction, livelihood promotion, education, and environmental protection, as well as promote people's sense of identity and place attachment. Neglecting or marginalizing historic groups and cultural sites may result in loss of a significant asset to both local communities and external tourist and researcher groups.

Coastal and maritime cultural heritage is crucial in maintaining mutual understanding and cultural exchange among nations, bringing economic benefit, and improving our knowledge on how we have interacted with the nature, how natural environment influenced us, and also

providing valuable insights into the future. Examples of this heritage can be seen in maritime landscapes and coastal native populations, such as traditional commercial fishing communities, and Native Americans. Coastal heritage encompasses the history of interaction between local communities and the sea, producing a rich multi-cultural maritime landscape with physical manifestations of maritime activities like working waterfronts, shipwrecks, vernacular watercraft, fishing structures, and other assorted remnants of native and immigrant populations. Neglected or marginalized historic groups and sites may be significant to both local communities and external tourist groups. Maritime heritage is a broad legacy that includes not only physical resources, such as archival documents, historic shipwrecks and historic/prehistoric archaeological sites, but also intangible aspects such as oral histories, and traditional seafaring and ecological knowledge of indigenous cultures. However, coastal areas are of the most dynamic and vulnerable areas due to the high level of industrial and urban development and settlement attraction, as well as the impact of climate change, sea-level rise and coastal processes. These can cause irreversible damages to coastal cultural heritage and loss of part of human history.

The overall objective of this research is to highlight the importance of cultural heritage as a resource in the coastal areas and to identify heritage assets that are valuable for people and can be used as resources for social and economic development purposes, in order to adopt a policy and strategy for coastal cultural heritage protection and its use in regards to sustainable development. This study hypothesizes that cultural heritage can be used in sustainable development through the common targets that heritage preservation and sustainable development have in respect to socioeconomic development, education and livelihood promotion.

The study will be formed in three main sections: 1) The first paper will have an assessment of the state of coastal cultural heritage in the coastal towns and islands of southeastern

counties. 2) The second paper will address the cultural tourism and its state in the southeastern NC, 3) The third paper will address the socioeconomic value of fishing cultural heritage in fishing communities.In general, analysis will be conducted to see how each group of people (local people including fishermen and tourists) perceives their heritage. Qualitative analysis of the interviews and focus groups will allow for insight into the contested values over specific maritime archaeological resources, while the quantitative analysis will offer information about the strengths of relationships between the communities and their cultural resources.

Traditional occupations and fishing heritage

Traditional communities such as fishermen have established a long tradition of fishing and boatbuilding tradition along the coast. For over 200 years, North Carolina's coast supported a successful commercial fishing industry and communities of citizens who relied on the industry for their livelihood (NCGrant, 2007). Southeastern areas of North Carolina still have a large number of fishing communities. The residue of their fishing activities have emerged in their boats, fish houses, ship yards, crafts, traditions and other elements related to fishing and seafaring. These remains are a part of ongoing cultural resources in the coastlines. However, due to the changes in regulation and policies, development and climate change, many of these sites are endangered.

As a result of the archival studies and literature review the following data is collected from different communities and towns that can be of interest for the present study. Archaeological reports and North Carolina Office of State Archaeology have been used for identifying the location of the Indians 'sites. The fishing communities for this study have been chosen based on the study of "*Potential Fishing Communities in the Carolinas, Georgia and Florida: An effort in baseline profiling and mapping*". The National Registered buildings are listed as well. In addition, there are several other ethnic groups such as Afro-Americans and work immigrants who have

their own cultural heritage in terms of tangible and intangible values, however, many of them are unknown and unrecorded at present. Following is a brief study of cultural heritage aspects that have been found in the four counties of this study. The focus has been on places where still presence of cultural communities is felt.

Brunswick County:

The fishing communities that will be studied and compared are (The fishing communities for this study have been chosen based on the study of "*Potential Fishing Communities in the Carolinas, Georgia and Florida: An effort in baseline profiling and mapping"):*

1. Bald Head Island with no real commercial fishing at the present time, however there is an annual fishing rodeo.
2. Sunset Beach (and Shallotte): There are two communities on the Creek Side and Ocean Side. The community on the Creek Side is permanent residence. The area has some commercial fishing and seafood restaurant.
3. Oak Island: It is a rural town and a fishing hub. There have been five fish houses and a marina with commercial boats. Southport: It is an old-fashioned fishing community. There are seafood restaurants, boat yard and a maritime museum. There are annual fishing tournaments.

Brunswick County has six coastal National Registered buildings:

1. Creek Boathouse in Smith's Island
2. Bald Held Island Lighthouse in Southport.
3. Fort Caswell Historic District in Caswell beach vicinity.
4. Oak Island Life Saving Station in Caswell vicinity
5. Oak Island Lighthouse in Caswell Beach vicinity

Appendix 2. List of Project Partners and Contacts

Contact List	Agency	Email	Phone
Community and Managers			
Chris Webb	Interim Executive Director, Old Bald Head Foundation	director@oldbaldy.org	910 457-7481
Jim Steele	Director, Fort Fisher Historic Site	jim.steele@ncdcr.gov	910 458-5538
Nathan Henry	Assistant State Underwater Archaeologist	nathan.henry@ncdcr.gov	910 458-9042
Brenda Bryant	Brunswick Town/ Ft. Anderson State Historic Site	brenda.bryant@ncdcr.gov	910 371-6613
Billy Ray Morris	State Underwater Archaeologist	john.morris@ncdcr.gov	910 458-9042
Suzanne E. Dorsey	Bald Head Island Conservancy & Smith Island Land Trust	dorsey@bhic.org	910 457-0089
Kendyll Collins	Bald Head Island Conservancy & Smith Island Land Trust, Dorms	kendyll@bhic.org	
Kim Huffman	President and CEO, Wilmington and Beaches CVB	KHufham@wilmingtonandbeaches.com	
ECU Faculty	**Department**		
Lynn Harris	Maritime Studies, History Department	harrisly@ecu.edu	252 328-1967
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Thad Wasklewikz	Geography Department	wasklewiczt@ecu.edu	252 328-5192
David Mallinson	Geology Department	mallinsond@ecu.edu	252 328-1344
Pat Long	Sustainable Tourism	longp@ecu.edu	252 328-9469
Paige Viren	Sustainable Tourism	virenp14@ecu.edu	252 737-2425
Graduate Students			
Sorna Khakzad	ECU CRM Doctoral student	khakzads11@students.ecu.edu	
Jennifer Jones	ECU CRM Doctoral student	jonesje08@students.ecu.edu	
Jeremy Borrelli	ECU Maritime Studies Student, History	diverjjbo11@gmail.com	
Ivor Mollemma	ECU Maritime Studies Student, History	ivormollema@gmail.com	
Nic De Long	ECU Maritime Studies Student, History	nelsondelongn12@students.ecu.edu	
Jeneva Wright	ECU Maritime Studies Student, History	wrightje12@students.ecu.edu	
Charis Tucker	Sustainable Tourism	charist18@gmail.com	252 414-6261

Appendix 3.Sustainable Tourism

Suggested actions for Paige Viren, Charis Tucker and Patrick Long:

1. Create a map using GIS that places the assets in relationship to each other and then in relationship with other similar cultural/historic assets, access points, lodging, food service, and possibly other tourist attractions;
2. Create a reference list of journal and non-scientific articles and documents that address cultural/historic tourism development with a subset specific to sustainable tourism and cultural/historic assets;
3. Identify models/theories (e.g. Collaborative Theory; Social Exchange Theory) upon which to base our thinking regarding cultural/historic tourism development in order to prepare for future grant submission;
4. Interview key person(s) representing the agency/organization which has oversight or management responsibility of each asset regarding acceptance level of tourism visitation, possible revenue generators and willingness to consider collaboration;
5. Identify sustainable actions that might contribute to cost savings, energy, water and waste management, and cultural and historic sustainability.

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