A TALE OF TWO SHIPWRECKS: U. S. STEAMER *CONVOY* AND CONFEDERATE SCHOONER *WILLIAM H. JUDAH*

by

Christopher Todd Dewey

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The thesis of Christopher Todd Dewey is approved:

Gregory D. Cook, Ph.D, Committee Member — Date

Amy Mitchell-Cook, Ph.D., Committee Member — Date

Hilde Snoeckx, Ph.D., Committee Member — Date

John R. Bratten, Ph.D., Committee Chair — Date

Accepted for the Department/Division:

John R. Bratten, Ph.D., Chair — Date

Accepted for the University:

Richard S. Podemski, Ph.D., Dean of Graduate School — Date

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ABSTRACT

A TALE OF TWO SHIPWRECKS: U. S. STEAMER *CONVOY*
AND CONFEDERATE SCHOONER *WILLIAM H. JUDAH*

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This paper examines the site formation processes of the U. S. Steamer *Convoy* that burned and sank in Pensacola Pass in March 1866 and the search for the Confederate Schooner *William H. Judah* that burned and sank in the same vicinity five years earlier. The vessels' Civil War histories are discussed, as well as the deliberate and opportunistic salvage operations conducted on *Convoy*'s wreck site during the 19th and 20th centuries. The paper details a recent *Convoy* wreck site survey that explored the possibility that both wrecks were located at the same site. The research also discussed the geomorphologic processes that impacted the *Convoy* site. The result of this research is a comprehensive examination of the cultural and natural forces that created *Convoy*'s contemporary wreck site, definitively addressing a local folklore tradition regarding the wrecks' collocation.

CHAPTER I

INTRODUCTION

Renewed archaeological interest in the Civil War shipwrecks in Pensacola Bay was sparked by the approach of the sesquicentennial anniversary of the attack on the Confederate schooner *William H. Judah* in September 2011. In 1992, the Florida Bureau of Archaeological Research (FBAR) identified a wooden hull structure buried beneath a mound of sand in the northern reaches of the Pensacola Pass. State maritime archaeologists tentatively identified the site as the remains of the Confederate schooner, but they recommended further investigation of the wreckage in order to establish a more definitive identification (Franklin et al. 1992:145). University of West Florida (UWF) archaeologists and graduate students carried out a systematic search for *Judah*'s wreck site using remote sensing equipment and targeted diver investigations during the summers of 2010 and 2011 but did not locate the wreck.

In response, a UWF research team investigated alternative theories for the location of *Judah*'s wreck site. A local oral history project uncovered an oral tradition about Confederate artifacts found by sport divers on a wreck known to the state as the U. S. steamer *Convoy*. The steamer and the schooner sank in the same vicinity within five years of each other. Unfortunately, none of the alleged Confederate artifacts were available for examination by university archaeologists, and neither their authenticity nor their existence could be verified (Madden 2012; Sharar 2012). Boiler and machinery remains at *Convoy*'s wreck site, discovered in 1987, confirmed that the site is at least part steamer, but rumors persisted in the local dive community that the wreck might also contain some or all of the Confederate schooner *Judah*. The UWF archaeological research team, consisting of staff archaeologists and graduate students, developed a research methodology to answer the question of the two wrecks' possible collocation and to better understand the processes that formed the wreck site.

Pensacola Pass is the western-most inlet in Florida, connecting the Gulf of Mexico with Pensacola Bay. Figure 1 shows a section of the modern National Oceanic and Atmospheric

Administration (NOAA) navigational chart of the area. Although not listed on the official chart, many locals refer to the area south of the Naval Air Station (NAS) Pensacola as Pensacola Sound in order to differentiate it from the remainder of Pensacola Bay.

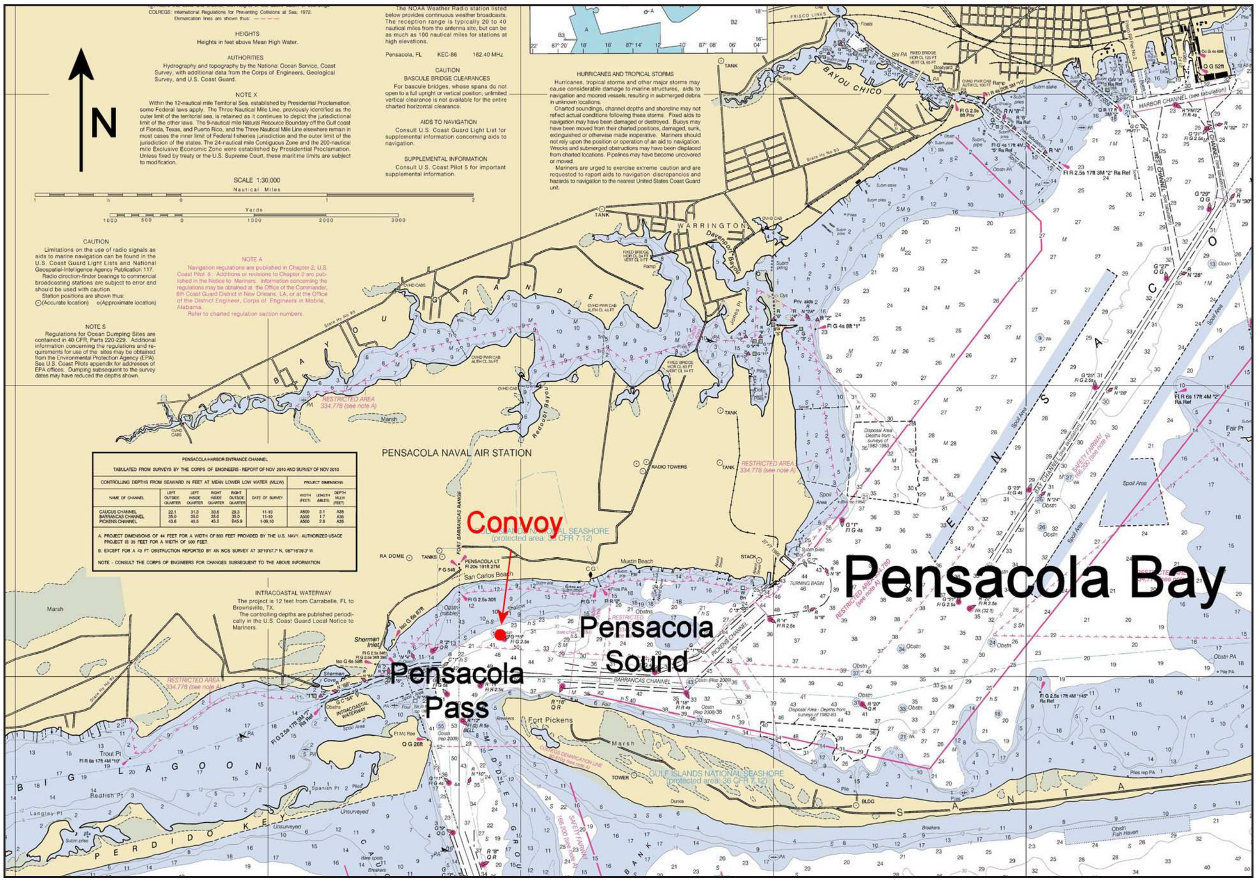

FIGURE 1. Pensacola navigation chart, sounding in feet. (Figure by author, 2013. Modified from NOAA 2011.)

Research Methodology

This thesis seeks to answer two questions in order to more accurately characterize the wreck site in Pensacola Pass known to the FBAR as the steamer *Convoy*, site number 8ES1372:

1. What are the site formation processes that have contributed to the current wreck site?
2. Are the wrecks of the U. S. steamer *Convoy* and the Confederate schooner *William H. Judah* collocated?

The thesis research included a search of historical documents, an archaeological survey of the wreck site, and an examination of the geomorphologic forces that affected the wreck, such as current scour and sediment movement that might impact the site's preservation. The archives of West Florida Historic Preservation, Inc. (WFHPI), provided documentation of the attack on *Judah*, including newspaper accounts, access to the official records of the Union and Confederate Navies, and photocopies of Confederate government receipts for the loss of the schooner. The WFHPI archives proved to be a valuable source for digital and hardcopy newspaper articles about the steamer *Convoy*.

The University Archives and West Florida History Center at the John C. Pace Library on the UWF Main Campus provided additional information on *Judah*'s attack. The John C. Pace Library main stacks, the microfilm newspaper archives, and documents available through the inter-library loan program helped to round out the historical picture of both vessels. The researcher conducted oral history interviews with two Pensacola divers who have visited the wreck. Joe Madden (2012) related stories of his dives on the *Convoy* site during the early 1960s, and Fritz Sharar (2012) told of his experiences exploring the wreck site in the late 1990s. Appendix A contains the release forms associated with these interviews. Diving time on the wreck site and the archaeological survey, described in Chapter III, focused on providing the most detailed accounting of the site possible and on gathering information to answer the primary and secondary thesis questions concerning the site formation processes and the possible collocation of the wrecks.

Geomorphologic research documented the changes in the bottom of Pensacola Pass. Fortunately, the City of Pensacola, U. S. Navy, U. S. Army Corps of Engineers (USACE), and Environmental Protection Agency (EPA) all have substantial interests in Pensacola Bay and the pass specifically. Frequent hydrographical surveys of the pass show a migration of the underwater channel bank, or scarp, that had a significant influence on *Convoy*'s preservation. The NOAA Office of Coast Survey Historical Chart website was a valuable resource that provided historic nautical charts in digital formats that were compatible with geographical information system displays. The John C. Pace Library main stacks provided additional information on the environmental conditions in the pass, and diver investigations confirmed the physical predictions.

The final step required to answer the thesis questions was to apply site formation process theory to the historical, archaeological, and geomorphologic findings. The theoretical concepts of Muckelroy (1978:158), Gibbs (2006), and others who use systems theory helped define how a wreck site might evolve in response to cultural and physical forces that act upon it. The filtering of the findings through known site formation process theory helped define/refine the conclusions and the answers to the thesis questions.

Maritime Archaeological Theory

Many scholars point to the subtle differences among the terms *nautical archaeology*, *maritime archaeology*, and *underwater archaeology*. Muckelroy (1978:4) defines *maritime archaeology* as "the scientific study of material remains of man and his activities on the sea." He does not include in his definition a study of the material culture of related coastal communities. Muckelroy (1978:8-9) further defines *nautical archaeology* as the study of ships and their construction, and *underwater archaeology* as any archaeology conducted underwater, as opposed to the examination of a shipwreck found buried ashore. The terms *maritime*, *nautical*, and *underwater archaeology* are used interchangeably in this paper for the sake of brevity and clarity.

Nautical archaeology has been dominated by cultural historians who record the smallest details of a ship's construction and its cargo; however, some maritime archaeologists have attempted to define a ship's impact on human culture, or in some cases the impacts of fleets or classes of ships, leading to processualist and postprocessualist approaches to nautical archaeology (Gould 2000:2-5). Each shipwreck is a time capsule waiting to be revealed by nautical archaeologists. Whether the wreck provides a glimpse into the history of the ship and its immediate environment or documents a major cultural transition is often up to the archaeologist and his or her desire to follow the material culture to its conclusion.

History vs. Anthropology

Archaeological theorists have long argued over the discipline to which archaeology belongs. Hume (1964) codified the beliefs of many theorists that archaeology is firmly in the domain of history, while Willey and Phillips (1958) echoed the ideas of many North

Americans who were more likely to use archaeological discoveries to search for answers to anthropological questions. Taylor (1948) offered a compromise and proposed that archaeologists work as historians when they help to put together cultural historiographies but that they work as anthropologists when they study the culture itself. In other words, Taylor proposed that archaeology could serve both history and anthropology and that good anthropology often depends on good history. Although this accommodation seems to have had a lasting impact on archaeological theory in the United States, it did not placate some theorists.

Culture historical archaeology sometimes conjures up visions of the abuses of past archaeologists, such as the racist theories that justified the oppression of Native Americans in the 19th century and the nationalist archaeologies of the early 20th century (Trigger 1996:211). Although the racist and nationalist underpinnings of culture history archaeology have been discredited, the concept of describing a culture through its archaeological material record has remained a cornerstone of modern archaeological method and practice. Willey and Phillips (1958:6) describe cultural-historical integration as “the primary task of archaeology on the descriptive level of organization.”

Nautical archaeology tends to focus on descriptive, particularist approaches that paint historical pictures of shipwreck sites frozen in time; this focus is also prevalent in historical archaeological sites, including terrestrial sites (Gould 2000:10). Historical archaeologists on land and sea have engaged in “discovery mode” archaeology, which tends to use the archaeological record to confirm or refute historical accounts. Accurate discovery and documentation of an archaeological site is a critical first step that may lead to further understandings of the human condition at sea (Gould 2000:2-3).

Nautical archaeologists are, in some ways, behind their terrestrial counterparts in the area of categorized assemblages and databases. Missing are databases of ship construction parameters to assist in identifying and dating shipwrecks. Acclaimed nautical archaeologist Bass (1983:103) called for more effort to establish such analytical tools, placing a high importance on historical particularism in shipwreck archaeology. Many nautical archaeologists consider shipwreck identification and documentation to be their most important charge and, in some cases, their final task. Culture history-minded archaeologists are happy to let others take up the task of determining the ship's cultural contribution, if it has any (Gould 2000:5).

Processual archaeology

Processual archaeology grew from a desire to better understand human behaviors through an analysis of the material record of past cultures. In doing so, proponents of Binford's "New Archaeology" attempted to make archaeology more scientific by developing linkages between the archaeological record and past behaviors. These linkages were termed *Middle-Range Theory*. Processual archaeologists used ethnoarchaeology, experimental archaeology, and taphonomy to explain how objects were created and discarded and how site formation processes transformed these objects into artifacts detectable in the archaeological record (Tschauner 1996:2).

Processual theory has also affected the maritime world, although many nautical archaeologists still prefer to study the drama of shipwrecks and the conditions that produced them (Gould 2000:12). Some archaeologists began to shift their attention away from the description and documentation of wrecks, focusing instead on the ways that ships of the distant past sailed and fought and on the behaviors of the passengers and crew. Experimental archaeologists used information derived from historical documents and archaeological sites to construct replica ships that have been used to better understand the operation and daily life aboard ships of the distant past. Vessels from small oar-powered batteau, used to fight on the Great Lakes during the French and Indian Wars (Crisman 1988:130), to full-scale replicas of Christopher Columbus' flagship *Santa Maria* have been built to study early shipbuilding characteristics (Smith 1988:36).

Deducing how an artifact or feature was constructed and used is only part of the process of understanding a shipwreck site. Taphonomy-based approaches to studying the effects of the maritime environment on archaeological sites are necessary to gain a full understanding of how a wreck site might have changed after it entered the archaeological record (Stewart 1999:584). Anuskiewicz (1998) proposed using remote sensing tools such as side-scanning sonar, magnetometers, and sub-bottom profilers to build bridging, middle-range theories to explain how shipwreck sites have formed.

Ethnoarchaeology, the archaeological study of present-day cultures in order to answer questions about past cultures (London 2000:2), is also available to the maritime archaeologist, particularly in the study of prehistoric watercraft. Many indigenous peoples continue to make small to medium sized watercraft using traditional methods. In many cases, ethnoarchaeology is the only method of inferring the maritime cultures of past civilizations since most of the material used in the construction of prehistoric boats does not survive well in the archaeological record (Leshikar 1988:13). Another variation on ethnoarchaeology is the use of the documentary record by historical archaeologists. In some cases, the historical record can be used successfully as a Middle-Range Theory to bridge from the archaeological record to past human behavior (Johnson 2010).

Shipwrecks are unique archaeological sites containing “the full spectrum of the group’s activities at the location, represented by the material culture in use at the time, deposited as a discrete unit . . . [which] contrasts sharply with the complex and disarticulated depositions characterizing the more common chronologically ordered archaeological sites” (Murphy 1983:66). Data derived from shipwrecks may be used to describe the shipboard culture and subcultures of the ship and to possibly identify aspects of the society from which it originated or the locations it visited. An examination of a shipwreck may help determine if a sailor’s life more closely resembled that of his countrymen ashore or that of other sailors from different nations. In such cases, the Middle-Range Theory, described above, is useful in bridging from static artifacts to the dynamic behaviors and contributes to the anthropological understanding of maritime cultures (Murphy 1983:68).

Postprocessual archaeology

By the early 1990s, some archaeologists became dissatisfied with the espoused objectivity of processualism and began to look for more interpretive understandings of archaeological sites. Hodder (1991:14-15) built upon processual theory by adding an interpretive component and a requirement for reflexivity. He distinguished postprocessual theory from flights of fancy by requiring that hermeneutic hypotheses fit the most coherent interpretation of objectively sequenced data patterns. A series of interpretive-based archaeologies followed, including feminist, Marxist, and cognitive approaches. Gibbins and Adams (2001:286) credit post-processualism's theoretical inclusiveness, as opposed to processualism's rigidly defined methodology, for allowing nautical archaeologists the increased freedom to incorporate multiple contexts and meanings. Postprocessualism in nautical archaeology tends to take one of two forms: (a) a cognitive approach by which archeologists seek to infer the thoughts of the manufacturers or users of maritime artifacts or (b) the maritime landscape concept, in which nautical archaeologists attempt to place archaeological items in the experiential landscape of a nautical community.

Cognitive Archaeology

Some maritime archaeologists used material culture to better understand the thoughts and ideas of past civilizations. Bass (1990) and others used interpretations of amphora from a bronze-age shipwreck off Cypress to more accurately understand the intricacies of second-millennium B.C. trade. Bass (1990:11) also led a team that discovered the wreck of a seventh-century Byzantine shipwreck off Turkey containing more amphora from which some scholars "are trying to reconstruct the economic conditions of the Byzantine Empire." Both ships were discovered and excavated in the early 1960s. No direct archaeological evidence exists to tie the amphora clay discovered in a shipwreck to the economic structures of early Mediterranean cultures; however, logical inferences can be made that follow Hodder's (1991) requirement to fit hypotheses to the most coherent explanation. Scafuri (2002) discovered that the physical characteristics of the amphora changed around A.D. 700 to a more standardized shape that conformed to the Byzantine tax standards. Unfortunately, this new standard form did not easily fit into the holds of merchant ships, and Byzantine ship owners likely lost money because their ships sailed without an optimal cargo load. Scafuri (2002:34) interpreted the shift to the new amphora as another aspect of the stoic struggles of Byzantine wine merchants: "the economic consequences of this type of over-regulation [of amphora] would have been only one more difficulty for Byzantine traders in an increasingly competitive commercial world."

Other nautical archaeologists have made suppositions from wrecks to cultural phenomena ashore. Gould (2000:3-5) studied stress fractures in the hull of *Marine Electric* and in similar U. S. flagged ships sunk by storms and other natural phenomena in the 1970s and 1980s. He discovered that the ships were lost because the storms stressed the recent ships' hull structural modifications. These modifications were implemented in an attempt to extend the service life of the vessels rather than replacing them with expensive, newly constructed ships. Through these studies, Gould (2000:5) interpreted the root cause of the ships' demise to be the "social institutions of long-standing that motivated ship owners to push their ships beyond their intended use-lives." Gould fit his inferences to the best possible arrangement of the data.

Adams (2001) saw a cognitive aspect to ships that are abandoned. Because abandoned vessels contain evidence of the intention of the owner or operator who abandoned them, they are sometimes more informative than shipwrecks that were lost unintentionally. The manner in which vessels were disposed reveals a great deal about the social attitudes towards the watercraft. An examination of the equipment that was left behind can often reveal ideas about what was important or what could be reused (Adams 2001:295). The crew or the owner of an abandoned vessel usually stripped the ship of all useable equipment before or immediately after abandonment; what remained was not usually reusable or valuable.

The Abandoned Shipwreck Project examined more than one hundred deliberately abandoned ships in Australian waters. Richards and Staniforth (2006:91) made inferences about why some of ships were abandoned, including damage to the vessel and obsolescence. The analysis also identified modifications to the ships made prior to their scuttling. The modifications led Richards and Staniforth (2006:91) to suppose the owners' reasons for improving vessels that were past their prime; most involved extending the usable life of the vessels. The interpretations of the Abandoned Shipwreck Project and Gould's (2000:5) work are examples of maritime archaeology's capability to reach into the minds of past peoples though cognitive theory.

Other cognitive studies supposed that some maritime societies believed that boats possessed souls. Sometimes ritual dismemberment was part of a ship's decommissioning ceremony. Boats in Sweden had their keels severed, possibly to prevent others from using the vessel, or as part of a decommissioning ceremony or symbolic death of the boat (Adams 2001:295).

Basch (1972:9) used the archaeological record supported by maritime iconography to infer the mental reasoning of shipwrights and to highlight the different theories for the transmission of shipbuilding technologies from one area to another. Before the 17th century, shipwrights used no written plans and constructed ships principally by sight and feel. Prynne (1973) did not think that early shipwrights were eager to copy the works of others, reasoning instead that shipbuilders likely developed similar styles as they endeavored to improve their own designs. Prynne's (1973:228) assertion, although unsupported, was an example of naval architecture's design analogies resulting from construction evolution rather than diffusion. Hunter (1994) studied the cultural landscapes of early European maritime societies and from the archaeological and iconographic records, recognized the major symbolic importance of ships and other watercraft. Hunter (1994:264) inferred that such important symbolism, in the form of ship-shaped houses and burial carvings, resulted from "a combination of the importance of the sea as a route for transport and the mystery of the sea itself." He noted that this symbolic structure was particularly evident in early, less technically advanced societies, resulting in another interpretation of a past culture's cognitive thought processes through its material culture.

The material record also reflects the presence of women and children aboard ships. Van Holk (1997) examined the archaeological and historical records of Dutch ships lost in the 19th and 20th centuries and discovered artifacts that indicated the presence of women and children aboard merchant ships. Van Holk concluded through postprocessual inference that the captains brought their wives and children aboard because the Dutch merchant service changed from regular service to tramping. Regular service brought the captains back to their homeports on a regular basis, allowing a family ashore; tramping, by contrast, took ships and their captains to different ports of opportunity without a routine schedule. Ships were often gone for extended periods, and captains were more likely to bring their families aboard rather than waiting years between visits home (Van Holk 1997:228).

Landscape Archaeology

Shipwrecks and other aspects of maritime culture have become integral parts of maritime landscapes. Muckelroy (1978:53) viewed the maritime landscape as involving only ships, or other types of watercraft, and the people who sailed them. One of the most prolific writers on maritime landscape theory, the prominent Scandinavian archaeologist Westerdahl, disagreed with Muckelroy. Westerdahl (1992:5) asserted that the maritime landscape should include cultural contexts near shore, facilities such as docks and wharfs, and populations on land near the shore. Westerdahl's (2008:24) research of Norwegian boathouses indicated that in addition to their practical function as places to protect the precious boats, these buildings served a social function as banquet halls. He also maintained that although maritime landscapes cognitively represented the manifestations of their developers' minds, these landscapes tend to reach through time from past cultures into today's modern maritime societies (Westerdahl 1994:266).

Other maritime archaeologists see possible interpretations to be made in disparate areas of shipwreck study such as feminist and Marxist archaeology; these researchers seek evidence of women, women's influences aboard ships, or indications in the material record of the dialectic conflict between the officers of the wardroom and the common tar of the forecastle (Flatman 2003). However, such specific traces will not likely materialize in the archaeological record of a shipwreck because many of the soft material, such as paper, clothing, and rigging, do not preserve well in submerged environments.

Systems Theory

General Systems Theory forms the basis of practical analysis of site formation processes of submerged archaeological sites. Early shipwreck site formation studies acted as middle-range bridging arguments for nautical archaeologists (Gibbs 2006:4). Systems theory provides a helpful framework for identification of the processes involved in the formation of shipwreck sites. Early theorists such as Muckelroy (1978) and Schiffer (1975) developed rudimentary process models that applied to all or most shipwrecks; using a systems approach, later archaeologists focused on the subsystems of physical and cultural processes and provided more detailed models to explain how shipwrecks might evolve to their present conditions. Ward et al. (1999) studied the physical effects on a shipwreck, and Gibbs (2006) combined Schiffer's (1975) and Muckelroy's (1978) basic concepts to develop a comprehensive description of the cultural processes that affect shipwrecks. Countless nautical archaeologists have used these process models, both cultural and physical, to elucidate the progression of individual ships from fully formed vessels to debris fields on the seafloor. The current challenge is to bring the detailed cultural and physical process models together to form an integrated and detailed process model that maritime archaeologists may apply to most or all shipwreck sites.

Nautical archaeologists exercise the full range of archaeological theory while studying shipwrecks and other maritime environments. The development of postprocessual theory in maritime archaeology can be traced from its necessary components of historical particularism and processualism to its more advanced concepts of cognitive, landscape, and systems theories. All three stages of archaeological analysis are valid theoretical perspectives from which an investigation of a maritime archaeological site may be undertaken. Nautical archaeologists employ, as do their terrestrial counterparts, a multitude of theories in the process of fully describing a shipwreck and its cultural impacts. Significant effort must be put into documenting the specific characteristics of a shipwreck and its artifacts; however, the full potential of nautical archaeology goes far beyond this limited aspect (Murphy 1983:78).

Answering anthropological questions concerning the cultural consequences of a shipwreck is certainly one goal worthy of pursuit, but often such ambitious objectives are impossible to meet. Some shipwrecks are little more than a collection of hull planks and ballast stones, offering few clues about the behavior of its crew; in such instances, a historically based archaeological inquiry is necessary. The specialization of historical particularists, behavioral archaeologists, and anthropologists seeking to reconstruct major cultural functions is natural in any archaeological endeavor. Pottery experts abound in terrestrial archaeology, as do behaviorists who seek to explain prehistoric conduct or building styles (Gould 1983:21); nautical archaeology is replete with cannon and anchor experts. This delegation and specialization is necessary to build the narrative of past cultures beginning with the culture historical documentation of specific details, proceeding to the behavior-focused theories of processualist Middle-Range Theory, and culminating in an inference to larger cultural relationships.

Cultural historians and particularists have dominated nautical archaeology, but this hegemony is only natural since these theories apply to all shipwrecks and are the basis for further archaeological investigation. Postprocessualist approaches in nautical archaeology are few in number; however, their number and the veracity of their arguments should only increase as this relatively new subfield of archaeology continues to evolve.

The archaeological investigation into the wrecks of *Convoy* and *Judah* moved fluidly between historical particularist, processualist, and post-processualist approaches; the answers to the thesis questions could not be determined otherwise. The three theoretical constructs build one upon the other to provide the fullest image of the wreck site. The particular details of the wreck comprise the logical starting point of the investigation and add to the database of shipwrecks found in high-energy environments. The site formation process development formed the bridging arguments that join the particularist data to the theories of past behaviors, particularly the actions of the 19th-century salvage crew. Finally, the study entered the post-processualist realm when researchers made assumptions regarding the reasons for past behaviors.

Importance of the Study

The two most important contributions of this study are the identification of the site formation processes of the wreck site and the determination as to whether or not the wrecks of *Convoy* and *Judah* are collocated. This thesis contributes to the growing body of knowledge regarding the evolution of shipwrecks in high-energy coastal environments; it is another stark witness to the detrimental effects of relic hunters on historic wrecks. The small portable artifacts, now missing from the site, might have provided a keen insight into the everyday life of passengers and crew of coastal steamers during the opening phases of the Reconstruction Era. The investigation makes clear the deleterious effects of strong currents, biological forces, and chemical reactions on a shipwreck in a highly dynamic environment that is subjected to episodic periods of scour and reburial.

The study also makes a contribution to the maritime historical landscape of the Pensacola area. The Federal attack on *Judah* was the first of only three minor naval engagements in the Pensacola Bay. The attack is better understood as a result of the historical research into the Union Navy's effort to gain the initiative in the early days of the conflict. The previously unknown details of *Convoy*'s history help to illuminate the community's experiences during the year immediately following the end of the Civil War.

Finally, the exploration put the full weight of current technology and research methodology behind a search for *Judah*'s final resting place. All reasonable alternatives were studied, and Chapter VI reveals the results of those efforts. The research has disproved a local folklore story regarding the collocation of the two wrecks in a single site. Barring additional evidence, no further investigations into the schooner's location are advisable.

CHAPTER II

HISTORY

Researchers can often determine the formation processes that affect an archaeological site through an examination of the site's history. In many cases, processes that have influenced a wreck site before the disaster happened can be determined only through historical research. However, in the case of the U. S. steamer *Convoy*, a careful study of the ship's history alone is insufficient.

The dynamic environment of Pensacola Pass jumbles shipwreck remains, possibly causing confusion over a wreck site's identity. Local folklore contends that *Convoy*'s wreck site, long known to sport divers and treasure hunters, is collocated with the wreck of the Confederate schooner *William H. Judah*, which sank in the same area five years before *Convoy*'s sinking. At least in the minds of local divers, the two ships' histories are forever linked because of their proximity, method of destruction, and dates; no examination of *Convoy*'s history would be complete without also looking at *Judah*'s tale as well.

The history of Pensacola Pass may uncover hidden effects on *Convoy*'s wreck site. Changes in the natural harbor caused by dredging, the establishment of the Intracoastal Waterway, and shifts in ship traffic patterns have contributed to the physical processes that have worked on the wreck site and are important considerations in the following chapters. Finally, the survey history and the excavation history of the site are important pieces of the mosaic that form the complete story of *Convoy*'s current wreck site. Surveys by state and federal government agencies have influenced the site's identification over the years, and the removal of artifacts by sport divers has contributed greatly to the post-disaster phase site formation processes.

U. S. Steamer *Convoy*

During the mid-19th century, Williamsborough, New York, was a bustling shipyard town north of Brooklyn. The shipyards at Williamsborough and the Brooklyn suburb Greenpoint built hundreds of sailing vessels and steamships during the 1850s and 1860s (Silka 2006). During this time, Canadian-born shipwright Stack earned respect for designing and building many vessels, some of which set waterborne speed records (*New York Times* 1902:17).

Stack completed the side-wheel steamer *Convoy* in the Williamsborough shipyard in 1862 and launched the steamer in January 1863. Lloyds American Registry listed the Leary Brothers as *Convoy*'s owners at the time of her construction (Lloyd's of London 1870:610). *Convoy* was a nondescript cargo vessel, a long-haul truck of her time. She was 54.9 m (180 ft.) in length and just over 7.9 m (26 ft.) in the beam; the 2.7-m (9 ft.) depth of her hold allowed her to carry 344.7 mt (380 tons) of cargo. The white oak frames of her hull were spaced 0.6 m (24 in.) apart. One single-cylinder, walking-beam, steam engine with a 1-m (40 in.) diameter piston and a 3-m (10 ft.) stroke powered her two 7.6 m (25 ft.) diameter paddle wheels. Her single tubular boiler was located in the hold (*New York Times* 1863a:6). In addition, *Convoy* had a single enclosed deck designed for river navigation (Lloyd's of London 1870:610). The artist Valentine (1863) rendered *Convoy* in a painting commissioned by the War Department (Figure 2).

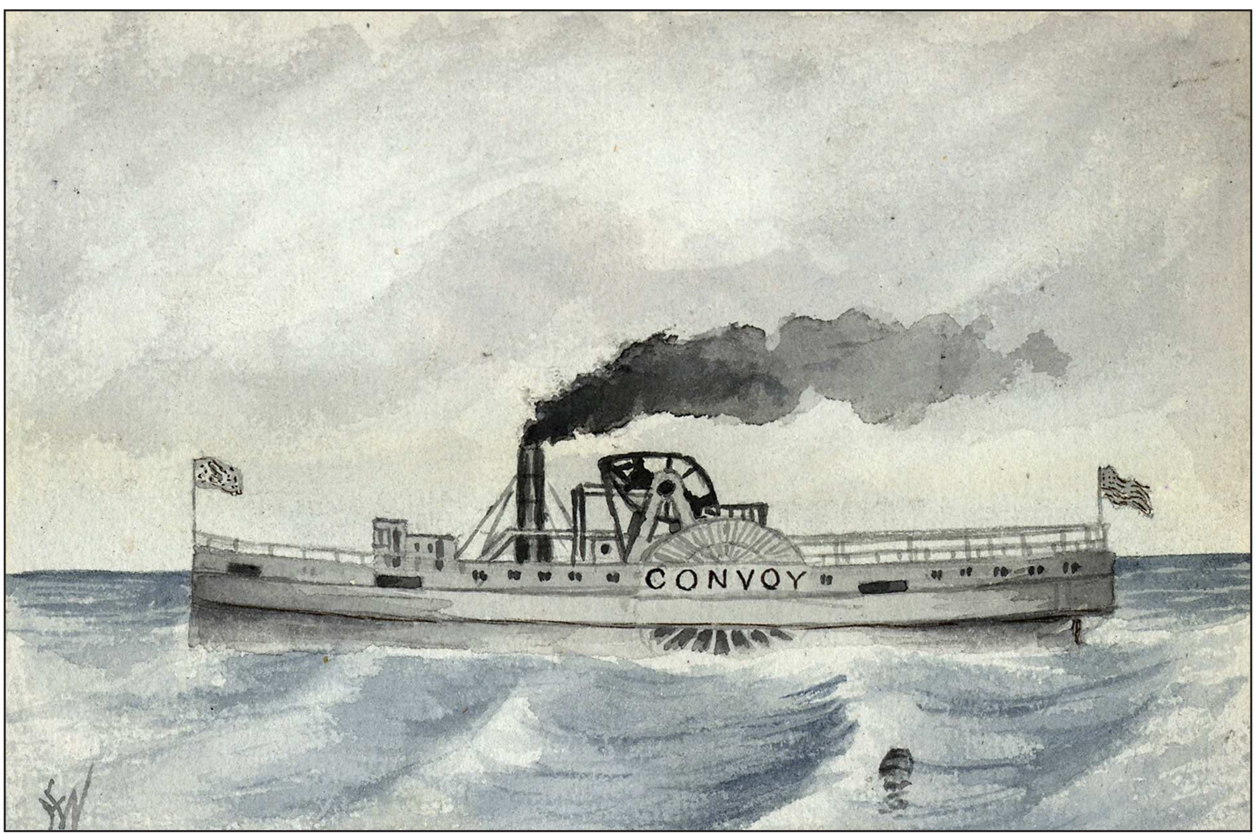

FIGURE 2. "Steamer *Convoy* carried mail from Hilton Head to St. Helena, S. Carolina" by Herbert Valentine. (Courtesy of the National Archives.)

The vessel in Valentine's (1863) painting matches the description in Lloyds, and the vessel's name is emblazoned on her paddle-wheel housing. The walking beam steam engine is clearly visible aft of *Convoy*'s stack. Valentine titled his work "Steamer *Convoy* carried mail from Hilton Head to St. Helena, S. Carolina." The title accurately represented the nature of the ship's work during the Civil War, as reflected in the historical record.

The United States Army Quartermaster Corps chartered *Convoy* on at least two separate occasions during the Civil War (Meigs 1868:3). Following her launch and lease by the government, she settled into her mundane duties of carrying dispatches, cargo, and personnel along the Atlantic coast. However, the little steamer became involved in the first of several controversies when she participated in the occupation and eventual evacuation of Jacksonville, Florida, in April 1863 (Stickney 1865:101).

Union intelligence believed that only a few thousand rebel troops occupied Florida in early 1863 and that the time was right for an invasion and occupation of Jacksonville on the state's northeastern coast. The attack fell apart because of a lack of commitment by Federal commanders. Troops from the Sixth Connecticut and Eighth Maine infantry regiments were withdrawn almost as soon as they had arrived, in order to reinforce the Union Army at Charleston. The Union commanders withdrew from Jacksonville and evacuated any loyal residents who wished to travel back to the north (*Weekly Wisconsin Patriot* 1863:3).

The assault was also an experiment in the deployment of black soldiers in battle for the first time. The departing Federal troops evacuated women and children onto *Convoy*'s waiting deck and off-loaded furniture and bedding for the distressed evacuees. Colonel Higginson, of the Union Army's First South Carolina Regiment, came aboard and ordered the ship's crew to throw the refugees' furniture into the St. John's River to make room for his black soldiers (*Weekly Wisconsin Patriot* 1863:3). The *Weekly Wisconsin Patriot* (1863:3) was critical of Colonel Higginson's actions and reported that "the order was carried out amid the tears and protestations of the defenseless women and children."

Convoy continued to transport equipment and men in support of the Federal war effort. In May 1863, she returned to New York from a voyage to Port Royal, South Carolina, and her crew reported hearing the guns of the Union ironclads as they attacked Morris Island in support of the campaign against Charleston (*Portsmouth Journal of Literature and Politics* 1863:2). *Convoy* arrived at Fort Monroe on the Virginia Peninsula on 23 June 1863 from New Bern, North Carolina, with Fifth Massachusetts Regiment soldiers whose enlistments had expired (*Moore's Rural New Yorker* 1863:218).

Convoy also conducted medical evacuations of the sick and wounded from southern battlefields to hospitals in the Federal states (*Massachusetts Spy* 1863:3). She arrived in Boston on 7 July 1863 with 330 convalescing soldiers from several Massachusetts regiments; two soldiers had died of typhoid fever during the trip. During her approach to Boston Harbor, the steamer ran aground in thick fog off the coast near Scituate Beach. One hundred forty-nine sick and wounded soldiers traveled to Boston overland before *Convoy* was freed from the sandbar and able to proceed to Boston (*Boston Daily Advertiser* 1863:4).

Controversy again swirled around the little steamer when she arrived in Newport, Rhode Island, on 3 July 1863. *Convoy*'s hold carried gifts of ice, fresh vegetables, and other items from the people of Rhode Island for the Fifth Regiment of the Rhode Island Volunteers. The revenue officer aboard the ship claimed that his orders did not allow the provisions to be unloaded; possibly the Treasury Department had intended to send the supplies to units fighting in the South. General Foster of the Fifth Rhode Island Volunteers sent an order to the ship for the crew to begin unloading the stores. The revenue officer returned the general's message with an impassioned message of his own. General Foster ended the argument by sending a squad of armed soldiers to the ship with orders to shoot anyone who interfered with the unloading; the regiment's chaplain received the goods with grace and a knowing smile (*Newport Mercury* 1863:2).

Convoy returned to her task of providing the frontline with critically needed soldiers and equipment. She departed Norfolk, Virginia, on 17 July 1863 with camp and garrison equipment, eighty tons of ammunition, and a contingent of soldiers bound for Charleston, South Carolina. When the ship encountered a gale off Cape Hatteras, she took on water and returned to Norfolk. The soldiers and their equipment went aboard the steamer *Maple Leaf* to continue their voyage to Charleston. The chaplain seemed genuinely fond of *Convoy* and her crew when he wrote, "We parted from the *Convoy* with regret for, though a small boat, the Captain and officers were gentle men and disposed to make our journey as pleasant as possible" (Ryberg 1993:37).

Convoy resumed her primary mission after she had completed repairs in Norfolk. The *New York Times* (1863b:13) reported her departure from New Bern, North Carolina, on 3 August 1861 and listed Captain Boehner in command, the first mention of her captain's name. Captain Boehner was a Canadian-born merchant captain who had served on many ships throughout his long career, including command of a vessel during the Mexican War and command of *Convoy* during the Civil War (*Mills County Tribune* 1904:4).

September 1863 found *Convoy* again running mail and personnel along the east coast. General Foster, who had forcibly removed *Convoy*'s cargo in Newport, traveled from New Bern, North Carolina, to Fort Monroe aboard the steamer, arriving on 11 September (*New York Times* 1863c:5). She departed Fort Monroe, bound for New York on 25 September (*Philadelphia Inquirer* 1863:1).

Perhaps the biggest controversy involving *Convoy* took place in mid-November 1863. The steamer departed Fort Monroe on 13 November laden with supplies for Federal prisoners held in the Richmond, Virginia, area. She proceeded under a flag of truce to the rebel-held port of City Point, Virginia, about 20 miles south of Richmond on the James River. *Convoy* returned to Fort Monroe three days later with all the provisions still aboard. The Confederates refused to allow Union Army Colonel Irving, who was traveling aboard *Convoy* with the supplies, to land the provisions and take them to Richmond (*New York Herald* 1863:3). The incident created an uproar in the northern press, including calls for the Federal army to march on Richmond to relieve the situation:

> Thus our unfortunate soldiers, numbering some twelve thousand, are left to perish of want in the prisons of the rebel capital. If ever there was a time when it became the solemn duty of the government to push its armies on to Richmond surely it is now. We must wait, however, to see whether the War Department appreciates the necessity or not. The prisoners are being removed to Danville, some twenty-five hundred [sic] of them having already started for that place. (*New York Tribune* 1863:1)

The day after *Convoy*'s arrival at Fort Monroe, another shipment of supplies arrived from the Baltimore American Relief Society and was immediately transshipped aboard the steamer. Colonel Irving again traveled up the James River at noon on 17 November aboard *Convoy* to deliver the goods to Richmond (*New York Times* 1863d:4). He succeeded in transferring the supplies to the Confederate agent at City Point and returned to Fort Monroe on 23 November (*New York Times* 1863e:5).

Not surprisingly, the Confederates held a different view of the entire matter. Judge Robert Ould, listed in a *New York Times* (1863d:4) report as the Confederate agent who received the supplies from *Convoy*, stated in 1882 that he had never heard of Colonel Irving or the steamer *Convoy*. He asserted that Federal officers slandered the Confederates by reporting in northern newspapers that they, the Confederates, kept the supplies bound for the Union prisoners. Judge Ould (1882) believed that the Confederate officers in charge of the distribution of the supplies stopped some of the shipments in retaliation for the newspaper reports that he considered libelous; an account that may have been the case with *Convoy*'s shipment.

The little steamer plied the hawkish waters of the Chesapeake Bay and the Atlantic coast in early 1864. *Convoy* was again at Fort Monroe on 1 April 1864 for the visit of General Ulysses S. Grant; however, that evening a strange telegraph message arrived from New York. The steamer *Fulton* arrived there and sent a message that she had passed an unidentified steamer in distress off Cape Henry, Virginia, more than 24 hours earlier. The unknown steamer was adrift in a gale without propulsion. General Butler directed Captain Ainsworth of the Union Navy to organize a search for the distressed ship (*New York Herald* 1864:2).

Ainsworth sent out four steamers in search of their stricken shipmates, of which *Convoy* was one. Three ships left Fort Monroe just before midnight; and the fourth, with Ainsworth aboard, left at two o'clock the next morning. Two steamers headed southeast for 80 miles, turned northeast for 28 miles, and then turned back west toward Fort Monroe. The ships' tracks were offset slightly so that they did not cover the same area of the ocean. The second group, which included *Convoy*, steamed due east for 80 miles, turned northeast for another 28 miles, and then turned west toward home. Again, Ainsworth offset the ships' tracks to cover more of the search area. The small flotilla of steamers never found the disabled ship despite Captain Ainsworth's best efforts (*New York Herald* 1864:2). Perhaps the helpless vessel repaired her engine and steamed off to safety.

Convoy was absent from the historical record for over a year, from April 1864 to May 1865. During this time, the Union forces under General Grant trapped the tattered and starving Confederates under General Robert E. Lee at a small courthouse in central Virginia, thus ending the Civil War in April 1865. The reconstruction of the South began almost immediately. Lines of communication between Washington DC and Richmond had been destroyed during four years of brutal warfare, including mail and passenger service. Rail service between the two belligerent capitals would take some time to repair. The U. S. Army Quartermaster Corps again pressed their steamers into service to carry vital supplies, personnel, and news between Washington DC, Fort Monroe, and Richmond (*Evening Union* 1865:2).

Convoy spent May and June of 1865 refitting in a Baltimore, Maryland, shipyard. Captain Boehner was still in command when she arrived in Washington DC on 2 July. She began her postwar duties as part of the government mail-packet service between the capital and Richmond. However, the rail lines were repaired less than three weeks later, and *Convoy* made her final mail run from Richmond on 20 July (*New York Times* 1865:5).

Convoy returned to the Baltimore shipyard in August 1865. The *Baltimore Sun* (1865:6) reported that she underwent a thorough refit while there in preparation for her voyage to Texas, where she was to become the dispatch boat for the commander of the Texas military department.

However, it is unlikely that *Convoy* had received an extensive overhaul after spending May and June in the repair yard. A more likely explanation is that she had received a superficial cleaning and painting before the Army sent her to Texas. The *Baltimore Sun* (1865) article reported that "She is a side-wheeled vessel, said to be remarkably fast, and has two masts, and having been newly painted, presented a handsome appearance as she steamed out of the harbor." The report of *Convoy* having had two masts is unique; nowhere else in the historical record is she described as having two masts. Valentine's 1863 painting showed the steamer with no masts at all. Perhaps the shipyard added the masts during *Convoy*'s visit, although the steamer might have been fitted with the masts during the year it was absent from the historical record.

Convoy arrived at Fort Monroe on 20 August 1865 for what was to be her last visit to her frequent port of call (*Norfolk Post* 1865:2). She departed three days later, bound for Texas via New Orleans, most likely to assume her duties as the dispatch boat for the Army in Texas (*Daily National Intelligencer* 1865:3). *Convoy* had not operated along the Gulf Coast until her move to Texas, where she resumed her job of moving mail, personnel, and cargo.

One of *Convoy*'s passengers in late 1865 was Rowland Bailey Howard, a Congregational minister and a member of the Christian Commission (Bowdoin College 1937). The commission was an evangelical Christian organization and the forerunner of the U. S. Army Chaplain Corps (Cannon 1951), a fact which explains why the Army allowed Reverend Howard to travel aboard a government steamer. The minister boarded *Convoy* at St. Marks, Florida, on 31 October 1865. He rode a freight train 23 miles south from Tallahassee to meet the steamer at the confluence of the Wakulla and East Rivers. He intended to sail aboard the steamer *McClellan*, but since that ship was still in Pensacola taking on coal, he accepted passage aboard *Convoy*. Unfortunately, *Convoy* was aground in the river, and Reverend Howard (1865a) had to wait until the next morning when the crew managed to free the ship.

Reverend Howard wrote three letters to his wife during his six-day transit to New Orleans aboard *Convoy*. He wrote few details about the ship; however, he commented frequently on the appearance and demeanor of his fellow passengers. His first letter related his impression of

Floridians: “They are a whiskey drinking, tobacco chewing, swearing, and lying set” (Howard 1865a). He wrote to his wife of the officers he met who still believed in states’ rights despite the outcome of the war (Howard 1865b). He enjoyed the quality of *Convoy*’s food, particularly the black coffee with chicory that the crew served when the ship stopped briefly in Lake Pontchartrain (Howard 1865c). Reverend Howard’s letters provide insights into the everyday challenges faced by the passengers including occasional delays because of groundings and storms.

Convoy continued its duties as the government mail-packet boat along the Gulf Coast, but its honorable career ended on the waters of Pensacola Bay on the evening of 21 March 1866 (Wise 1866:2). An oil lamp overturned in *Convoy*’s engine room, igniting a fire that consumed the ship; the crew took to the lifeboats wearing only their nightclothes. The initial report indicated that one crewmember had lost his life (*New York Times* 1866:5); however, subsequent reports revealed that the entire crew had escaped the blaze. (Wise 1866:2).

Captain Williams, instead of Captain Boehner, commanded *Convoy* at the time of her destruction (*New York Times* 1866:5). Captain Boehner may have left the ship after her final mail run to Richmond, Virginia, in July 1865, when the Army decided to transfer *Convoy* to the Gulf Coast, and Boehner may have chosen to stay behind rather than move his family to the south. A Captain Williams had commanded the steamer *Thomas Collyer* at Fort Monroe in July 1865 (*Evening Union* 1865:2), and he may have been the captain who relieved Captain Boehner aboard *Convoy*.

Convoy sank in 3.6 m (11 ft.) of water south of Fort Barrancas in Pensacola Bay with part of her superstructure visible above the water. The *New York Herald* (1876:10) reported that *Convoy*’s boiler drum and connecting rod protruded from the water and looked much like a navigation buoy. In 1877, the U. S. Army Corps of Engineers decided that the wreck was a hazard to navigation and contracted to remove *Convoy*’s remains. George W. Le Gallais, of Warrington, Florida, was contracted to remove the wrecks of the bark *Ada*, the ship *Miles*, the pilot-boat *Nettle*, and the steamer *Convoy* for the sum of $8,600.00. Work began in November

1878, when the salvage crews used blasting powder to break apart the wrecks, and then "the engine and machinery and one-half of the steamer *Convoy* were taken up and removed to Fort Pickens wharf and broken up" (Damrell 1879:801). The Corps of Engineers used "an experienced diver" to verify that the work had been completed as per the contract, and the diver reported that "the pilot-boat *Nettle* and the steamer *Convoy* had been completely removed" (Damrell 1880:1067). The diver's report does not mesh with the archaeological evidence, however, as large portions of *Convoy*'s wreck site remained on the bottom as evidenced by the U. S. Navy site report in 1987 and the Pensacola Bay archaeological survey report issued by the Florida Bureau of Archaeological Resources (FBAR) in 1992 (U. S. Navy 1987, Franklin et al 1992). What remained of *Convoy* lay at the bottom of Pensacola Bay for over 100 years.

Confederate Schooner *William H. Judah*

By September 1861, the Federal forces in the Pensacola area had withdrawn to the relative security of Fort Pickens, located on the western end of Santa Rosa Island, a thin barrier island that runs east to west and ends at Pensacola Pass (Parks 1986). Across from Fort Pickens to the north is Fort Barrancas, and to the northeast is the Pensacola Navy Yard. Fort McRee stood directly across the pass to the east on a narrow stretch of sand between Perdido Key and the mainland. Although Fort Pickens, Fort Barrancas, and the Navy Yard still exist, Fort McRee was abandoned in the early 20th century, and the bricks were used for other purposes.

The Confederate schooner *Judah* first appeared in the historical record as a merchant schooner for the Judah and Le Baron Company, a Pensacola import business; the schooner was named for the senior partner, William H. Judah (Confederate States of America 1861a). Both Judah and C. L. Le Baron were prominent men in the Pensacola business community (Skinner 1961:272).

Judah departed Nova Scotia with a shipment of quicksilver, lead, and tin and ran the Pensacola blockade in late June or July 1861. Two rebel pilots helped the schooner penetrate the fledgling Yankee blockade (Scharf 1894:47). Trapped in Pensacola Bay after slipping past the Union armada, the Confederates converted *Judah* into a private vessel of war. The rebels fitted the schooner with five guns, including four cannon on the broadside and a single pivot gun (Mervine 1861:1). *Judah*'s dimensions can be estimated through the examination of several sources. Figure 3 is a copy of an engraving from an eyewitness to the attack on *Judah* that ran on the front page of *Frank Leslie's Illustrated Newspaper* on 5 October 1861.

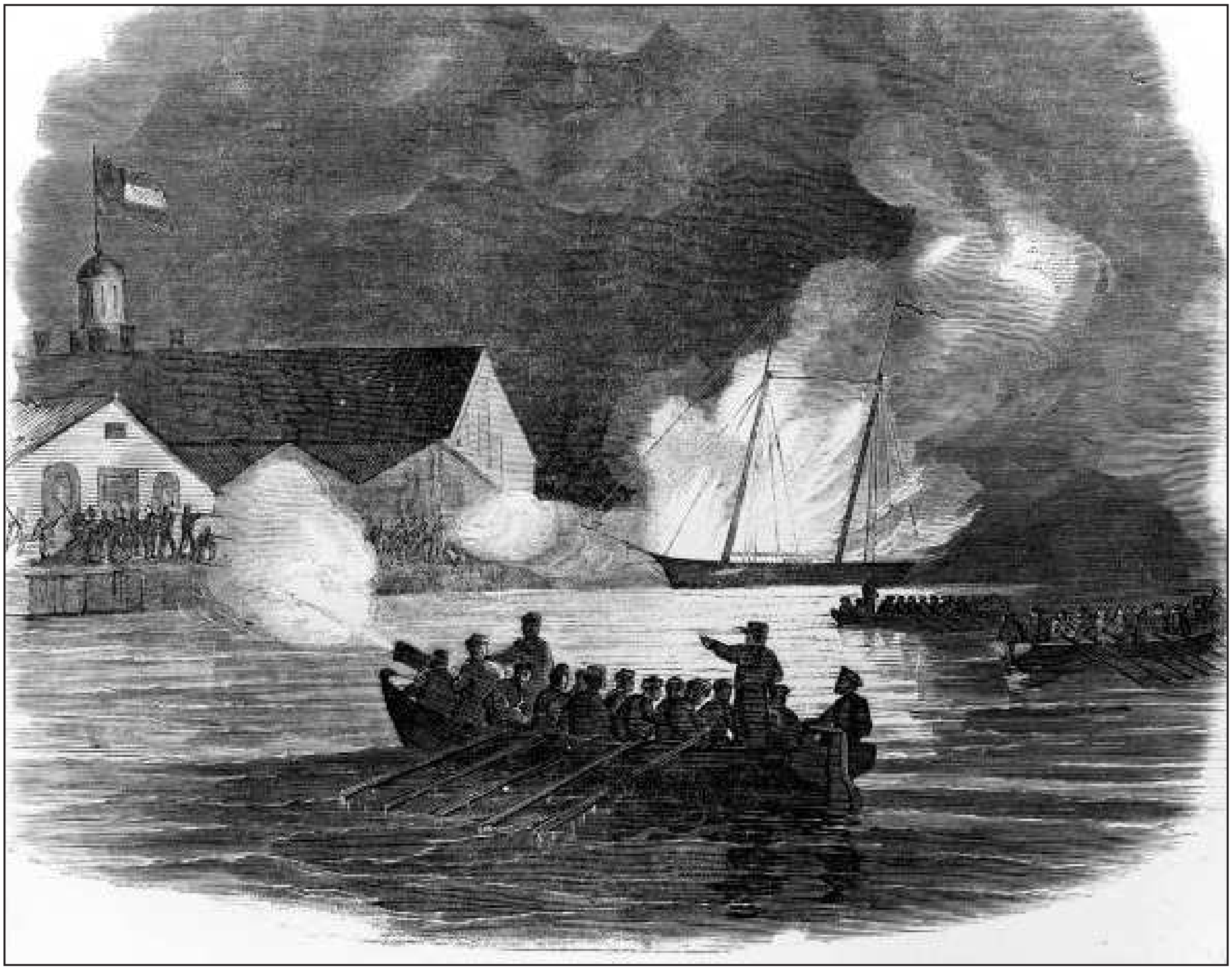

FIGURE 3. Brilliant naval exploit in Pensacola Harbor–burning of the rebel war schooner *Judith*. (State Archives of Florida 2012, *Florida Memory*, RC04664.)

The engraving clearly shows *Judah*'s silhouette against the rising flames. The schooner's fore-and-main sail rig with top masts, her sharp bow, and the aft rake of her two masts identify her as a topsail schooner of the Baltimore clipper style (Chapelle 1935:239-246). The Union Navy used similar vessels in their mortar schooner fleet; each schooner carried four guns in the broadside and a mortar located amidships. *Judah* carried a pivot gun instead of a mortar, but the arrangement was likely similar to that of the Union fleet. Based on an average of the Union schooner fleet, she probably displaced approximately 226 mt (250 tons), measured between 30 m (100 ft.) and 35 m (115 ft.) in length, and 7.6 m (25 ft.) to 8.5 (28 ft.) in the beam, (Silverstone 1989:136-138). During the early days of September 1861, Union naval officers watched *Judah* as she rode at her moorings at the Pensacola Navy Yard and took notice of the construction activity aboard the schooner. Union sailors rowed longboats and cutters across the mouth of the Pensacola Pass, ready to send rockets aloft should *Judah* attempt to run the blockade. Confederate deserters confirmed the Federal commanders' fears that the rebels were converting *Judah* from a merchant vessel to a ship-of-war (*New York Times* 1861:1).

On 12 September 1861, Captain Bailey of the U.S.S. *Colorado*, which was anchored south of Pensacola Pass, went ashore at Fort Pickens to size up the little schooner (*New York Times* 1861:1). He devised a bold plan to rid the harbor of the rebel schooner. Bailey chose a 20-year veteran who had seen action at Vera Cruz during the Mexican War to execute his plan. Thirty-five year-old Lieutenant John Russell proved to be the right man for the job (U. S. Senate 1896:1-2). Russell assembled his raiding party of 100 sailors and marines in four boats and pushed off from *Colorado*'s side at approximately eleven o'clock on the evening of 13 September. The oarsmen padded the blades of their sweeps in order to muffle the sound of their slap against the water. The sailors pulled against the tide and took three and a half hours to cover the three to four miles to their objective. They glided silently through the inlet and past the rebel sentries at Forts McCree and Barrancas; each stroke of their oars carried them farther into enemy waters. The Confederate gunners could have easily destroyed the small boats in short order with chain-shot and canister ammunition (*New York Times* 1861:1).

Russell divided his force: He sent two boats to attack *Judah* and the other two boats to the wharf to silence the shore battery that guarded the schooner. Despite the raiders' careful preparations, guards aboard *Judah* spotted the approaching craft and hailed the unidentified boats. Without receiving a satisfactory reply, the sentries opened fire with small arms from the deck and the fighting tops (*New York Times* 1861:1). The forwardmost sailors in the two boats were shot down where they stood (Mervine 1861:671). The Union boat crews pulled with all their might as the rebels reloaded. A young marine was the first attacker to set foot on the schooner's deck, followed closely by Lieutenants Russell and Blake; more than 40 other raiders scurried quickly aboard the schooner. One defender attempted to stem the flood of sailors and marines pouring over *Judah*'s side, but Lieutenant Russell shot him. The others of the rebel guard abandoned the schooner, but attempted to rally on the wharf and retake their ship with help from the Confederate garrison (*New York Times* 1861:1).

Lieutenant Sproston landed his boat on the stony wharf and attacked the shore battery protecting *Judah*; the raiders found only one soldier guarding the gun. This lone defender raised his musket toward the approaching enemy, but intense fire from the attackers cut him down. Sproston's raiders spiked the large, 10-inch columbaid and rendered the gun permanently inoperable. Midshipman Steece arrived with his raiding party, but they were too late to participate in the action to secure the shore battery. Steece and his crew did not want to miss all the action; they returned to their boat and pulled hard toward *Judah* to assist Lieutenant Russell (*New York Times* 1861:1).

Midshipman Steece and his raiding party arrived in time to assist the others in setting fire to *Judah*. The Federal raiders successfully held the rebels at bay until the ship was fully aflame and then departed in their boats toward safety. When the boats were beyond musket range, Russell ordered a farewell salute, and the boats opened fire on the wharf with canister shot from their 12-pound howitzers (*New York Times* 1861:1).

Casualties were surprisingly light for such a fierce battle. One Union marine lost his life in addition to the two Union sailors who died in the bows of their boats. In the confusion on deck, the young marine who led the initial charge lost his identification marker. One of the Union raiders mortally wounded the marine because he was mistaken for a rebel defender (*New York Times* 1861:1). Three Confederate defenders died: the sentry who guarded the shore battery, the defender killed by Lieutenant Russell, and a third man shot down from the maintop by a Union sharpshooter (Mervine 1861:671). Lieutenant Russell's farewell volley from the boats' howitzers likely injured or possibly killed several more rebels, but no official records of Confederate losses exist (*New York Times* 1861:1). The Confederates cast off the burning schooner, and the outgoing tide carried her west along the shore. Eyewitness reports indicated that the ship sank near Fort Barrancas, slightly less than two miles west of where the Federal raiders had attacked *Judah* (Mervine 1861).

The Confederacy usually assigned ships-of-war to one of three primary roles: a commissioned vessel in the Confederate States Navy, a privateer, or a blockade runner. The Confederate Navy identified clearly commissioned vessels as Confederate States Ships, which the navy built or purchased (Robinson 1928:232). The C.S.S. *Virginia*, which fought the U.S.S. *Monitor* at the battle of Hampton Roads, was an example of a commissioned confederate vessel (Silverstone 1989:84). The Confederate government provided letters of marque to privately owned vessels of war that allowed them to prey on enemy shipping. The Confederate government seldom owned or leased the privateers; instead, the ship's owners made their profits by capturing and selling enemy shipping and cargo. Neither were blockade runners usually owned by the Confederacy; these ships made their money selling the cargo they ran through the Union blockade (Robinson 1928:232).

Judah's role as a ship of war is not clear. In August 1861, the Confederate government entered into an agreement with William H. Judah and Charles L. Le Baron for the use of their schooner for public services; the agreement did not specify the nature of the services (Confederate States of America 1861a). In his book *The Confederate Privateers*, Robinson (1928:232) believed *Judah*'s role to be something different:

> There are no Confederate reports in the naval records, nor does the *Judah* show in the existing list of letters of marque. However, the very circumstance that the schooner was lying in the navy yard should have indicated clearly her public nature. During the summer of 1861, she was chartered for duty as the harbor police boat at Pensacola.

The theory that *Judah* was a harbor police boat was strengthened by an article in the *Richmond Dispatch* (1861:2) that reported the "burning our little guard boat, the *Judah*, near the Pensacola Navy-Yard." However, state and city governments usually executed police operations, and the Confederate government clearly chartered *Judah* for public services (Confederate States of America 1861b) and reimbursed William H. Judah and Charles Le Baron for the loss of their ship because of enemy action (Confederate States of America 1861c). The Confederacy may have envisioned *Judah*'s role as that of a Revenue Service or Coast Guard cutter to protect Pensacola's port from Union incursions and enforce Confederate customs obligations after the war.

Pensacola Pass History

In addition to the histories of the two ships, the history of Pensacola Pass is important to a complete understanding of wreck site. Man-made changes in the channels and the surrounding waterways influenced the erosion and sediment patterns at or nearby the wreck. Changes to the ship traffic around the site also impacted the wreck site over time.

Following a failed attempt at colonization by the Spanish in 1559 and 1560, the Spanish returned to Pensacola in 1698 and established a garrison. Over the next 123 years, the area changed hands repeatedly among the Spanish, English, and the French, until the Florida Territory was transferred to the United States from Spain in 1821 (Parks 1986:19-48). In 1826, the U. S. Navy established a navy yard on the mainland, three miles east of the pass. During the 1830s and 1840s, the U. S. Army completed construction of three new forts to protect the Pensacola Pass: a new brick fort named Fort Barrancas at the site of the old Spanish Fort San Carlos on the mainland, Fort Pickens at the end of Santa Rosa Island, and Fort McRee on the swampy western side of the pass. With construction completed by the start of the Civil War, the entrance to Pensacola Bay was protected by overlapping fire from three forts (Parks 1986:48-68).

Fort McRee occupied the most precarious position of the three forts, on the western side of the pass. The fort was heavily damaged by fire from two Union ships in November 1861 and abandoned completely in May 1862 when Confederate forces withdrew from Pensacola. Many of the fort's bricks were removed in the 1870s and were used to rebuild Fort Barrancas. Fort McRee's remote location prevented proper preservation; the fort fell into disrepair, and much of the structure was claimed by the western progression of Pensacola Pass. Today, the remaining bricks are spread across the bottom of the pass just north of the fort's previous location (Coleman 1988:51-86).

Perhaps the most dynamic change to the waterway around Pensacola Pass took place in the early 1930s. Congressional interest in an inland waterway between Pensacola and Mobile was growing: "the report of the survey authorized in 1925 indicated . . . that excavation of a mere 16 miles of canal in this stretch would open a continuous waterway westward to Louisiana and Texas and eastward to the eastern end of Choctawhatchee Bay" (Alperin 1983:14). In mid-1931, construction began on the segment of what became known as the Pensacola-Mobile Canal through the swampy area west of Pensacola Pass (*Pensacola Journal* 1931:10). The entire canal project was completed in 1934 (Alperin 1983:14). Figure 4 is a segment from the 1925 navigation chart showing the area immediately before construction began, and Figure 5 is a segment of the 1933 chart that shows the completed canal between the pass and Big Lagoon.

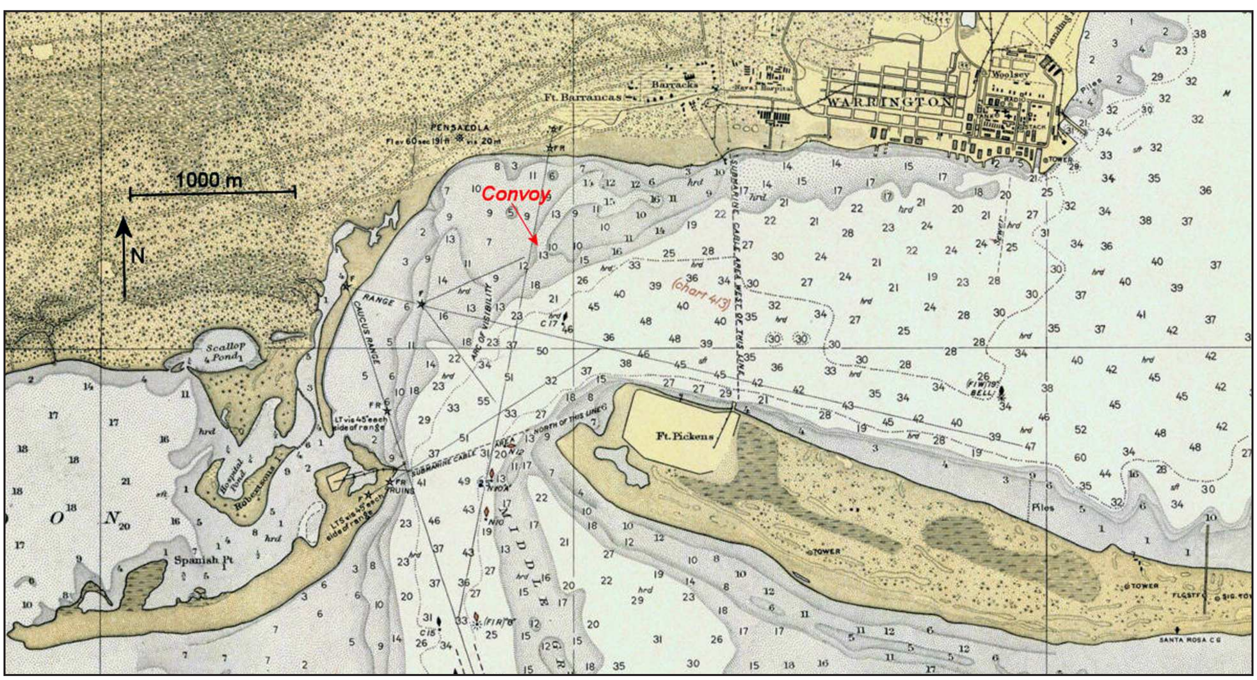

FIGURE 4. 1925 Chart segment before construction of the Pensacola-Mobile Canal, soundings in feet. (Figure by author, 2013. Modified from NOAA 1925.)

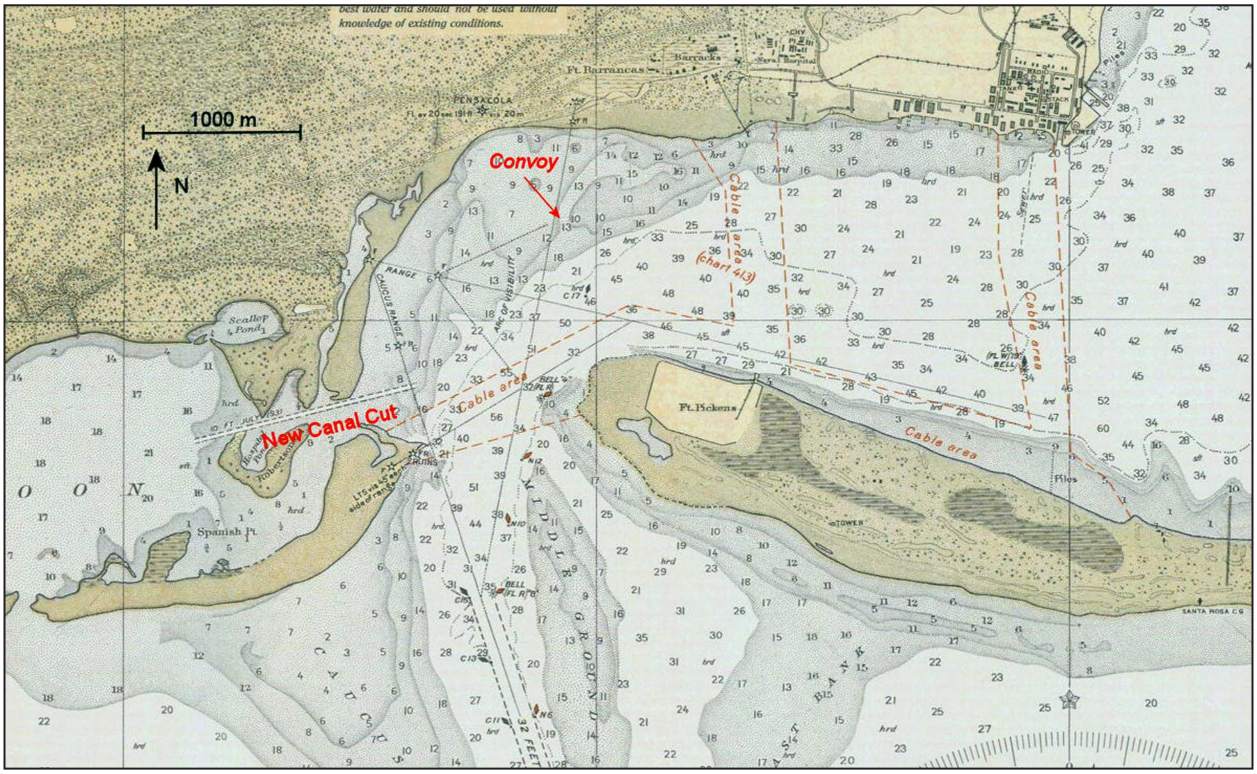

FIGURE 5. 1933 Chart segment showing newly constructed Pensacola-Mobile Canal, soundings in feet. (Figure by author, 2013. Modified from NOAA 1933.)

The construction of the canal opened up barge traffic along the inland waterway and increased the number of screw-driven vessels passing near the wrecks of *Convoy* and *Judah*. Pensacola Pass has remained largely unchanged since the Pensacola-Mobile Canal was completed, although the U. S. Navy and USACE conduct routine dredging operations to maintain the depth and width of the canal and the ship channel.

Archaeological History

The two shipwrecks remained at the bottom of Pensacola Pass for nearly 100 years. The stories of the *Convoy* and *Judah* wrecks faded from memory until the widespread use of scuba by sport divers in the 1960s revived an interest in shipwrecks, and many recreational divers planned their dives in the history sections of their local libraries. Local oral history interviews indicated that some divers had known about and visited *Convoy*'s wreck site as early as 1962 (Madden 2012).

When New Orleans sport diver Larry Broussard conducted an underwater search in the early 1980s to locate *Judah*'s wreck site, he discovered a wooden shipwreck that was the approximate size of *Judah* south of Fort Barrancas, the estimated location of her sinking. He recovered artifacts that included copper sheathing, clay pipes, galley-ware, and a cannon ball. The artifact assemblage, the lack of machinery, and the dimensions of the wreck led Broussard (1988) to assume that he had discovered *Judah*'s wreck site. Broussard donated the artifacts he recovered to the Pensacola Historical Society in 1988. Appendix B contains a detailed list of all the recovered artifacts. Despite Broussard's claims to have found *Judah*'s wreck site, divers from Tidewater Atlantic Research, working under contract for the U. S. Navy, conducted a survey of the same location in 1987 and discovered remnants of a steamship including boiler material (U. S. Navy 1987:23). Clearly, Broussard had found the wreck of *Convoy*, not *Judah*. The 1987 survey was extensive, including a detailed site diagram and several photographs of exposed features on the bottom of the pass.

An FBAR dive team conducted an archaeological survey of Pensacola Bay in 1992, located *Convoy*'s wreck site, and confirmed the 1987 U. S. Navy site descriptions. They also identified buried wooden hull structure west of *Convoy*'s wreck site. Divers found the wreck in 15 to 20 feet of water, and they used steel rods to detect the wooden structure buried under 0.6 m to 1 m (2 ft. to 3 ft.) of sand that measured 7.6 m (25 ft.) by 15.2 m (50 ft.) in area. The state did not record the precise location of the wreck, except that it was over 335 m (1100 ft.) west of *Convoy*'s wreck site. The dive team recovered one artifact from the site: a ceramic jug found northwest of the buried hull timbers. However, an analysis of the jug indicated that it likely dated to the first decade of the 20th century. State archaeologists assessed the site to be that of *Judah*; however, they could not confirm the wreck's identity and recommended further investigation to determine a definitive identification (Franklin et al 1992:145).

In recent years, recreational divers claimed to have recovered "confederate bullets" from *Convoy*'s wreck site; however, none of the divers has allowed a trained archaeologist to examine the bullets. Some local recreational divers maintain that the wreck known to the state as *Convoy* is actually *Judah* (Sharar 2012). The 1992 state survey appeared to leave room for this conclusion: “Both sites are contemporary, but given the fact that the *Convoy* sank in either 1864 or 1867, it may not have contained the quantity of arms and ammunition recovered here” (Franklin et al 1992:138). The presence of boiler material from the 1987 survey indicates that the wreck is at least partially the steamer *Convoy* (U. S. Navy 1987:23); however, the claim by local sport divers that they had discovered Confederate ammunition on *Convoy*’s wreck site reinforced a theory that at least part of *Judah* may be collocated with *Convoy* (Sharar 2012). The collocation theory assumed that either the buried hull structure identified in the 1992 survey was not *Judah* or that the ship broke apart as she sank and that *Judah*’s remains were in two different locations. The 1992 state survey seemed to confirm the questionable nature of the second wreck’s identification: “There is insufficient data to either confirm or deny that the buried structure at this site are those of the *William H. Judah*” (Franklin et al 1992:145).

When a dredge operating in Pensacola Pass in 1990 snagged an obstruction that caused the equipment to shut down, an investigation revealed that a bronze howitzer (Figure 6) was caught in the dredge intake. The cannon was taken to the T. T. Wentworth Museum, where it was conserved and placed on display (WFHPI 1990). The wooden gun carriage was missing; however, preliminary investigations indicate that the gun is consistent with the age and style of similar weapons carried aboard ships during the American Civil War. A nearly identical howitzer is on display at the Washington Navy Yard, and that weapon is believed to date from the war with Mexico in the 1840s (Naval History and Heritage Command 2013). The only recorded location for the find was “off Perdido Key during a dredging operation to deepen the channel into Pensacola Bay. The scars on the barrel were formed when the dredge pulled the howitzer from its resting place in a sand bar” (WFHPI 1990). The dredge may have destroyed a wooden wreck in the process of deepening the channel, and “a survey of the area did not turn up any further evidence of significant remains, although ship timbers had been brought up in the dredging that produced the howitzer” (Phillips and Cozzi 2013).

FIGURE 6. Howitzer recovered from dredge. (Photo by author, 2013.)

The coincidental burning of the two wooden ships in close proximity to each other gave rise to local folklore about the wrecks' collocation. Stories of "Confederate bullets" on the wreck of a Union steamer and a bronze cannon uncovered in a dredging operation continued to feed local curiosity about the final resting places of the U. S. steamer *Convoy* and the Confederate schooner *William H. Judah*.

The historical record and oral traditions provide useful insight into some of the processes that formed *Convoy*'s current wreck site. Unfortunately, confusion about the exact location of the two wreck sites continued. Further archaeological research was necessary to clarify the situation in Pensacola Pass.

CHAPTER III

ARCHAEOLOGICAL FINDINGS

The archaeological efforts to locate, identify, and study the Civil War shipwrecks in Pensacola Pass began as a search for the site of the Confederate schooner *William H. Judah*. Archaeologists and graduate students from UWF searched for the schooner using clues from previous explorations over the past thirty years. The team investigated an unusual bottom formation from the navigational chart using remote sensing surveys and targeted diver explorations. Unfortunately, the elusive wreck did not give up its location.

Judah sank in Pensacola Pass south of Fort Barrancas, as did the U. S. steamer *Convoy* five years later. *Convoy*'s wreck site was known throughout the diving community and had been visited by professional archaeologists and sport divers for many years. Both vessels burned before they sank, and 19th-century salvage of much of *Convoy*'s wreck might have intermingled the two debris fields causing them to appear as one. The UWF team shifted its inquiry from a quest to find the *Judah* to an investigation of *Convoy*'s wreck site in an attempt to determine if the wrecks were collocated. Researchers employed remote sensing surveys and an intensive diving program to document the steamer's wreck site. The survey identified many diagnostic features and artifacts and brought into focus the site formation processes surrounding the wreck.

Judah Quest

The search of *Judah*'s location began in the late summer of 2010. Using the state archaeological master site file and the FBAR Underwater Survey of Pensacola Bay report (Franklin et al 1992) as guides, UWF archaeologists examined a local navigation chart for clues to the schooner's final resting place. To prevent looters from finding sensitive archaeological sites, the state did not list exact site locations in the master site file or in the 1992 survey report. The divers who participated in the 1992 survey reported finding a buried wooden hull structure "over 1,100 feet" west of the wreck site of the steamer *Convoy*. The structure was detected by using steel rods to probe the sand, and the wreck site was described as being "in 15 to 20 feet of water . . . buried beneath the sand in an area at least 25 feet by 50 feet. The entire area was a large sand mound rising approximately 2 to 3 feet from the bottom surface" (Franklin et al 1992:138).

Convoy's location is clearly marked as an obstruction on the 2006 navigation chart of Pensacola Bay. Also marked is a small sand mound, south-southwest of the obstruction, almost exactly 335 m (1100 ft.) from the charted obstruction (NOAA 2006). Figure 7 is a segment of the 2006 navigation chart showing the location of the sand mound and *Convoy*'s wreck site. Additionally, the sand mound's location seemed to match the position of *Judah*'s wreck site on the chart from the 1992 archaeological survey (Figure 8).

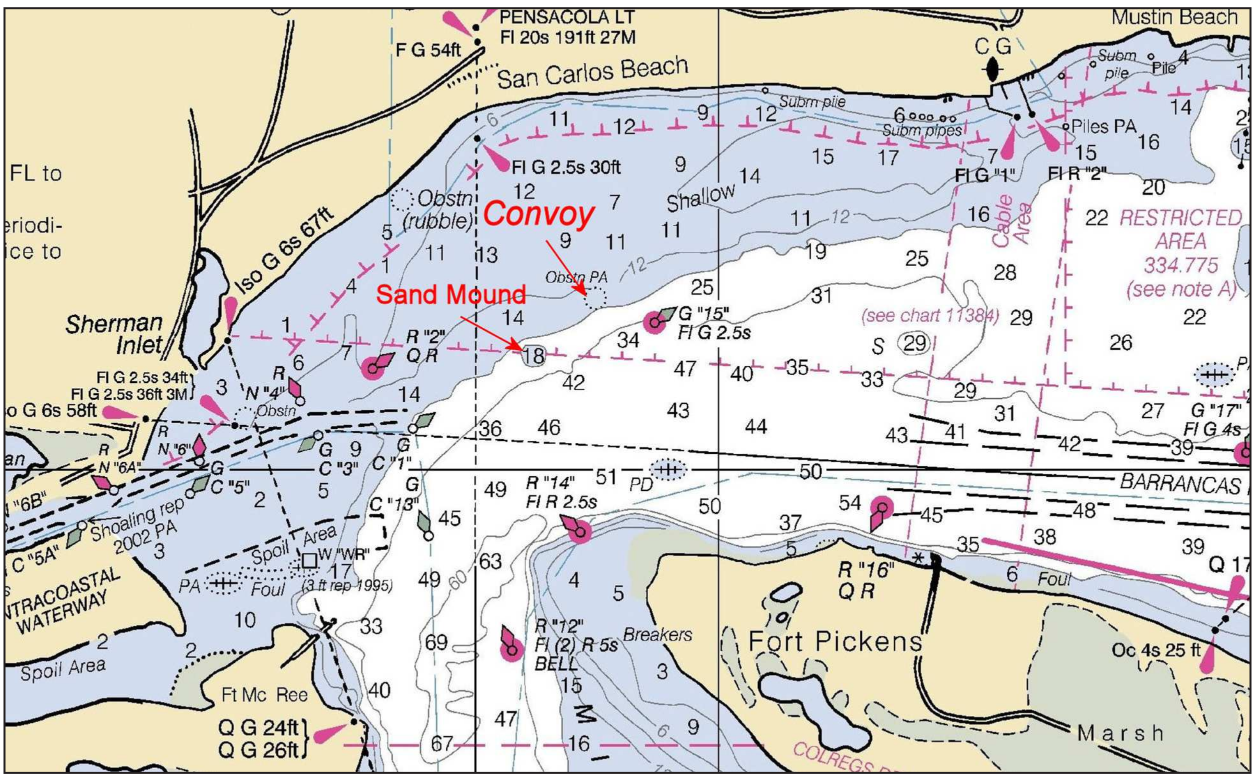

FIGURE 7. 2006 Navigation chart showing sand mound location with *Convoy*'s location added, sounding in feet. (Figure by author, 2013. Modified from NOAA 2006.)

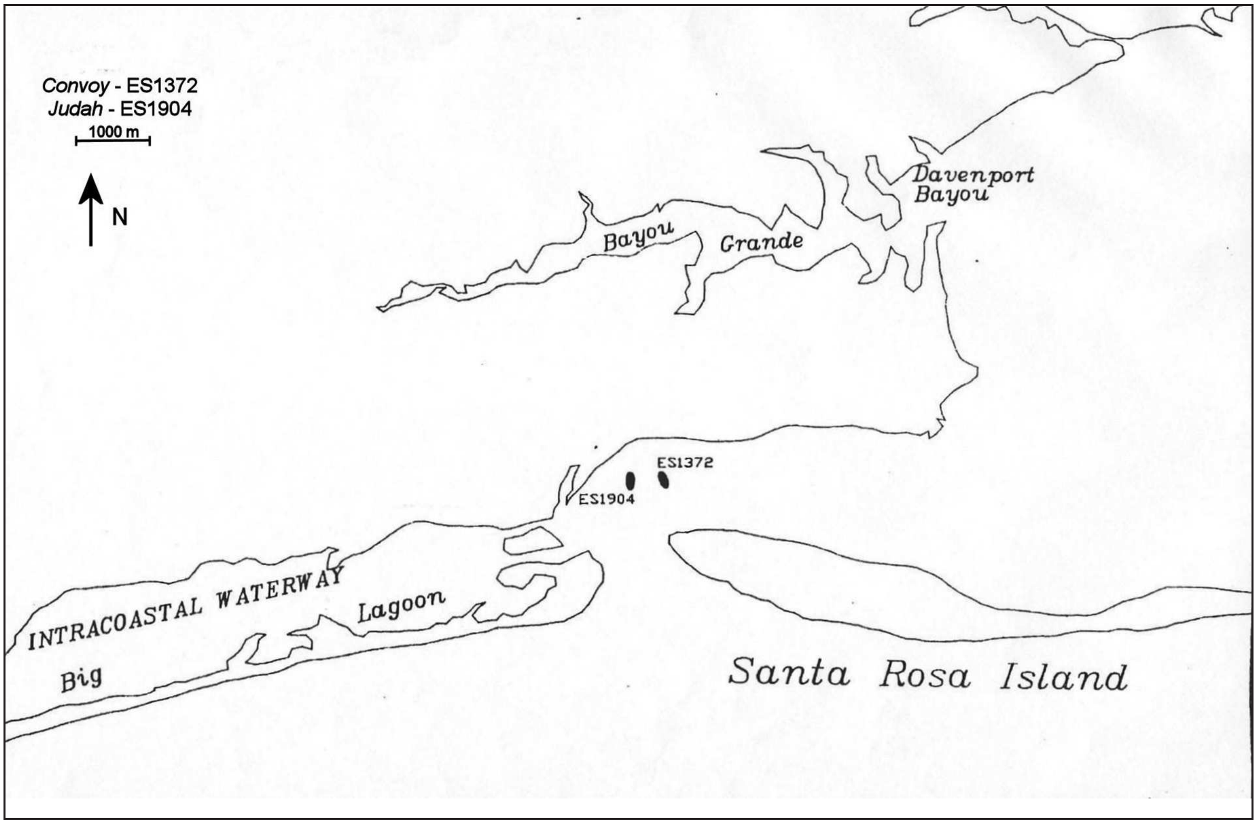

FIGURE 8. Locations of *Judah* and *Convoy* wreck sites. (Modified from Florida Bureau of Archaeological Research 1992.)

Researchers were confident that they had identified the location described in the 1992 archaeological survey and were eager to determine if the buried structure was the remains of the lost schooner. Archaeologists and graduate students from UWF conducted three dives over a two month period in the summer of 2010 but did not locate the wreckage or the sand mound described in the report. The divers used expanding circle searches to look for the site. The archaeological dive team on the first dive reported that they found no cultural artifacts except for a small section of modern concreted chain. The team on the second dive succeeded in locating one badly degraded hull timber that measured 30 cm (1 ft.) wide and approximately 3 m (10 ft.) long. The timber had no identifying markings or attached artifacts such as sheathing or fasteners (Figure 9). The third dive did not occur until a month later, and members of the third dive team did not relocate the timber, which was likely re-covered with sand.

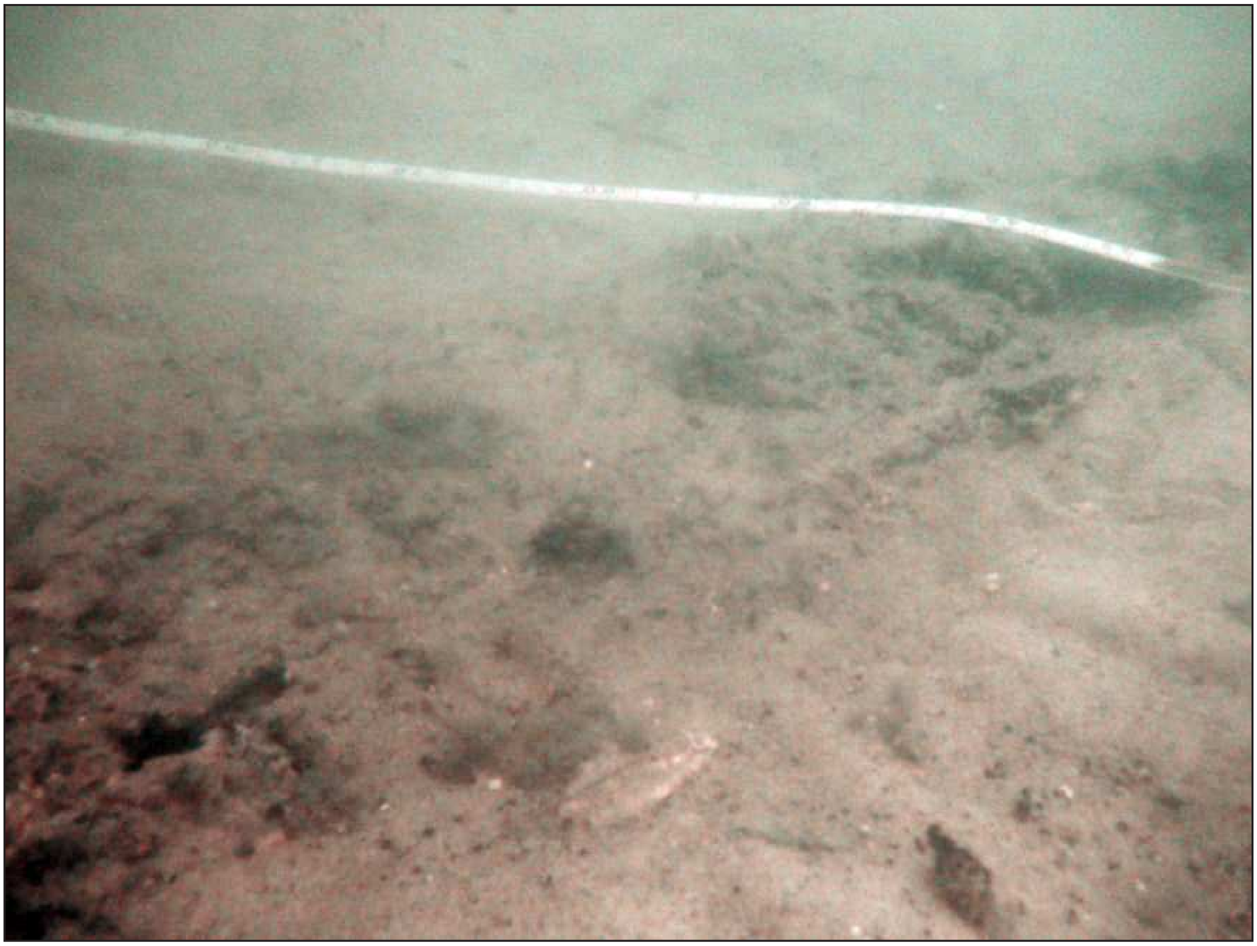

FIGURE 9. Ship's hull timber. (Photo by author, 2013.)

The following spring, UWF archaeologists conducted a series of magnetometer and side-scan sonar surveys of the areas in which *Judah* was most likely to be found based on historical evidence and previous searches by FBAR. The searches covered the channel scarp, where the shallow flats meet the deeper water of the channel, from the entrance to the Intracoastal Waterway (ICW) cut between Perdido Key and the Naval Air Station and an area just past *Convoy*'s wreck site. Figure 10 shows the magnetic contours from the magnetometer survey. Several large magnetometer readings were identified in the ICW channel south of buoy line formed by buoys 4, 2, and 15 on Figure 10. The target magnitudes exceeded 200 nanoteslas (nT); however, the area was also known to contain the remnants of modern barge wrecks and other large ferrous metal objects. Despite the magnitude of the targets, the UWF Diving Safety Officer determined that their locations prevented safe diver operations because of the large number of tugs with barges that frequently transited the area. Various agencies have dredged the ICW channel since the Civil War; therefore, UWF archaeologists were confident that if *Judah*'s remains were in the channel, they would not retain significant archaeological integrity.

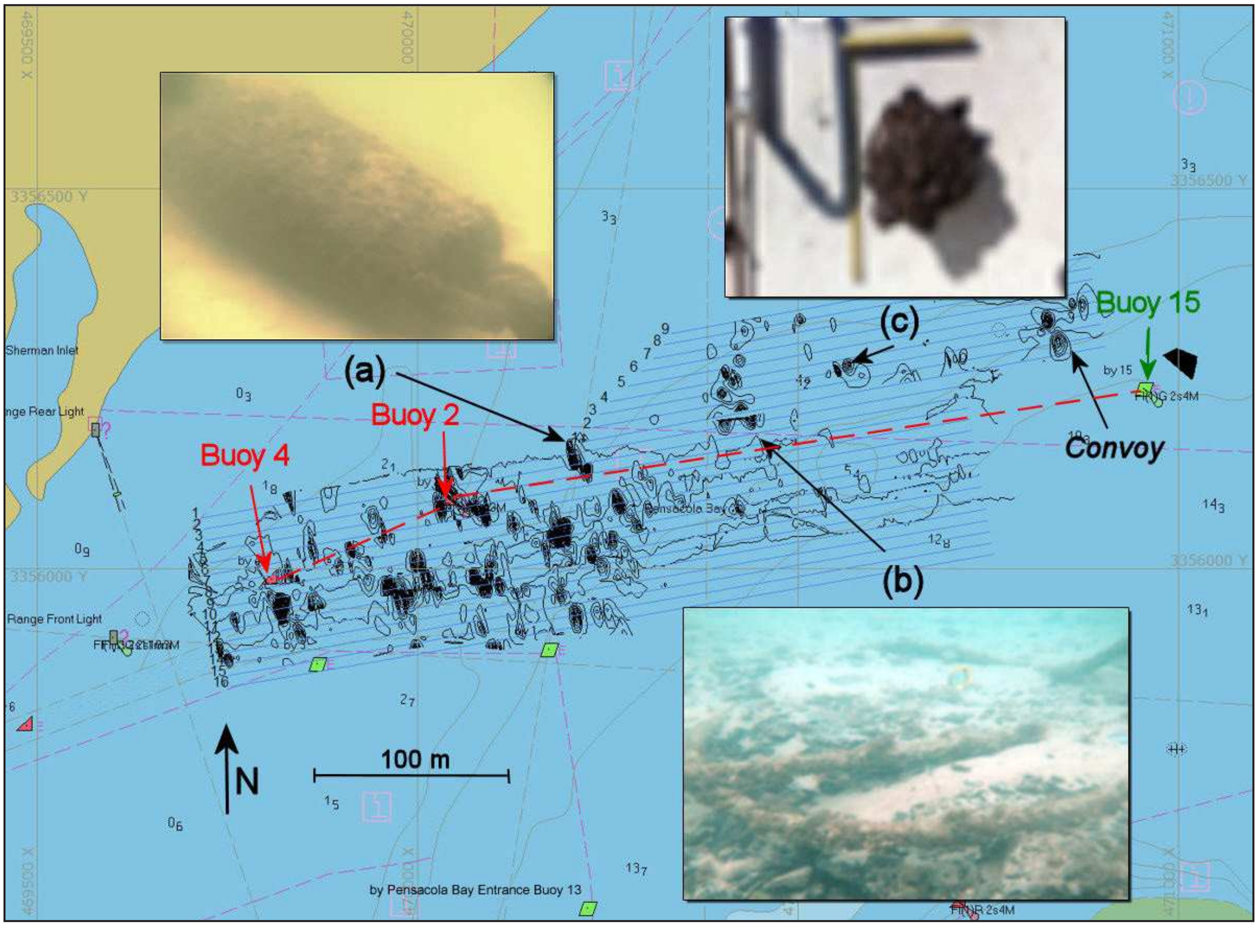

FIGURE 10. Magnetic contour chart showing channel north boundary and magnetic anomalies. (Figure by author, 2013.)

Divers from UWF did investigate three targets or target areas north of the ICW channel during the summer of 2011 (Figure 10). The dive teams identified target (a) as a sunken channel marker; target area (b) as a debris field consisting of coils of wire rope and sections of a modern metal shipwreck, possibly that of a barge; and target (c) as a ferrous metal object resembling a concreted iron cannon ball. Target area (b) was large enough to conceal the wreck of a 19th-century schooner; however, underwater archaeological operations required to determine if *Judah* is buried beneath the modern wreckage would be time consuming and cost prohibitive.

Wreck Site Collocation Theory

After two unsuccessful field seasons searching for *Judah*, focus shifted to the possibility that the schooner was collocated with *Convoy*'s wreck near the east end of the search area (Figure 4). Local sport divers buttressed the collocation theory with tales of Confederate artifacts that had been removed from *Convoy*'s wreck site, and some local divers still referred to the site as the *Judah* wreck (Sharar 2012).

Judah sank nearly five years before *Convoy* in the approximate location. The schooner's wreckage could have formed a ship trap, as described by Throckmorton (1964:51-61), because it was likely not covered with sediment before the burning hulk of *Convoy* drifted past on an outgoing tide. *Judah*'s wreckage, which likely extended above the bottom of the pass, may have caught the burning steamer and held it in place until the flames reached the waterline, and *Convoy* settled to the bottom. The wreckage of both ships may have appeared as a single large site when the 1879 salvage crew blasted apart the remains, intermingling the two wrecks. The collocation theory assumed that the hull structure identified in the 1992 archaeological survey was not *Judah* or that the ship broke apart as it sank, and its remains were in two different locations. Archaeologists from UWF decided that a more detailed study of *Convoy*'s site formation processes was required to update the findings of the 1987 survey conducted by the U. S. Navy and to supplement the historical record regarding the 1877 to 1879 salvage efforts. In the process, the archaeologists also hoped to determine if the wrecks of *Convoy* and *Judah* were collocated.

Remote Sensing Surveys

An examination of *Convoy*'s wreck site began in the spring of 2012 with magnetometer and side-scan sonar surveys of the wreck's suspected location. The results of the surveys displayed all the classic signs of a shipwreck debris field scattered over a large area. The magnetometer survey results were consistent with a shipwreck or complex debris field as outlined in Gearhart's (2011) theory of magnetic interpretation. Gearhart (2011:93) defines a magnetic moment as a vector "pointing along a dipole's axis from its negative pole to its positive pole." Magnetism of a cast iron object is determined by the object's orientation to the earth's magnetic fields at the moment the object cools during production; this type of magnetism is known as the object's *permanent magnetization*. All ferromagnetic material also produces a secondary magnetic field that is oriented toward magnetic north, in the northern hemisphere, known as the object's *induced magnetic field*. Normally, the strength of an object's induced magnetic field is less than 10% of it permanent magnetism. However, Gearhart (2011:95) asserts that in a field of ferrous metal material such as one resulting from the iron objects contained within a shipwreck, the permanent magnetic fields of each component interact, causing "destructive interference, which minimizes the influence of permanent magnetization, leaving the normally weaker, induced magnetic field to dominate observations." The observable magnetic moment of a complex source, such as the debris field from a shipwreck, will be oriented closely with magnetic north. Conversely, the magnet moment of a single source material, such as an isolated metal object, will be oriented toward the direction of the object's permanent magnetism. Since objects fall onto the sea floor in random orientations, statistically, 25% of magnetic moments from single-source objects will be oriented within 45° either side of magnetic north, and 75% will point away from magnetic north by more than 45°. While many debris fields are caused by events other than shipwrecks, Gearhart's (2011:93-111) theory does not help identify shipwrecks. Rather, the theory is useful in identifying anomalies that are not shipwrecks, such as those whose magnetic moments do not point within 45° of magnetic north.

Figure 11 shows the magnetic contours from the magnetometer survey, including the magnetic moments of *Convoy*'s wreck site and a large ferrous metal object to the northwest of the wreck. The large magnetic contours near the center of Figure 11 represent the magnetic moment of *Convoy*'s debris field, which is oriented approximately 20° west of magnetic north. The magnetic fields are consistent with the induced magnetic fields of a shipwreck, or complex source. In contrast with the orientation of *Convoy*'s debris field, the magnetic moment of the simple-source anomaly that is northeast of *Convoy*'s location in Figure 11 is oriented over 100° west of magnetic north, which is also consistent with the magnetic moment of a simple source object (Gearhart 2011:101-102). Researchers could not identify the simple source object because it was too heavily concreted, nor could they determine of it was associated with the wreck.

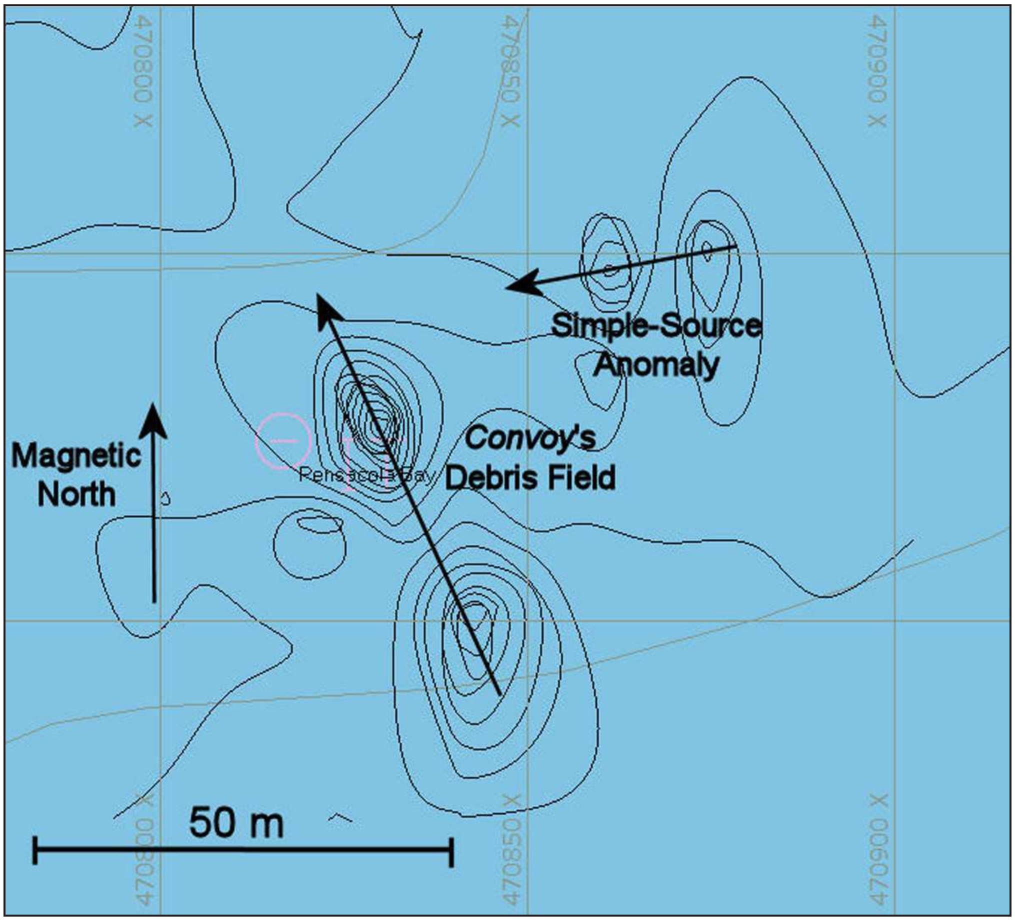

FIGURE 11. Results of *Convoy* magnetometer survey. (Figure by author, 2013.)

The results of the side-scan sonar analysis were also consistent with the known or suspected characteristics of the wreck site, with one exception. Figure 12(a) is a composite of the side-scan sonar data for the eastern end of the survey sector, and *Convoy*'s wreck site is clearly visible near the center of the image. While the wreck site was in the correct location, the images showed a debris field with little relief from the surrounding bottom. Figure 12(b) shows only a small acoustic shadow indicating that the wreckage extended only a few feet above the bottom.

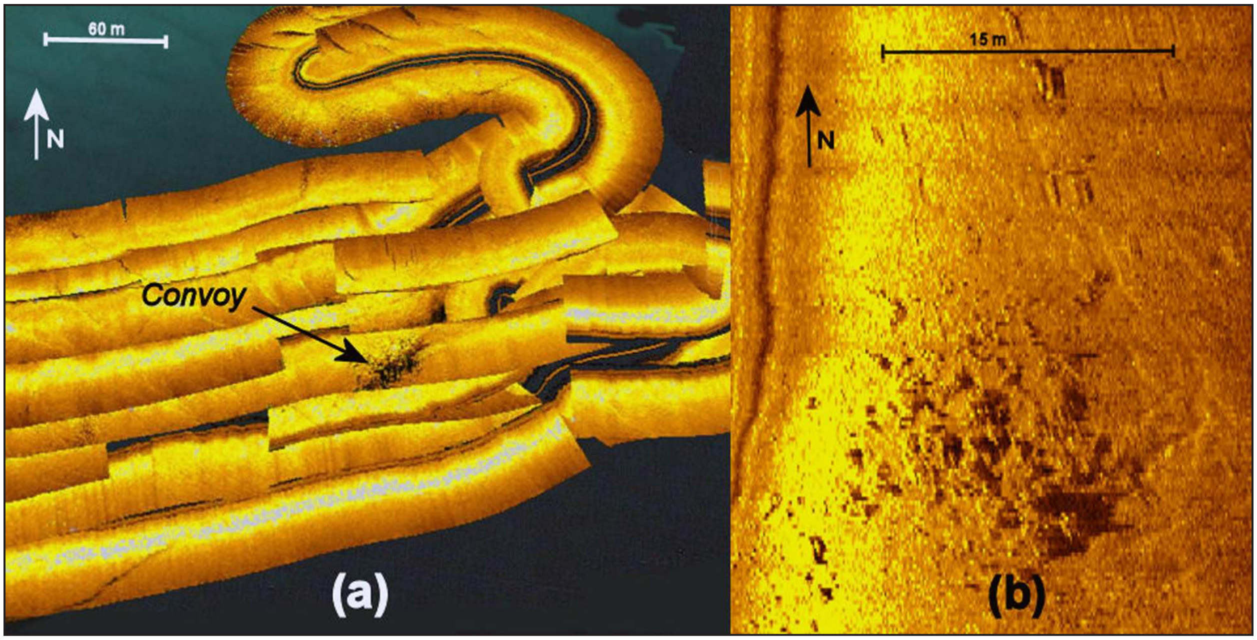

FIGURE 12. *Convoy* side-scan sonar imagery. (Figure by author, 2013.)

The 2011 navigation chart, which used data from the 2009 NOAA hydrographic survey, showed a significant difference around the wreck site when compared to the 2006 navigation chart, which used data from the 1989 NOAA hydrographic survey. Figure 13 is a segment of the 2011 chart, on which *Convoy*'s wreck site is listed as having a depth of 4 m (13 ft.); the surrounding water depth is approximately 7 m (23 ft.). The difference of 3 m (10 ft.) between the wreckage and the adjacent bottom should have produced a more pronounced acoustic shadow on the side-scan sonar image on Figure 12(b). Diver investigations verified the low profile of the wreckage.

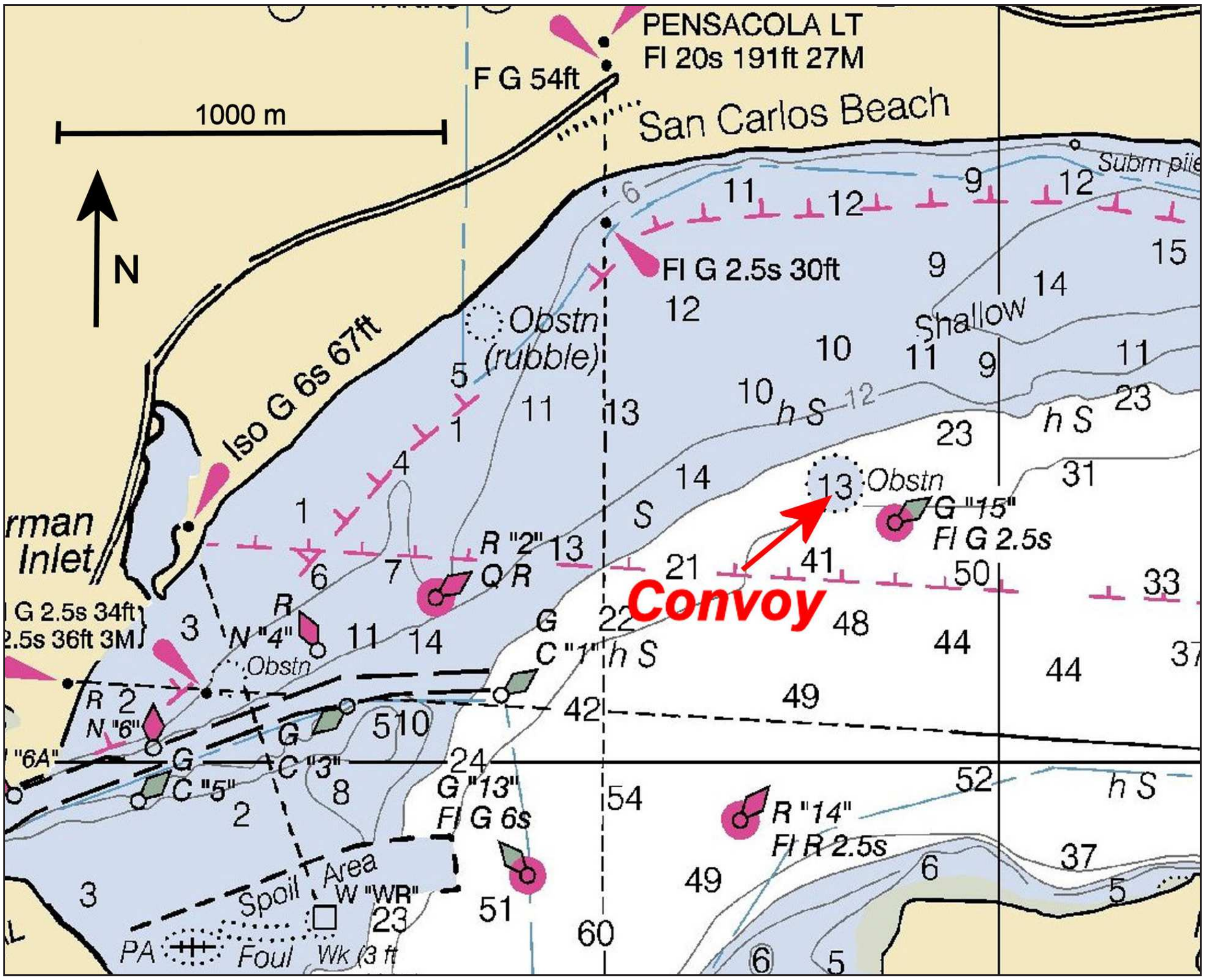

FIGURE 13. 2011 Navigational chart showing convoy and the surrounding water depth, soundings in feet. (Figure by author, 2013. Modified from NOAA 2011.)

Diving Operations

Diving operations began on 19 April 2012 with the initial site orientation dives. The team knew of Pensacola Pass's strong tidal currents and organized the dive to coincide with slack water. Using the 2011 NOAA chart for the wreck's location, the dive team found the wreck site with no difficulty. Visibility was between 4.6 m (15 ft.) and 6 m (20 ft.). The current, while strong, was within safe diving tolerances. The crew found a large debris field that they estimated was at least 50 m (164 ft.) north to south, and 30 m (98 ft.) east to west; included in the debris were large areas of concreted ferrous metal features and artifacts, outer-hull sheathing with attached fasteners, and some wooden hull structure. The dive crew photographed some of the features before the tide turned, but the dive team leader cancelled the remainder of the underwater operations for the day after the current increased.

Based on the orientation dive and his personal experience diving in Pensacola Pass, the UWF Diving Safety Officer placed additional safety requirements on operations around *Convoy*'s wreck site. Because of the close proximity of the site to the ICW channel, a diver recall device was required on each dive boat. The equipment allowed the topside crew to recall the dive team in case of an approaching tug and barge, deteriorating weather, or other emergency. Instead of making a safe ascent from their locations as was standard procedure at other dive sites, all divers were to return to the boat's anchor and ascend using the anchor line; this procedure was used even when the diver recall device was activated. Use of the boat's anchor line for all ascents and descents ensured that divers did not surface close to an approaching barge and helped the divers ascend and descend in strong currents. Surface currents were sometimes experienced when no current existed only a few feet below the surface. A safety line was connected from the anchor line at the bow of the dive boat and was strung down the side of the boat on which the boarding ladder was rigged; the line continued to the stern, where it was tied to the drift line that extended down current behind the boat. In this fashion, returning divers could maintain positive contact with a safety line at all times, and if they lost contact with the line along the boat, they could reach for the trailing drift line by swimming across the current and not become carried away by it. Additionally, binoculars were useful to identify tugs and barges approaching the site at greater distances, allowing for additional time to recall the dive team.

Slack water was determined each day via a NOAA (2012) website that predicted the times of maximum current, slack water, and the tidal current velocity throughout the day. The research team was fortunate to have such useful data for their site because not all areas are covered by NOAA current predictions. The NOAA current predictions confirmed the local divers' suspicions that slack water did not occur at the turn of the ebb or flood tides; instead, slack water occurred between 1.5 and 2 hours after the listed high and low tide predictions for Pensacola Pass. Changes in the maximum velocity of the daily flood and ebb, based on the spring and neap tide cycles, affected the window during which diving operations could be safely conducted. Each dive day, the dive team leader carefully documented the times when the current became too strong to continue archaeological operations. Table 1 lists the observed safe tide window as a function of maximum current at ebb or flood.

TABLE 1
DIVE WINDOW AS A FUNCTION OF MAXIMUM CURRENT AT EBB OR FLOOD

Current speed at max flood or ebb	Safe current before listed slack water	Safe current after listed slack water
3.0 knots	1.0 hour	1.5 hour
2.0 knots	1.5 hour	2.0 hour
1.0 knot	2.0 hour	2.5 hour

Planning for the 2012 field season, which ran for 10 weeks from mid-May through mid-July, proceeded with several issues in mind. The predicted slack water time at the site was approximately one hour later each day because of the normal tide cycles. Diving operations could not commence before 8:30 A.M. because of the time required to check out and load the boats, travel to the launch site, and then travel to the dive site. Diving operations were required to end by 2:00 P.M. in order for the team to return to the Maritime Services Center for debriefing, artifact preparation, and cleanup. These factors limited the number of wreck site dive opportunities to 21 during the planned field season. A single pontoon dive boat provided a maximum of seven divers with their personal dive gear and 11 scuba tanks. The site's shallowness meant that individual divers could conduct two one-hour dives without exceeding the no-decompression dive limits. The requirements for a topside supervisor and safety diver limited the dive rotation to two five-person one-hour dives. Dive regulations at UWF prohibit solo diving, so the dives were divided into a two-person team and a three-person team.

The limited number of dive opportunities and the size of the wreck site convinced the lead archaeologist that a detailed site diagram was not possible. Instead, the crew operated with the following objectives: (a) determination of the extents of the debris field, (b) identification of features from the 1987 U. S. Navy archaeological survey (c) construction of detailed diagrams or photo-mosaics of important features (d) identification of archaeological evidence of the 1879 salvage operations (e) documentation of evidence of opportunistic salvage by sport divers or treasure hunters, and (f) identification of any features or artifacts that were specifically linked to the Confederate schooner *Judah*.

Unfortunately, adverse weather conditions in Pensacola Pass prevented diving on the *Convoy* wreck site from early May until late June. The delayed start and additional poor weather limited the number of dive days during the field school season to eight. However, five additional days were available during late July, August, and September, bringing the total number of days available to dive the wreck to thirteen.

Diver Investigations

The limited number of dive days forced the team to focus on the primary objectives of uncovering evidence of *Convoy*'s site formation processes, such as finding indications of the 1879 deliberate salvage operations and opportunistic salvage by sport divers, searching for evidence of *Judah*'s wreck, and comparing the site's current condition to the 1987 archaeological survey. However, before these objectives were pursued, the crew had to establish references and delineate the boundaries of the archaeological site.

Site Dimensions

The archaeological dive team's first priority was to establish a baseline from which all features and artifacts were referenced. The crew chose a location for the south end of the baseline in the deep sand beyond the known limits of the site and near the estimated middle of the wreck. Divers embedded a screw eye in the sand and secured a quarter-inch nylon line through the eyelet. They swam north, steering by their dive compasses with the nylon line behind them. The crew secured the north end of the baseline using another screw eye through which the nylon line passed. Before the line was made fast, several team members swam the baseline, ensuring that the line was straight and not diverted around a feature. Divers made a final check to ensure that the baseline was oriented as close to magnetic north as possible before the line was secured to the northern screw eye. The baseline measured 48.8 m (160.1 ft.) between the screw eyes. A metric measuring tape secured to the nylon line served to keep track of distances along the baseline. Starting at the south end, a zip-tie placed every one half meter allowed for measurements in low visibility. The crew recorded the locations of the north and south screw eyes using surface buoys and a GPS receiver. Once they plotted the baseline in true space, the crew determined that it was oriented 15° west of true north. The magnetic variation in the area is less than 1°, but the baseline's orientation might be explained by a small amount of deviation likely induced in the dive compasses by the large amount of ferrous metal around the wreck site and by the requirement to lay the baseline as straight as possible without bending around or being laid over large features.

Teams of two or three divers measured the extents of the site's debris field using the baseline-offset method. One diver held the end of a measuring tape at the farthest edge of the debris field while another diver recorded (a) the location along the baseline and (b) the horizontal distance along the tape measure. The diver at the baseline used a right angle device to ensure that the measuring tape was oriented 90° from the baseline; for long measurements, the team employed the triangulation method, calculating the hypotenuse of two distances along the measuring tape and the baseline. Since the distances often extended beyond the limits of the underwater visibility, a third diver swam the length of the measuring tape to ensure that the tape was not entangled on any wreckage.

The dive teams required two full dive days to map the extents of the site. To help orient them on the bottom, the team used the site diagram from the 1987 U. S. Navy survey (Figure 14) and immediately realized that the wreck was spread over a much larger area than the 1987 plan indicated. The north-south measurements were similar, but the east-west extents were nearly twice as great. The drawing and photos from the 1987 survey gave the impression of isolated outcroppings of features and artifacts interspersed among large areas of loose sand; this configuration was not the case in 2012. The present wreck was more like a continuous debris field of concreted features and artifacts with little loose sand between.

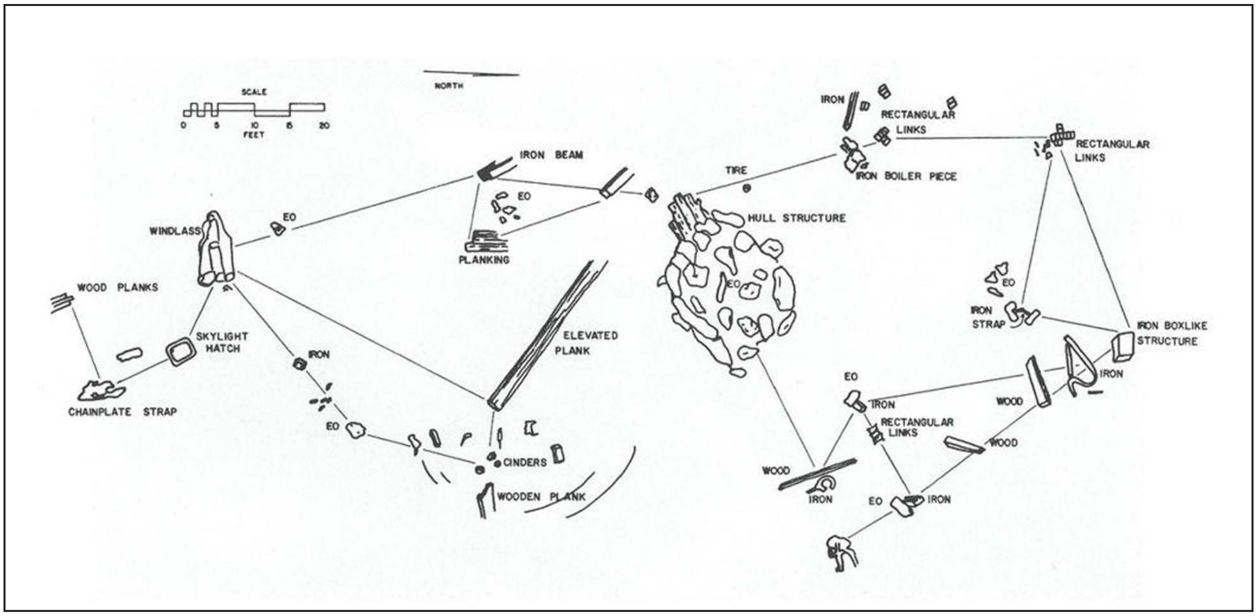

FIGURE 14. *Convoy* 1987 site diagram. (Diagram courtesy of U. S. Navy 1987).

The northwest area of the wreck took the most time to map because a significant debris field was located approximately 25 m (82 ft.) west of the north end of the baseline (Figure 15). The area initially appeared to be a separate debris scatter from the main wreck site and might have been the remains of a second wreck; however, closer inspection—including intensive hand fanning by the dive team—revealed that the wreckage was part of one continuous field of concreted ferrous metal features extending north and west of the main wreck site. No cupreous metal features were discovered in this area, indicating that the scatter was likely outside the main hull wreckage.

FIGURE 15. Northwest debris field. (Photo by author, 2012.)

Divers inadvertently discovered a third area of the wreck. The wreck site was not accessible for a period of 14 days between 16 July and 30 July because of inopportune tide windows and poor weather. When the crew returned to the wreck on 30 July, they discovered that the screw eye anchoring the north end of the baseline had been uprooted. The dive team found the screw eye near the center of the wreck and spent the rest of the day repairing the damage (Figure 16). The slack in the baseline had drifted south into the deep water beyond the known limits of the debris field. Divers followed the tattered baseline until they came upon another large area of debris, including an object 2.0 m (6.6 ft.) long that was clearly the main gear of the steam windlass. Figure 17 shows the windlass main gear, including the sprocketed section used to hold the anchor chain known as the wildcat. While one dive team repaired the baseline, a second team mapped the extents of the new southern area using bearing and ranges from the southern end of the baseline.

FIGURE 16. Damage to north baseline screw eye. (Photo by author, 2012.)

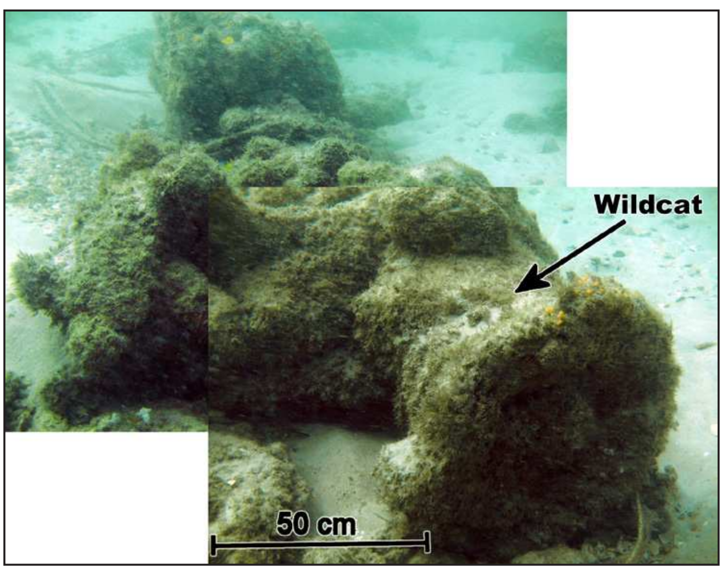

FIGURE 17. Windlass main gear. (Photo by author, 2012.)

A reexamination of the wreck revealed that during the intervening two weeks, the pass currents had scoured the new southern debris field down to the hardpan sediment beneath. Approximately one half meter (1.5 ft.) of sand had previously covered the area. Additionally, fresh sand deposits covered large sections of the east side of the wreck. A moving mound of sand, approximately 0.6 m (2 ft.) high, appeared to drift around the site, alternately uncovering, then recovering various sections of the wreck. Figure 18 shows the sand mound on the edge of the newly discovered southern debris field. The area in the foreground is newly scoured hardpan bottom, and the sand mound is visible beyond. Figure 19 is a detailed diagram of the 2012 site showing the baseline, the extents of the main debris field, the northwest artifact scatter, and the new southern debris field.

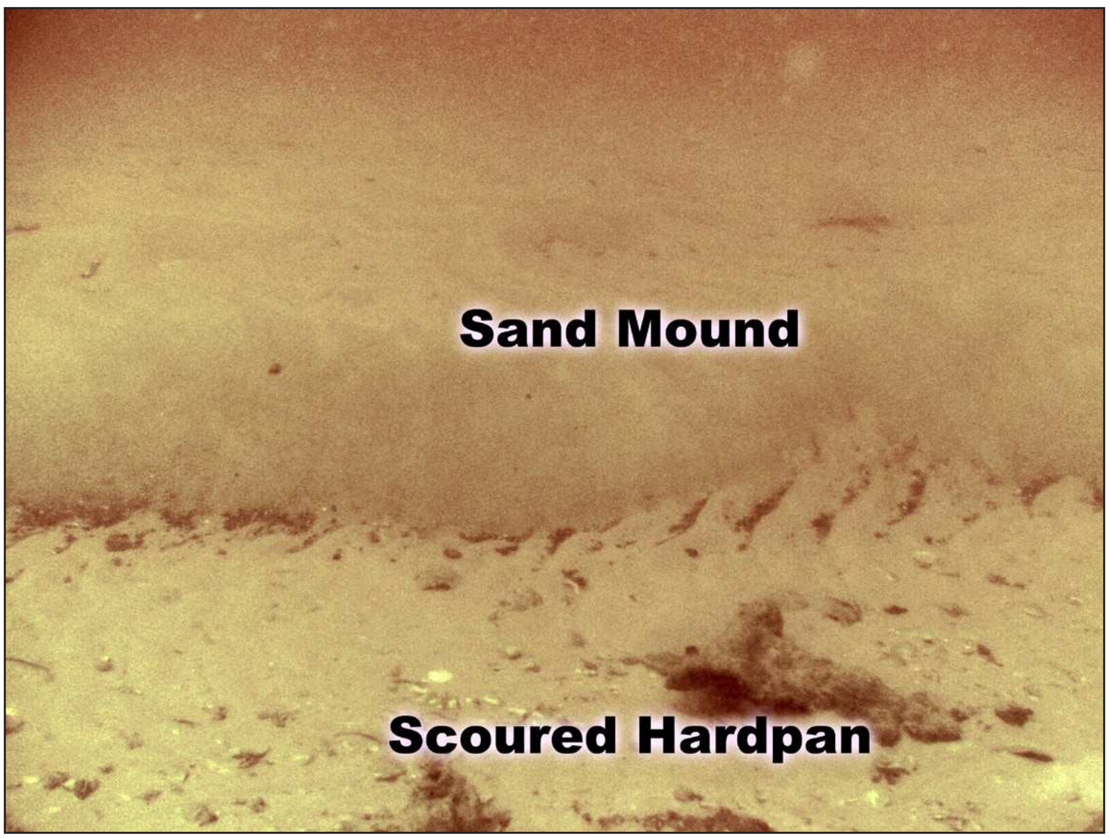

FIGURE 18. Sand mound and bottom scour. (Photo by author, 2012.)

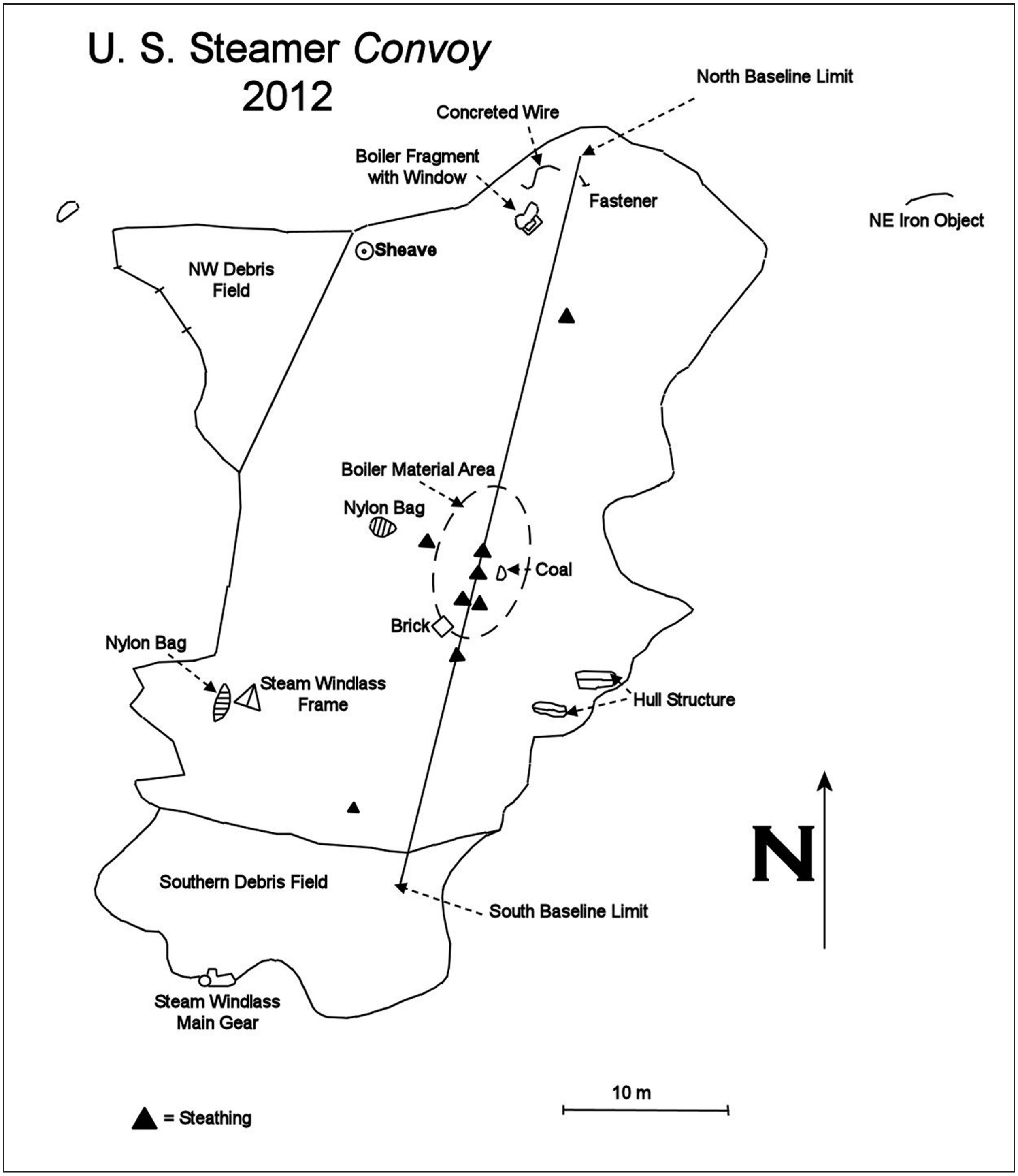

FIGURE 19. *Convoy* site diagram. (Diagram by author, 2012.)

Site Artifacts and Features

The wreck site's depth was at odds with both the charted and the anticipated depth. The depth at the north end of the baseline was 7.6 m (25 ft.), while the south end was nearly 10.7 m

(35 ft.). The charted depth from Figure 13 shows the wreck in 4 m (13 ft.) of water; either the vessel should have been found on a pedestal of sand surrounded by 7.6 m (25 ft.) deep water, or a portion of the wreck should have protruded approximately 3.0 m (10 ft.) from the bottom (Figure 12). Yet no portion of the wreck site was shallower than 7.6 m (25 ft.).

Of several features that were identified on the bottom, some matched the 1987 U. S. Navy survey and others did not. Thick layers of concretion prevented identification of many features, but others retained their characteristic shapes. The most easily identified feature on the site was the boiler—or the area of concretions that was once a boiler—near the center of the wreck. The site diagram (Figure 13) shows the location of boilerplate and boiler tubes in close proximity to a brick—likely from the boiler's firebox—and a large piece of coal (Figure 20).

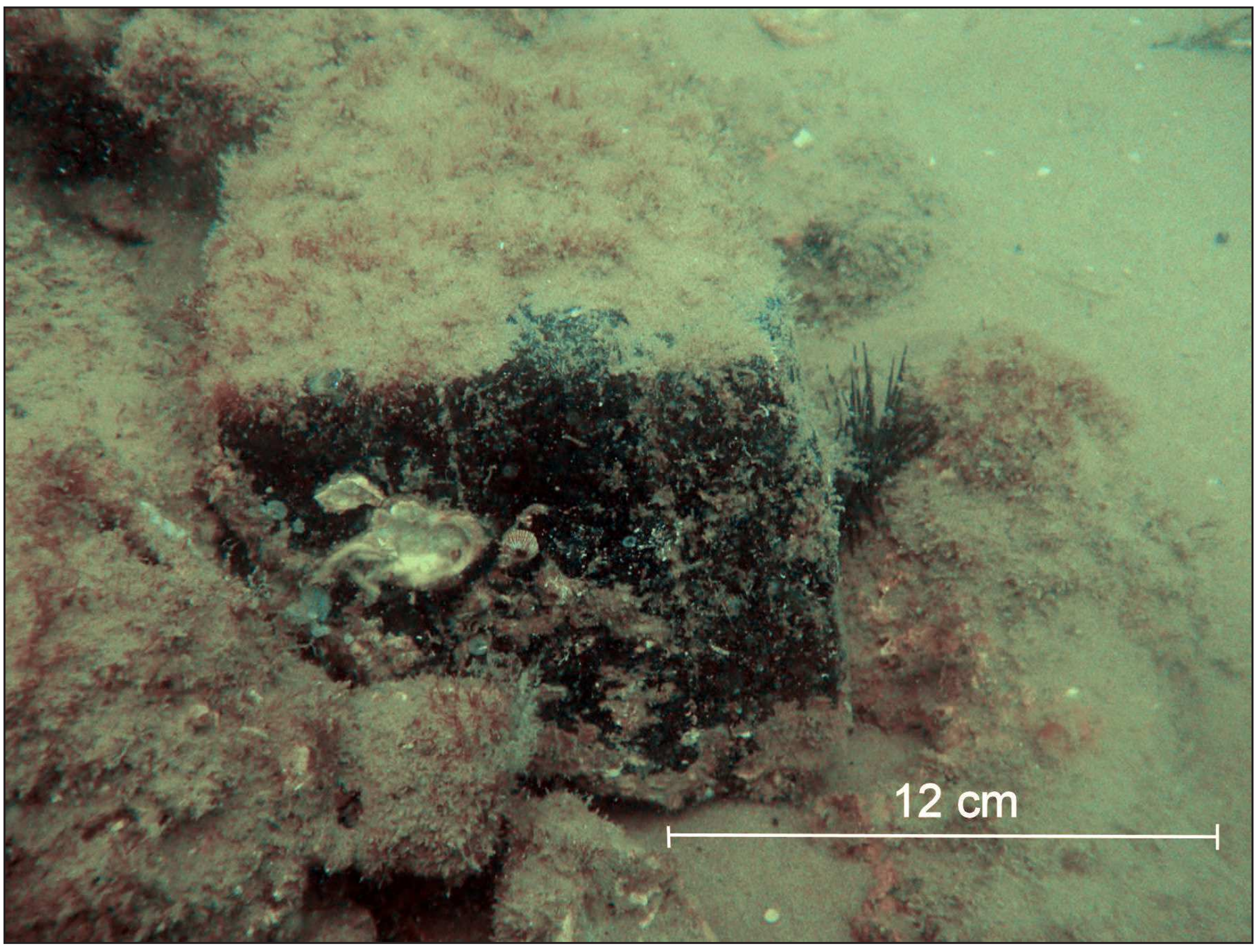

FIGURE 20. Large coal artifact near boiler debris. (Photo by author, 2012.)

The baseline passed directly through the boiler debris, which measured from approximately 16 m (52.5 ft.) to 20 m (66 ft.) along the baseline and extended approximately 3 m (10 ft.) from either side of the baseline. Figure 21(a) shows the boilerplate and Figure 21(b) shows the boiler tubes and the outer-hull sheathing beneath the boiler debris. The outer-hull sheathing beneath the boiler wreckage indicates that the debris lies within the limits of the hull area and was near the bottom of the ship. Another section of the boiler was found approximately 20 m (66 ft.) north of the main boiler debris field. A positive identification of this feature as part of the boiler was not possible because of the heavy concretion layers covering the ferrous metal; however, the feature was in the same vicinity and had the same basic shape as a feature identified from the 1987 U. S. Navy survey (Figures 19 and 22).

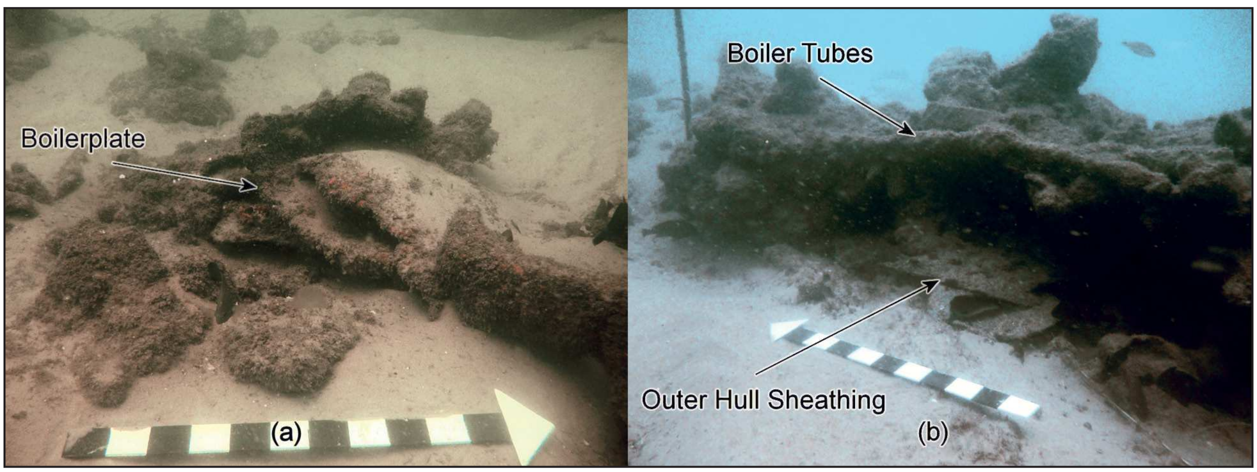

FIGURE 21. Boiler debris; scale equals 1 m. (Photo by author, 2012.)

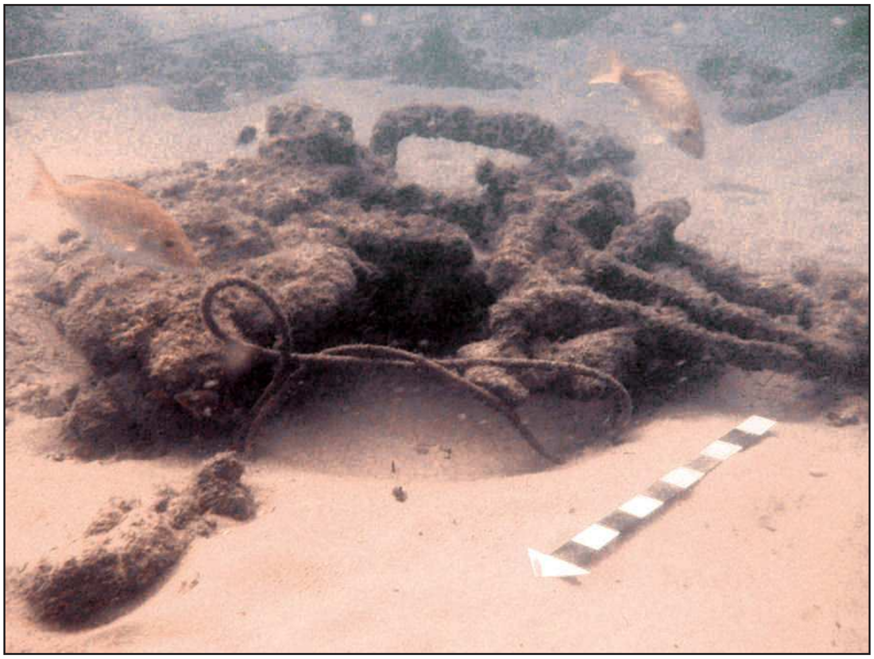

FIGURE 22. Northern boiler fragment; scale equals 1 m. (Photo by author, 2012.)

Other features and artifacts helped orient the 1987 survey site plan with the current wreck site. A section of concreted wire is visible in the north ends of both the 1987 and 2012 site plans, although they are oriented differently (Figures 14, 19, and 23). The item is a portable artifact; the difference in orientation could be the result of sport divers tampering with the site. The boiler section with the possible rectangular window in the north end of the site also concurs with both site diagrams.

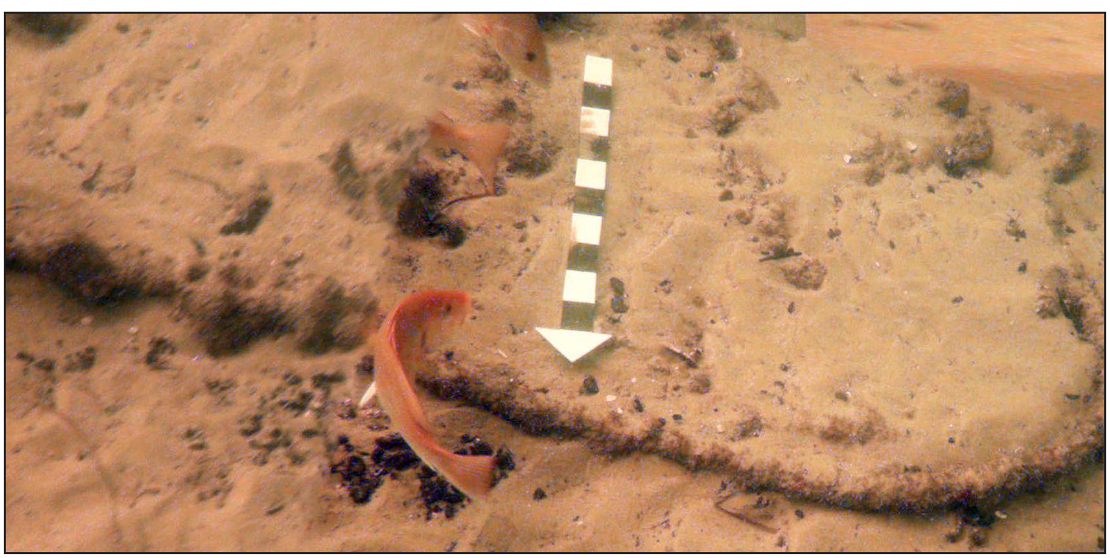

FIGURE 23. Concreted wire artifact; scale equals 1 m. (Photo by author, 2012.)

The final feature that helped orient the 2012 wreck site with the 1987 survey was the steam windlass. Dive teams searched the area several times before they recognized the windlass. The feature was difficult to identify because of the heavy accumulation of concretion on the object since the 1987 survey and because the windlass appears to have been reoriented on the bottom. Figure 24 is a photo of the steam windlass taken in 1987 by divers from Tidewater Atlantic Research. When compared to the drawing of the windlass near the southern end of Figure 14, the apex of the windlass was clearly pointing toward the west. Figure 25 shows the windlass as it lies on the bottom today, with the apex pointing toward the north. The object appears to have rotated 90° to the right and may also have flipped over. The size, shape, and location of the object match the description of the windlass from the 1987 survey despite its unusual orientation, the reasons for which are discussed in detail in Chapter V.

FIGURE 24. 1987 Photograph of *Convoy*'s steam windlass. (Photo courtesy of U. S. Navy 1987).

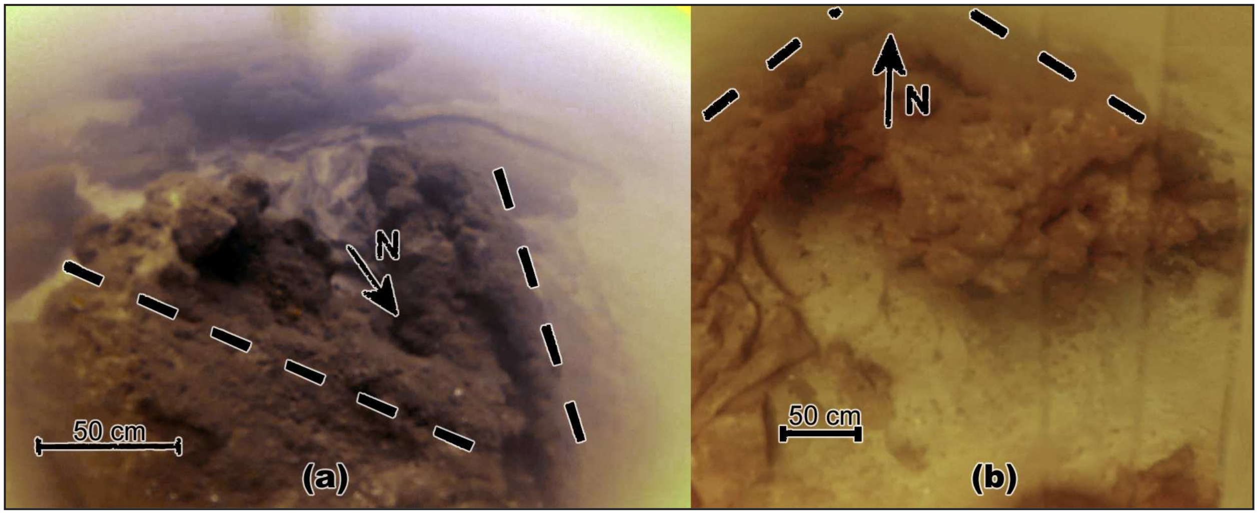

FIGURE 25. 2012 Photographs of *Convoy*'s steam windlass frame. (Photo by author, 2012.)

The main gear assembly of the steam-powered windlass was located more than 20 m (66 ft.) south of the feature identifed in the 1987 survey as the *steam-powered windlass*. Figure 26 shows the entire length of the windlass main gear, nearly 3.5 m (12.5 ft.) long; the head of the wildcat measured 50.8 cm (20 in.) in diameter.

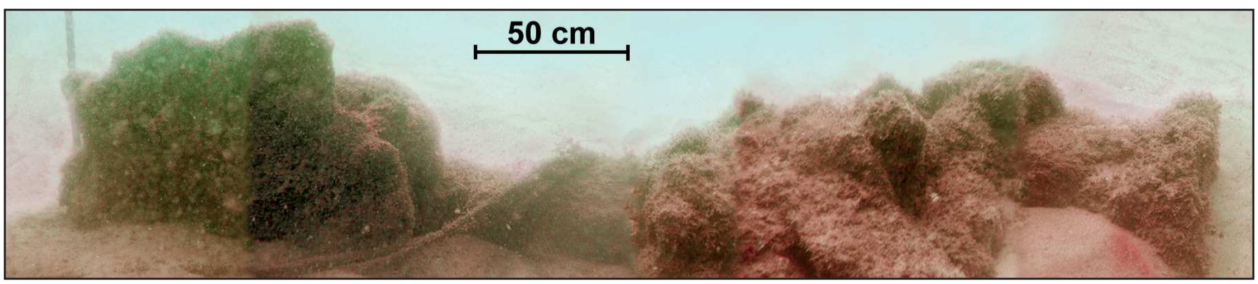

FIGURE 26. Steam windlass main gear. (Photo by author, 2012.)

The debris scatter to the northwest of the main wreck site was different from the other areas. The main site consisted of concreted ferrous metal features most likely associated with the steam plant, including segments of the boiler and engine, their associated piping, and the steam powered windlass near the bow. Straight and twisted linear features characterized the debris scatter to the northwest. The features did not resemble any known parts of a steam propulsion plant from the 19th-century. Although the features were twisted and heavily concreted, they resembled the frame assembly around the ship's engine depicted in Valentine's 1863 painting (Figure 2). Figures 27 and 28 illustrate the linear nature of the northwest debris. The structures measured approximately 8 cm (3.1 in.) by 10 cm to 15 cm (4 in. to 6 in.) in width.

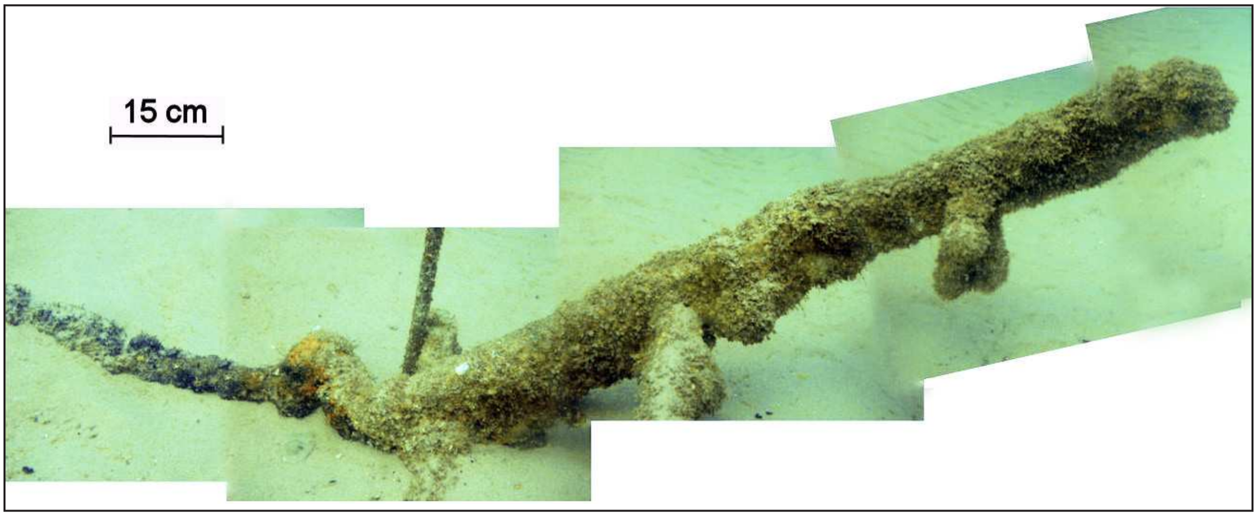

FIGURE 27. Northwest debris. (Photo by author, 2012.)

FIGURE 28. Northwest debris. (Photo by author, 2012)

Much of the wooden hull structure described in the 1987 U. S. Navy survey was absent from the 2012 wreck site. The presence of nearly intact sections of cupreous sheathing with its associated fasteners indicates the location and extents of the now-missing hull (Figure 29). Despite the dearth of wooden hull structure on the wreck site, two sections of the outer hull survived on the eastern limits of the wreck (Figure 19.) The timbers in Figure 30 measured 168 cm (66.1 in.) long by 78 cm (30.7 in.) wide; the outer hull sheathing is visible in the triangular notch near the bottom of the photo. The hull structure in Figure 31 was 90 cm (35.4 in.) by 32 cm (12.6 in.); the light strip across the top of the plank is intact sheathing. Both structures were 7.5 cm (3 in.) thick and both showed extensive shipworm damage.

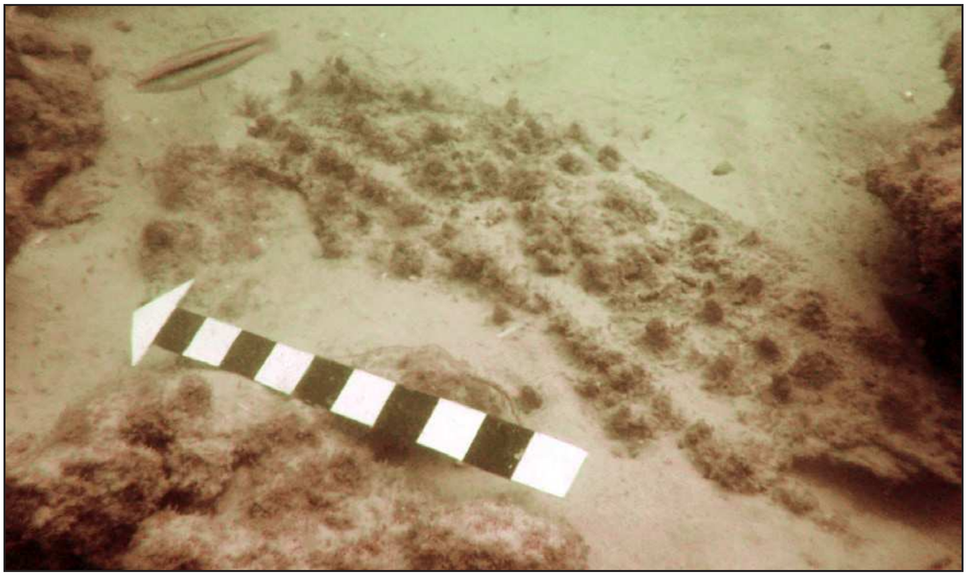

FIGURE 29. Outer hull sheathing with exposed fasteners; scale equals 1 m. (Photo by author, 2012.)

FIGURE 30. Outer hull planks with attached sheathing. (Photo by author, 2012.)

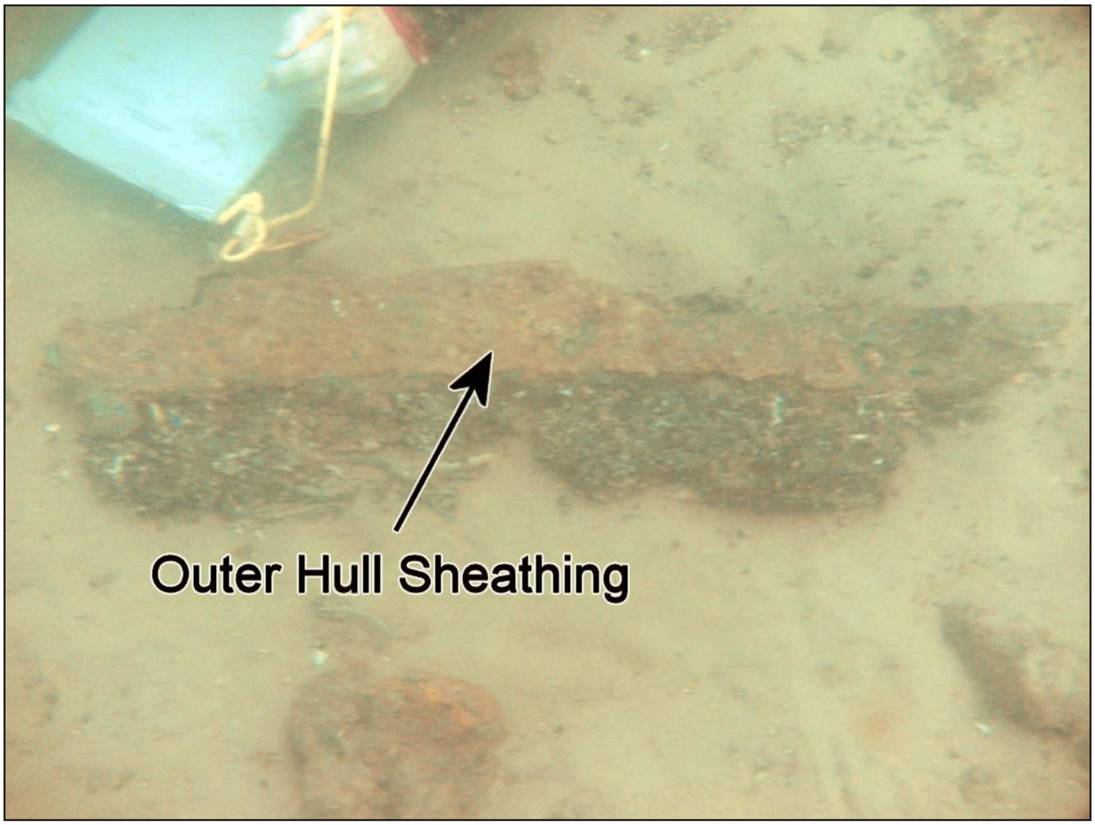

FIGURE 31. Outer hull plank with attached sheathing. (Photo by author, 2012.)

Opportunistic Salvage Indicators

Convoy's wreck site remains a popular dive site for sport divers and relic hunters. Many divers have removed artifacts from the site over the past five decades (Brussard 1988; Madden 2012; Sharar 2012). Evidence of these treasure-hunting activities was found in many sections of the site. Old lines litter the wreck; Figure 22 shows a line tied round the northern boiler fragment, and a line is visible near the center of the windlass main gear in Figure 26. Although these lines were too light to raise the features around which they were tied, they were clearly not the types of lines used by divers to find their way around the wreck site. Relic hunters could have used the lines to secure equipment such as dredges or lift bags.

Two large canvas covers were found in unusual places on the wreck. Figure 32 shows one of the covers located near the windlass frame. The other cover was found just west of the boiler area (Figure 19). The canvas in Figure 32 looks like burlap or another natural material, but a red nylon material with a white zippered end was revealed when UWF divers pulled back the end of the canvas. The material resembled a nylon boat cover. Investigations beneath the material revealed old very degraded wood that was barely distinguishable from the surrounding sand. The nylon material may have been designed to protect or hide valuable wooden structures or artifacts for later retrieval or may have been used as some type of improvised lift bag that was abandoned. The material did not seem to be debris that had intruded on the wreck site; it appeared to have been deliberately brought to the wreck for some intended purpose. The covers seemed to be purposefully placed over wreckage and then secured around it, and they are likely further evidence of sport diver opportunistic salvage operations.

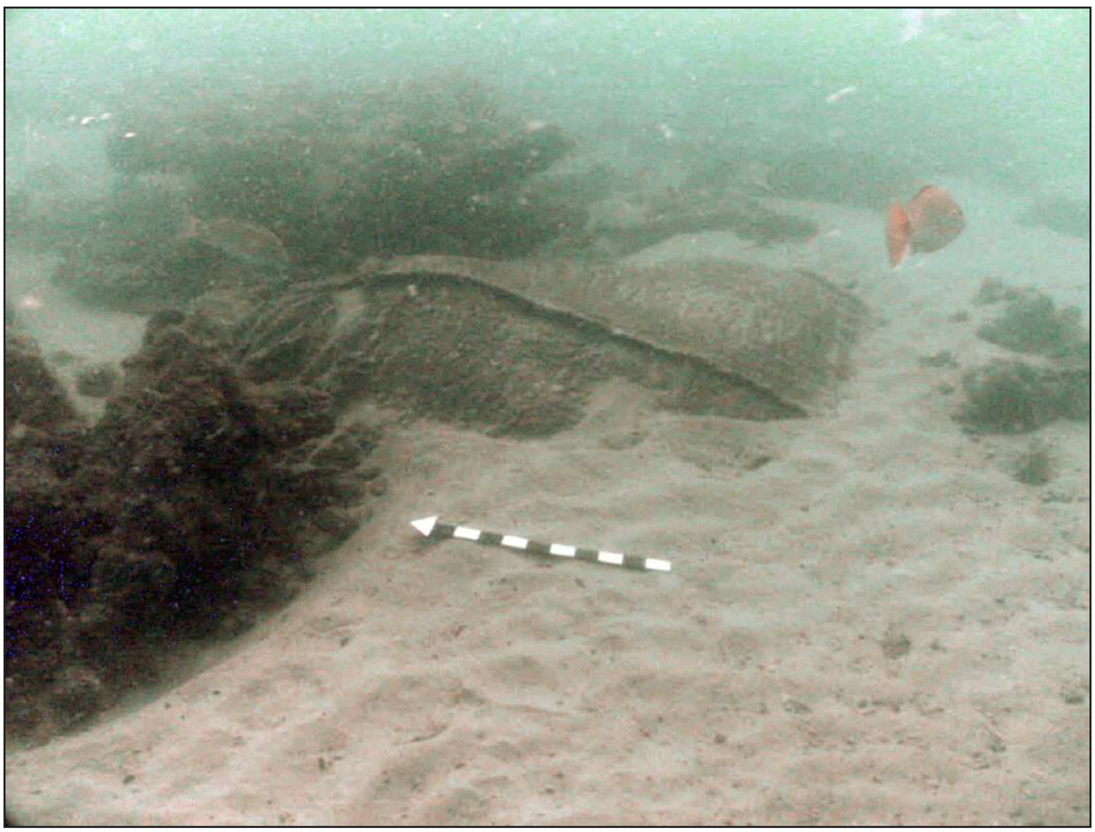

FIGURE 32. Canvas cover; scale equals 1 m. (Photo by author, 2012.)

Artifact Analysis

The *Convoy* artifacts available for analysis came from two sources. One source was the material that Broussard donated to WFHPI in 1987 (Appendix B). The collection consisted of cupreous metal sheathing, large numbers of ceramic sherds, two kaolin pipes, links of iron chain, a whiskey bottle, and a large quantity of metal fasteners. The items in the collection had no provenience other than that they were recovered from *Convoy*'s wreck site. In May 2012, WFHPI lent the collection to the UWF Archaeology Institute, where the items were measured, weighed, drawn, and photographed before being returned.

The second source of artifacts from the wreck site was the material recovered during the diver investigations in the summer and fall of 2012. The artifacts recovered in this manner maintained their three-dimensional proveniences. Appendix C contains a list of the site-recovered artifacts. All the artifacts were recovered at surface level or slightly below via direct collection or hand fanning methods. The dive team collected only a small sample of artifacts for analysis, leaving many similar artifacts in situ.

Researchers compared the sample of artifacts recovered from the site to the items in the WFHPI collection and discovered that the two groups' items were consistent in shape, size, and weight. The 2012 team collected one wood sample, one concreted iron fastener, a brick, a large piece of coal, two stoneware sherds, and many cupreous sheathing and fasteners. Figure 33 shows cupreous fasteners from the 1987 WFHPI collection (Figure 33a) and similar artifacts collected in 2012 (Figure 33b). Although the WFHPI collection contains more varied artifacts, similar artifacts overlapped both collections, including stoneware and cupreous metals. The recovered sheathing was surprisingly concreted and much more fragile than the same type of material from the museum collection. The deteriorated condition was possibly because of the additional time that the site-recovered material spent exposed to saltwater from 1987 until 2012.

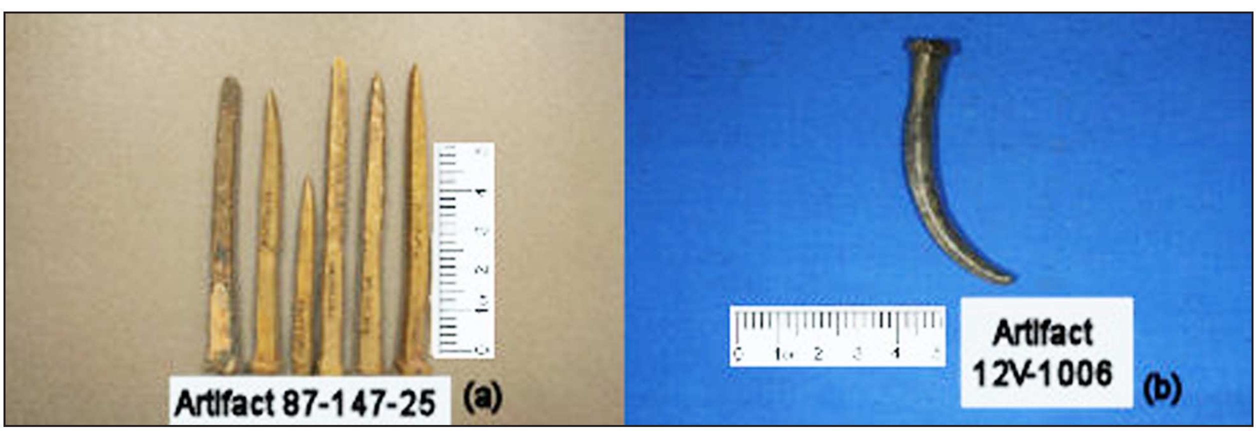

FIGURE 33. Cupreous fasteners. (Photo by author, 2012.)

The WFHPI artifacts include both thin and relatively thicker sections of hull sheathing. The thin material is comparable with the site-recovered sheathing, approximately 1 mm (0.04 in.), while two large sections of sheathing from the WFHPI collection measured nearly 3 mm (0.12 in.) thick. The difference might be explained by the availability and cost of different thicknesses of bottom sheathing during *Convoy*'s different shipyard visits. Another possible explanation is that the thicker material was used to protect sensitive sections of the hull such as the bow, which absorbed more of the waves' impact than the hull did as the ship moved through the water.

The dive teams recovered the cupreous metal sheathing from the wreck site to determine if the Muntz Corporation manufactured the metal. The research team hoped to recover a section of the sheathing that contained the stamped Muntz logo, but none was found during conservation. In the manufacture of their hull sheathing, the Muntz Corporation used a proprietary alloy of metals consisting of 59-61% copper, 38-40% zinc, and 0.50-1% tin (Crothers 1997:330). A sample of the site-recovered sheathing was analyzed using an X-ray fluorescence spectrometer, and the following results were recorded: 66.7% copper, 32.3% zinc, and 0.34% tin. Although the percentage of copper contained in the sample sheathing was higher than the Muntz formula, some of the zinc and tin may have been chemically extracted from the metal by corrosion processes during its time spent underwater. Figure 34 shows a section of cupreous sheathing before treatment (a) and after treatment (b).

FIGURE 34. Cupreous sheathing before and after conservation. (Photo by author, 2012.)

The UWF technicians used standard archaeological conservation methods for the stabilization, preservation, and storage of the site-recovered artifacts. Successive baths of tap water followed by baths of deionized water desalinated all the artifacts. Desalination continued until the bath water salinity stabilized below 100 parts per million. The artifacts were numbered, documented, photographed, and then stored in the desalination bin awaiting conservation.

The coal, brick, and stoneware artifacts were mechanically cleaned before they were sent to storage in the curation facility. The wooden artifacts were pre-treated in a 30% solution of polyethylene glycol before they were freeze-dried and sent to curation. During initial cleaning, conservators discovered a small piece of oakum attached to a section of cupreous sheathing. The oakum was removed and conserved in the same fashion as the wood sample.

The metal artifacts were placed in an electrolytic reduction tank to remove the concretion. Electrolysis worked well on the cupreous metals but did little to remove the iron concretion. The concretion around the iron fastener was removed using an air scribe, and the fastener was treated with tannic acid and then impregnated with microcrystalline wax. Figure 35 shows the iron fastener before treatment (a) and after treatment (b). The cupreous metal artifacts were removed from electrolysis and mechanically cleaned before they were sent to storage.

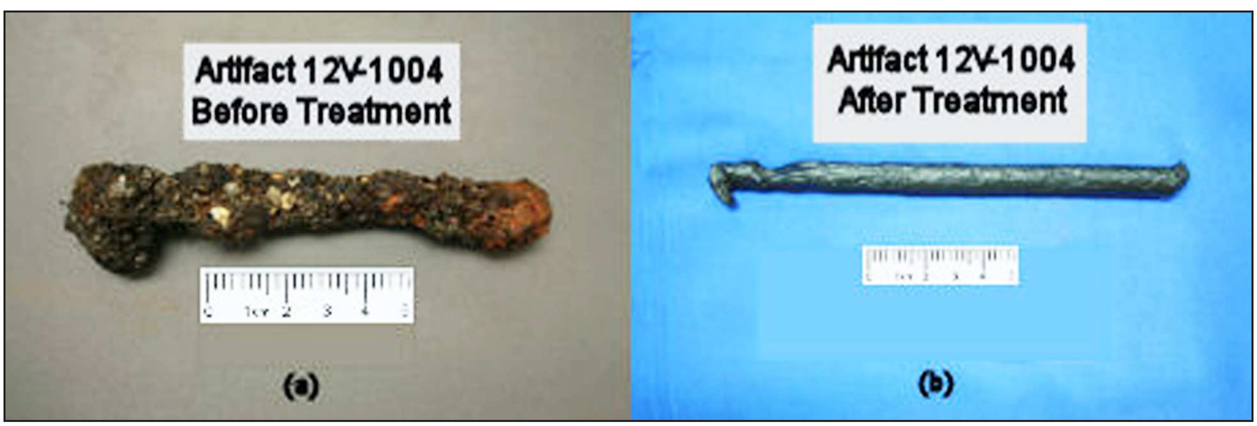

FIGURE 35. Iron fastener before and after conservation. (Photo by author, 2012.)

Summary

The search for *Judah* and the examination of *Convoy*'s wreck site provided an opportunity for UWF archaeologists and graduate students to exercise the full range of maritime archaeological investigative techniques, including remote sensing operations, diver investigations, and artifact analysis. While searching for *Judah*'s wreck, charted bottom anomalies and remote sensing targets provided hypotheses of the schooner's location. Diver explorations revealed a complex bottom littered with castoff debris, the origins of which covered several centuries.

The remote sensing surveys of *Convoy*'s wreck site produced unexpected results. The side-scan sonar images showed a large debris field with little bottom relief. While these results differed from those anticipated after examining the navigational chart, they were confirmed by later diver investigations. A magnetometer survey of the area revealed data consistent with a complex target exhibiting an induced magnetic moment, as outlined in Gearhart's (2011:90-113) theory of marine magnetic interpretation.

The dynamic diving environment provided opportunities as well as challenges; strict adherence to high current diving protocols ensured that the archaeological mission was completed successfully and safely. Although the high current in Pensacola Pass limited the diving opportunities, it excavated different sections of the wreck down to the hardpan sediment beneath and allowed the researchers to observe the entire wreck site without the need for dredging.

Hands-on scrutiny of *Convoy*'s wreck site revealed a complicated conglomeration of features and artifacts that provided clues to the processes that developed the current archaeological site. The short daily diving windows limited site description to gross overall measurements, photomosaic, and video documentation. The 2012 wreck site was compared to the 1987 U. S. Navy survey, and several features common to both surveys were identified. The depth and size of the exposed debris field were the two major differences between the survey results. Also, the added concretion layer on most ferrous metal artifacts rendered some features unidentifiable in 2012, although they were visible in 1987.

In addition to features found within the steamer's hull, such as the boiler and outer hull structure, the 2012 dive team identified debris scatters to the northwest and south of the main wreck site that may be indicative of the 19th-century salvage operations. The divers also recorded other areas on the site that appear to be characteristic of recent opportunistic salvage by sport divers.

A limited artifact assemblage was collected from the site and compared to the material recovered from the wreck by a sport diver in 1987. The 1987 collection was larger and more varied, but the overlapping artifacts in the two groups were similar. Based on the similarity between the two groups of overlapping artifacts, the sport diver likely collected his artifacts from the *Convoy* site.

The archaeological findings support both the history of the site (Chapter II) and the geophysical evidence (Chapter IV). Historical events such as the deliberate 19th-century salvage and the more recent opportunistic salvage by sport divers were confirmed using archaeological evidence. Geophysical findings were supported by diver investigations showing that a significant quantity of sediment was removed from beneath the wreck and that the tidal currents move loose sand and other sediments around the bottom, covering and uncovering different portions of the wreck with each tide cycle.

CHAPTER IV

GEOMORPHOLOGIC FINDINGS

During the 2012 field season, UWF divers discovered the wreck of the steamer *Convoy* at a greater depth then they had anticipated. Historical evidence indicated that the ship sank in 3.6 m (11 ft.) of water, yet the UWF dive team recorded the wreck's depth as 7.6 m (25 ft.) at the north end and 10.7 m (35 ft.) at the south end. The unexpected depth of the site was first observed during remote sensing operations.

An examination of historical hydrographic charts revealed possible explanations for the excessive depth of the site. The channel scarp—the underwater ledge where the shallow flats meet the deep channel—had migrated several hundred meters to the north and west between 1859 and 2009. The channel movement eventually undermined the wreck site, most likely between 1989 and 2009. Both natural and man-made forces probably influenced the migration of the channel scarp. Current patterns change in Pensacola Pass based on rainfall that impacts the contribution of fresh water from local rivers. High rainfall brings muddy sediment from Pensacola Bay into the pass, while relatively stronger tidal influences transport sandier sediment from the Gulf of Mexico into the inlet during periods of low rainfall.

Strong tidal currents and differing sediment contributions based on variations in local rainfall resulted in the wreck site undergoing a series of scour and reburial phases. The changes in *Convoy*'s site progressed in patterns similar to those observed at other historical wrecks in highly dynamic locations. For example, the wreck of Blackbeard's pirate ship, *Queen Anne's Revenge*, exhibited evidence of similar site formation processes (Wells and McNinch 2003:94).

Pensacola Pass

The westernmost tidal inlet in Florida, Pensacola Pass connects the Gulf of Mexico, Pensacola Bay, and a swampy area west of the pass known as Big Lagoon. The pass separates two barrier islands: The eastern end of Perdido Key forms the west side, and Santa Rosa Island is the eastern boundary. The discharges of the Escambia and Blackwater Rivers empty through

Pensacola Pass and into the Gulf of Mexico. Barrier islands protect the natural harbor and sound and provide limited shelter from storms. Figure 36 is a segment of an 1859 Pensacola Pass coast survey chart, showing Pensacola Sound stretching to the east and an area of swampy islets to the west separating the pass from Big Lagoon before the construction of the ICW canal.

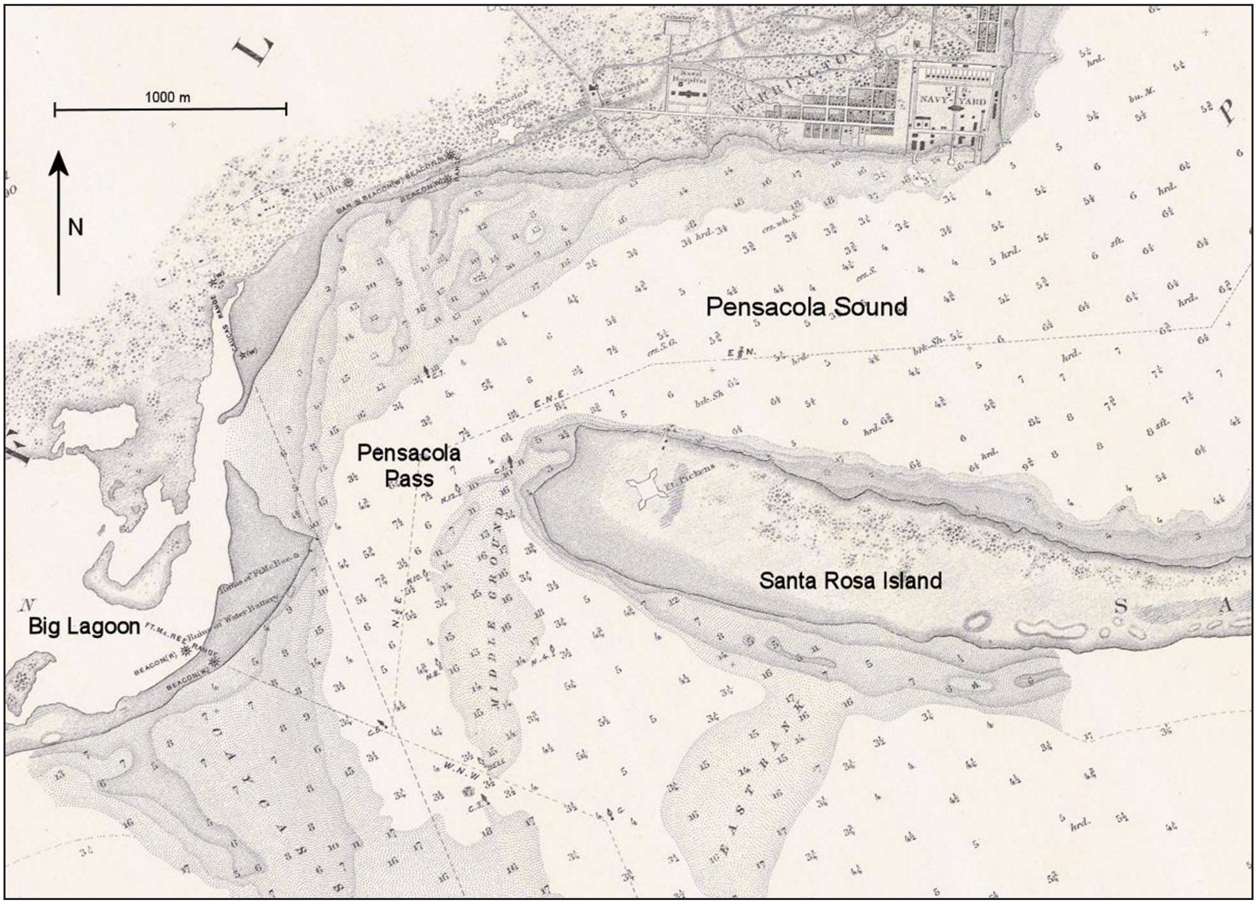

FIGURE 36. 1859 Chart of Pensacola Pass, soundings in feet. (Figure by author, 2013. Modified from NOAA 1859.)

Estuaries create turbulent environments in which salt water and freshwater meet. Estuaries are classified into three types based on their circulation patterns: salt wedge, well-mixed, and partially mixed systems. The outflow of the rivers and the strength of the tides determine the type of estuary, which may change over time as the strength of the river discharge changes with local rainfall patterns. A salt wedge estuary is characterized by a highly stratified water column in which strong freshwater discharge currents from the river contributions ride over slower moving tidal currents. The fresh and salt water masses do not mix, forming a sharp change in vertical salinity known as a *halocline* (Pinet 1998:294). Sediment movement in a salt wedge system is predominantly from the river system into the estuary: "the weak bottom currents of salt-wedge estuaries are not able to transport significant quantities of sediment into the basin from offshore sources. Rather, the bulk of the sedimentary fill is supplied by river transport from inland sources . . . the vast bulk of this sand and mud is river-derived" (Pinet 1998:296).

Estuaries dominated by strong tides are considered well-mixed and demonstrate no halocline, or vertical separation of the fresh and salt water masses. Large quantities of offshore sediment are imported into well-mixed estuaries by strong tidal currents. The river-supplied sediment contribution is slight because of the relatively small river discharge compared to the tidal current (Pinet 1998:301).

The third type of estuary is known as partially mixed. A weaker halocline than that found in a salt wedge estuary is the result of a smaller input of river water and a relatively stronger tidal based water movement. As a result, the sediments near the mouth of the estuary are predominantly marine sediments (Pinet 1998:296).

Most estuaries change their short-term circulation classification based on hydrological conditions, particularly local rainfall. As an estuary changes from salt wedge to partially or well-mixed conditions, different types of sediment enter the system, either muddy sediment from rivers or sand from the marine environment (Pinet 1998:294-301). Shipwrecks discovered in such dynamic environments may be buried under layers of different types or sediments or may experience episodic burial and scour events (Wells and McNinch 2003:94).

The Pensacola Pass estuary shifts between a salt wedge and partially mixed classification based on the river output; high river contributions produce a salt wedge, while periods of low rainfall result in partial mixing of the fresh and salt water in the pass (EPA 2005:3). The 2012 UWF dive team experienced salt wedge conditions during several days of the dive season. The dive team reported heavy outbound surface currents even when no current existed only a few feet below the surface (Chapter III). The sediments of Pensacola Bay are in the intermediate size category, consist of fine silt and sand, and are the result of deposits from both the local rivers and tidal contributions from the gulf. However, fine quartz sand predominates in the areas around the pass (Gorsline 1967:220). The different types of sediment reported in Pensacola Bay and the pass reflect the changes in the estuary circulation. These circulation patterns influenced the migration of the channel scarp.

Channel Scarp Migration

In 1866, the steamer *Convoy* sank in 3.6 m (11 ft.) of water on the shallow sand flats north of the main ship channel in Pensacola Pass (*New York Herald* 1876:10). However, the UWF dive teams recorded the minimum depth at the wreck site's north end as 7.6 m (25 ft.), while the south end was nearly 10.7 m (35 ft.). The change in depth was likely caused by the regression of the channel scarp to the north and west over 150 years. Figure 37 shows the progressive migration of the northern channel scarp from 1859 to 2009. Both natural and man-made influences caused the migration.

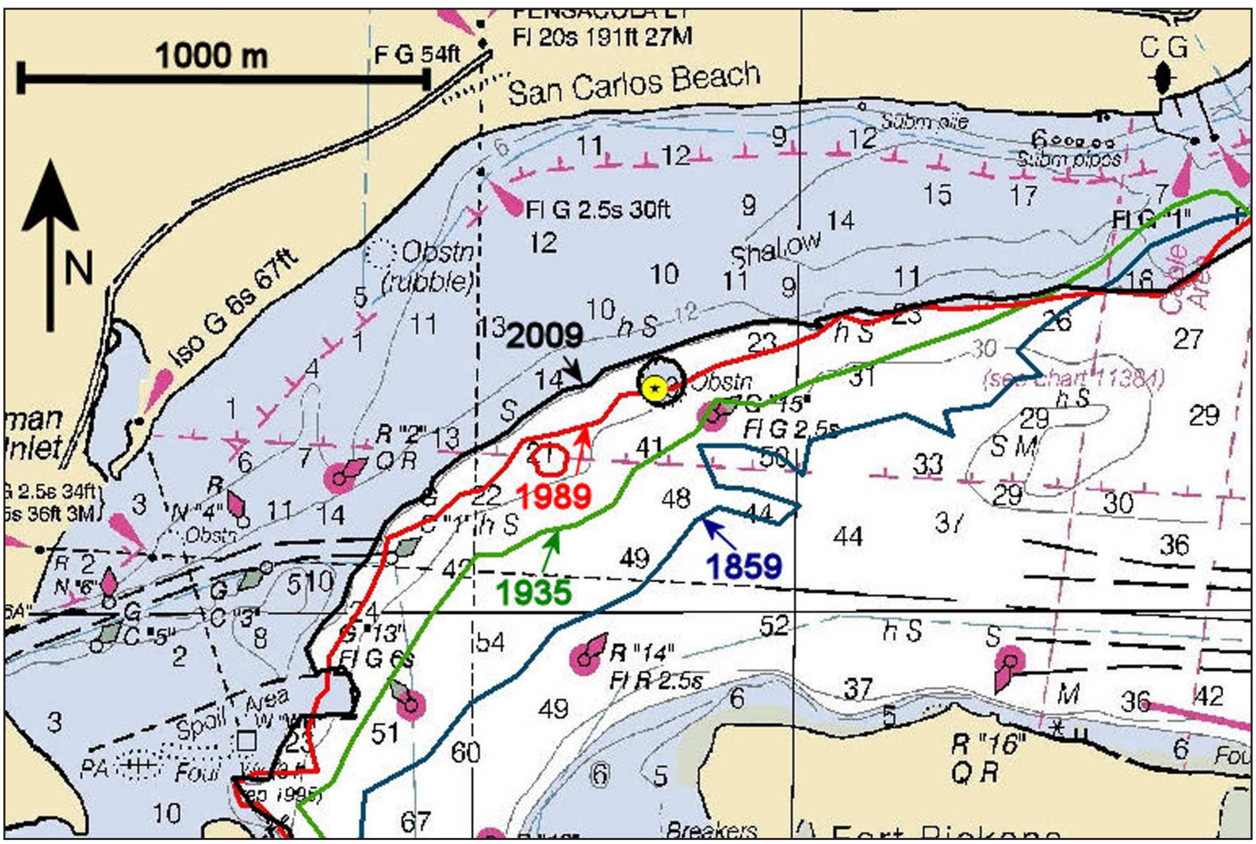

FIGURE 37. Channel scarp migration 1859-2009, soundings in feet. (Figure by author, 2013. Modified from NOAA 2011.)

Natural Influences

Tides at Pensacola Pass are characterized as mixed, with a mean range of 0.4 m (1.2 ft.; Browder and Dean 1999:7). Average tidal current velocities in the pass range from 1.6 knots to 1.8 knots, and the average maximum current velocities are 2.8-knot flood currents and 3.1-knot ebb currents; however, current velocities as high as 8 knots have been recorded (Browder and Dean 1999:9). Table 2 represents the Pensacola Pass tidal currents for June 2012, the only complete month during the field season.

TABLE 2
JUNE 2012 PENSACOLA PASS TIDAL CURRENTS. (TABLE BY AUTHOR, 2013. DATA FROM NOAA 2012).

Day	Slack Water	Max Current		Slack Water	Max Current		Slack Water
	Time	Time	Velocity	Time	Time	Velocity	Time
1		0304	+1.5	0935	1401	-2.2	2030
2		0332	+2.2	1014	1440	-2.8	2118
3		0416	+2.6	1102	1526	-3.2	2211
4		0507	+3.0	1154	1615	-3.5	2306
5		0559	+3.1	1247	1705	-3.5	
6	0001	0651	+3.0	1339	1754	-3.2	
7	0054	0740	+2.6	1429	1839	-2.8	
8	0140	0823	+2.2	1513	1917	-2.3	
9	0216	0855	+1.7	1549	1943	-1.6	
10	0230	0856	+1.0	1605	1948	-1.0	
11	0157	0704	+0.6	1452	1858	-0.5	
12	0001	0452	+0.6	1024	1403	-0.5	2109
13		0352	+0.8	0926	1313	-1.1	1959
14		0330	+1.1	0931	1330	-1.6	2006
15		0333	+1.4	0954	1359	-1.9	2033
16		0351	+1.8	1026	1434	-2.3	2108
17		0418	+2.0	1101	1512	-2.5	2147
18		0451	+2.1	1139	1552	-2.6	2228
19		0526	+2.2	1217	1632	-2.6	2309

Table 2 continues

Table 2 (continued)

Day	Slack Water Time	Max Current		Slack Water Time	Max Current		Slack Water Time
		Time	Velocity		Time	Velocity	
20		0600	+2.3	1254	1712	-2.6	2350
21		0634	+2.2	1330	1749	-2.5	
22	0028	0705	+2.1	1405	1825	-2.3	
23	0104	0733	+1.9	1436	1855	-1.9	
24	0136	0753	+1.5	1501	1916	-1.4	
25	0154	0751	+1.1	1503	1903	-0.8	
26	0127	0638	+0.6	1308	1631	-0.5	2205
27		0345	+0.4	0913	1318	-0.8	1911
28		0204	+1.0	0821	1251	-1.6	1907
29		0202	+1.7	0841	1314	-2.3	1942
30		0236	+2.2	0923	1352	-2.9	2029

Spring tides occur twice in a lunar month and are associated with the highest high tides, the lowest low tides, and the strongest tidal currents (Pinet 1998:250). Table 2 indicates that in the Pensacola Pass in June 2012, the maximum tidal current velocity was approximately three knots during spring tides. These strong currents impinge on the northwest scarp of the natural channel because of the change in direction of the inlet. During ebb, the current flows westward but is deflected toward the south as the current encounters the channel scarp. The reverse action takes place during flood tides; the northern flow is directed to the east at the northwest channel scarp (Militello and Zarillo 2000:850). In addition to the scouring effects of the current, river sediment moves into the estuarine area during salt wedge conditions and sand from the Gulf of Mexico is brought in through the pass during more mixed conditions (EPA 2005:3). These changes contributed to the episodic scour and reburial events that affected the wreck site.

The loss of sediment from beneath *Convoy*'s wreck site was probably a consequence of small episodic scour and settling events over many years. These occurrences likely began to affect the area after the 1989 hydrographic survey. This survey showed *Convoy*'s wreck on the edge of the flats, a few meters north of the channel scarp. Figure 38(a) is a segment of the 2006 navigation chart that shows the location of *Convoy*'s wreck (yellow disk) on the edge of the channel scarp. Figure 38(b) is a segment of the 2011 navigation chart, which used sounding data from the 2009 NOAA hydrographic survey. The chart clearly shows the location of the wreck with a depth of 4 m (13ft.) and the nearby soundings in excess of 6.1 m (20 ft.). The wreck probably retained some sediment beneath it as the surrounding sand was scoured around the wreck. During the three years between the 2009 hydrographic survey and the 2012 diver investigations, the currents likely eroded the remaining sediment beneath the wreck until it came to rest on the hardpan sediment beneath.

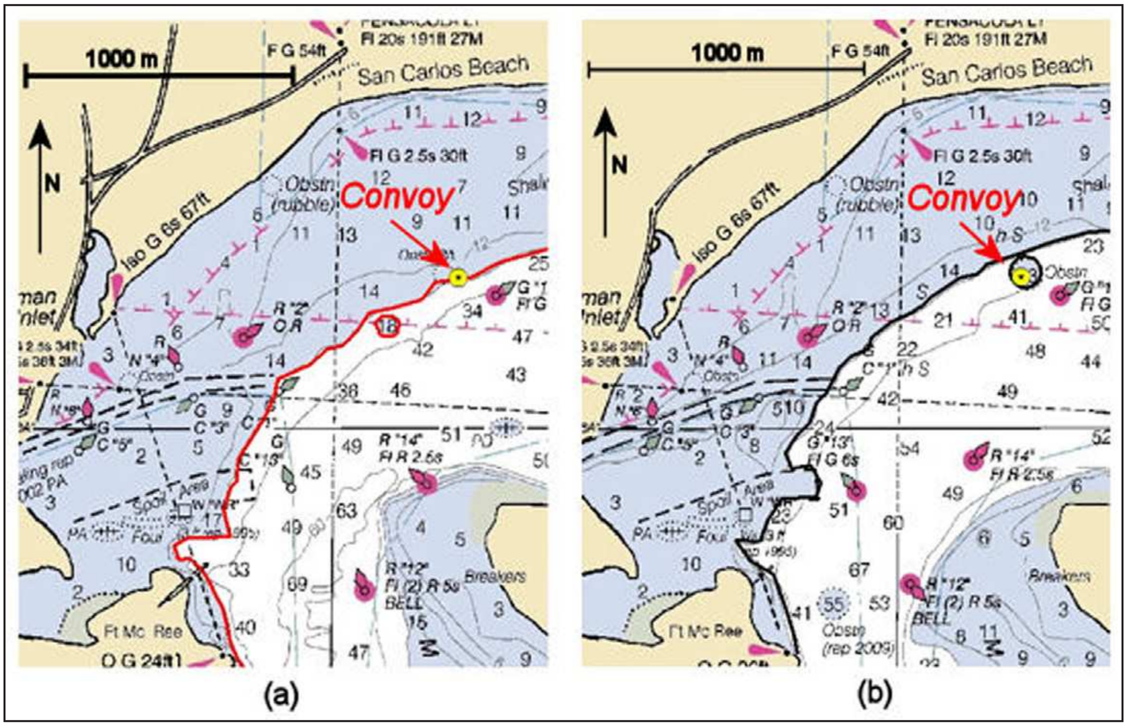

FIGURE 38. NOAA charts showing channel scarp regression, soundings in feet. (Figure by author, 2013. Modified from NOAA 2006 and NOAA 2011.)

Other historic shipwrecks have been subjected to a series of scour and settling events, and researchers have found the wrecks at deeper depths than those reported at the time of their sinking. Wells and McNinch (2003:94) assert that Blackbeard's pirate ship, *Queen Anne's Revenge* (*QAR*), is an example of a wreck found at greater than anticipated depth:

> We believe that a . . . sequence of scour and settling occurred episodically at the *QAR* site after the vessel ran aground. The lower hull and intact artifacts probably settled quickly

into the sandy shoal after the initial destruction of the masts and superstructure by waves. Strong tidal and wave-driven currents would have created rapid scour and subsequent settling until all of the artifacts that were littered around the hull, and the hull itself became level with the surrounding shallow seabed. This sequence of scour and settling probably repeated itself whenever strong flows from a storm or from the inlet channel caused erosion of the surrounding bed. Once the artifacts were exposed, subsequent tidal and wave-driven currents would continue the scour process until the objects settled to the level roughly equal to the new bed depth.

Figure 39 shows the likely sequence of scour and settling of *Convoy*'s wreck based on evidence from historical charts and the 2012 diver investigations. Figure 39(a) illustrates the wreck in the shallow flats; Figure 39(b) shows the approach of the channel scarp; Figure 39(c) demonstrates the erosion of the sediment around the wreck after the 2009 hydrographic survey; and Figure 39(d) shows the resulting wreck site after the underlying sediment was scoured between 2009 and 2012. Figure 40 shows the sediment scour likely caused by spring tidal current at the north end of *Convoy*'s wreck site.

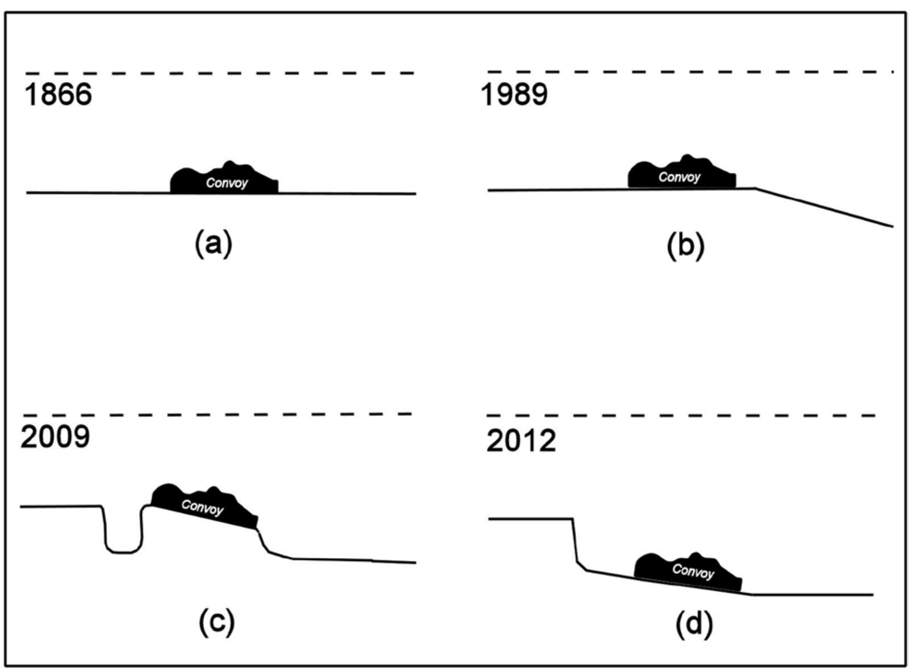

FIGURE 39. Scour and settle process for *Convoy*'s wreck site. (Figure by author, 2013. Modified from McNinch et al 2006:294.)

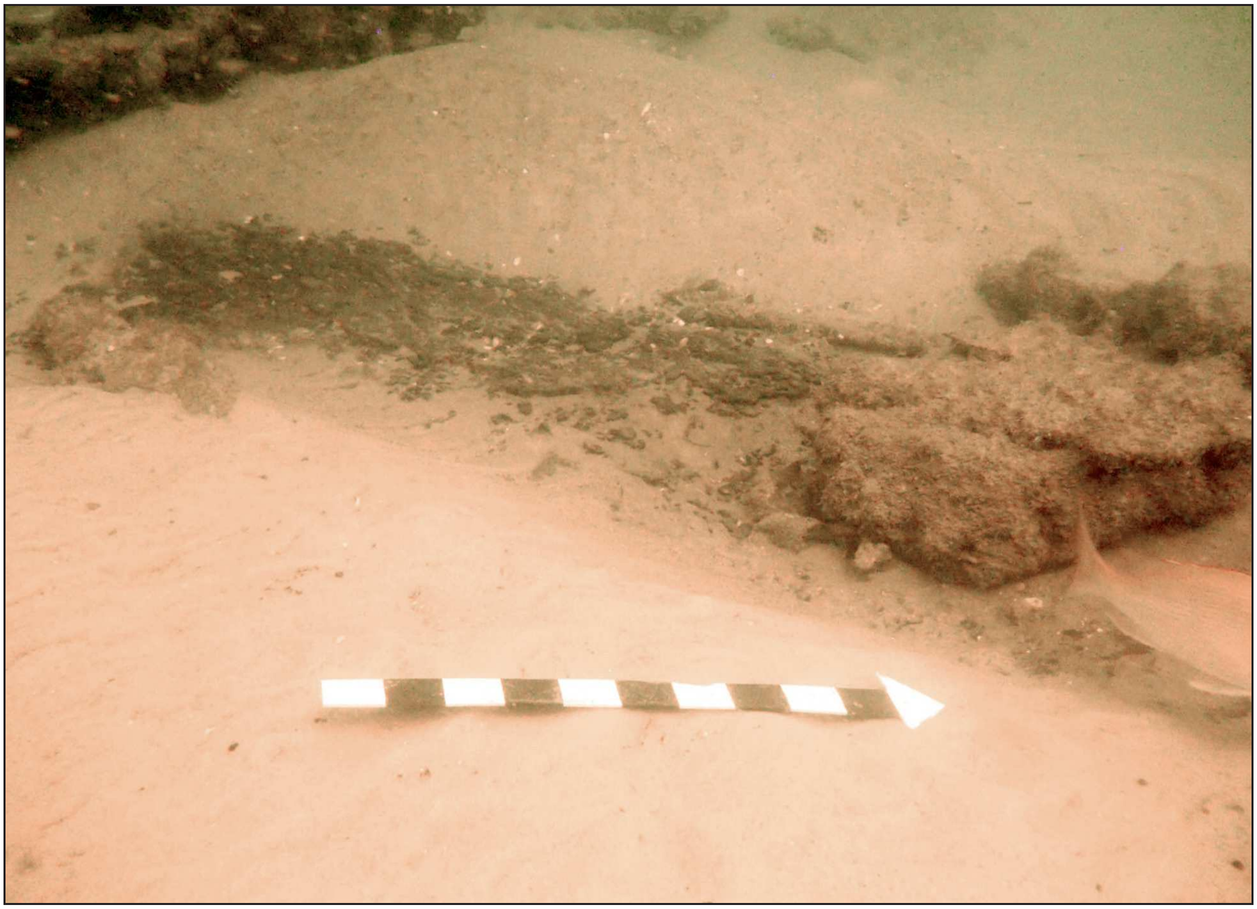

FIGURE 40. Spring tide current scour; scale equals 1 m. (Photo by author, 2012.)

Dredging Effects

Various agencies, including the U. S. Navy and USACE, have dredged Pensacola Pass since the 1880s (Browder and Dean 1999:19). Additionally, the land cut between Perdido Key and Naval Air Station (NAS) Pensacola was completed as part of the Mobile-Pensacola Canal in 1934 (Chapter II). Figure 41 shows the location and dimensions of the Navy-maintained channel stretching from the entrance channel to the turning basin west of NAS Pensacola. The USACE is responsible for maintaining the depth of the ship channel from Fort Pickens on Santa Rosa Island to the Port of Pensacola docks at the City of Pensacola (USACE and EPA 2005:5).

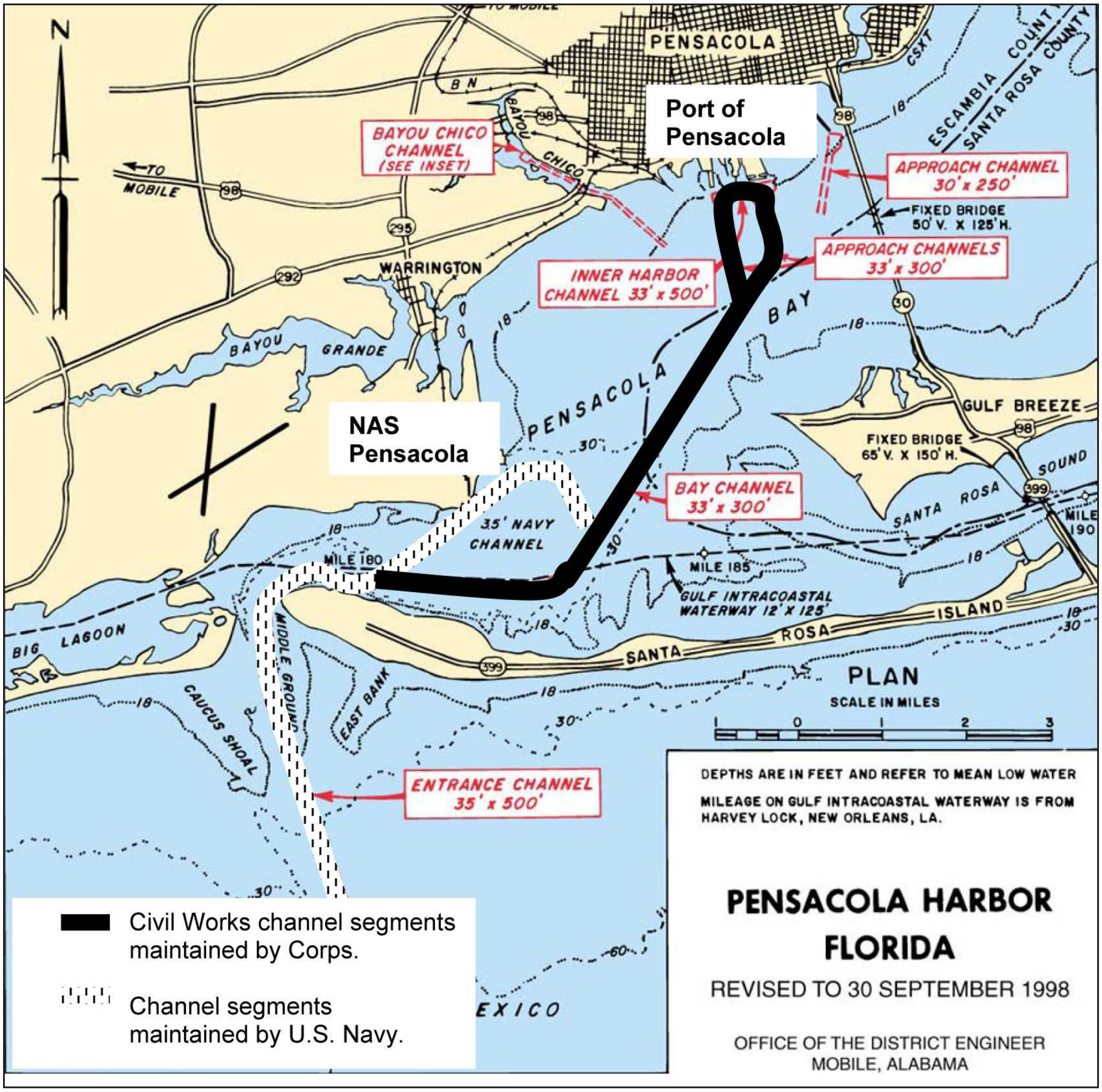

FIGURE 41. Pensacola Harbor dredging. (Figure by author, 2013. Modified from USACE and EPA 2005.)

Large quantities of dredge spoil have been removed from the Pensacola ship channel since dredging began in 1881. The annual dredging rate since then has increased, according to USACE records. Dredging the ship channel now influences the surrounding shoals:

> [The quantity of material removed by dredging] represents more material than is supplied to the Pass from the net littoral drift and the adjacent eroding shorelines. This implies

> that the dredging operations are serving to "draw down" the shoals. That is, the shoals are decreasing in volume as a result of the maintenance of the deep navigation channel. (Browder and Dean 1999:20)

The increase in the volume of material removed from the ship channel in order to maintain the same depth might be the result of a collapse of the sides of a newly dredged channel. The new material is then removed during the next dredging event. The increased dredging of the ship channel may have accelerated the natural regression of the northwest channel scarp (Browder and Dean 1999:23). Additionally, the small dredging operations to maintain the ICW channel between NAS Pensacola and Perdido Key may account for some of the loss of the northwest channel scarp (Browder and Dean 1999:24).

Ship Effects

As ships move through the water in a restricted channel or near a channel bank, "a displacement wave of depression forms . . . the wave can be effective in creating negative impacts in shallow water and at channel banks" (Hochstein and Adams 1986:4). In addition to displacement waves created under the water, movement of a vessel through the water also generates bow waves and wakes that are oriented approximately 20° from the vessel's trackline. These surface waves create orbital velocities that are adequate to re-suspend bank sediment in shallow water. Screw wash (also known as *jet force*) from the rotating screws of ship traffic impinges on channel banks and causes erosion of the sediment (Hochstein and Adams 1986:4). A ship's bow is pushed away from a nearby channel bank by a force known to navigators and coastal pilots as *bank cushion*; conversely, the complementary force that pushes a ship's screws toward the same bank is *bank suction*. Sometimes a pilot might use combined forces of bank cushion and bank suction by applying a slight right rudder—assuming the bank is on the starboard side of the ship—to cushion the bow away from the bank and simultaneously compensate for the bank's suction effect (Noel et al 1989:225).

As the northwest channel scarp eroded, the position of Buoy 15 in the ship channel was adjusted approximately 110 m (360 ft.) to the northeast of its charted location. The green dot on

Figure 42 indicates the measured position of Buoy 15 compared to its charted location (G “15” Fl G 2.5s). The effect of moving the buoy was that the northern edge of the channel moved 40 m (133 ft.) closer to *Convoy*’s wreck site. The red dashed line on Figure 42 shows the new northern limit of the channel that is followed closely by tug and barge traffic traveling east and west to and from the ICW channel through the land cut. The prevailing winds during the winter months are from the north, and tug and barge pilots sometimes hug the north side of the channel in order to “crab” into position to enter the ICW channel. In doing so, these vessels may use bank cushion and bank suction to line up for their approach as they pass very near *Convoy*’s wreck site. The close proximity of the vessel passage likely increased the effects of displacement waves, bow waves and wakes, and screw wash on the wreck site and has likely resulted in increased sediment erosion in, under, and around the site.

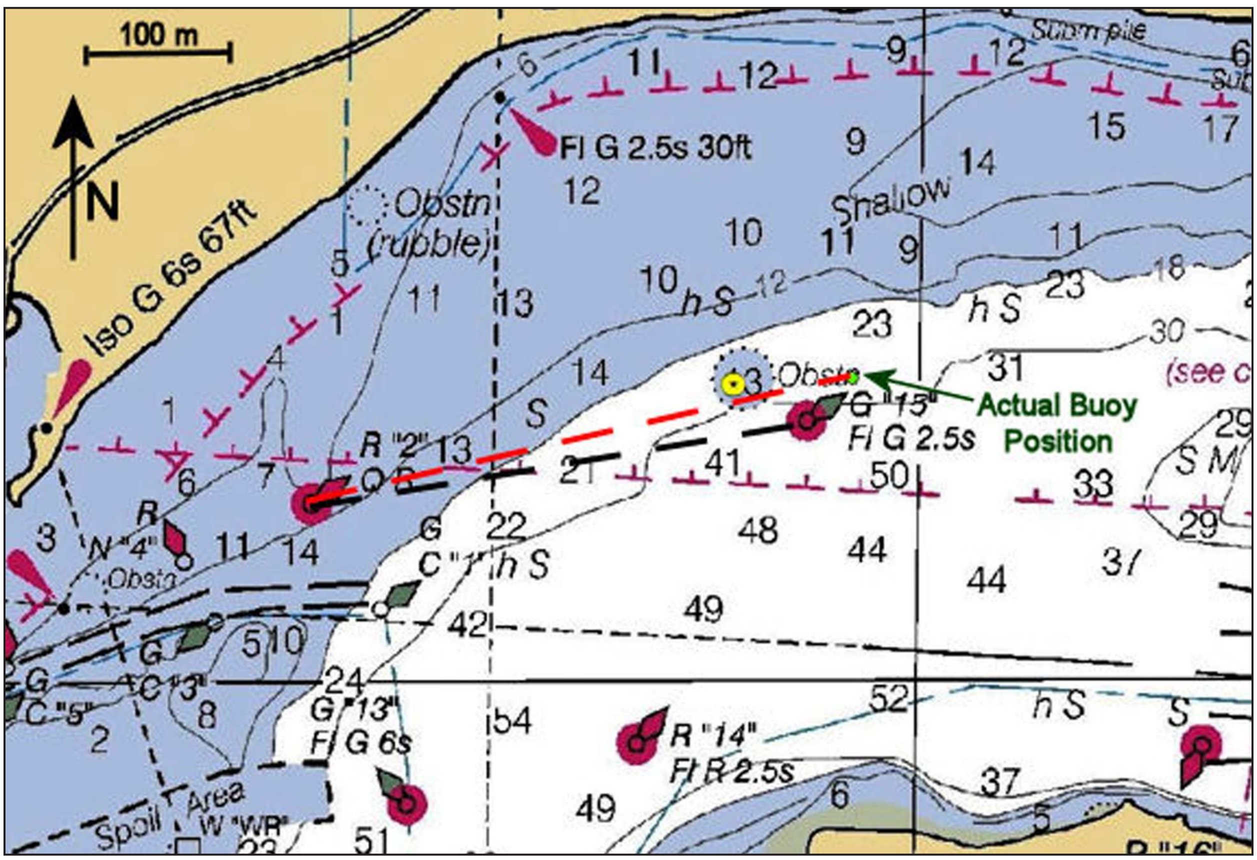

FIGURE 42. Migration of the north channel boundary, soundings in feet. (Figure by author, 2013. Modified from NOAA 2011.)

Three factors contributed to the erosion and migration of the northern channel scarp. The primary cause of the bank erosion was the natural impingement of the spring tidal currents on the channel bank, where the channel changes direction. Second, dredging operations in the ship channel and the ICW channel likely accelerated the erosion process. Finally, the movement of the navigation buoy closer to the eroded bank—and closer to *Convoy*'s wreck site—likely also contributed to the erosion and migration of the northern channel scarp.

Summary

A review of historical hydrographic charts of Pensacola Pass indicates that the northern channel scarp has regressed significantly over the past 150 years. Much of the sediment movement can be attributed to natural forces. Strong spring tides eroded the sediments at the edge of the channel. Variations in rainfall caused changes in the freshwater contributions of the local rivers; correspondingly, Pensacola Pass shifts between salt wedge conditions that supply the estuary with fresh river sediments and partially mixed cycles that receive sand from the Gulf of Mexico.

Man-made forces have likely increased the speed of the channel scarp regression. Dredging of the main ship channel and the ICW land cut between NAS Pensacola and Perdido Key have likely contributed to the migration of the northern channel scarp through the process of channel bank slump. Sediment from the shallows has flowed into the channels only to be removed during U. S. Navy and USACE dredging operations. Screw wash, displacement waves, bow waves, and wakes from passing vessels likely had a corrosive effect on the channel bank.

Natural and human forces have changed the wreck site. The features and artifacts associated with *Convoy*'s wreck have undergone a series of scour and settling periods that have created the current archaeological site. In the summer of 2012, diving operations in Pensacola Pass recorded the strong currents that limited the safe diving windows each day, particularly during the bimonthly spring tides. The divers also witnessed the results of these currents in the form of large sediment drifts and scours that uncovered and then re-covered different sections of the wreck site.

The geomorphological findings from the *Convoy* wreck have contributed to a greater understanding of the natural forces that make up the site's physical site formation processes. These processes acted as scrambling devices by rearranging artifacts and features on the bottom. The strong currents in the pass also functioned as extraction filters as they carried away small portable artifacts and structures weakened by shipworms (Muckelroy 1978:159-184).

CHAPTER V

SITE FORMATION PROCESS DISCUSSION

The study of maritime site formation processes has produced a wide variety of theories, most of which address distinct sub-processes of the overall formation of shipwreck sites. Some maritime archaeological theorists have focused on the physical influences of a wreck, while others have examined the intentional and unintentional consequences of human activity on a site. This chapter discusses various site formation process theories and proposes a new generic model that addresses both physical and cultural processes.

Systems theory has helped to identify the progression of site formation theory over the last three decades. Early theorists developed simple process models that applied to all or most shipwrecks; later archaeologists have focused on the subsystems of physical and cultural processes, providing more detailed models to explain the evolution of shipwrecks on the bottom. Figure 43 is a process diagram for the development of maritime site formation theory.

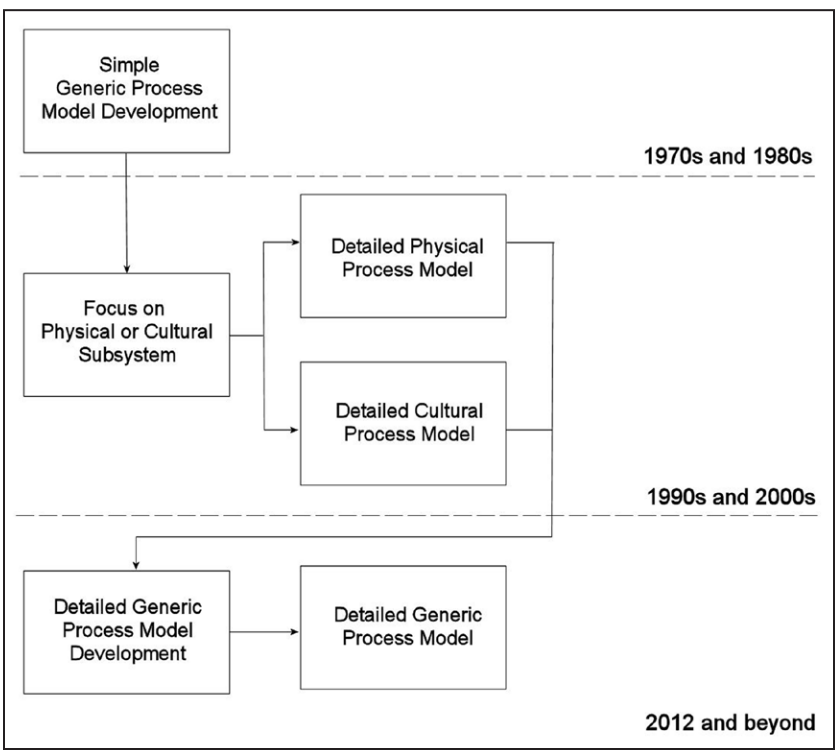

FIGURE 43. Evolution of maritime site formation process theory. (Figure by author, 2013.)

Early Site Formation Theories

Muckelroy (1978) was the first maritime archaeologist to represent shipwreck site formation processes as a system. He envisioned a ship as a system that has undergone a series of transformations to form the present wreck site (Muckelroy 1978:158). His transformations were similar to Schiffer's (1975) cultural (C) and non-cultural (N) transforms. Although Muckelroy did not divide his transformations into cultural and non-cultural categories, his processes included both C-transforms and N-transforms from Shiffer's classification scheme. The concept of site transformation was common to both authors in their writings in the mid to late 1970s. Muckelroy grouped both cultural and non-cultural transformations into extracting filters and scrambling devices. Extracting filters work to remove parts of the ship from the wreck site, while scrambling devices rearrange artifacts and features at the site (Muckelroy 1978:159-184).

By removing portions of the ship, extracting filters play an important role in the evolution of the wreck site. The initial phase of Muckelroy's (1978) process diagram is the ship's wrecking event. As the sea inundates a ship, some parts of the wreck float away. Large portions of wooden wrecks can remain buoyant long enough to become separated from the main wreck. Air trapped in sections of steel- or iron-hulled ships may cause sections to float away. All ships contain buoyant or semi-buoyant objects that researchers typically do not find at the wreck site. In addition, before being quenched by the sea, many shipboard fires consume large portions of wooden ships. The extracting forces of the process of wrecking often carry away or consume sections of the ship that never become part of the wreck site. Other extracting filters remove portions of the wreck site after the initial process of sinking, including artifact and feature deterioration by physical, chemical, and biological forces. Muckelroy (1978:165-169) listed salvage operations and archaeological excavations as extraction filters because they removed artifacts and features from wreck sites. Figure 44 is a modification of Muckelroy's flow chart showing the processes that he considered extracting filters and scrambling devices.

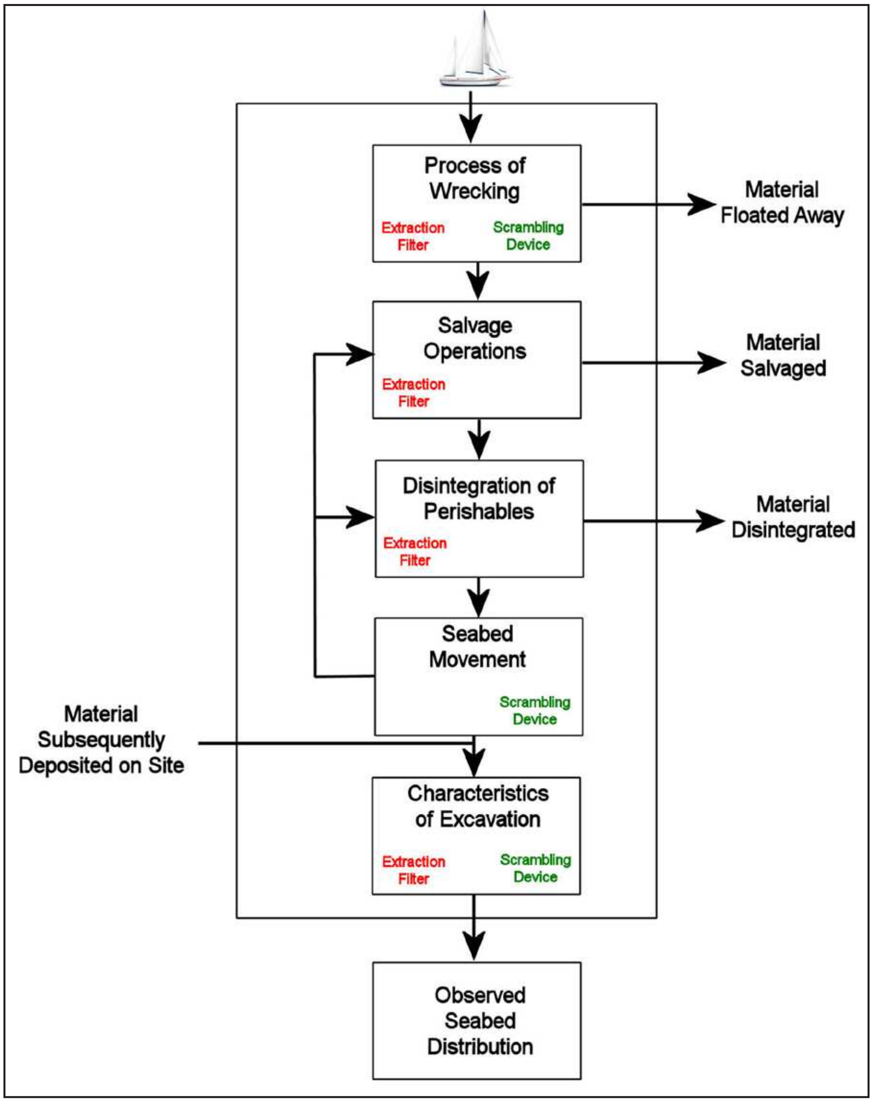

FIGURE 44. Muckelroy's process. (Chart by author, 2013. Modified from Muckelroy 1978:158.)

Muckelroy (1978) divided scrambling devices into two broad categories: the wrecking process and seabed movement. During the wrecking process, the ship system suffers a catastrophic failure that causes the rearrangement of artifacts and features on the bottom. The process continues for many years as the wreck site breaks up and settles. Once the wreck becomes part of the seascape, the process of seabed movement causes the site to develop into the present day site (Muckelroy 1978:169-182). Interestingly, Muckelroy did not list salvage efforts as scrambling devices despite the tendency of such operations to move or reorient objects on the seafloor.

Muckelroy (1978:159) attempted to develop predictive models for site formation processes and defined the ship and the process of shipwrecking as closed systems; however, current systems theorists would most likely define both as open systems. Ships and their wreck sites are open to and are influenced by the unpredictable nature of their environments. In this sense, many systems today are considered open systems; exceptions include mechanized production equipment and other systems with fixed inputs and outputs (Cavaleri and Obloj 1993:29).

Despite the openness of the systems, Muckelroy (1978:159-165) did provide some useful generalizations regarding the predictable nature of extracting filters and scrambling devices. He examined 20 wreck sites around the British Isles, using 11 site attributes ranging from the minimum and maximum depths to the types and depths of the seafloor sediments. His analysis indicated that the underwater topography and the nature of the sediment were the most influential factors in determining site preservation and integrity.

Physical Site Formation Processes

While Muckelroy (1978) focused on subdividing site formation processes into extracting filters and scrambling devices, many geologically trained archaeologists studied Schiffer's (1975) non-cultural N-transforms and examined the subsystem of non-cultural or natural wreck site processes. Ward et al. (1999), in perhaps the best high-level explanation of the underwater natural processes effecting submerged wreck sites, divided the natural processes into physical, biological, and chemical. Their research showed that the amount and type of sediment around the wreck and the hydrodynamic environment (high versus low energy) had the greatest impacts on site integrity and preservation. The thickness of the surrounding sediment layer determined the mass of the wreck exposed to the three subsystems of physical, biological, and chemical processes. This concept seemed to confirm Muckelroy's research.

Swift currents, abrasive sediment movement, and other moving debris wear down exposed elements of wrecks in high-energy environments. In low-energy areas, chemical processes influence the wrecks of iron ships more than wooden ships, while wooden shipwrecks more easily fall prey to biological factors (Ward et al. 1999). Ward et al. (1999) illustrate that three non-cultural sub-processes were not mutually exclusive. Figure 45 illustrates these processes.

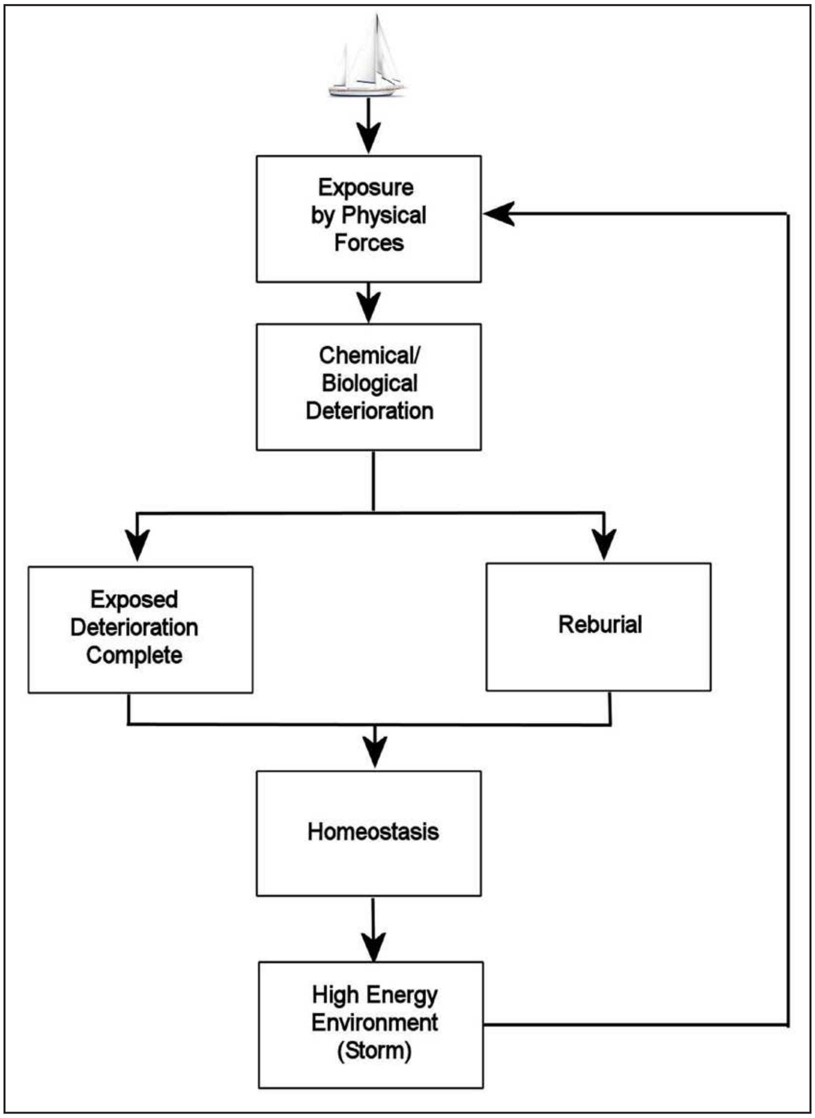

FIGURE 45. Physical process model. (Chart by author, 2013. Modified from Ward et al. 1999.)

All three processes work together to reach homeostasis, determined by the sediment load and the mass of exposed structure. Chemical and/or biological deterioration continues on a site until all exposed material has disintegrated. Large portions of a wreck are lost in high-energy environments, where sediment trapping is small, and much of the wreck is exposed above the bottom. Greater hull preservation exists at wreck sites with smaller exposed structural mass, as most structure is buried beneath thick sediments in low-energy environments. In either case, the wreck reaches homeostasis when the chemical and/or biological processes deteriorate the exposed structure above the sediment and the anoxic sediment layer. Storms may disrupt the homeostasis and function as a catalyst for punctuated equilibrium by exposing new portions of a wreck site to the deteriorating effects of seawater.

Cultural Site Formation Processes

Gibbs (2006) expanded Muckelroy's (1978) process models for cultural maritime site formation processes. Gibbs (2006:7) based his research on models used in disaster studies in which human activities "can be viewed and investigated within a process-oriented framework of consistent stage that embraces both the physical progress of the event and the behaviors that take place in each phase." The five major disaster stages fit well into a systems approach to studying shipwrecks: pre-impact, impact, recoil, rescue, and post-trauma (Leach 1994:8). Gibbs's (2006:7-8) disaster phased process is a framework that other researchers can use to define the cultural site formation processes of a shipwreck. These processes are equally applicable to non-cultural processes. Figure 46 is a simplified version of Gibbs's application of Leach's disaster phases to a shipwreck.

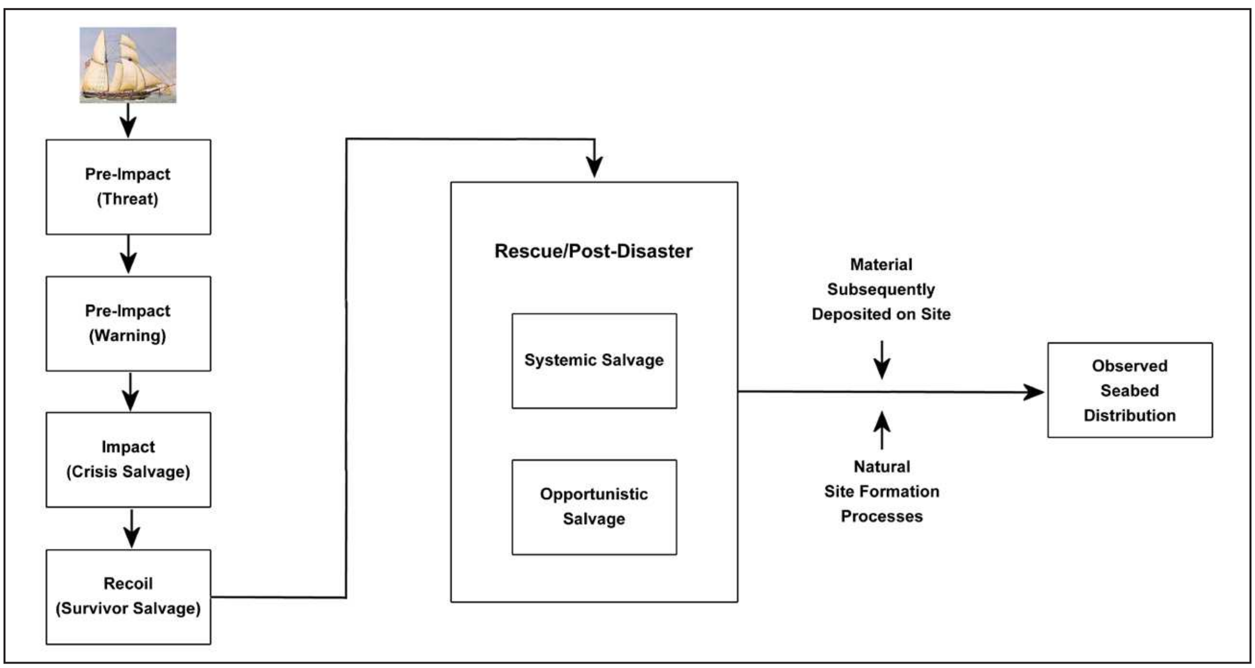

FIGURE 46. Gibbs's cultural processes. (Chart by author, 2013. Modified from Gibbs 2006.)

Pre-impact phase processes consist of two sub-phases: threat and warning. Threat sub-phase processes take place before wrecking and may include pre-voyage preparations, route planning, crew training, and vessel design (Gibbs 2006:8). Historical archaeology plays an important part in all the phases of cultural site formation processes, but perhaps none more than during research into the threat sub-phase. Historical records are often the only source of this type of information. Documentation covering improper route planning or inadequate crew training is invaluable to researchers because these aspects of the vessel's lifespan are nearly impossible to detect in the archaeological record.

Poor vessel design might manifest itself in the archaeological record in the form of substandard choices of wood for hull elements or unfinished frames. Sometimes evident are repairs that attempted to compensate for problems that arose from improper design. For example, maritime archaeologists studying the remains of the Swedish warship *Vasa* may have discovered evidence of the ship's poor design. *Vasa* sank on its maiden voyage in 1628 when a gust of wind caused the ship to heal over, exposing its open gunports to the sea. The Swedish government raised the ship in 1961 and built a museum around the nearly intact hull. Recent detailed examinations of *Vasa*'s hull indicate that the shipwrights built the warship with an asymmetrical hull shape. As a result, *Vasa*'s hull may have been heavier on one side, and the imbalance may have contributed to the disaster (Laursen 2012:46).

The warning sub-phase of a disaster includes activities to avoid or lessen the impact of the disaster. While heavily dependent on the historical record, many warning sub-phase behaviors are detectable in the archaeological record, such as rudder positions that might indicate last minute course changes to avoid disaster or the dropping of an anchor to slow or stop a vessel (Gibbs 2006:10). A remarkable example of warning sub-phase activities observable in the archaeological record is the "Ghost Ship" discovered in the Baltic Sea in 2003. The 17th-century Dutch-built merchant ship rests upright on the bottom in nearly 130 m (427 ft.) of water. The cold anoxic waters of the Baltic preserved many of the vessel's masts and spars that would have deteriorated in warmer water. Archaeologists studying the ship reassembled nearly the entire sail rig and determined the last trim of the sails. The research team inferred that the sails were set to "heave-to" in order to slow the ship; heaving-to involves backing some or all of the sails. The evidence suggests that "this was the last maneuver carried out on board the Ghost Ship before it sank; the reason for 'heaving–to' may have been to operate the pumps or even to get into the lifeboats" (Eriksson and Ronnby 2012:359).

The impact phase of a disaster involves actions taken in direct response to the threat as it happened. Examples include jettisoning material to lighten a grounded ship or to reduce combustible material aboard a burning vessel, damage control efforts in response to battle damage such as patching leaks or shoring bulkheads, or lowering lifeboats. Sometimes archaeological traces may be difficult to categorize as either pre-impact or impact phase actions because the crew's efforts to abandon ship or drop anchors might start in either phase. Crisis salvage is also possible during the impact phase; some crewmembers might have time to retrieve personal gear or keepsakes before abandoning their ship. Documented cases aboard Dutch ships reveal that some sailors, perhaps facing the inevitability of their demise, chose to break into the spirits locker and drink themselves into a stupor. Evidence of such actions can be seen in the archaeological record of a wreck site in the form of broken liquor lockers and/or bodies found in or near the area (Gibbs 2006:11-12).

The recoil phase of a disaster usually begins immediately after the crisis has passed. The crew is often in their lifeboats or ashore on a desolate island during this phase. Sometimes the surviving crew find themselves in another crisis, such as aboard a leaky lifeboat or ashore on an island without food or water. Limited survivor salvage of the vessel can occur if the wreck is close enough and shallow enough to allow such behavior. The recoil phase can be short if the crew finds safety quickly (Gibbs 2006: 13).

An example of crew action during the recoil phase of a shipwreck that appears in the archaeological record is found in the wreck of *La Belle* in Matagorda Bay, Texas. The ship was part of Sieur de La Salle's 17th-century French expedition commissioned to locate the mouth of the Mississippi River and establish a settlement there. After missing the Mississippi, LaSalle left the ship to search for the river via a land route. Supplies aboard *La Belle* ran low, and the ship grounded in a storm. Hostile native Americans prevented the crew from seeking fresh water ashore, and the remaining crew died of dehydration after their drinking water ran out. In 1993, archaeologists discovered two skeletons on the wreck, one near the stern and the other in the bow near the anchor line. Excavators found the remains in the bow next to a cask where the crewmember likely died, implying that the man may have died of dehydration after he exhausted his drinking water supply (Bruseth and Turner 2005:116-117).

The rescue phase of a shipwreck commences when the crew reaches safety. When all hands are lost, a wreck never reaches this phase. Rescuers can bring additional labor and equipment to conduct a more extensive salvage of the wreck; salvage during this phase would likely focus on recovery of items beyond those necessary for survival, including cargo and ship's equipment. The first official documentation of the disaster usually begins during this phase (Gibbs 2006:13).

The final phase of a shipwreck's site formation process is the post-disaster phase. Most of the natural or non-cultural formation processes take place during this phase, including those identified by Ward et al. (1999) as outlined above. However, cultural processes continue during this phase, including various types of salvage. Gibbs (2006:15) outlined two separate forms of salvage that take place during the post-disaster phase of a maritime disaster. Opportunistic salvage is an unorganized process that involves the removal of artifacts and features by groups or individuals—often local inhabitants—who happen upon a wreck. Typically, opportunistic salvage includes the removal of easily accessible cargo, fittings, and small structures. In that sense, opportunistic salvage is similar to crisis or survivor salvage except that it takes place in the post-disaster phase (Gibbs 2006:15-17).

Systematic salvage is a much more organized process that accesses all levels of a shipwreck site. Systematic or deliberate salvage often has a specific goal, such as the recovery of important or profitable cargo. Salvage operators execute their activities only after careful consideration of the anticipated costs and benefits (Gibbs 2006:17). Sometimes cargo recovery is not the primary motivation behind the salvage operation; salvors also remove vessels because they are navigational hazards. Interestingly, Gibbs (2006) followed Muckelroy's (1978) lead and did not mention the scrambling qualities of either forms of salvage.

While Gibbs's (2006) model detailed the cultural processes of a shipwreck within the framework of the phases of a disaster, he left out some key cultural processes in the post-disaster phase. Gibbs (2006) effectively covered the deliberate systems of wreck site formation, but he gave little attention to the unwitting impacts of humans on shipwrecks. Stewart (1999:574-578) touched on the ill effects of treasure hunters and sport divers on underwater sites; however, he also addressed the unintentional effects of humans on submerged sites, including construction (such as the erection of bridges and oil platforms and the laying of underwater pipelines and cables), the dredging of harbors and channels, and the disposal of refuse.

Combining Stewart's (1999) and 's (2006) process models, the cultural processes in the post-disaster phase of a site's formation can be divided into intentional and unintentional. The intentional sub-processes would include opportunistic and systematic salvage, and the unintentional sub-processes would consist of construction, dredging, and refuse deposition.

Combining the Process Models

The different models for explaining the sub-processes of wreck site formation can be combined to examine individual wrecks, providing a detailed systems approach to explain the impacts on a wreck site. The comprehensive generic model for shipwreck site formation in Figure 47 incorporates the theories of Muckelroy (1978), Schiffer (1975), Gibbs (2006), Ward et al. (1999), and Stewart (1999), showing the generic processes for the post-disaster phase of a shipwreck and including all the likely cultural and non-cultural processes affecting the extracting filters' sub-process. Many of these processes can also be applied to the scrambling device sub-process as well as to other phases of a shipwreck disaster. However, not all processes will be applicable to every phase.

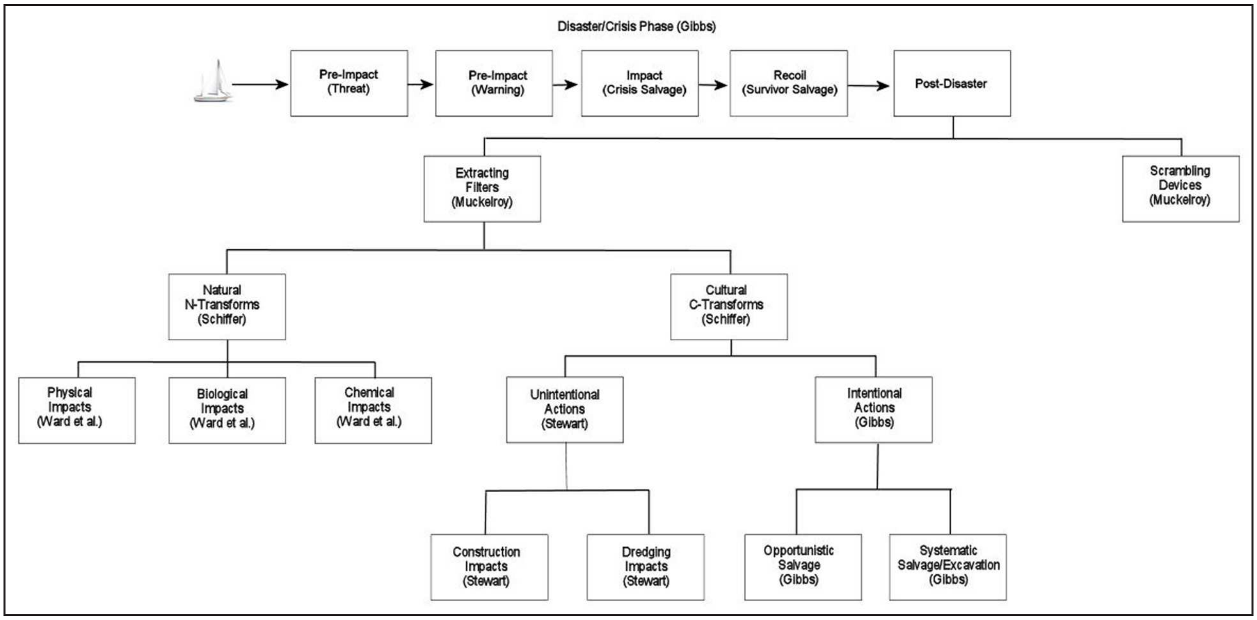

FIGURE 47. Generic site formation process model. (Chart by author, 2013.)

Summary

Generic maritime site formation process models are useful when applied to a specific shipwreck or to a set of shipwrecks. Schiffer (1975) divided the actions that influence an archaeological site into Cultural (C-transforms) and Non-cultural (N-transforms), a concept that spawned a series of maritime theories focusing on one or the other of Schiffer's transforms. Gibbs (2006) combined Schiffer's (1975) cultural transforms, Muckelroy's (1978) concepts of extracting filters and scrambling devices, and Leach's (1994) phased disaster process to develope a comprehensive description of the cultural processes that affect shipwrecks. Ward et al. (1999) studied Schiffer's (1975) N-transforms and assembled a physical site formation process model that accurately depicts the physical, biological, and chemical interactions on a wreck site.

When combined, the generic site formation process models help explain how the wreck site of the steamer *Convoy* developed over 150 years; Chapter VI considers these processes in detail. Researchers have determined some of the site formation processes that impact the wreck of the Confederate schooner *William H. Judah*, even without a firm location for the wreck. An examination of *Judah*'shistorical record and the physical processes that impacted *Convoy*'s wreck site have defined many of *Judah*'s site formation processes, detailed in Chapter VI.

CHAPTER VI

CONCLUSIONS

Thesis Questions Revisited

Answering the primary question concerning *Convoy*'s site formation processes required the application of site formation theory (discussed in Chapter V) to the historical, archaeological, and geomorphologic findings. The answer to the secondary question, that of *Judah*'s collocation with *Convoy*'s wreck, required a comprehensive examination of the area including remote sensing surveys and diver investigations. Ancillary to both research questions is the possible location of *Judah*'s wreck site, which can be estimated based on the knowledge of where it is not. The findings from *Convoy*'s wreck site shed light on some likely formation processes that also affected *Judah*'s site.

Convoy Site Formation Processes

Application of the historical, archaeological, and geomorphologic findings described in Chapters II, III, and IV to the generic site formation process model explained in Chapter V determined *Convoy*'s site formation processes. Figure 48 illustrates the activities that contributed to the wreck site that was observed on the bottom of Pensacola Pass in 2012. The process blocks follow Gibbs's (2006:7-8) crisis/disaster model with the corresponding date on the left and the major impacts to the wreck site on the right. The post-disaster phase has been subdivided to cover the major timeframes since the ship sank in 1866.

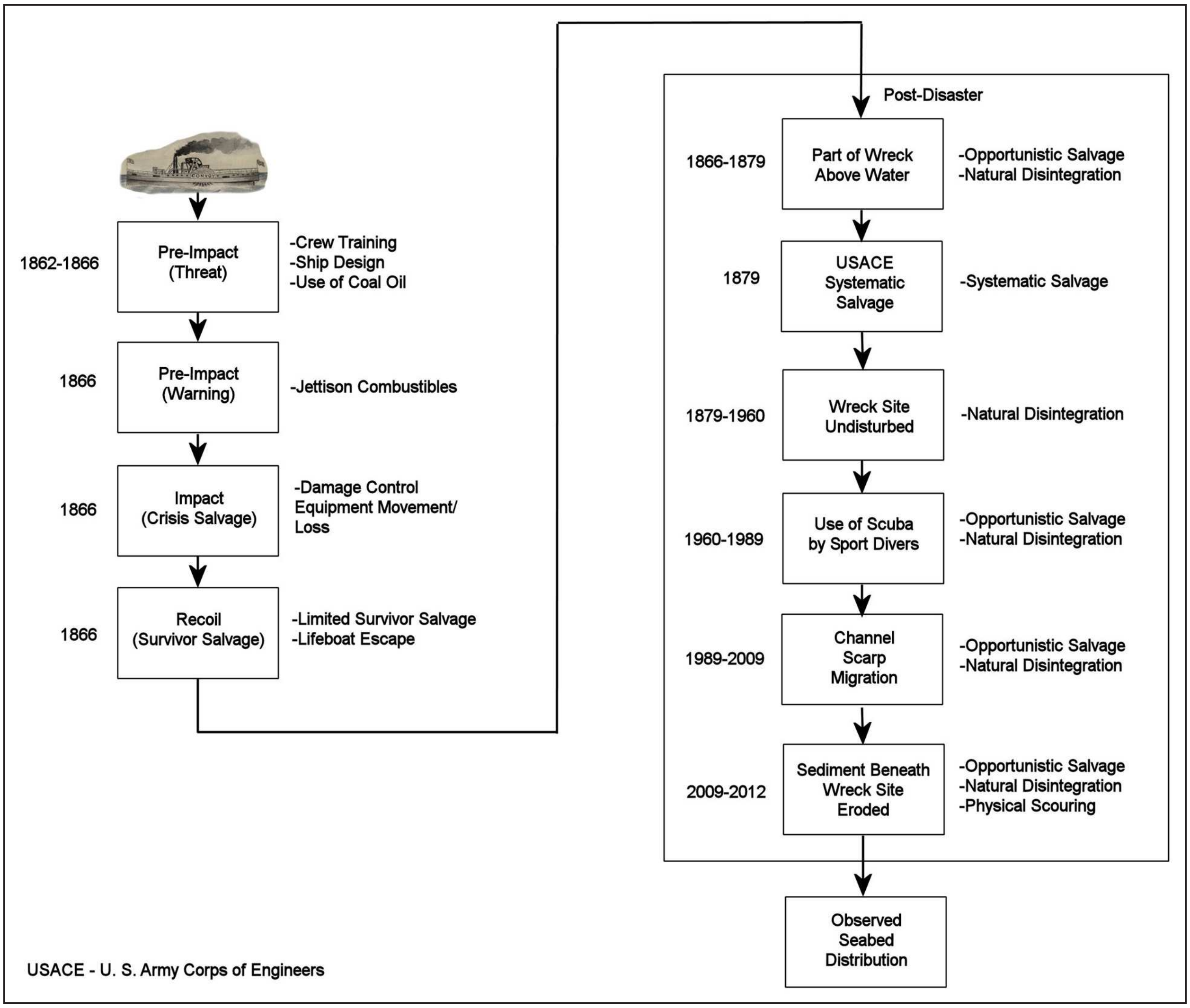

FIGURE 48. *Convoy* process model. (Chart by author, 2013.)

Pre-Impact, Impact, and Recoil Phases

Some of the factors that contributed to *Convoy*'s demise are found in the historical record, and others can only be inferred. Colonel George Wise (1866:122) of the U. S. Army Quartermaster Department described the steamer's loss as a direct result of the use of coal oil in the engineering space, an occurrence that was not unique: "I cannot too strongly condemn the practice of using this inflammable material for illuminating purposes on shipboard, it being the frequent cause of loss to life and property."

Other processes are not as clearly attributable to the ship's loss. The training of the crew to control an oil spill and combat a small fire can be brought into question. An oil spill and the resultant fire should not have caused the destruction of the entire vessel. The ship's design may have contributed to its loss because a poorly designed ship might have prevented the crew from reaching the fire before it grew out of control.

The crew may have had time to jettison some of the more explosive and combustible items in an effort to save their ship; such actions would have been extracting filters. Firefighting equipment such as buckets of sand or water and fire axes were likely displaced as the crew battled the blaze in the engine room. All these actions changed the wreck site; jettisoning acted as an extraction filter, and the movement of the firefighting equipment worked as a scrambling device.

The crew departed the burning ship quickly. The *New York Times* (1866:5) reported that "the captain and crew were obliged to escape in boats in their night clothes." The newspaper article provides two important clues that influenced the wreck. First, the rapid departure of the crew indicates that they had little time for crisis or survivor salvage. Some crewmembers awakened by the alarm might have had time to retrieve personal items before abandoning ship, but most had little time to do so. Most of the crew probably left their few personal possessions aboard the steamer as the vessel burned and sank. An example of personal gear found on the wreck site is the two kaolin pipes that were possibly left behind as the sailors abandoned ship.

The second fact cited in the 1866 *New York Times* article that might have affected the wreck was that the crew escaped in boats. These boats were probably *Convoy*'s lifeboats, carried for just such an occasion. The crew likely rowed to the nearest shore in Pensacola Bay, which was approximately 800 m (880 yds.) from the wreck site. Because the crew removed the lifeboats from the ship, no lifeboat debris should have been found on the wreck site. Accordingly, no such features or artifacts were recovered.

Post-Disaster Phases

Parts of the wreck site remained above the 3.4 m (11 ft.) deep water. The *Baltimore Sun* (1876:1) reported that "the steam drum and connecting rod show above high water, the former about five feet and having the appearance of a buoy." Members of the local population may have visited the wreck and acted as extraction filters as the opportunistic salvors retrieved small portable artifacts.

The systematic salvage operation by USACE in 1879 had a dramatic effect on the current wreck site. The official report of the salvage effort described the removal of the engine and machinery and the use of blasting powder to break apart the wreck (Damrell 1879:801). The 2012 dive team discovered a large debris field northwest of the main area of wreckage. Figure 49 shows the most probable orientation of the steamer's hull based on the boiler location, the limits of the debris scatter, and the areas of cupreous metal hull sheathing. The northwest debris area is outside the most plausible location of *Convoy*'s hull, indicating that the area is likely a separate scatter associated with another event.

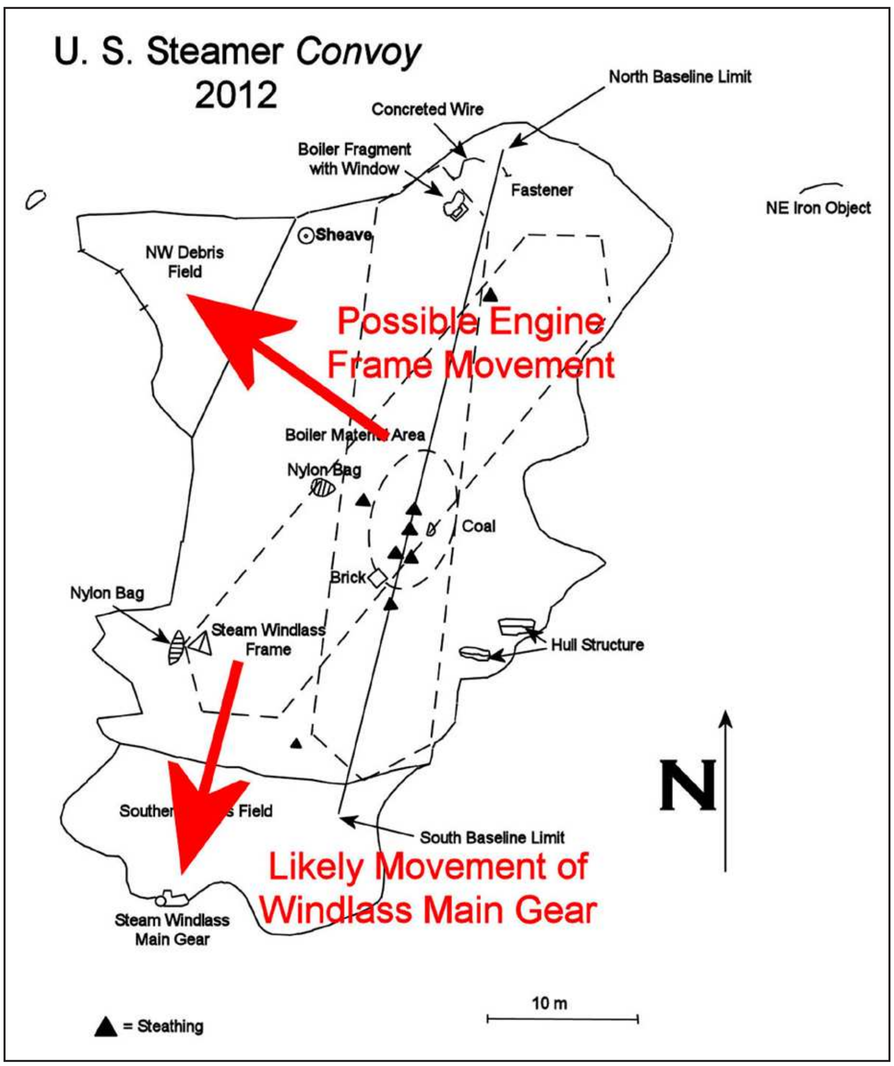

FIGURE 49. Site diagram with salvage indicators. (Diagram by author, 2013.)

Further evidence of the 1879 salvage operations is indicated by the location of the steam anchor windlass main gear more than 20 m (66 ft.) south of the windlass frame (Figure 49). The main gear assembly rests well outside the likely extents of *Convoy*'s hull, and the salvage crew may have separated the main gear from the windlass frame as they removed portions of the steamer's hull. A steam tug or steam powered winch might have been employed to detach the windlass sections. It is likely that the salvage team cut or pulled the frame assembly from around the engine and boiler and deposited the wreckage northwest of the steamer's hull, resulting in the debris scatter documented by the 2012 UWF dive crew. The dive team also identified a sheave of a block (Figure 49), also known as a wheel of a pulley, near the northwest debris area. While *Convoy* carried many such blocks for handling cargo, the location of this sheave may indicate that the salvage crew might have used it to hoist the frame assembly away from the main wreck.

In order to access *Convoy*'s engine and boiler, the 1879 salvage crew probably had to remove the frame structure around the engine as seen in Figure 50. The framework resembles much of the debris found in the northwest scatter area (Figure 51).

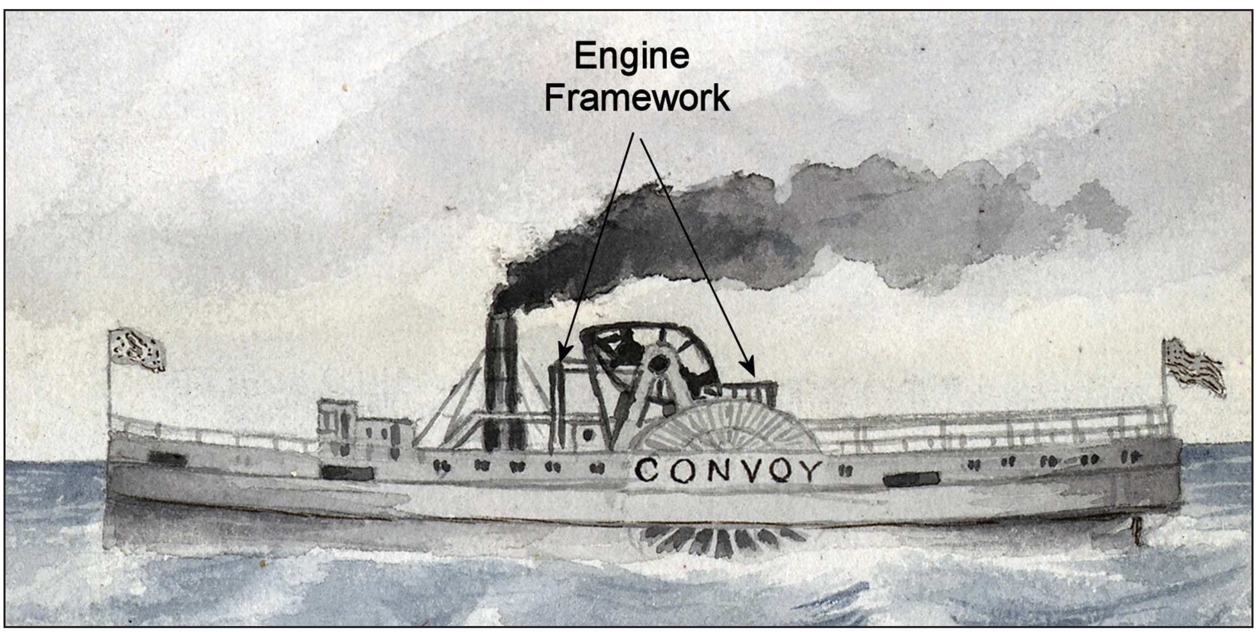

FIGURE 50. Engine framework. (Modified from Valentine 1863. Original image courtesy of the National Archives.)

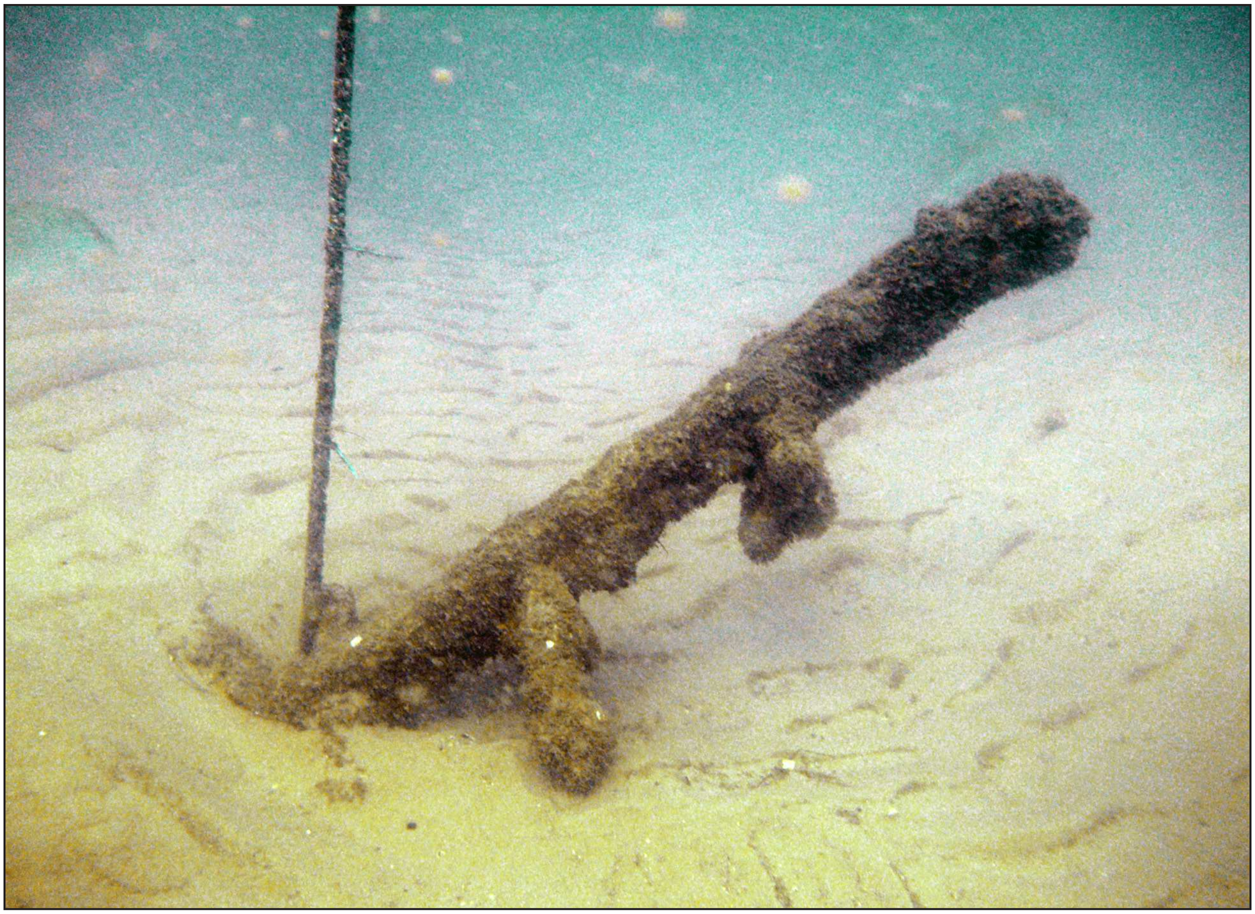

FIGURE 51. Northwest debris. (Photo by author, 2012.)

The 19th-century salvage work acted as both an extraction filter and as a scrambling device. Clearly, the extraction of much of the ship's engine and half of its hull influenced the wreck site visible on the bottom today. Besides the possible removal and deposition of the engine framework and the anchor windlass main gear, the salvage crew likely moved other sections of the ship in order to access other areas or to reduce the wreck's profile above the bottom.

The wreck site remained relatively undisturbed by humans from the completion of the salvage operations in 1879 until widespread use of scuba by recreational divers in the early 1960s. Storms and spring tide currents acted as extracting filters by uncovering sections of the wreck and exposing the soft portions such as wood, cloth, leather, and hemp to deterioration by biological and chemical processes. Scrambling devices were also at work: Pieces of the wreck, weakened by chemical and biological actions, were likely redistributed around the site or carried away by strong currents and storm surge from hurricanes (Chapter IV).

Scuba divers knew the location of *Convoy*'s wreck site by the early 1960s; it became a popular dive site for spearfishing and relic hunting and remains so today. Many divers took artifacts from the site; reportedly, they removed bottles, flatware, ceramic sherds, and other items (Madden 2012; Sharar 2012). The sport divers' actions represent extracting filters as they removed artifacts from the site. Many of the divers kept the artifacts, but even those (such as Larry Broussard, Chapter II) who turned their finds over to museums did not follow proper archaeological procedures, and the proveniences were lost. The divers also acted as scrambling devices when various portions of the wreck were moved around the bottom, possibly to access areas that the divers hoped would contain valuable artifacts (Madden 2012). Figure 5 shows evidence of sport diver opportunistic salvage; Figure 52(a) shows a large section of nylon fabric draped over a feature, and Figure 52(b) shows a modern nylon line tied to the center of the windlass main gear, probably in a vain attempt to raise the heavy feature.

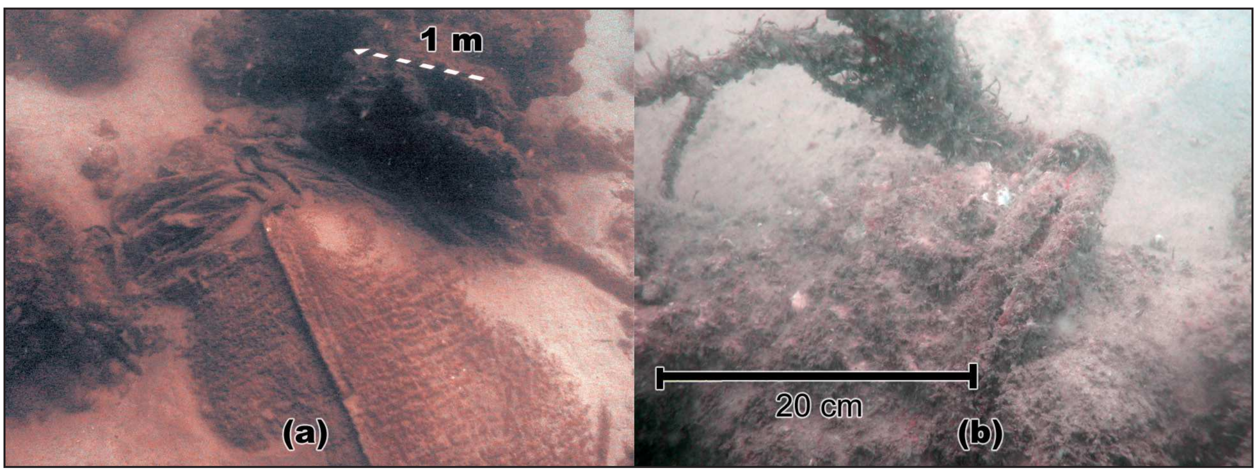

FIGURE 52. Evidence of sport divers on *Convoy* wreck. (Photo by author, 2012.)

Scuba divers continued to remove artifacts from the wreck, and physical, biological, and chemical processes have reduced the wreckage visible above the bottom. However, starting about 1989, an additional physical force began to influence the site and acted as an additional scrambling device. Significant scour of the sediments around the wreck began as the migrating channel scarp approached the site (Chapter IV). The 1989 hydrographic survey showed *Convoy*'s wreck site at a depth of 4.6 m (15 ft.) on the edge of the channel scarp, where the shallow flats meet the deeper water of the natural channel. The strong tidal currents likely accelerated the extracting filter effects of the physical processes on the remaining wreck site. By the time of the 2009 hydrographic survey, the navigational chart indicated that the current had eroded the sand around the wreck to a depth in excess of 6.1 m (20 ft.), but the wreck remained at a depth of 4 m (13ft.). The wreck retained some sediment beneath it as the surrounding sand was scoured around the wreck. By the time UWF divers accessed the wreck site in 2012, the currents had eroded the sediment beneath the wreck so that the shallowest portion of the site was 7.6 m (25 ft.) deep, while the deepest portion was nearly 10.7 m (35 ft.) below the surface.

The scouring effects of the tidal current were likely amplified by the unintended consequences of dredging operations in the Pensacola ship channel and the ICW channel. The effect of the dredging that happens when the sides of a dredged channel fall into the channel, known as *bank slump*, likely accelerated the migration of the channel scarp (Browder and Dean 1999:20). The movement of the ship channel buoy to the northeast of its charted position effectively shifted the navigation channel 40 m (133 ft.) closer to *Convoy*'s wreck site, likely enhancing the erosive effects of passing vessels on the channel scarp and the wreck site (Chapter IV).

The increased sediment erosion acted as a scrambling device by rearranging artifacts and features as the wreckage settled to the hardpan sediment at the bottom of the natural channel. A clear example of this rearranging effect is the orientation of the steam windlass frame whose apex was recorded pointing west in 1987 (U. S. Navy 1987:16) but was recorded pointing north in 2012. The object is much too heavy to have been moved by divers, and its orientation likely shifted 90° as it settled on the bottom of the channel.

The history of *Convoy*'s wreck site formation is evident from the historical, archaeological, and hydrographic records; the ship was subject to cultural and physical processes that removed artifacts and features and other actions that scrambled the vessel's remains on the bottom of Pensacola Pass. Cultural factors generally caused rapid change, such as the deliberate and opportunistic salvage efforts that removed or rearranged sections of the wreck. However, one could make the case that the use of coal oil lamps in *Convoy*'s engine room was one cultural process that took a long time to influence the wreck. In this case, the use of coal oil likely began at the time of commissioning, so the potential for a catastrophic fire existed from January 1863 until the ship was lost in April 1866.

Physical processes worked more slowly. The two most significant physical factors—the erosion of sediments beneath the wreck and the deterioration of the wooden components—required many years to achieve their full effect. By contrast, the wreck's appearance changed with each tide cycle as the shifting sand covered and uncovered different portions of the site, and storm surge from major hurricanes likely changed the site's appearance quickly.

Judah's Location

Despite the local folklore, no archaeological evidence exists to support the theory that *Judah*'s wreck is collocated with *Convoy*'s wreck site. *Convoy*'s site was much larger than expected, and larger than what was recorded in 1987 by Tidewater Atlantic Research divers working for the U. S. Navy. However, the spring tidal currents revealed the entire debris field, and no features or artifacts were found that would indicate either the presence of another shipwreck or anything that was inconsistent with *Convoy*'s wreck.

Judah is probably lost to history. The wreck's most likely location was the buried wooden structure identified by FBAR during the 1992 Pensacola Bay underwater archaeological survey. The structure was located 335 m (1100 ft.) west of *Convoy*'s wreck site, and the area was identifiable on the navigation chart using the 1989 hydrographic survey data (Chapter II). Archaeologists and graduate students from UWF searched the area extensively between 2010 and 2012 using remote sensing surveys and diver investigations and did not find any indication of the wreck. The site was likely destroyed by dredge work to maintain the ICW depth during the 20 years between the site's discovery and the diver investigations.

Archaeologists from UWF also investigated other possible, although less likely, locations for *Judah*'s wreck site; unfortunately, none could be investigated further because of time, cost, and safety concerns. Survey crews detected several large magnetometer targets in the ICW channel, but concerns for diver safety in the busy channel prevented further investigations. Various agencies have dredged the area extensively in order to maintain the ICW channel depth, so the archaeological integrity of any shipwreck found in the channel would be compromised.

On the northern channel scarp, divers and remote sensing crews documented a debris field large enough to conceal the schooner's wreck site, but the area was too littered with modern debris to make further investigation feasible without considerably more funds and time (Chapter III). The scope of such a project was even more daunting given the limited tide window in which dive crews were forced to operate in Pensacola Pass. Figure 53 shows the northern channel scarp debris, consisting of a large metallic cleat and many coils of wire rope.

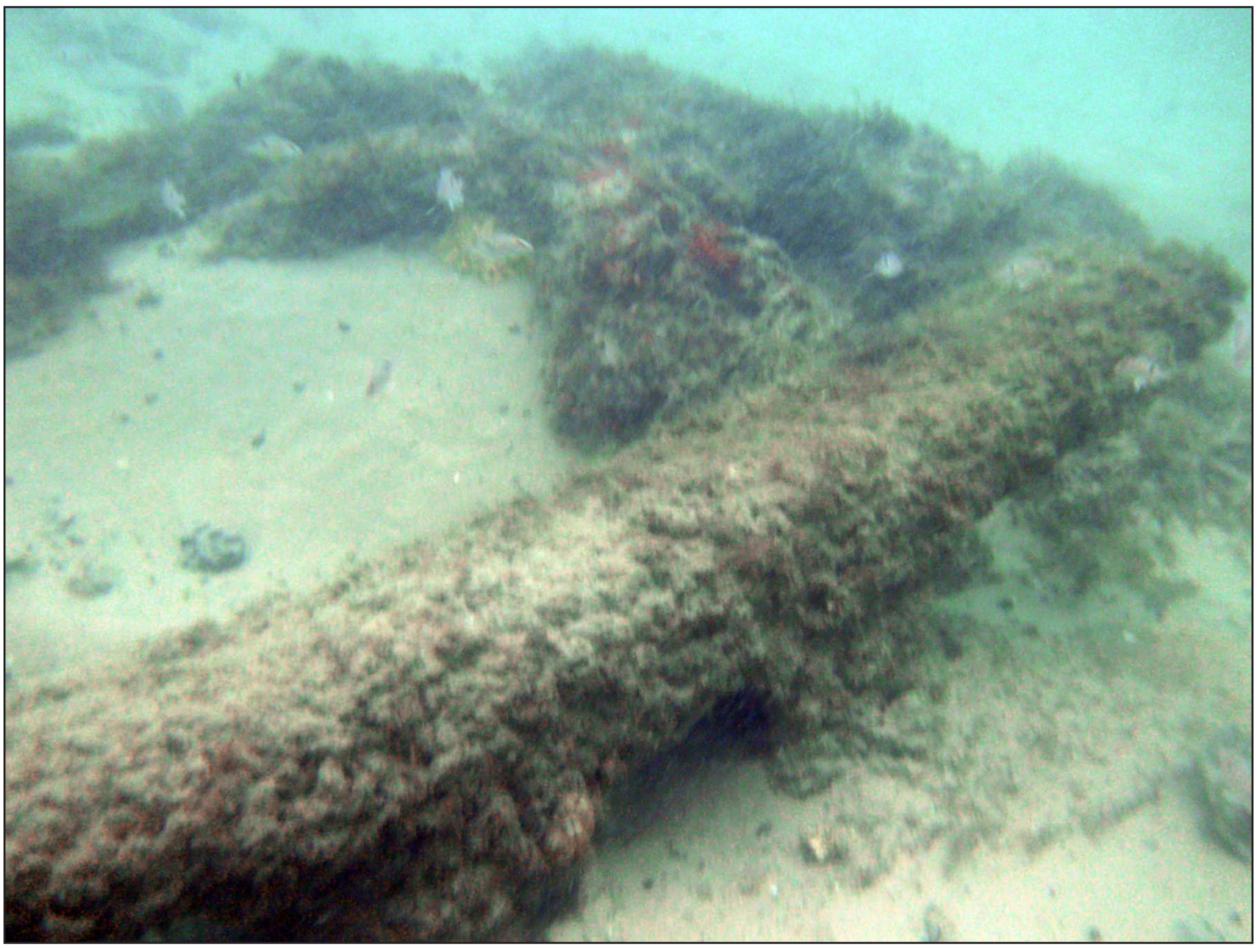

FIGURE 53. Northern channel scarp debris. (Photo by author, 2010.)

The final theory investigated by the research team involved the location of *Judah*'s wreck site beneath the landfill areas on NAS Pensacola. The idea originated from the discovery of a shipwreck during excavations for a new pool on NAS in 2006 (Nichols 2006). Figure 54 shows the U. S. Navy archaeologists excavating the site. Based on the ceramic assemblage recovered, UWF archaeologists assessed the wreck to be of Spanish origin from the 18th century or later.

FIGURE 54. U. S. Navy archaeologists excavating a shipwreck on NAS Pensacola, 2006. (Photo by Nichols, courtesy of U. S. Navy Newstand, 2006.)

The NAS Pensacola wreck was important to the *Judah* investigation because eyewitness accounts of *Judah*'s loss recorded that the schooner sank south of Fort Barrancas (Mervine 1861). Some of the land area directly south of Fort Barrancas on NAS Pensacola was constructed on landfill during or after World War II. The possibility could not be ignored that *Judah* sank much closer to land, and the wreck was covered by the post-war construction. Figure 55 shows the 1859 chart with the 2009 shoreline superimposed; the locations of the Spanish Wreck and Fort Barrancas are also identified. The Spanish Wreck is situated well within the 1859 coastline at the head of a small stream or creek. The wreck was likely used to hold fill material before the 1859 shoreline was charted. Further investigation of the shoreline south of Fort Barrancas indicates approximately 150 m (492 ft.) of new landfill between 1859 and 2009. This area might contain *Judah*’s wreck site, but the maximum depth of the area, recorded on the 1859 chart, is 3.4 m (11 ft.). *Judah*’s wreck would have been visible above the water if the schooner sank in the area that is now landfill; therefore, it is unlikely that the wreck is beneath the land on NAS Pensacola.

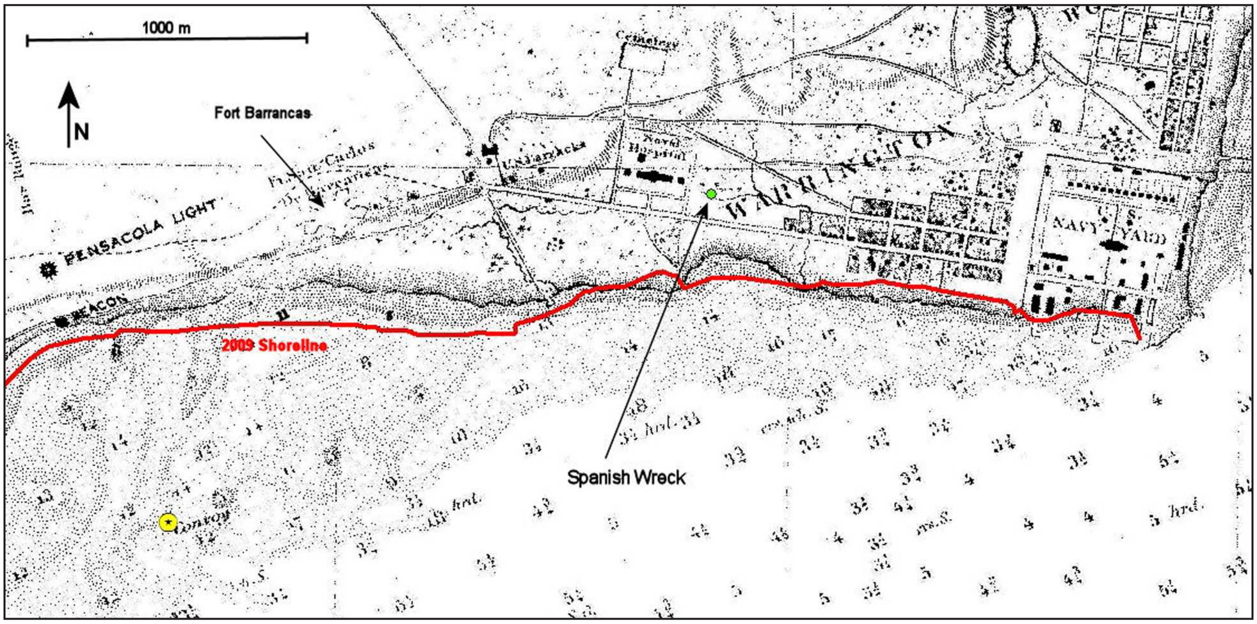

FIGURE 55. Coastal changes 1859 to 2009, soundings in feet and fathoms. (Figure by author, 2013. Modified from NOAA 2011.)

Judah Processes

Because *Judah*’s wreck site remains unknown, many of the post-disaster phase processes are still a mystery; however, researchers can determine some of the schooner’s pre-impact, impact, and recoil phase processes through the historical record. Much like *Convoy*, the Confederate schooner’s disaster impact was a shipboard fire; in this case, however, Federal attackers set the blaze aboard *Judah*.

The pre-impact (threat) phase processes include poor operations security on the part of the Confederate commanders. The U. S. military defines operations security as the following:

> A process that identifies critical information to determine if friendly actions can be observed by adversary intelligence systems, determines if information obtained by adversaries could

> be interpreted to be useful to them, and then executes selected measures that eliminate or reduce adversary exploitation of friendly critical information. (U. S. Joint Chiefs of Staff 2006:vii)

Confederate forces carried out *Judah*'s conversion from a private merchant to a ship-of-war at the Pensacola Navy Yard in clear view of the Federal forces at Fort Pickens (*New York Times* 1861:1). Although *operations security* is a modern military term, the concept of protecting friendly intentions from the enemy is found in the writings of 5th-century B. C. Chinese military theorist Sun Tzu. Andress (2011:83-84) interprets Sun Tzu's writing to mean that "we should conduct our strategic planning in an area that is very difficult for our opponents to observe . . . this is a recommendation to very carefully protect our planning activities so that they do not leak to those that might oppose our efforts." A prudent commander would have refitted the schooner in a more secure location away from the prying eyes of their adversary. The Confederates should have increased the number of sentries guarding *Judah* if a more clandestine refit location was impossible. The results of the engagement show that the size of the guard force was insufficient to repel a determined Federal attack.

The most significant action during the impact and recoil phases was the fire. The conflagration worked as an extraction filter by consuming most of the ship in the flames and likely acted as a scrambling device that created a debris field on the bottom. The sentries were either killed or forced from the ship by the attackers; consequently, there was no crisis or survivor salvage.

Although *Judah*'s wreck site has yet to be discovered, some of the post-disaster phase processes can be assumed. The schooner's wreck site was likely influenced by a similar series of physical processes that affected *Convoy*'s wreck. The strong spring tide currents and storm surges from hurricanes likely covered and then uncovered the wreck at different times. The exposed wooden and metal features and artifacts were probably deteriorated and corroded by the same biological and chemical forces that influenced *Convoy*'s wreck. *Judah*'s wreck site was likely buried beneath the sand mound when FBAR divers located the site in 1992. The episodic scour and burial, similar to the processes that impacted *Convoy*'s wreck, probably weakened the wreck's wooden structure. In this weakened state, the site likely fell victim to storm surge and/or dredging operations.

Summary

By merging the work of Muckelroy (1978), Gibbs (2006), and Ward et al. (1999), along with Stewart's (1999) concept of unintended cultural impacts on shipwrecks, a clearer process model for *Convoy*'s wreck site emerged (Figure 48). Pre-impact events such as crew training and the use of coal oil for illumination were identified through the historical record. The archaeological record was the main source for identifying many of the post-disaster phase processes. The debris fields to the northwest and south of the main wreck are evidence of the disintegration of the wreck by 19th-century salvors. The migration of the channel scarp that eventually eroded the sediment beneath the wreck contributed to the development of the current wreck site. Local dredging operations and the passage of modern vessels near the site accelerated the process.

Judah's wreck site is not collocated with *Convoy*'s wreck, and the schooner is likely lost to history. The 1992 FBAR archaeological survey probably discovered *Judah*'s site, but the dive team could not make a positive identification. During the nearly 20 years between the FBAR survey and the UWF search efforts, the wreck site likely fell victim to the natural and man-made forces that caused the migration of the northern channel scarp, including dredging operations to maintain the depth of the ICW channel. Researchers considered alternative theories regarding the schooner's location, but none were as plausible as the wreck's loss to dredging operations.

Although *Judah*'s wreck location remains unknown, many of its site formation processes can be determined by an examination of the schooner's history and the processes that affected *Convoy*'s wreck. The two ships sank in the same vicinity; therefore, many of the physical processes that impacted *Convoy*'s wreck likely also affected *Judah*'s site, including scour and reburial, biological deterioration, and chemical corrosion. The pre-impact processes are identifiable in the historical record, such as the Confederates' inability to adequately protect the schooner.

The investigation into the wrecks of *Convoy* and *Judah* brought historical, archaeological, and the geomorphologic evidence into a clear picture of the events in the 150-year development of the sites. The research adds to the rich maritime landscape of the Pensacola Civil War period. The historical particularistic data from *Convoy*'s wreck should become the basis for more culturally centered investigations of the wreck. Ample artifact data and historical accounts are available to future researchers to study life aboard a Civil War steamer. Additionally, the site formation process information adds to the growing database of processes that impact wrecks in high-energy environments. Finally, this research answers the question advanced through Pensacola scuba diving folklore; namely, *Judah*'s wreck is not collocated with the wreck of *Convoy*, but instead lay to the west of *Convoy* and has since disappeared.

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APPENDIXES

Appendix A

Oral History Release Forms

University of West Florida

11000 University Parkway
Pensacola, FL 32514-5750

Dear JOE MADDEN:

I am a student/volunteer oral historian with the Oral History Program of the University of West Florida Department of History's Public History Program. I am conducting oral interviews to examine the history, environment, people, and culture of Pensacola, the Florida Panhandle, and the Gulf South.

Your participation will involve an audiotaped or videotaped interview session. Your participation in this program is voluntary. If you choose not to participate or to withdraw from the program at any time, it will not result in any repercussions. The materials obtained from the study may be used in future studies, exhibits, displays, programs, documentaries, web productions, and publications. Your name will not be used without your permission. Your interview will also be made available to the public but not without your permission.

If at any time you have questions about this interview or the materials obtained, please feel free to contact me at: 850-582-0366.

If you have any questions about this interview, your participation as a subject in this program, or if you believe you have been placed at risk, you may contact Dr. Patrick Moore at (850) 474-2680 or (850) 474-2683.

Sincerely,

Christoph 2 Dewey

Student/Volunteer Oral Historian,
University of West Florida Department of History

****

I give consent to participate in the program described above.

I understand that I will receive no remuneration for my participation.

I give permission for my name to be used by the program: Yes X No____

I give permission for the public to use the audio or video recordings of the interview, and any recordings or documents that are derived therefrom:

Yes X No____

Signature [signature] Date 6-9-12

Phone 850.474.2680 Fax 850.857.6015
Web uwf.edu/history
An Equal Opportunity/Equal Access Institution

University of West Florida

11000 University Parkway
Pensacola, FL 32514-5750

I relinquish and transfer to the University of West Florida Department of History: (1) all legal title and literary property rights that I have or may be deemed to have in any audio or video recording of the interview, and any recordings or documents that are derived therefrom; and (2) all my rights, title and interest in copyright which I have or may be deemed to have in the audio or video recordings of the interview, and any recordings or documents that are derived therefrom: Yes X No____

Signature, Date 6-9-12

Signature, UWF Oral Historian Date 6/9/12

Phone 850.474.2680 Fax 850.857.6015
Web uwf.edu/history
An Equal Opportunity/Equal Access Institution

University of West Florida

11000 University Parkway
Pensacola, FL 32514-5750

Dear FRITZ SHARAR:

I am a student/volunteer oral historian with the Oral History Program of the University of West Florida Department of History's Public History Program. I am conducting oral interviews to examine the history, environment, people, and culture of Pensacola, the Florida Panhandle, and the Gulf South.

Your participation will involve an audiotaped or videotaped interview session. Your participation in this program is voluntary. If you choose not to participate or to withdraw from the program at any time, it will not result in any repercussions. The materials obtained from the study may be used in future studies, exhibits, displays, programs, documentaries, web productions, and publications. Your name will not be used without your permission. Your interview will also be made available to the public but not without your permission.

If at any time you have questions about this interview or the materials obtained, please feel free to contact me at: 850-582-0366.

If you have any questions about this interview, your participation as a subject in this program, or if you believe you have been placed at risk, you may contact Dr. Patrick Moore at (850) 474-2680 or (850) 474-2683.

Sincerely,

Christopher L. Dewey

Student/Volunteer Oral Historian,
University of West Florida Department of History

****

I give consent to participate in the program described above.

I understand that I will receive no remuneration for my participation.

I give permission for my name to be used by the program: Yes X No____

I give permission for the public to use the audio or video recordings of the interview, and any recordings or documents that are derived therefrom: Yes X No____

Signature [signature]   Date 6-12-12

Phone 850.474.2680 Fax 850.857.6015
Web uwf.edu/history

University of West Florida

11000 University Parkway
Pensacola, FL 32514-5750

I relinquish and transfer to the University of West Florida Department of History: (1) all legal title and literary property rights that I have or may be deemed to have in any audio or video recording of the interview, and any recordings or documents that are derived therefrom; and (2) all my rights, title and interest in copyright which I have or may be deemed to have in the audio or video recordings of the interview, and any recordings or documents that are derived therefrom: Yes X No____

________________ 6-12-12
Signature, Date

Christopher L Dewey 6-12-12
Signature, UWF Oral Historian Date

Phone 850.474.2680 Fax 850.857.6015
Web uwf.edu/history

Appendix B

West Florida Historic Preservation, Inc., Artifacts

Number	Artifact		Count	Metal Type	Ceramic Class	Notes
	Class	Type				
87-147-2	Personal	Pipe	2		Kolin	2 complete smoking pipes
87-147-3	Kitchen	Ceramic Cup	1		Stoneware	
87-147-4	Kitchen	Sherd	1		Porcelain	Maker's Mark
87-147-5	Kitchen	Sherd	3		Porcelain	Maker's Mark
87-147-7	Kitchen	Sherd	1		Porcelain	Maker's Mark
87-147-8	Kitchen	Sherd	5		Whiteware	
87-147-9	Kitchen	Sherd	2		Stoneware	Possible melted glass on inside rim
87-147-10	Kitchen	Sherd	6		Whiteware	Possible water pitcher fragments
87-147-11	Kitchen	Sherd	8		Whiteware	
87-147-12	Kitchen	Sherd	1		Whiteware	Possible plate sherd
87-147-13	Kitchen	Sherd	38		Whiteware	
87-147-14	Kitchen	Sherd	12		Whiteware	
87-147-15	Kitchen	Sherd	3		Whiteware	Plate base
87-147-16	Kitchen	Sherd	6		Whiteware	
87-147-17	Kitchen	Sherd	10		Whiteware	
87-147-18	Kitchen	Sherd	3		Whiteware	
87-147-22	Deck	Hook	1	Cupreous		
87-147-23	Deck	Grommet	1	Cupreous		
87-147-25	Hull	Fasteners	6	Cupreous		
87-147-26	Hull	Fasteners	6	Cupreous		4 fasteners and 2 fragments
87-147-27	Hull	Fasteners	2	Cupreous		
87-147-30	Personal	Fishing Weights	3	Lead		
87-147-31	Deck	Sounding Lead	1	Lead		
87-147-33	Unknown	Melted Copper	2	Copper		
87-147-34a	Hull	Sheathing	1	Cupreous		Large section 4 mm thick
87-147-34b	Hull	Sheathing	1	Cupreous		Large section 4 mm thick
87-147-35	Hull	Sheathing	1	Copper		Smaller section 2 mm thick
87-147-37	Hull	Fastener	1	Cupreous		
87-147-38	Tools	Ax Head	1	Ferrous		
87-147-39	Hull	Bracket	1	Ferrous		
87-147-40	Deck	Door Knob	1	Cupreous		
87-147-41	Deck	Tacks	16	Cupreous		

Number	Artifact		Count	Metal Type	Ceramic Class	Notes
	Class	Type				
87-147-42	Unknown	Wood	1			Unknown wood object, possible shoring material
87-147-43	Hull	Fastener	1	Ferrous		Large fastener
87-147-44	Propulsion	Tubing Material	1	Ferrous		Possible boiler tubing
87-147-45	Kitchen	Sherd	3		Whiteware	
87-147-46	Kitchen	Sherd	1		Whiteware	
87-147-47	Hull	Tacks	5	Cupreous		
87-147-48	Unknown	Unknown	1		Stone	Unidentified stone fragment
87-147-49	Hull	Tacks	112	Cupreous		
87-147-50	Unknown	Tile	1		Clay	Unidentified clay tile, possibly intrusive
87-147-51	Unknown	Wire	2	Ferrous		Unidentified wire, possibly intrusive
87-147-52	Kitchen	Bottle	1		Brown Glass	Possible whiskey bottle
87-147-53	Deck	Chain	1	Iron		

Appendix C

Site-Recovered Artifacts

Number	Artifact		Count	Metal Type	Ceramic Class	Notes
	Class	Type				
1001	Propulsion	Brick	1			
1002	Hull	Wood	2			
1003	Propulsion	Coal	1			
1004	Hull	Fastener Concretion	1	Iron		
1005	Galley	Ceramic Sherd	2		Stoneware	
1006	Hull	Fastener	1	Bronze		
1007	Hull	Sheathing	1	Cupreous		
1008-1	Hull	Sheathing	1	Cupreous		
1008-2	Hull	Sheathing	1	Cupreous		
1009	Hull	Sheathing	1	Cupreous		
1010	Hull	Sheathing	1	Cupreous		
1011	Hull	Sheathing	1	Cupreous		
1012	Hull	Sheathing	1	Cupreous		
1013	Hull	Tack	1	Cupreous		
1014-1	Hull	Sheathing	1	Cupreous		
1014-2	Hull	Sheathing	1	Cupreous		
1014-3	Hull	Sheathing	1	Cupreous		
1014-4	Hull	Sheathing	1	Cupreous		
1014-5	Hull	Sheathing	1	Cupreous		
1015	Hull	Fastener segment	1	Cupreous		
1016	Hull	Sheathing	1	Cupreous		
1017	Hull	Sheathing	1	Cupreous		
1018	Hull	Sheathing	1	Cupreous		
1019	Hull	Sheathing	1	Cupreous		
1020	None	None	1			Lab cleaning revealed object was all concretion, not an artifact
1021	Hull	Sheathing	1	Cupreous		
1022	Hull	Sheathing	1	Cupreous		
1023	Hull	Sheathing	1	Cupreous		
1024	Hull	Sheathing	1	Cupreous		
1025	Hull	Sheathing	1	Cupreous		
1026	Hull	Sheathing	1	Cupreous		
1027	Hull	Oakum	1			Found during lab analysis on 1014-1