

The Environment of Historic Maritime Trade: Shipwreck Site Formation Processes in Ghana

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Abstract

The investigation of shipwreck site formation processes sets the stage for the interpretation of events from an historical maritime past and supports the investigations of wider cultural phenomena. In a region such as coastal Ghana, where relatively little is known concerning the maritime environment and its effects on historic trade and on consequent submerged cultural resources, an understanding of site formation processes is foundational in terms of how sites are investigated and interpreted. This paper is a discussion of an integrative and interdisciplinary approach to investigating these processes within the natural and historical cultural settings of a select shipwreck site in Ghana. Data from this shipwreck site, in conjunction with data from experimental control areas, provide insights into historic trade in the region, and make available a comparative data set for future investigations on a regional scale.

This paper was presented at the Society for African Archaeology Conference in Frankfurt, Germany. It is not intended to be a thorough discussion of the subject, but rather an introduction to work being done on it in West Africa.

Introduction

While maritime archaeology has not historically been a strong presence in terms of research tools in Africa, its value as a means of investigating fascinating and immensely complex histories associated with Africa, its peoples, and its relations to the rest of the world is beginning to be recognized. Here I discuss the environment of historic maritime trade in Ghana, principally as it concerns the characterization of site formation processes as an investigative tool. Site formation processes may be defined as the dynamic processes which create and transform archaeological sites through time – in this case, such things as currents, sedimentation, storms, benthic organisms, and even the events that occurred which wrecked the vessel.

The investigation of shipwreck site formation processes sets the stage for the interpretation of events from an historical maritime past and supports investigations of wider cultural phenomena (Adams 2001; Gibbins 1990; Oxley 1992, 1998; Schiffer 1987; Ward et al 1999). In a region such as coastal Ghana, where relatively little is known concerning the maritime environment and its effects on historic trade and

on consequent submerged cultural resources, an understanding of site formation processes is foundational in terms of how sites are investigated and interpreted. This paper is a discussion of an integrative and interdisciplinary approach to investigating these processes within the natural and historical cultural settings of a select shipwreck site in Ghana. Data from this shipwreck site, in conjunction with data from experimental control areas, provide insights into historic trade in the region, and make available a comparative data set for future investigations on a regional scale.

Maritime Archaeology and Site Formation Processes

One of the great strengths of archaeology is its ability to inform us of and enrich our understanding of the past, although means of investigating and interpreting are highly varied. Regardless of theoretical persuasion, it is generally considered the responsibility of the archaeologist to endeavor to make our work relevant both to the local people in the environments in which we work and those far away who have an interest in it. As is illustrated in **Figure 1**, through the left side is visible the cannon and seascape which would have been familiar to soldiers based at this fort along the Ghana coast, and through the right, the everyday trappings of life people in a coastal fishing village, likely people descended from those who lived and worked near the fort in the past. Perhaps they may even be distant descendants of the European soldiers who once manned the fort.

Kristin Mann (2001:10) writes that coastal interactions between traders of both African and western heritage created the means for people, goods, beliefs, and practices to flow both east to west and west to east. Historically little attention has been paid to the investigation of the everyday “ground-level” interactions of these all important maritime-terrestrial relationships, and this is particularly the case in coastal West Africa. Focus on trade interactions on the sea is a window into the intricate and dynamic relationships of international maritime trade at both the local and the global level, and an in-depth understanding of the fundamentals of submerged cultural resources is a vital first step in being able to discover and understand aspects of history associated with and hidden by the sea. The cultural context of shipwreck site formation research near Elmina is embedded in the fact that most of the historic trade in this region was maritime, and therefore it is within the historic maritime context that this should be examined.

Like other types of archaeology, maritime archaeology is a lens through which we can see and study people and history, and it is a means with which it is possible to engage disparate peoples. In my research, I venture to look through the lens or window of shipwrecks to understand the people, cultures, and logistics of historical trade in West Africa. As is illustrated in **Figure 2**, by looking through this example

of a modern shipwreck at the Elmina castle, one is literally looking at aspects of the past, and yet, as can be seen by the school girl in this image, elements of the present are always represented.

Maritime Archaeology in Ghana

My region of study is near the modern town of Elmina, Ghana. In 1482 the Portuguese established a permanent fortress, trading center and mission in an already established fishing town, and called it São Jorge da Mina (Elmina) (DeCorse 2001:7; Feinberg 1989:27). This fort, located on the Gold Coast, figures prominently in the history of the transatlantic trade between Africans and Europeans on the West Coast of Africa (DeCorse 2001, 2005). The primary importance of Elmina for the Europeans was initially the gold trade, and later, the slave trade (DeCorse 2001:7; Hair 1994b; Meredith 1967 [1812]:91; Wilks 1993:4). Exchange between Africans and Europeans at Elmina involved inbound manufactured goods such as cloth, iron, copper basins and glass beads, and outbound commodities such as gold, ivory, agricultural products, and enslaved Africans (Cook and Spiers 2004:17; 2001:26-28; Hopkins 1973:111; Kea 1971:185, 189). Shallow water, rocky shorelines with swift currents, large waves, and hidden reefs dictated that large trading vessels would normally anchor up to two miles (3.2 km) offshore and usually in eight fathoms (15 m) or more water depth (where possible) (Barbot 1746:456; Phillips 1746). As a result, trade was conducted by means of smaller boats, usually local canoes, which ferried goods and people between vessels and shore.

The historically important site of Elmina was initially selected for maritime survey primarily because of Elmina's dynamic, fundamental, enduring and well-documented role in the maritime Atlantic trade between Africans and Europeans on the west coast of Africa (Ballong-Wen-Mewuda 1993, 1996; DeCorse 1996:684; Feinberg 1989:v; Hair 1994b; Law 1995; Vogt 1974:103). A subsidiary consideration pertained to the high volume of international vessels trading there for over four centuries and the resultant high potential for shipwrecks in this heavily trafficked region. In addition to the heavy traffic, other perils, such as ship rot and infestation by boring marine organisms, catastrophic tropical storms and the often-present threat of privateers or pirates and enemy warfare (both African and European), took their toll on the people and vessels engaged in trade, and resulted in an untold loss of human life and resources (Eltis et al 1999; Inikori 1996). Site formation investigation on shipwreck sites cannot provide insights into all the challenges of historic trade in Ghana, but it is a valuable tool to begin to explore this immensely complex era.

Maritime archaeological research in Ghana is part of the Central Region Project, a long-term archaeological project spearheaded by Dr. Christopher DeCorse of Syracuse University (DeCorse 2001;

DeCorse et al forthcoming). In 2003, Syracuse University doctoral student Greg Cook conducted the first systematic archaeological survey searching for shipwreck sites in sub-Saharan West Africa. Cook's initial survey focused on areas near Elmina likely to contain shipwrecks dating to the era of the Atlantic trade. Choice of survey locales took into account such factors as natural navigation hazards, shipping routes and anchorages, specific historic accounts regarding the loss of vessels and reports by local fishermen of net snags on physical obstructions on the seafloor. After eight days of side scan sonar survey and one day of diving on survey targets, divers confirmed the location of an historic shipwreck, likely dating to the nineteenth century (**Figure 3**) (Cook and Spiers 2004).

In 2005 Cook returned to Ghana with a team of volunteers and succeeded in creating a site plan of the wreck site, despite highly dynamic and nearly zero-visibility sea conditions (Cook and Spiers 2004). The site plan was created based on measurements of and between artifacts sitting proud of the seafloor. The primary categories of recognizable artifacts consist of cannon, stacks of basins made of varying metals such as brass and pewter, concretions of manilas and rolls of lead. Some diagnostic artifacts recovered from the site provided the estimated date and some other aspects of the vessel, including its probable association with the period of Dutch occupation of the Elmina. Cook's pioneering efforts provided the platform for both the preliminary study already conducted and for my research.

Site Formation Research and the Environment of Maritime Trade in Ghana

In 2007 I traveled to Ghana to conduct doctoral field research, building on Cook's project, in conjunction with fellow Syracuse University doctoral student Andrew Pietruszka and several volunteers. Funding for this research was provided by National Science Foundation Equipment grant (MRI 0521121), Syracuse University's Goekjian Scholarship, and a Leopold Schepp Foundation Scholarship. Although the foci of our research differed, it was a prudent use of resources, time and volunteer aid to conduct joint investigations. My research was intended to investigate fundamental aspects of international maritime trade in the region with a focus on the characterization, testing and modeling of shipwreck site formation processes across the region.

Prior to conducting this field work, I reassessed Cook's side scan sonar data and was able to identify more than 30 potential shipwreck site targets in the side scan record, which were later corroborated by Pietruszka. The team was able to dive on the 30 most promising targets, but results were disappointing, as no additional historic shipwreck locations were discovered. This is likely due to a number of factors, including heavy sedimentation in the region; these are currently being investigated. The lack of additional shipwreck sites is surprising, however, on at least two accounts; first, many targets appeared very

promising, an second, though the archival record on shipwrecks directly associated with Elmina is extremely limited (Hair 1994a; Inikori 1996; Vogt 1979), it is unlikely that in a period of nearly 500 years of shipping activity and heavy traffic in the area, there was only a single instance of a vessel wrecking. In the absence of additional shipwreck sites, and in the interest of time and limited resources, it was decided to intensively investigate the known shipwreck site. Accordingly, the majority of my data from the preliminary field season concerns site formation processes and environmental data from the single shipwreck site identified by Cook in 2003. In addition, I was also able to collect a limited amount of data from a control experiment designed to enable me to directly study the site formation effects of this incredibly dynamic environment on a simulated shipwreck site. Although the research parameters were necessarily somewhat restricted due to resources and time, I followed established archaeological practices for recording and characterization of the shipwreck, seafloor environment, and local formation processes. It was, however, necessary to implement some significant modifications, specifically in terms of methodologies, to adapt the work to the west coast of Africa.

Cook's initial investigation of the site had already provided us with a significant amount of information concerning the contents, and to an extent, the lading of the vessel. However, as all that was known was learned from surface finds, we were anxious to know more about what was going on beneath the sediments in terms of preservation, extent of the site, other trade goods, and, most specifically, what effects the powerful site formation processes in the area had had on the vessel. Although the blackwater conditions were not conducive to profiling the excavated units, I was able to do some comparisons between several of the excavated units and the cores I collected on the site based on textures and artifact contents of strata (Horlings forthcoming).

We were able to collect cores in quite an even distribution around the site, and were also able to collect additional cores in several areas of particular interest, such as in the eastern region of the site, which appeared to have greater preservation. A thorough sampling of the site provided a detailed comparative data set, and also indicated that the extent of the wreck itself is at least 15 meters longer than is indicated by the surface artifactual scatter. Although this is a limited sample from a single site, sediment coring was clearly a powerful tool for investigating site formation processes of shipwreck sites, even in extremely dynamic environments.

The significance of these sediment cores with their various strata lies in what we can learn from them in terms of the wreck itself, as well as the marine environment in which it is found. For example, we know, from looking at just one core, that this vessel was not totally and immediately destroyed upon wrecking,

but rather that a significant portion of it remained on the seafloor for some time (**Figure 4**). This may seem intuitive and not surprising, but, when one considers that this is an extremely rough and dynamic environment, located in warm tropical waters highly conducive to marine boring organisms which break down wooden vessels at impressive rates, it is intriguing that such a significant portion of the vessel remains. Data from this site, when compared with data garnered from cores collected at an off-site location, can be used as indicators of the extent of preservation and deterioration on submerged sites, and can begin to paint a picture of the condition of submerged cultural sites in this region. These data can in turn be used to build a predictive model of shipwreck sites in the region, as well as to aid in informing future investigations into maritime trade in coastal Ghana.

Future Directions

Plans for further investigations are in progress. These will consist of re-surveying Cook's 2003 survey area using side scan sonar, magnetometer, and limited use of a sub-bottom profiler, as well as diver ground-truthing of targets and sites. These tools will be used to assess any additional cultural resources, including information concerning site formation processes associated with them. These and already collected data will be used to create a comparative data base of environmental data concerning submerged cultural resources. Researchers will be able to utilize this data set to further understanding of cultural phenomena and the logistics of international maritime trade in Ghana, and to expand the maritime archaeological study of trade into other areas of coastal West Africa.

Conclusion

Through these investigations we have made strides toward a greater understanding of the historical and cultural environments of interactions and trade in this intriguing area of the world. While more work remains to be done in terms of understanding even this single shipwreck, much less wrecks across the region, we have learned a great deal already about the physical environment of maritime trade in coastal West Africa.

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FIGURE CAPTIONS

Fig. 1. Archaeology is a tool which can be used to look both at the past and the present, as is illustrated by looking through the different sides of this image: to the left one looks at a maritime past, and through the right, at a maritime present (Photo R. Horlings).

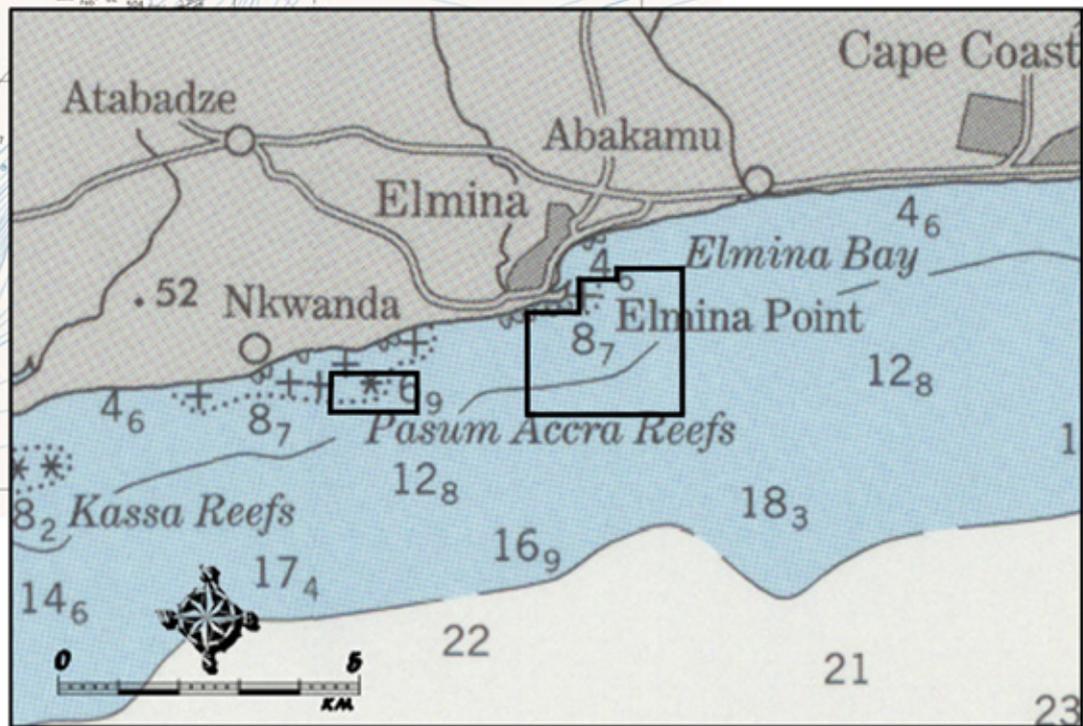
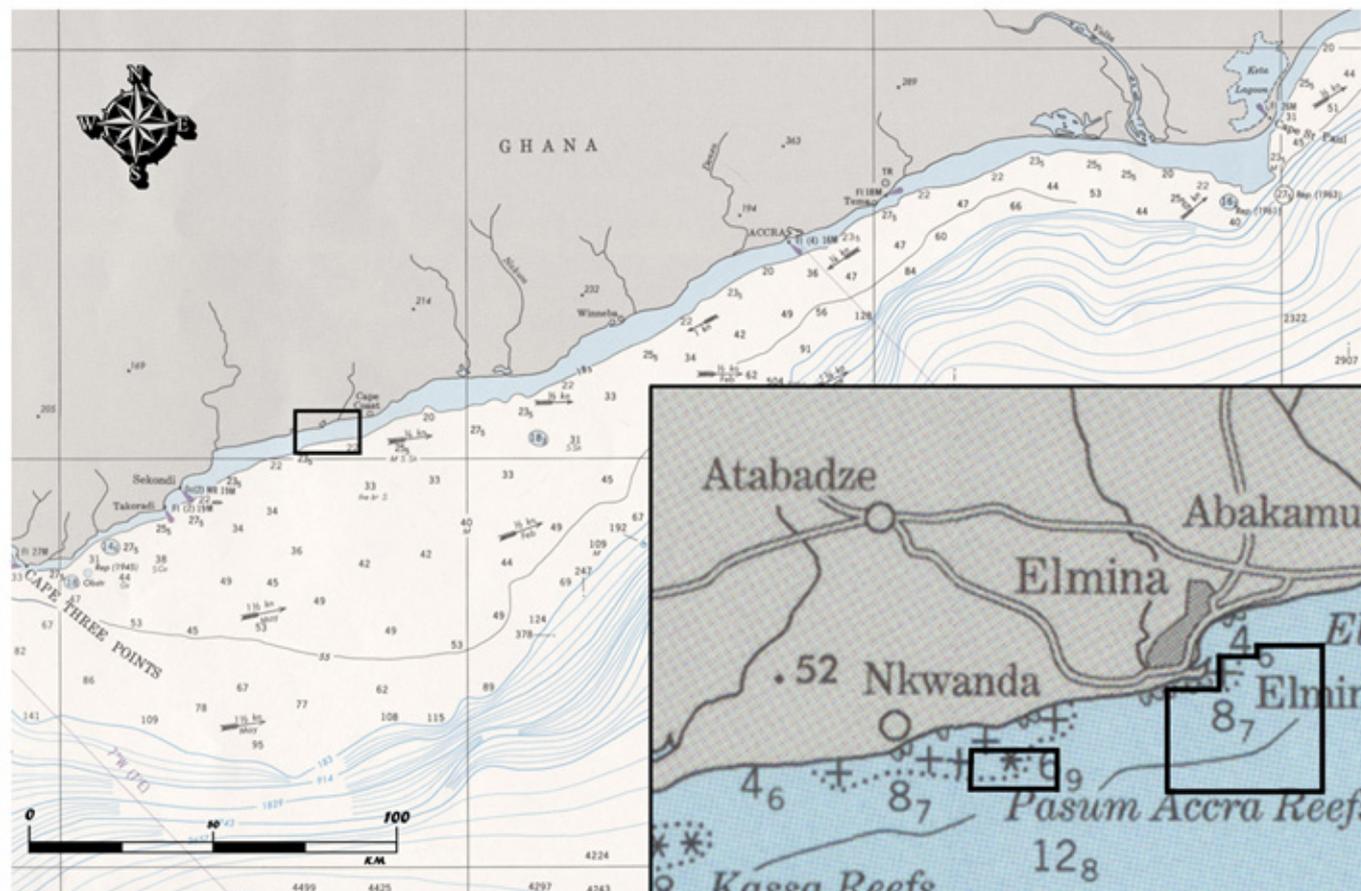
Fig. 2. By looking through this example of a modern shipwreck at the Elmina castle, one is literally looking at aspects of the past, and yet, as can be seen by the school girl in this image, elements of the present are always represented (Photo R. Horlings).

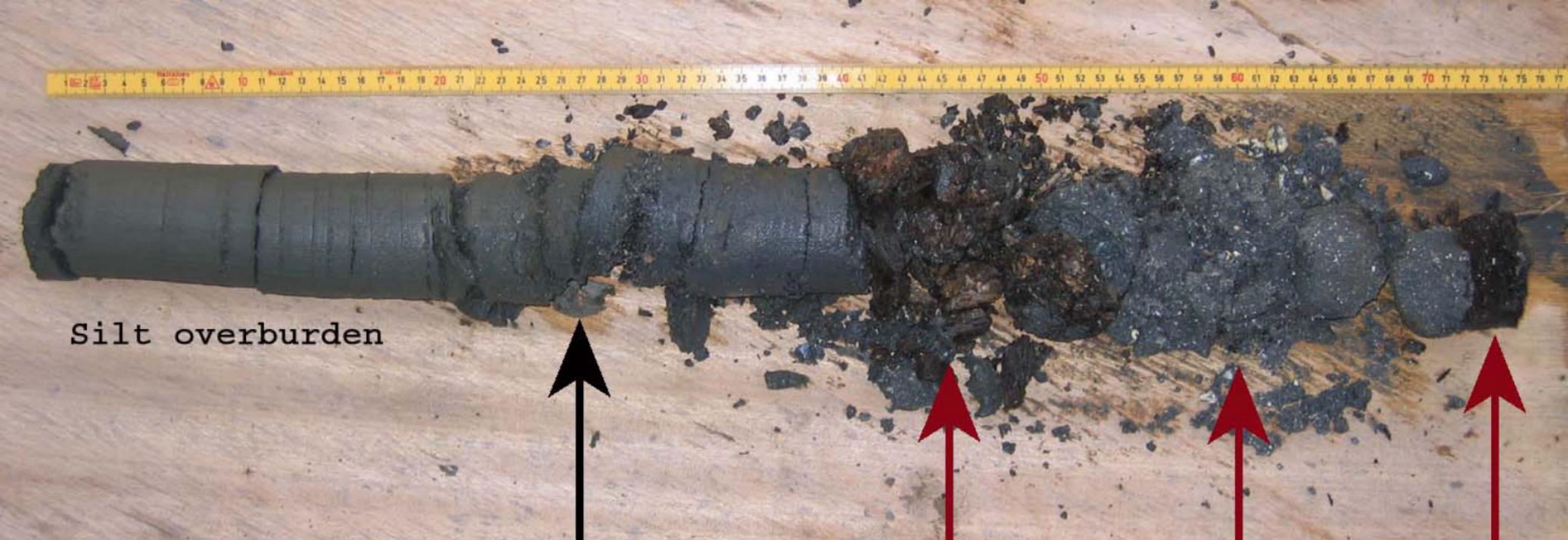
Fig. 3. The location of Cook's 2003 survey and all subsequent research is outlined in this close-up of the central Ghanaian coastline (After National Oceanic and Atmospheric Administration (1990-1998) and British Admiralty Chart (1996).

Fig. 4. This core clearly demonstrates the presence of vessel structure, provides us with evidence of cargoes, and displays indicators of site formation processes, including structure deterioration and sediment in-filling (Photo R. Horlings).









Silt overburden

Clear strata
distinction -
indicates
changes in sediment
accumulation

Dilapidated
wood

Shell and
sediment
accumulation -
includes trade
cowry shells

Intact
Wood