

# *Queen Anne's Revenge*

## **Shipwreck Project**



### **RESEARCH REPORT AND BULLETIN SERIES QAR-R-05-02**

#### **Phase I – Dive Access Marketing Research and Feasibility Study Needs and Requirements**

**Feasibility Report  
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**Lauren Hermley**

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Underwater Archaeology Branch  
Office of State Archaeology  
Department of Cultural Resources  
State of North Carolina  
[www.qaronline.org](http://www.qaronline.org)

## Summary

Since its discovery in 1996, archaeological site 31CR314 has proven a challenge in submerged cultural resource management. Believed to be the remains of Blackbeard's flagship, *Queen Anne's Revenge (QAR)*, it represents an internationally recognized discovery in the field of underwater archaeology and an important cultural resource for Carteret County. Located in state waters near Beaufort Inlet, it falls under the jurisdiction of the North Carolina Underwater Archaeology Branch (UAB) who retains responsibility for its management. Until recently, the management plan for the *QAR* called for limited site access exclusively for scientists and archaeologists ensuring protection. Public education was satisfied through various traveling presentations, aired documentaries and publications, and a primary exhibit at the North Carolina Maritime Museum (NCMM). In an effort to explore other public outreach opportunities, the UAB decided to examine the possibilities of allowing recreational divers access to the site. While the UAB considers unlimited access too great a threat to site preservation, there are various options for limited access programs. This study has determined that given the available resources in Carteret County, particularly the presence of a UAB field office, the NCMM, and a developed dive industry and tourism infrastructure, it is feasible to design and implement a recreational diver outreach program, entitled Dive Down, that not only provides a unique, educational, and entertaining experience, but also advocates for the protection of this and other underwater heritage sites.

### *QAR Dive Down Goals and Components:*

- *Education:* The *QAR* site exemplifies the multidisciplinary nature of a shipwreck. The program illustrates this value by incorporating educational modules on maritime history, coastal geology, underwater archaeology, and marine ecology. In addition, divers will learn proper techniques for diving on sensitive and protected underwater sites with emphasis placed on safety, non-disturbance, observation, and task management.
- *Entertainment:* Designed for the recreational diving community, entertainment plays an important role in program execution. Incorporating fun and enjoyment affords several benefits including enhanced marketability, increased effectiveness of education efforts, and an improved perception of program value among participants.
- *Site Preservation:* Precautionary measures implemented during the dive include pre-dive briefings on regulations, guide rails, and careful supervision. Intentional site disturbance is forbidden and enforcement policies will be put in place. The UAB will periodically survey the site to monitor any detrimental affects of the program and reserves the right to implement changes in the program if

warranted. Moreover, preservation is an underlying theme present throughout the program in an attempt to raise awareness about the importance of protecting underwater sites.

- *Program Funding:* The program is designed to achieve self-sufficiency, following initial outside funding requirements. The fee charged for participation in the Dive Down educational program is based on operational costs and falls within the market parameters of recreational diving. The proposed budget and an analysis of market conditions support this assertion.

- *Benefits to Carteret County:* Carteret County has already realized benefits from the existence of *QAR* in its waters through media and promotional activities. As Dive Down is a collaborative effort relying on partnerships with various County organizations, businesses, and tourist attractions, there are numerous opportunities for increased exposure and visitation afforded by its implementation.

- *Implications for North Carolina Shipwrecks:* If successful, the Dive Down program can be used as a model for future sites within the state bringing added appreciation for and preservation of North Carolina's underwater cultural heritage.

- *Support for QAR Preservation:* The shipwreck site will benefit from increased monitoring afforded by the Dive Down budget. In addition, participation in the program will foster a connection to the site among divers that, while not directly solicited, may lead to future donations and project support.

#### *Program Design*

- *Schedule:* The 2-day program will run sixteen times over a period of eight weeks spanning from mid-September through mid-November. Each program session will host 20 divers totaling 40 per week or 320 per season. The autumn months were chosen because of the optimum water conditions and the likely availability of resources during this time.

- *Organization:* The program is an initiative of the UAB in partnership with the NCMM. A Program Coordinator is responsible for administration and management, and reports directly to the Director of the *QAR* Shipwreck Project.

- *Additional Partners:* Participation from various organizations is needed for effective program implementation. Partners thus far include: The NCMM, Division of Marine Fisheries, the Institute for Marine Sciences, the Carteret County Tourism Board, NAUI, Olympus Dive Center, and Discovery Diving. Additional collaborative relationships are expected to develop.

## Introduction

### *Background*

The North Carolina Underwater Archaeology Branch (UAB) is a nationally recognized state program that was begun over 30 years ago. UAB has historically documented nearly 6,000 shipwrecks lost in North Carolina waters. The physical remains of vessels ranging from 4,000 year-old dugout canoes, colonial ferries, Civil War blockade running steamships to World War II submarine chasers have been located and archaeologically recorded. None of these underwater archaeological sites carries the impact as the shipwreck discovered in Beaufort Inlet in 1996. The site dates to the early eighteenth century and is the oldest wreck found in state waters.

Since its discovery, researchers have sought to determine that the shipwreck is the pirate Blackbeard's flagship *Queen Anne's Revenge*, lost in 1718. During three years of intense study, UAB archaeologists and associates made great strides toward understanding the site's origin and significance. Three major expeditions to the site were conducted for a total of sixty days. During that time over one thousand dive hours were spent examining the shipwreck. In addition to UAB staff members and volunteers, divers came from Maritime Research Institute, University of North Carolina-Wilmington (UNCW), University of North Carolina-Chapel Hill (UNC-CH), East Carolina University (ECU), North Carolina Marine Fisheries, Appalachian University, Virginia Polytechnical Institute and other agencies and institutions. The NCMM and Cape Fear Community College provided land-based support and assistance in large artifact recovery. This widely varied group of archaeologists, specialists and technicians provided a broad view of the site. Based on their findings, there can be little doubt that this shipwreck is *Queen Anne's Revenge*. The location of the shipwreck, its tantalizing array of early eighteenth century artifacts, and lack of any other possible candidates from the historical record strongly support this conclusion.

UAB staff also closely examined site conditions relying heavily on marine scientists to help interpret how environmental conditions have and continue to affect the shipwreck since its sinking. Currently, an impressive, albeit small, area of the shipwreck is likely to stay exposed above the seabed indefinitely. This artifact mound rises two to three feet above the bottom and encompasses an area approximately 20 feet by 30 feet. It features two large anchors, several cannons, a grapnel hook, ship's rigging, cask hoops and numerous ballast stone. A third anchor is located a short distance away. After diving on *QAR* in 1999 Florida archaeologist Roger Smith commented, "This site contains the classic elements of a colonial shipwreck with cannons, anchors and a main ballast pile. Rather than being dispersed over a wide area, these components still retain the same association on the sea bed that they had before the ship sank."

During investigations, UAB archaeologists and colleagues created detailed maps of the exposed remains at *QAR*, as well as, those adjacent areas that are prone to exposure as a result of shifting bottom sediments. Extensive still and video photography has been used to record all features. Since its discovery, the shipwreck site has often been inspected for diagnostic, small artifacts, which, when located, have been recorded and recovered for analysis and conservation. What is exposed and available for visual observation at *QAR* is an intriguing cluster of encrusted large artifacts, unidentifiable concretions, and ballast stone. In addition to their historical link, these remains serve as an artificial reef for a typical near-shore benthic community. Water clarity normally provides underwater visibility of three to five feet, but it can range from no sight to 20+ feet depending on daily tidal cycles and broader weather patterns. Conditions are best a few hours on either side of high tide during the fall and winter months. Lying in 23 feet of water a little over a mile offshore and in close proximity to Beaufort Inlet, the *QAR* site is easily accessible from shore-based dive facilities. In 1998 the site was declared a protected area reserved for scientific study and currently remains under surveillance and protection with enforcement by the North Carolina Marine Patrol. Unauthorized anchoring, trawling, and diving are not allowed within a 300-yard diameter area centered on *QAR*.

#### *Program Introduction*

When considering the *Queen Anne's Revenge* site as a submerged cultural resource its value is multifaceted. To archaeologists, historians, and scientists, the site represents an unprecedented informational database. For educators, the site provides endless possibilities for engaging children, as well as adults, in a multitude of educational disciplines. And, for the businesses of Carteret County, *QAR* is a valuable marketing tool for Crystal Coast tourism, given its already flourishing recreational diving industry and rich maritime history. To successfully meet its public responsibilities, the state must balance the often-conflicting interests of its constituents. Public outreach and site preservation must be balanced. Thus far access to the site remains prohibited and the state has achieved its public outreach goals by providing museum exhibits, an informative website, presentations, media documentaries, festivals, and speaking engagements.

Given the success of its current programs, why is the state now considering a program that includes an underwater tour of the site? The answer lies in both the need and demand for public education in the value of submerged cultural resources. Evidence for this demand is widespread. It exists in the realms of public history with the increasing popularity of the History Channel and the Discovery Channel, both of which sponsor documentary programs devoted to underwater sites. In addition, recreational diving agencies such as NAUI and PADI enjoy considerable participation in their wreck diving programs. The drama and romance of a shipwreck, coupled with the thrill of discovery, lures audiences into the realms of underwater archaeology, and it is remiss not to

acknowledge the benefits of engaging this captive audience. Using the attractiveness of an exciting, high-profile wreck site such as the *QAR*, we are potentially able to offer a unique and enriching diving experience structured around education and preservation objectives.

Education, in the form of public outreach by cultural resource managers, assumes a variety of forms. High-profile historic sites, such as the *USS Monitor* or the *HMS Mary Rose*, lend themselves to large exhibits, complete with not only artifacts, but also excavated sections of the vessels themselves. Clearly, these types of projects are the exception rather than the norm with most shipwrecks exhibited more modestly with drawings, historical data, and artifact displays.

In locations that lend themselves to recreational diving, there is an increasing trend towards underwater parks and shipwreck trails. These programs provide valuable information for assessing and developing a diver outreach program for *QAR*, as they address many common goals and concerns. Several government organizations including state agencies and the National Oceanic and Atmospheric Association (NOAA) have developed various preserves and heritage trails that offer divers the opportunity to experience historic shipwrecks up close, while also aiming to preserve the integrity of the sites. For example, NOAA's Thunder Bay National Marine Sanctuary on Lake Huron is home to over 100 identified shipwrecks dating from 1840 to 1970. The sites are accessible to divers, though activities deemed destructive to the sites, such as dredging and artifact removal, are strictly forbidden. Thunder Bay's management plan outlines numerous educational and research goals, as well as details an enforcement policy to ensure compliance with non-destructive regulations.

In addition to programs based predominantly on preservation and public history, there are also education programs that incorporate training in underwater archaeological fieldwork. Similar to the goals of eco-tourism organizations, these programs strive to train divers as potential volunteer fieldworkers for research projects. The origins for these programs typically fall into one of two categories, site-specific and non-site-specific. In the case of site-specific initiatives, an interested party assumes responsibility for stewardship of the wreck site. An archaeologist oversees the project as the volunteers are trained in site mapping, survey techniques, and artifact drawing. The result is a site map and accompanying documentation that preserves the site in the historical record. The state of Florida has incorporated this model into their management of submerged cultural resources. Through a nomination and approval process, community organizations obtain stewardship of wreck sites and advocate for their protection. The state then provides support to these organizations in the way of archaeological training and technical assistance. Once the documentation process is complete, the state adds the site to their Maritime Heritage Trail

Accompanying site-specific initiatives, there are also groups focused on non-site-specific training in underwater archaeology. The Maritime Archaeological and Historical Society (MAHS), a non-profit organization based in Maryland is one such example. Governed by a board of directors

comprised of professional archaeologists and historians, MAHS advocates for the preservation and study of maritime heritage. A ten-day training course in underwater archaeology is offered once a year, followed by a field school to prepare volunteers for participation in field projects. MAHS volunteers have played an integral role in underwater archaeological projects across the globe and their work is well respected throughout the industry. MAHS was also the first volunteer group granted membership on the advisory council for Underwater Archaeology of the Society for Historical Archaeologists.

In each of the above cases, cultural resource managers made decisions based on the respective potentials of their resources, established program goals, and catered their efforts to the environments in which these resources exist. This study embodies this decision-making process by evaluating the above factors as they relate to the *Queen Anne's Revenge*. Proposed is a diver outreach program hosted by the North Carolina Underwater Archaeology Branch in partnership with the NCMMA, entitled **Dive Down**. The purpose of this program is to illuminate the value of this important shipwreck to the recreational diving community by providing a one-of-a-kind underwater experience, to advocate for the preservation of shipwrecks, and to promote Carteret County as home to this unique cultural resource. The self-funding program will be offered on a yearly basis in three-day increments over an eight-week period for a term of three to five years.

The foundation of the current study is as follows: Is it possible and feasible to develop a program that not only capitalizes on the invaluable educational opportunities afforded by this unique resource, but simultaneously preserves its integrity? What are the potential benefits? What obstacles must be overcome? Is there sufficient interest to warrant such an undertaking? Are the resources and personnel available for implementation? Is it appropriate, or legal, for the state to host such a program? The aim of this study is to research and evaluate these various aspects of a public dive program to weigh costs and benefits.

### **Program Goals and Objectives**

There are numerous goals associated with a public outreach program such as **Dive Down**, which permits recreational divers to visit one of world's most noted shipwrecks. The program is designed to achieve these goals by incorporating a variety of public outreach methods successfully employed in other programs, as well as introduce new initiatives specific to **Dive Down**. Specific goals fall into seven categories: education, entertainment, site preservation, program funding, benefits to Carteret County, implications for North Carolina shipwrecks, and support for *QAR* preservation.

### *Education*

While the educational goals of Dive Down share commonalities with aforementioned programs, it differs with respect to its primary purpose. Rather than focusing on a shipwreck and its value to historic archaeologists, Dive Down aims to broaden its scope and expose participants to the value of a shipwreck as a database for multiple disciplines. Educational goals not only include history and archaeology, but also marine ecology and coastal geology. The program, therefore, does not train archaeological fieldworkers or amateur historians. Instead, Dive Down strives to provide, through an interdisciplinary syllabus and a unique diving experience, recreational sport divers with a better understanding of shipwrecks as underwater laboratories, worthy of preservation, and capable of holding valuable natural and cultural information important to both researchers and the public.

### *Entertainment*

Dive Down is a program for the recreational diving community. As a result, it is critical that its developers remain conscious of the importance of creating an experience that, while educational, is also entertaining. The idea of combining fun and learning is not a new concept and is, in fact, an integral component of any cultural public outreach project. Museums and heritage attractions consistently strive to develop new and interesting ways to present information via multi-media displays, living history presentations, and interactive exhibits. This philosophy is applicable to a program such as Dive Down, as there is a variety of ways to enhance or emphasize the recreational aspects of diving on a shipwreck.

Focusing on the fun and exciting aspects of the Dive Down program affords several benefits. First, research shows that individuals are more likely to retain information if the process by which it is disseminated is entertaining. Participants are apt not to become bored or lose interest during an engaging activity. Secondly, promoting the recreational aspects of Dive Down is a powerful marketing tool as it considerably adds to the program's attractiveness. Lastly, by ensuring that the experience is enjoyable, participants are not only more likely to engage in future endeavors, but will also be more inclined to view Carteret County as a future vacation destination and encourage family and friends to do likewise.

### *Site Preservation*

The shipwreck site designated 31CR314, believed to be remains of *Queen Anne's Revenge*, comes under the jurisdiction of the North Carolina Department of Cultural Resources (DCR) as set forth in NCGS 121-23, which provides the department "title and management authority for lost and abandoned vessels in state waters." As custodian of all shipwrecks and other underwater archaeological resources the department has the authority to designate as protected areas certain



abandoned shipwrecks and artifacts of primary scientific, archaeological, or historical value as set forth in 7 NCAC 04R.1009. Due to its historical significance, DCR Secretary Betty Ray McCain, “designated shipwreck site 31CR314, and an area within 300 yards of that site, as a protected area and all access, recovery, and salvage of that shipwreck and associated artifacts shall be in accordance with DCR’s management plan.”

The initial *QAR* management plan, completed in May 1999 after a two-year assessment period, dealt specifically with preservation options related to the scientific use of the historic shipwreck and subsequent public benefits. Management options, ranging from no action to full-scale recovery, considered the costs and benefits to researchers and how each option provided artifacts and data for research, which in turn enhanced to various degrees the ability to meet the public’s demand for information and exhibits. After an additional four years studying *QAR* and its surrounding conditions, site managers are now in a better position to consider on-site diver visitation as a potential public use. Site protection and preservation are of utmost importance for the *QAR* site since researchers have just begun to realize its rich archaeological record.

*QAR* represents a heritage resource that is not only unique and demands high public interest but is situated in a location exhibiting easy accessibility, generally good diving conditions, and striking visible remains. Remains that extend above the seabed have been thoroughly documented through archaeological mapping and photography. The exposed mound encompasses a 20’ by 30’ area consisting of heavily concreted cannons, anchors, barrel hoops, ship’s rigging features, and ballast cobbles. Small, recognizable artifacts have been recorded and removed from the site for study and conservation, which minimizes the temptation for potential souvenir collecting. For the most part, the reference and datum stations presently in place on the site can be used or strengthened to serve as part of a visitor guide system, and as restraining devices to protect exposed artifacts. This system will lead the visiting diver around the periphery of the site, offering site interpretation at select locations while keeping artifacts and the reef’s biological community protected from adverse affects of traffic, such as inadvertent human contact. Emphasis on dive training, preservation ethics, and stewardship has been demonstrated to be effective in reducing visitor stress on the resource.

#### *Program Funding*

As with any project, funding is of critical importance. Most programs of this nature rely on grants from various funding sources including government organizations and foundations. It is in this respect that Dive Down again differs from its peers. While it will be necessary to secure grants to pay for start-up costs, the program is designed to be self-funding. Fees charged to individuals participating in Dive Down are reinvested in the program to achieve sustainability. UAB considers the ability of the program to fund itself a requirement for two reasons.

The first and more pragmatic reason is that public funding is presently not available to implement and manage a public access program on *QAR*. The current budget short fall requires state agencies to offer only basic services and, in the case of UAB to concentrate on site protection of all North Carolina's shipwrecks. While grants are useful alternatives, they require extensive man-hours to obtain. With a full work schedule, UAB is restricted in their ability to devote personnel to pursuing outside funding for site-specific projects or new initiatives.

The second reason for establishing a self-funding program is ethical in nature. The Dive Down Program is inherently discriminatory. While there are indirect benefits to the general public through participant spending, its primary customer base is experienced scuba divers. This demographic is clearly not representative of the overall population as it consists primarily of individuals with an above-average income level. As a result, it is inappropriate to fund Dive Down using taxpayer dollars, and thus, the fiscal responsibility must lay with its participants.

#### *Benefits to Carteret County*

While Dive Down is an initiative controlled and administered by UAB, there are numerous opportunities for community participation, collaboration, and benefit. The following sections address the potential impact of Dive Down on Carteret County groups, businesses, and museums.

*Tourism* - The existence of shipwrecks lost in nearby waters have long been a part of the Cape Lookout area and provided both real and intangible benefits to the region. The discovery of *QAR* has further heightened attention towards the vital role of the sea and maritime activities. As the potential of this internationally recognized site is developed, tourist attractions such as the Maritime Museum's exhibit and the Blackbeard Festival will continue to attract more visitors. In this sense, Dive Down serves as yet another means of drawing attention to this unique historical asset, and consequently, to Carteret County itself. Thus, Dive Down will not only benefit tourism by bringing divers to the area, but will also broaden the county's exposure through marketing, word of mouth, and the potential publicity generated by the program. A goal of the program is to capitalize on the marketing potential afforded by Dive Down and to maximize its ability to promote eastern North Carolina, Carteret County, and the state wherever possible.

*Increased Visitation to Heritage Sites and Related Venues* - Carteret County retains a collection of non-profit organizations devoted to various aspects of human activities and the local environment. Some, such as the NCMM, the History Place, Fort Macon State Park, and the various historical sites and societies, focus on Carteret County's maritime heritage. Others, including the North Carolina Aquarium, the Core Sound Waterfowl Museum, Cape Lookout National Seashore, and the Rachel Carson Preserve, are dedicated to marine habitats and wildlife. Since Dive Down shares a common

interest in preservation and public education with these organizations, there are numerous opportunities to form partnerships within the community.

In many ways, Dive Down can encourage visitation not only to local attractions but associated tourist destinations. Up and down North Carolina's coast many places, such as Bath, Ocracoke Island, and Albemarle Sound, can claim a link to Blackbeard and pirates. The program provides for the direct distribution of marketing materials to its participants with the intent of encouraging participants to seek additional information about the rich interpretive centers available locally and regionally. In addition, there is also the opportunity for the various organizations to directly participate in the program by providing meeting facilities and speakers. Through direct involvement, both local groups and Dive Down can realize benefits, while also enhancing the experience for participants, by providing a rich and comprehensive program.

#### *Implications for North Carolina Shipwrecks*

Efforts by UAB to monitor, study, document, and protect the numerous shipwrecks in North Carolina waters will benefit from an increasing public awareness of the importance of preservation of these valuable cultural resources. Dive Down not only illustrates to recreational divers the value of a shipwreck, but also encourages them to advocate for the preservation of shipwrecks in their own communities and throughout the state. If successful, UAB could potentially use the Dive Down program as a model to meet the needs of other shipwreck sites in North Carolina.

Dive Down is unique in that it attempts to partner two conflicting sides of the shipwreck contingency, namely underwater archaeologists and the wreck diving community. Archaeological ethics mandate the systematic study of shipwrecks and prohibit the removal of artifacts for personal collection or sale. Underwater archaeologists strive to protect submerged sites from looting and destruction and consider the majority of wreck diving, especially treasure hunting, as activities contrary to their efforts. Conversely, armed with its own perspectives and values, the flourishing recreational diving industry demands a voice in the management of North Carolina's shipwrecks. Opposed to any legislation restricting diving activities, including the removal of artifacts from wreck sites, their views are clearly adversarial to those of underwater archaeologists. Strong convictions, ethics, and emotions exhibited by both sides have thus far prohibited any cooperation between the antithetical groups.

Dive Down presents a unique opportunity to unite the opposing sides in a common goal. The program is beneficial to both as it allows archaeologists to advocate for shipwreck protection, and provides the dive operators with business during an otherwise slow season. By focusing efforts on a single, mutually beneficial project that utilizes skills and assets from both sides, it is conceivable that a new relationship, based on communication and respect, may develop. While this relationship may not

yield immediate consensus, it nonetheless represents a potentially important step toward better management and preservation of North Carolina's publicly-owned shipwrecks in the best interest of all its citizens.

#### *Support for QAR Preservation*

As with most archaeological projects of this scope, the *QAR* shipwreck project lacks the necessary funding and resources to adequately protect and preserve this historic site. Managers are constantly faced with threats to site integrity, primarily due to the erosive action of currents during catastrophic storms. Monitoring of site conditions and artifacts, and instigation of emergency recovery when necessary to mitigate damage, are on-going and never ending. Add to these activities the fact that recovered artifacts require cleaning, analysis, and conservation, which, by nature, is extremely expensive and time-consuming, requiring experienced personnel, dedicated facilities, and proper equipment resources. Allowing public visitation to the site will require a greater level of monitoring of site conditions by managers to insure the program does not create adverse effects.

Given these site preservation needs, Dive Down has the potential to generate monies through program fees to sponsor a higher level of site monitoring and preservation, which not only will observe and mitigate possible diver effects but can assist in addressing storm-related impacts as well. Furthermore, Dive Down can instill a sense of ownership among participants, and a desire to contribute further toward the protection and preservation of *QAR*. Fund-raising activities, however, will be passive in nature and conducted through the distribution of information and continuing contact with participants via email and mailings, rather than overtly asking for contributions.

### **Program Components**

The goals for Dive Down are ambitious, with success hinging on the coordination of a multitude of resources. The integral program components correspond directly to identified goals, and their subsequent achievement. Feasibility is assessed with respect to the execution of each component, bearing in mind that **an inability to meet any of the identified project goals is considered contradictory to the success of the program.**

It is in the availability of resources that the fortuitous location of the *QAR* site, most notably in Carteret County, is paramount. Regarding the dive itself, only a mile and a quarter offshore in 23 feet of water, *QAR* is readily accessible to the shore facilities of major dive operations. Further, Carteret County's healthy sport diving industry provides for the availability of boats, dive equipment, and personnel already familiar with local conditions.

Equally important is the wealth of educational resources extant in Carteret County. Home to the UAB's *QAR* management headquarters, the Division of Marine Fisheries' Artificial Reef Program, the marine science programs of three major North Carolina universities, Carteret Community College, NOAA regional offices, and the NCMM, the county provides an invaluable consortium of expertise and usable facilities. The following section outlines the two main components of the Dive Down Program, education and diving. It describes how each component relates to program goals, and inventories the resources necessary for successful implementation.

### *Education*

Dive Down is designed to emphasize the interdisciplinary nature of submerged archaeological sites, specifically *QAR*. As such, the education segment of the program is divided into four modules: Maritime History, Underwater Archaeology, Coastal Geology, and Marine Ecology. Each module is slated for a specific time during the program and has its own expert presenter(s) and accompanying set of materials. The goal is to identify two to four eligible speakers and rotate them throughout the duration of the Dive Down's eight-week period. A line item to compensate the presenters is included in the program budget. Overviews for each module are provided below.

*Maritime History Module* - The History Module is designed to give an overview of Carteret County's maritime history and cover the coastal North Carolina colonial economy, the types of ships employed during this time, and of course, the impact of piracy. Additionally, the module will provide a description of Carteret County's nineteenth and twentieth century maritime history by focusing on the Civil War and the events of World War II when shipwreck loss was extremely high.

The purpose of the History Module is two-fold. First, historical context is critical to the *QAR* dive experience. It explains why the ship was located in Beaufort Inlet and the circumstances under which it sank. Illuminating the historical figures involved at the time within the context of broader events related to the colonization of the Americas creates a personnel connection to this important site and can only enhance the divers' comprehension of its significance.

Secondly, this module is intended to entice participants to seek additional information about Carteret County's maritime history. It is a unique opportunity to draw attention to attractions such as the NCMM, Fort Macon, the History Place, and the abundance of World War II shipwrecks, which are accessible to divers. On a broader scope, by illustrating to divers the benefits of being familiar with the history associated with a given vessel, we hope to encourage them to incorporate history into any future shipwreck diving experiences.

The Maritime History Module will draw on individuals from within the county. Included in the materials will be a comprehensive bibliography of sources on colonial maritime history, piracy, and North Carolina history, highlighting those texts locally available.

*Coastal Geology Module* - The role of geology in the study of shipwrecks is complex. As an integral part of the site formation process- how the site came to exist in its current condition-, it is essential for participants to have a basic comprehension of geological features and characteristics, and how they relate to an archaeological site. This Module will focus on the unique geological composition of the North Carolina coastline, emphasizing its dynamic environment and sediment types. By examining the various shoals, participants can gain a better understanding of how North Carolina waters became the Graveyard of the Atlantic.

The role geology played in the wrecking process of the *QAR* will be discussed, and geological factors that contributed to its current state will be identified. For example, participants will learn to recognize scour patterns and interpret their significance. On a more comprehensive level, the affects of sediment types and their movement on all underwater sites will be examined and how these factors contribute to the overall state of site preservation will be demonstrated. This module also provides an opportunity to discuss the importance of sand and the advantages of site burial, especially in the case of the *QAR*.

The preservation of artifacts as they rest on the seabed is heavily dependent on the rates of physical deterioration and corrosion. A segment of this module will be devoted to the introduction of how differing materials, particularly metals, are affected by immersion in seawater. This will involve a discussion of electrolytic chemical activities and galvanic action that serve to corrode and in some cases preserve certain artifacts.

Most likely, presenters for the Coastal Geology Module will come from scientists at UNC-CH's Institute of Marine Science and private companies involved in coastal geophysical studies. Materials for the module will include information on coastal process, a timeline of inlet activities and a submersible site map of the *QAR* pointing out prominent geological features, and published articles relating to the Cape Lookout coastal geology, and a bibliography of useful sources.

*Underwater Archaeology Module* - The purpose of the Underwater Archaeology Module is to provide an overview of the discipline, using the *QAR* as its prime example. It will focus on the importance of research design and discuss the information archaeologists can obtain through the systematic study of a shipwreck. Divers will be introduced to the techniques of site mapping and interpretation, the basics of ship construction, and the value of material culture. In addition, awareness will be raised about the positive and negative aspects of excavation, focusing heavily on the importance of conservation planning.

There are several objectives. First, this module is intended to illuminate the archaeological research associated with *QAR*, as the purpose of the program is to encourage divers to observe the site from a professional perspective. A basic understanding of archaeological methodology, therefore, will ultimately enhance the divers' experience on the site. Secondly, the module is a valuable tool for

dispelling the misconception that underwater archaeology is simply the removal of artifacts from a given shipwreck site and thus no different from salvors and individual divers who do the same. By emphasizing the amount of information obtainable through careful archaeological study, and the fact that not excavating a site is a viable option, preservation of submerged cultural resources will be advocated.

Most likely, presenters for the Underwater Archaeology Module will consist of archaeologists from the North Carolina UAB, ECU's Maritime Studies Program, and the Maritime Museum. Materials for the module will include a submersible site map of the *QAR*, published articles relating to archaeological ethics, and a bibliography of useful sources.

*Marine Ecology Module* - When studying a shipwreck, it is important to remember that humans are not the only life forms involved. Each hard structure, natural or manmade that is exposed above the seabed, is, in fact, home to an array of marine life whose presence invites consideration and study. The Marine Ecology Module addresses two objectives. The first objective is to outline the biological activities that affect a wreck site, namely, woodborers, bacteria, and crustaceans. Similar to geology, these factors greatly contribute to the site formation process and carry tremendous implications for how artifacts from *QAR* are affected by biological elements. Organisms present on the *QAR* will be identified and examined for their effects on the shipwreck, as well as, at other locations.

The second objective is to emphasize that *QAR* also exists as a living near-shore reef. This module allows us to introduce participants to local species they will likely encounter during their dive. It is also hoped that awareness is raised concerning the importance of reefs, both natural and artificial, as marine habitats, further emphasizing the challenges faced by submerged cultural resource managers.

The organizations present in Carteret County provide a pool of eligible presenters for the Marine Ecology Module. The NCMM, Division of Marine Fisheries Artificial Reef Program, the North Carolina Aquarium at Pine Knoll Shores, and NOAA are all valuable resources. Materials for this module will include a submersible illustrated list of local marine life for diver identification during their dive. Participants will be encouraged to observe particular species and their abundance and behavior, further contributing to their understanding of the interdisciplinary nature of the site.

### *Diving*

Within the recreational community, divers are consistently encouraged to seek additional training through their respective dive shops, personal experiences, and certification agencies. PADI and NAUI continue to strive to meet the demands of both divers and resources, advocating for safe and responsible interaction with the underwater environment and providing a multitude of specialty dive certifications. The Dive Down program is designed to complement the efforts of these agencies and

others, by providing a new experience for recreational divers. By taking an interdisciplinary approach to wreck diving that focuses on education and preservation, divers are introduced to techniques they can use to maximize their underwater experience on not only the *QAR*, but on future dive excursions as well.

Participants in Dive Down will be experienced divers holding advanced certifications. With potentially adverse site conditions, including low visibility, current, and lower temperatures, safety is of the utmost concern. Furthermore, the skills emphasized in the Diving Component necessitate a comfort level in the water and familiarity with equipment typically not present in new divers.

In an effort to be consistent with the precedents set by the recreational dive industry's certifying agencies, a certification card will be offered to participants. The program was designed to adhere to NAUI standards and, once finalized, a syllabus will be submitted to NAUI for review. Approval from NAUI will allow participants to be certified upon completion of the program as North Carolina Archaeological Site Divers (NCASD). This step is necessary as approval from NAUI lends credibility, as well as marketability, to the program among recreational divers.

It must be emphasized that enjoyment from diving *QAR* does not lie in the quality of the dive since conditions are rarely optimal. Rather, the enjoyment stems from the unique opportunity to view the sunken remains of what is believed to be an infamous colonial pirate ship as an archaeological site—an experience that only comes from enhanced observation. The Education Modules are designed to provide divers with this very knowledge. Once completed, participants are then prepared to proceed with the Diving component.

*Diver Techniques Module* - A successful dive on an archaeological site requires the utilization of several integral skills and techniques. The purpose of this component is to emphasize the importance of two skills, non-disturbance and observation. During the classroom portion of dive training, participants will be instructed on techniques designed to ensure neutral buoyancy and minimal body movement as they move around the site. As the *QAR* sits on a sandy bottom, it is prone to sediment disturbance that can adversely affect, if not destroy, visibility. Current and surge are common on *QAR*, and instructors will review proper techniques for diving in such conditions.

Archaeological site diving also requires considerable task management, as divers will be asked to make observations and take notes, while monitoring their buoyancy and air consumption. Divers will carry submersible reference cards with information on geology, ecology, and archaeology, including a detailed site map. The classroom portion will cover an overview of the training dive and the *QAR* dive, illuminating prominent features of both sites. Instructors will also review likely site conditions, dive plans, diver tasks, and safety.

Presenters for the Diving Module will be NAUI Instructors, specifically those with wreck diving and/or archaeological experience. Candidates will likely come from ECU and UAB. Carteret



County's diving industry serves as a useful resource, as it too can supply qualified Instructors. A line item for compensating Instructors is included in the budget.

*Training Dive* - Following the classroom portion of the Diving Module, divers will participate in a training dive to review their techniques. Several available sites are located in near shore waters and exhibit conditions similar to those of the *QAR*. Participants will be asked to demonstrate the skills emphasized in the classroom as the Dive Down instructor, accompanied by an additional dive master, monitors and evaluates them, providing guidance when necessary. Upon completion of the dive, the instructor will hold a short debriefing session to review the experience.

The location of Dive Down in Carteret County is advantageous, as local charters will be used for the training dive. This arrangement affords numerous benefits, not the least of which are convenience and insurance. Moreover, the collective knowledge of local conditions and navigation by the County's dive operators provide an added level of safety and professionalism. Their participation is essential to the success of the program.

*QAR Dive* - The *QAR* Dive begins with a site review and dive plan. Participants will then proceed to the docks of a local dive charter for transportation to the site. Following an equipment check and a safety briefing by the charter staff, the Dive Down instructor will reiterate the layout of the site and the goals of the dive. Present on the site will be station markers and a guideline to facilitate movement and safety, as well as site protection. The participants will be divided into two groups of ten, each group staffed by a Dive Down instructor and a dive master. Each dive will last approximately thirty minutes, with one group in the water at a time. Divers will descend the mooring line and proceed along the guideline, stopping at each pre-designated station.

As an added feature to the *QAR* dive experience, divers will be equipped with one-way communication devices. This addition allows the Dive Down instructor to speak to the participants and help guide them around the site while disseminating information about prominent site features. The introduction of communications equipment not only facilitates site education, but also adds a level of sophistication likely not experienced by the participants on past dives.

Following the dive there will be a short debrief and question-and-answer session. The dive concludes with the presentation of certification cards, certificates, and closing words from the *QAR* Project Director. Participants will be asked to complete an evaluation form on their experiences throughout the program, as well as on their attitudes regarding the preservation of submerged cultural resources. Results of the evaluation will be analyzed to determine the success of the program in terms of public education, awareness, preservation, and enjoyment. Timely analysis will allow elements within the program to be adjusted accordingly.

## Program Design

The Dive Down program design involves scheduling, an organizational structure and a proposed budget. It should be stressed that program development is a dynamic process requiring diligent evaluation and adjustment and the associated addition or removal of elements. During the initial stages of program implementation, minor adjustments are expected based on participant feedback and staff experience. A full evaluation by participating organizations will be undertaken upon completion of Dive Down's inaugural season to determine how the program met its stated objectives. Based on this evaluation and the capability to modify the Dive Down in the future to better achieve program goals, UAB will determine whether it is in the best public interest to continue the program.

### *Proposed Schedule*

Dive Down is slated to run from late September through Thanksgiving. The fall and winter months exhibit the best conditions for diving on the site as the prevailing northerly are diminished due to Shackelford Banks and subsequently an overall cycle of calmer sea states. In addition, because this period is a traditionally slower time for Carteret County, necessary resources and personnel are more likely to be available. Summertime is the worst period for near shore diving at *QAR* since the predominantly southwest winds cause wind driven waves originating far out to sea. Though the spring months are also a possibility, fall water temperatures are more moderate as compared to temperatures in March and April.

While the Dive Down program requires two and a half days, it will take place over three and a half days, allowing an extra day for potentially inclement weather or difficult tides. Water clarity at *QAR* is generally dependent on tides with a few hours on either side of extreme high tide known to provide optimal conditions. The goal is to run two groups of twenty divers per week for eight weeks, with one group scheduled from Sunday evening through Wednesday, and the other from Tuesday evening through Friday. A tentative schedule is outlined below:

### **Sunday/Tuesday Evening**

- Welcome reception at local restaurant
  - Welcoming words from *QAR* Project Director
    - What participants can expect to take from the program
  - History Module- Keynote speaker on Carteret County History
    - Distribution of informational and promotional materials

### **Monday/Wednesday**

- Continental breakfast at NCMM
- Classroom segment (8:00-12:00)

- Underwater Archaeology Module
- Coastal Geology Module
- Marine Ecology Module
- Diving Module- Classroom Component
  - Neutral buoyancy
  - Observation
  - Non-disturbance
- Lunch at Museum
- 2:00- Assemble with gear at dock for departure to training site
- 3:00- Training Dive
  - 1:5 Guide-Diver ratio
- 4:00- Debrief

### Tuesday/Thursday

- Continental breakfast at the History Place
- *QAR* Briefing- history, excavation, site layout
  - Review site map and dive plan
    - Re-emphasize skills from training dive
- Proceed to dock for departure to site
  - Before departure, conduct equipment checks
  - Listen to dive operator safety briefing
- 30 minute guided dive on *QAR*
  - Site will consist of 5-8 predetermined stations. Divers will remain behind a guide rail (PVC or cable) to minimize site disturbance, moving along the guide to the next station. The Group Leader will communicate using one-way Buddy phones to enhance the diver experience
  - 2 groups of 10, 2 guides per group with 1 group leader
- Return to dock
- Reconvene at NCMM Gallants Channel facility for debrief
  - Revisit key points
    - Discussion – Q & A session
  - Continuing education possibilities: MAHS, NAS
  - Congratulate participants
  - Present certification materials- card, pin, patch
  - Evaluation forms

### *Organizational Structure*

Given UAB's responsibility for both preservation and management of the state's submerged heritage sites, including *QAR*, it is natural that they administer Dive Down. The program budget allows for the addition of a Program Coordinator whose responsibilities are predominantly administrative. This individual would report directly to the Director of the *QAR* Shipwreck Project, and would work closely with program principals, and supervise all components.

Working with UAB, the other primary member of the Dive Down is the NCMM (NCMM). Education is the main mission of the museum and their participation is fundamental to the program's success. Further, upon completion of the cleaning, analysis, and conservation by UAB, all artifacts

recovered from the *QAR* are destined to be stored, exhibited, interpreted, and administered by the NCMM. Specifically important to Dive Down, the museum has the internal mechanisms in place to effectively serve as the administrative agent for the program, fulfilling such fiscal duties as check writing, deposits, and accounting. A line item to account for these responsibilities is included in the program budget.

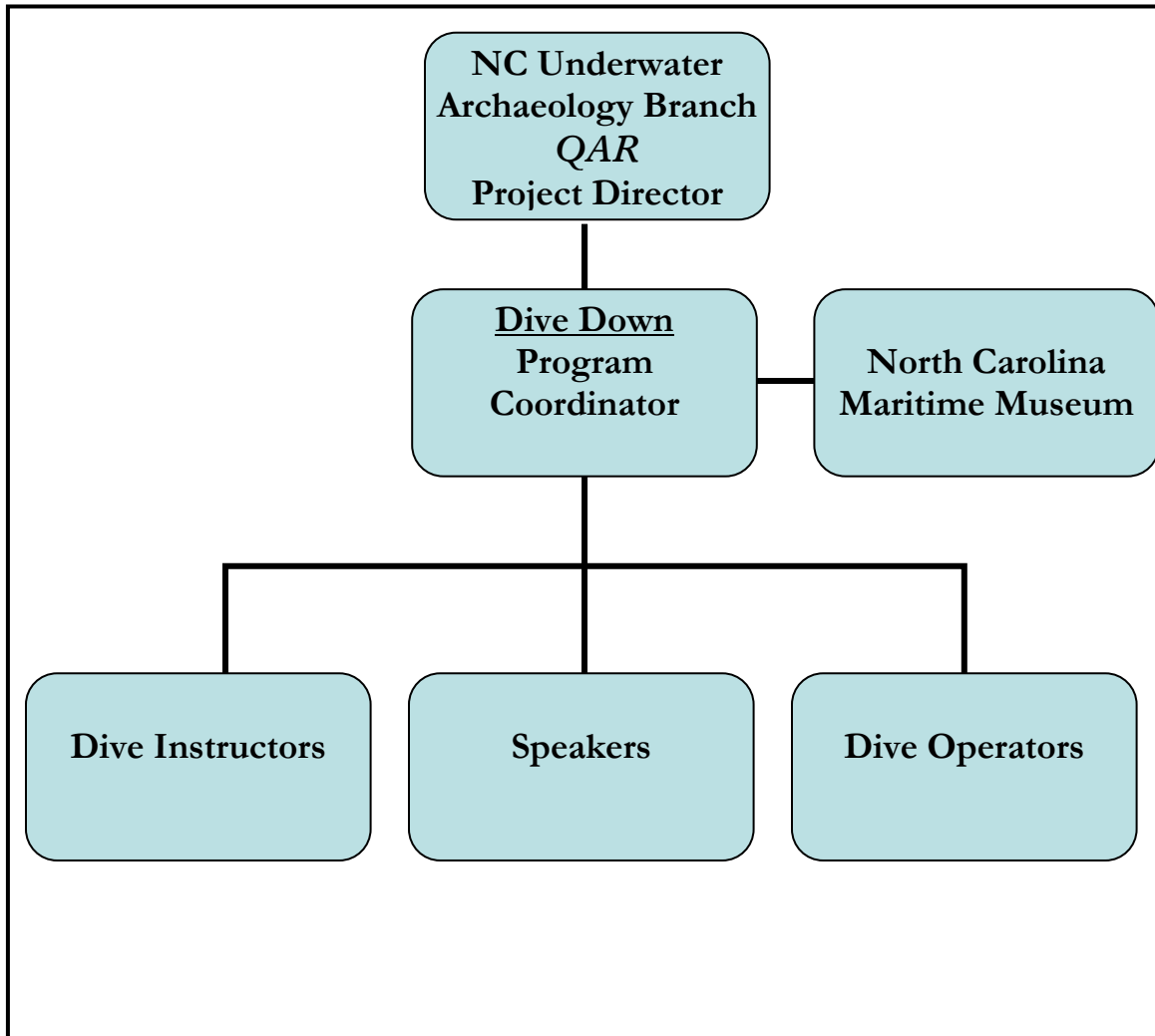


Figure 1: Dive Down Organizational Chart

ITEMS	Cost per participant	At 40 Participants per week for 8 weeks
<b>QAR Artifact Conservation/Site Monitoring</b>	\$100.00	\$32,000.00
<b>Administrative Overhead</b>	\$65.00	\$20,400.00
Marketing and Materials	\$100.00	\$32,000.00
<b>Dive Charter- includes tank/wts.</b>	\$120.00	\$38,400.00
<b>Salaries</b>		
Program Coordinator	\$20.00	\$6,400.00
Keynote Speaker (\$75/appearance)	\$3.75	\$1,200.00
2 Dive Guides (\$50/group)	\$5.00	\$1,600.00
Ecologist (\$75/appearance)	\$3.75	\$1,200.00
Underwater Archaeologist (\$75/appearance)	\$3.75	\$1,200.00
2 Dive Instructors (\$100/group)	\$10.00	\$3,200.00
Geologist (\$75/appearance)	\$3.75	\$1,200.00
<b>Catering</b>		
Welcome Reception (1)	\$25.00	\$8,000.00
Continental Breakfast (2)	\$10.00	\$3,200.00
Lunch (2)	\$20.00	\$6,400.00
	<b>\$490.00</b>	<b>\$157,800.00</b>

**Figure 2: Proposed Budget for Dive Down**

## Conclusions

The objective of this study was to establish clear program goals and components to facilitate the evaluation of desirability and feasibility for Dive Down. The goals section articulated the resource's potential benefits to its constituents, while the components section outlined the proposed means in which to achieve these goals. Additionally, each segment identified the resources needed for success, as well as illuminated challenges to face and possible obstacles to overcome.

### *Program Feasibility*

The study reveals that the implementation of a diver outreach program on the *Queen Anne's Revenge* is not only feasible, but desirable. This feasibility is attributable most notably to the amount of locally available resources. Carteret County's wealth of marine expertise allows for the relatively easy assembling of presenters necessary to successfully conduct the program modules. In addition, there exist a number of appropriate facilities available to host training sessions in exchange for increased exposure or visitation. Throughout Dive Down's development and implementation, program leaders will continue to develop partnerships within the community and work to identify new opportunities for collaboration and mutual benefit.

Carteret County's diving industry also plays an important role in program feasibility as it provides readily available and suitable instructors, dive vessels and equipment. Having access to these resources is advantageous for two reasons. First, the state and UAB are relieved of the majority of their liability by using private charter companies, which maintain adequate insurance to cover scuba diving activities. Second, local dive operators' expertise, combined with their experience with the recreational dive community and emphasis on customer service, ensures the efficiency, safety, and professionalism of the diving component.

With the resources clearly available, the challenge then lies in coordination and facilitation. Organizational structure, combined with budgeted compensation for various participants, mitigates this potential obstacle on several levels. The program includes a staff Dive Down Program Coordinator whose primary responsibility is program management and administration. With program implementation scheduled for fall 2004, there is sufficient time to implement a marketing plan and most scheduling and preparatory work can be done well in advance of the arrival of participants. Further, by compensating speakers and dive charters, rather than requesting them to volunteer, their consistent participation is more likely assured.

Concerning the issue of site preservation, site managers feel *QAR's* archaeological integrity is sustainable during the Dive Down program. To ensure that loss is minimal, the program budget supports periodic site monitoring through visual inspections, video imaging and an *in situ* conservation program to track the stability of the larger artifacts. UAB will conduct condition surveys before, after, and in some cases, while Dive Down is on-going, to evaluate increased visitation and determine if affects are occurring. Adverse threats to site preservation are expected to be negligible. Should, however, evidence from monitoring suggest otherwise, remedial steps would be developed and implemented to mitigate the problem. In an extreme and highly unlikely situation, site managers reserve the right to terminate the program.

The ability for Dive Down to exist as a self-funding entity depends on whether the recreational diving industry can support the proposed cost for participation. Market analysis revealed that a specialty certification similar to the Dive Down's proposed North Carolina Archaeological Site Diver

retails at \$175 per diver. In conjunction, the cost of a half-day dive charter with air tanks off the Carteret County is approximately \$60 per diver. With two dives scheduled, the combined cost therefore, of the Dive Down's Diving Component alone retains a market value of \$295. With the inclusion of several meals (\$55) the recreational diving market is expected to provide an additional \$135 for the added value of presenter expertise, the lure of *QAR*, and the uniqueness of the experience for an overall program fee of \$490. An informal polling of dive shop owners revealed not only a demand for diver access to *QAR*, but a concurrence with the above stated market conditions. Furthermore, as Dive Down is intended for a limited time, namely three to five years, program attendance and participant willingness to pay should benefit from the economic rules of supply and demand.

Dive Down is expected to have a positive impact on Carteret County tourism. Consistent with other coastal communities, local tourism is based on the effective capitalization of the various opportunities for enjoyment afforded by geographical resources. The beach, boating, fishing, diving, bird watching, shell collecting, cultural attractions, and others are all useful means for promoting Carteret County as a multifaceted tourist area. The ability of *QAR*'s mystique and uniqueness to contribute to this effort should not be underestimated nor underutilized. The county has already realized benefits from *QAR* with the increased public exposure that stems from its existence. The numerous articles and programs devoted to *Queen Anne's Revenge* in Smithsonian and National Geographic magazines, Discovery Channel, and various newspapers, the increased visitation to the museum, and the growing popularity of the annual Blackbeard Festival, are indicators of *QAR*'s value in this capacity. Dive Down is yet another way Carteret County can use this important site to promote itself as a vacation destination. Additionally, as Dive Down represents an unprecedented effort in the public display of underwater archaeological sites, it is an opportunity for the County to gain further exposure by participating first hand in the development of a new model in submerged cultural resource management. Moreover, given Carteret County's proximity to one of the most renowned collections of shipwrecks and favorable diving conditions in the world, uncovering the potential benefits to tourism from submerged sites is of great interest.

This study was an important step. It forced the objective evaluation of the site's potential and established desired goals and outcomes. It illuminated the magnitude of such an initiative and identified the resources required for successful implementation. Program developers, including the UAB and the NCMM, as well as higher-level state officials, are encouraged by the numerous prospects afforded by Dive Down. A true testament to the value of Dive Down, however, lies in its ability to attract community members who are not merely supportive, but excited and proud that Carteret County is so well positioned to host such a unique and valuable experience.

## Appendix: Next Steps

With the establishment of feasibility, efforts can now focus on development and implementation. While outside the purview of this study, a brief overview of subsequent activities is listed below.

1. Module design
  - a. Convene module experts
    - i. Articulate objectives
    - ii. Create syllabus
    - iii. Conduct information-gathering dive
      1. Identify stations on site
      2. Determine most effective means of installing guidelines or rails
      3. Evaluate site conditions for safety
      4. Inventory marine life for Ecology module
      5. Identify areas that effectively illustrate geological processes
  - b. Design materials
    - i. Instructor's Handbook/Module binders
    - ii. Power Point presentations
    - iii. Dive slates
  - c. Compose contracts for presenters
2. Submit program to NAUI for approval
3. Develop a marketing plan
  - a. Create a logo
  - b. Decide on most effective means of reaching target audiences
    - i. Dive shops
    - ii. Divers
  - c. Define potential roles for local businesses
    - i. Marketing partnerships
    - ii. Solicit participation
  - d. Design materials
    - i. Marketing packets for dive shops
    - ii. Advertisements
    - iii. Welcome package
    - iv. T-shirts
    - v. Certification cards
    - vi. Dive Log for museum display
4. Secure funding for marketing materials
5. Run a trial program for final evaluation using North Carolina dive operators as test group
6. Print and disseminate materials
7. Participant enrollment, confirmation of project personnel and equipment and site preparation
8. Implement QAR Dive Down program



9. Post-program evaluation process
10. Program report and recommendations
11. Dive Down Program Presentation at the 2005 Society of Historical Archaeology Conference