

History 696  
Final Project Proposal  
T. Kurt Knoerl  
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## Introduction

History as a discipline has expanded the list of tools and methodologies available to its practitioners. In addition to more refined sub fields such as social and labor history it has increasingly adopted new methodologies such as oral history and material culture studies. While still not in wide use by historians, archaeology has grown in acceptance as a means to obtain additional data that is not available through traditional documentary sources. Such information often speaks for those segments of the population that are often missing from the written record. The histories and activities of illiterate and often poor members of society were either deemed not worthy of study and or left little trace for historians to examine. Yet the physical record can tell their story or parts of it if researchers possess the knowledge and training in how to read it. Excavations of slave quarters in the Chesapeake, for instance, revealed the persistence of secret traditional African rituals in the eighteenth century. Symbolic items such as beads, crystals, and disks with pierced holes have been found hidden in walls and under floor boards.<sup>1</sup> Underwater archaeology can also provide information not otherwise available. For example long held theories suggested the Spanish Armada's defeat to the English was the result of a lack of shot. Underwater archaeological investigations, however, showed large quantities of shot were present on board and that defective cannons were more likely the cause.<sup>2</sup>

Historians such as those trained in East Carolina University's Program in Maritime Studies learn underwater archaeological field methods as well as traditional archival research. Graduates from the program, begun in the late 1970's, have joined those from other disciplines and recorded hundreds if not thousands of sites in US waters alone. Their reports represent a wealth of information that can be used to educate the public, assist other researchers, and inform public leaders as to the importance and extent of our nations submerged cultural resources. This site

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<sup>1</sup> Jon Butler, *Becoming America The Revolution Before 1776* (Cambridge, MA, 2000), p 221.

proposes one step that can be taken to assist in all those efforts by creating a tool to harness the huge database of information that underwater archaeologists created that is just waiting to be tapped. This project represents one part of an existing website called the Museum of Underwater Archaeology (MUA). The following proposal will discuss how that tool fits into the MUA's overall mission and how it can benefit historians and underwater archaeologists alike. In addition it will layout the structure of the site, its mechanics, and rationale.

## **Scope**

The online Museum of Underwater Archaeology (MUA) was founded in 2003 as an effort to support professional, student, and avocational underwater archaeologists. Its primary goal is to offer an outlet for the dissemination of their research results to their peers and the general public. Many archaeologists do not possess the time, money, or skills needed to create web based presentations of their work. The MUA helps fill this void by creating online museum style exhibits for display on its website at no cost to the archaeologist.

The MUA sought for additional ways to support underwater archaeologists beyond exhibit presentations. Museum displays while important occur after the research is completed. How could the MUA help prior to those investigations? The answer lies in creating a tool for researchers to use during the earliest phase of their projects. That tool, the subject of this proposal, will aid in tracking down information on what has already been examined by other underwater archaeologists. That information is contained in site reports from completed projects including reports on the following topics:

- Shipwrecks and hulks terrestrial and submerged
- Maritime related sites terrestrial and submerged
- Wharves
- Shipways
- Inundated ecofacts
- Inundated terrestrial sites

These documents typically follow a standard format that contains information on a site's historical background, previous work done on the site if any, what their research goal was, what

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<sup>2</sup> Colin Martin and Geoffrey Parker, *The Spanish Armada* (Manchester, 1988), pp190-194.

methodology was employed, what information was gathered, analysis of the data and their conclusions, and recommendations for future management of the site and additional research.

Libraries carry some published works along with student theses and dissertations but this represents only a fraction of the extant literature that is produced by government sponsored projects produced typically as part of mitigation surveys prior to construction activities such as river channel dredging or widening. Many states such as Maryland and South Carolina continually conduct surveys as part of their mission to protect state bottom lands and the material culture deposited there. They also work in cooperation with the US Navy and the National Park Service. In addition they occasionally offer guidance and set priorities for avocational groups seeking to catalog shipwreck sites throughout state waters as part of their altruistic goal of protecting historic sites for the public good. The resultant reports or “gray literature” often reside in state offices and are not easily accessible to the public or researchers. In many cases no electronic catalog exists which make accessing them much harder. While there is a benefit to protecting this information, namely guarding site location information so as to prevent looting, such inaccessibility can defeat the purpose of collecting the data in the first place.

Currently individuals wishing to view the reports must contact the proper state office and ask what reports exist. More than likely this would result in several telephone calls, faxes, or emails just to determine what is available. This process would have to be repeated for every state that might potentially have relevant data. I propose to gather bibliographic information on these site reports and make that data available online through a search tool for researchers to use. A coordinated effort with state underwater archaeologists will provide a safe compromise whereby the titles of research reports and other non sensitive metadata will be released online while leaving ultimate control of the reports in state hands. Once completed this project would allow any user to go to one page on the web and search the holdings of all participating states at one time.

Initially the database would be populated with titles from one or two states as a trial. Dr. Susan Langley, the State Underwater Archaeologist for Maryland has agreed to release their titles to the MUA for this project. Maryland has over 100 reports on hand. Six other states were

contacted and have agreed to this project but their data will be included only after any initial bugs have been worked out of the system. Samples from each state however will be used to refine the table structure. After the initial data is appended to the tables, additional states will be contacted. This piece meal approach is designed to start with those willing to participate in an unproven system. Hopefully a more developed tool will encourage additional states that might initially have rejected working on an untested project. Looking further ahead one could envision incorporating US Army Corp of Engineer titles, MA and PhD dissertations, Museum sponsored projects, and avocational research reports.

How users search is a function of the database schema design. Due consideration was given to what type of data to store. A simple searchable listing of titles and publication information would be useful in and of itself. But because this must be created from scratch an opportunity exists to plan for greater flexibility and learning potential. Additional metadata will be built into the table structure that will allow for searches based on many factors. A search on time period for instance might return all shipwrecks excavated dating to the eighteenth-century. Limiting results to site type on the other hand could return all wharves or shipways if desired. Due to the need to protect against looting users would not receive information on exact site location; they could, however, search on a generalized location such as the Potomac River, or lower Chesapeake Bay. Such searches if added to a mapping component (discussed in the review portion of this proposal) could not only return relevant report titles but spatial relationships as well. A search on keywords or any field for that matter (see the Home section of this proposal) will provide unique data sets limited only by the search criteria the user can think of. Report abstracts will also be included whenever possible thus offer more data to mine. When data is queried and combined in this way something important happens. New information is created and revealed from what had been independent units of data separated by time, space, and technology. A simple query becomes an act of creation. While databases are not narratives on their own, search capabilities offer researchers a way to take previously disconnected sets of arbitrary data and move one step closer to creating their own narrative based on their own goals.<sup>3</sup>

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<sup>3</sup> Lev Manovich, *The Language of New Media* (Cambridge, MA, 2001), p. 227.

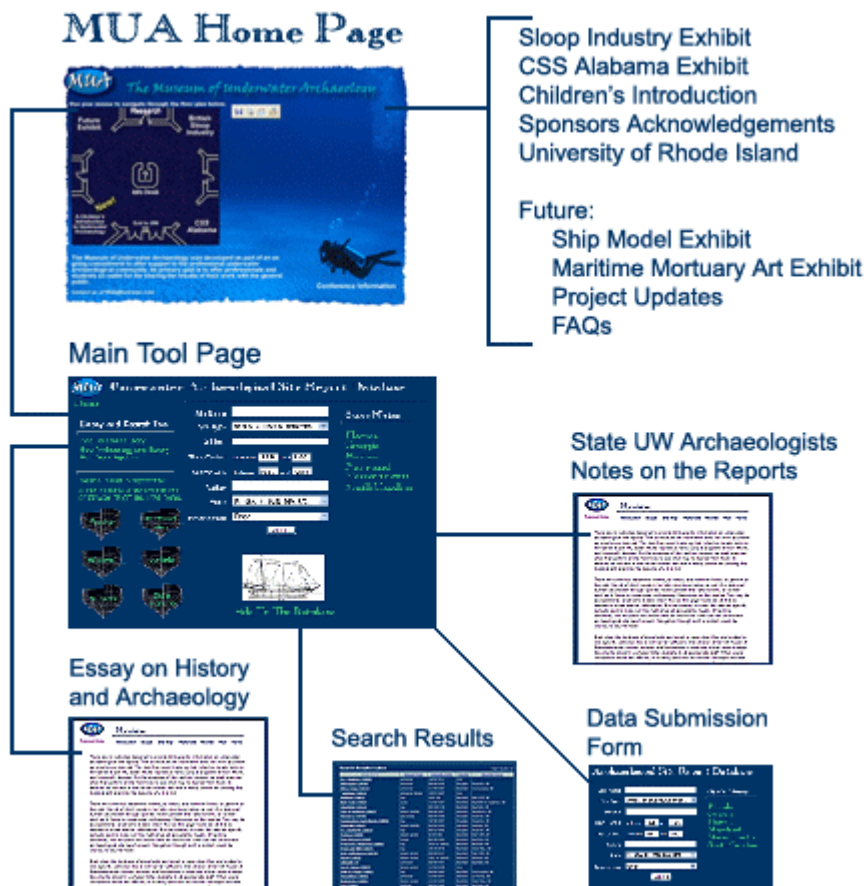
Reasons for utilizing such a tool include historians who lack underwater archaeological training. They might want to look at regional sets of data or search for individual sites that relate to their archival research. For example maritime historians might be interested in seeing material culture data from all wharf sites investigated in the Chesapeake Bay from the eighteenth-century. Reports from those projects could shed light on how goods were transported across time and terrain. Other questions might reveal the spread of ship construction sites through the bay along with changes in technology or construction methods not described in the literature of the period. Archaeologists might use the database to confirm what areas of investigation have received too little attention or if greatly covered what new questions that data might be pointing to. Museum groups might wish to mine this data for potential exhibits. The general public too might be interested in what resources are roughly in their geographic areas. Avocational groups might use this to help set priorities for future surveys. Cultural resource management firms might utilize the data to prepare better reports by having a better awareness of previous work. The potential uses for this data is extensive.

Other components of this site would include an introductory essay on how archaeological data can be used by historians, introductory notes by state underwater archaeologists on their report collections, and a data submission form to be added at a later date that would all contributors to upload new information and or update their existing data sets.

A key component for maintaining the usefulness of such a database would be keeping it up to date and publicizing its existence. The two elements are inter-related. Gathering this data will be time consuming. While some states have seen its potential at the very beginning others may take some convincing. No one wants to build a tool that doesn't get used. Use will depend on how complete the database is. This seems like a potentially vicious circle. That is why the original states willing to take part must not be disappointed by the site's performance and utilization. Once initially populated it will be incumbent upon the MUA to broadcast its existence to as wide an audience as possible. This can be accomplished by getting the project up on the web and announcing it to the world through press releases, notices to discussion boards, presentations at professional conferences, and through university involvement. The MUA noticed a surge in interest in its site

when it involved a graduate student in the creation of a children’s exhibit. Graduate students have their own informal network that includes their professors. They share their experiences and thus quickly spread the word about their project. Another key to activity is keeping the site fresh. By continuing to add new data sets there are new reasons for additional public announcements. This encourages users to return to investigate the new records. And, because they know what states have been added they can quickly rerun previous searches specifically on the new data set to see if it is of interest to them. Robust activity then would help attract additional states and institutions to contribute their data sets thus perpetuating a cycle of growth.

## Site Map



The bibliographic underwater archaeological site report search tool is one portion of the larger MUA site. For the purposes of this project I have only expanded the section of the site map pertaining to this tool. The main components of the tool are:

- Database Search (By Field or Through Finding Aid)

- An Essay on the Use Of Archaeological Sources in History
- Introductory Notes on State Reports By the State Underwater Archaeologists
- A Data Submission Form

The data submission form would not be included with the first iteration of the site. When completed it would provide a password protected means for new states to submit or update their data.

## Rationale

It is feasible to collect all the bibliographic information about the hundreds or thousands of site reports currently contained within state underwater archaeologist's offices and produce a printed copy of those titles. They could be organized in chapters by state. An index could be attached to aid in finding specific reports. It's even possible to come up with alternate organizational themes and include them in the publication. Let's examine a similar printed collection entitled *Virginia and Maryland Shipwreck Accounts 1623-1950* by Joan Charles. Unlike our bibliographic collection of archaeological report titles this collection contains documented references to shipwreck events but the principals are the same. Her book catalogs over 1200 shipwreck incidents and displays them three different ways; in chronological order, by geographic area, and by vessel name.<sup>4</sup> It is an amazing resource that is very easy to use. It is also arguably one of the most complete collections of shipwreck data for the Chesapeake Bay. And yet this does not seem to be a good model for the bibliographic database discussed in this proposal. Why?

Documents are static and potentially dated the moment they roll off the presses and so like a new car they tend to drop in value as soon as a new discovery is made. Her research was quiet exhaustive and it's possible there may not be any additions to her list anytime soon. New site reports however, are generated continually. A web based database would be much easier to update than reprinting a publication every year.

Online searching allows the user to define what subsets of data they would like displayed. The shipwreck book while offering three useful ways of finding a particular vessel will now allow me to see a subset that I might be interested in, say all schooners for example. Given proper data

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<sup>4</sup> Joan Charles, *Virginia and Maryland Shipwreck Accounts 1623-1950*(Hampton, VA, 2004). Please note this book is a collection of shipwreck notices from various written sources such as newspapers and insurance records. It includes wrecks that have never been found and make no mention of archaeological investigations.

preparation our bibliographic database would allow me to see all schooners investigated in as wide an area as I wished. This functionality alone justifies the time and energy required to publish the bibliographic record via an online database. As mentioned in the scope section of this document, the ability to reorganize and query the database in new ways is a creative act that reveals data that not only hasn't been seen but that didn't previously exist.

An online database has an additional advantage over printed material in that with proper coding, contributions to the site can be made by individuals other than the original creator. Once the format for the data has been standardized templates can be supplied to new states or organizations for their use. They can in turn upload their own data without requiring the original creator to be involved beyond perhaps some last minute data validation. This would allow the database to continue to grow without being a constant drain on the originators time. This is not generally an option with a printed publication. Additionally commonly agreed upon metadata standards would allow different organizations to utilize this data within their own database systems. Such interoperability will be key in the future for discovering the real potential of this data set.

## **Review of Existing Sites**

There are no websites designed to provide bibliographic information on underwater archaeological site reports. That is because the information does not exist anywhere as a particular data set. The data that would make up that collection largely rests in the hands of over fifty state offices, numerous Army Corp of Engineer district offices, and University libraries. For the purposes of this section however we shall examine sites that perform similar functions to see what may be learned from them. In addition we will take a look at the closest site that in theory should be covering this material and examine the reasons why it is not.

There are numerous databases relating to history and maritime history in general on the web. Not all of which reside in formally structured tables as part of a relational system accessible through queries. Some present their data directly on screen such as *A Guide to Underwater Archaeology Resources on the Internet* (<http://www.pophaus.com/underwater/>). This may be acceptable for small sets of data where "find on this page" tools are all that is needed to locate specific information. But the inability to query the data for specific subsets quickly rules out this

method as an acceptable means of tracking potentially one thousand document titles as maybe the case with the underwater archaeological site report project. Navigation through such a system would be clumsy to say the least.

Even when we know where the documents are located or even when they are located in one specific collection this is still not sufficient. One division of the US House of Representatives (House) support staff possessed a collection of over three hundred documents stored in a shared folder available to all appropriate staff. When users complained about the difficulty in locating particular documents managers decided to use a mysql relational database to track document locations. Fields for metadata were added to track information such as document creation date, last date of review, version numbers, as well as other descriptive fields. In addition a web based front end was created to allow users to search by author, document type (i.e. reference documents, operating procedures, etc Managers discovered that the new metadata, previously unavailable without looking at each individual document, could be used to create new reports. By searching fields such as "REVIEW\_DATE" where the value was over six months old they could identify which items were expired and in need of review. In another example an author list could be compared against departing staff announcements to see which items had to be reassigned. The database and metadata in particular opened up new avenues for analysis previously not possible or in some cases imagined.

This system has inadvertently served as a prototype for the underwater archaeology report bibliography project. Although the subject matter is vastly different the mysql database and PHP coding for the web front end used at the House offered a chance to learn from their mistakes and successes. The House project however, served a very small audience with a limited, and more clearly defined, list of requirements. Users on the Internet accessing the underwater archaeology report bibliography database would potentially have a greater variety of interests and query needs. Any system developed for their use requires greater flexibility.

Underwater archaeologists for the state of Wisconsin helped develop the shipwreck database at the *Wisconsin Maritime Trails* (<http://www.maritimetrails.org/research.cfm>) web site. It contains over 680 records searchable on at least thirteen fields. While this is not bibliographic data

it does offer something not available with the House project. In addition to the ability to search on the various fields it offers a finding aid. A map of Wisconsin's Great Lakes shoreline shows four distinct zones. These zones represent predefined queries that select wrecks from those specific geographic areas. From the resulting table returned to the screen users can select specific shipwrecks and gain more information. This aid offers users quick and easy entry into the database and perhaps encourages users to then create more detailed queries once they have seen what data appears in different fields. In addition to the finding aid this site stands as an excellent design model in terms of layout and color. Alternating lines in the table differ in color allowing the eye to easily comprehend the data. In general the site's navigation helps the user explore the records without feeling overwhelmed. In short there is much to be learned from this here.

The National Park Service's Archaeology Program runs the *National Archaeological Database Reports module (NADB)* (<http://www.cast.uark.edu/other/nps/nadb/nadb.mul.html>). At first glance one might conclude that this site should contain the underwater archaeological bibliographic data the MUA project intends to capture. The site states that it contains, "...an expanded bibliographic inventory of over 350,000 reports on archeological investigation..." Further it supposedly, "benefits from the bibliographic records contributed by many partners, particularly State Historic Preservation Offices and federal agencies." A quick search of the database confirmed it does contain some underwater archaeological reports. What then is left for the MUA to cover one might ask, apparently a great deal. An interview with National Park Service staff suggests that NADB was originally intended to prevent agencies from requiring surveys of the same areas by different organizations that were unaware of past survey activity.<sup>5</sup> The database was primarily created to house reports generated by surveys paid for or supported by federal funding. It should be noted, however that the database does include some reports that were not federally funded as well.

While this site seems like the perfect repository for the underwater reports several problems suggest otherwise. For one thing the system is voluntary. Collections for some states

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<sup>5</sup> Personal conversation with Dr. John Knoerl of the NPS GIS Lab (Washington, DC, 2005).

are incomplete. Others are missing altogether due to some state's refusal to participate. Reasons for this vary including lack of funding to prepare materials for inclusion. (NADB requires that abstracts be submitted with the report's bibliographic information). The results of this can be seen when searching the database on shipwreck related reports. The state underwater archaeologist for Georgia suggested that he has more than one hundred reports on underwater surveys within that state.<sup>6</sup> A search on the NADB site for Georgia and the term shipwreck returns two reports. While it is true that the term shipwreck does not necessarily appear in every underwater site report one would expect to find more than two titles. Another issue may be related to the site's original purpose of housing federally funded or supported reports. Results vary from state to state but this may account for why many purely state funded projects do not appear. Clearly a new effort at culling this data is required.

A further question and perhaps the most important one arises from a review of the NADB site. Shouldn't this data be stored in one location for searching rather than two; the NADB and the MUA? After all the primary goal of the MUA project was to eliminate the need for researcher to have to visit more than one site. Several options are available here. One might be for the MUA to proceed with the project and turn over all the data it gathers to the NADB. Another would be to drop the project altogether and wait for the data to be collected by someone else and placed in the NADB. A third option might be for the MUA to collect the data, create the search tool, and make the data available on its own site and perhaps share it with the NADB. A key point to consider is that up to now the system has not captured all the information. This may be entirely no one's fault as both state and federal agencies have had to deal with tighter budgets and reduced manpower. Left on its own this data might never be collected. If the MUA were to collect the data and simply turn it over to the NADB this would only solve the problem in the short term. In order to truly make this system work contacts with state agencies must be maintained along with regular requests for additional updates. If that type of communication is not in place now there is no reason to assume it would be in the future. When six state underwater archaeologists were approached about this project by the MUA's not one mentioned the existence of NADB. No doubt these professionals are

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<sup>6</sup> Personal conversation with Jason Burns, MA Georgia State Underwater Archaeologist (Savannah, 2005).

aware of its existence but for whatever reason did not suggest it as an alternative. Finally if the MUA were to gather the data and create a web based front end it makes sense for that group to maintain it since relationships will have been established that can be utilized to keep the database current. If the data structure is compatible with the NADB then the data could be shared. Having that information in two places would provide some measure of security in case one set was destroyed or lost.

## **Work and Technical Plan**

The MUA's underwater archaeological bibliographic database project will benefit from groundwork completed over the past two years while I was employed at the US House of Representatives. During that time I devised and created a document metadata database quite similar to that which I am proposing now. Document information was stored in a mysql relational database and was accessed via a web page that used PHP (Personal Home Page Hypertext Processor) code to handle database queries and create pages to display their results. In addition the MUA has been in existence for approximately 2 years and in that time the quality of the html has improved though it still has far to go. I am attempting to make use of these two experiences in order to create the bibliographic tool.

The first major task will be to secure an initial data set and to test the waters to see if additional collections would be forthcoming. As described in the scope section the plan involved securing data from a few state underwater archaeologists to build a proof of concept. Once that was accomplished other states would be invited to participate. Hopefully they would be attracted by the functioning site. Maryland State Underwater Archaeologist Dr. Susan Langley was approached first due to a pre existing close working relationship and her noted practice of encouraging innovation. Dr. Langley agreed to work with the MUA to provide bibliographic information on state underwater reports and to consider including abstracts if financially feasible. Four other east coast states and one Pacific coast state were approached informally about participating in the project. Each agreed in principal to participate. Only Maryland data would be used during the initial stages of development due to the ease of acquiring the data which numbers well over one hundred records. Once testing shows stable results the other previously contacted

states will again be approached in a more formal manner. After successful completion of further testing with the new records a plan will be created for acquiring additional data. This approach seeks to build a reputation based on a working tested site.

One of the greatest challenges facing this project is the planning of the database itself. While previous House experience demonstrates that a working set of tables could be created in mysql in a relatively short period of time this does not mean that that is the best approach. An interview with the Scott Gillespie, the Project Manager and Programmer for the Virginia Center of Digital History suggests far more thought must be given to the manner in which the tables and fields should be created. Gillespie worked on the Geography of Slavery website which utilizes XML rather than a relational database. While he agrees that the limited amount of text along with the type of metadata to be associated with the site report records makes a relational database a good choice there are additional considerations that must be reviewed prior to beginning work.

One of the most important trends in the web development is the move toward standards for the creation of metadata storage.<sup>7</sup> Gillespie notes that his current project seeks to comply with the Dublin Core Metadata Initiative (DC). This is “an open forum engaged in the development of interoperable online metadata standards that support a broad range of purposes and business models.”<sup>8</sup> By meeting this standard other organizations will be able to share and make use of the elements stored in the MUA database because both parties will be utilizing a commonly agreed upon set of elements, element refinements, and encoding schemes. In the common tongue this means an agreed upon way to describe field names and the types of values they will store. Meeting this standard is perhaps the truest expression of the MUA’s desire to live up to its mission to support the professional community. As this is a new standard not immediately known to me it will take additional time to learn how create tables following this standard. The DC website hosts numerous documents that should aid in that effort. As this data set is not extensive the additional work should not be overwhelming and will certainly be worth the effort. An example of the potential benefits that derive from following this standard is the ability to use standard spatial codes that

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<sup>7</sup> Many thanks go to Scott Gillespie for his willingness to discuss and share his views and work on building data structures that will comply with the Dublin Core standard.

<sup>8</sup> The Dublin Core Metadata Initiative (<http://dublincore.org/>)

could be utilized at a later date to map the general high level locations of the various sites thus providing a visual reference tool for analysis.

Having created the standardized database schema and tables PHP (Personal Home Page Hypertext Processor) code will be used to enable web based queries and to format the results. The web interface available to the public will only process select statements and not allow any record insertions, deletions, or updates. Utilities for those processes will be restricted to a small group of individuals possessing the proper authorization and skill sets. After creating the database and web interfaces a copy of the Maryland data to will be loaded for testing. The database will reside on a University of Rhode Island, Kingston (URI) server; the current home of the MUA website. Upon successful completion of those tests the tool will be incorporated into a test version of the main MUA website. Navigational links connecting the tool to the site will also be tested and appropriate color schemes and logos will be applied to maintain a consistent look and feel. Additional data sets from those states willing to participate would be added at this time followed by new tests until all of the original six states have been included and thoroughly tested. Finally announcements regarding the tool would be released to the general public and the underwater archaeological community.

Various tools and assistance will be required for this project including Dreamweaver and Photoshop. Software development web sites such as the [PHP web site](#) and [mysql.com](#) are also important sources of information. FTP clients and the server expertise of the URI information technology staff play a critical role in supporting this project and the MUA in general. This support is made possible by the URI History department and in particular Dr. Roderick Mather, Associate Professor of History and Director of the Archaeology and Anthropology option of their M.A. program. Taking all of this together this project could take upwards of one year to reach the stage where additional data sets could be added. This is a result of the numerous people that have to be contacted and upon whom we would be dependent for the data sets. From a financial perspective costs would be incurred with some travel for early data acquisition in Maryland along with phone calls to coordinate other issues as they arise. Start up cost for the site has already been covered by the MUA. This includes equipment costs such as the purchase of a desk top computer, a

scanner, printer, and media storage devices. Additional specialty software for images and video was donated by several companies.<sup>9</sup>

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<sup>9</sup> See the sponsors page on the MUA website for a complete listing (<http://www.uri.edu/mua>).