

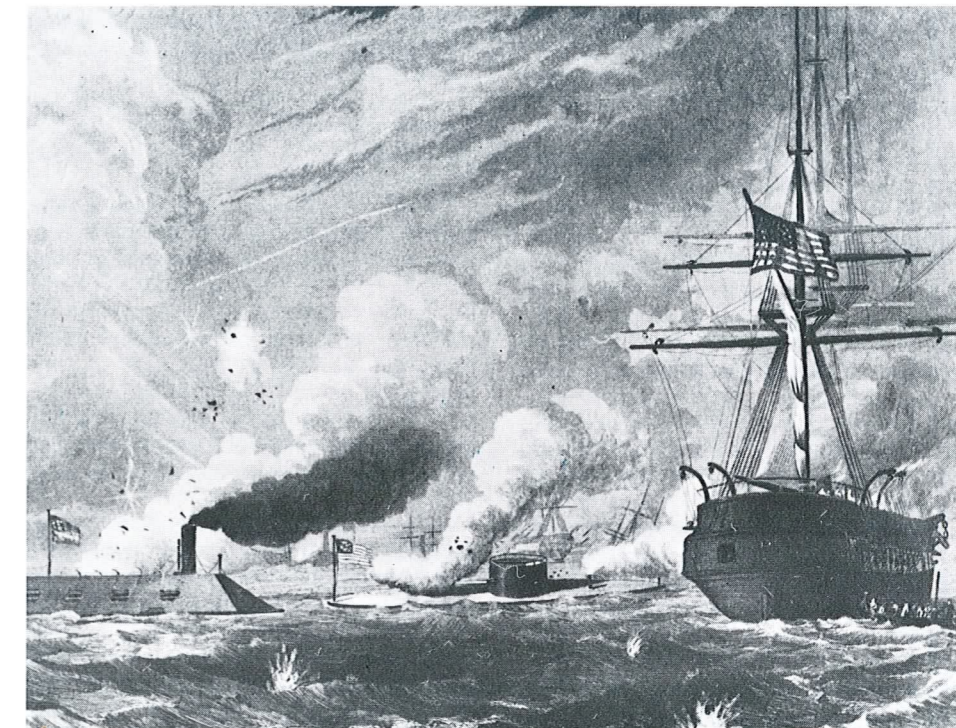


Volume V, No. 1 February 1987

National Ceremonies Will Commemorate Ironclad Battle

A national commemoration of the 125th anniversary of the Battle of the Ironclads, which occurred March 9, 1862, will be held March 6-9, 1987, in the Hampton Roads, Virginia, area. The famous battle, which lasted only four hours, assured a place in history for both the USS Monitor and her adversary, the CSS Virginia.

- Events being planned include:
- Formal designation of the Monitor as a National Historic Landmark by the Department of Interior's National Park Service
- Formal designation of the Principal Museum to manage and curate the National Collection
- Dedication of the National Collection of Monitor Artifacts and Papers
- Announcement of the planned 1987 Monitor scientific and documentary filming expedition.



In national ceremonies to be held in Hampton Roads, Virginia, March 6-9, 1987, the battle between the USS Monitor and the CSS Virginia will be commemorated.

CAMM Report Delivered to NOAA; Recommends Museum Selection Criteria

On September 4, 1986, The Federal Register carried notice that the National Oceanic and Atmospheric Administration (NOAA) intends to select, early in 1987, the principal museum to manage the Monitor Collection of Artifacts and Papers. The notice also contained guidelines for submission of proposals by interested museums.

The notice itself was a milestone in a sequence of events set in motion in 1984, when NOAA requested the Council of American Maritime Museums (CAMM) to

delineate recommended criteria to guide NOAA in the selection process. The final report was presented to NOAA at the CAMM annual meeting in Beaufort, North Carolina, on April 26, 1986.

Understanding the significance of NOAA's intended selection requires an appreciation of the background of the Monitor National Marine Sanctuary. Most of the contents of this article have been liberally borrowed from the CAMM report, entitled, "Recommended Criteria for the

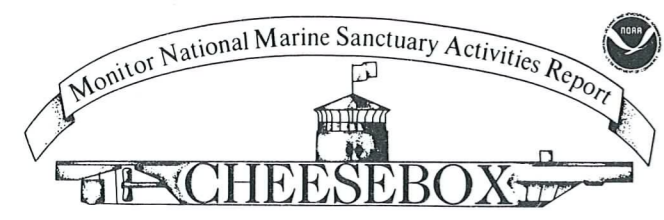
Selection of the Principal Museum for the Monitor Collection of Artifacts and Papers," authored on CAMM's behalf by Dr. Ralph Eshelman, Director, Calvert Marine Museum, Solomons, Maryland.

Background On January 30, 1975, the Monitor National Marine Sanctuary (MNMS) was designated by the Commerce Secretary under Title III of the Marine Protection, Research and Sanctuaries Act of 1972. NOAA's Sanctuary Programs Division, now

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Marine and Estuarine Management Division, was delegated authority for development and administration of research and management programs for the Sanctuary as a component of the National Marine Sanctuary Program (NMSP).

The intent of such a designation was to extend resource protection through a structured program of management, research and public education. The overall goals of the NMSP are to:

- enhance resource protection through implementation of a comprehensive, long-term plan tailored to specific resources
- promote and coordinate research to expand scientific knowledge of significant marine resources and improve management decision-making
- provide for maximum compatible public and private use.

In January 1975, NOAA and the U.S. Navy signed a Memorandum of Understanding (MOU) under which the Navy would assume initial responsibility for curation of *Monitor* artifacts under an existing U.S. Navy system for collections management. The MOU was envisioned as an interim disposition of the shipwreck and its artifacts.

The MOU has remained in effect in the ensuing eleven years, with intermittent arrangements being made to accomplish conservation of artifacts outside the Navy's purview — notably the *Monitor* lantern and anchor. The lantern was recovered in 1977 and conserved by the Smithsonian Institution. The anchor, recovered in 1983, was conserved over the last three years at East Carolina University and the South Carolina Institute of Archaeology and Anthropology.

A consensus was expressed at the 1978 conference entitled "The *Monitor*, its Meaning and Future" that further study was needed to determine the full nature of the environment and physical condition of the wreck, so that sound management decisions and long-range plans could be made. Additional recommendations included:

- Establish specific sanctuary goals
- Develop a master plan meeting the above goals
- Devise specific operational organizations to conduct necessary stages of research for implementation of the master plan.

In accordance with these recommendations, NOAA established the following goals for the MNMS in January 1982:

- to protect and preserve the *Monitor*, and all its associated records, documents and archaeological collections.
- to ensure systematic scientific recovery and dissemination of historical and cultural information preserved at the *Monitor* site, and to preserve and develop the physical remains of the wreck in a manner which appropriately enhances both the significance and interpretive potential of the remains; and
- To enhance public awareness and

understanding of the *Monitor* as an historical and cultural resource by providing interpretive and educational services and materials.

On November 9, 1982, the State of North Carolina Technical Advisory Committee (TAC), established by the State to assist in review of research proposals, recommended that a major goal be the "recovery of the vessel...and its removal to an appropriate location for study, conservation and display."

In response to this recommendation, between December 1983 and March 1984 NOAA conducted a program review and assessment of its management and research program for the MNMS. Preliminary research to date points to a possible threat to the integrity of the vessel. This has been evaluated as having a potentially adverse effect on the resource and the management goals established for the Sanctuary.

#### Conservation and Interpretation Considerations

The NOAA program review, noted above, recommended that the decision relative to final disposition of the shipwreck should carefully consider both technical and fiscal feasibility of each option and should include planning for proper conservation, interpretation and perpetual care of any recovered artifacts. The report recommended that the highest management priority be development of a master plan that will identify and evaluate the various preservation options.

For a site as historically significant as the *Monitor*, no recovery should be allowed unless there are sufficient resources and complete assurance that artifacts can be successfully stabilized through conservation. Evaluation of conservation requirements should be accomplished during the project planning phase, and precede any site disturbance. It should consider both technical limits on artifact stabilization and projected perpetual maintenance costs. Additionally, no material should be recovered and conserved unless there is an approved plan for its interpretation in a museum context.

#### USS Monitor Project

As a direct result of the 1984 NOAA report, the highest priority was assigned to development of a master plan. This ongoing effort is organized as the USS *Monitor* Project. It is a NOAA project to plan, develop and implement the master plan for the MNMS. It has been structured to facilitate participation of other agencies, organizations and individuals representing the national expertise in cultural resource management, archaeology, history, conservation, engineering, museology and fundraising. Critical expertise is being furnished to the Project by the U.S. Navy,

National Park Service and National Trust for Historic Preservation.

Phase I of the USS *Monitor* Project, planning and evaluation, will be conducted in three steps. Step One involves research and collection of data necessary to conduct an alternatives study of all management options ranging from non-disturbance through complete recovery.

Step Two, the alternatives study, will identify requirements for all management options in terms of archaeology, conservation, engineering, museology and fundraising, using the following criteria:

- Suitability — does it achieve management goals?
- Feasibility — are required resources available?
- Acceptability — are final results worth the costs?

From results of this alternatives study, a preferred management option will be recommended to NOAA for the final decision. When NOAA has rendered this decision, a detailed master plan for the selected management option will be developed in Step Three of the Planning and Evaluation Phase of the Project. Subsequent phases of the USS *Monitor* Project will be detailed in the master plan and involve implementation of the approved plan.

#### Museum Benefits

Selection of a principal museum at this time will permit consolidation of the *Monitor* Collection under a single qualified steward and also concentrate crucial conservation/museum/management input for the project planning and evaluation phase. Greater public access to the growing collection will be possible by suitable interpretation through educational displays, a research library and publications.

#### Selection Process

In June 1984 NOAA presented the evolving project concept to the CAMM membership and requested that the organization develop professional criteria for selection of a principal museum. CAMM was chosen because it is the national association of maritime museums in the United States, and is most qualified to deal with issues that are involved on a strictly professional basis. A further advantage of CAMM's involvement is that many museums with potential interest in the *Monitor* collection are members of the organization and therefore have had an opportunity to actively participate in development of the criteria.

CAMM recommended a four-step process to assist NOAA in selecting a qualified principal museum. The four steps are:

1. Recommendation of selection criteria
2. Issuance of a Request for Proposal (RFP) based upon recommended criteria
3. Evaluation of proposals submitted, using published evaluation factors
4. Selection of most qualified museum by NOAA.

The selected principal museum will be

delegated responsibility from NOAA under the terms of a cooperative agreement to provide specific museum services including collections management, curation, archiving and others.

#### Criteria Development

The American Association of Museums (AAM) is the professional organization of United States museums. In 1984 the AAM's Commission on Museums for a New Century published a report, *Museums for a New Century*, which examined the role of museums in general, and their responsibility to the society of which they are a product. Following are some of the Commission's general recommendations, which are applicable to the *Monitor* principal museum as well.

- "...Museums with similar interests are urged to develop the elements of coordinated policies on what objects, artifacts and specimens are to be collected, how and by what institutions."
- "Collaborative approaches to public programs that include educational as well as scholarly and exhibition components facilitate achieving the full educational mission of museums."
- "...The benefits museums bring to a community and nation must be demonstrated, and government officials must be more aware of their responsibility in the partnership of financial support. In particular, the necessity for federal leadership in commitment to museums as irreplaceable national resources must be aggressively and consistently emphasized."

#### Recommended Criteria

In order of priority, the following are CAMM's recommended criteria for selection of a principal museum.

- Capability — The institution should have, or be capable of obtaining, qualified personnel and required physical resources to professionally manage, conserve, archive, research and interpret the *Monitor* Collection.
- Accreditation — The institution should be professionally recognized and meet the minimum of professional standards of a museum as established by the American Association of Museums.
- Historical Context or Geographical Appropriateness — The institution should be located in an area that is significantly linked to the history of the USS *Monitor*.
- Accessibility — The institution should be located where a significant portion of the American public already visits or can easily visit to appreciate this aspect of United States history.

Additionally, CAMM recommended that the following suggestions be considered in the museum selection:

1. Maritime Historian — A qualified maritime historian should be the curator for the collection. The individual should be familiar with major depositories of records concerning the *Monitor* and possess strong academic credentials in Civil War naval history. Ideally, the individual already will have focused on the historical significance of the *Monitor* and conducted research in the major record groups.

## USS Monitor Project Organization Facilitates NOAA Planning Effort

- Dr. Phillip Lundeberg, curator emeritus, Smithsonian Institution
- Mr. Edward Miller, sanctuary project manager, Marine and Estuarine Management Division, NOAA
- Dr. William Morgan, senior historian emeritus, Department of the Navy, Naval Historical Center, Washington, D.C.
- Mr. Craig Mullen, president, Eastport International
- Ms. Marcia Myers, vice president, Department of maritime Preservation, National Trust for Historic Preservation
- Capt. E.W. Peterkin, USNR (Ret.).

The diversity of expertise represented in the PPC membership reflects the multidisciplinary demands of the sanctuary, and NOAA's commitment to bring individuals possessing pertinent training and experience into the planning phase of the project.

As referenced in the CAMM report elsewhere in this newsletter, the planning phase is critical to the *Monitor* project,

2. Marine Conservator — A qualified conservator should have experience with a broad range of materials recovered from underwater sites. Ideally, the individual will have specialized experience with a strong desire to conduct further research on conservation of iron from submerged sites.

3. Non-profit Status — The institution should be a non-profit organization under IRS regulations and be willing to be involved in fundraising to sustain the collection and achieve the goals of the USS *Monitor* Project.

4. Sound financial status — The institution should be financially secure.

5. Facilities should be barrier-free to allow access by the handicapped.

6. The institution should be an Equal Opportunity Employer.

#### Conclusion

The December 22, 1986, deadline for submission of proposals will permit NOAA to select the principal museum early in 1987. Ed Miller, Sanctuary Project Manager in NOAA's Marine and Estuarine Management Division, told *Cheesebox* that consideration is being given to selecting participating museums, as well as the principal museum, so that there will not be one winner and the rest losers in the selection. Rather, although the principal museum will retain overall responsibility for the entire *Monitor* Collection, management philosophy allows for the participation of other qualified museums. In this way, the public will derive maximum benefit from the *Monitor's* legacy.

since success of subsequent phases depends upon having fully thought out potential courses of action and likely repercussions.

Subcommittees reporting to the PPC, with their respective chairmen, are the following:

1. Historical documentation — Dr. William Morgan
2. Architectural and engineering — Capt. E.W. Peterkin
3. Archaeological documentation — Mr. C. Cummings
4. Site documentation — Mr. Craig Mullen
5. Museum and conservation — Dr. P. Lundeberg
6. Funding — Ms. Marcia Myers

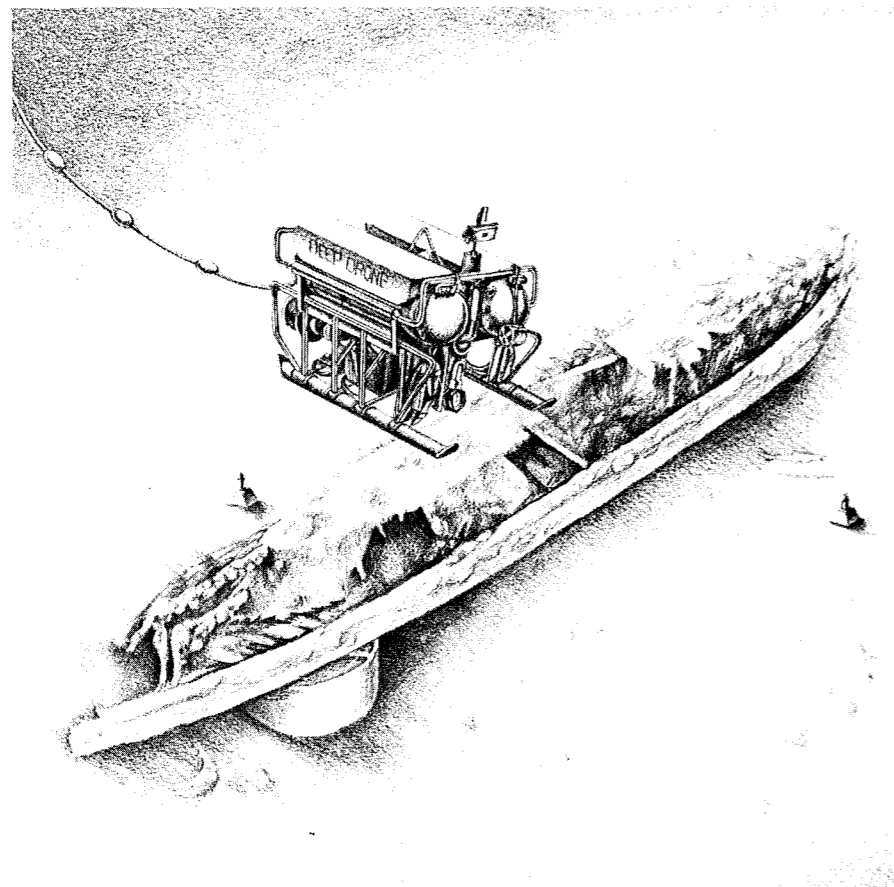
The archaeological documentation, and architecture and engineering subcommittees all have met recently. All subcommittees will continue to meet at regular intervals to address issues facing project organizers.

## Monitor Photomapping Expedition Scheduled for Summer 1987

A photomapping expedition to the **Monitor** wreck site, estimated to include some 10,000 photographs, is planned for May 25 through June 15, 1987. It will build on work carried out in the summer and fall of 1985 (see "Recap of 1985 **Monitor** Expeditions" in this issue). NOAA is sponsoring this ambitious mission in cooperation with the United States Navy.

The Navy will provide the undersea remotely-operated vehicle **Deep Drone** with its support vessel. Eastport International of Upper Marlboro, Maryland, will operate the vehicle in its capacity as prime contractor for Navy underseas operations.

A controlled photomosaic of the **Monitor** and its surrounding area is the principal scientific objective. It must be of sufficient accuracy that measurements from the mosaic can be used to locate objects and structures at the site to within one to two feet. The mosaic will be made available to marine archaeologists, naval architects, engineers and historians, who will utilize it in the course of reconstructing features of the original ship and measuring effects from environmental and human-related factors. This information will greatly assist in development of alternatives that will ensure the **Monitor's** future preservation as a national historical and cultural resource.



The United States Navy's remotely operated vehicle **Deep Drone** will be utilized in a photomapping expedition to the **Monitor** wreck site during May and June 1987. For additional details, see "Monitor Photomapping Set for Summer 1987" elsewhere in this issue.

### Background

Three main classes of events have collectively influenced the **Monitor's** present condition. They are, chronologically, capsizing/sinking; the environment; and the reported World War II depth charging. Based on a complex analysis of known parameters, Captain E. W. Peterkin has developed a predictive model of artifact distribution in the area surrounding the wreck. He has concluded that artifacts may be found within an area measuring approximately 106,000 sq. ft., or an area of roughly 2.3 acres in seafloor real estate. This is the preliminary estimate of the archaeological site, and is the primary area of concentration during this summer's photomapping mission.

Expedition photography will take several forms, including:

- 70 mm still, for photomapping
- 35 mm stereo for photographic documentation
- color broadcast-quality video for real-time analysis of scientific data, and
- film documentation of the expedition as a whole.

The photography should enable a comparison between historical records of the ship's original configuration and her appearance today, after weathering the effects of the Gulf Stream and being exposed to the corrosive effect of 125 years' seawater and biofouling.

These insights, combined with information gained from previous expeditions to the wreck, will aid NOAA in development of preservation alternatives. All alternatives will be considered from non-disturbance through complete recovery.

NOAA has said that even if future plans for the **Monitor** National Marine Sanctuary include artifact recovery, nothing will be raised in the absence of a well-thought-out plan for conservation and interpretation of such artifacts. The approach for next summer's mission reflects the agency's methodical assessment of the wreck's current condition as well as available management options for ensuring its continued protection in future generations.

## 1985 Monitor Expedition: Review of Accomplishments

In August and November 1985, NOAA sponsored two research trips to the **Monitor** site as part of the initial phase of final site documentation and mapping. Data collected during these expeditions will contribute to development of a sanctuary atlas, a management document that will analyze interaction between the environment and the shipwreck. Additionally, development of an electronic grid was proved, laying the groundwork for the planned 1987 photomapping and site documentation expedition.

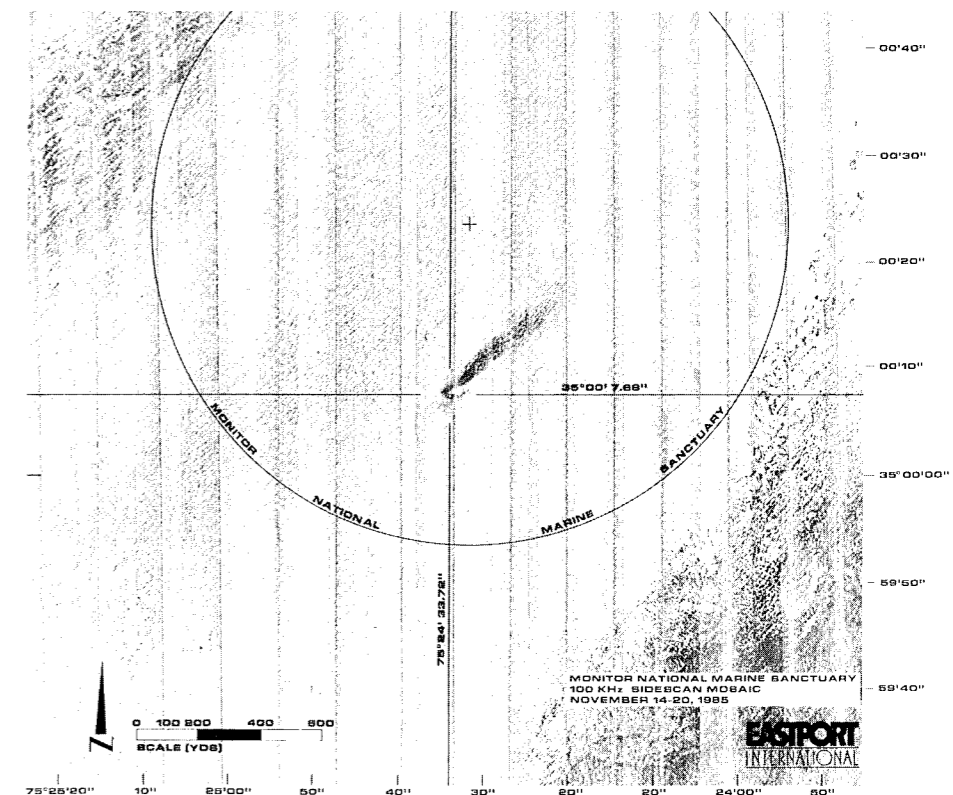
Eastport International, as contractor to NOAA, coordinated a complex program of scientific remote sensing of the wreck and adjacent area. Operations included side scan sonar imaging, current measurement, subbottom profiling and magnetometry. A major Eastport contribution to future archaeological work on the **Monitor** was development of an electronic grid system.

All archaeology, whether on land or underwater, depends for its orientation on all objects found being referenced to a horizontal grid system over the site. This applies equally to survey and excavation. Underwater archaeologists have long (i.e., since the 1940s, when wartime development of the SCUBA system enabled underwater archaeology to be conducted) made use of mechanical grid systems using string and pegged corners or PVC pipes, but such methods work well only in relatively shallow water. Since the **Monitor's** 230-foot depth is too deep for these conventional approaches, a new method had to be devised.

Eastport International utilized its proprietary ALLNAV system to integrate surface and undersea navigation inputs to produce an electronic grid system, covering an area encompassing over 2,500 square meters, with the **Monitor** near its center. In this application ALLNAV's surface navigation input came from the Motorola Mini-Ranger positioning system, and the subsea input from EG&G SeaLink transponders.

Mini-Ranger is based on two transmitters, with the receiving location constituting the third side of the navigational triangle. One transmitter was located on the Cape Hatteras Lighthouse at Buxton, North Carolina, 16.1 nautical miles northwest of the wreck, and the other at Diamond Shoals Light. The latter is located offshore on a structure resembling an offshore oil platform. The Environmental Protection Agency Research Vessel **Peter W. Anderson** contained ALLNAV's shipboard portion. The shipboard computer continuously processes received signals to produce real-time position fixes on the surface, accurate to within a few meters.

After establishing position over the **Monitor** by means of an earlier Loran-C fix and a systematic grid search combining



The remains of the **Monitor** and the large scour on the northeast side of the wreck are visible in this side scan sonar image of the **Monitor** National Marine Sanctuary.

Mini-Ranger coordinates with side/scan sonar, the SeaLink subsea navigation system was deployed. It consisted of four underwater transponders placed in specially-constructed metal stands beyond the four corners of the grid. At the conclusion of the survey, these transponders were released from their stands and floated to the surface for recovery. During the 1987 return to the wreck site an electronic grid will be re-established over the ship, but with higher-accuracy transponders enabling navigational accuracies to within centimeters, as opposed to the 1-to-3-meter accuracies achieved in 1985.

SeaLink works acoustically. A transducer, operating like an underwater microphone, emits a signal to interrogate each transponder and obtain exact range fixes, which are integrated and displayed aboard ship every 30 seconds. Unlike Mini-Ranger, SeaLink is not a real-time system, limited by the speed of sound in water and the complex geometry which the computer must solve. As a result, SeaLink's surface navigation usefulness in this mission was found to be greater in relatively smooth water conditions with minimal winds and currents. Results also depend on the ship's ability to maintain course.

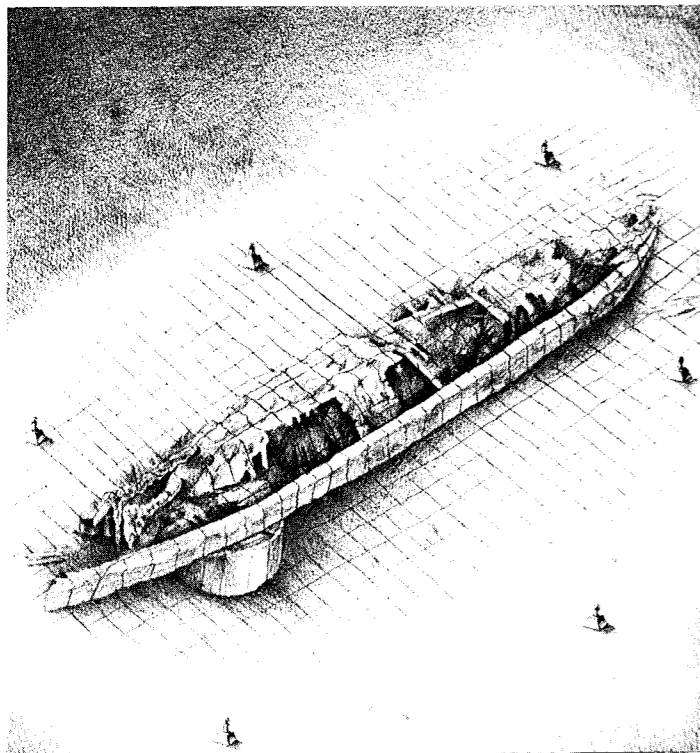
### Remote Sensing Survey

A controlled sidescan sonar survey was

run over the wreck site, towing an EG&G 100-kHz "fish" at 3 to 5 knots over the underwater grid, with 50-meter north-south and 100-meter east-west track spacing. Simultaneously the ship's two digital depth sounders provided continuous depth readings.

Side scan sonar revealed that the wreck lies in an essentially featureless silty plain extending over the full area of the grid. Beyond the grid limits, however, indications point to more complex geological formations with areas of exposed rock and terrain features of depressions and outcrops. Results of a higher-resolution 500-kHz side scan survey indicate that the **Monitor** itself may have contributed to alteration of surrounding landforms: a prominent northeast-to-southwest scour mark on the seabed extends from the wreck on its lee or northeast side. These may have been formed by the passage of the northerly Gulf Stream over the wreck.

Two current meters and a transmissometer instrument for measuring relative visibility (absence of particulate matter) in water were deployed east and west of the wreck. It is hoped that before next season's work begins their data will help explain current dynamics and seabed deposition/erosion in the area immediately adjacent to the **Monitor**.



Artist's concept of the electronic grid system in operation over the remains of the USS Monitor.

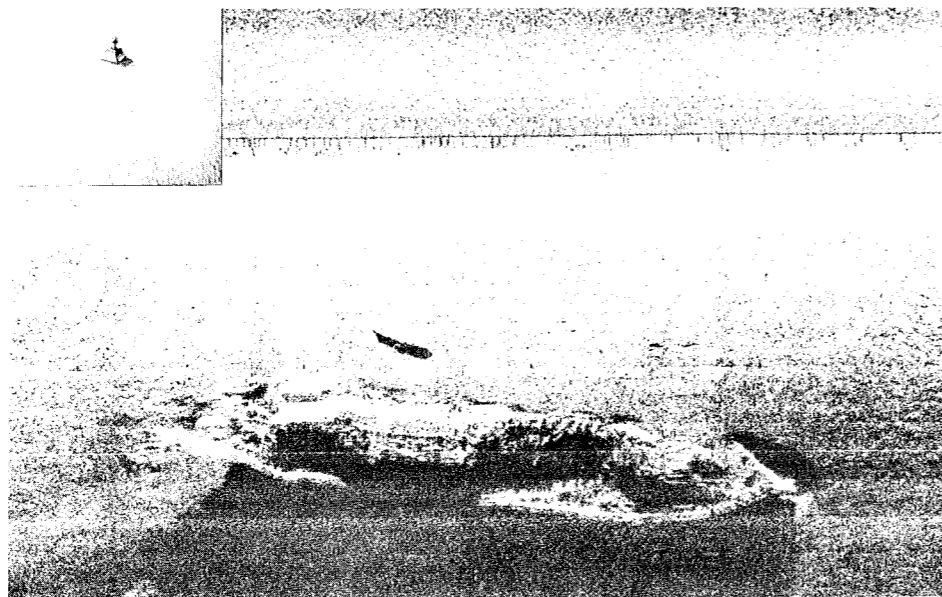
**Summary of Results**

The following are some preliminary results of the 1985 field work.

- The electronic grid that was established will enable archaeologists to perform controlled studies of deeply submerged sites with accuracy and repeatability comparable to current practices in land archaeology. Methodologically speaking, this accomplishment will apply not only to future studies of the **Monitor**, but also to a broad array of other deeply submerged sites which would be closed to archaeologists whose only options for "getting to the site" was SCUBA diving.

- Data collection enabled further definition of the wreck site, which now is known to extend beyond the wreck itself. Apparent debris was "visible" on the side scan sonar record and extended at least 100 meters to the north and northeast of the wreck. A scientific object of the 1987 expedition will be to identify these "targets" as geological or archaeological. The photographic parameters for the 1987 expedition are based upon a predictive model of artifact distribution. Identification and documentation of these "targets" will allow further definition of the wreck site and facilitate planning for future research.

Collectively, these accomplishments provide a framework for planning further non-destructive survey and site testing. The electronic grid now established should make it possible to measure the structure of the wreck along with objects that have become detached from the ship, with sufficient accuracy to begin systematic com-



Actual side scan sonar image of the remains of the USS Monitor recorded during 1985 operations. A large unidentified object is visible behind the wreck.

parisons with historical documentation on how the ship was constructed. This information is crucial to understanding the inter-

action of the wreck with the environment and will permit systematic evaluation of various preservation alternatives.

*Editor's Note: The preceding recap draws largely on the paper "Monitor Project Research Design," presented at the 1985 Naval History Symposium, by Dr. Richard A. Gould, Department of Anthropology, Brown University. It is supplemented by observations by the Cheesebox editors.*

**Dear Friend Lawrence..."**

*Editor's Note: Permission to print the following letter was granted by Richard W. Lawrence of Wilmington, North Carolina. The letter was given to him by his father, James F. Lawrence. It was addressed to Richard Lawrence's grandfather, also James F. Lawrence, who was originally from Tennessee. The family moved from Tennessee to Asheville, North Carolina, and upon the deaths of the elder Mr. Lawrence and his wife, the younger James F. Lawrence found this letter in a box of family papers. The recipient of the letter was not in the military when he received the letter, but later joined Company I, Tennessee Infantry of the Confederate Army, and was captured and imprisoned at Camp Chase, Ohio.*

Camp 3rd Ala. Reg., Portsmouth, Va.  
Wednesday, March 12, '62

Dear Friend Lawrence:

You must, ere this, have numbered me with the slain of one of the many battle fields we daily hear of, but it gives me much pleasure to state that I still "live, move, and have my being." I have refrained from writing for the simple reason that I have nothing to write about — that is, only what I read, and you have the same means of gaining information.

You told me your brothers had joined the army, and I have watched the papers faithfully to see if they were harmed or taken prisoners, but have seen nothing of them.

Even you may now be in the army. How is it?

With much regret did we read of our defeat in Eastern Kentucky, and of the death of your gallant Gallicuffer\* (sic). Then followed the defeats of Forts Henry and Donaldson, and Roanoke Island. The success at the last named place almost put Norfolk, Portsmouth, and the Gosport Navy Yard within their power, unless reinforcements were soon sent here. Our Regiment was ordered to report to Gen. Blanchard, at Suffolk, where it was supposed Burnside's land force would attempt to get possession of the two railroads leaving the place for Richmond and the south. For two weeks we felt that if attacked, we either would be slaughtered, taken prisoners, or starved out. But fortunately, before Burnside got ready to strike his second blow, we received reinforcements, and had given them a blow that will compensate for all the recent defeats on our side. As follows: The hull of the old steamer Merrimac (burned by the Federals when they endeavored to destroy the Navy Yard) has been converted into a powerful battery resembling the roof of a house as seen on the water, and encased in five inches thickness of iron, with a sharp iron prow beneath the water and carrying ten heavily rifled cannon. On Saturday, 8th, she went down to the enemy's shipping accompanied by several small gunboats, and during the afternoon sunk the frigate Congress, grounded and riddled the steamer Minnesota, and bid deference to the Men-of-War Roanoke and St. Lawrence, as well as killing a great many at the

Newport News batteries. Some five hundred more were drowned on the Cumberland, a great many burned on the Congress, and a goodly number of prisoners taken. At night the magazine of the Congress exploded with terrific force.

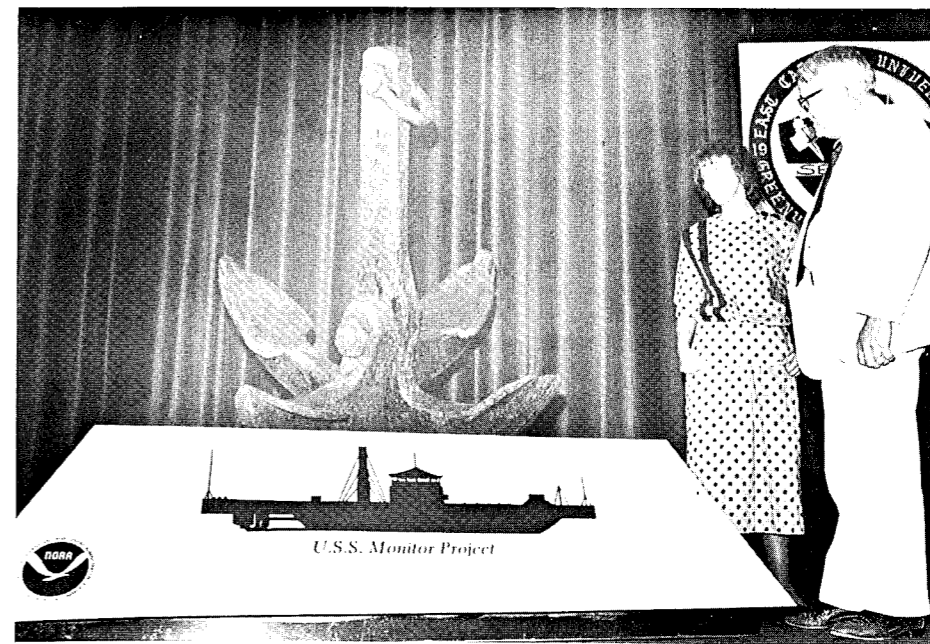
This great fight took place within plain sight of Norfolk and thousands of us witnessed it all. The burning ship was particularly grand at night. But the morning following the enemy sent in a small iron-clad battery of two guns, and for four hours they kept up a terrific fire, without material injury on either side, when finally the Merrimac (now "Virginia") ran into her, and it is supposed set her to leaking. She had the day before broken her iron prow in the Cumberland or she would undoubtedly have sunk the Ericson (sic) also.

About noon Sunday the Virginia and all the James River gunboats came up the Yard leaving the blockade of the noble James broken. The Virginia bears many marks, but nothing serious. Total loss on our side: 7 killed and 17 wounded. Nothing more, but hoping to hear from you at Norfolk.

Your Friend,

J.G. Gilmore

*\*Editor's note: Probably a reference to Confederate Brigadier General Felix Zollicoffer, who was killed in the battle of Mill Springs on January 19, 1862.*



Upon completion of conservation at East Carolina University (ECU), Greenville, North Carolina, and the South Carolina Institute of Archaeology and Anthropology, University of South Carolina, Columbia, South Carolina, the *Monitor* anchor was unveiled in ceremonies at ECU on July 24. Dr. Nancy Foster, Chief of Marine and Estuarine Management Division, NOAA, and Dr. John Howell, Chancellor, ECU, examine the anchor following the unveiling. The anchor is currently on display in Washington, D.C. (ECU News Bureau photo).

## The John L. Worden Papers

*Editor's Note: The following article is reprinted with permission from the Mariners' Museum, Newport News, Virginia.*

In the pre-dawn hours of March 9, 1862, a thick fog blanketed Hampton Roads. The mantle of invisibility did not ease the crew's anxiety aboard the *Monitor*. The rough voyage from New York allowed little opportunity for sleep. The *Monitor's* late-night arrival in the harbor was greeted by a glowing red sky, illuminating the grim results of the Union fleet's misfortune against the Rebel ironclad *Virginia* (ex-USS *Merrimack*). Three warships were either sunk, burning or damaged. No one in Hampton Roads was encouraged when the pygmy ironclad arrived. Many brave survivors had witnessed the destructive power of the *Virginia* and few believed this tiny vessel could save the fleet. Lieutenant John L. Worden, commanding the *Monitor*, reported for duty and anchored his vessel for the night. Before going to sleep he penned a short letter to his wife stating, "the Merrimac has caused sad work amongst our vessels," but wrote confidently, "She can't hurt us."

The fifty-two year naval career of John L. Worden would have largely gone unnoticed to history had it not been for his brief encounter in Hampton Roads. His career already spanned twenty-eight years without distinction, but a sudden turn found him in command of an untried, experimental, ironclad warship on the verge of making naval history. Located just a few miles from the scene of this historic conflict, The Mariners' Museum is fortunate to hold a collection of papers documenting the career of this man who helped usher in the age of armored warships.

The bulk of this collection lies within the Civil War period. This was a war of many firsts and Worden was one of the early statistics as the first Union prisoner of War. In those uncertain days preceding the conflict, Worden was sent South to deliver secret orders to the U.S. naval squadron at Pensacola, Florida, regarding the reinforcement of Fort Pickens. This fortification controlled the shipping channel into Pensacola Bay and ownership of it held great strategic importance to both Union and Confederate forces. Worden journeyed safely through the South to deliver his message, but was arrested by Confederate authorities on his return trip, April 13, 1861, after the two belligerent sections commenced hostilities.

A series of letters is contained in the Worden papers highlighting the negotiations for his release. They reveal the complicated procedure for the voluntary exchange of prisoners during this early state of war. Since the U.S. government did not recognize the legitimacy of the Confederacy, all negotiations were conducted privately with-

out official sanction by either government. As a result, Worden remained incarcerated for seven long months.

Following his exchange and subsequent historic encounter with the *Virginia*, Worden was promoted to Commander and transferred to the South Atlantic Blockading Squadron. Here he was given command of the *Montauk*, one of the newest monitors. Admiral Samuel F. DuPont, commanding the Squadron, wished to test the firepower and vulnerability of this new ironclad. To accomplish this, in January, 1863, DuPont ordered the *Montauk* to deliver a series of attacks upon Fort McAllister, Georgia, on the Ogeechee River. Although the monitor proved to be a superb defensive weapon, its offensive capabilities were hampered by slow and inaccurate firing. Undaunted, Commander Worden continued to hammer the Confederate batteries for some weeks. His fortitude was finally rewarded on February 28, when he discovered and destroyed the privateer CSS *Nashville*, grounded near the fort, and described by Worden as a "troublesome pest." For this exemplary work he was promoted to captain and received a personal letter of thanks from Admiral DuPont, which can be found in the collection. In the Spring of 1863, Captain Worden was transferred to New York to supervise ironclad construction until the war ended. His post-war career saw a continued rise in rank to commodore, May 1868 and rear admiral, November 1872. During these intervening years he also served as superintendent of the Naval Academy, 1869-1874. Leaving the Academy, Worden sought a more adventurous life as commander of the European Squadron, 1875-1877, which visited many ports of Europe. His papers indicate a strong popularity with the Europeans as a military hero from his command of Ericsson's *Monitor*. As a result, he received numerous social invitations from royalty and heads of state. After returning from his European command, the aging admiral settled down as a member of the Navy Examining Board and later President of the Retiring Board until his voluntary retirement in December 1886. At this time Congress awarded him for life full sea pay in appreciation for honorable distinguished service.

Worden continued to remember with pride his days aboard the *Monitor*. The Mariners' Museum Library also has a photograph album which he filled with images of those young officers and crew who served him so well during those turbulent days. These are often rare views of those crewmembers of the *Monitor*; whom the history books have forgotten. Also included are photographs of such related individuals as Thomas F. Rowland, builder of the *Monitor*; John M. Brooke, naval constructor of the *Virginia*; and John Taylor

Wood, officer on board the *Virginia*. In all, this is a rich collection of photographs and manuscripts which help to document one of America's naval heroes. It is also one of the many Library collections preserved for the benefit of both the naval buff and the historian.

Roger Thomas Crew, Jr.  
The Mariners' Museum



John L. Worden



Members of the *Monitor* Archaeological Documentation Subcommittee and others at their first meeting April 4, 1986. Eastport International, Upper Marlboro, Maryland, hosted the meeting. Pictured, seated, are (L-R) Gordon Watts, East Carolina University; John Broadwater, Virginia State Archaeologist; Edward Miller, NOAA; Chairman Calvin Cummings and Dr. Larry Nordby, National Park Service. Standing (L-R), Michael Mulcahy, Eastport International; Carol Olsen, National Trust for Historic Preservation; Dr. Barto Arnold, III, Texas State Archaeologist, and Dr. Bruce Rippeteau, South Carolina Institute of Archaeology and Anthropology.

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Readers are encouraged to comment on **Cheesebox**. All comments will be acknowledged and none will be published without the written consent of the author. Correspondence should be addressed to Ms. Hill at the South Carolina Institute of Archaeology and Anthropology.

### The Pilot House

This is the first issue of *Cheesebox* to appear since April 1985. The hiatus occurred due to printing difficulties encountered at East Carolina University (ECU) and the completion of the NOAA cooperative agreement with ECU in July 1986. The South Carolina Institute of Archaeology and Anthropology (SCIAA) is under contract to continue publication of *Cheesebox*, while the USS *Monitor* Project continues to evolve.

During the *Cheesebox* reorganization Mr. Michael Mulcahy, managing editor of *Sea Technology* Magazine for nine years, joined the USS *Monitor* Project as assistant project manager for public relations, and is *Cheesebox* managing editor. Ms. Dina Hill, formerly of ECU, has joined SCIAA as *Monitor* Project coordinator and is *Cheesebox* production editor.

The Pilot House will continue to be a forum in which *Cheesebox* editors will underscore current events. The following are significant recent events.

- The photomapping expedition originally scheduled for July 1986 was postponed until summer 1987 (see story on page 4). This was due to a scheduling conflict affecting availability of the U.S. Navy research vessel required to support the Navy undersea vehicle *Deep Drone*.
- In September 1986, the National Committee for the 125th Commemoration of the Battle of the Ironclads was established to plan ceremonies for a national observance of the famous battle. The commemorative events will be held March 6-9, 1987, in Hampton Roads, Va. The article on page 1 of this *Cheesebox* describes national events to be held. Hampton Roads area events will include special tours of local historic areas and addresses by authorities on Civil War naval history.
- On October 30, 1986, the USS *Monitor* Project Planning Committee recommended that a foundation be established to support the objectives of not only the USS *Monitor* Project but also the National Marine Sanctuary Program and maritime conservation in general.



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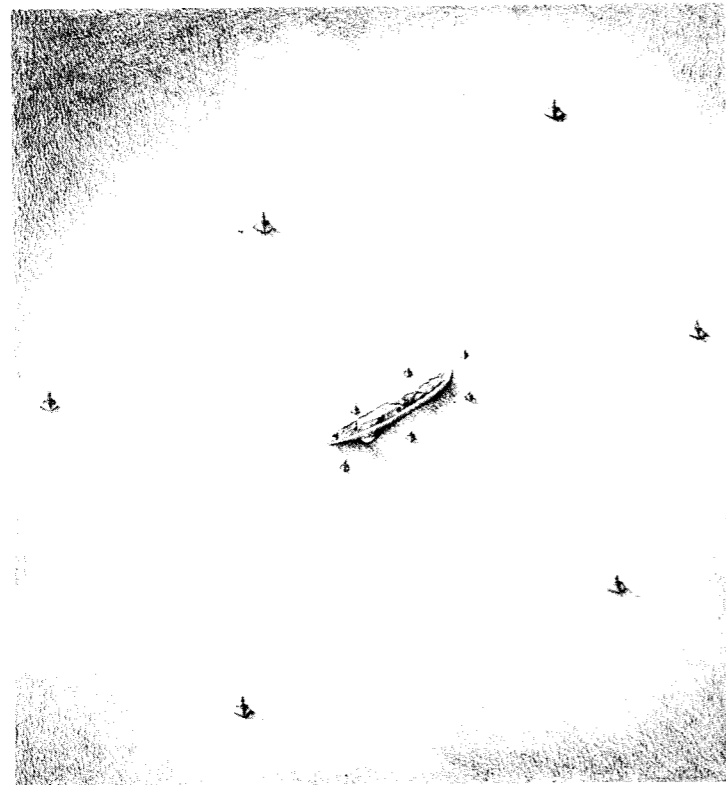
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*The Titanic Revisited*. *Oceanus*, Vol. 29, No. 3, Fall 1986. Special issue. \$5.00.

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MONITOR Project Coordinator  
South Carolina Institute of Archaeology  
and Anthropology  
University of South Carolina  
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USS MONITOR PROJECT



Artist's concept of the transponders placed at the *Monitor* site in order to establish the electronic grid system during 1985 on-site operations.



## The Monitor at Drewry's Bluff

(continued from page 10)

good commander to withdraw. I suppose the secession sheets are shrieking with delight at the defeat of the Lincoln gunboats. Our turn will come soon when we can act in conjunction with McClelland [sic], who is forcing his way toward the Rebel capital.

We came down the river in the evening & are now (Friday morning) [May 16] lying at anchor off City Point...I went on board the Galena at the termination of the action &...she looked like a slaughter house... of human beings....

[Editor Daly notes that, despite Keeler's statement that the Drewry's Bluff engagement was not a defeat for the Federal vessels, it was in fact viewed as a defeat. Admiral Goldsborough on May 12 wrote to Gideon Welles: "The Monitor and Stevens have both gone up the James River, with orders from me to reduce all the works of the enemy as they go along, spike all their guns, blow up all their magazines, and then get up to Richmond, all with the least possible delay, and shell the city to a surrender." The Navy did not pass the barrier until 1865.]

## Perspectives on the Civil War 1993 Civil War Lecture Series

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Sunday, July 25, 2:00–3:00 P.M.  
Huntington Room

*Iron Sides and Iron Hearts: The Crew of the Monitor*, Mark Greenough, Public Historian, Living History Associates, Ltd.

Sunday, August 22, 2:00–3:00 P.M.  
Huntington Room

*The Battle of Mobile Bay: A Case Study in Modern Warfare*, Dr. Emory M. Thomas, Professor of History, University of Georgia

Friday, September 10, 5:30–6:30 P.M.  
Huntington Room

*The Monitors and Admiral Samuel DuPont's Attack on Charleston*, William Dudley, Senior Historian, Naval Historical Center

Sunday, October 17, 2:00–3:00 P.M.  
Huntington Room

*The Monitor Revisited: The 1993 Field Season*, John Broadwater, Manager, Monitor National Marine Sanctuary

These events made possible in part by funding from Sanctuaries and Reserves Division, National Oceanic and Atmospheric Administration

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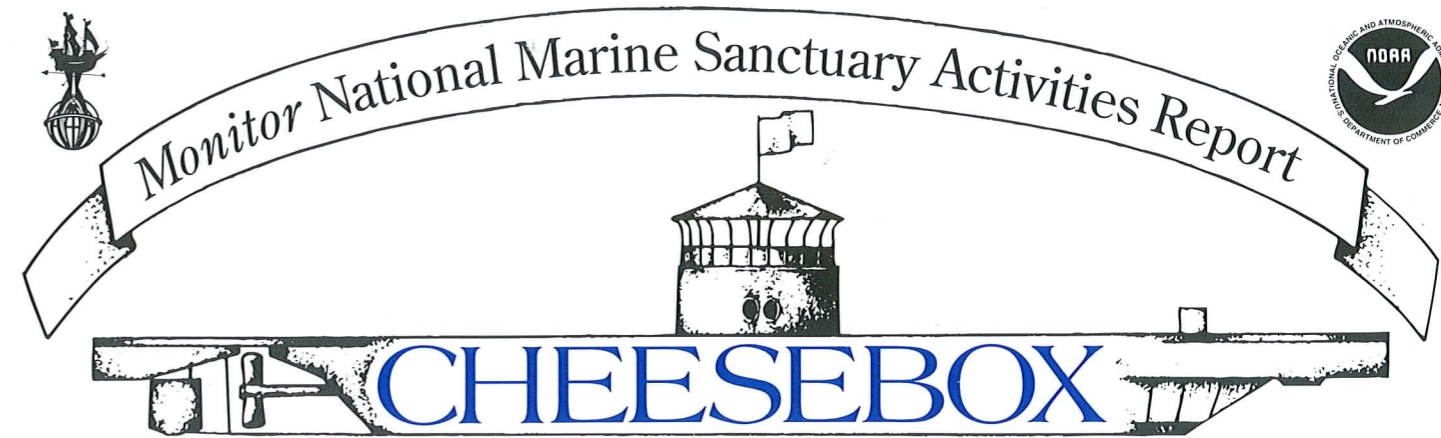
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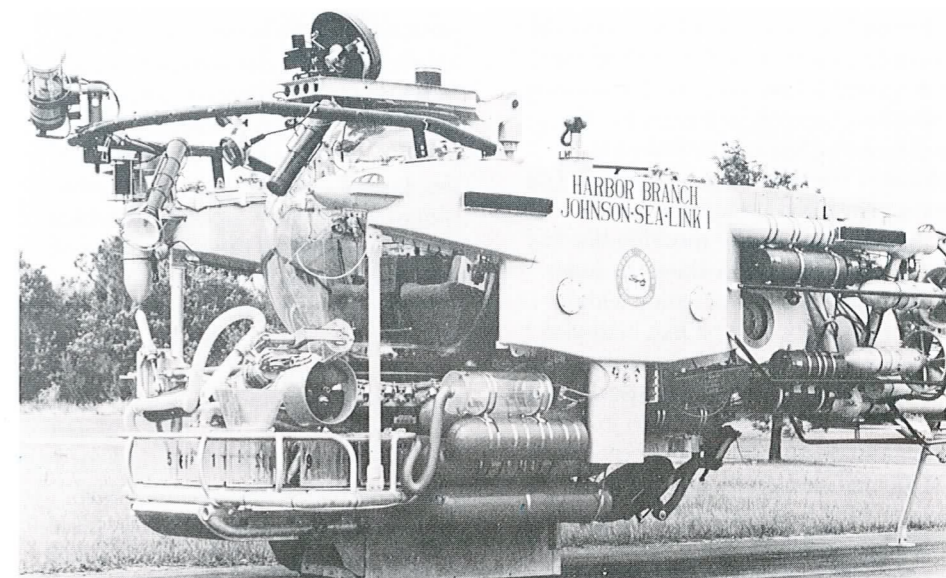
Volume VI, No. 1

July 1993

## NOAA PLANS MAJOR SCIENTIFIC EXPEDITION TO THE MONITOR IN 1993

In July of this year NOAA will launch its first major expedition to the Monitor since 1987. Known as the Monitor Archaeological Research and Structural Survey (MARSS), the expedition involves a variety of investigations that will be carried out by a team of scientific divers and a manned submersible. MARSS will be conducted from the 168-foot research vessel *Edwin Link*, which is being chartered from the Harbor Branch Oceanographic Institution in Fort Pierce, Florida. All dives will employ mixed-gas technology in order to avoid the adverse effects which result from breathing compressed air at the Monitor's depth. (Most dive training organizations urge divers not to go below 130 feet on compressed air, and the Monitor lies in 230 feet of water.) Diving operations will be supported by a NOAA open diving bell, a deck decompression chamber, and a team of NOAA diving experts. In addition, the manned submersible *Johnson-Sea-Link* will be on hand to record the site and site operations on high-resolution color video. Sanctuary Manager John Broadwater will direct the expedition and participate in the diving. MARSS is being conducted by the Sanctuaries and Reserves Division of NOAA.

MARSS is an essential first step in assessing current management options for such issues as site stabilization,



The Johnson-Sea-Link submersible will support the 1993 expedition to the Monitor National Marine Sanctuary.

archaeological and research needs, and increasing public access to the Sanctuary. NOAA has been requested by various elements within the sport diving community as well as by several members of Congress to reevaluate policies related to public access at the Sanctuary. Before that can take place, however, NOAA must first conduct a detailed on-site assessment in order to comply with Federal historic preservation legislation.

There is also an urgent need to conduct a detailed assessment of the Monitor's hull. In recent years, NOAA has observed accelerated deterioration of the hull. Evidence points to both natural and human causes. A detailed assessment of these changes is an essential prerequisite to any plan to stabilize the hull by mechanical or electrochemical means. Divers conducting research on the Monitor have discovered more than a dozen fragile glass bottles on the

wreck, apparently uncovered by the strong currents that sweep through the site. Archaeologists must map and recover these and possibly other artifacts before they are damaged or lost due to additional erosion or other causes. Archaeologists will also conduct a limited test excavation within the base of the turret to determine its condition and possible contents. As a pilot project for hull stabilization, divers will pump sand from the periphery of the site to an area beneath the hull to shore up the hull and relieve stresses. If successful, the entire area beneath the hull could be filled with sand to support the hull. NOAA will also deploy a permanent single-point mooring and sub-surface buoy suitable for supporting future expeditions to the site.

### Research Objectives

NOAA has divided expedition goals and objectives into two categories, primary and secondary, to indicate their



relative importance and to indicate the criteria applied to the development of contingency plans. NOAA's research and management goals, as described in the Draft Revised Management Plan distributed in May 1992, as well as suggestions and comments from persons who reviewed the draft plan, were the basis for the expedition priorities.

**Primary research goals**

*Deployment of a permanent mooring at the sanctuary:* NOAA will deploy a clump anchor of approximately 4,000 pounds weight at a position about 50 feet off the *Monitor's* port stern (i.e., northeast of the stern). The location for the mooring anchor is a function of the prevailing currents at the site and the anticipated future usage of the mooring. Prevailing currents will carry the buoy and mooring lines away from the *Monitor*. The anchor will be located far enough away to protect the wreck against chafing by the mooring line but close enough to allow divers to swim from the anchor to the wreck without undue difficulty. The NOAA National Data Buoy Center will help determine the final size of the anchor based upon a maximum drag weight of an inflatable boat, two divers and related equipment. Project personnel will affix a sub-surface float to the mooring anchor using line or cable.

*Recording horizontal and vertical measurements of key hull components:* the expedition director will determine the final hull points to be measured after an analysis of recent changes at the site. Scientists will record horizontal and/or straight-line distances between key points on the hull for use in periodic assessment of changes in the site. They will also record key relative elevations on the hull using a preselected point on the rim of the turret as a datum. These measurements will be used for updating the site three-dimensional model and for periodic assessment of site changes.

*Mapping and recovering exposed and threatened artifacts:* project personnel will establish a temporary baseline forward of the midships bulkhead to serve as a reference for mapping. They will then record the position of the baseline. Project personnel will also establish a reference elevation datum at the rim of the turret and document its position. Archaeologists can then record artifact locations in plan and elevation

and photograph their locations. Finally, archaeologists will recover the artifacts, which will be placed in the care of a conservator for cleaning and treatment.

*Conducting a test excavation within the turret:* first, archaeologists will carry out a small test excavation within the base of the turret to determine whether the turret floor is still in place. They will also determine if artifacts and deck plating have fallen into the turret from the hole in the deck above the *Johnson-Sea-Link* submersible will have a special thruster located on a bracket near the submersible's bow. The submersible pilot will maneuver the submersible to a position over the turret in the desired location near the forward portion of the turret where the main crossmember is attached to the turret wall. This is the location where a hatch in the base of the turret should be located. An archaeologist will closely supervise the excavation from within the pilot sphere of the submersible, and/or in the water next to the turret. The excavation should not need to penetrate more than 3-6 inches before the base (floor) of the turret is encountered. Even if the wooden floor of the turret has disintegrated, the metal framework should still be in place. Archaeologists will examine whatever remains are encountered. If wooden decking is still present, it will be carefully probed with a wire or knife blade to reach a subjective determination of the extent of deterioration and damage from teredo worms. If practical, archaeologists will recover a wood sample from the turret floor.

**Secondary objectives**

*Stabilizing a portion of the hull with sandbags and dredged sand:* first project personnel will assess the feasibility of pumping sand from the site perimeter to the area beneath the hull where the hull is suspended off the bottom as well as the effectiveness of pumped sand in supporting and stabilizing the hull.

If project personnel determine that this activity is feasible, they will use a hydraulic dredge with extended hose sections to pump sand beneath the wreck. They will carry a long suction hose approximately 50 feet to the north of the hull, out of the primary debris field, from which they will pump sand to an area under the hull to be selected by an archaeologist after an initial inspection.

The archaeologist will select the area based upon how well the sand is likely to be contained by the hull in the face of constant currents. Divers will anchor the discharge hose in the desired location beneath the hull where sand is to be deposited. They will lower sandbags to the bottom for placement beneath the hull as needed to help shore up the area being filled with sand. Divers will also place several small pvc rods, marked at one-foot increments in the area before sand pumping begins, so that progress can easily be gauged. The rods will permit periodic measurements to be made in the future to determine if the sand remained in place or was scoured away or transported to another location.

*Recording select portions of the hull in high-resolution video:* project personnel will first videotape the underside of the hull forward and aft of the turret and in the vicinity of the pilot house. They will then videotape the stern, with special attention to the skeg, shaft, propeller and debris field where recent changes have been noted.

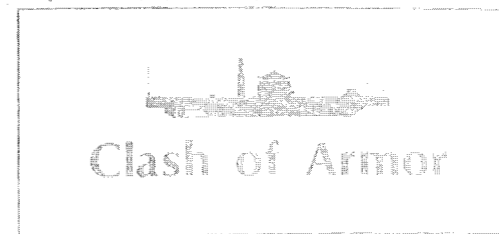
*Deploying a current meter and thermograph and recovering the thermograph placed at the site in 1991:* divers will recover the thermograph already in place and deploy a current meter and thermograph. These instruments will record long-term site environmental conditions, specifically water temperature and current velocity and direction.

*Recovering selected artifacts from within the hull:* project archaeologists will select artifacts for recovery based on an analysis of recent site video records. Artifacts considered for recovery include the broken portions of a serpentine-spoked wheel that activated a valve chest for reversing the engine and glass bottles that have been uncovered by currents.

Previous expeditions have located a number of bottles within the hull forward of the midships bulkhead. In order to map the locations of these artifacts, project personnel will establish a temporary baseline by using a vinyl-coated

*(continued on page 11)*

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PHOTOGRAPH BY RICHARD GARY

A costumed interpreter greets visitors to the *Monitor* exhibit Clash of Armor.

## Discover 3,000 Years of Maritime History at The Mariners' Museum

One of the largest international maritime museums in the world, The Mariners' Museum in Newport News, Virginia, is dedicated to "preserving the culture of the sea and its tributaries, its conquest by man, and its influence on civilization." Since its founding in 1930, the museum has developed a collection of more than 35,000 maritime artifacts including ship models, scrimshaw, maritime paintings, decorative arts, intricately carved figureheads, working steam engines, and other items. The interpretation of its collection, which reflects man's use of the sea for transportation, food, battle, and pleasure, offers visitors insight into 3,000 years of maritime history.

**The Galleries**

Among the museum's newest galleries is the Age of Exploration, one of The Mariners' "core curriculum galleries" designed to cover important concepts of maritime heritage and experience. Through a fascinating collection of maps, ship models, charts, and books, the gallery chronicles the scientific and technological changes in shipbuilding, ocean navigation, and cartography that made the explorations of the fifteenth through eighteenth centuries possible. A unique hands-on Discovery Library features reproductions of early charts, books, maps, and navigation instruments for visitors to examine. Complementing the exhibit are fifteen short videos that

help bring the Age of Exploration to life.

Other galleries include the *Engage the Enemy More Closely: Admiral Horatio Nelson* gallery, which highlights the brilliant career of the British admiral; the Chesapeake Bay Gallery, which pays tribute to this great body of water through maritime artifacts and photographs, work and pleasure boats unique to the Bay, fiber-optic maps, and interactive exhibits; and the "William Francis Gibbs: Naval Architect" gallery, which highlights the career of the man who designed the SS *United States*, World War II Liberty ships, and more than 6,000 naval and commercial vessels. The Mariners' Small Craft Collection reflects the international scope of the museum with more than forty vessels from five continents, including a gondola from Italy, canoes from Africa, and sampans from China and Burma.

Among the museum's most popular exhibits is the Crabtree Collection of Miniature Ships—sixteen exquisitely detailed hand-crafted miniature ships that depict the evolution of the sailing ship. The collection reflects twenty-eight years of intensive effort by artist-carver August F. Crabtree, whose models, most of them built to the scale of 1/4 inch to the foot, are truly miniature ships. Each vessel is constructed in the same way its full-size counterpart was built and many are decorated with incredibly detailed carvings.

The Mariners' Great Hall of Steam relates the story of oceangoing commercial steamships and includes the *Clash of Armor* exhibit which tells the story of the famous battle between the USS *Monitor* and the CSS *Virginia*. The exhibit features artifacts from the *Monitor* National Marine Sanctuary including the ship's iron anchor and navigation lantern. A video recorded in the sanctuary takes visitors on an underwater tour of the *Monitor* wreck site as it appears today. A platform in the shape of a ship's bow provides a stage for costumed interpreters who are on hand periodically to talk with visitors about the work of the *Monitor's* crew and life aboard an ironclad.