

## The USS Monitor: In Situ Preservation and Recovery

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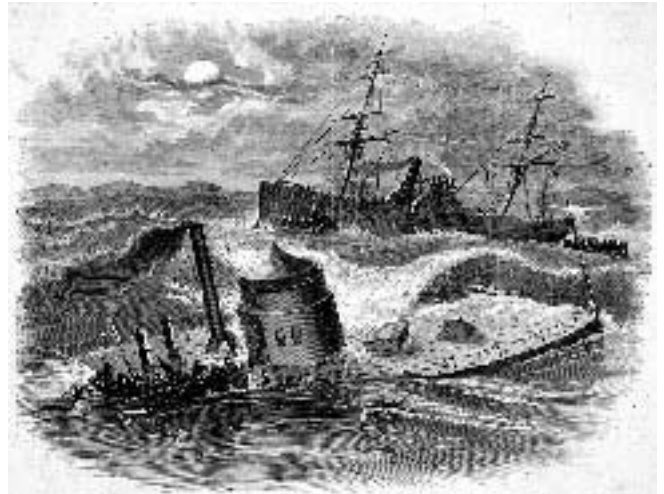
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On March 9, 1862 the ironclad warships *USS Monitor* and *CSS Virginia* (ex-*USS Merrimack*) fought to a draw at Hampton Roads, Virginia, in one of the most famous sea battles in the history of the United States. The *Monitor* sank later that year while being towed south along the Atlantic coast of the United States. *Monitor's* remains were not discovered until 1973, lying in 230 ft. (71 m) of water off Cape Hatteras, North Carolina. Two years later, the *Monitor* was designated America's first National Marine Sanctuary, and is managed by the National Oceanic and Atmospheric Administration (NOAA) to prevent looting and unwanted salvage. *In situ* preservation was the primary objective of the management plan. Of course, certain artifacts were periodically recovered, conserved and curated at a museum of public access out of concern that they would be lost to strong currents or looters. During the 1990s, however, NOAA determined that the *Monitor* was fighting a losing battle against both natural and human threats. As a result, NOAA aggressively applied comprehensive planning strategies and ocean technology to the problem of preserving the *Monitor*, resulting in a multi-year recovery project and a major museum exhibition.

### History

At the time of its launching in 1862, the *USS Monitor* was a radical departure from conventional wooden broadside warships. The *Monitor's* hull was heavily armor-plated and almost completely submerged, presenting enemy gunners a very small target. The only structures above the deck were an armored, rotating gun turret amidships and a pilot house near the bow. The gun turret could be revolved from within to train its two 11-inch Dahlgren smoothbore guns in any direction, independent of the ship's heading.

The *Monitor* was launched on January 30, 1862, early in the American Civil War, and ordered almost immediately to battle. The *Monitor* arrived in Hampton Roads, Virginia, on the evening of March 8, 1862. Earlier that day, the *CSS Virginia* (ex-*USS Merrimack*) had made her maiden voyage into Hampton Roads, sinking two Union warships and running a third aground. Early on March 9, the *Virginia* steamed back into Hampton Roads, prepared to finish off the Union fleet. The *Monitor* advanced to engage her iron counterpart, thus commencing one of the most celebrated



**Figure 1: The sinking of *USS Monitor*, 31 December 1862, as depicted in *Harper's Weekly Magazine*, January 1862 (NOAA Monitor Collection)**

sea battles in history. The four-hour duel ended in a draw; however, the repercussions were felt worldwide, hastening the abandonment of conventional wooden broadside warships.

Although impervious to cannon fire, the *Monitor* succumbed later that year to the power of the sea. While being towed south along the Atlantic coast, the *Monitor* foundered in a gale off Cape Hatteras, North Carolina on New Year's Eve, with the loss of sixteen lives.

### The Shipwreck

The *Monitor's* remains were discovered in 1973 in an expedition led by Duke University's Marine Laboratory and funded by the US Government National Science Foundation. The wreck lies on a flat, featureless, sandy bottom in 230 ft. (71 m) of water, sixteen nautical miles SSE of Cape Hatteras Lighthouse. The *Monitor* rolled over as it sank, causing its turret to pull free and fall to the bottom, upside down. The hull then settled onto the turret. The inverted hull came to rest with the stern port quarter supported above the bottom by the displaced turret. The lower hull had collapsed forward of the midships bulkhead, and the stern armor belt and associated structure was badly deteriorated. The position of the turret under the port quarter elevated the stern and port side, producing a list to starboard and creating severe stresses on the hull. Only a small portion of the hull is buried, leaving the rest exposed to strong currents, trawl nets and the possibility of illegal salvage.

Lying near the confluence of the Labrador Current and Gulf Stream, the *Monitor* is swept by strong, opposing currents that frequently generate sudden and severe storms. The adverse weather conditions, strong currents and deep water hamper research by divers and remotely-operated instrumentation.

## Protection, Research, and Management

Almost immediately after the *Monitor's* discovery was announced, historic preservation managers began earnestly seeking some mechanism for protecting the remains from scavenging or salvage. Because the *Monitor* lay beyond the (then) three-mile territorial sea limit, none of the conventional state or federal legislation was applicable. However, the recently enacted National Marine Sanctuaries Act of 1972 (NMSA), offered the means for preserving the *Monitor* as part of a planned national system of marine protected areas. As a result, on January 30, 1975 the *Monitor* was designated America's first National Marine Sanctuary, to be managed by the National Oceanic and Atmospheric Administration (NOAA), an agency of the U.S. Department of Commerce. The *Monitor* National Marine Sanctuary is now part of a system consisting of thirteen sanctuaries, with another, the Northwestern Hawaiian Islands, in the designation process.

The wreck of the *USS Monitor* presented NOAA with unique management issues. The *Monitor* is considered one of the most significant underwater cultural heritage sites in the United States. Listed on the National Register of Historic Places, *Monitor* also has been designated a National Historic Landmark. NOAA's *in situ* management and recovery plan is consistent with the Annex Rules to the UNESCO Convention on the Protection of the Underwater Cultural Heritage. Over the years, NOAA conducted extensive research at the sanctuary and issued permits to other researchers who added their data to the growing *Monitor* archive that is available to the public. In the early 1990s, NOAA won two legal challenges to its authority and jurisdiction to control public access to the site by permitting access only for scientific research. NOAA, however, subsequently issued permits to recreational divers to visit and photograph the wreck. Those private divers conducted research and photographic activities that contributed significantly to site documentation, especially by generating excellent still and video imagery of the wreck.

During this time NOAA began to accumulate strong evidence that the *Monitor's* hull was undergoing major deterioration and that the disintegration process was accelerating.

**Figure 2: US Navy divers videotaping the *Monitor's* gun turret in preparation for recovery (U.S. Navy)**



NOAA continued gathering data at the site but also began consulting with marine engineers and salvage experts to identify strategies for responding to the developing crisis at the sanctuary. There was a growing realization that even under an *in situ* preservation policy, it was time to consider alternative plans for more rigorous research and recovery at the wreck site.

In 1998, NOAA released a long-range, comprehensive plan for the management, stabilization, preservation, and recovery of artifacts and materials from the *Monitor*, "Charting a New Course for the *Monitor*." This comprehensive plan documents NOAA's response to the challenging problem of the *Monitor's* deterioration, describing each major planning element in detail and addressing all aspects of management, protection and possible recovery. The US Navy's salvage contractor, Eastport International (now a division of Oceaneering International) contributed an extensive engineering analysis and trade study that provided valuable recommendations on the best methods for stabilization and recovery. After presenting and discussing numerous options, the plan recommended a six-phase program for stabilization of the *Monitor's* hull, followed by selective recovery of significant components of the hull for long-term conservation and exhibit. The recommendations included estimated timelines and budgets for each phase, including recommended conservation facilities and personnel and anticipated sources of funding for the entire program. The advanced state of hull deterioration and the extremely high estimated cost of total recovery and conservation prevented NOAA from considering an option for recovery of the entire wreck and contents.

Soon after delivery of the comprehensive plan, NOAA was able to announce that a partnership had been formed between NOAA, the U.S. Navy, and The Mariners' Museum for implementation of the plan. The necessary funding was obtained from NOAA, the Department of Defense Legacy Resource Management Grants Program, The Mariners' Museum, and others.

During 1998 to 2002, NOAA and the US Navy carried out the six-phase plan during a series of large-scale missions to the

**Figure 3: NOAA researchers documenting the bow of the *USS Monitor* (Doug Kesling, NOAA Monitor Collection)**





**Figure 4: The *Monitor*'s gun turret emerging from the sea, 5 August 2002 (U.S. Navy)**

sanctuary. Navy divers recovered the *Monitor*'s propeller, engine, and its famous gun turret, which still contained the guns, carriages and hundreds of other artifacts. Also discovered inside the turret were the remains of two of *Monitor*'s crew. All recovered artifacts and hull components from the *Monitor* are located at The Mariners' Museum, Newport News, Virginia, where they are undergoing conservation treatment that, for the larger objects, may require a decade or more to complete. The plans for conservation and curation are consistent with the US Federal Archaeological Program as well as the Rules annexed to the UNESCO UCH Convention.

### Current NOAA Plans for Management of Underwater Cultural Heritage

In March, 2007, the Mariners' Museum will open the *USS Monitor* Center, a major exhibition facility that will tell the *Monitor*'s story within the broader context of world politics, naval technology, and the American Civil War. The Center also contains a major conservation laboratory, where visitors will be able to learn about the conservation process while observing *Monitor* artifacts being treated.

Although NOAA would have preferred to continue to preserve and manage the *Monitor* on the seabed, close examination of

the recovered hull components confirmed that recovery was the appropriate action. Many of the iron components of the *Monitor*'s engine are badly deteriorated, as are the guns and other objects. The rest of the *Monitor*'s hull and contents will remain on the seabed indefinitely, and will continue to attract researchers and divers, while the *USS Monitor* Center will permit millions of visitors to enjoy the *Monitor*.

Nationally, NOAA is placing more emphasis on the underwater cultural heritage aspects of its sanctuaries through its Maritime Heritage Program, a part of the National Marine Sanctuary Program. The Maritime Heritage Program is developing partnerships with other federal and state preservation agencies in order to more effectively protect and manage underwater culture heritage while, at the same time, providing expanded opportunities for the public to visit and enjoy that heritage. The Maritime Heritage Program also is participating in the development, for broader ocean management planning, of an inventory of cultural heritage sites that may be potential threats to the marine environment. NOAA will continue to emphasize resource protection while, at the same time, ensuring that the sanctuaries' natural and cultural heritage is accessible—not just to visitors, but to people worldwide through expanded online content, live webcasts, and other education and outreach strategies.

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