



Celebrating the Discovery of the USS *Monitor*

On August 24, 2003, NOAA and The Mariners' Museum celebrated the 30th anniversary of the discovery of the wreck of the USS *Monitor*. This special day featured fun-filled activities for children and adults alike. The celebration included a talk by Dr. John Broadwater, Manager of the *Monitor* National Marine Sanctuary, on the history of the vessel and her discovery. NOAA historian Jeff Johnston gave a talk on the large-scale recovery operations that ended last year with the recovery of the *Monitor*'s world-famous gun turret.

The North Carolina Maritime Museum in Beaufort, NC, also celebrated the anniversary. Some of the original researchers who found the *Monitor*, including Robert Sheridan, Gordon Watts and William Still, were present at a reception celebrating the discovery of the *Monitor* and a two-day Underwater Archaeology Symposium sponsored by the Museum. John Broadwater and Jeff Johnston also gave talks on the *Monitor*'s discovery and recovery.



THE MARINERS' MUSEUM



Photo Courtesy The Mariners' Museum



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CHEESEBOX

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Recovery and excavation of the turret

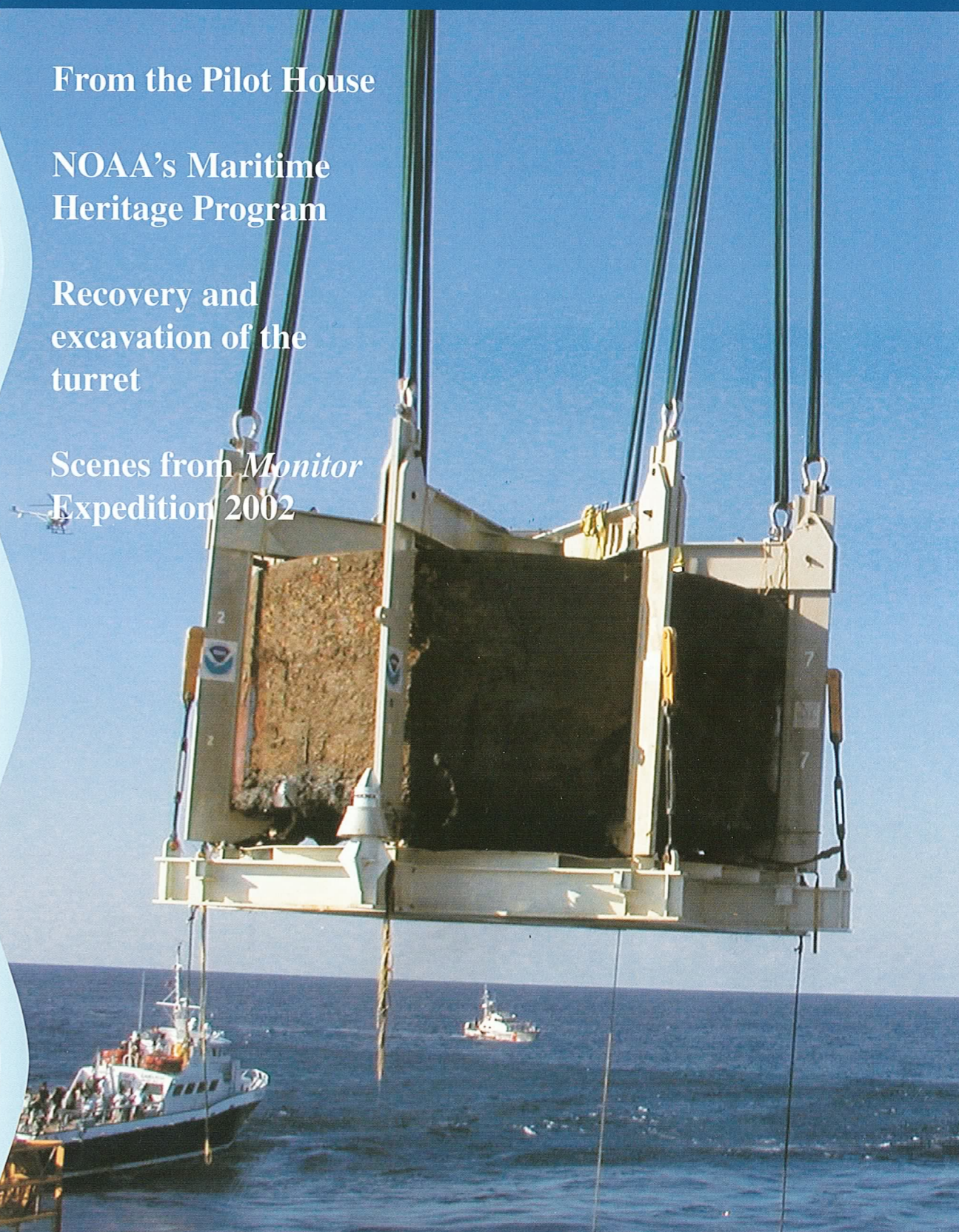
Scenes from *Monitor Expedition 2002*



NATIONAL MARINE SANCTUARIES™

MONITOR

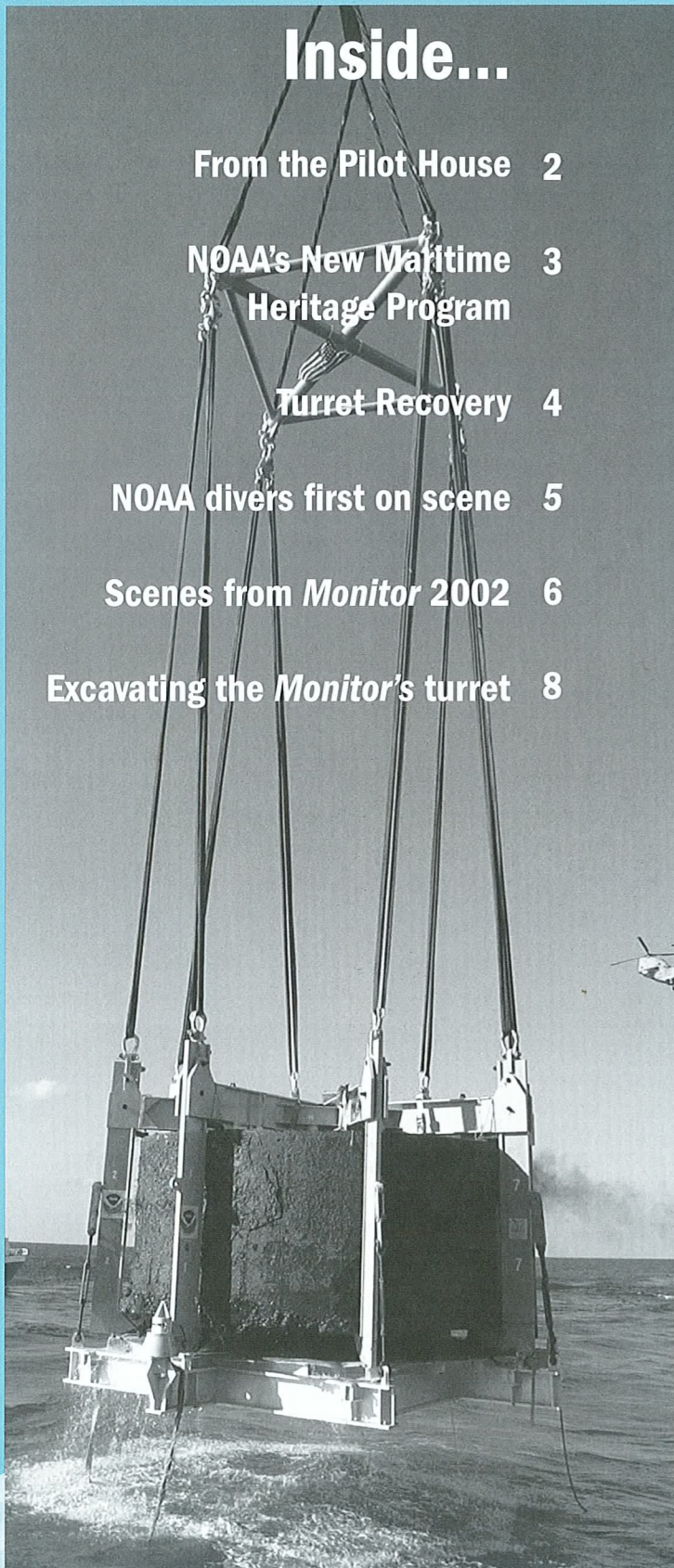
THE MARINERS' MUSEUM



From the Pilot House

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I'm sure that some of you have been wondering if you'd been dropped from our mailing list! No, it's just that so much has happened since the last *Cheesebox*, we haven't had time to put another issue together. However, Michelle Fox not only developed this special *Cheesebox* edition, but gave it a new look as well. We hope you like it.

Our biggest news, reported herein, is the recovery last year of the *Monitor's* famous gun turret. Since turret recovery was the culmination of a decade of research, preparation and expeditions, we've included a portfolio of color images from *Monitor* Expedition 2002. As always, the Navy came through with flying colors, recovering the turret intact, with over 400 artifacts still inside! Working since 1998 with the Naval Sea Systems Command, Mobile Diving and Salvage Unit Two, and Navy divers from over two dozen units around the world has been the highlight of my NOAA career.

With the major *Monitor* recovery expeditions successfully completed, the *Monitor* National Marine Sanctuary is beginning a new phase. In July and August of this year, a NOAA team conducted mapping and photography at the sanctuary site. In future years, we hope to have Navy participation as we continue to reveal more of the *Monitor's* story through underwater archaeology. In the meantime, we're working closely with The Mariners' Museum, where *Monitor* artifacts are being conserved, stored and exhibited. The museum is developing plans for a USS *Monitor* Center, which we will tell you more about soon.

In the coming year, we will be telling you about even more exciting new programs and projects as well as an expanded Internet site.

So stay tuned: plenty of excitement is yet to come from the *Monitor* National Marine Sanctuary!



John Broadwater

John Broadwater, Manager
Monitor National Marine Sanctuary

NOAA establishes Maritime Heritage Program

In a historic step toward better preserving and managing our nation's maritime heritage, NOAA has formally created a Maritime Heritage Program (MHP). As an initiative of NOAA's National Marine Sanctuary Program (NMSP), the MHP will assist NOAA's national marine sanctuaries throughout the United States in their efforts to manage and protect maritime heritage resources within their boundaries.

"Locating, protecting, managing, researching and educating the public about archaeological sites throughout the sanctuary system is an important part of our overall mission," said Daniel J. Basta, director of the NMSP. "As with natural resources, numerous user and interest groups – from archaeologists to recreational divers to salvors – seek to interact with these resources in a variety

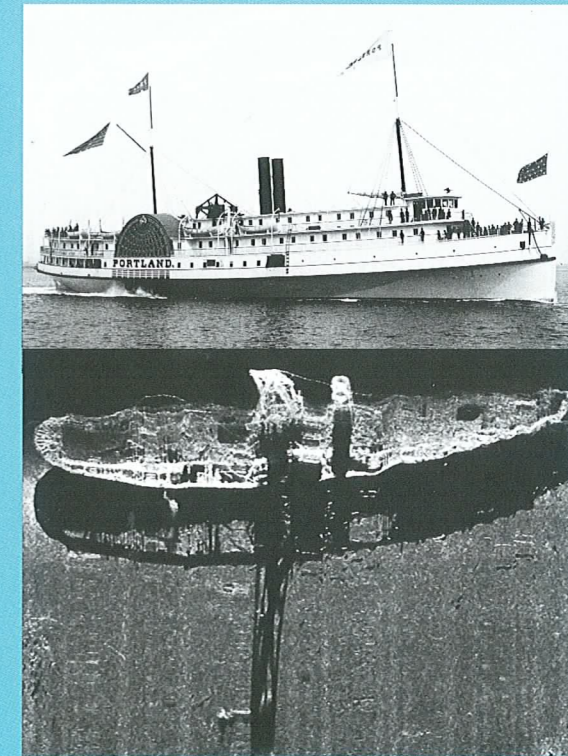
of ways. The cultural resources within our sanctuaries, if properly studied and interpreted, will increase public enjoyment and appreciation of our special and diverse sanctuary resources."

NOAA staff working for the MHP will be dedicated to assisting sanctuaries in their efforts to manage and protect their maritime and cultural artifacts. The MHP also will provide assistance and consultation to other federal and state agencies on issues concerning submerged maritime and cultural artifacts and seek to develop new methods, tools, and partnerships for achieving program objectives.

"I am very excited about the sanctuary program's increased emphasis on maritime and cultural

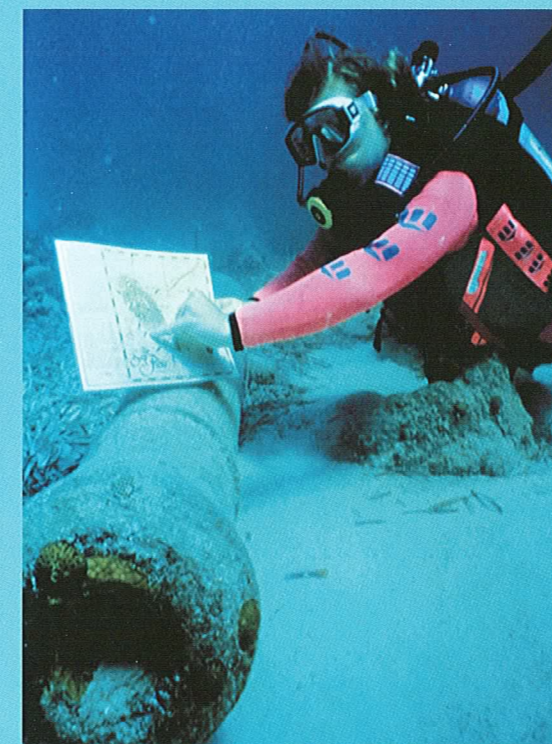
artifacts that will be embodied in this new program," said MHP Director and *Monitor* National Marine Sanctuary Manager John Broadwater. "Americans are, and always have been, a maritime people, beginning with the native coastal tribes, expanding with the European exploration and settlement period, and culminating in the greatest naval power the world has ever seen. One of the program's primary goals is to emphasize and interpret America's maritime heritage, thus adding a new dimension to the already well-developed natural resources programs."

One of the MHP's first projects is the Maritime Archaeological



The 281-foot side paddle wheel steamship *Portland* sank in 1898 and is known as one of New England's greatest sea tragedies. Using advanced deep-sea search technology, a team led by staff from the Stellwagen Bank National Marine Sanctuary confirmed the site of the *Portland* using side scan sonar. Photos: Courtesy The Mariners' Museum and Stellwagen Bank National Marine Sanctuary.

Resources Inventory for National Evaluation and Research (MARINER), a database containing basic information about shipwrecks and other submerged cultural sites within U.S. waters. The database will be a valuable management, research, and educational tool. This multi-year project is a continuation of a 2002 pilot project conducted by the NMSP in cooperation with the Santa Barbara Maritime Museum.



The *San Pedro* was part of the Spanish treasure fleet wrecked by a hurricane in 1733. This historic wreck is now part of the Shipwreck Trail in the Florida Keys National Marine Sanctuary. Photo: Courtesy Florida Bureau of Archaeology

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Monitor's Turret Returns to Hampton Roads, Va.

On August 9, 2002, the turret of the Civil War ironclad USS Monitor returned to Hampton Roads where it changed the face of naval warfare during its battle with the CSS Virginia on March 9, 1862. The turret, recovered by the National Oceanic and Atmospheric Administration (NOAA) and the U.S. Navy, was raised from the ocean floor off Cape Hatteras, NC, on August 5, 2002, after a 41-day mission.

Monitor Expedition 2002

Recovery of the Monitor's turret began on two fronts on June 24, 2002. NOAA and U.S. Navy personnel departed Norfolk, Va. aboard the Derrick Barge *Wotan*, operated by Manson-Gulf, Inc., and submersible dives were conducted by the Harbor Branch Oceanographic Institution at the *Wotan's* destination -- NOAA's Monitor National Marine Sanctuary (MNMS).

The barge reached the sanctuary at 3:15 am on June 26. Despite the hour and total darkness, the crew began deploying the eight 20,000-pound anchors that would hold the barge in position over the *Monitor*. At 7:05 am, all of the *Wotan's* anchors were set and, at 9:27 am, the first dive of the expedition took place. The divers reported nearly 100 feet of visibility and almost no current.

To gain access to the turret for excavation and



More than 160 personnel from NOAA, US Navy, The Mariners' Museum, Manson-Gulf Inc., and Phoenix International Inc., made recovery of the Monitor's turret possible. Photo: U.S. Navy

recovery, a 30-ton section of the ship's stern hull structure was removed. Before it could be removed and lifted, Navy divers had to remove tons of debris and coal, and cut through thick layers of iron and wood hull structure.

After nine days on site, on July 5 at 7:57 pm, the *Monitor's* famous gun turret was completely uncovered for the first time since the *Monitor* sank on December 31, 1862.

Recovery preparations

With the turret exposed, divers began to install the 57,000-pound lifting frame, known as the "spider," and began excavating the interior of the silt-filled turret.

Once inside the turret,

divers encountered a thick layer of iron fragments, iron concretions, coal and other hull debris. They were able to remove the most recently deposited layer (designated "Layer A") by July 8, and excavation proceeded into "Layer B"—a foot-thick stratum of compacted silt and dead coral.

By noon on July 9, most of the turret perimeter had been cleared of hull debris, and about half the coral layer was out of the turret. Unfortunately, the weather began to deteriorate. The wind and seas built out of the southwest throughout the night, reaching winds over 30 knots and sea swells of five to seven feet.

These difficult conditions

were exacerbated by periodic squalls and thunderstorms and by strong bottom currents. By 4 am on the 10th, surface-supplied diving had to be suspended, but saturation diving continued.

By midnight on July 10, the troublesome "Layer B" was nearly cleared, and divers on the night shift began to excavate "Layer C," a soft, gray clay that proved much easier to remove.

The team made an important discovery the following day. Navy divers, working with archaeologists from NOAA, uncovered one of the 16,000-pound guns within the *Monitor's* turret. For years, many historians and Civil War

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NOAA divers first on scene following turret recovery

Between July 21 and August 17, 2002, a team of research divers from the National Undersea Research Center at the University of North Carolina, East Carolina University and throughout the

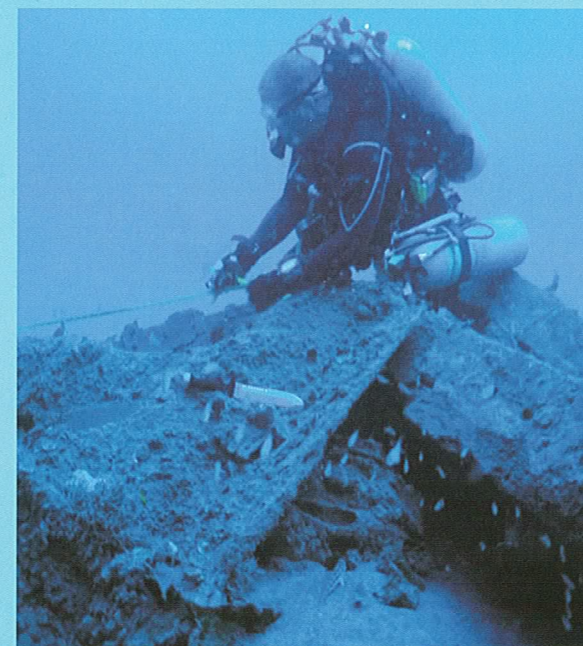
country documented the wreck of the *Monitor*.

Supervised by NOAA archaeologists, the NOAA dive team worked side-by-side with Navy divers to record turret excavation progress.

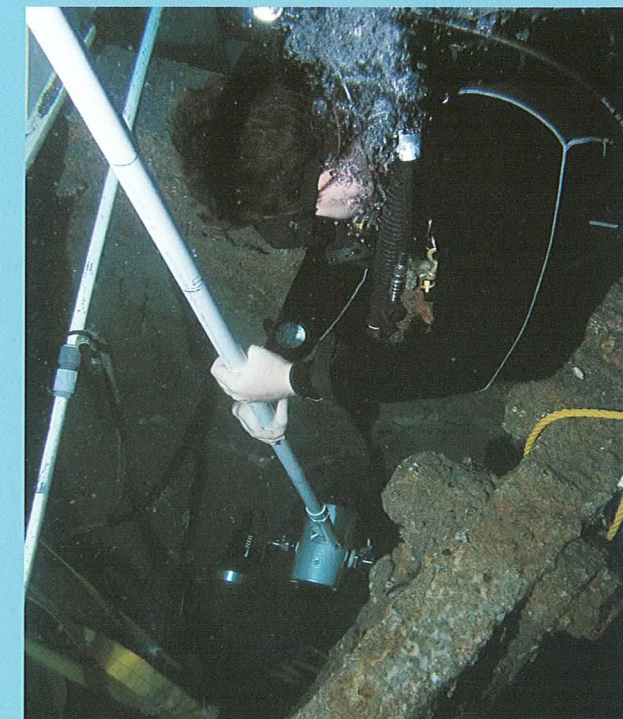
After the turret had been successfully lifted, the NOAA divers were the first to see the wreck without its most recognizable feature. The place where the turret sat for 140-years was now a 30-foot void.

Diving from the R/V *Cape Fear*, the team documented changes to the site using video, still photography and archaeological mapping techniques. They recovered two stanchions, three medicine bottles, a cannonball fuse and a porcelain door plate.

NOAA divers returned to the site on July 22, 2003. More details on *Monitor Expedition 2003* will be reported in the next edition of *Cheesebox*.



Volunteer diver Kevin Gurr records changes to the Monitor NMS after the turret was removed. Photo: Monitor Collection, NOAA



NOAA archaeologist Tane Casserley uses a video camera to record the turret roof. Photo: Monitor Collection, NOAA

Continue to follow
the *Monitor's*
story on the
web at:
<http://monitor.noaa.gov>

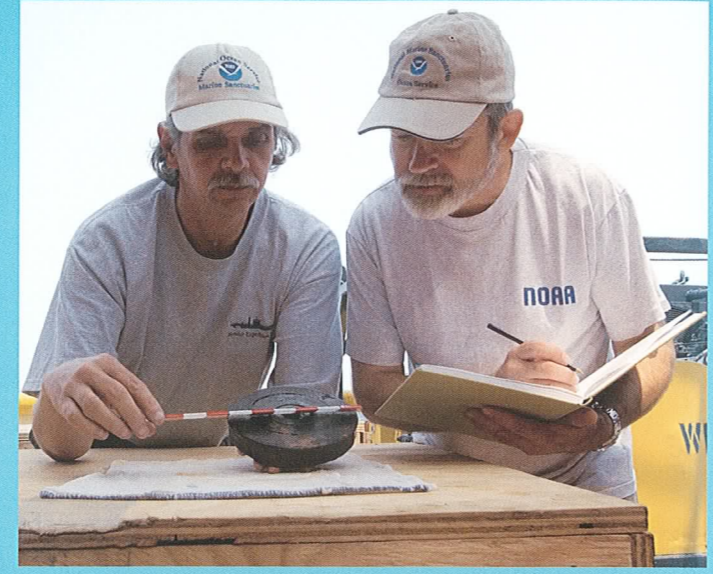


Monitor Expedition 2002

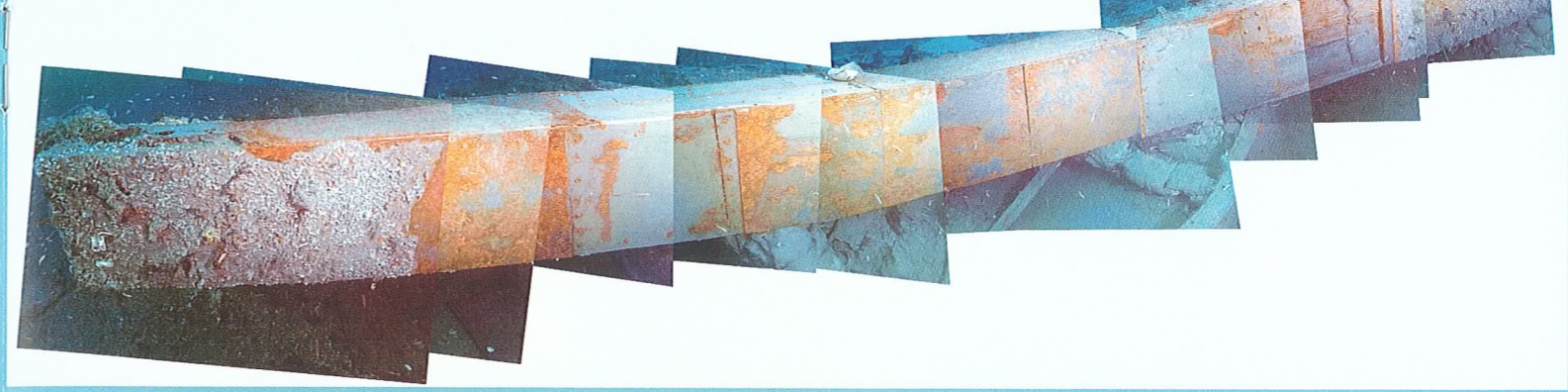


The Monitor's turret as it looked before NOAA and the US Navy removed a 30-ton section of hull and armor belt. Photo: Monitor Collection, NOAA

Jeff Johnston (left) and John Broadwater record one of the many artifacts recovered during the expedition. Photo: Monitor Collection, NOAA

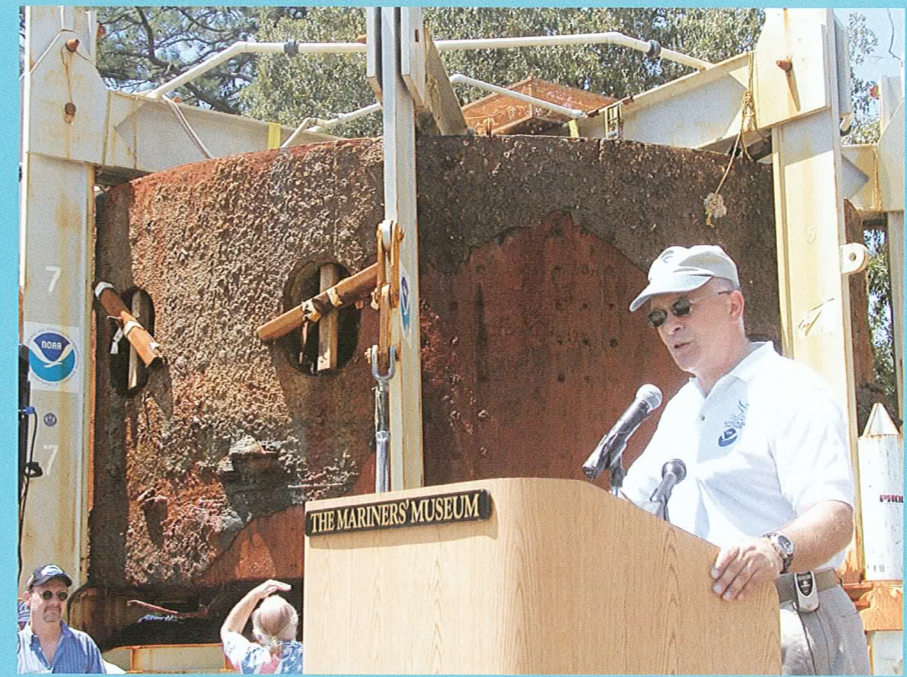


This mosaic of video imagery shows the section of the armor belt and hull that divers had to remove before the turret could be lifted. Photo: Monitor Collection, NOAA



Navy divers go "over the side" during a routine dive to the Monitor. Photo: Monitor Collection, NOAA

A large manta ray glides over the wreck of the Monitor, which many ocean species now call "home." Photo: Monitor Collection, NOAA



National Marine Sanctuary Program Director Dan Basta addresses a crowd gathered to welcome the turret to The Mariners' Museum on August 10, 2002. Photo: Monitor Collection, NOAA

The standby diver anxiously sits on the deck of the Wotan, ready to dive into action should an emergency occur while the working divers are below the surface. Photo: Monitor Collection, NOAA



A Navy diver signals to the crew on the Wotan that the platform has been secured to the lifting mechanism shortly before it is lowered to the Monitor. Photo: Monitor Collection, NOAA



Virginia Congresswoman Jo Ann Davis was one of several dignitaries to speak at the turret arrival ceremony held in Newport News on August 9, 2002. Photo: Monitor Collection, NOAA



The barge Wotan arrives safely in Newport News, Va. with the turret on board. A crowd of over 1,000 gathered for the homecoming ceremony. Photo: Monitor Collection, NOAA

Turret Excavation Reveals Insight into Ship's Sinking

A 16-week effort by NOAA and The Mariners' Museum to excavate the turret began shortly after it arrived at the Museum .

When the turret arrived, the Museum was well-prepared with a huge conservation tank and a computer-controlled chilled-water system to keep the turret submerged in cool water. The chilled



A nearly-complete wool overcoat is found inside the Monitor's turret. Photo: Monitor Collection, NOAA

water was important for the preservation of organic material in the turret.

When excavation began, the four gun slides, two vertical stanchions and two sets of horizontal braces were exposed, as were both roof hatches. The bases of both gun carriages were exposed along with the muzzle ends of both guns. Partially exposed artifacts included implements for working the guns, large and small cordage, cloth, and human remains.

During the first week, Eric Emery, an archaeologist from the U.S. Army's Central Identification Laboratory (CILHI) who participated in the Expedition, came to assist in the removal of human remains. A gold ring was found inside the turret, still on the fourth finger

of the right hand of one of the sailors.

Once the remains were removed from the turret, they were sent to CILHI where they currently are being analyzed for potential identification.

Other artifacts retrieved during the first week included a silver-plated serving spoon, a pocket comb stamped "U.S. Navy," the handle to a pocket knife, a nearly-complete wool overcoat, numerous coat buttons, three shoes, and pulley blocks associated with the gun carriages.

A few weeks later, the excavation team began to discover several additional pieces of silverware. The presence of silverware led to some speculation about the sinking sequence of the *Monitor*.

When the *Monitor* was designed, a portion of the turret was positioned over the ship's galley. Excavators began to speculate that the silverware could have fallen into the turret as the ship rolled over and sank. As excavations continued, more silverware was discovered, including several forks, some of which were monogrammed.

The first

fork, located on October 3, 2002, has an inscription "SAL" and "USN" (United States Navy). Archaeologists speculated



A silver spoon and three rubber US Navy buttons were among the over 400 artifacts recovered from the turret. Photo: Monitor Collection, NOAA

that "SAL" could be the initials of Third Assistant Engineer Samuel Auger Lewis, who was lost when the *Monitor* sank. A second fork was inscribed with "G. Frederickson," which undoubtedly belonged to George Frederickson, an

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One of the Monitor's two 11-inch Dahlgren guns is shown inside the turret. The Mariners' Museum plans to remove the guns in the near future. Photo: Monitor Collection, NOAA

NOAA, Navy safely lift turret from ocean floor (cont.)

(cont. from page 4)

buffs speculated that as the *Monitor* rolled over and sank, its two 11-inch Dahlgren guns broke free of the turret, fell to the seabed, and were buried beneath sand or the *Monitor's* hull. Others, including NOAA's MNMS manager John Broadwater and sanctuary historian Jeff Johnston, were confident that both guns would be found inside the turret, still attached to their carriages.

Divers first uncovered a series of metal plates that Johnston immediately recognized as part of the recoil mechanism on the bottom of the port carriage. The guns were inside the turret and attached to their carriages! Soon, divers had uncovered the muzzle end of one gun barrel. After this discovery was made, NOAA and the Navy were able to complete plans for securing the cannons and carriages, allowing them to make the final lift.

Three weeks of diving behind them, NOAA and the Navy were ready to lower the "spider" over the turret on July 17. The "spider" was lifted



A Navy diver "hats up" before heading 240 feet below the ocean's surface to secure the "spider" to the platform. Photo: Monitor Collection, NOAA



The Monitor's turret was revealed after NOAA and the US Navy removed a 30-ton section of ship's hull and armor belt. Photo: Monitor Collection, NOAA

from the deck of the barge, suspended over the side, then slowly lowered 230 feet to the sea bottom.

On July 22, Navy personnel working with Manson Gulf riggers on the *Wotan* lowered the turret support platform to the seabed. The platform sat just aft of the turret, over which the "spider" had already been placed.

Following placement of the platform, Navy divers resumed the difficult task of installing the spider into final position over the turret. They encountered literally tons of coal, crusty lumps of sand and iron concretion, and heavy wrought iron rods that once supported the awning over the turret. The job required a variety of tools, including air lifts, water lifts, and a high-pressure water jet.

On July 26, at approximately 9:00 am, Navy saturation diver BMCS Wade Bingham, who was excavating in the *Monitor's* turret near one of the cannons, encountered two bones that later proved to be human. Immediately, NOAA and U.S. Navy personnel implemented the procedures contained in their Expedition Operations Manual for just such a contingency. Archaeologist Eric Emery was called to the communications van, where Johnston was already talking to the diver. Emery

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World famous gun turret reveals clues about sailors, sinking (cont.)

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Acting Ensign who also perished.

Another exciting find was a lantern, complete with its glass globe. A lantern of this type would have been used on the *Monitor* to light the interior. It is uncommon to find an intact lantern that survived a sinking and 140 years on the ocean floor.

By the end of October, archaeologists had cleared the turret of 95 percent of the deep mud. They continued to find silver flatware between the roof rails. Several pieces, now on display at The Mariners' Museum, revealed additional initials.



This gold ring was found on the fourth finger of the right hand of one of the *Monitor's* sailors. Photo: Monitor Collection, NOAA

A silver spoon has the initials "JN" which match Seaman Jacob Nicklis, and the initials "NKA" found on a teaspoon match the name of Ensign Norman Knox

Attwater. By the time excavations came to a close in December, archaeologists had recovered 24 pieces of silver tableware.

From August to December, the excavation team was aided by over 100 volunteers from The Mariners'



The muzzle of one of the *Monitor's* Dahlgren guns which The Mariners' Museum hopes to remove from the turret later this year. Photo: Monitor Collection, NOAA

Museum, NOAA, East Carolina University, the College of William and Mary, and the public. Without their contributions, the turret excavation would not have been possible.

Excavation of the turret closed down for the winter on December 10, 2002 and resumed again in June of this year.

On April 8 and 9, NOAA and The Mariners' Museum, in collaboration with Lockwood Marine Brothers and Northrup Grumman Newport News, removed the "spider" from the turret, providing archaeologists and conservators better access to the turret as they prepare to remove the guns and carriages in the near future.



Sanctuary Manager John Broadwater (right) and NOAA Historian Jeff Johnston excavate inside the turret. Photo: Monitor Collection, NOAA

Turret delivered safely to The Mariners' Museum (cont.)

(cont. from page 9)
was assigned to the Expedition by the U.S. Army's Central Identification Laboratory in Hawaii (CILHI) to consult with NOAA and the Navy in the event that human remains were located.

Emery worked with the dive team to determine the exact positions of the bones. The area also was documented with digital still and video photography and the bones were covered for protection. At that point, work inside the turret was suspended so the saturation diver could assist the surface-supplied divers in the final placement of the "spider."

Ten days later, after 41 consecutive days at sea, NOAA and the U.S. Navy raised the turret of the USS *Monitor*. It broke the surface at 5:47 pm and landed safely on the deck of the Derrick Barge *Wotan* 12 minutes later.

The turret was then transported to Hampton Roads, VA, where it was greeted by hundreds of onlookers at an arrival ceremony on August 9 in downtown Newport News, VA.



Relieved the turret is safe on the deck of the *Wotan*, NOAA and The Mariners' Museum personnel proudly stand under the gun ports. From left to right: Bob Schwemmer, Wayne Lusardi, Jeff Johnston, Michelle Fox, and John Broadwater. Photo: Monitor Collection, NOAA



The *Monitor's* turret makes its way up Museum Drive to a conservation tank at The Mariners' Museum. The turret will go through a lengthy conservation process that could take 12 to 15 years. The turret, and many other *Monitor* artifacts, will be displayed in the Museum's new USS *Monitor* Center, scheduled to open in 2007. Photo: Monitor Collection, NOAA