

Two Ships / Two Centuries

Archaeological Research at

Yorktown and

Cape Hatteras



John D. Broadwater, PhD

2016 UNOLS Research Vessel
Operators Committee Meeting

Virginia Institute of Marine
Sciences/William & Mary

April 19, 2016



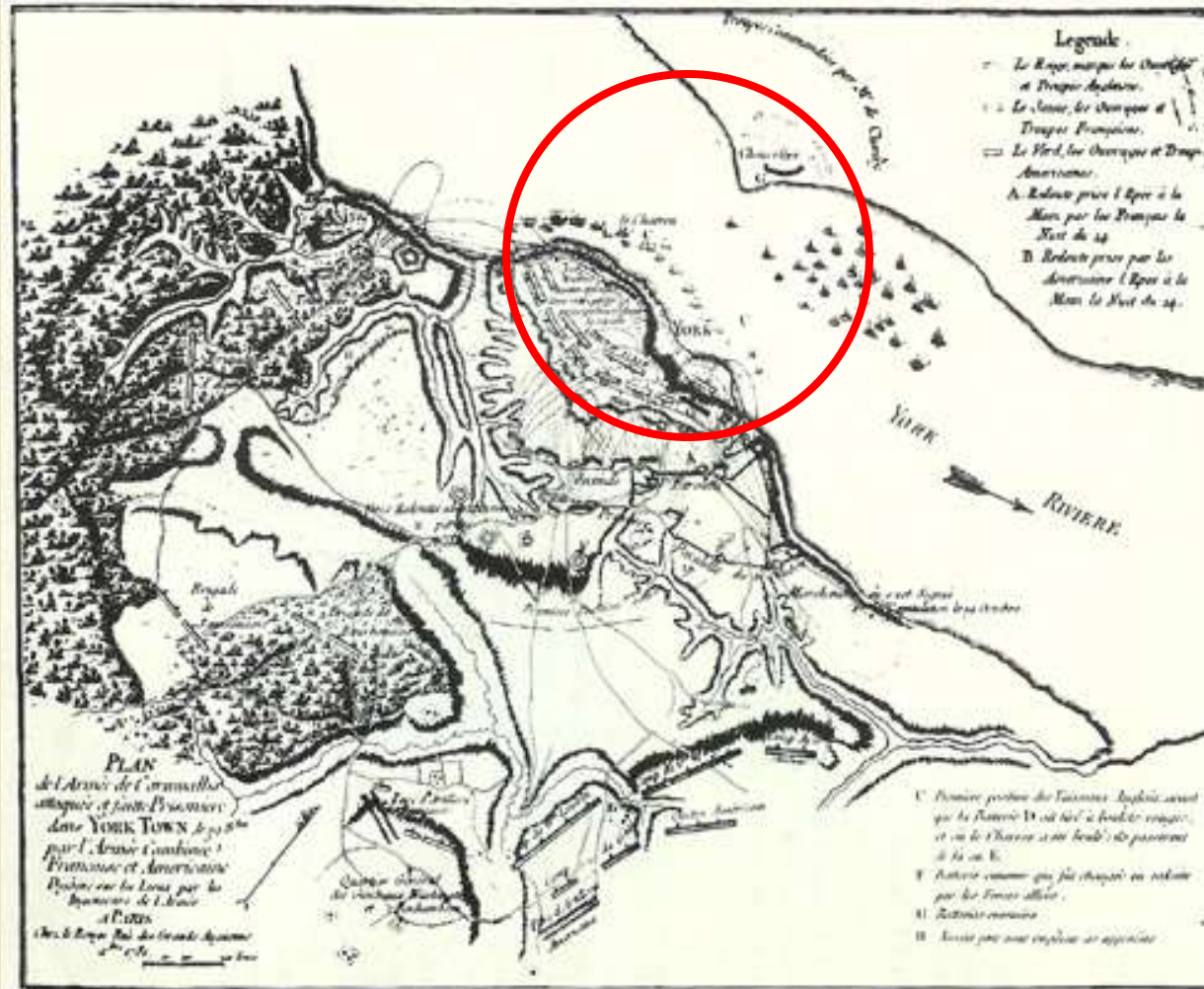


A satellite map showing the Yorktown and Monitor National Marine Sanctuaries. The map features a large body of water, likely the Chesapeake Bay, with a prominent river or inlet flowing into it from the left. The land area is green and forested, with some urban development visible. The water is a deep blue, and the seabed topography is visible in the lower right. Two yellow pushpin markers are placed on the map: one on the Yorktown peninsula and another further south in the water.

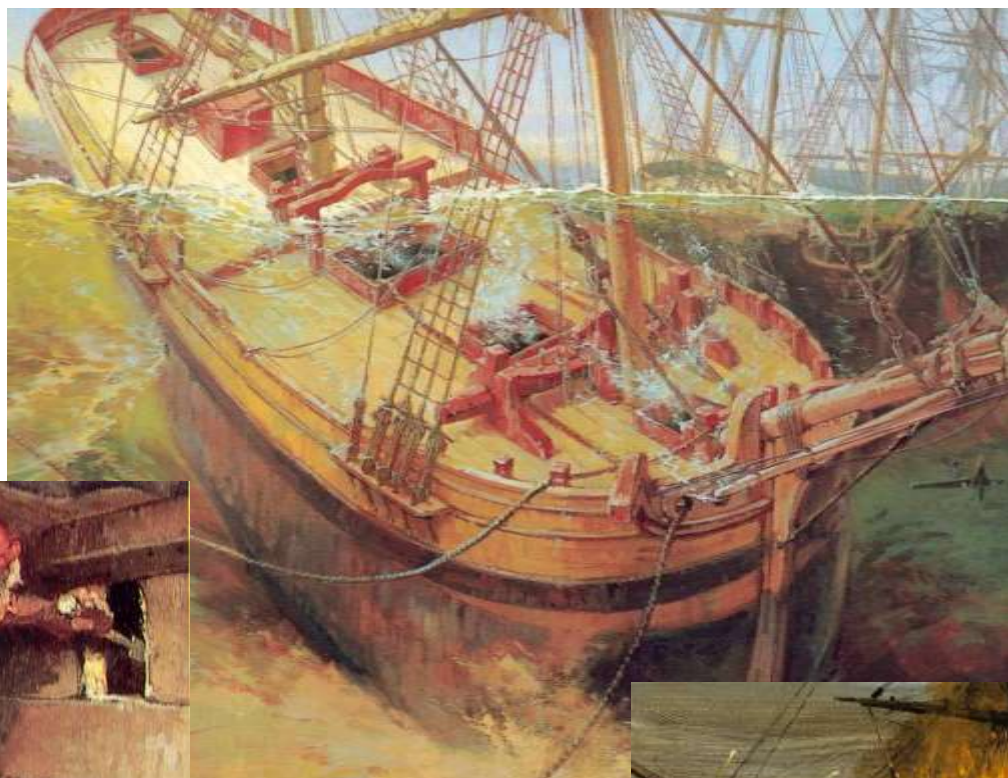
YORKTOWN

MONITOR National Marine Sanctuary

The Battle of Yorktown, 1781



Destruction of British Ships, Yorktown



© National Geographic
Magazine



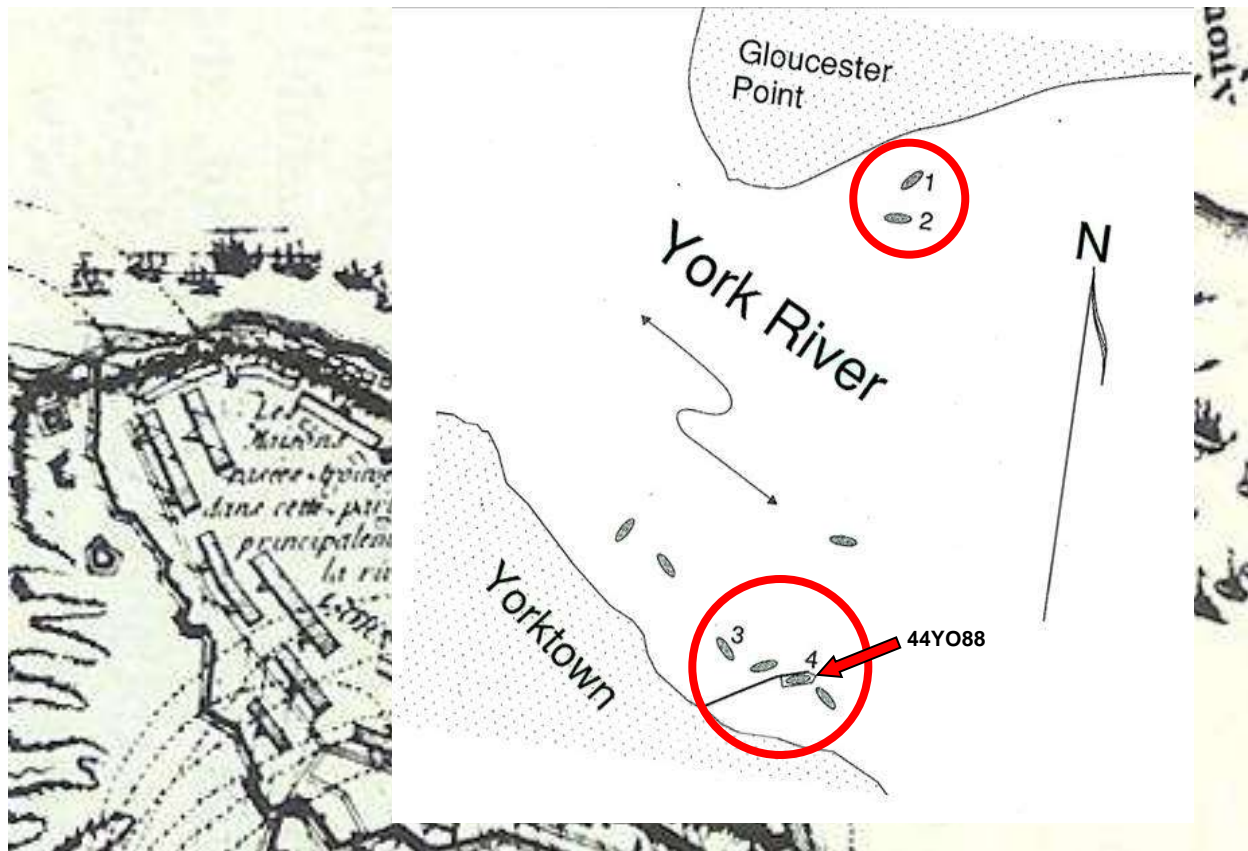
The Aftermath at Yorktown, 1781



Archaeological Surveys (1975 – 1978)



Survey Results



Environmental Conditions

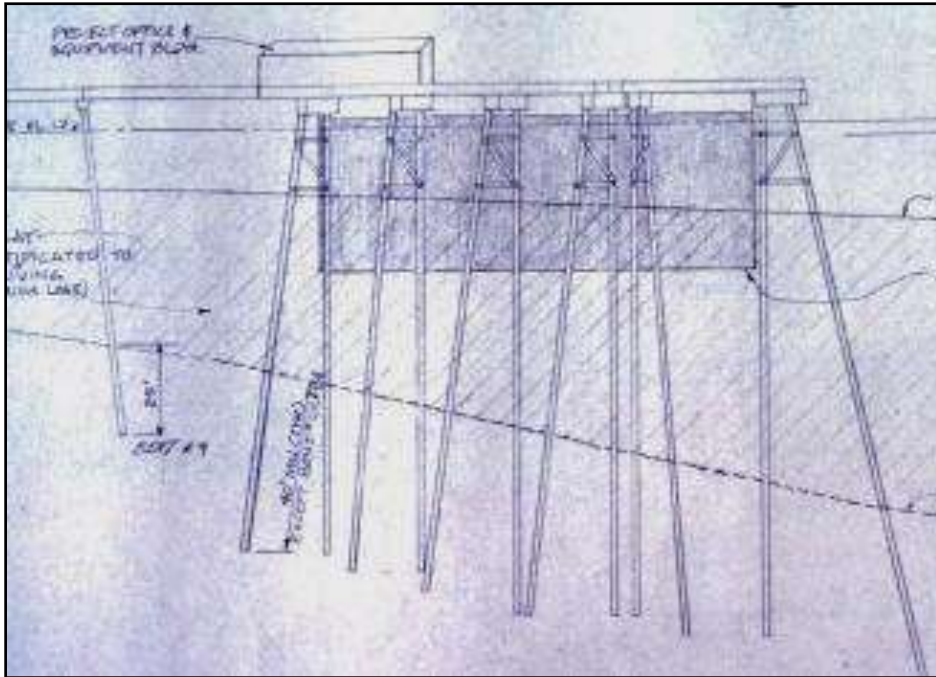


- o Strong currents
- o Stinging jellyfish
- o Dangerous boat traffic
- o Shallow – 25 feet max.
- o No visibility



View from diver's mask

The Answer: A Cofferdam



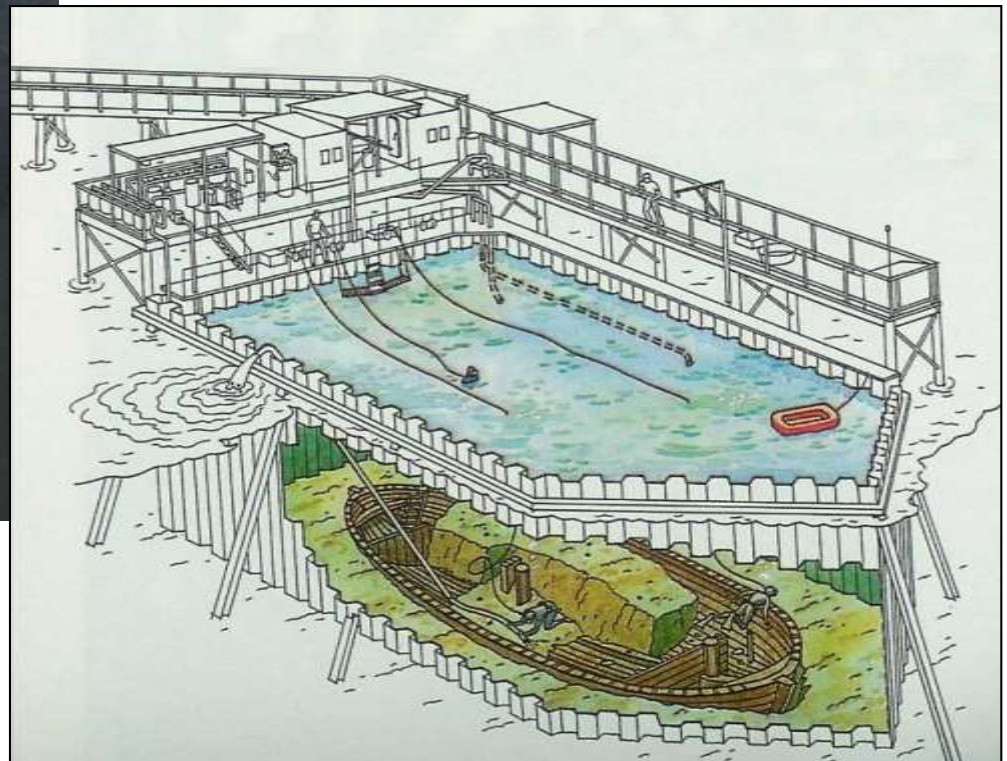
Cofferdam Excavation 1980s



© National Geographic Magazine



© NNS



Structural Features



Unique bow structure

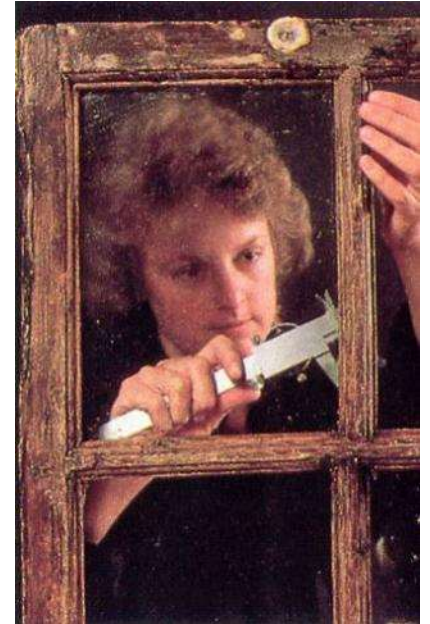
Pump box and mainmast





© National Geographic Magazine

Interior Furnishings



Military Items

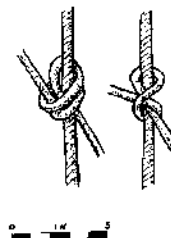
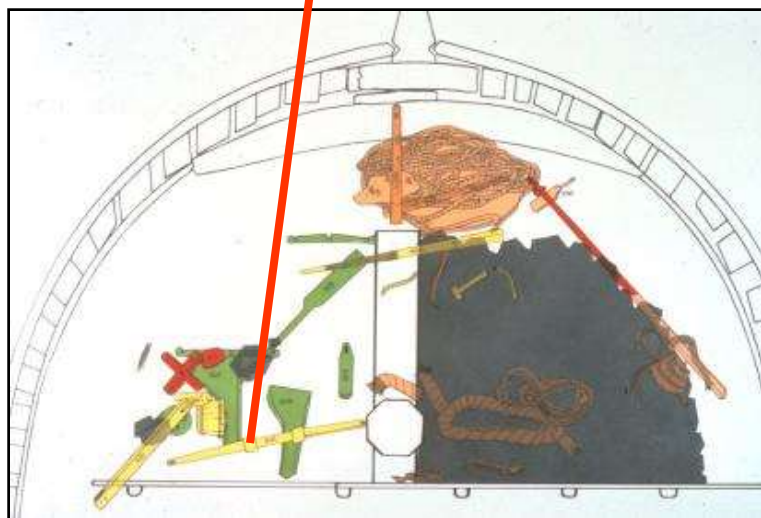
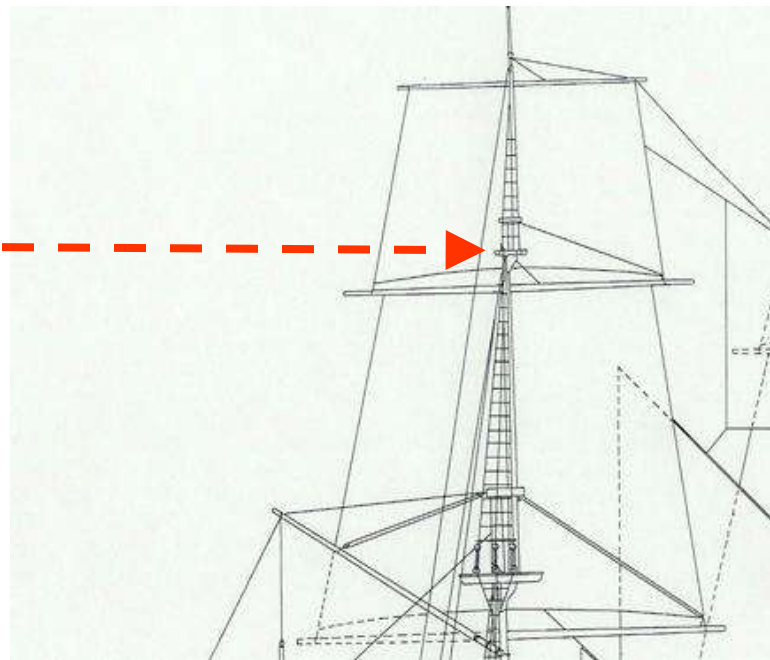


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Nautical and Rigging Items

© National Geographic Magazine

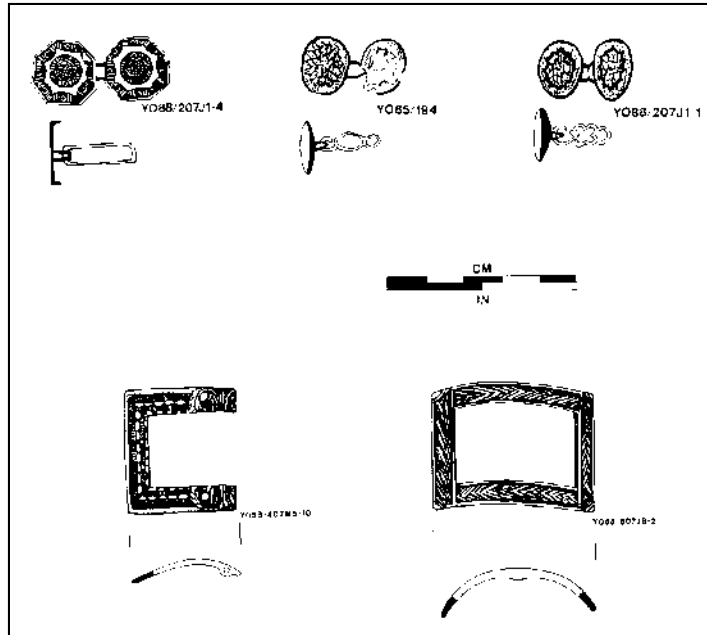


Cooperage



© National Geographic Magazine

Personal Items



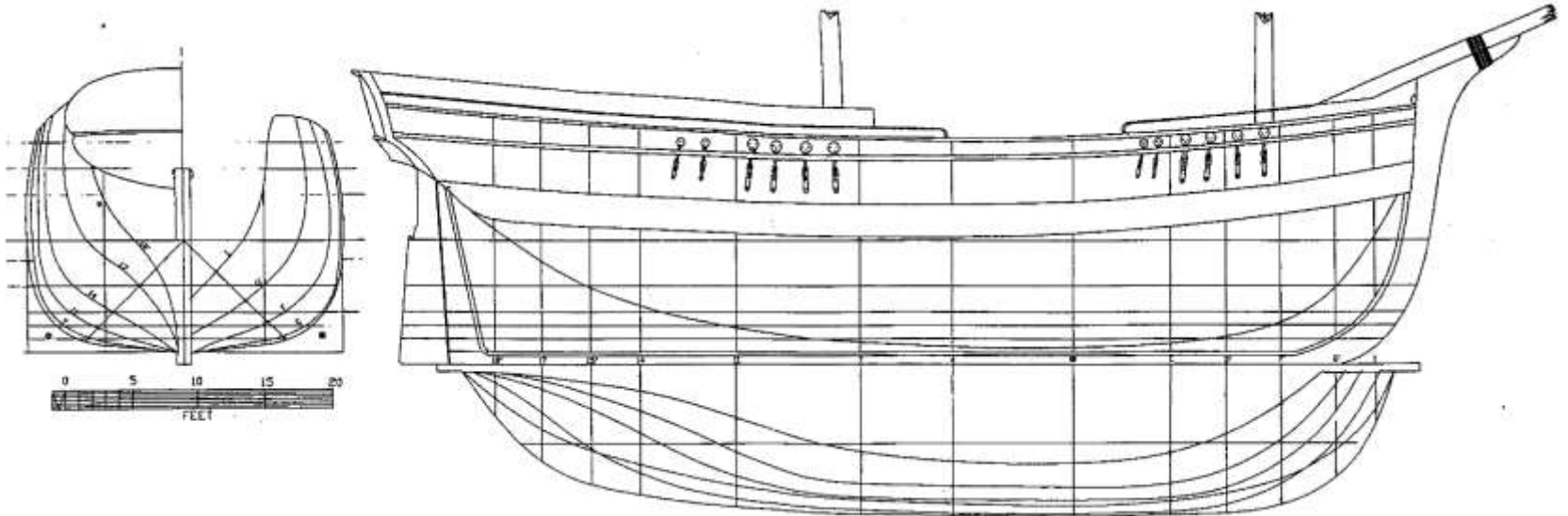
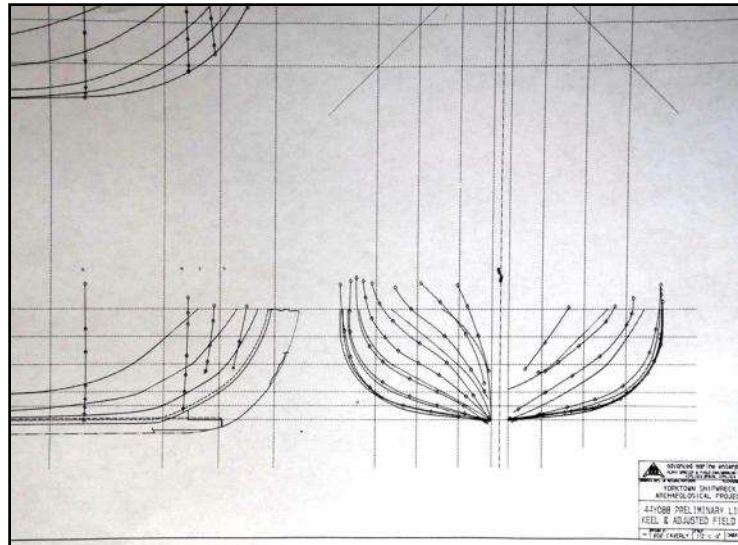
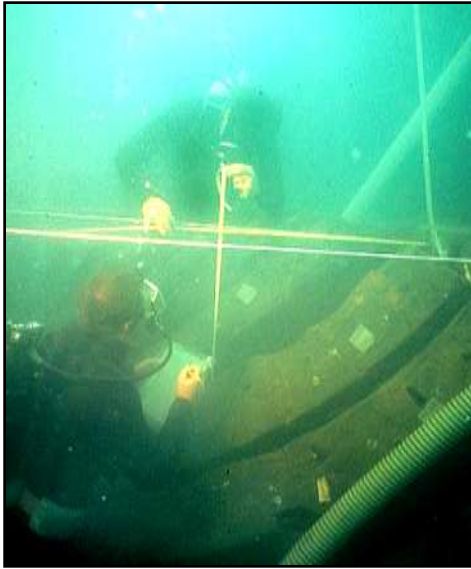
Faunal and Botanical Items



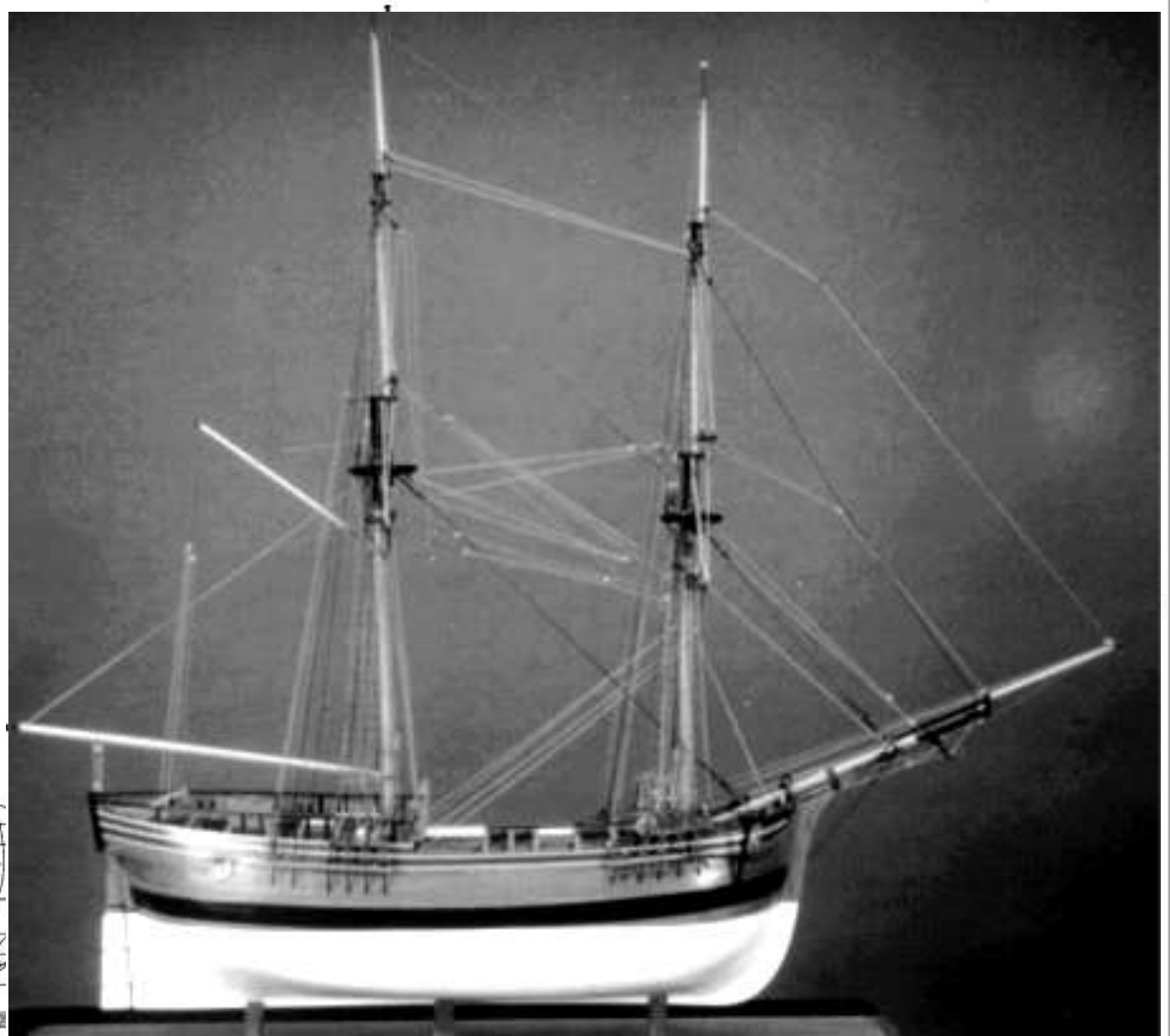
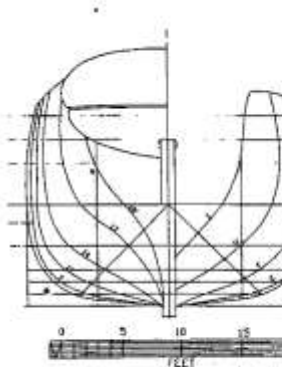
© National Geographic Magazine



Lines: plumb bob \rightarrow computer \rightarrow splines & ink



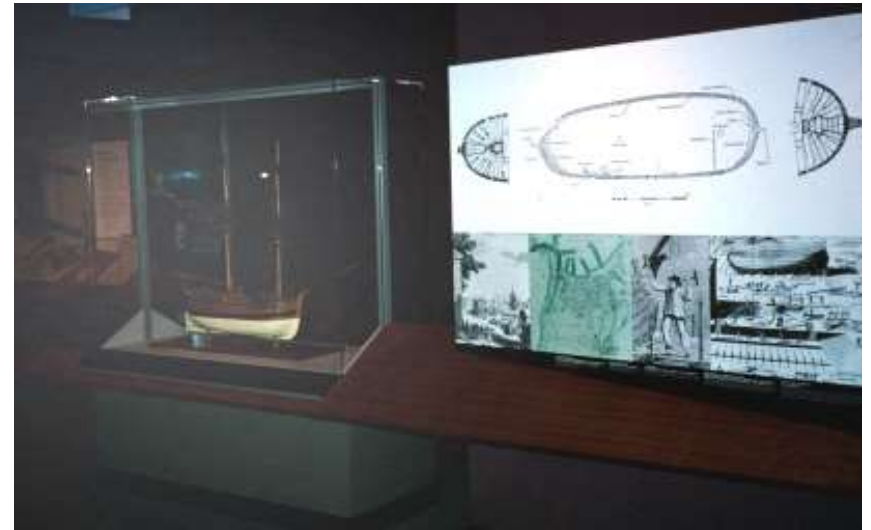
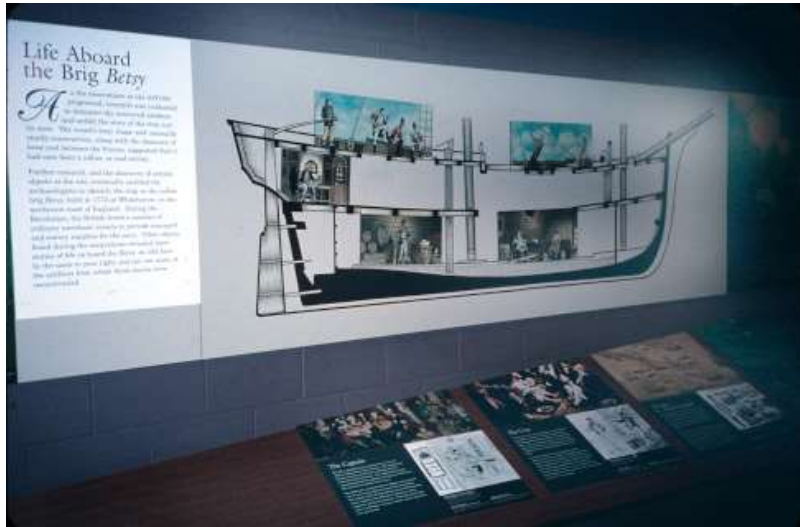
Lines →
Model



FEET



Model & Artifacts → Museum

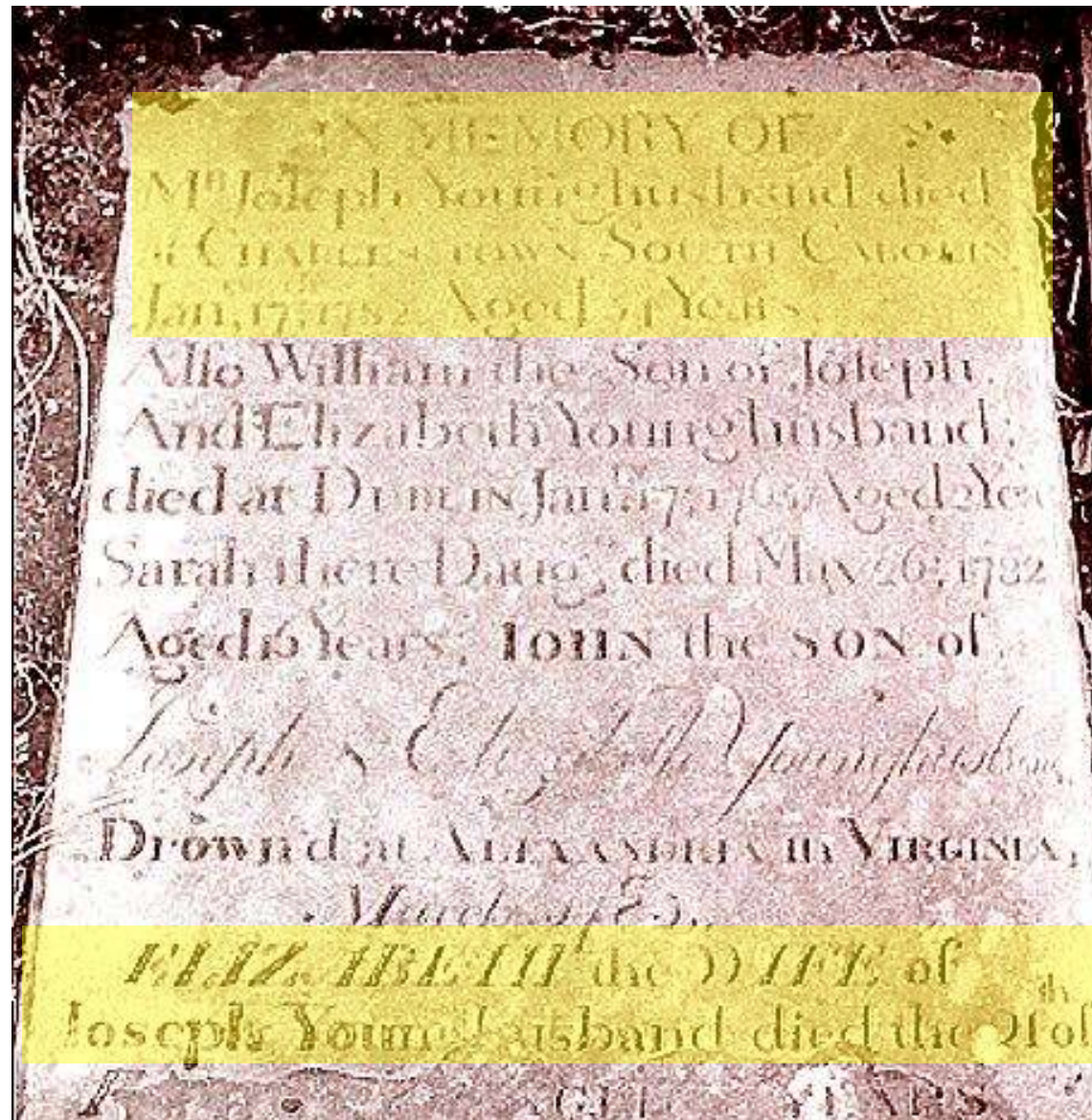


Reenactors help identify the wreck ...

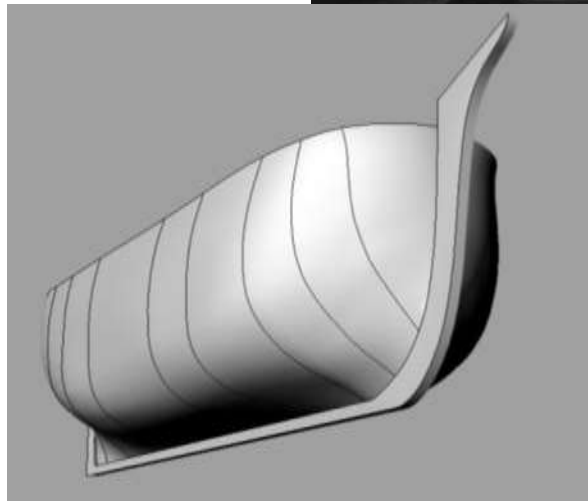
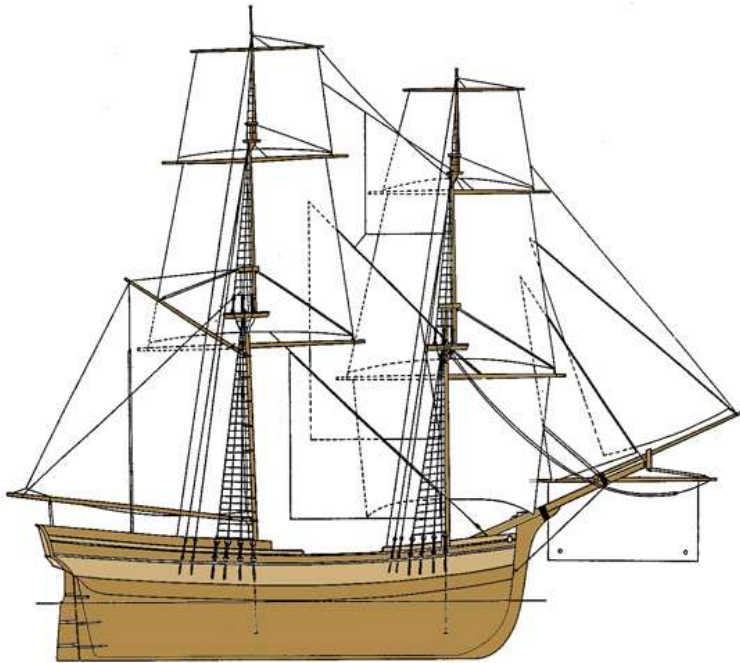


... the *Betsy*
of Whitehaven

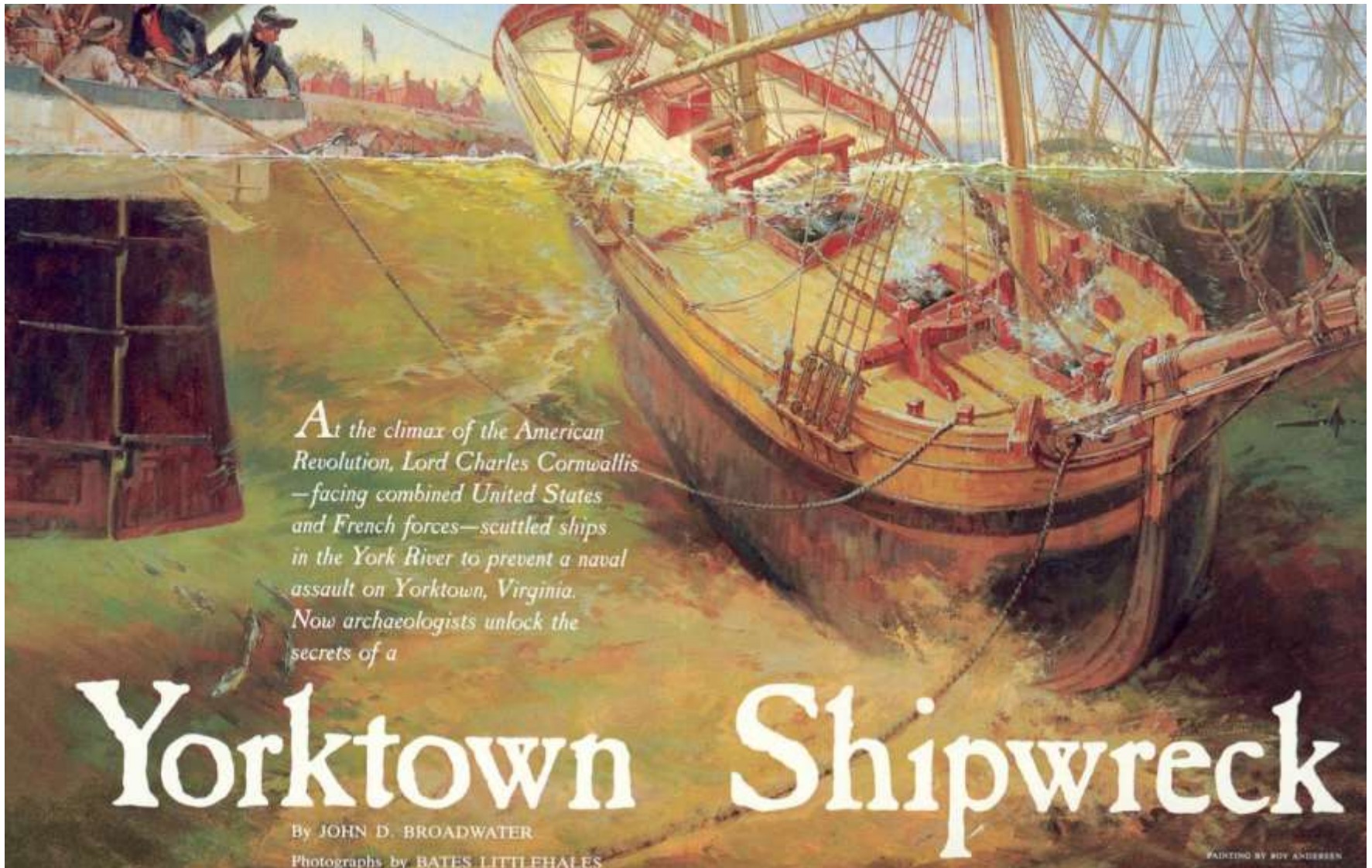
Discovering the *Betsy's* master

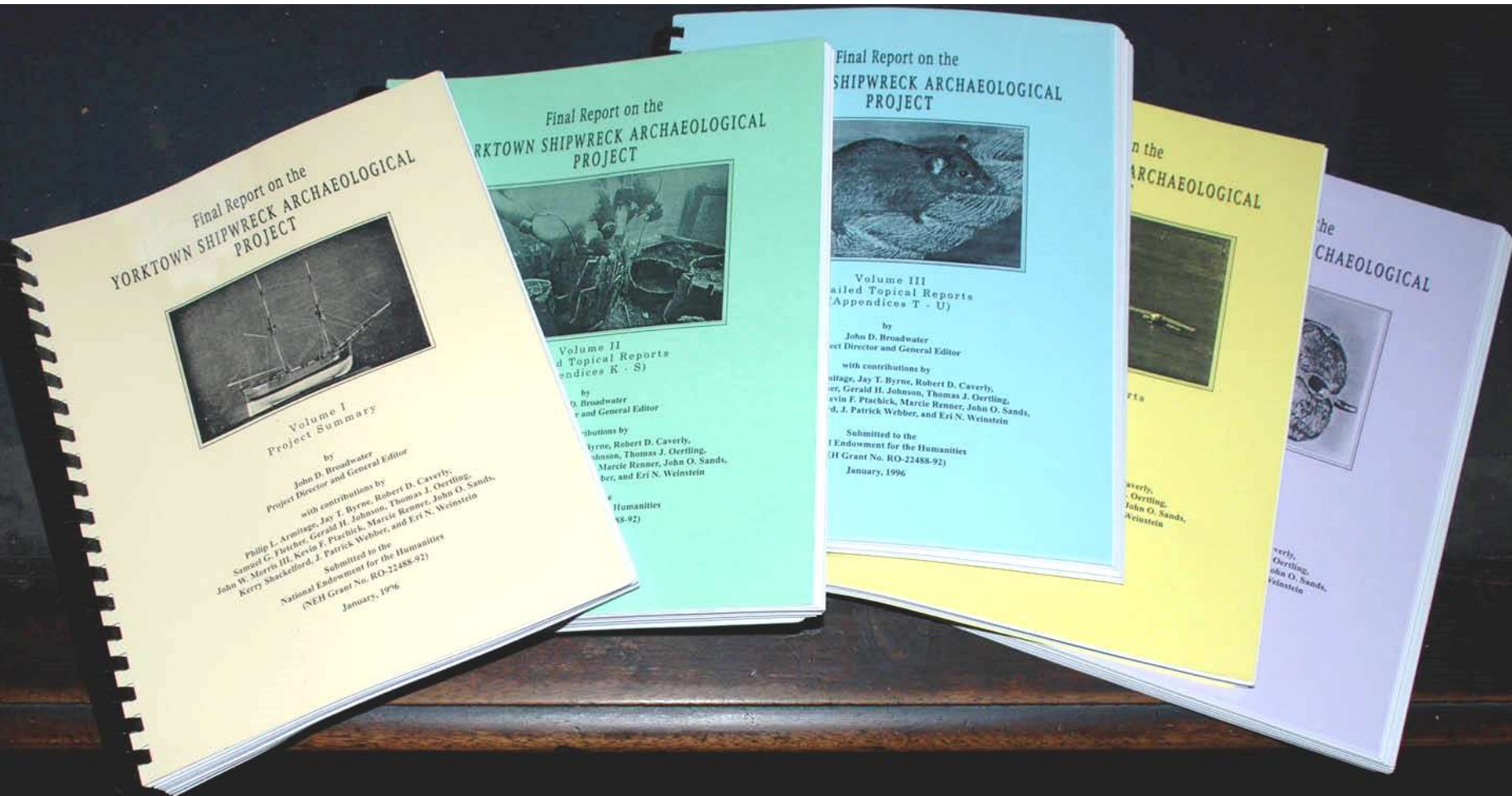


The (not quite) final results -- the ship



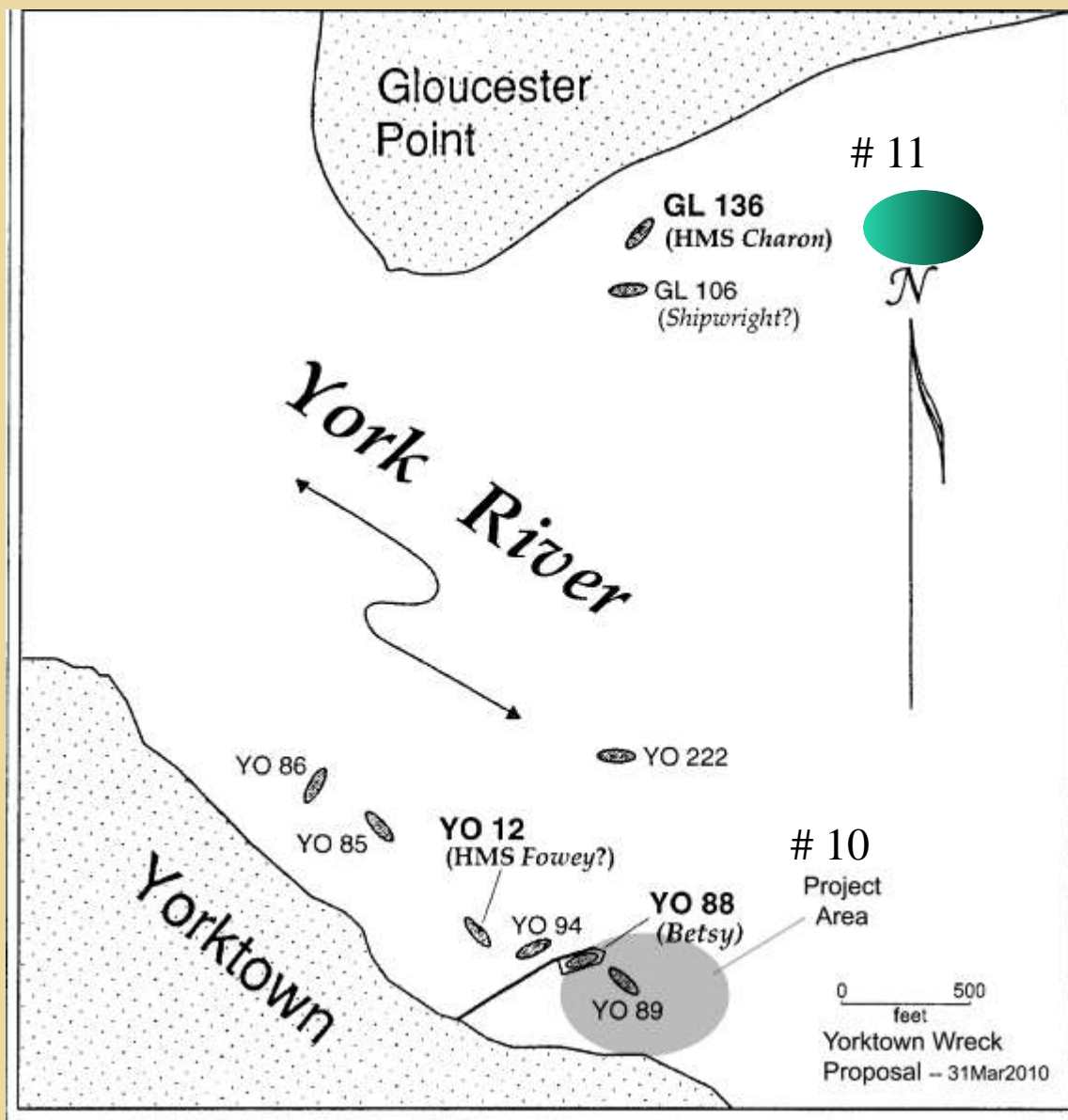
Research → Publication





A 5-volume report was completed
in 1996 . . .

New Wrecks



A diver in a dark wetsuit and scuba gear is swimming in deep blue water, illuminated by a bright flashlight beam. The diver is positioned on the left side of the frame, facing right towards a large, rusted metal structure. Bubbles from the diver's breathing apparatus rise into the water. The structure on the right is a large, rectangular piece of the USS Monitor's hull, heavily covered in marine life and rust. The overall scene is dimly lit, with the primary light source being the diver's flashlight.

USS Monitor

1862

A satellite map showing the Yorktown area and the Monitor National Marine Sanctuary. The land is green with some urban areas, and the water is blue. The Yorktown area is in the upper left, and the Monitor National Marine Sanctuary is in the lower right.

YORKTOWN

MONITOR National Marine Sanctuary

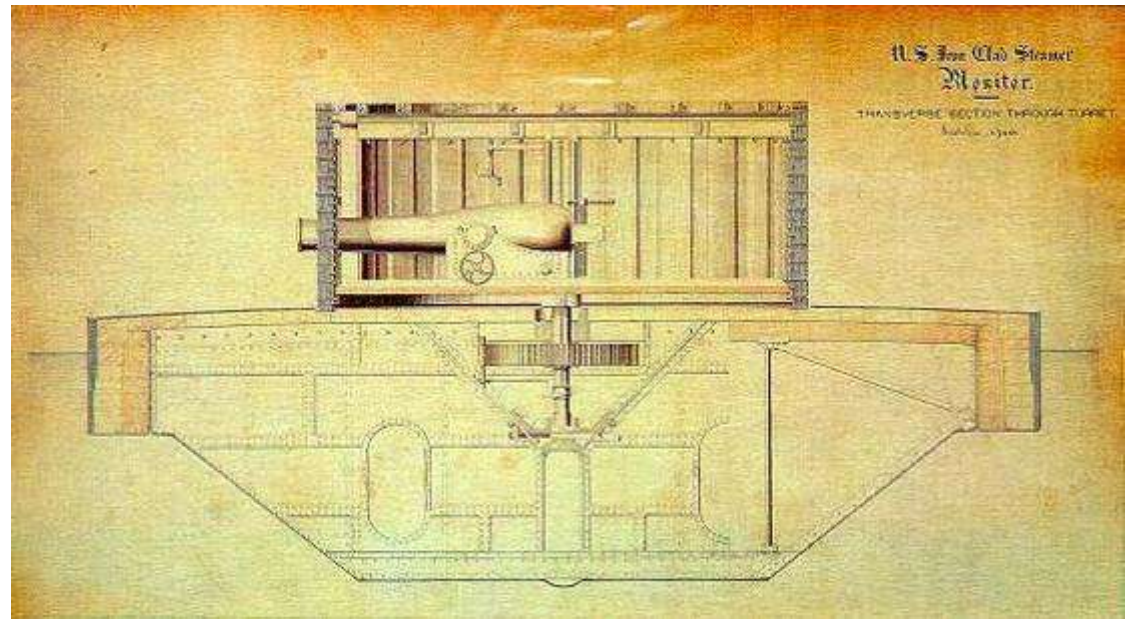
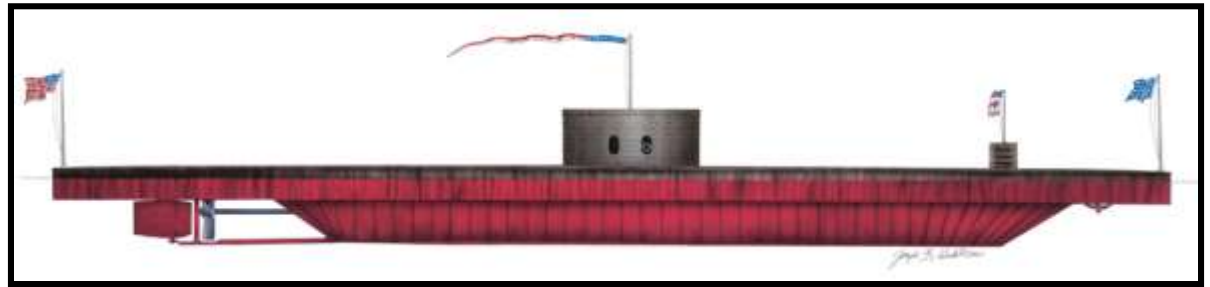
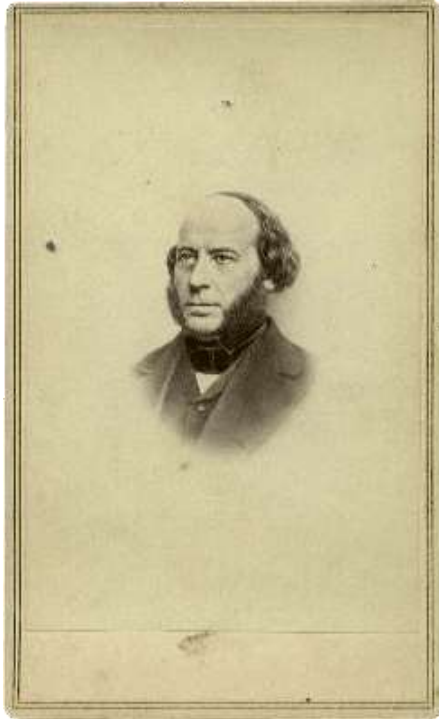
A diver in a dark blue wetsuit and scuba gear is swimming towards a large, rusted metal structure, likely a shipwreck, underwater. The diver is holding a flashlight that illuminates the structure. Bubbles are visible rising from the diver's breathing apparatus. The background is a deep blue, murky water.

The Race to Save *the Monitor*

John Ericsson

and the

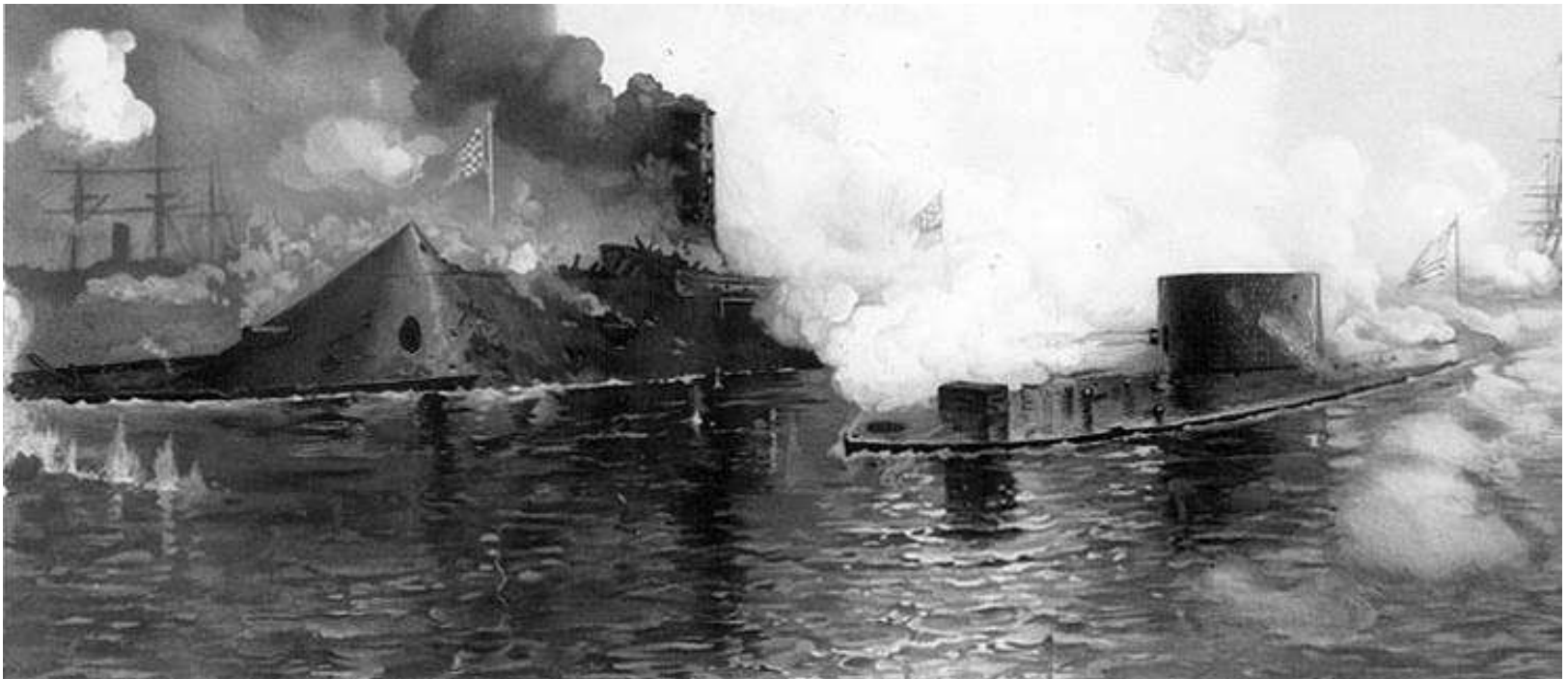
USS *Monitor*



Clash of the Titans

Hampton Roads, Virginia

March 9, 1862



Loss of the *Monitor*

December 31, 1862



“What the fire of the enemy failed to do, the elements have accomplished.”

-- Paymaster William Keeler



Search for the *Monitor*

August 1973

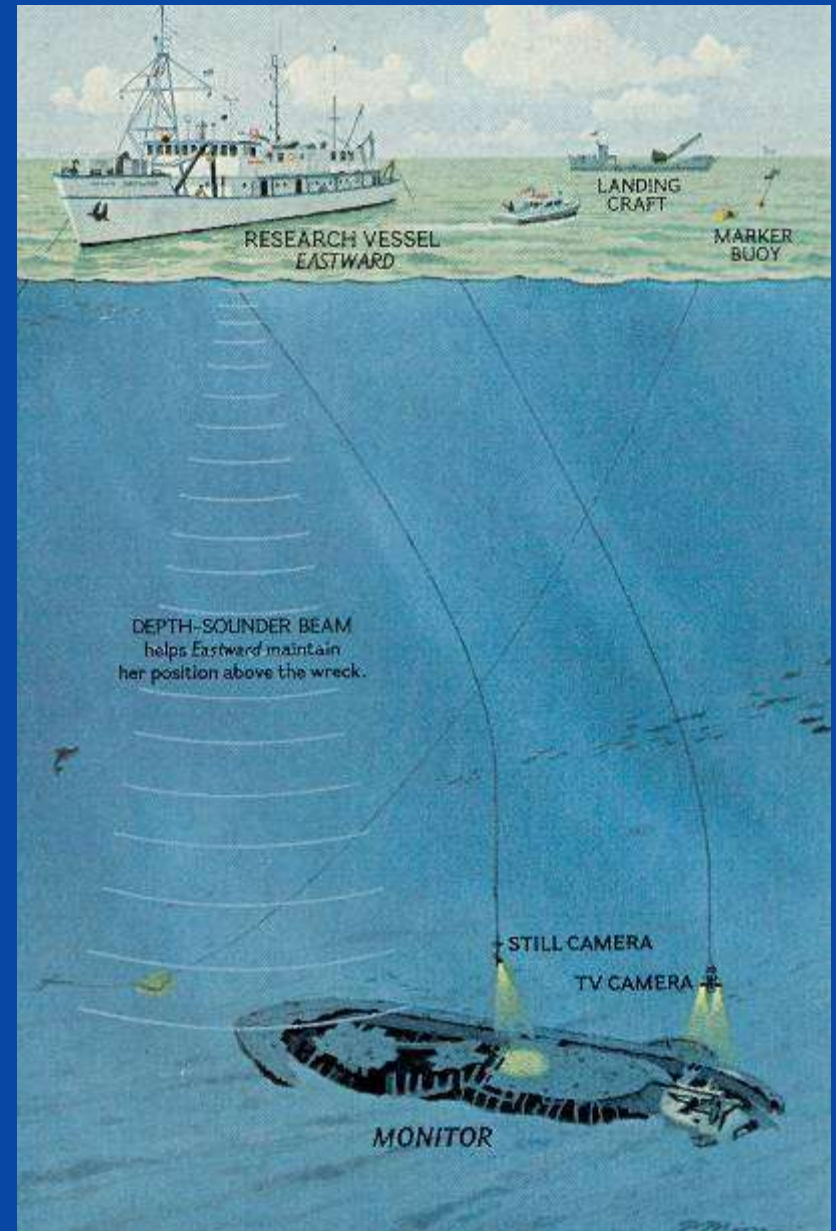
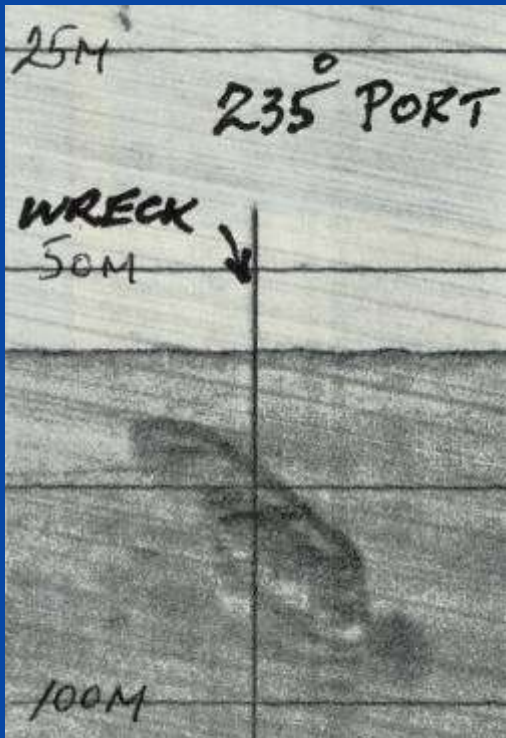


Discovery

August 1973

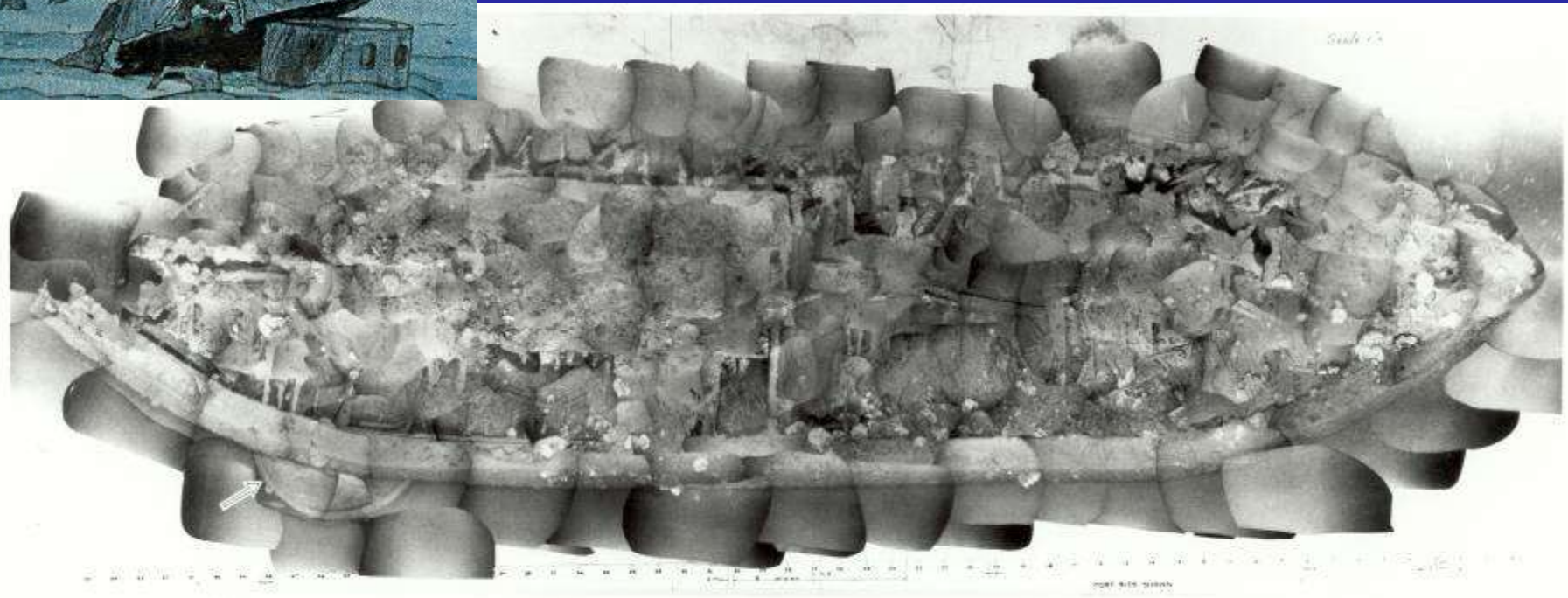
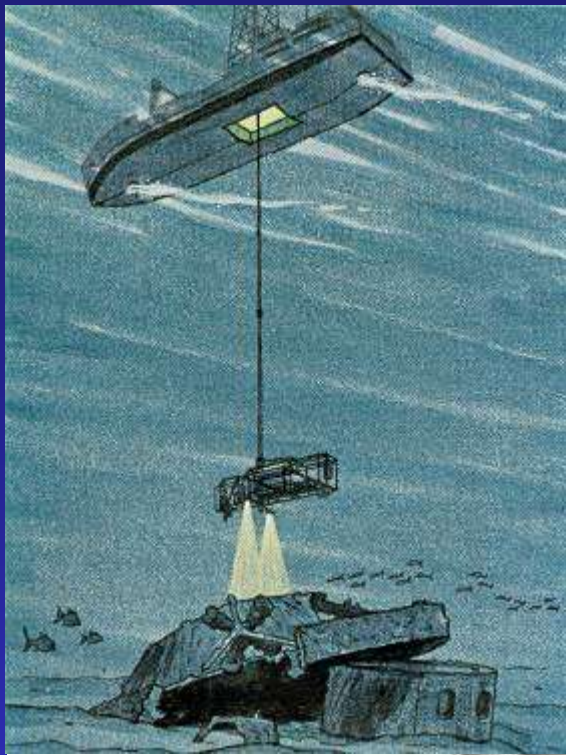
Off Cape Hatteras, NC

235 feet deep



R/V Alcoa Seaprobe **Expedition**

April 1974



Protecting the *Monitor* Through Sanctuary Designation

January 30, 1975

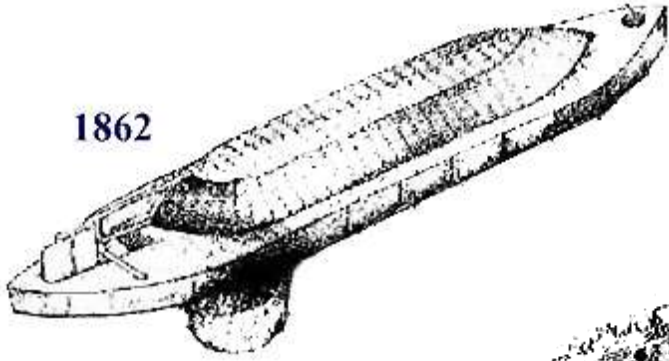




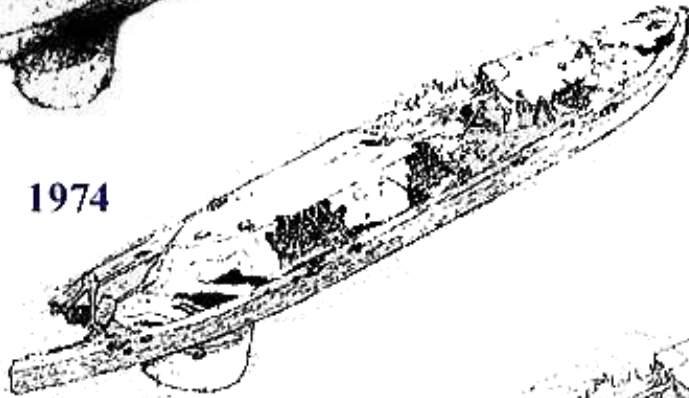
The *Monitor* lies at a depth of 235 feet

Deterioration of the *USS Monitor*

1862



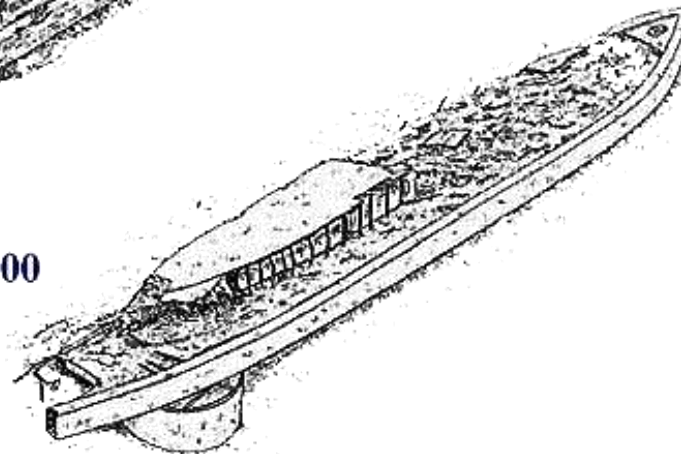
1974



1990



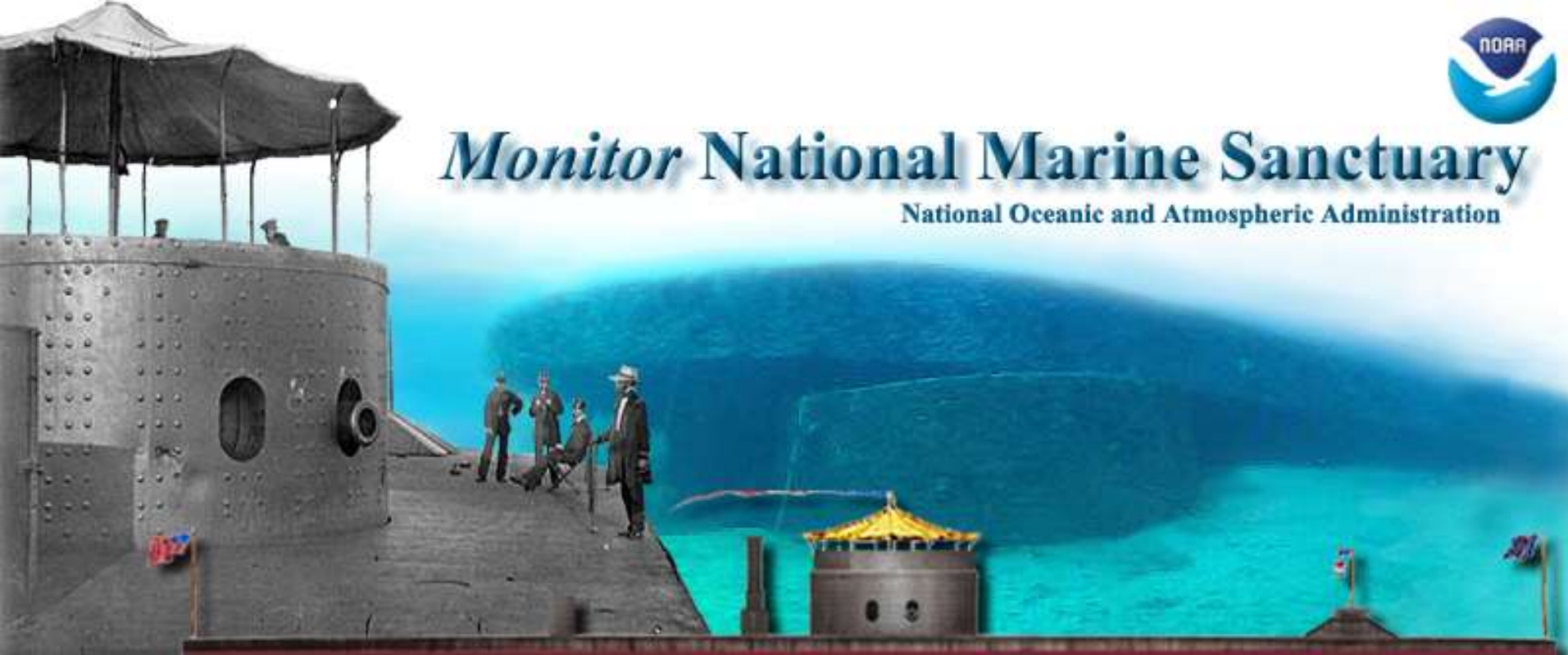
2000





Monitor National Marine Sanctuary

National Oceanic and Atmospheric Administration



The Race to Save the *Monitor*

Defining the Problem,
Proposing a Solution



***Monitor* Comprehensive, Long-Range Preservation Plan**

Conclusions:

- If left on the seabed, the *Monitor* will disintegrate rapidly
- Complete recovery of hull/contents is not viable
- Hull stabilization and selective recovery must begin soon if anything is to be saved



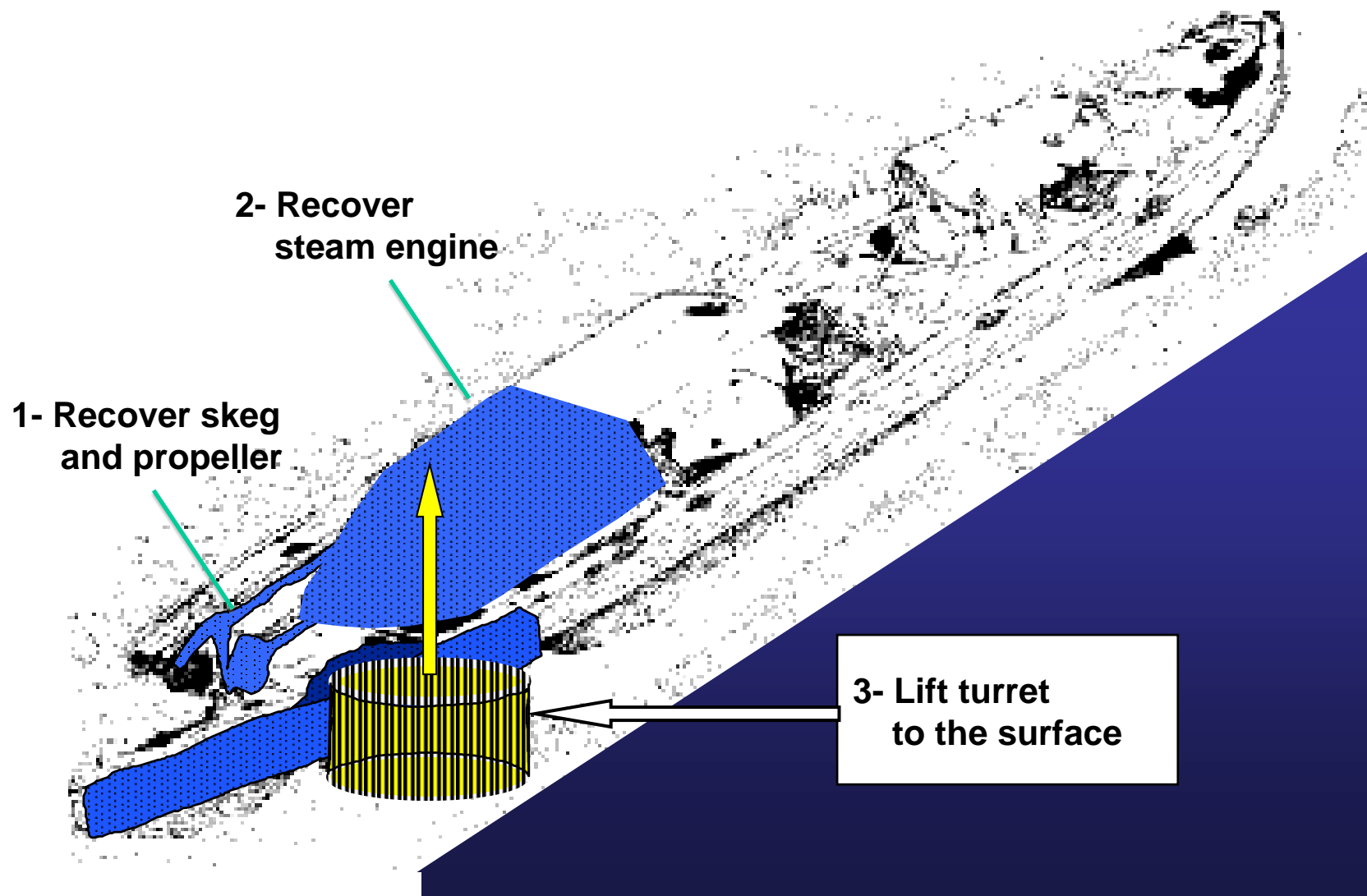
Charting a New Course
for the *Monitor*



NOAA's *Monitor* Preservation Plan

Preservation Strategy:

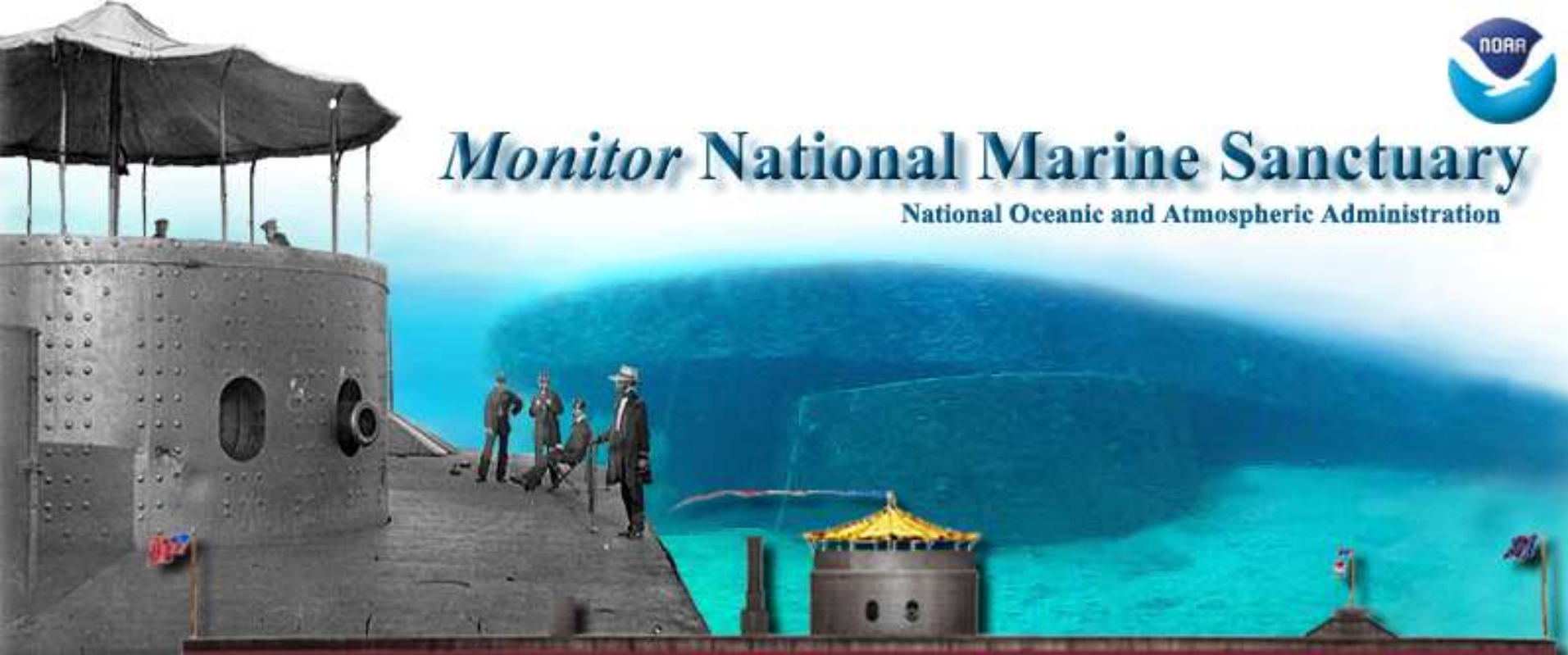
Six Phases of On-Site Archaeology and Engineering





Monitor National Marine Sanctuary

National Oceanic and Atmospheric Administration



The Race to Save the *Monitor*

Propeller Recovery

June 1998

**June 1998: the propeller
and eleven feet of
propeller shaft were
recovered by Navy divers**

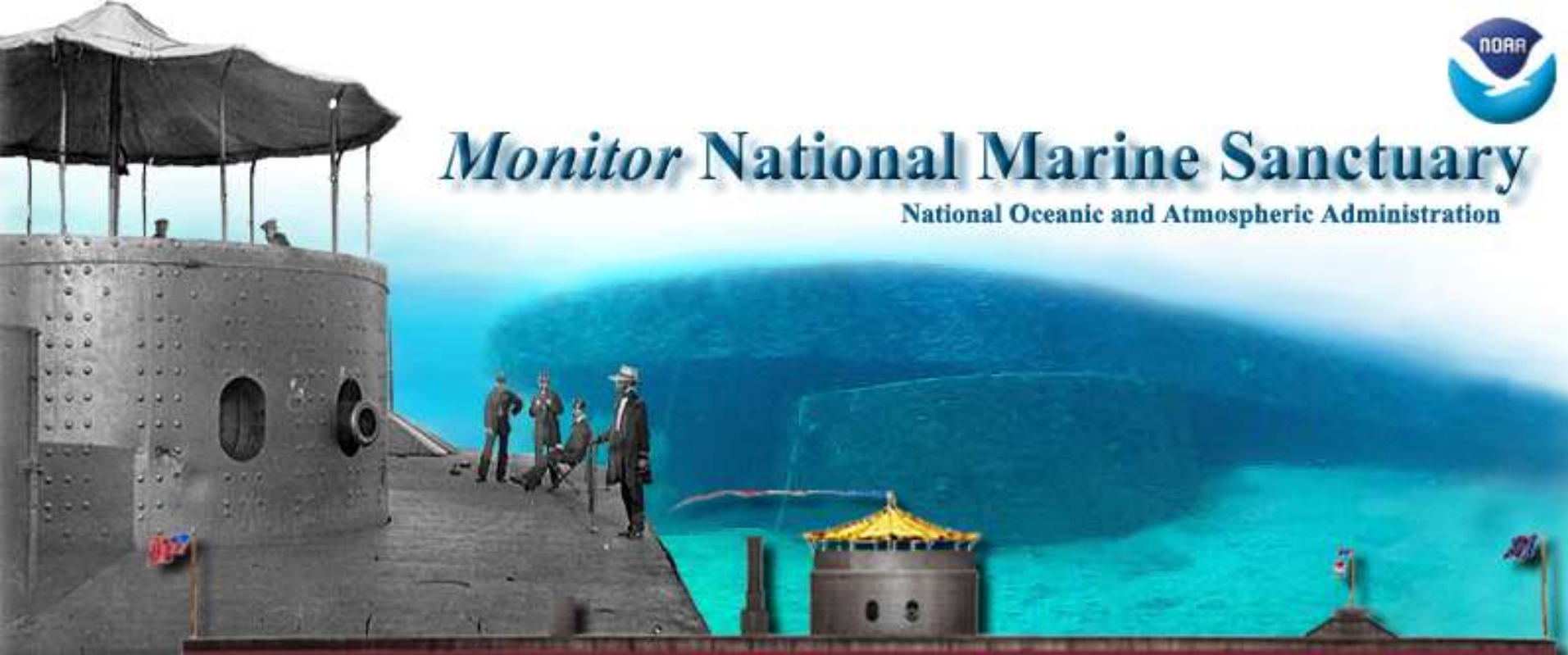






Monitor National Marine Sanctuary

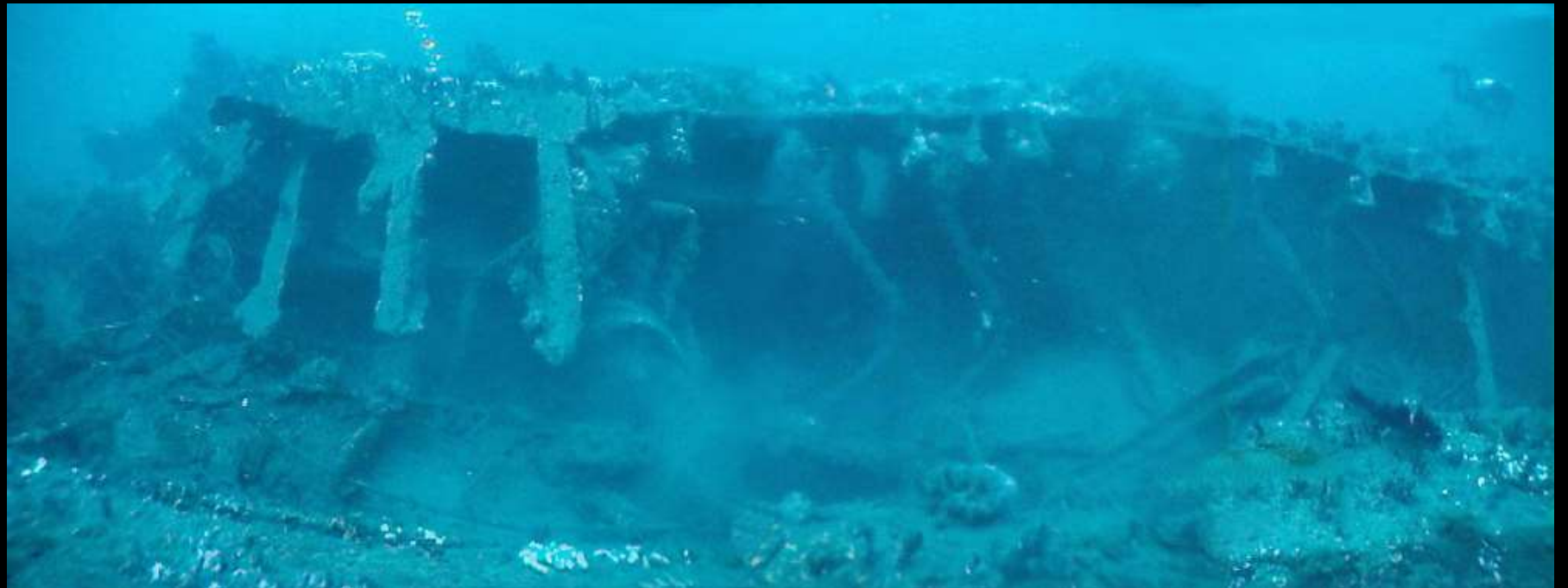
National Oceanic and Atmospheric Administration



The Race to Save the *Monitor*

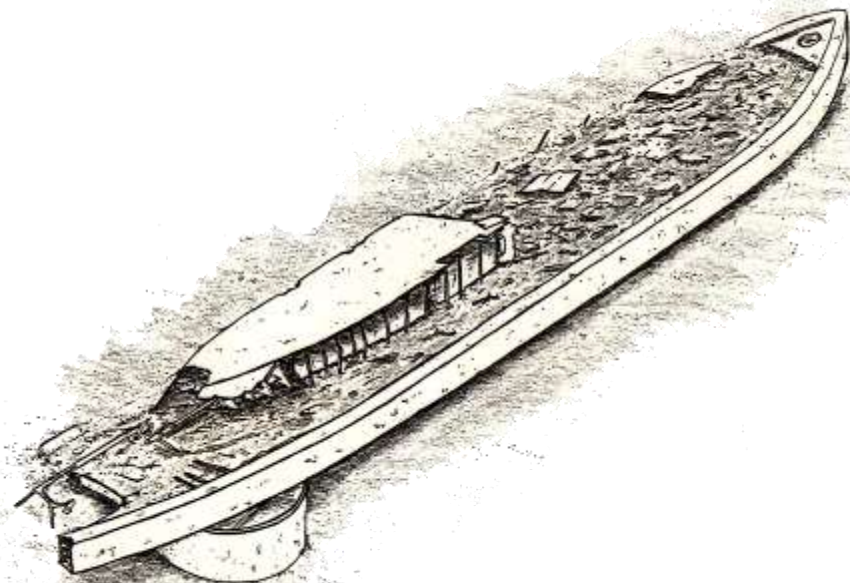
Engine Recovery

July 2001

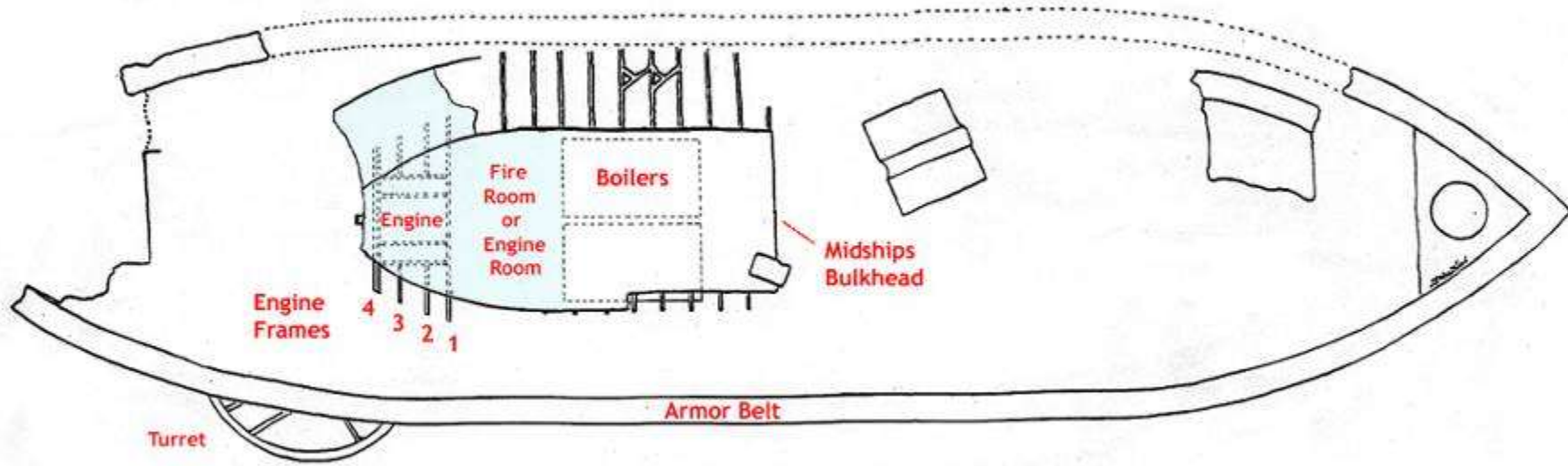




Wreck of the USS *Monitor*



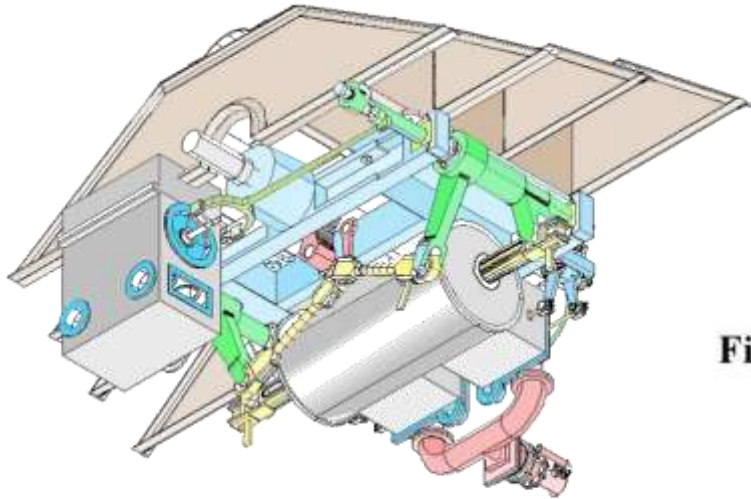
Starboard
[Low Side]



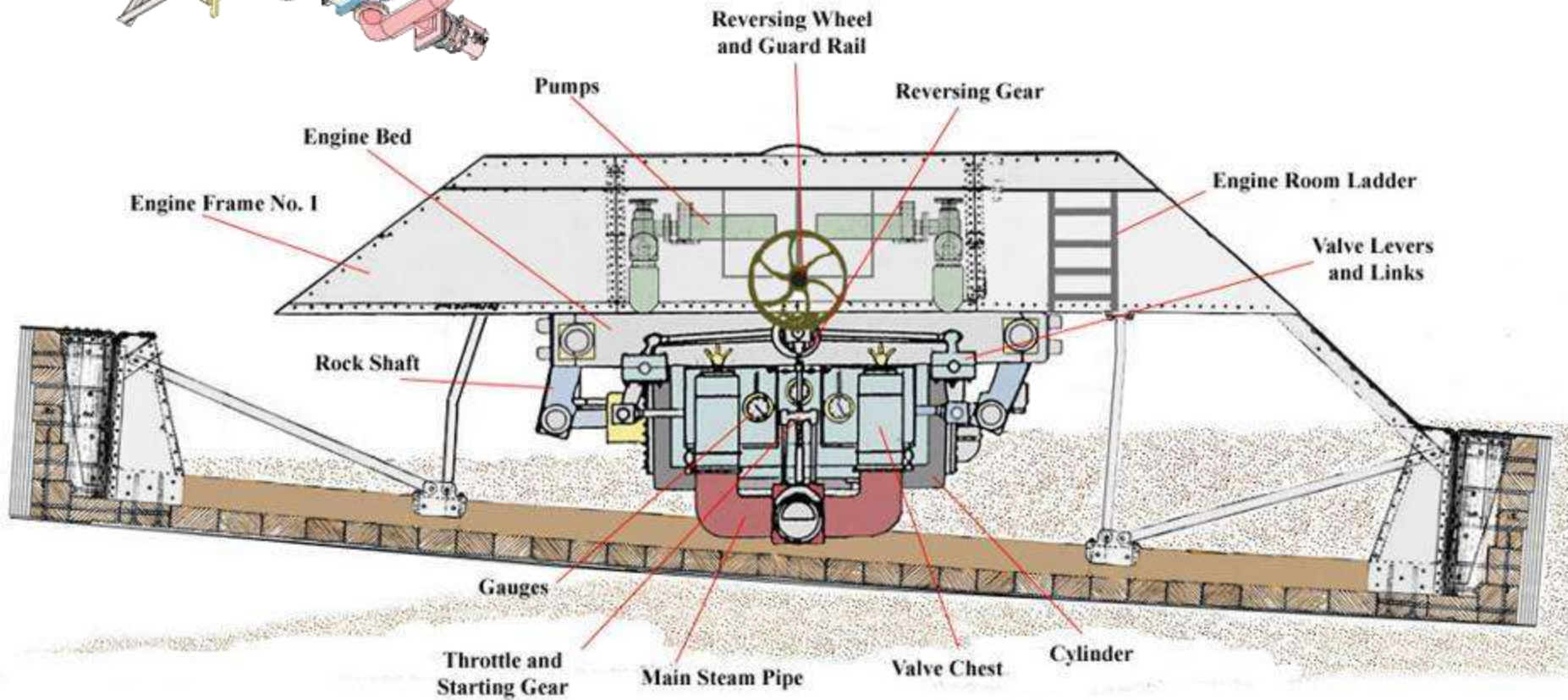
[Turret or High Side]
Port



Site Orientation



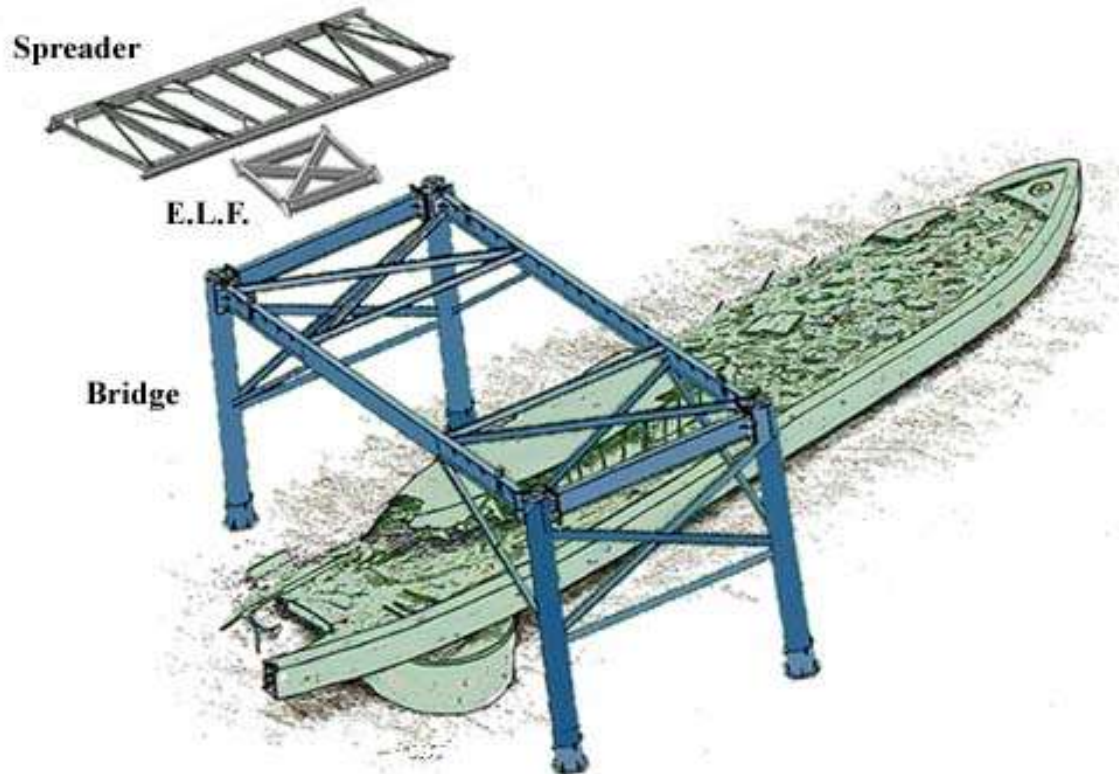
Fire Room



The Engine Recovery Structure

Installed in summer 2000

The three main components of the engine recovery structure (ERS).



Monitor Collection, NOAA



ERS in Place over the Wreck

Making Navy Diving History: 2001



First use of commercial
saturation system
by U.S. Navy



Navy divers worked
day and night,
7 days per week



Navy divers logged
666 hours bottom time,
70% of which was by
saturation divers





Self-Contained, Mixed-Gas
“Technical” Diving by
A NOAA-sponsored Team



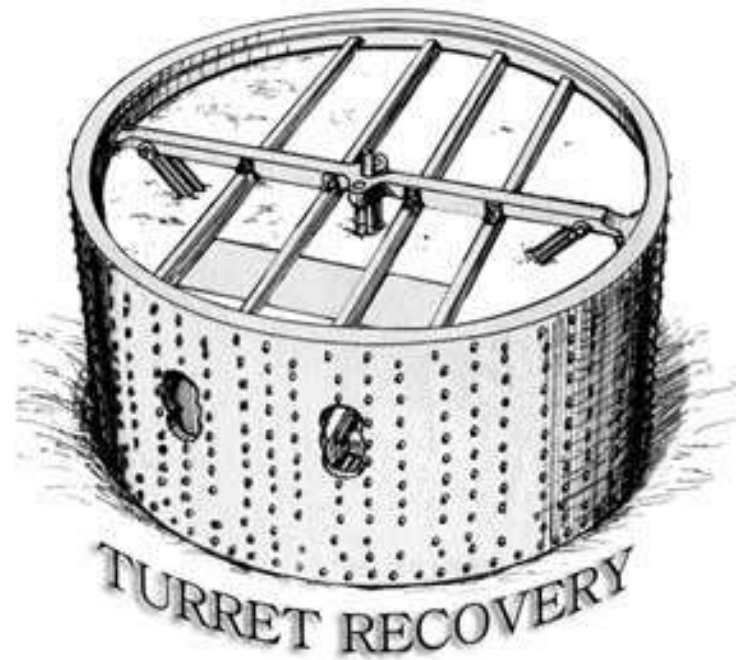
Recovery of the *Monitor's* Engine

July 16, 2001

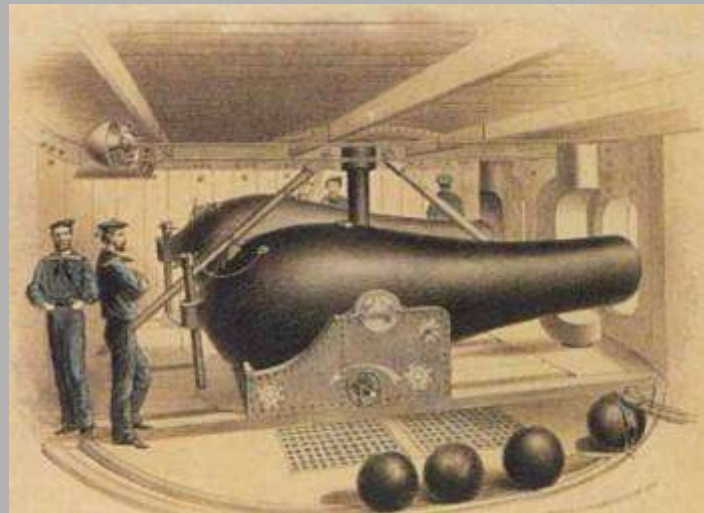
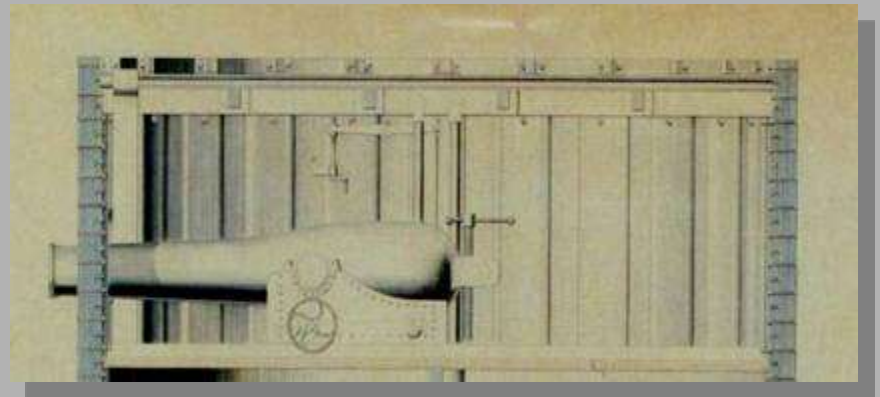
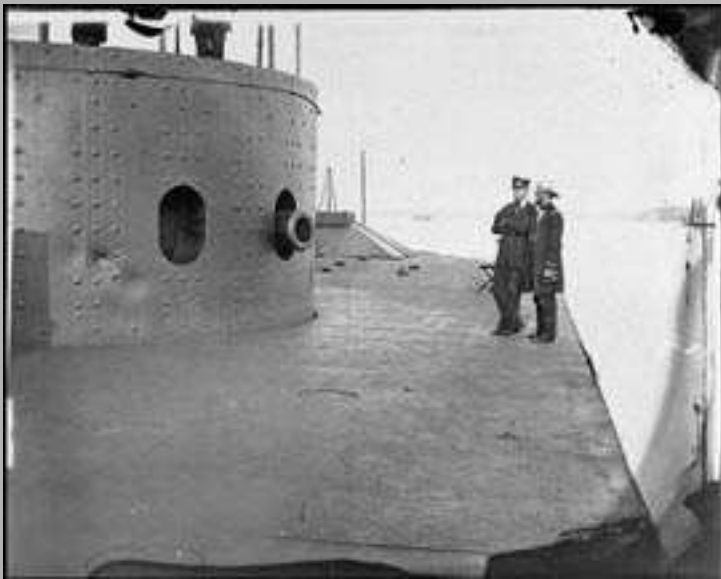




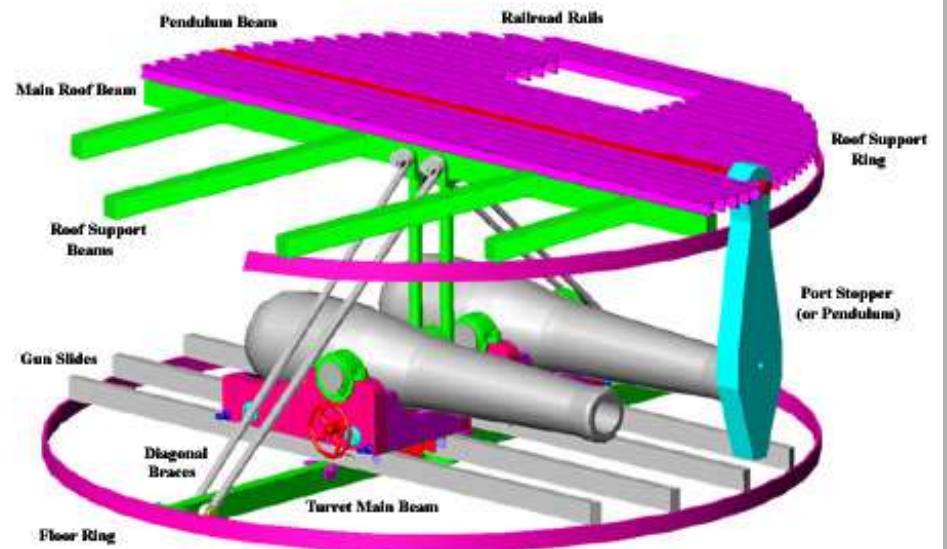
Monitor Expedition

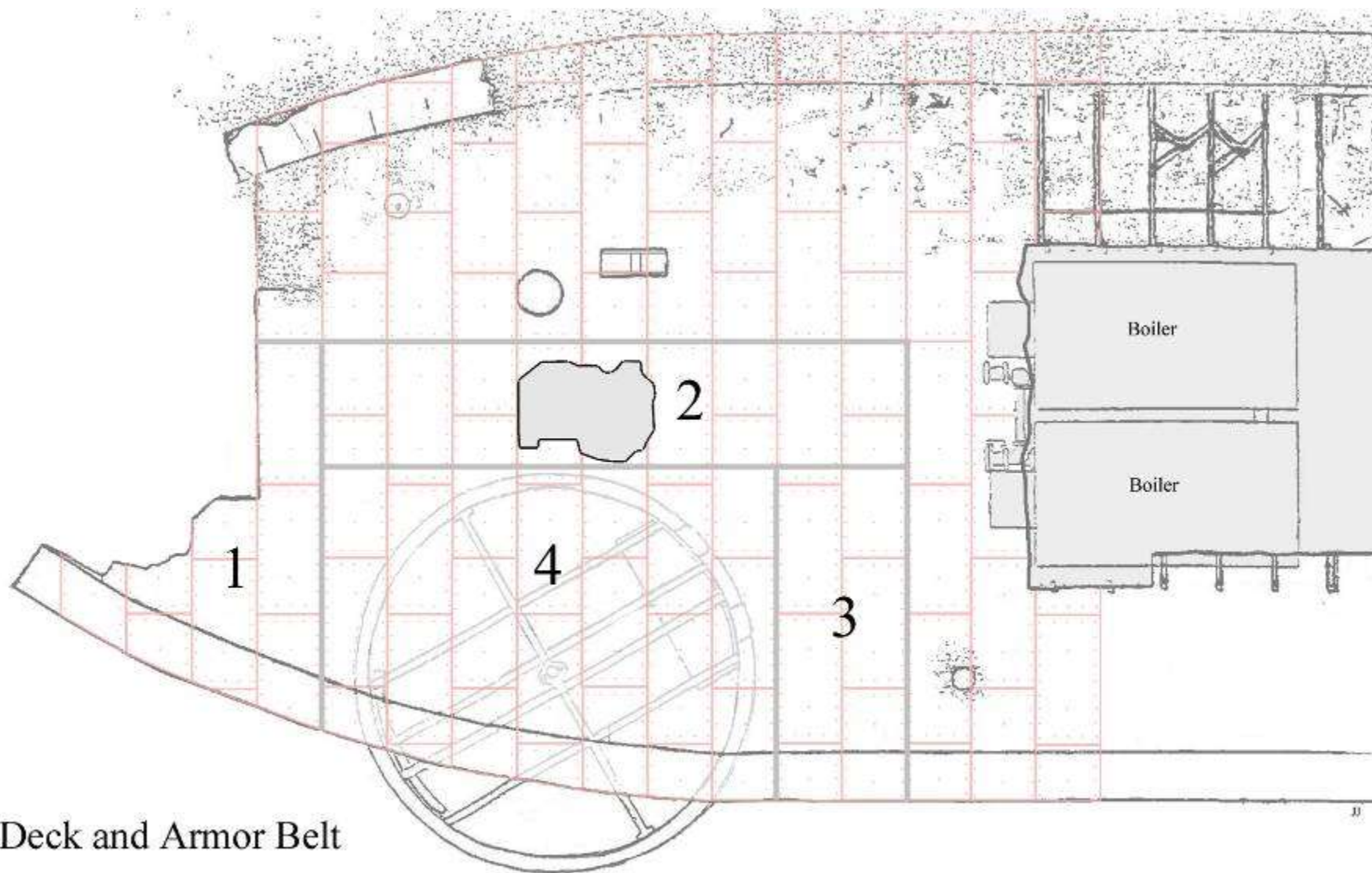


2002

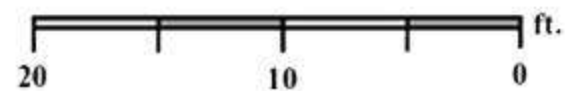


Turret Components

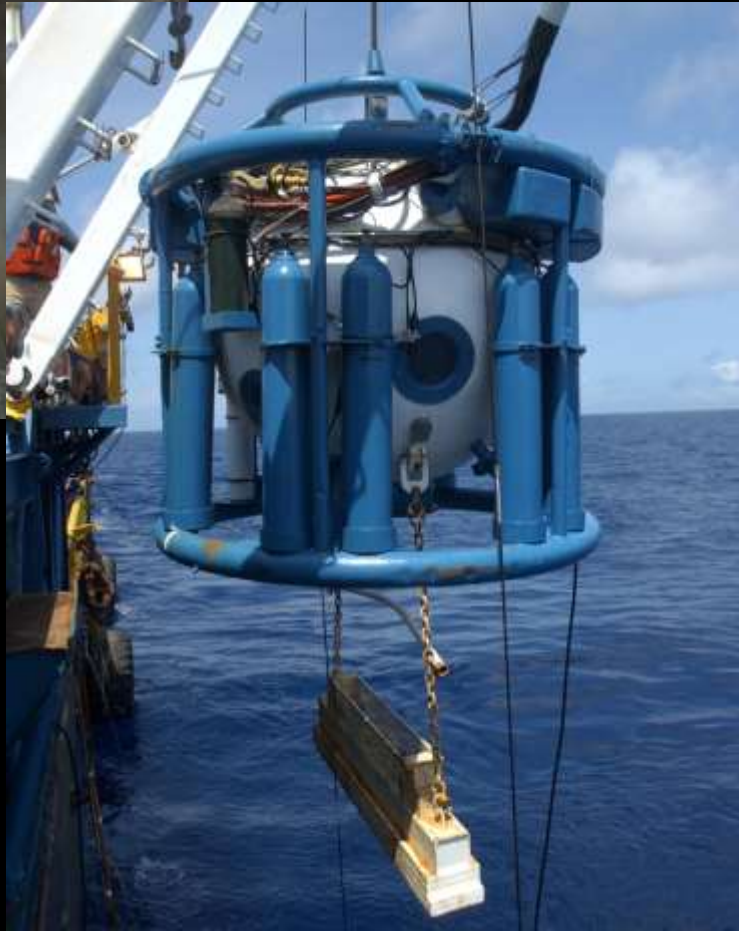




Deck and Armor Belt
Area Removal Sequence



Navy and NOAA/NURC Divers







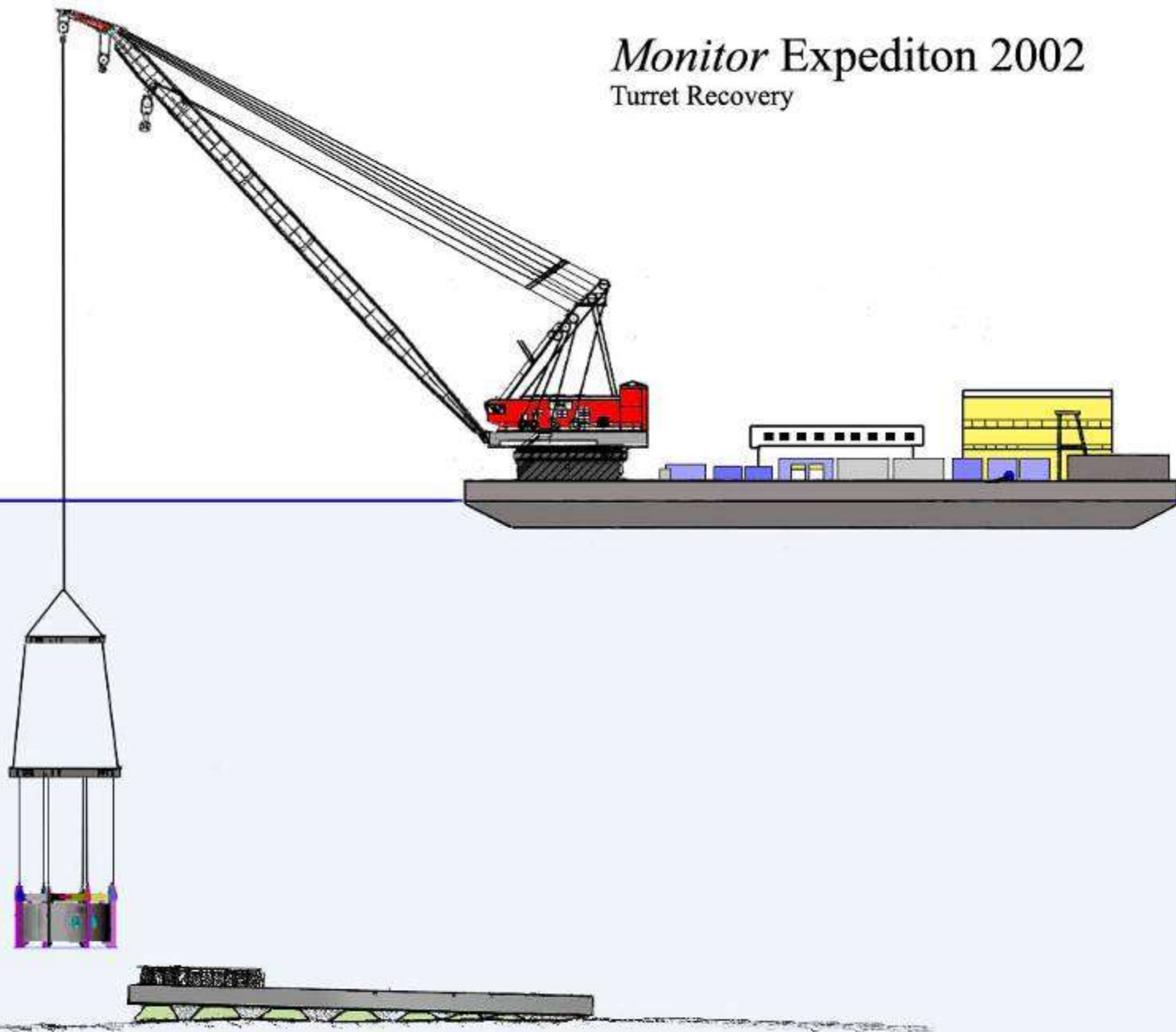


Spider and the Platform



Monitor Expedition 2002

Turret Recovery



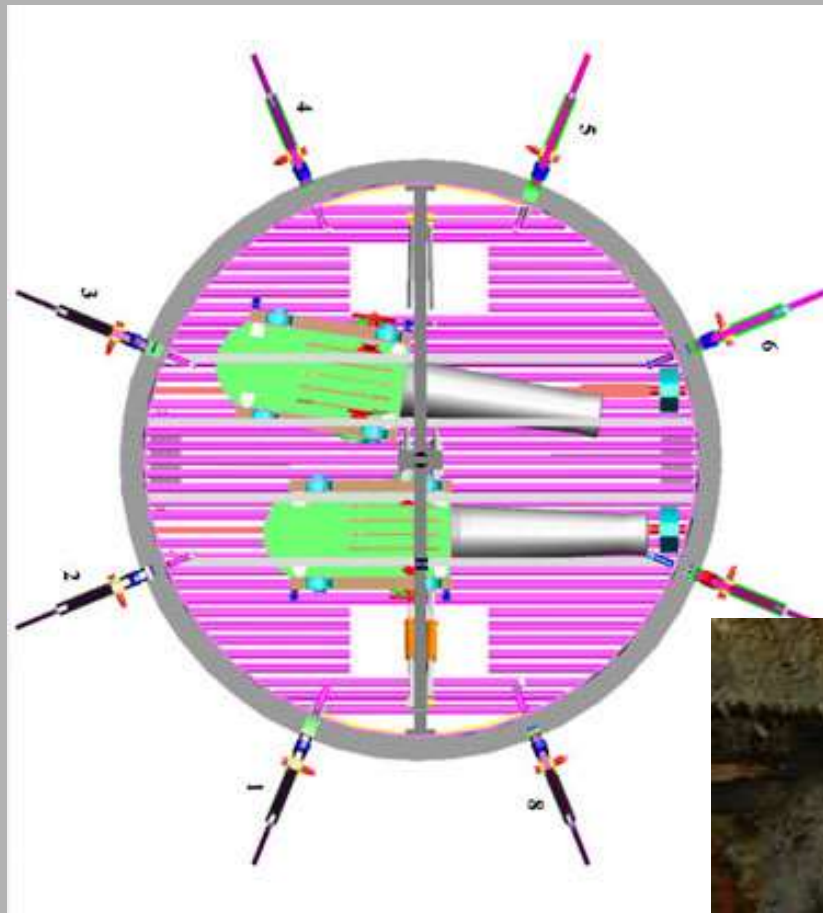














Monitor Collection, NOAA



Monitor Collection, NOAA

USS *Monitor* Center at The Mariners' Museum



USS *Monitor* Center at The Mariners' Museum



USS *Monitor* Center at The Mariners' Museum



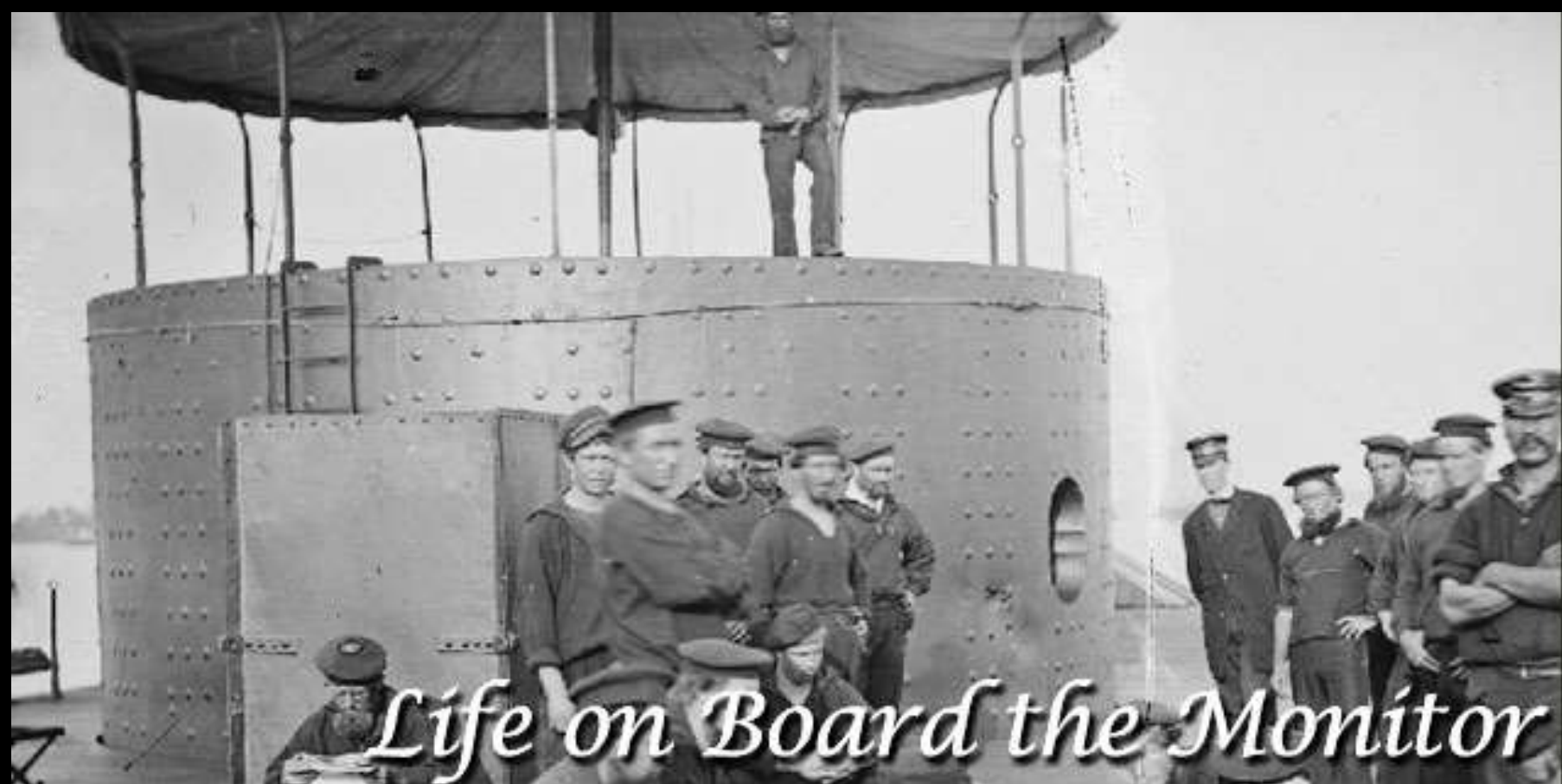




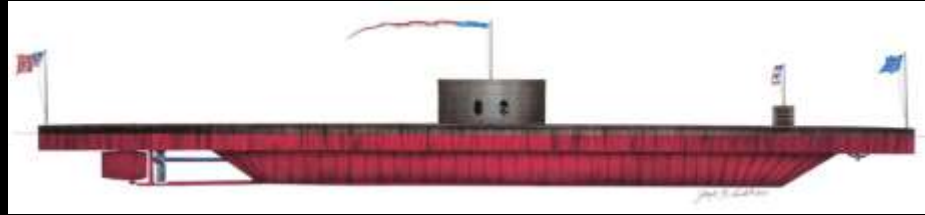
Facial Reconstructions







Life on Board the Monitor



“Their names are for history; and so long as we remain a people, so long will the work of the *Monitor* be remembered, and her story told to our children’s children... the ‘little cheesebox on a raft’ has made herself a name which will not soon be forgotten by the American people.”

Grenville Weeks, Surgeon, USS *Monitor*



