NOAA Office of Ocean Exploration

NOAA and RMS *Titanic :*

How technology and expeditions have changed the way we treat this wreck site

- NOAA Library Brown Bag -

- October 2004 -

LT Jeremy Weirich, NOAA
CAPT Craig McLean, NOAA

EXPLORE

NOAA and RMS *Titanic*

- Discuss the brief history of *Titanic* and how NOAA became involved
- Highlight recent NOAA Ocean Exploration-supported expeditions to the site
- Discuss major changes with regards to *Titanic*
  - ***NOAA's Involvement***
  - ***Technological Advancements***
  - ***Legal Decisions***
  - ***Archaeological approaches***

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A Brief History….

1912 Sinking

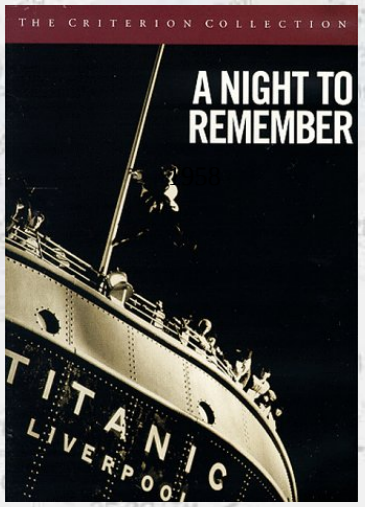
2004 Treaty

1986 Titanic Memorial Act

1987 Salvage

1985 Discovery

1958



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1985 Discovery
2004 International Treaty
OPINION
NOAA
PRACTICE
SUBMERSIBLES
TECHNOLOGY
ROVs
LOW
ARCHAEOLOGICAL PRICIPLES
HIGH
SALVAGE
LAW
PRESERVATION

OPINION *NOAA* PRACTICE

- 1986 - Support Titanic Memorial Act
- 1995 - International Meeting
  - National Maritime Museum, Greenwich, England
  - RMST Exhibit
- 1996 - Greenwich Declaration
- 2000 - Public Hearings for Guidelines
- 2001 - Advisory Guidelines Published
  - Participation on *Ghosts of the Abyss*
- 2003 - Preliminary Expedition to TITANIC
- 2004 - Dedicated Expedition to TITANIC

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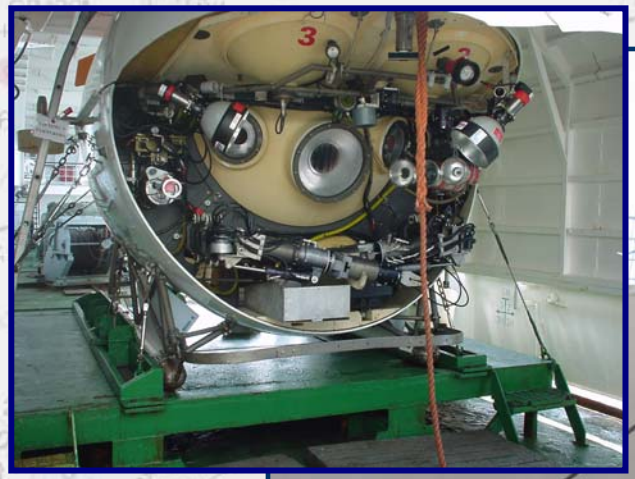
2003 *Titanic* Expedition – R/V KELDYSH



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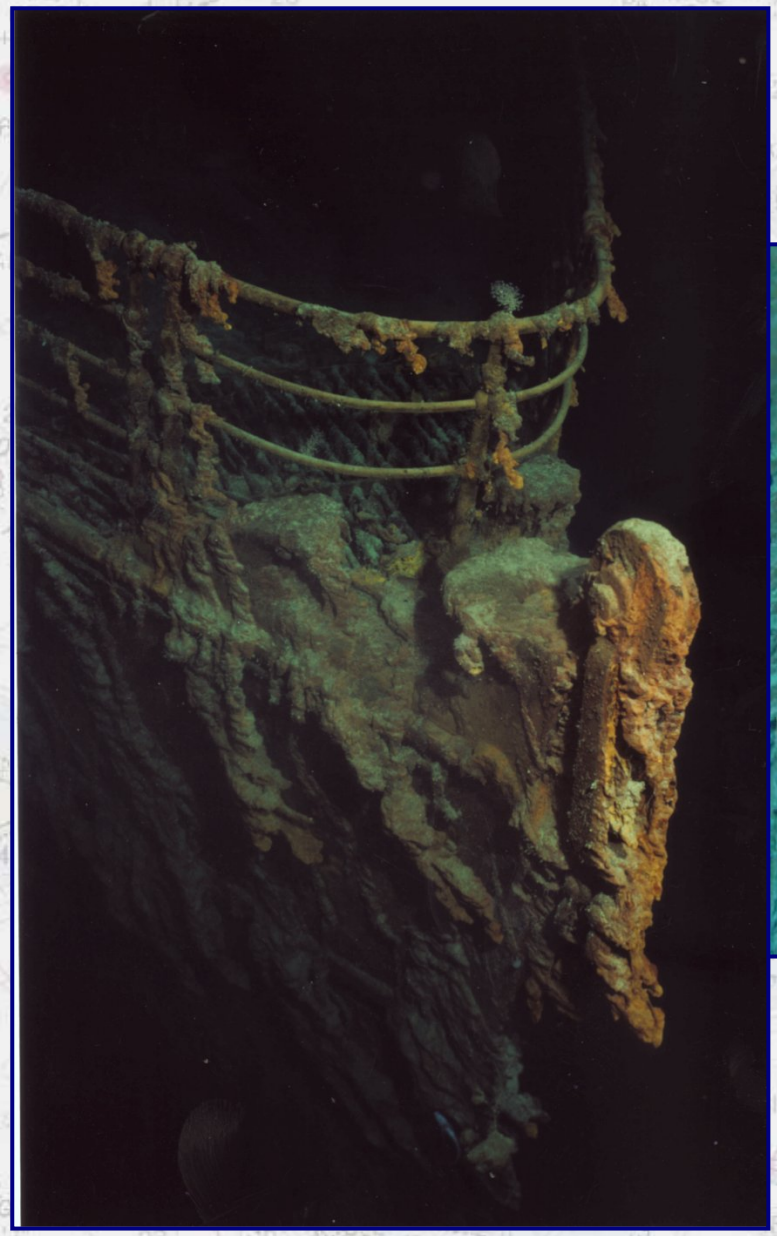
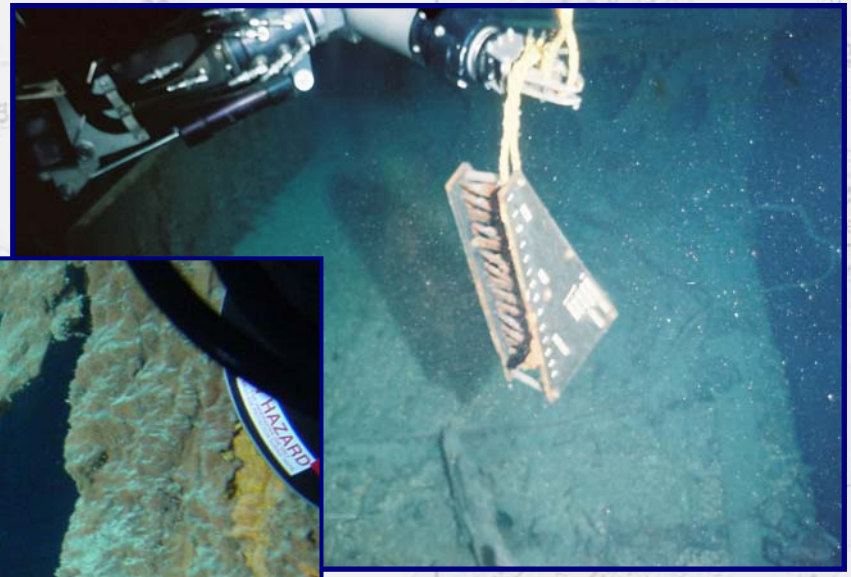
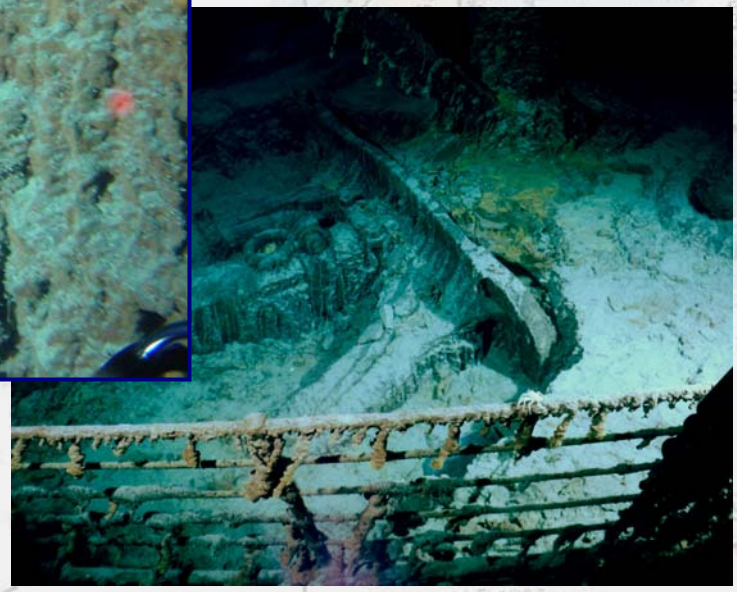
2003 *Titanic* Expedition – PERSONNEL

EXPLORE

2003 *Titanic* Expedition – MICROBIOLOGY







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2003 *Titanic* Expedition – HUMAN IMPACT

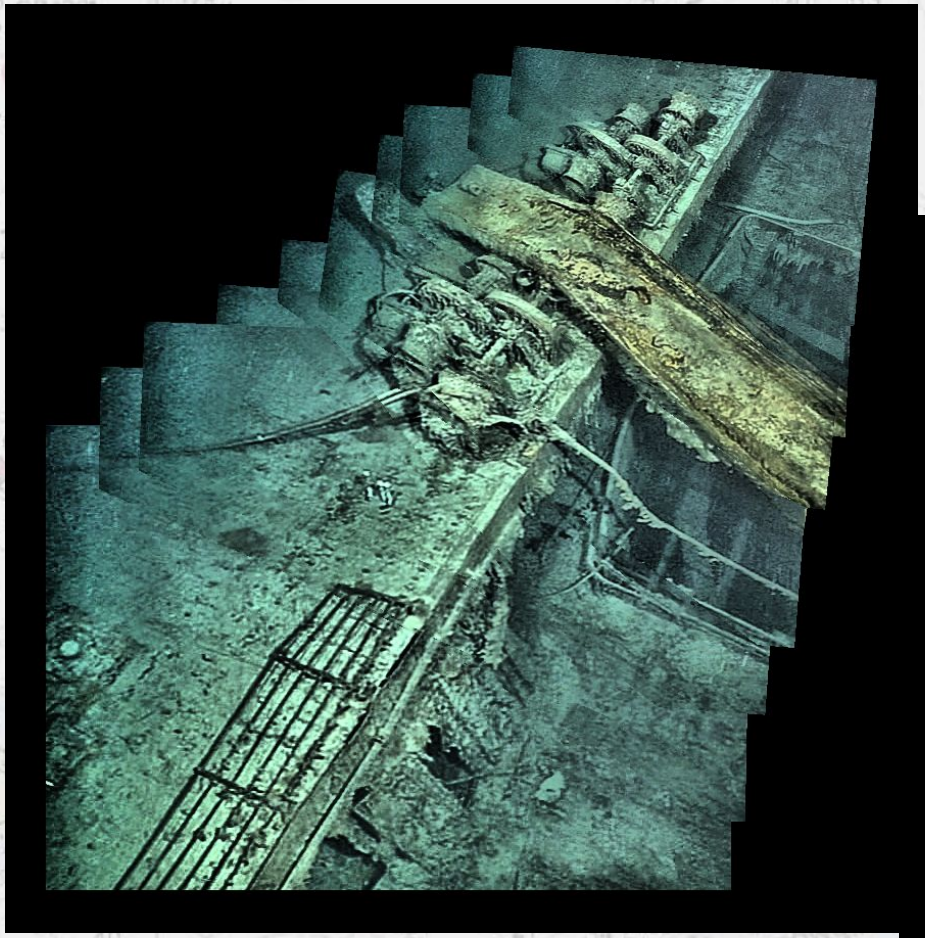
EXPLORE

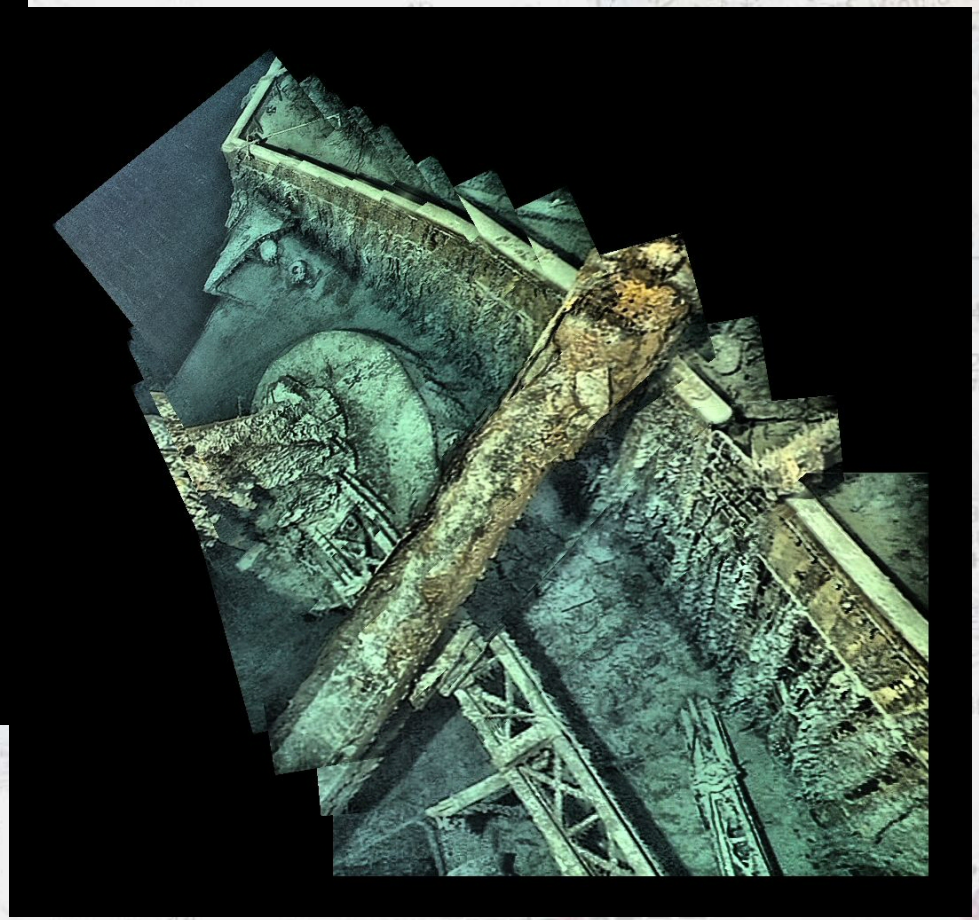
2003 *Titanic* Expedition – PHOTOMOSAICS

Images produced by Univ. of New Hampshire, CCOM/JHC

EXPLORE

2003 *Titanic* Expedition – PHOTOMOSAICS





Images produced by Univ. of New Hampshire, CCOM/JHC

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Dr. Robert Ballard

Explorer Dr. Ballard to assess state of the wreck

Nearly 20 years after first finding the sunken remains of RMS Titanic, marine explorer Dr. Robert Ballard is returning. Ballard will help the National Oceanic and Atmospheric Administration (NOAA) study the ship to better understand why and how fast it is deteriorating. Ballard and scientists from NOAA, Mystic Aquarium & Institute for Exploration, and other institutions will spend 11 days at the site, mapping the ship and conducting scientific analyses of its deterioration. JASON Foundation for Education is developing a new middle-school math curriculum based on the expedition. **Read more >**

Providing a research vessel for the expedition
read more >

Creating a middle-school math curriculum from the expedition
read more >

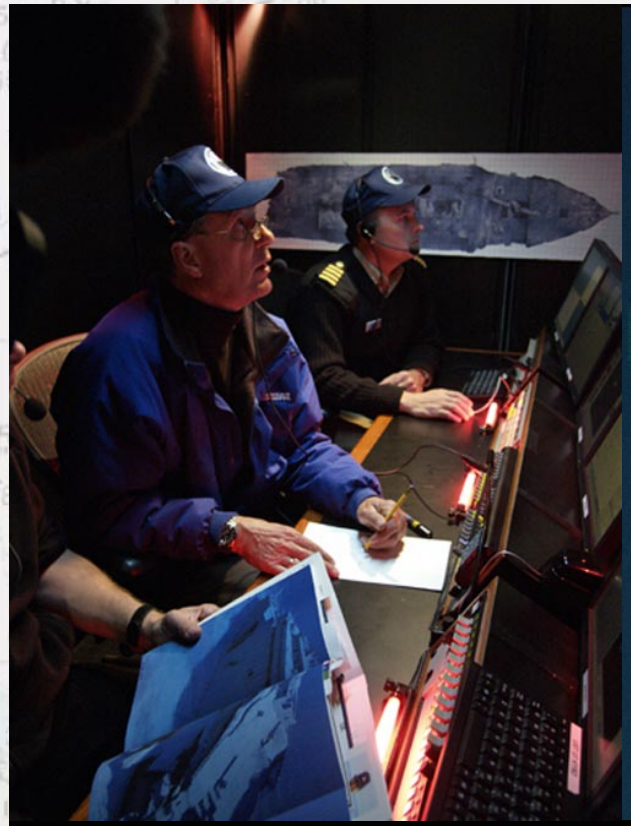
Broadcasting a one-hour special on June 7
read more >

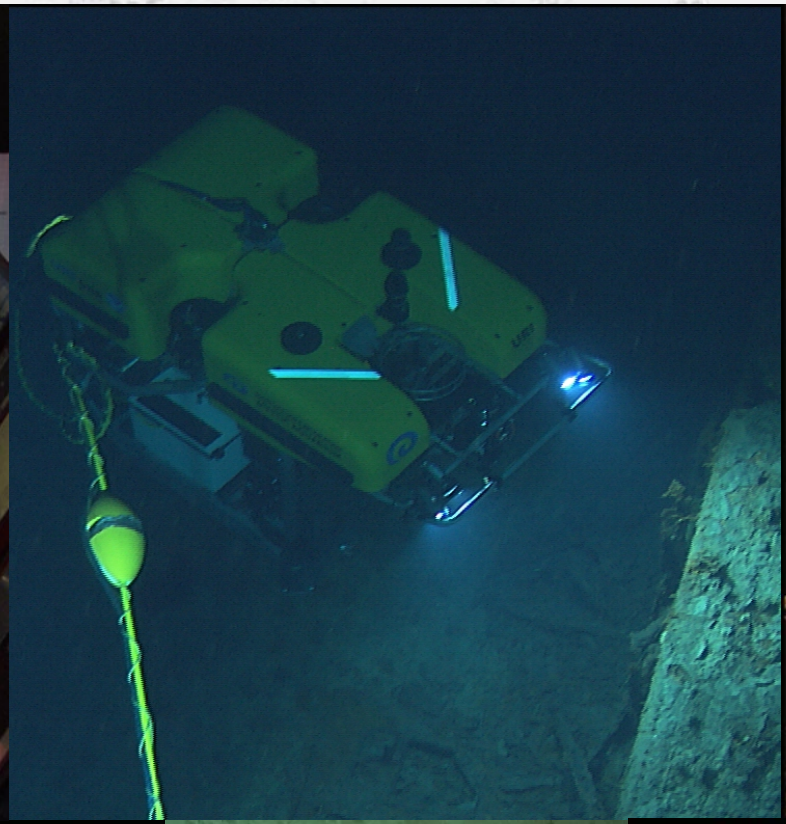
Supporting Titanic research since 1926
read more >

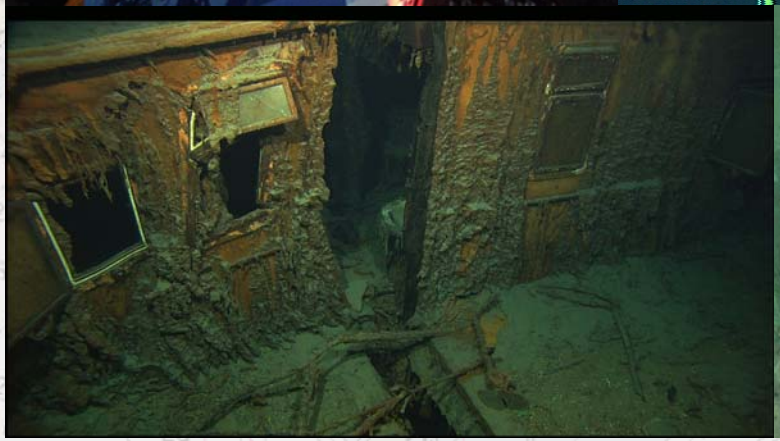
Bringing the expedition live to thousands of students across the U.S.
read more >

Revolutionizing education in Archaeological Oceanography
read more >

2004 Return to *Titanic* – An OE Signature Expedition







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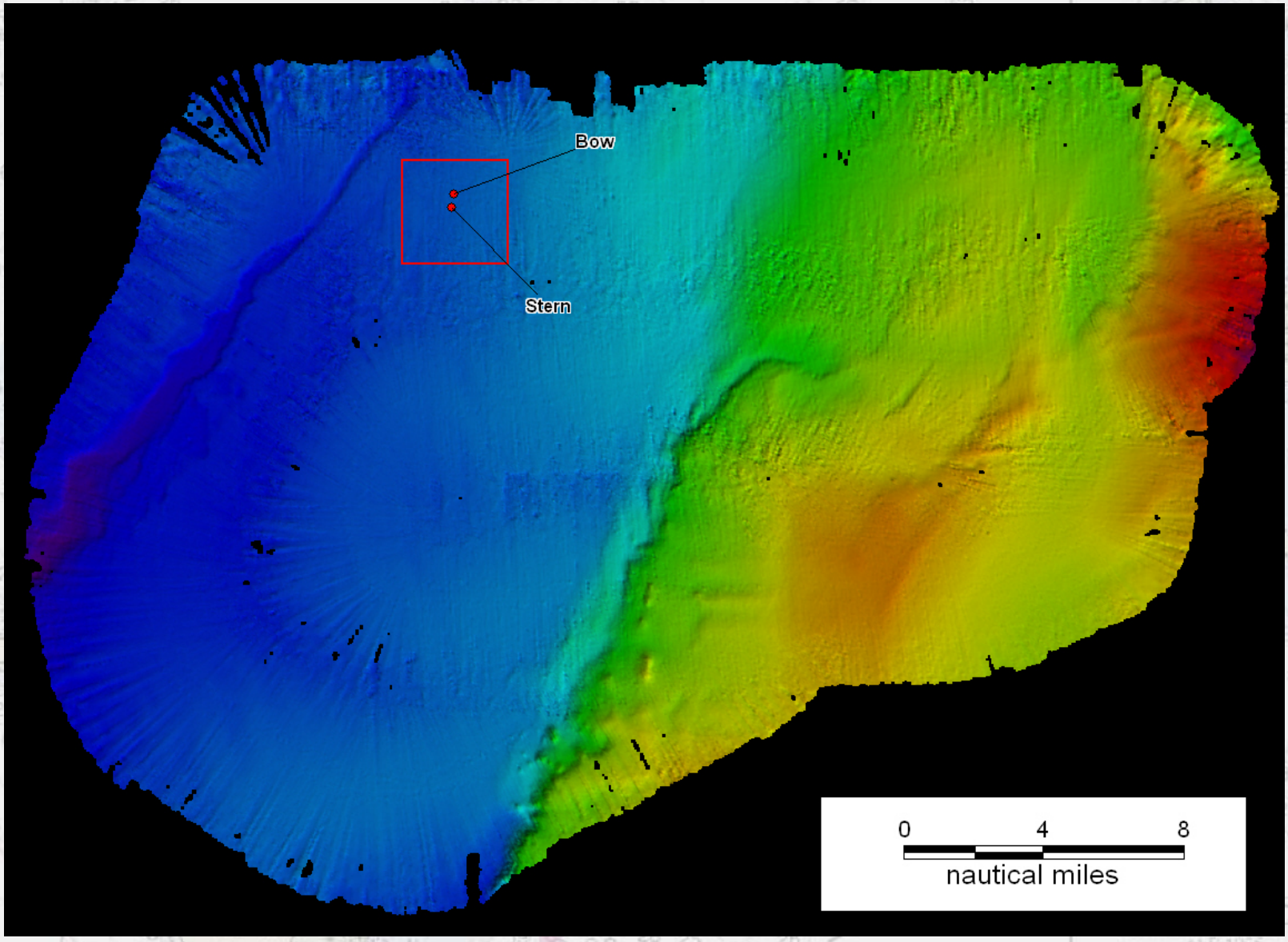
2004 Return to *Titanic* – Microbiology

EXPLORE

2004 Return to *Titanic* – BATHYMETRY



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2004 Return to *Titanic* – OUTREACH

Image courtesy of Bert Fox, National Geographic Magazine

Mystic Aquarium & Institute for Exploration
immersion project

NATIONAL GEOGRAPHIC

UNIVERSITY OF Rhode Island

JASON PROJECT

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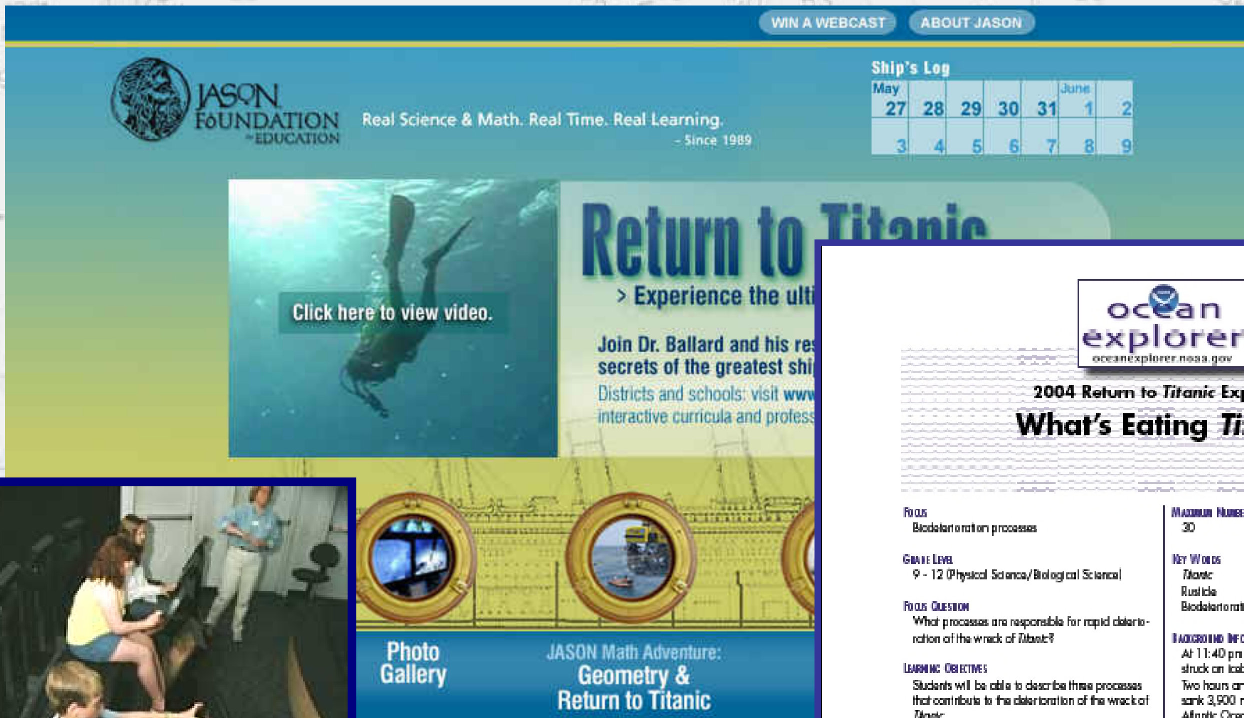
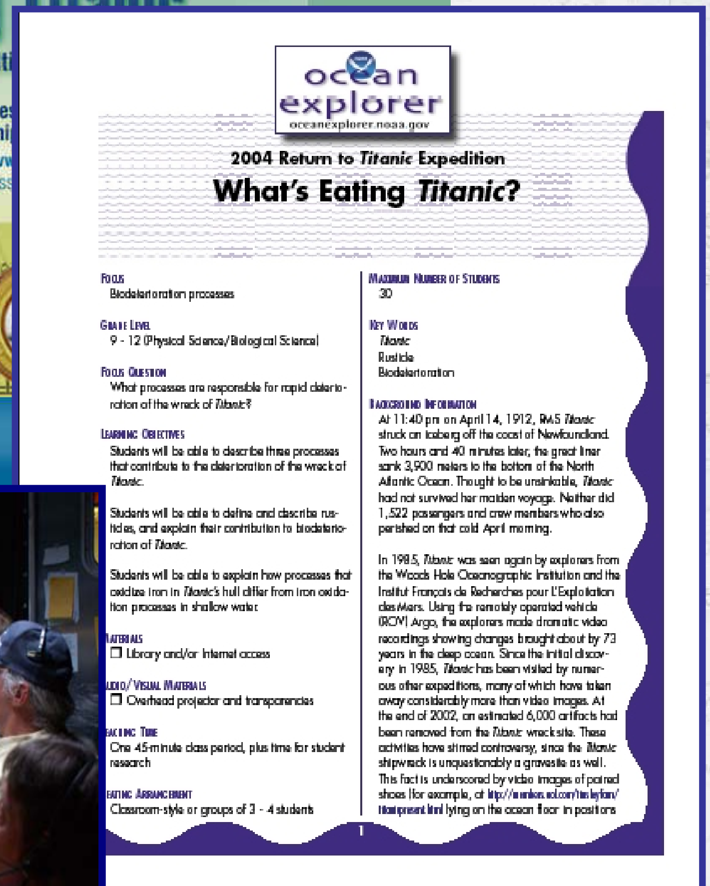
2004 Return to *Titanic* – EDUCATION





ocean explorer
oceanexplorer.noaa.gov

2004 Return to *Titanic* Expedition

What's Eating *Titanic*?

Focus
Biodeterioration processes

Grade Level
9 - 12 (Physical Science/Biological Science)

Focus Question
What processes are responsible for rapid deterioration of the wreck of *Titanic*?

Learning Objectives
Students will be able to describe three processes that contribute to the deterioration of the wreck of *Titanic*.

Students will be able to define and describe rusticles, and explain their contribution to biodeterioration of *Titanic*.

Students will be able to explain how processes that oxidize iron in *Titanic*'s hull differ from iron oxidation processes in shallow water.

Materials
- ❐ Library and/or Internet access

Audio/Visual Materials
- ❐ Overhead projector and transparencies

Teaching Time
One 45-minute class period, plus time for student research

Seating Arrangement
Classroom-style or groups of 3 - 4 students

Maximum Number of Students
30

Key Words
Titanic
Rusticle
Biodeterioration

Background Information
At 11:40 pm on April 14, 1912, RMS *Titanic* struck an iceberg off the coast of Newfoundland. Two hours and 40 minutes later, the great liner sank 3,900 meters to the bottom of the North Atlantic Ocean. Thought to be unsinkable, *Titanic* had not survived her maiden voyage. Neither did 1,522 passengers and crew members who also perished on that cold April morning.

In 1985, *Titanic* was seen again by explorers from the Woods Hole Oceanographic Institution and the Institut Français de Recherches pour L'Exploitation des Mers. Using the remotely operated vehicle (ROV) Argo, the explorers made dramatic video recordings showing changes brought about by 73 years in the deep ocean. Since the initial discovery in 1985, *Titanic* has been visited by numerous other expeditions, many of which have taken away considerably more than video images. At the end of 2002, an estimated 6,000 artifacts had been removed from the *Titanic* wreck site. These activities have stirred controversy, since the *Titanic* shipwreck is unquestionably a gravesite as well. This fact is underscored by video images of paired shoes (for example, at [illegible]) lying on the ocean floor in positions

1

Image courtesy of IFE

Mystic Aquarium & Institute for Exploration immersion project

NATIONAL GEOGRAPHIC

UNIVERSITY OF Rhode Island

JASON PROJECT

EXPLORE NOAA

- **Discovery from sonar and visual detection**
- **Submersible limitations and impacts**
- **Smaller ROVs**
- **High definition video**
- **Remote, *in situ*, live observation**
- **Technology is leading policy**

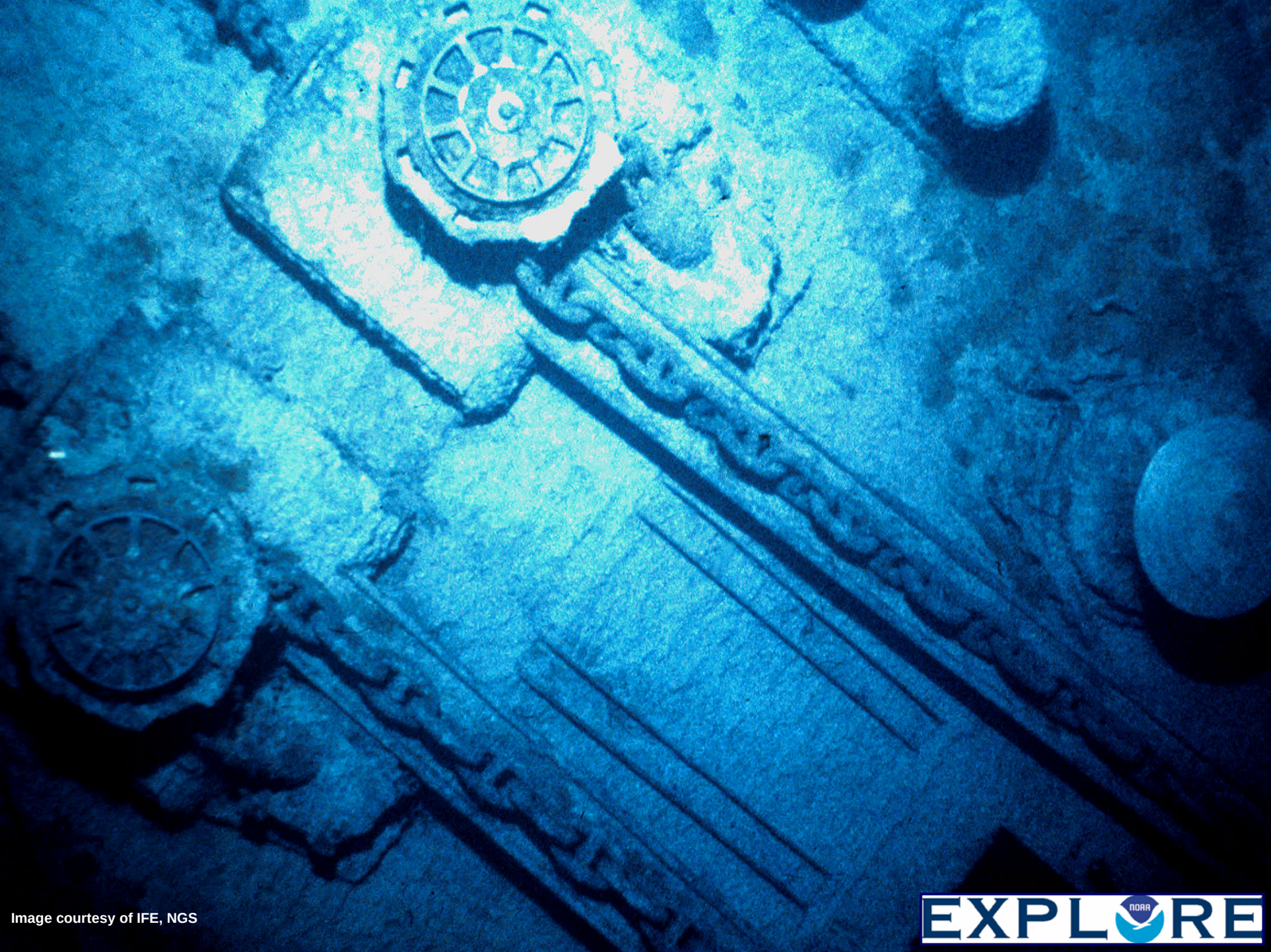


Image courtesy of IFE, NGS

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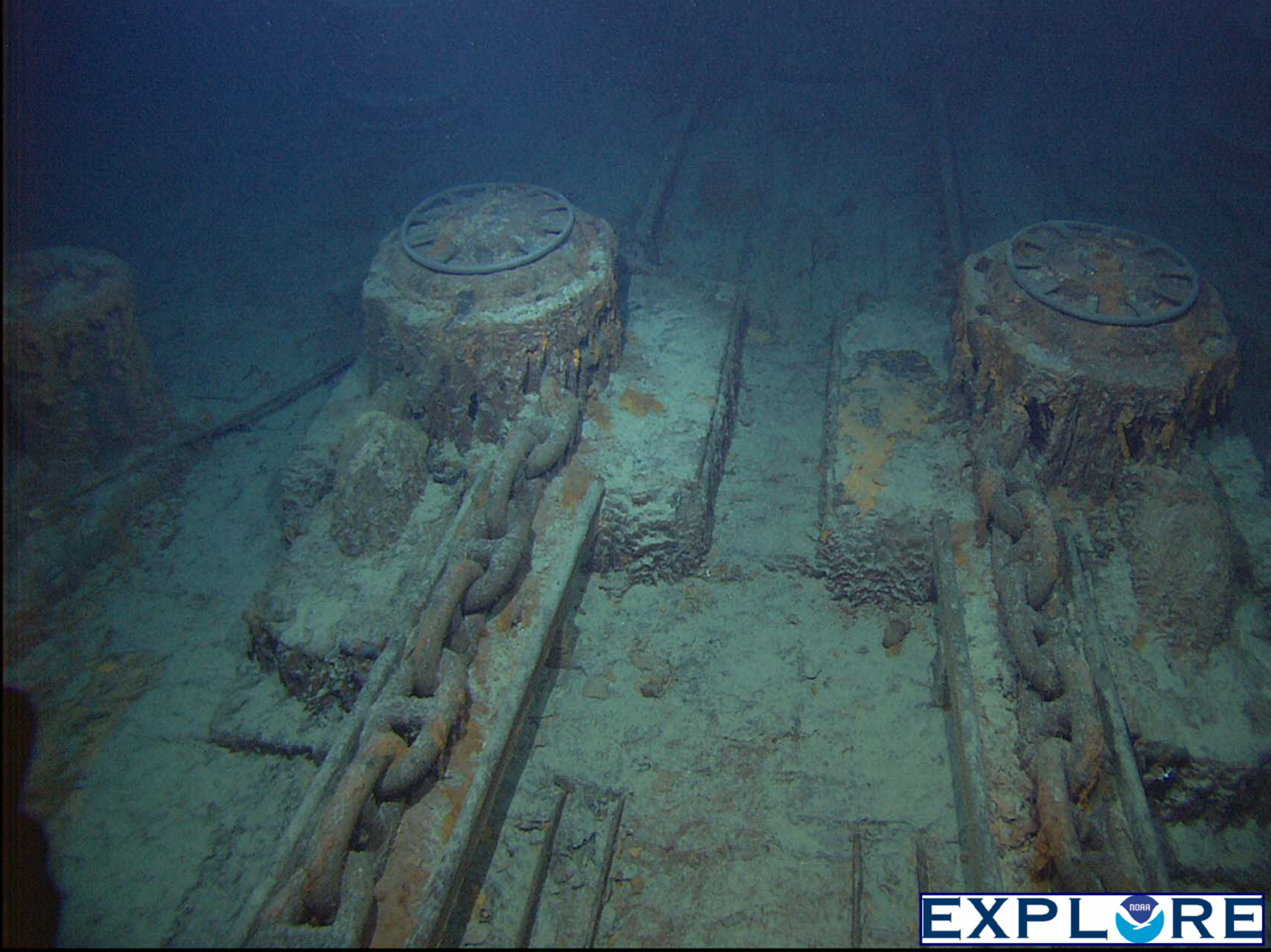
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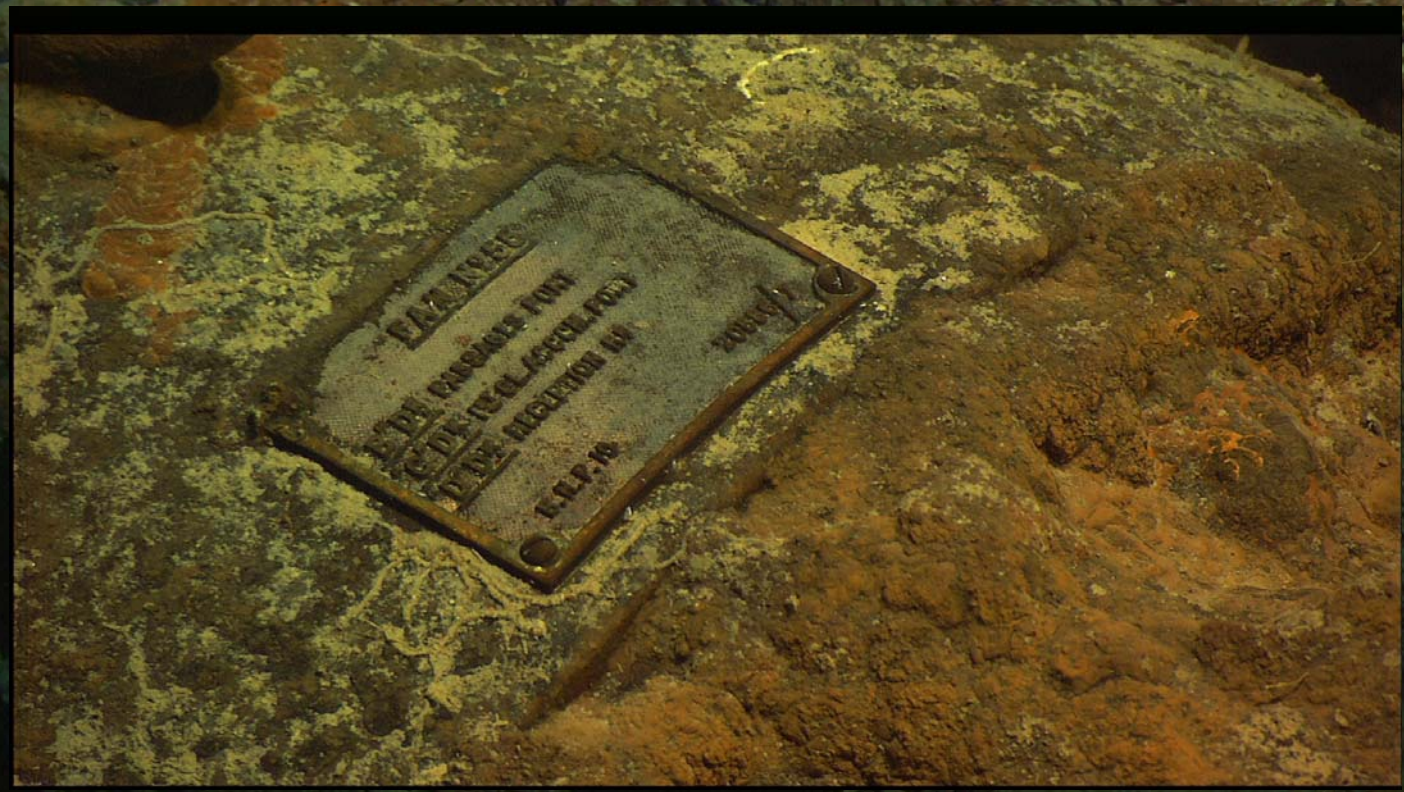
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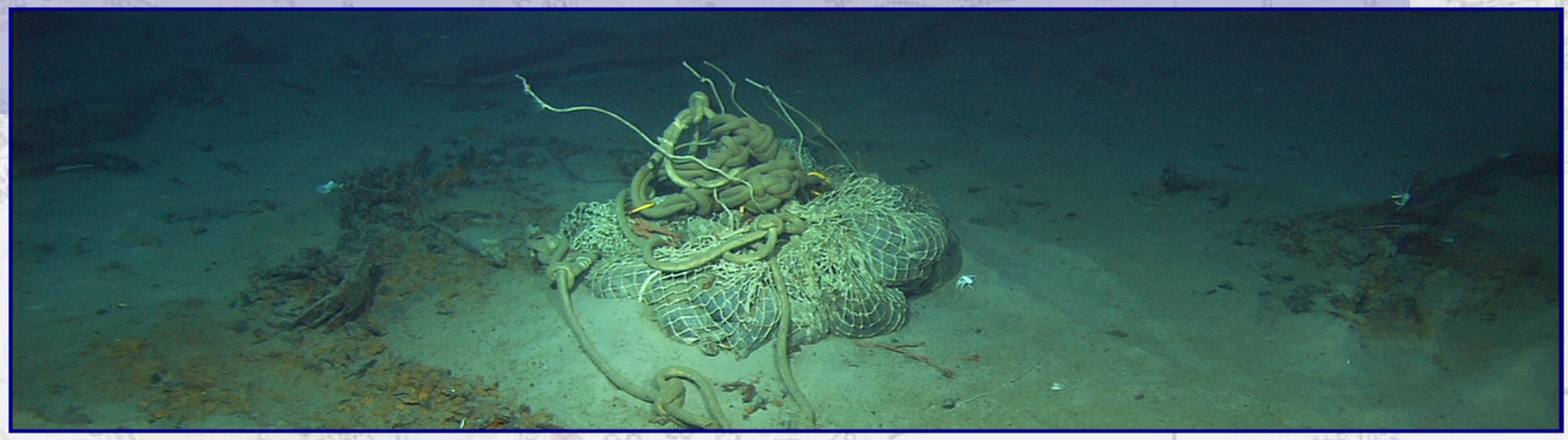
- Congress: Maritime Memorial
- Lawful salvage for commercial purposes
- TITANIC drove UNESCO
- TITANIC Treaty Signed (2004)
- Admiralty considers historical preservation



LOW **ARCHAEOLOGICAL PRICIPLES** HIGH

- Admiralty Law, Salvor in Possession
- Maritime Memorial, the Act of 1986
  - NOAA: Advisory Guidelines
  - DOS: Negotiate International Agreement
- Advisory Guidelines
  - Archaeology Principles, Internationally Agreed
  - Plan, Standards, Purpose, Review
- Court takes notice of Guidelines
- Titanic Treaty of 2004 includes Guidelines

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Next Steps…..

Maritime Heritage and NOAA

National Marine Sanctuaries Program
Office of Ocean Exploration
National Marine Protected Areas Center
Office of Coast Survey
Office of General Counsel for Ocean Services
NOAA Library
NOAA Dive Center

Latest NOAA Partnerships

- *Maritime Heritage Program*
- *Preserve America*
- *RUST and SHIELDS Databases*
- *200th Anniversary of the U.S. Coast Survey*

NATIONAL MARINE SANCTUARIES

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