



GOM-SCHEMA Project: Deepwater Shipwreck 3D Data Acquisition and Archaeological Analyses

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GOM-SCHEMA Project: Shipwrecks

In the Impact Zone

German U-boat, *U-166* (Steel)

Mica Wreck (Wood)

Near the Impact Zone

Steam Yacht, *Anona* (Steel)

Viosca Knoll Wreck (Wood)

Outside the Impact Zone

Tanker, *Halo* (Steel)

Ewing Bank Wreck (Wood)

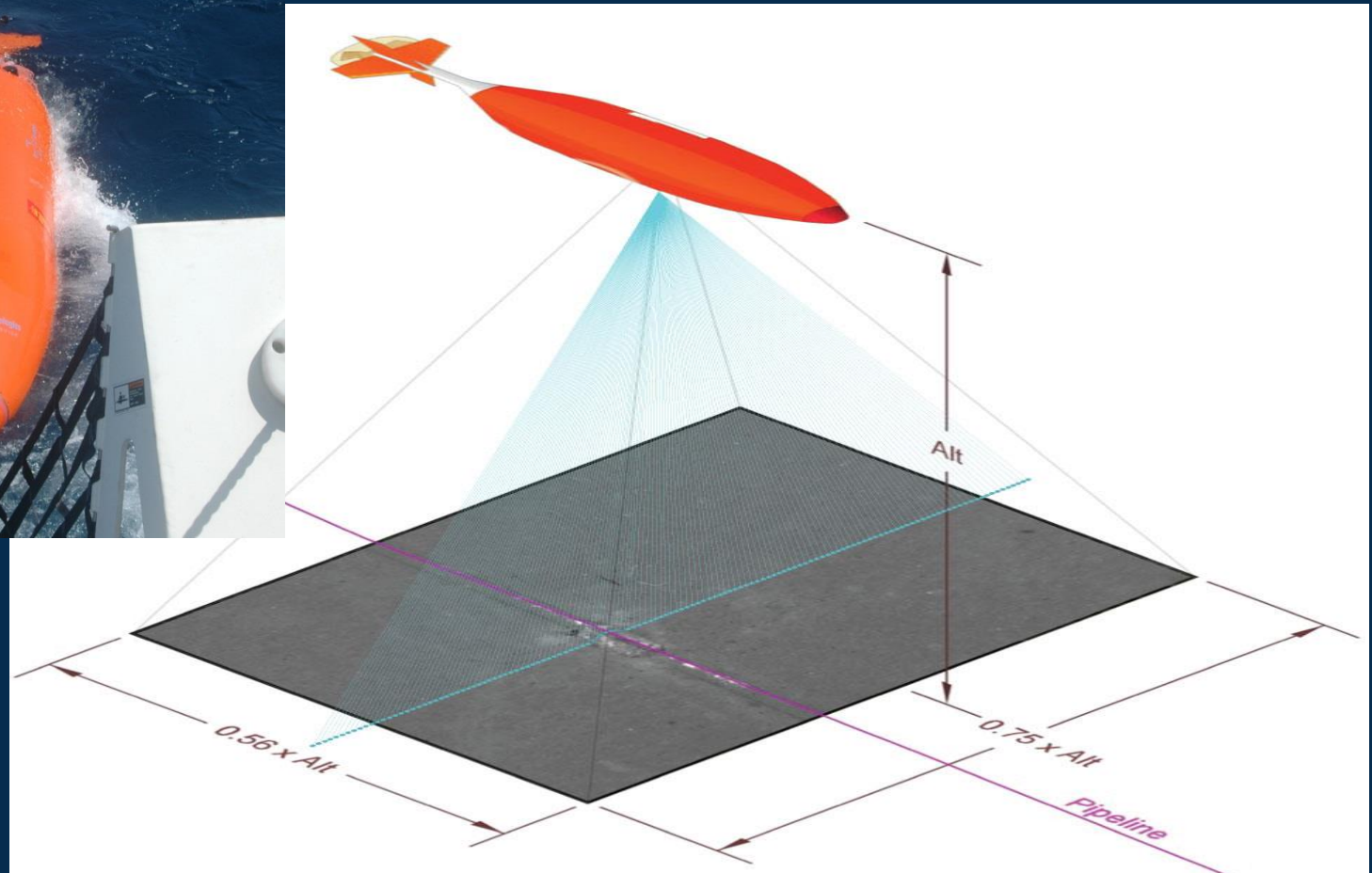
Archaeological Project Objectives

- **3-D Data of the Wrecks (Acoustic or Optical)**
- **Comparative Analyze**
- **Identify Changes in Site Stability and Degradation**
- **Update Archaeological Site Plans**
- **Producing / Updating Photo Mosaics**

2012-2013 AUV



Laser Development & EM2040 Multibeam



2013-2014 AUV Surveys

- ❖ EM 2040 Multibeam Bathymetry System (10 to 20cm Resolution)
- ❖ 3D Scanning Laser (5mm Resolution)
- ❖ And Other Sensors

Subbottom Profiler

Side Scan Sonar

Camera

& Others



Halo

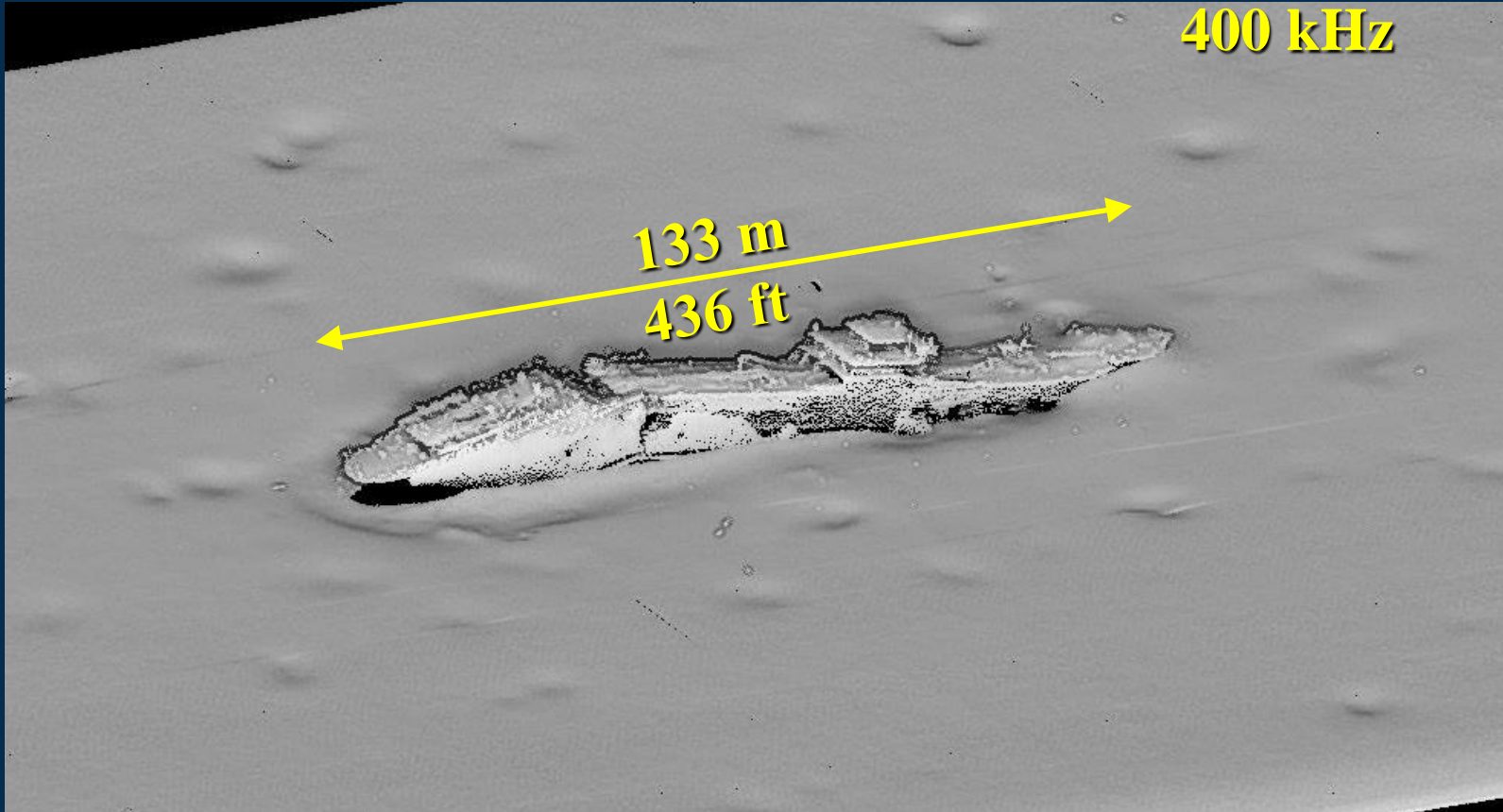
**Oil Tanker Sank
May 1942
~150 Meters Deep**



←N—TANKER " Q7G "(7958W-2658N)300' 12" 1728 1 MAY 42 970BSN 0-67
CONFIDENTIAL

Halo Multibeam

**AUV at 20 m Alt.
18 cm Resolution
400 kHz**



Halo Multibeam

**AUV at 20 m Alt.
18 cm Resolution**

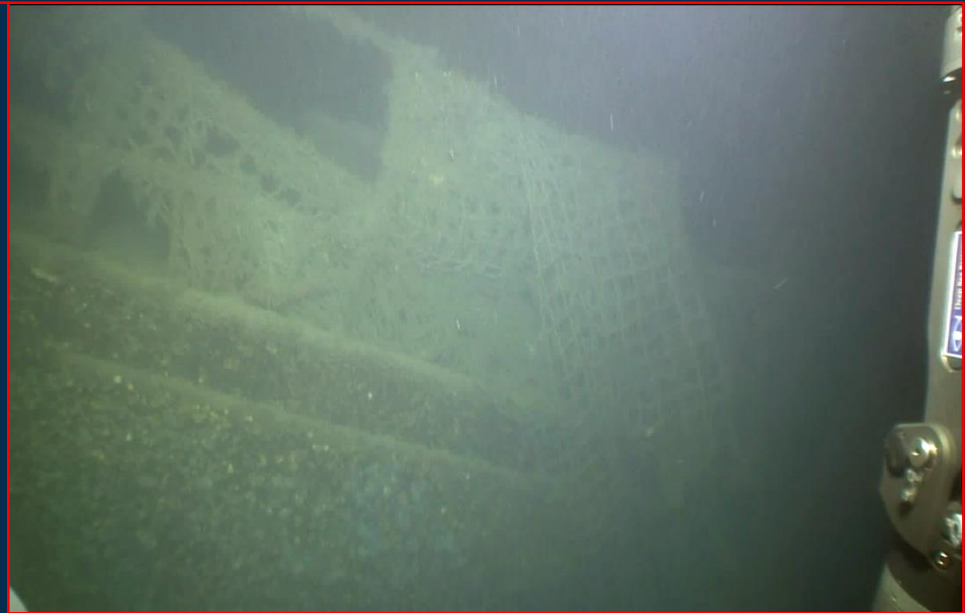
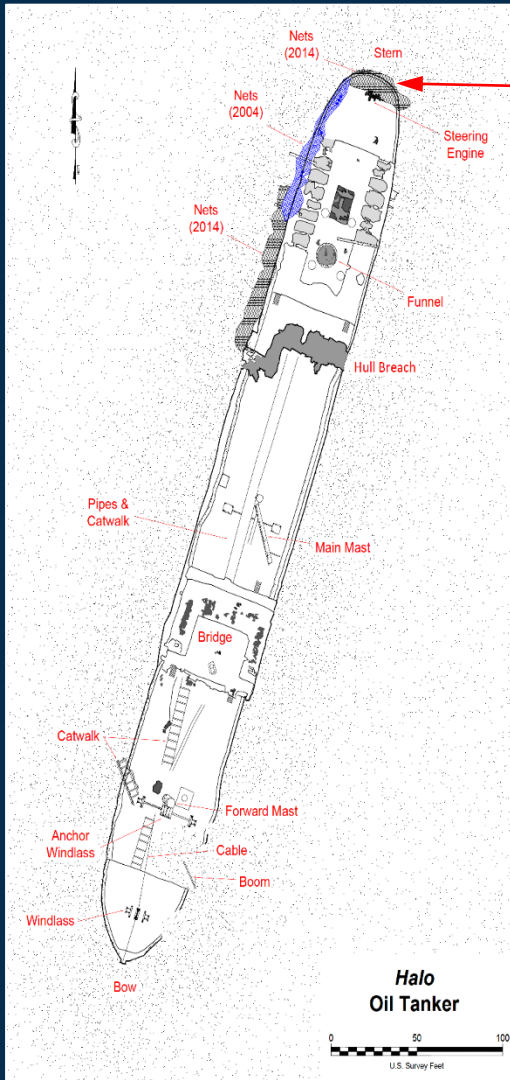
400 kHz



Halo

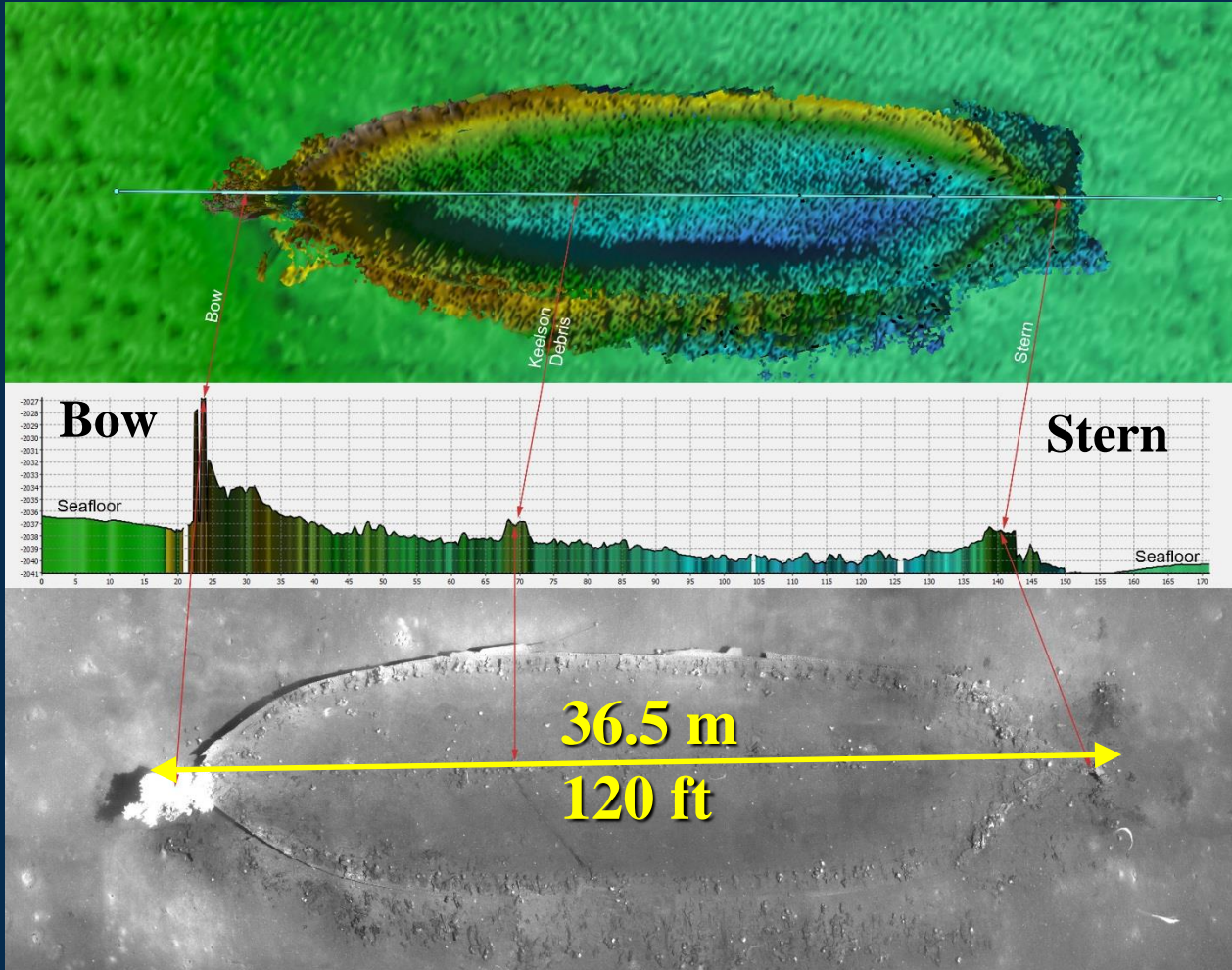
Fishing Nets

Stern



Ewing Bank Wreck

19 Century (Mid to Late)
~600 Meters Deep



Bathymetric Laser
& Multibeam

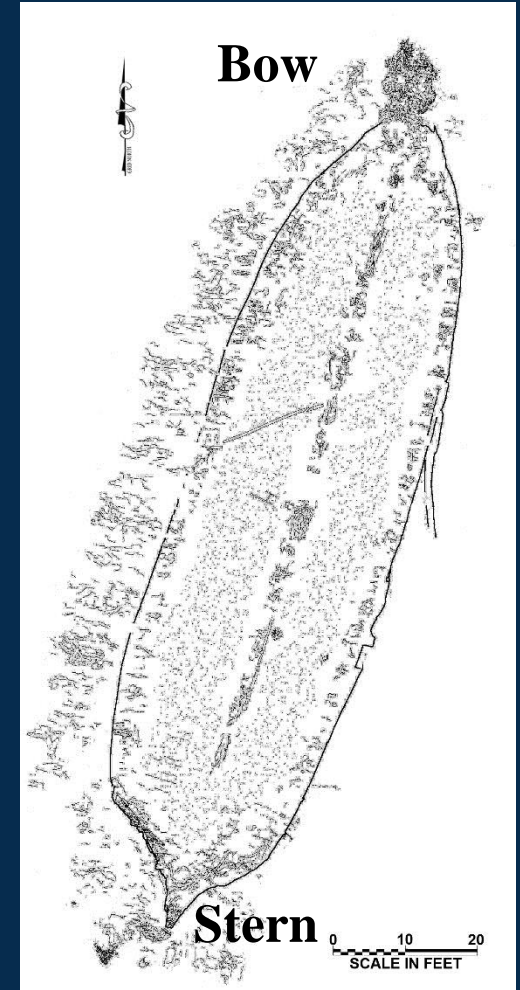
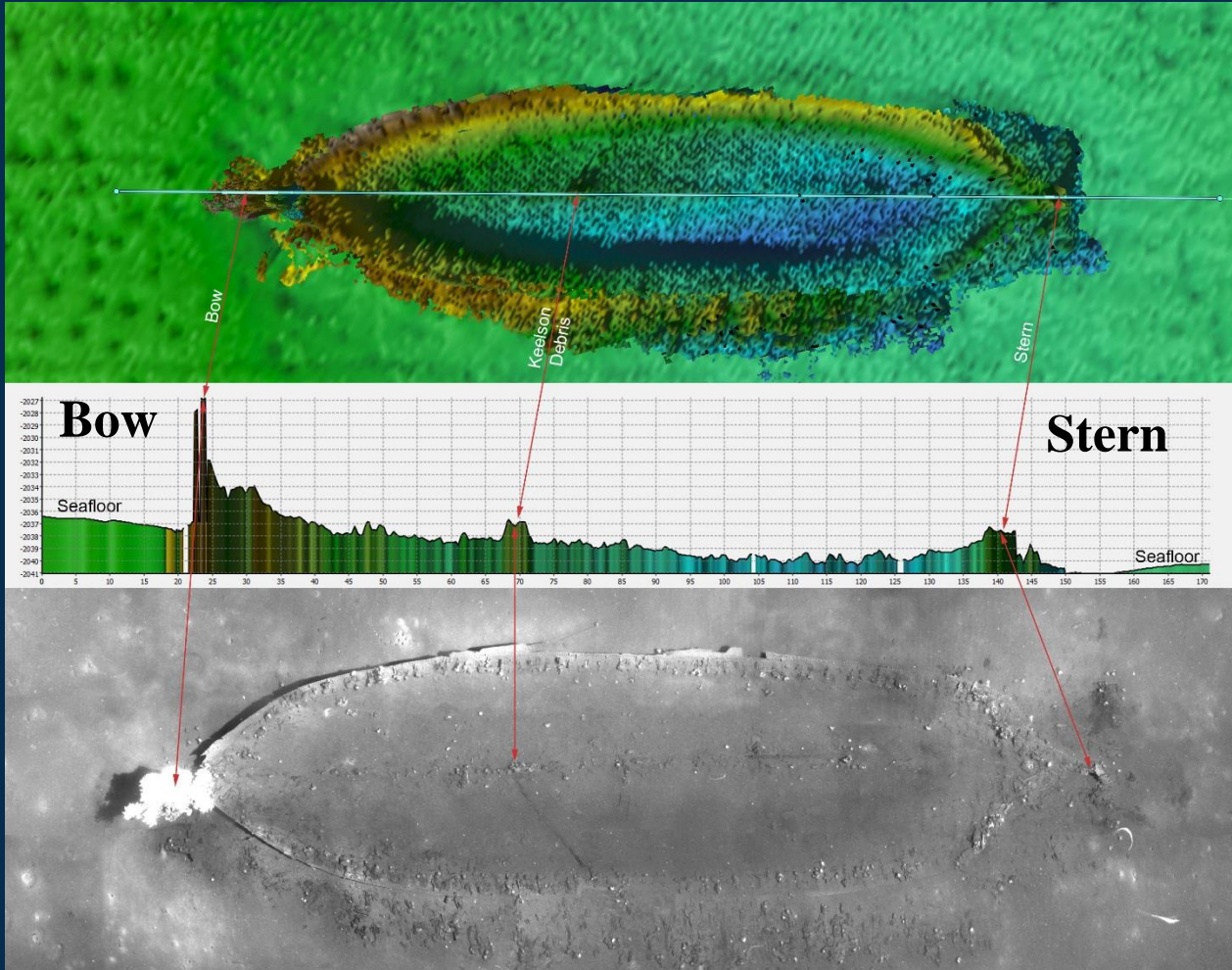
Profile

Photo Mosaic

Ewing Bank Wreck

19th Century (Mid to Late)
~600 Meters deep

North Up
Site Drawing



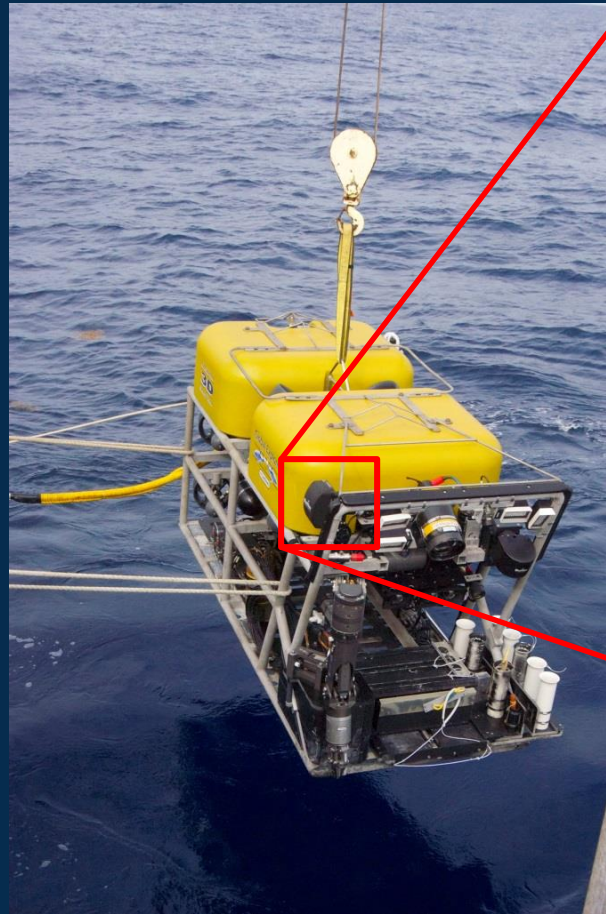
BlueView 3D Sonar on an ROV

In conjunction with AUV Laser Data



C-Surveyor VI AUV

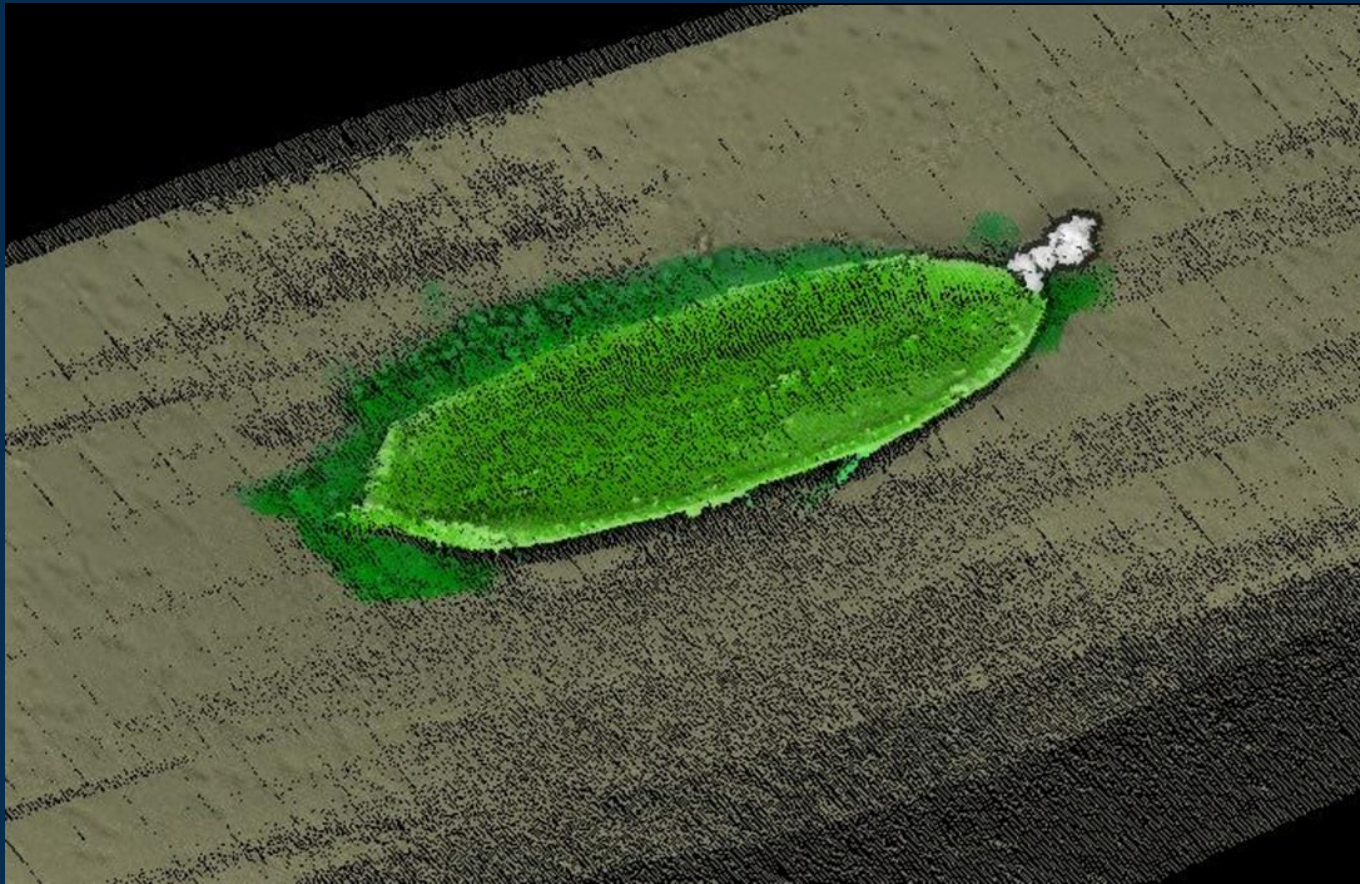
Global Explorer ROV



BlueView 5000

Ewing Bank Wreck

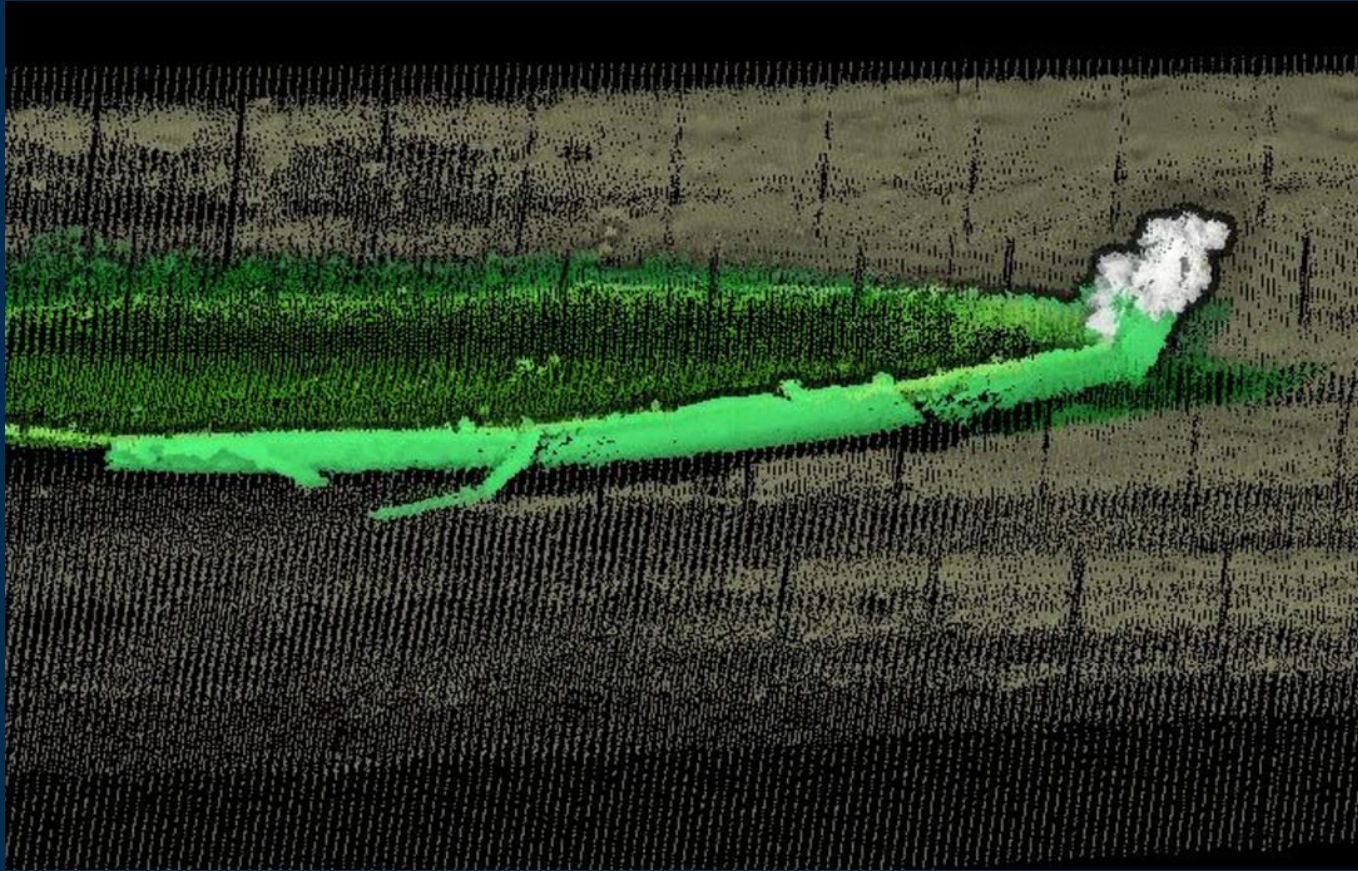
Laser & BlueView Sonar



Ewing Bank Wreck

Laser & BlueView Sonar

BlueView at the Bow and Starboard Side



Anona

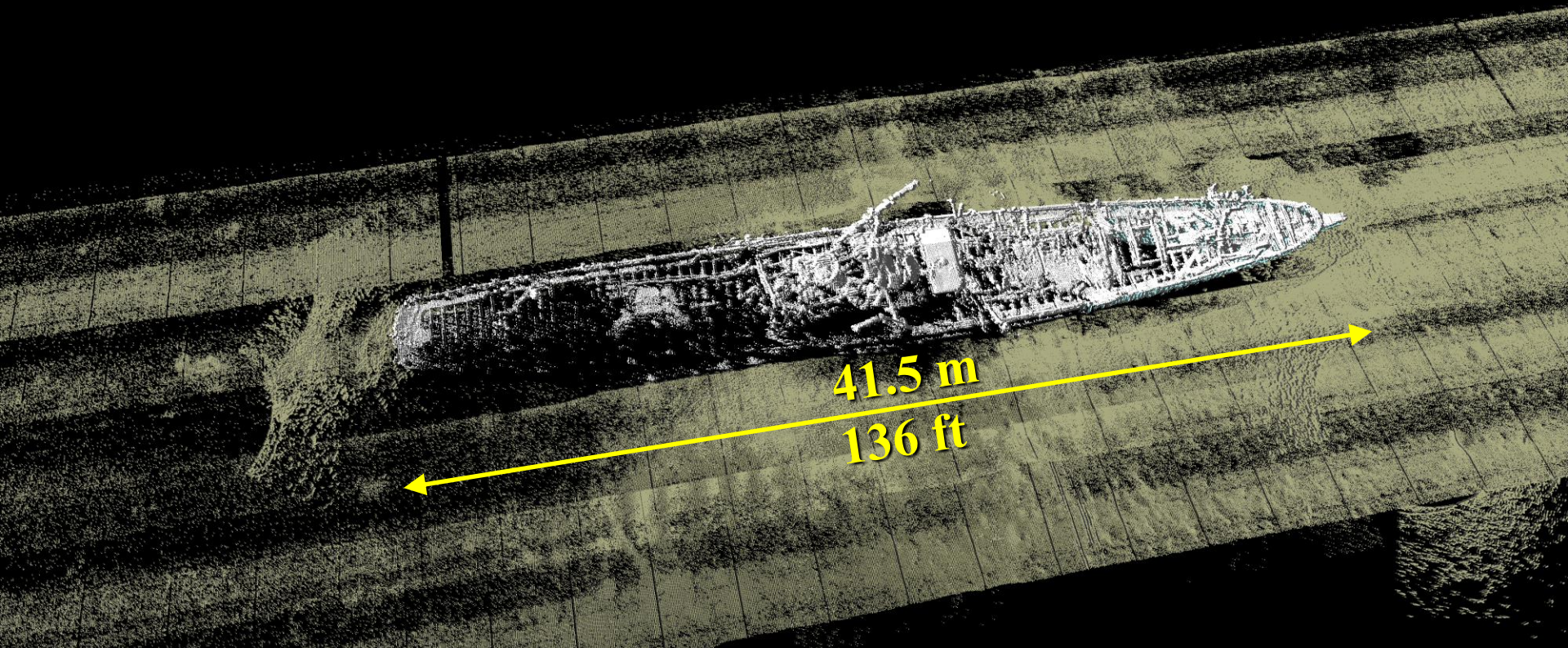
Historical Collections of the Great Lakes
Bowling Green State University

Sank 1944
~1,200 Meters Deep



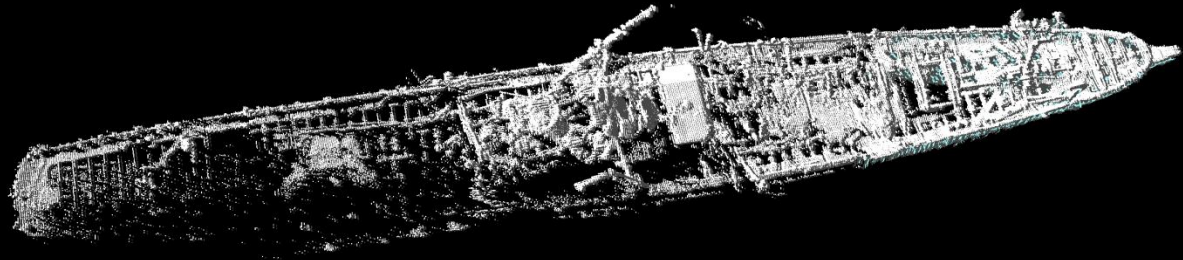
Anona

Laser & BlueView



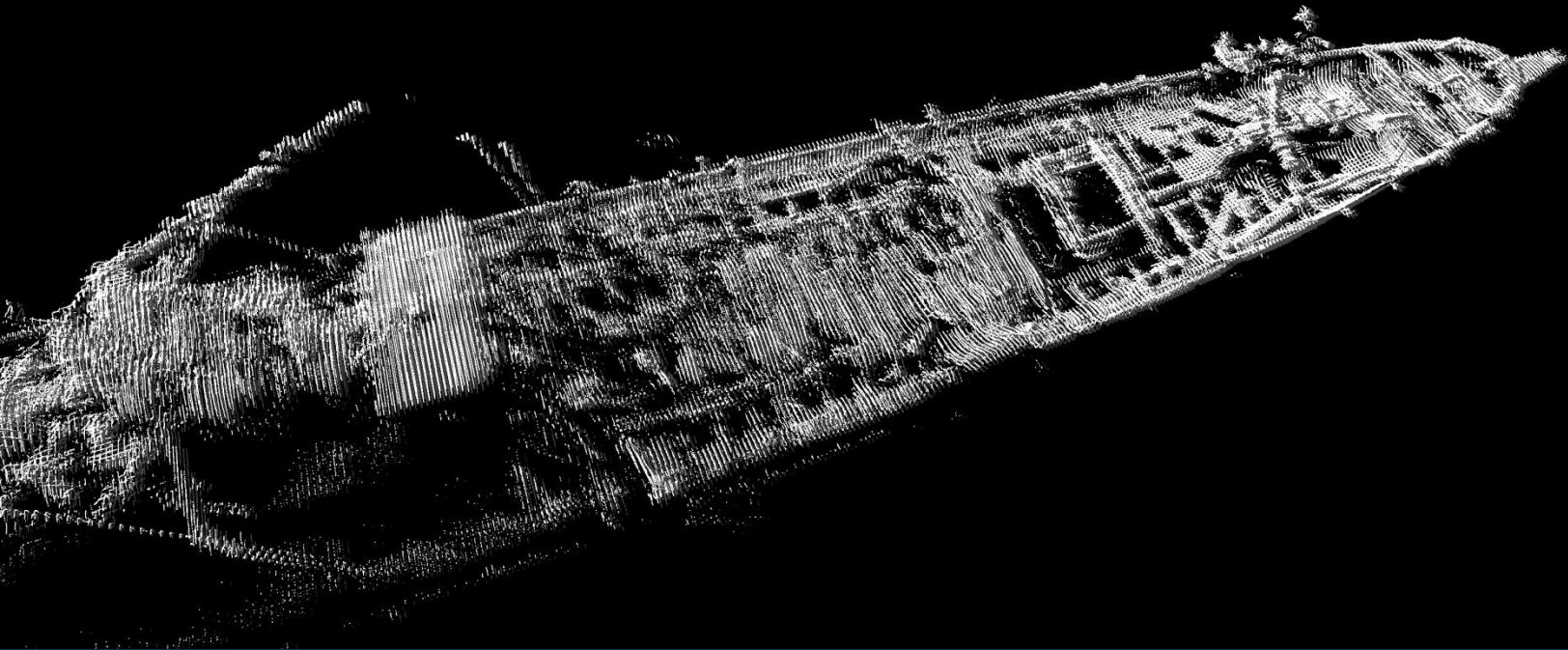
Anona

Laser & BlueView



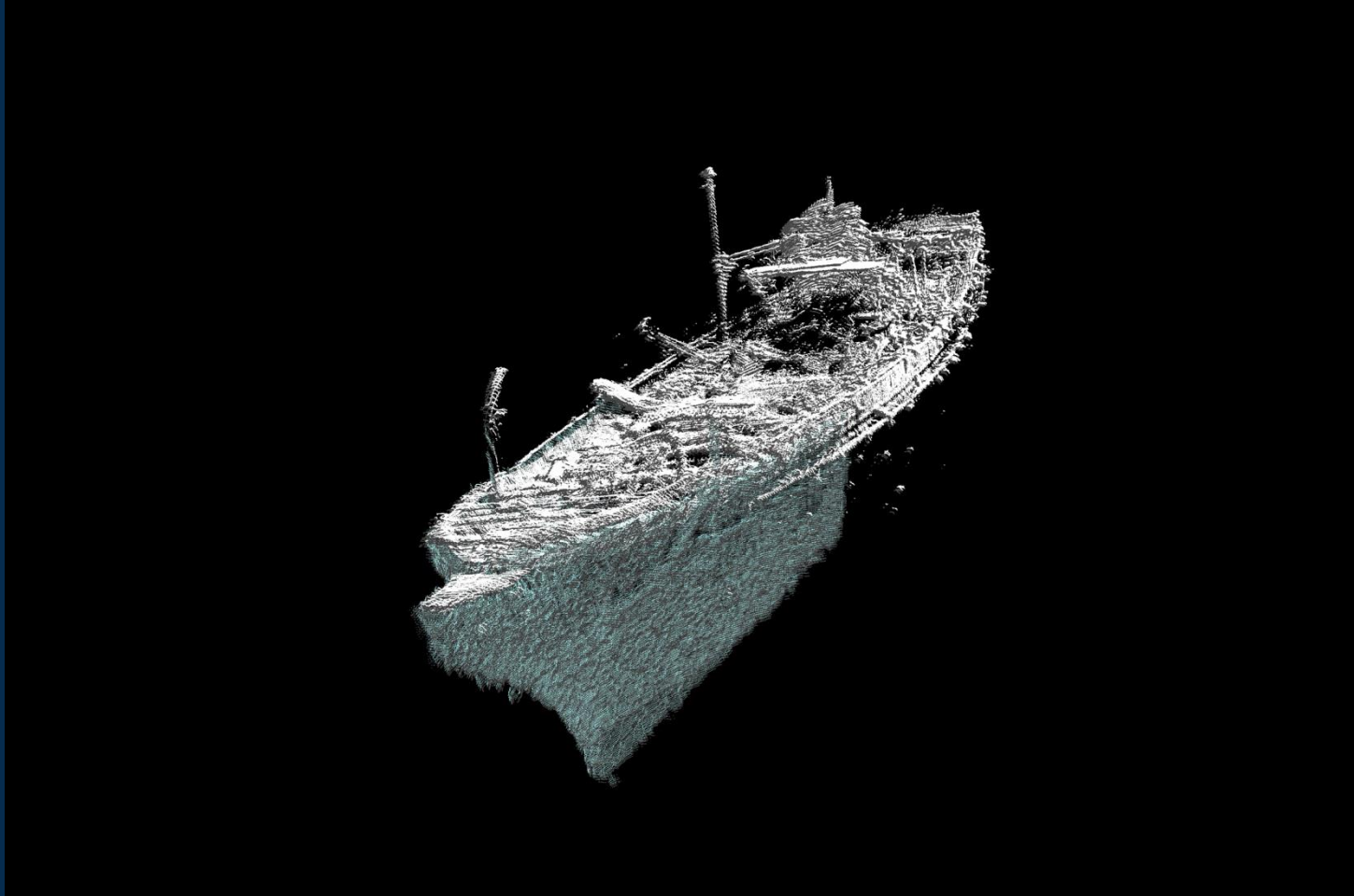
Anona

Laser & BlueView



Anona

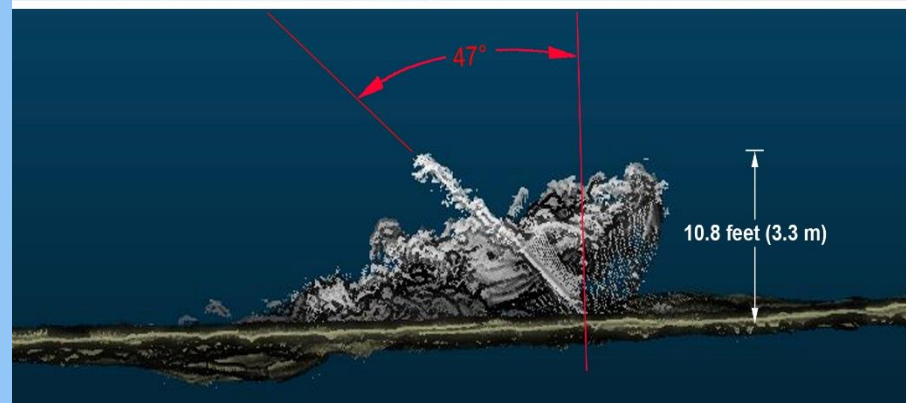
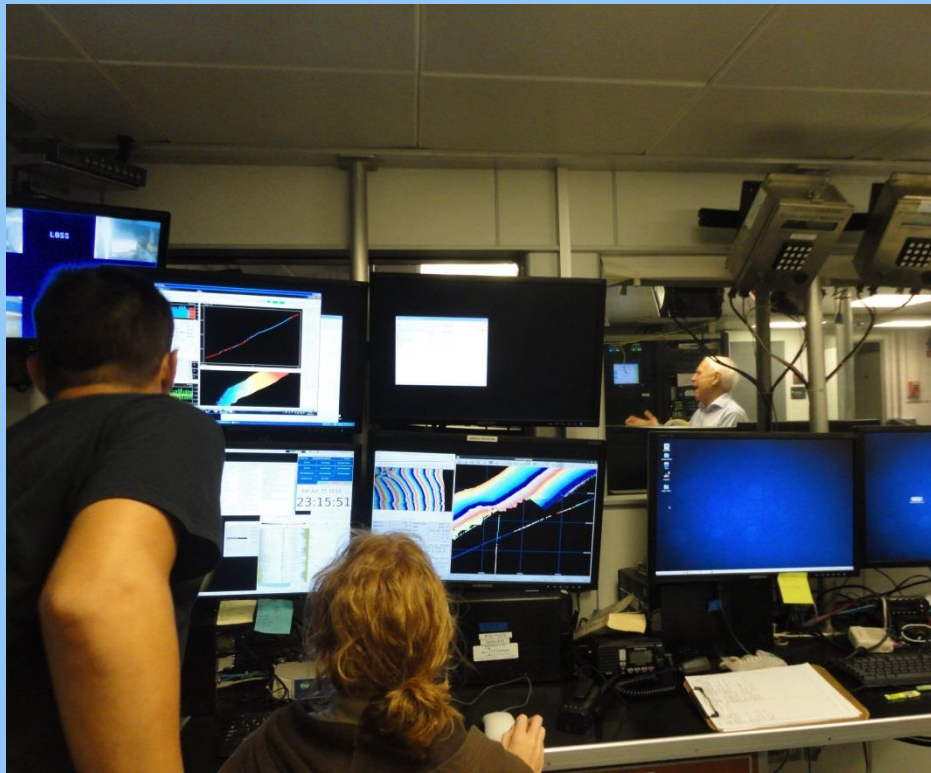
Laser & BlueView



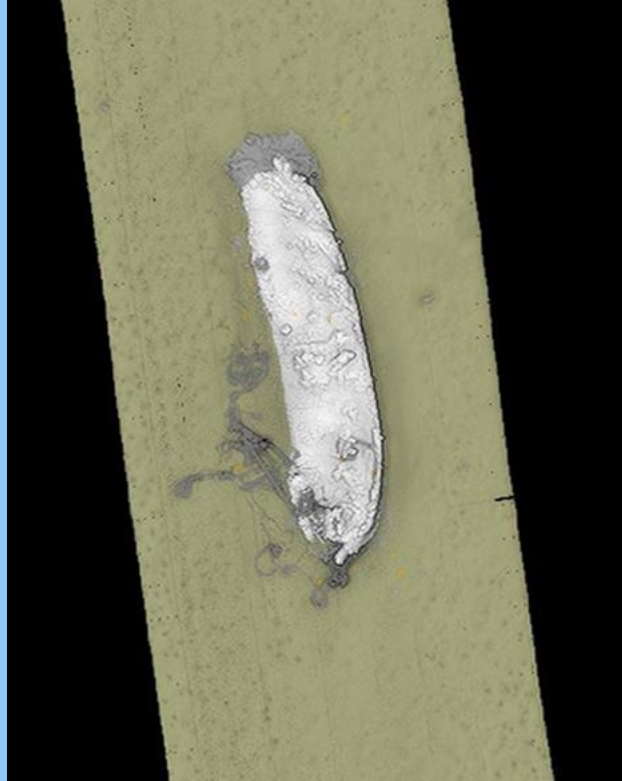
Viosca Knoll Wreck

The Process

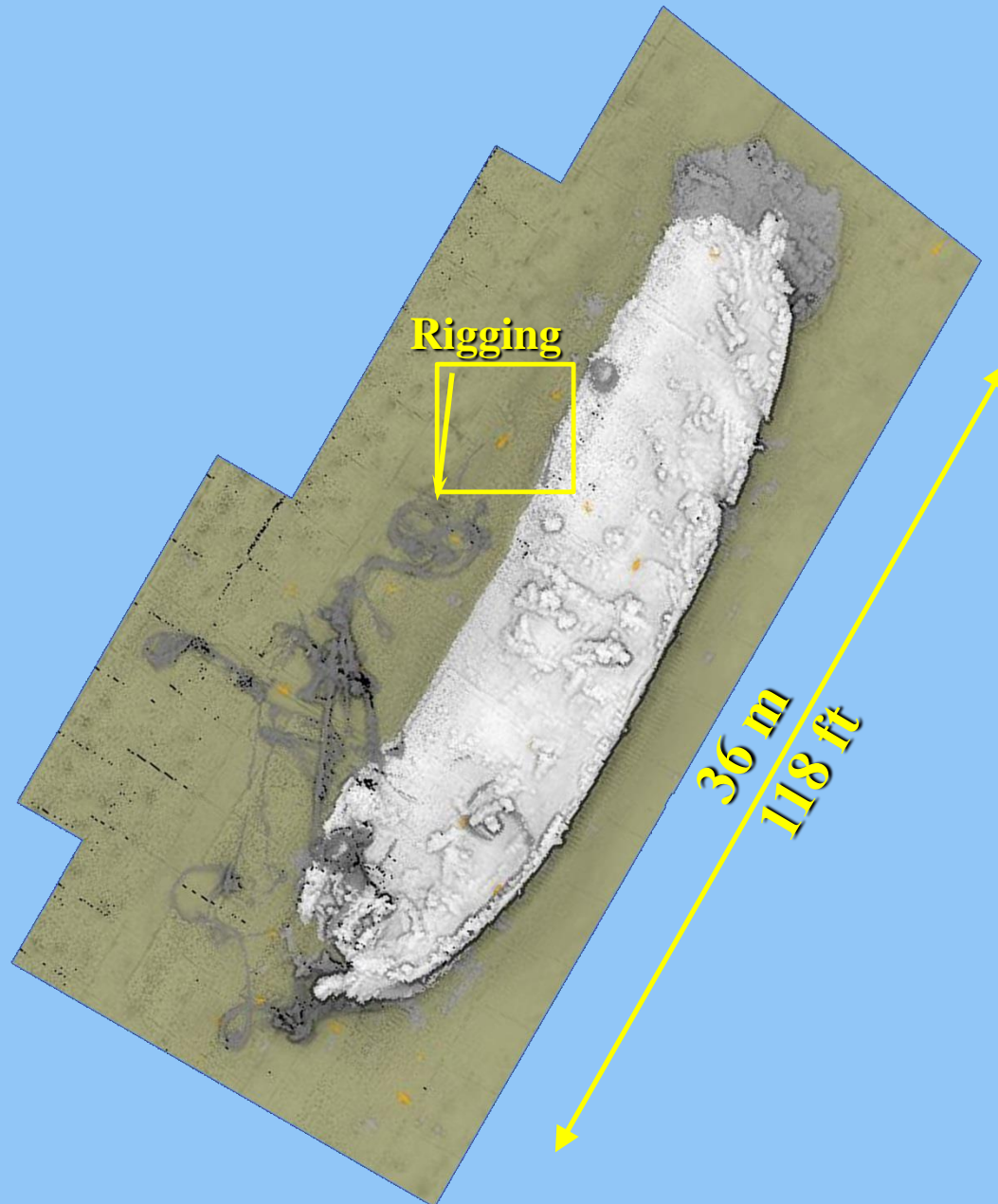
Late 19 Century
~600 Meters Deep



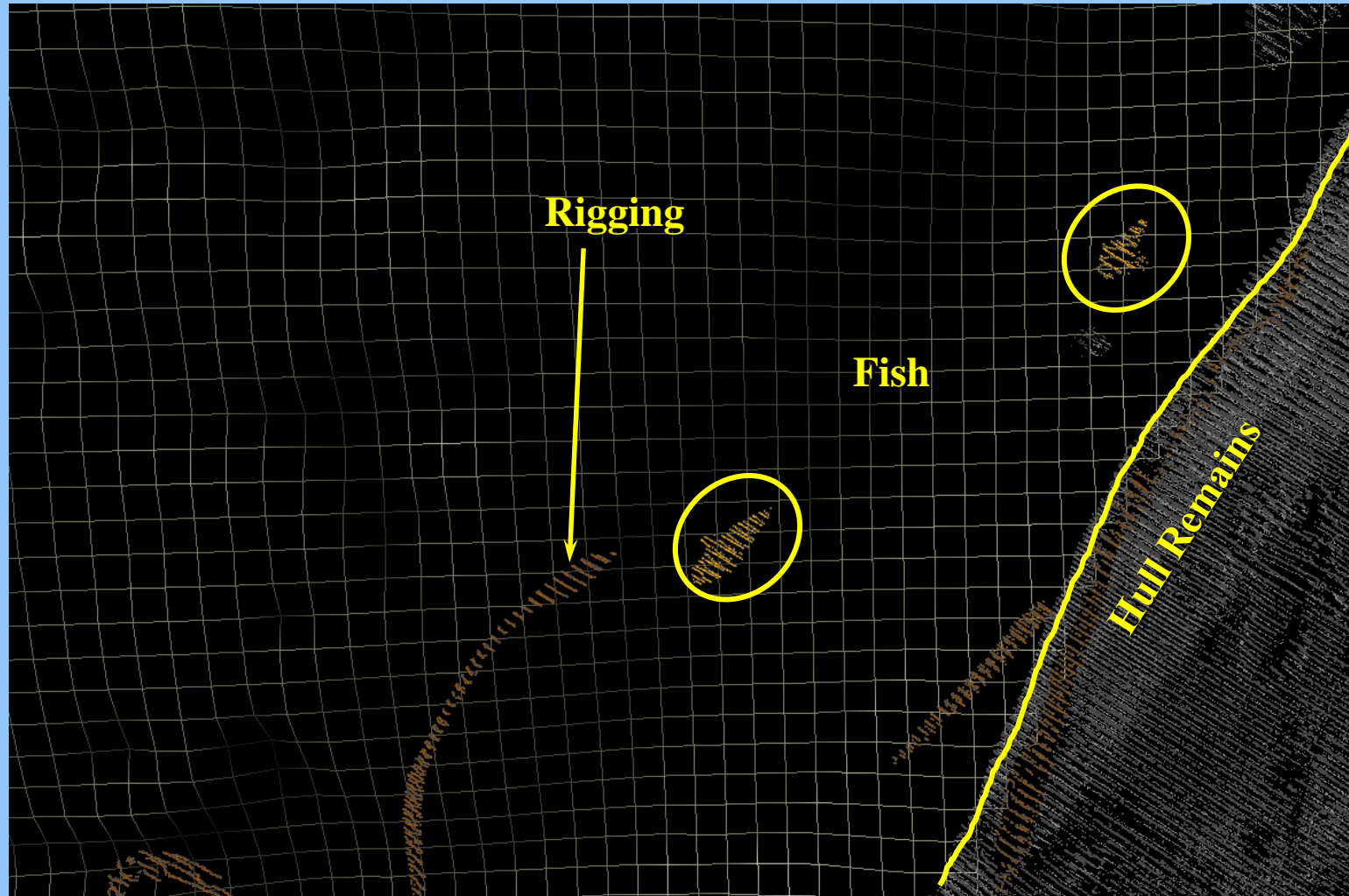
Viosca Knoll Wreck



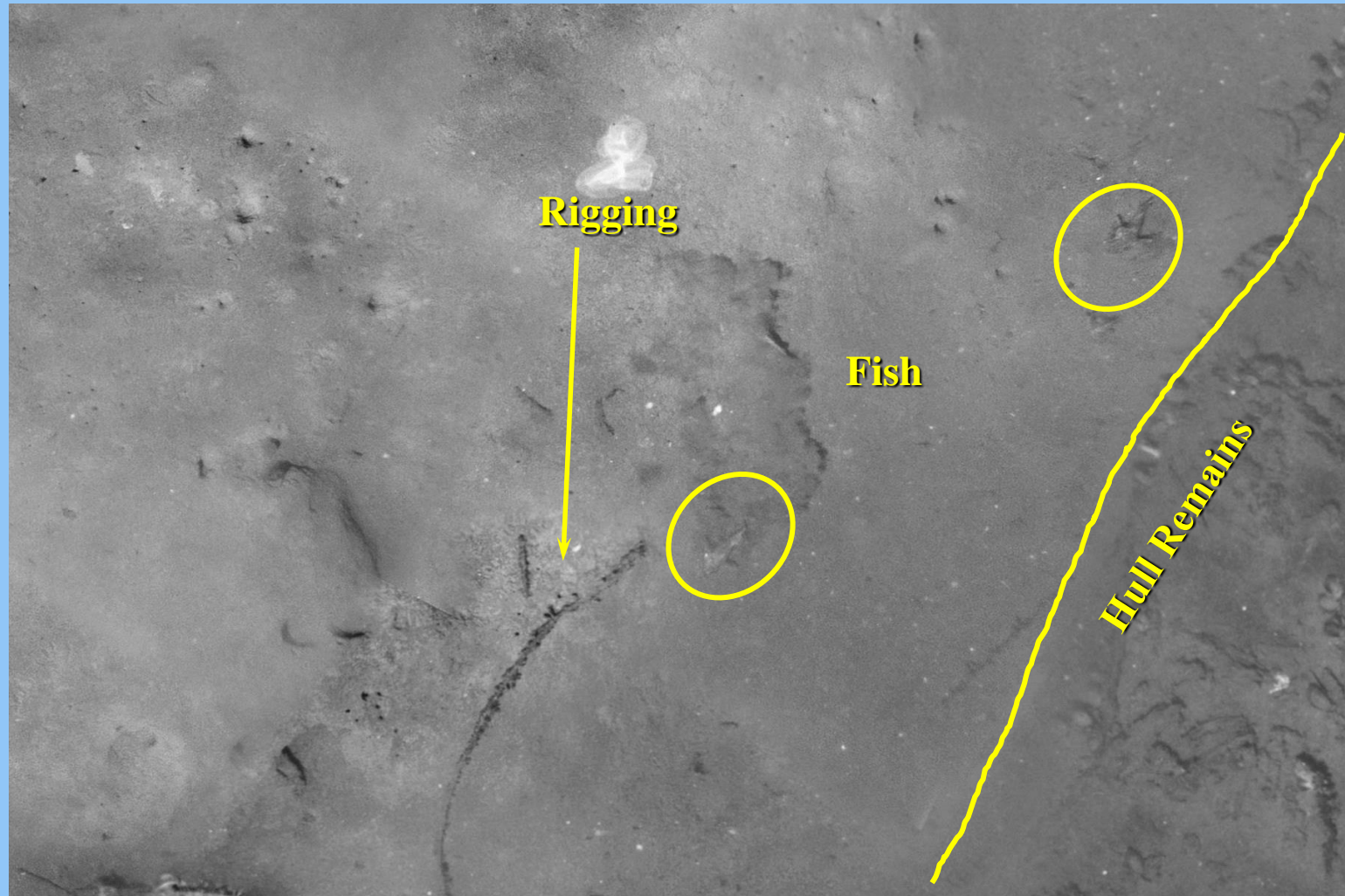
Viosca Knoll Wreck



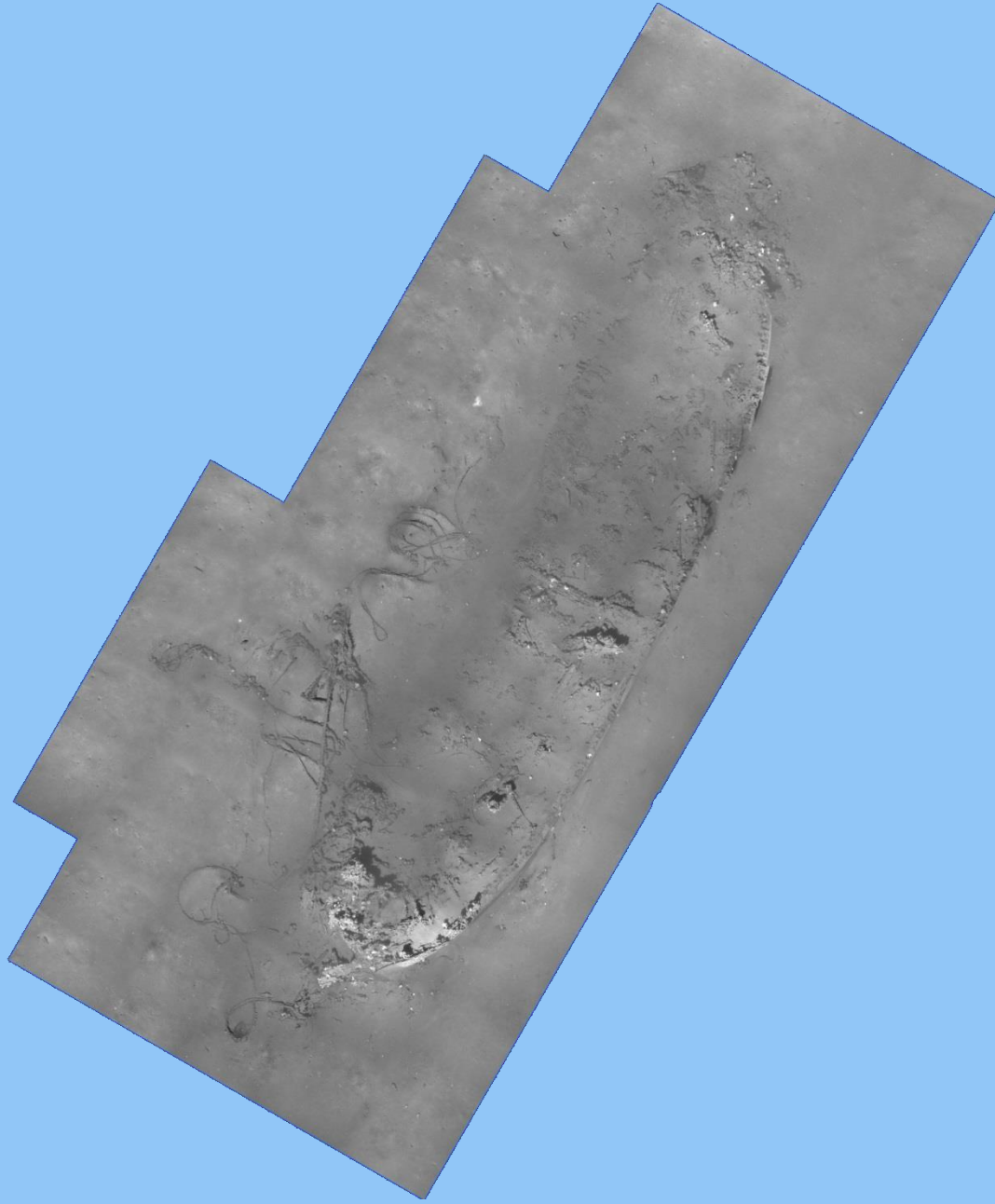
VK Wreck



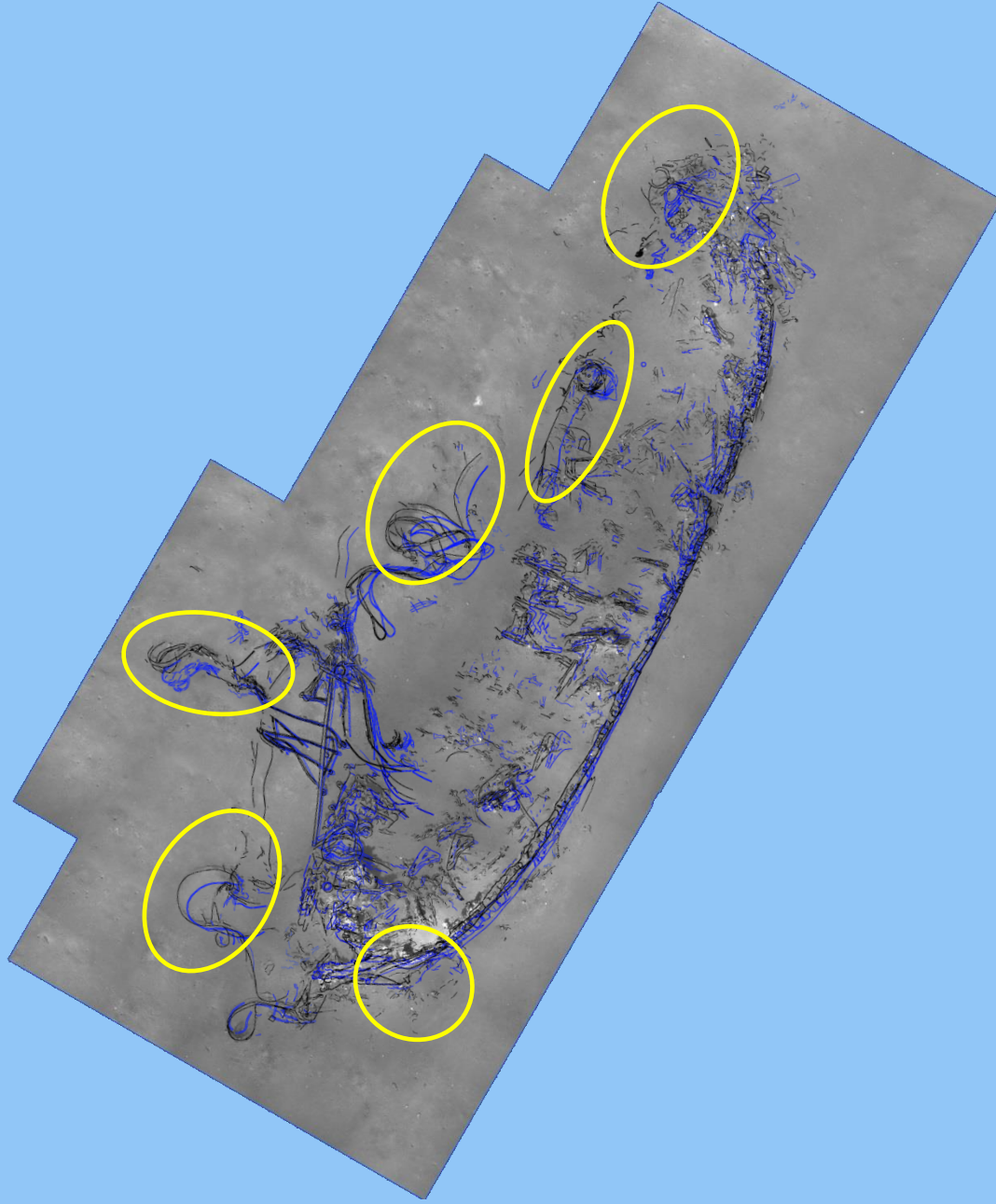
VK Wreck



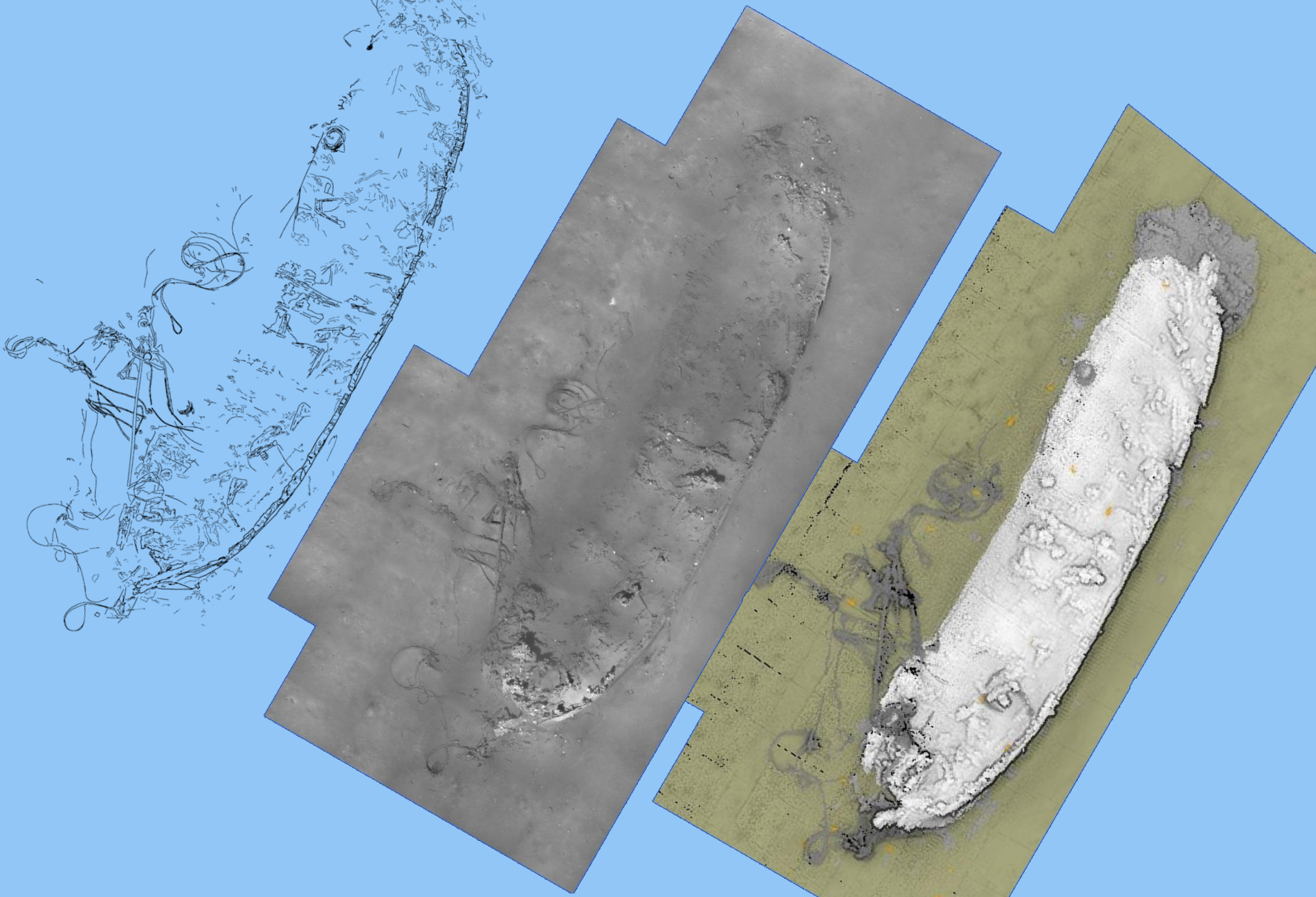
Viosca Knoll Wreck



Viosca Knoll Wreck



Viosca Knoll Wreck



Mica Wreck

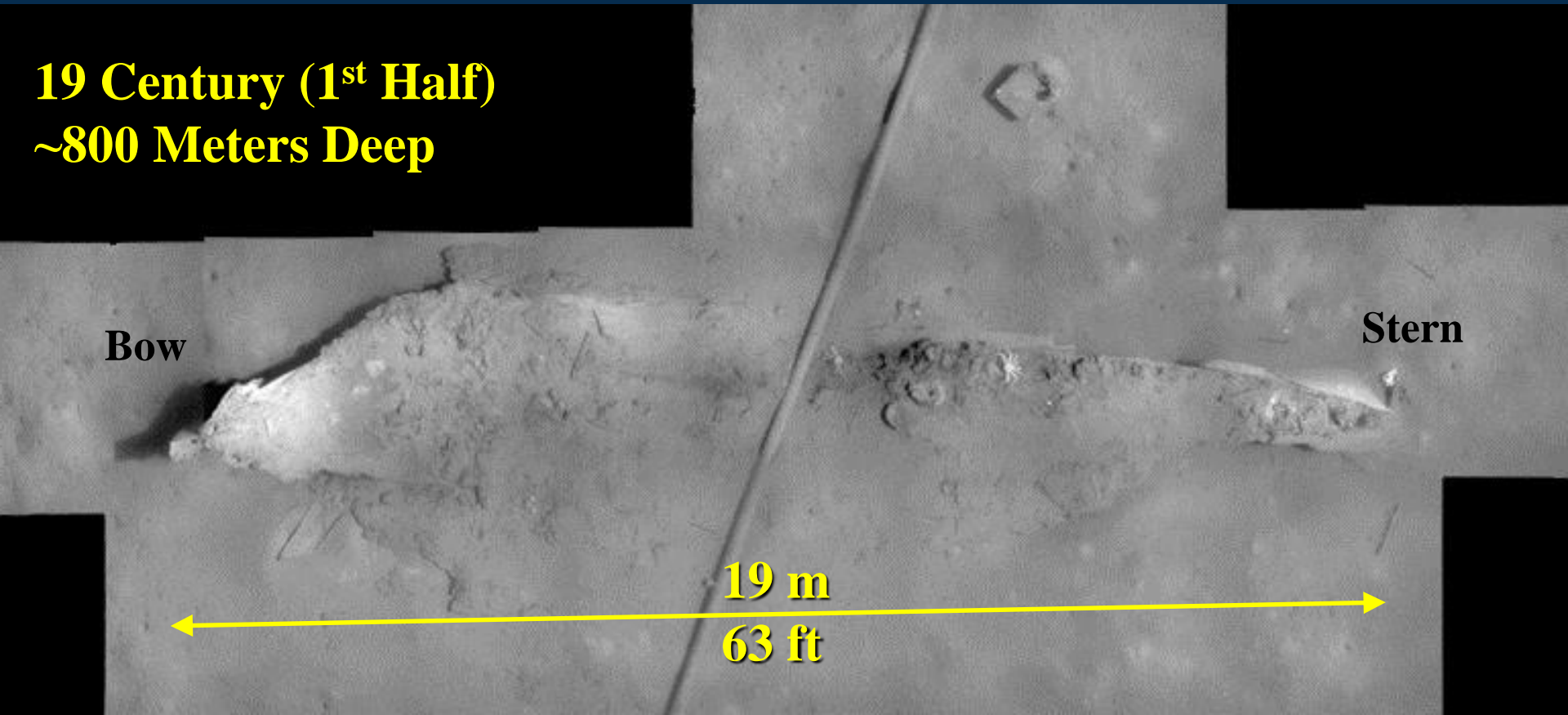
AUV Photo Mosaic

19 Century (1st Half)
~800 Meters Deep

Bow

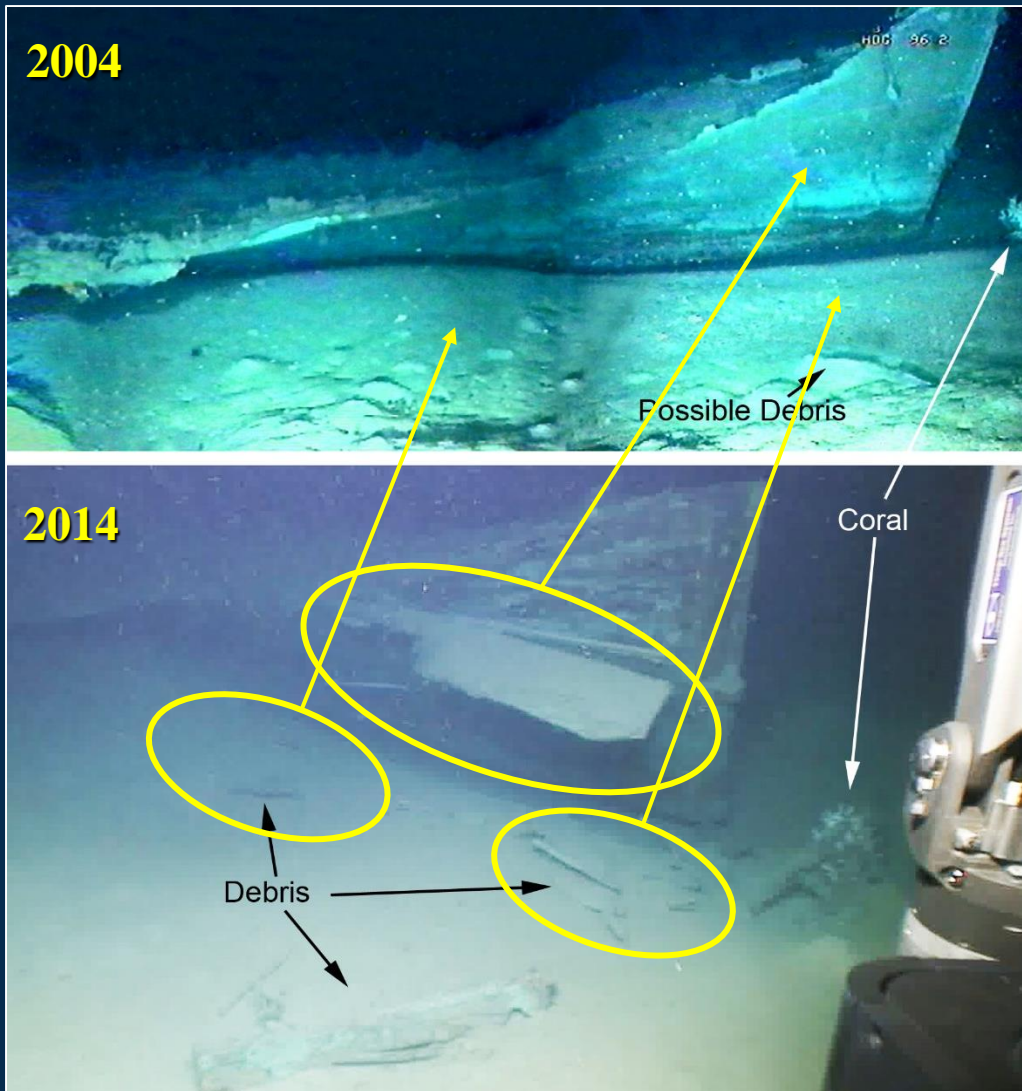
Stern

19 m
63 ft



Mica Wreck

Comparative Analysis



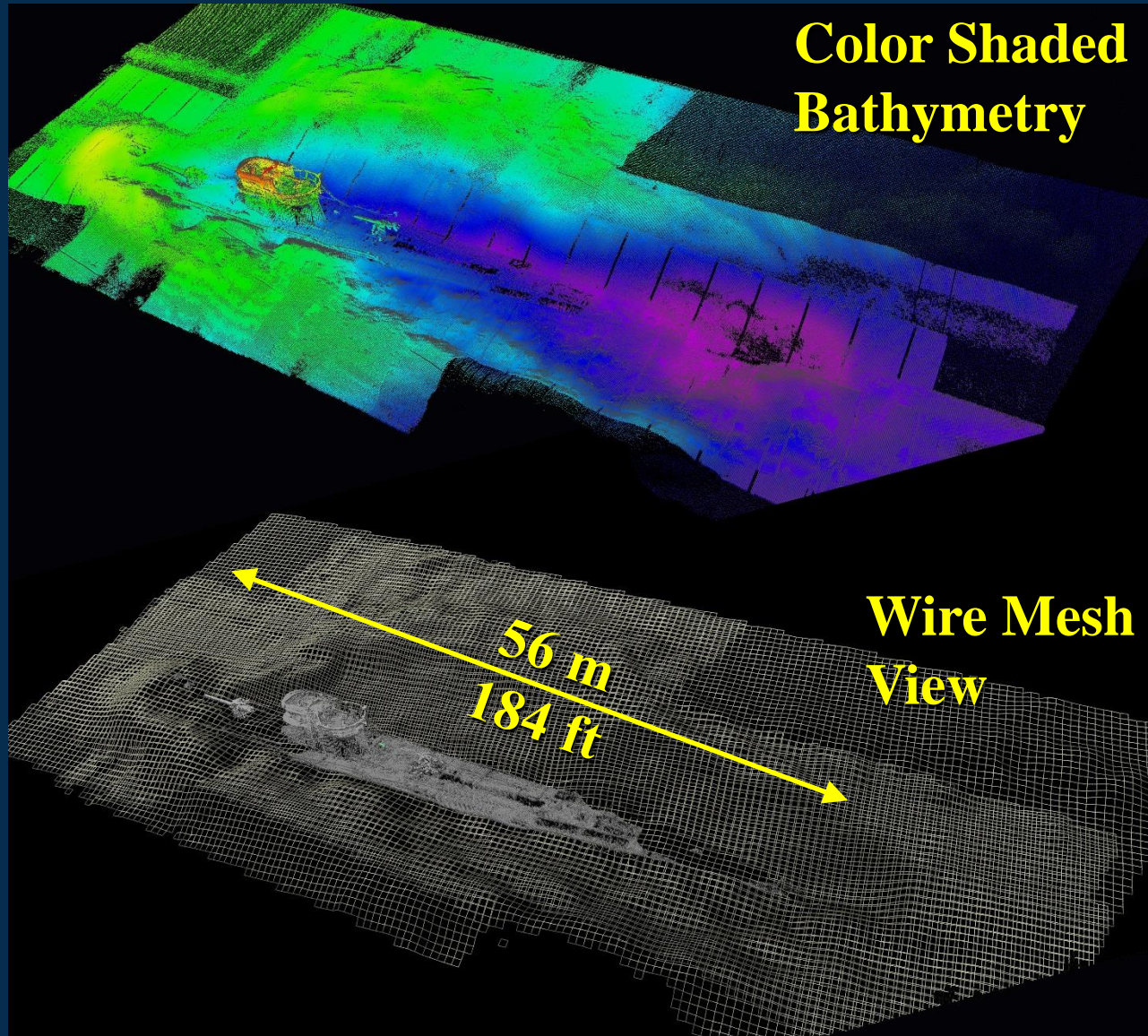
**Sheathing
Debris**

U-166

3D Laser Data (5mm Resolution)

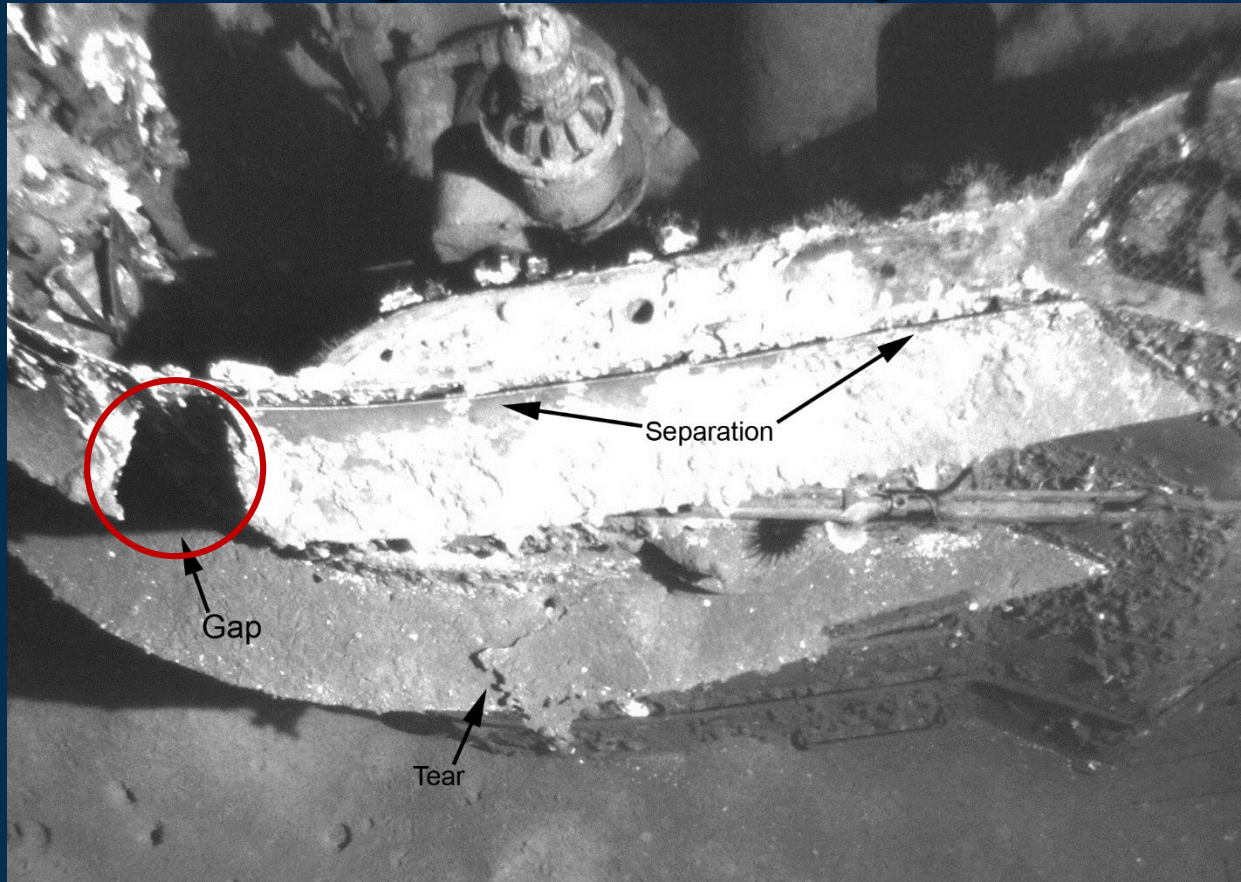
German U-boat
July 30, 1942
~1,500 Meters

Total length
= 76.8 m

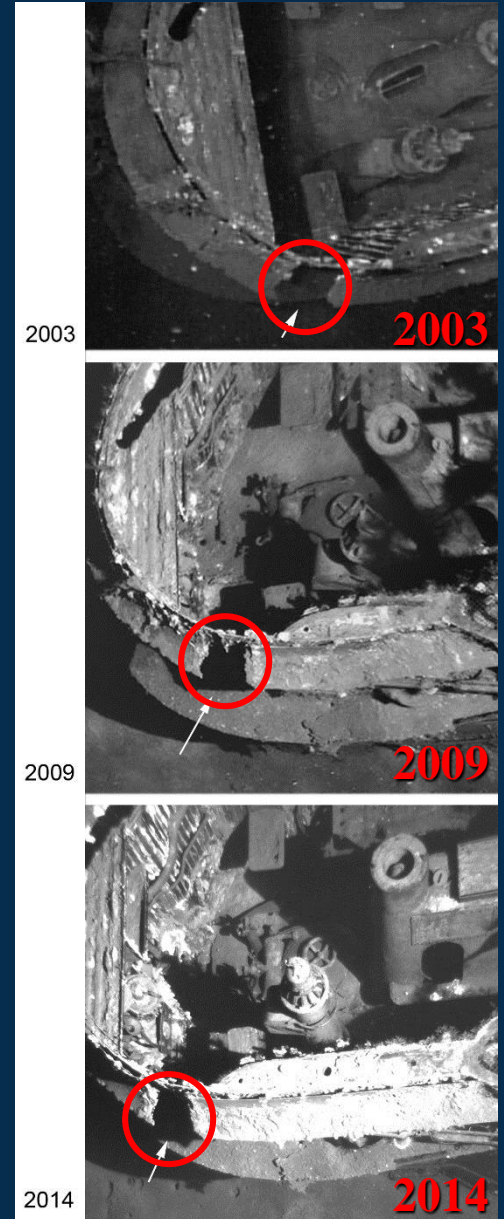


U-166

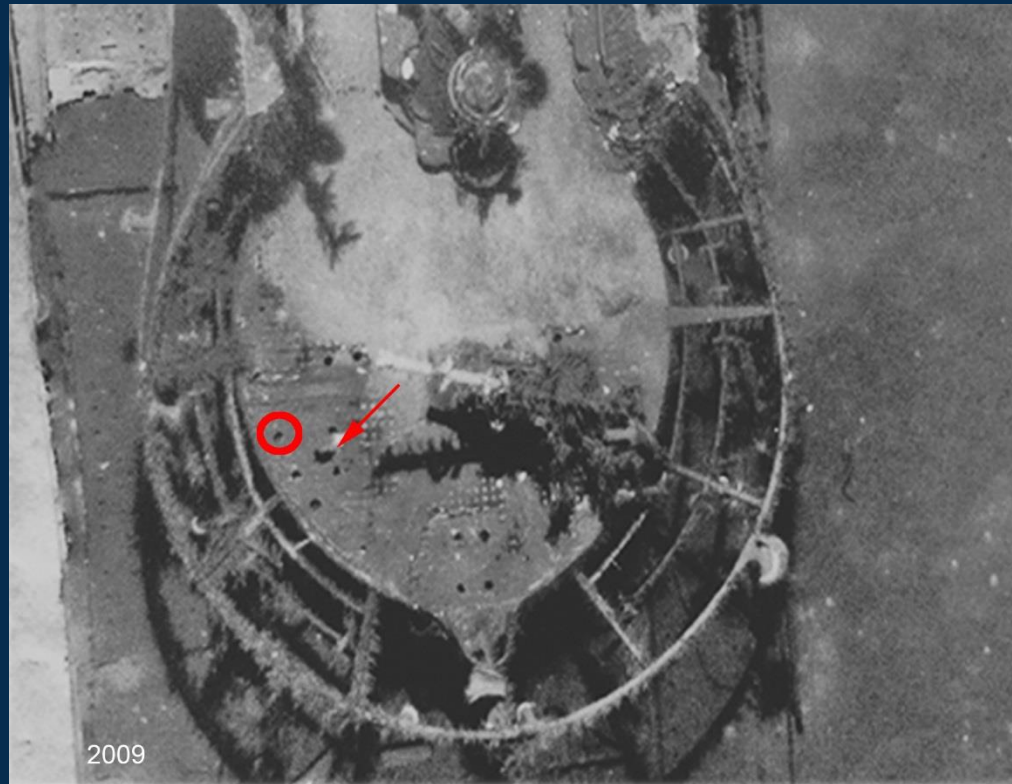
Comparative Analysis



2003-2014:
SCHEMA Project Analysis

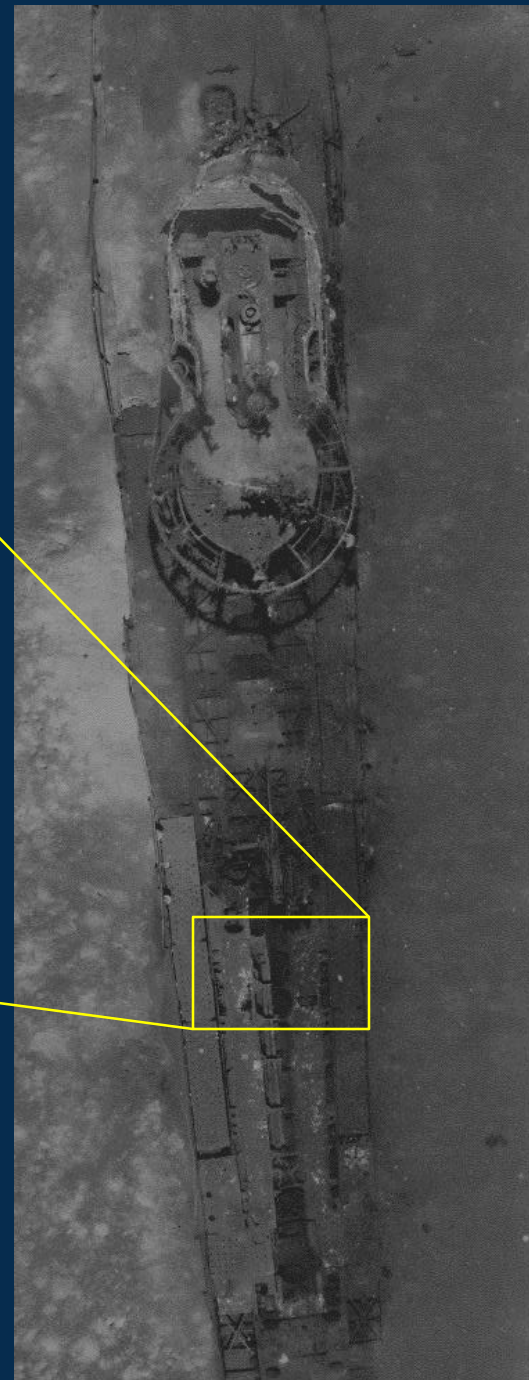
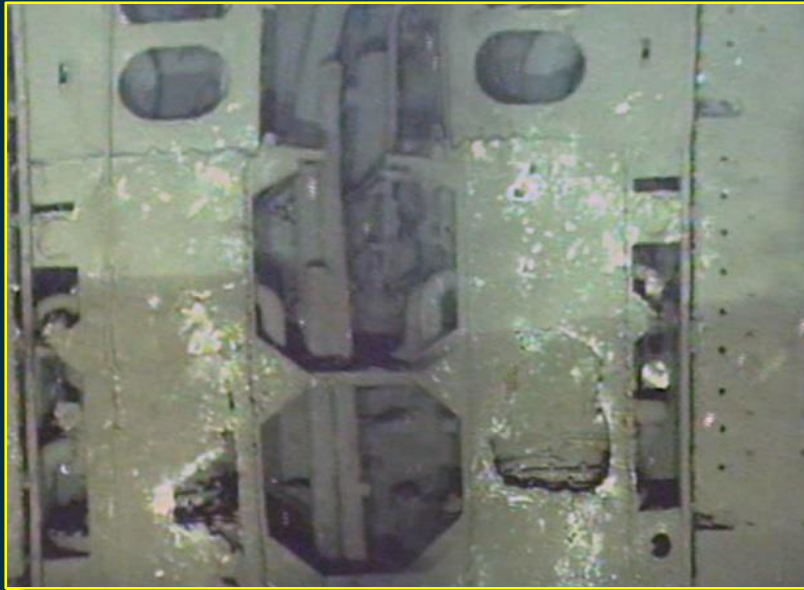


2003-2014: SCHEMA Project Analysis



2003-2014: SCHEMA Project

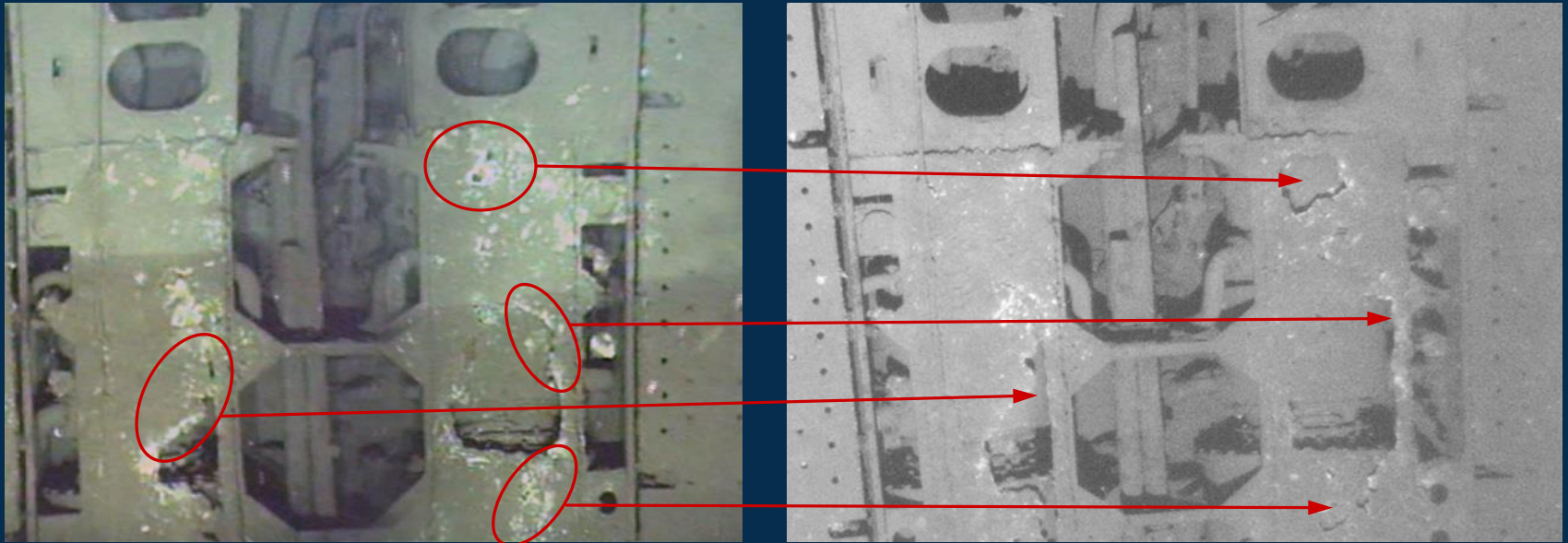
Analysis 2003



2003-2014: SCHEMA Project

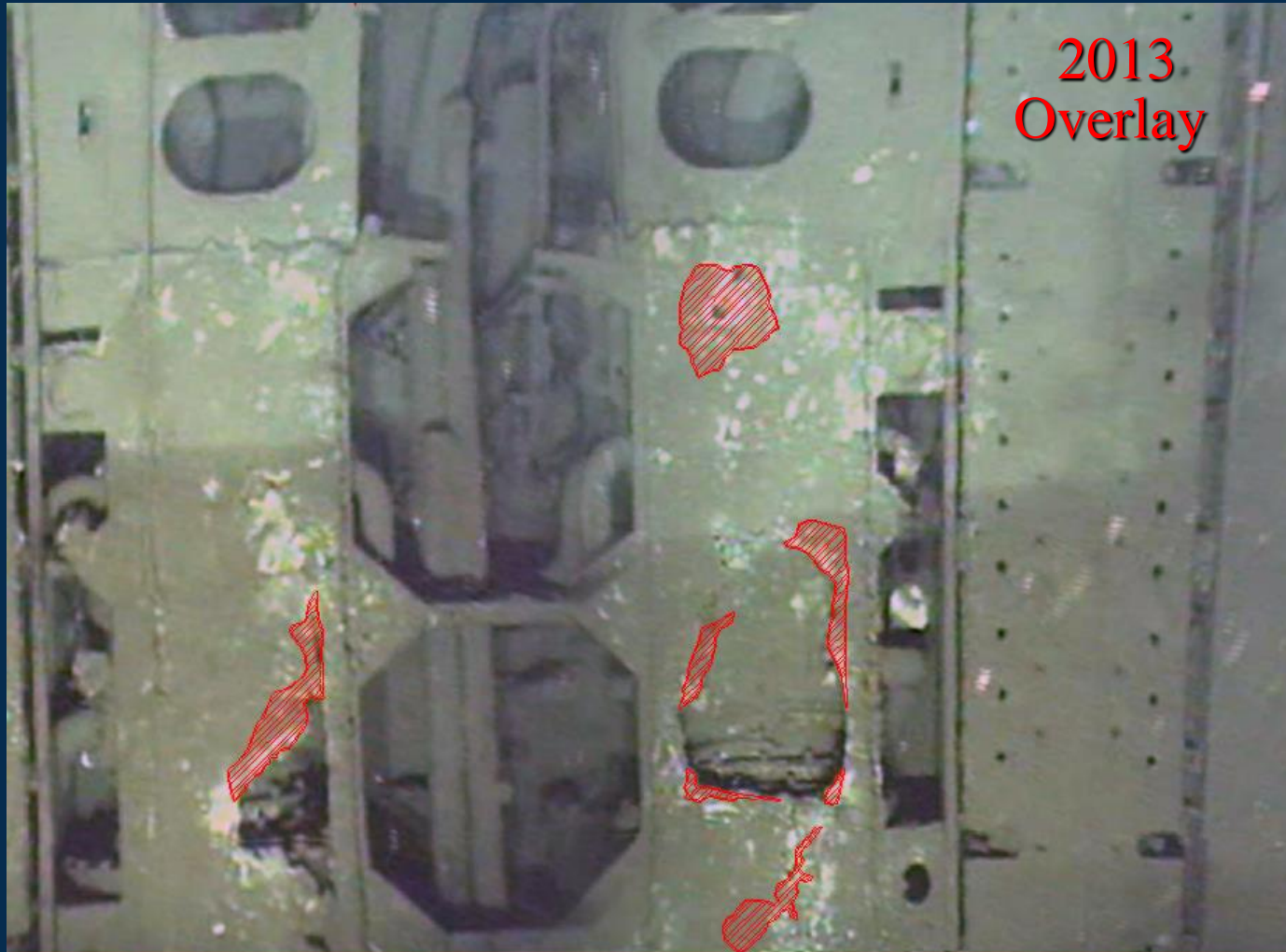
Analysis
2003

2013

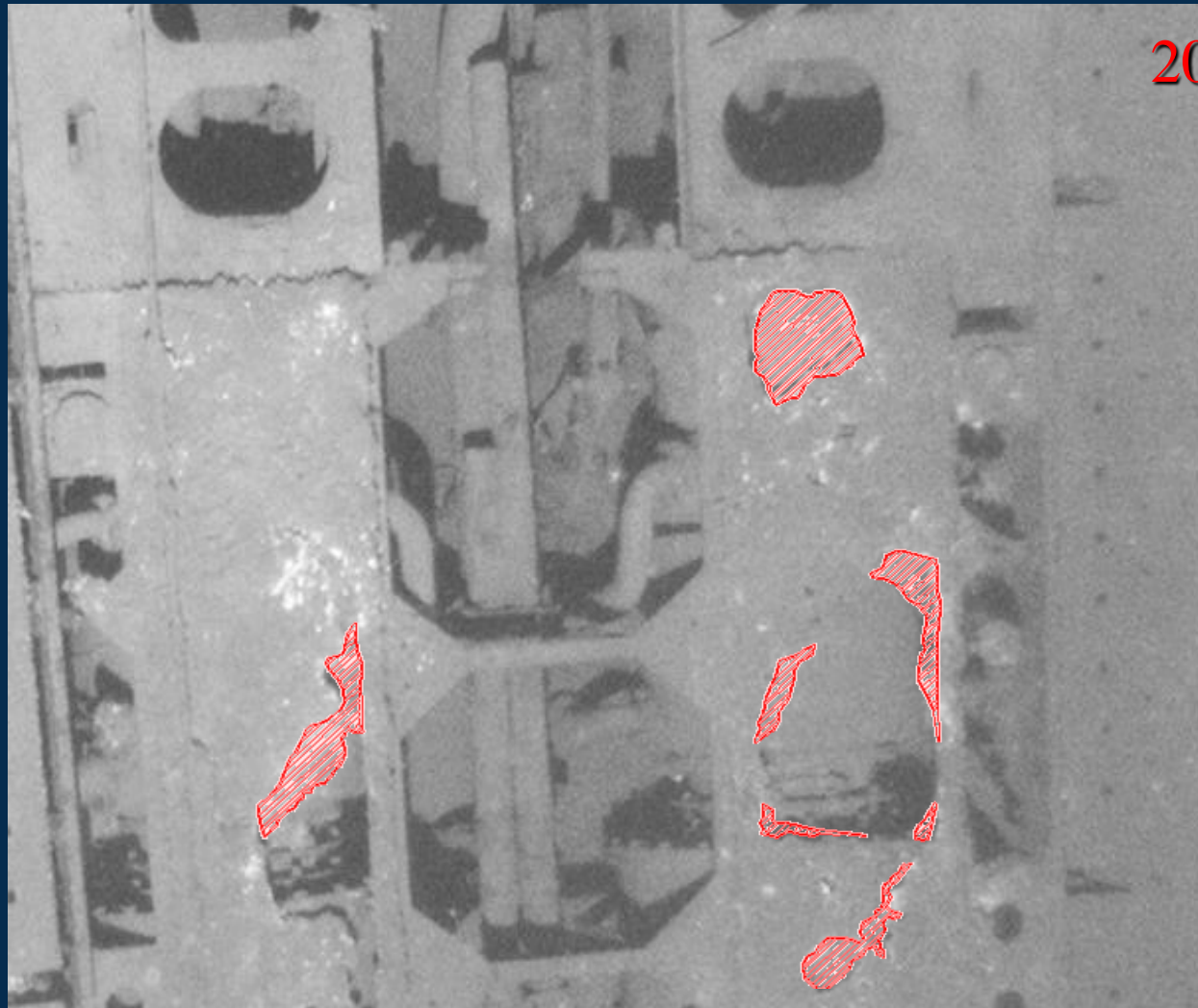


2003-2014: SCHEMA Project

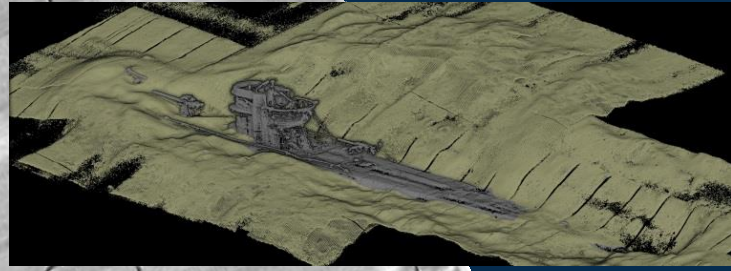
Analysis 2003



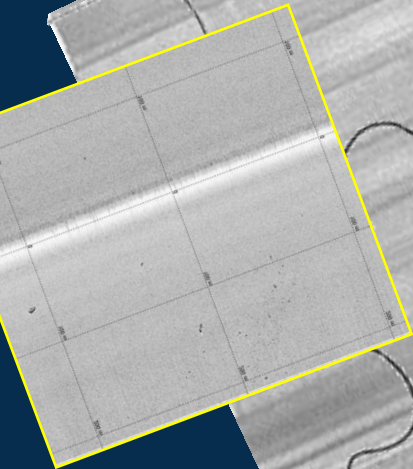
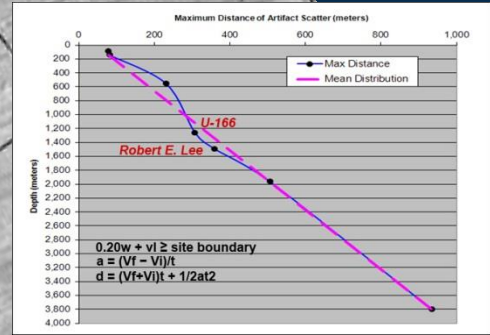
2003-2014: SCHEMA Project Analysis



2013



Conclusions



PC 566

Confidential

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Aug. 9, 1985

Front: The above information is for the use of the Navy, the Department of Defense, and the Department of Energy.

Subject: Atomic and nuclear activities which occurred on the island of Bikini and other islands in the Marshall Islands.

References: (a) The above information is for the use of the Navy, the Department of Defense, and the Department of Energy.

1. This information is for the use of the Navy, the Department of Defense, and the Department of Energy. It is classified "Confidential" because it contains information that is not generally known and its disclosure could be of value to the United States.