



Search for Cargo Vessel EI FARO

In support of NTSB

SUPSALV Overview

Underwater Ship Repair

(N97 & Customer Funded)

- ❑ Procedures/Technology Development
- ❑ Ship Design for Underwater Repair
- ❑ Up to 7:1 Return on Investment



Search & Recovery (N97 & Customer Funded)

- ❑ Air France Flight 447
- ❑ Space Shuttle Columbia & Challenger
- ❑ Ehime Maru
- ❑ Cargo Ship El Faro (NTSB Customer)
- ❑ DARPA/SSP Special Projects
- ❑ Malaysian Airlines Flight #370



Salvage, Towing, & Heavy Lift

(N97 & Customer Funded)

- ❑ Disaster Relief: Hurricane Sandy, Haiti Earthquake, Japan Tsunami, Hurricanes Katrina & Rita
- ❑ USNS SGT MATEJ KOCAK Grounding
- ❑ Refloating and Salvage of the Ex-SHADWELL
- ❑ USS GUARDIAN (MCM 5)

Oil Spill Response (N45)

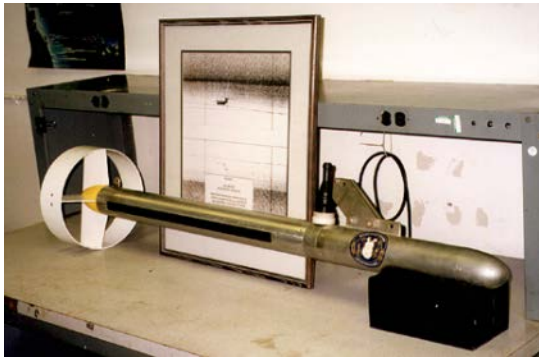
- ❑ Deepwater Horizon Oil Spill
- ❑ Ex USS CHEHALIS Fuel Removal
- ❑ Hurricanes Katrina and Rita
- ❑ Operation Iraqi Freedom
- ❑ USS MISSISSINEWA Oil Removal
- ❑ Large Inventory Sized to Act as Tier II/III OSRO for Navy Ships/Facilities
- ❑ Emphasis on Transportability in Austere Environments

Diving/Certification (N97)

- ❑ Saturation Diving Capability
- ❑ Navy Experimental Diving Unit
One of a kind in the world
- ❑ USN Lead Service for Diving
- ❑ USN Diving Manual & Decompression Tables used worldwide
- ❑ Equipment Dev & Procurement
- ❑ Certification Authority for all DoD



SUPSALV Search & Recovery Systems



Shallow Water Intermediate Search System (SWISS)
Depth - 7,000 ft



FADOSS 60-Kip
Ship Motion
Compensator



Orion21 Side Scan
System
Depth - 20,000 ft



Towed Pinger
Locator (TPL)



Magnum ROV
Depth - 8,000 ft



Deep Drone ROV
Depth - 8,000 ft



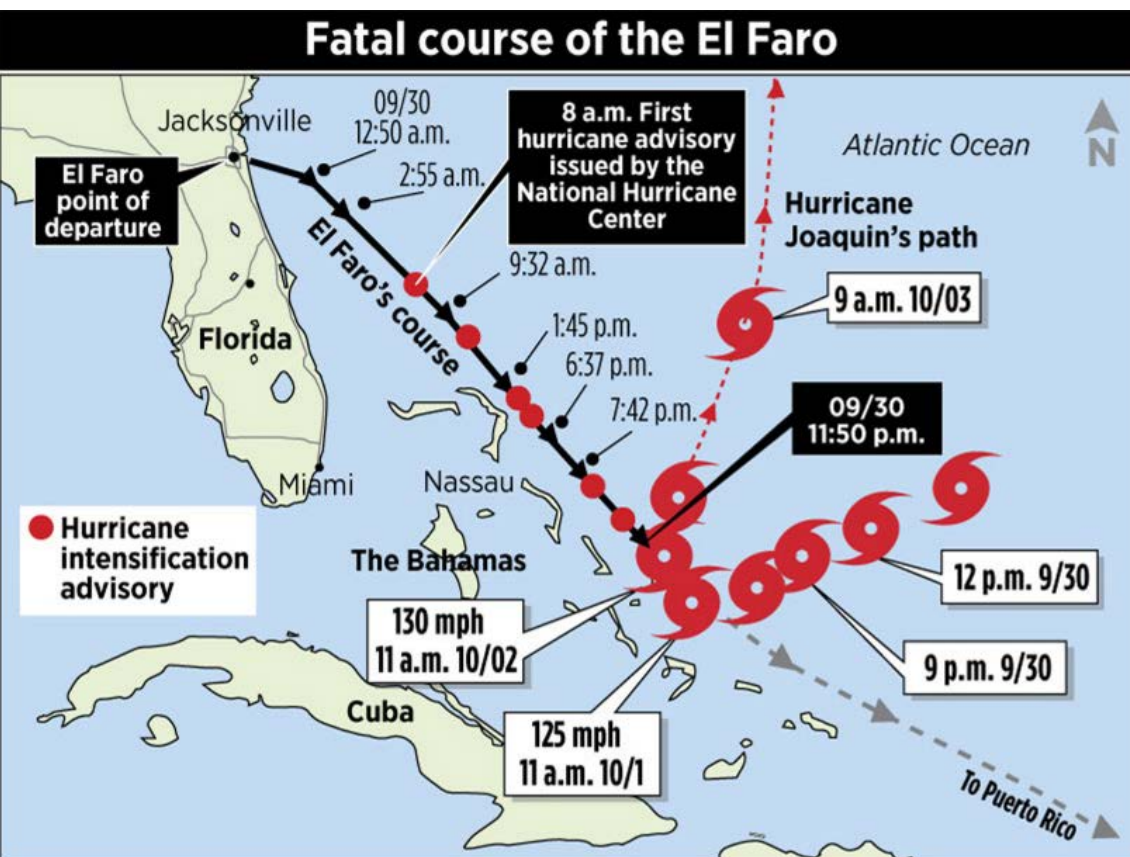
MR2 HYDROS
Depth - 5,000 ft



Cable-Controlled
Underwater
Recovery Vehicle
(CURV) 21 ROV
Depth - 20,000 ft

El Faro Background

- 30 Sep 2015: C/V El Faro set sail (Jacksonville, FL to Puerto Rico)
- The vessel's track crossed the path of Hurricane Joaquin
- 1 Oct (morning): the vessel and entire 33 person crew were lost



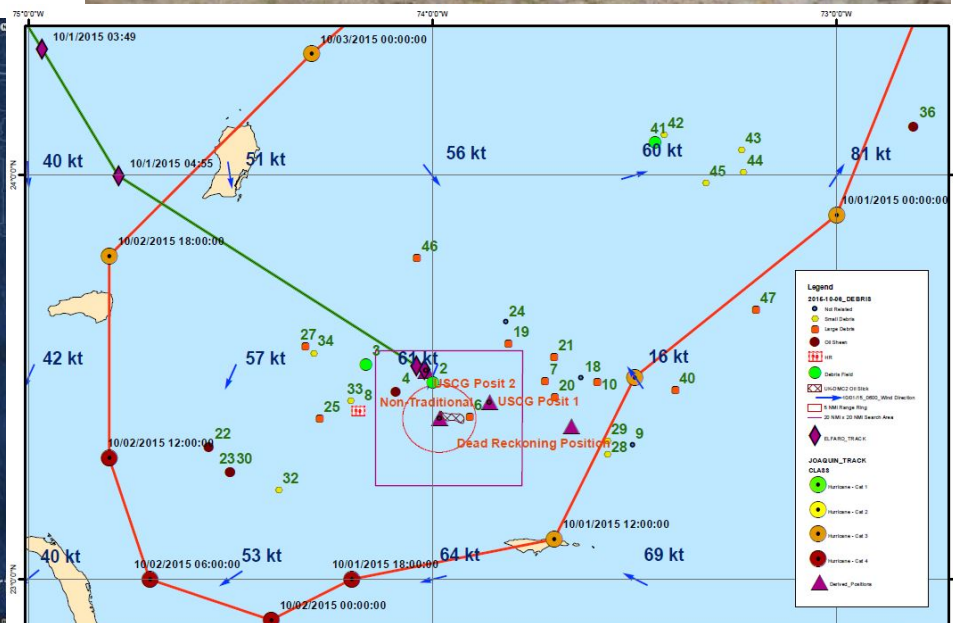
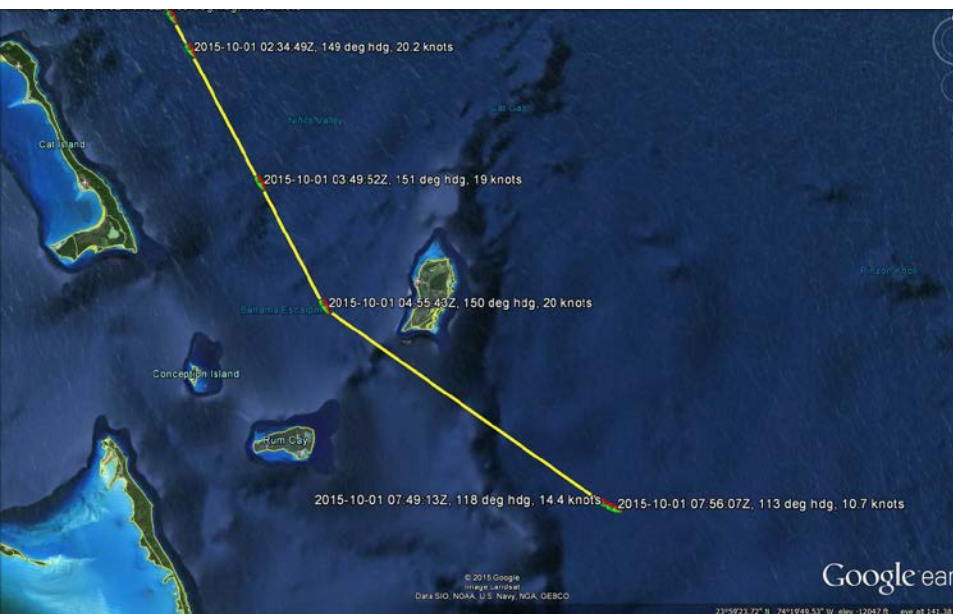
Track of El Faro and Hurricane, sourced from Portland Press Herald website.

C/V El Faro crew, sourced from CNN website.

Distribution Statement A: Approved for public release, distribution is unrestricted.

SUPSALV Tasking

- 9 Oct: NSTB requested US Navy & SUPSALV support to assist in the accident investigation
- Tasking:
 - Perform sonar search for the vessel
 - Perform video survey of debris field
 - Retrieve El Faro Voyage Data Recorder (VDR)





Phase I: Vessel Mobilization

USNS APACHE was outfitted in Little Creek with:

- TPL, Orion SSS, and CURV ROV
- Embarked 20-riders:
 - NTSB, USCG, TOTE Marine, ABS
 - (12) Phoenix, (2) SUPSALV
 - Corpsman, Combat Cameraman

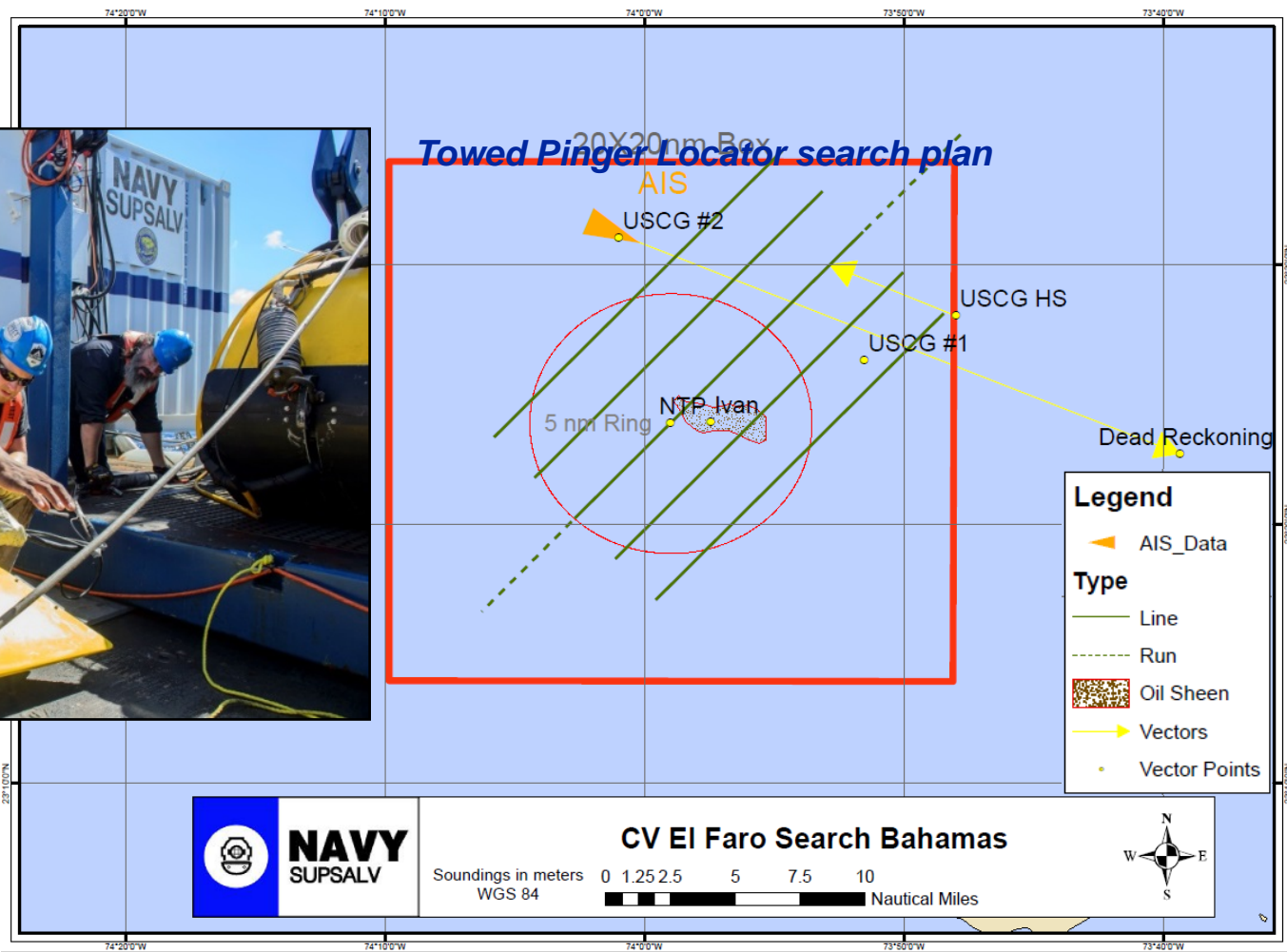


Towed Pinger Locator Search

- 23 – 27 Oct: TPL deployed
- 5 lines run, no signal from VDR acoustic pinger heard



Technicians prep the TPL for going over the side

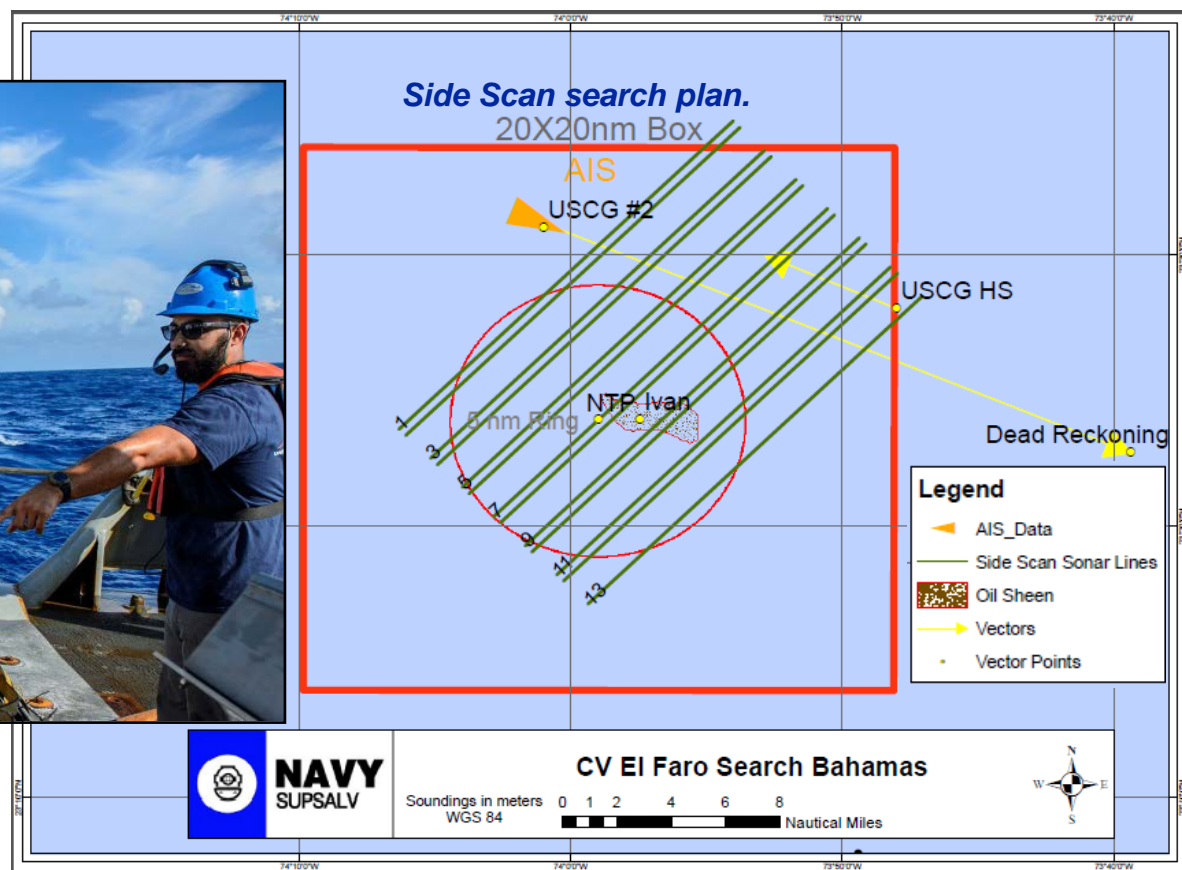


ORION Side Scan Sonar Search

- 27 Oct – Side scan search begun
- 31 Oct – Target detected on the 5th search line
- Location – eastern edge of the satellite identified oil slick

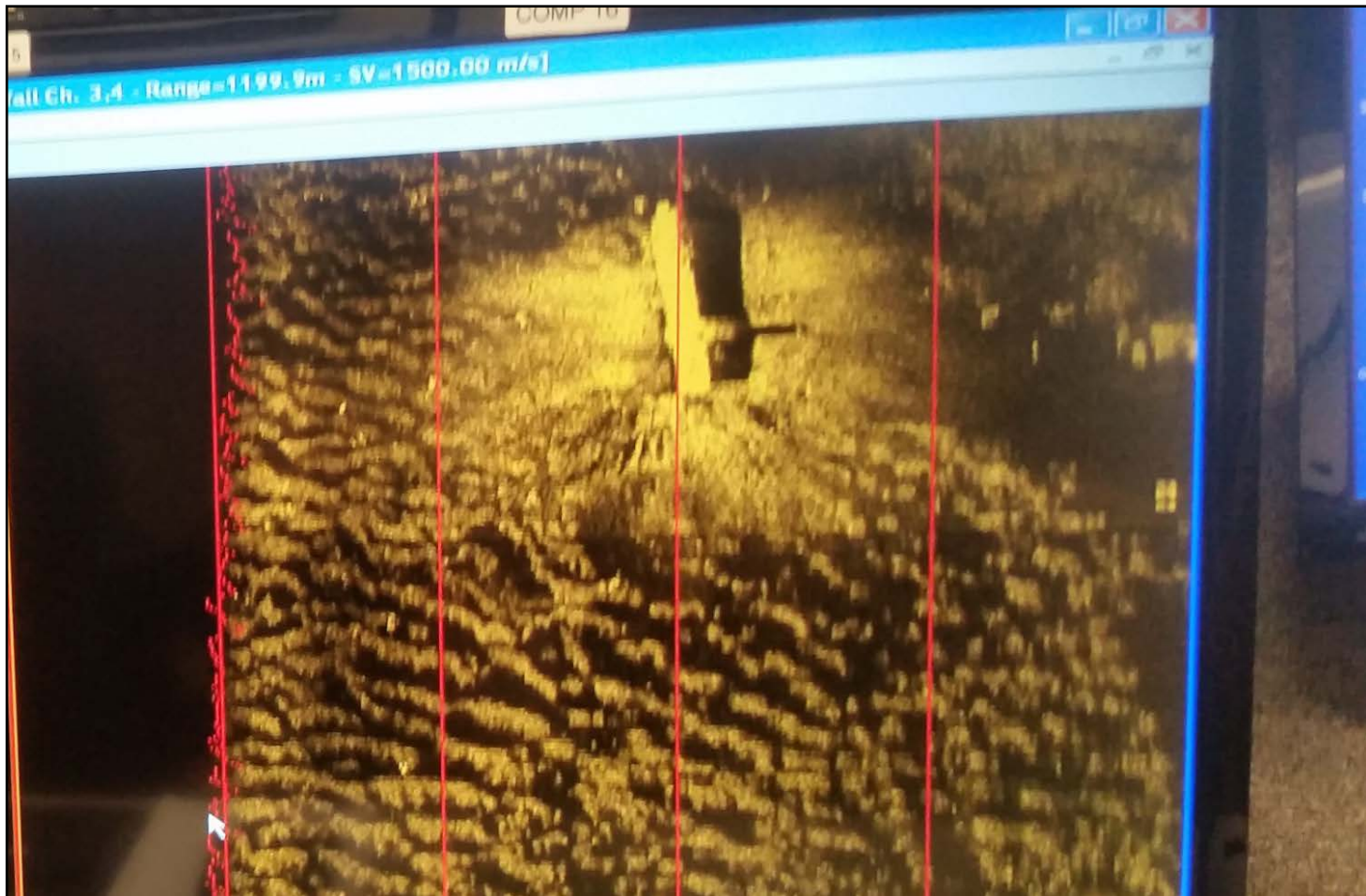


Team recovering Orion



El Faro Contact

- First sonar contact of the El Faro
- Vessel appeared intact and fairly upright



CURV21 ROV Inspection

- **CURV deployed Nov 1st to perform an inspection:**
 - **El Faro positively identified**
 - **Entire hull & structure were documented by video**
 - **Bridge & senior officers decks were completely missing**
 - **No signs of the missing decks, mast or VDR**



Bridge Deck Found

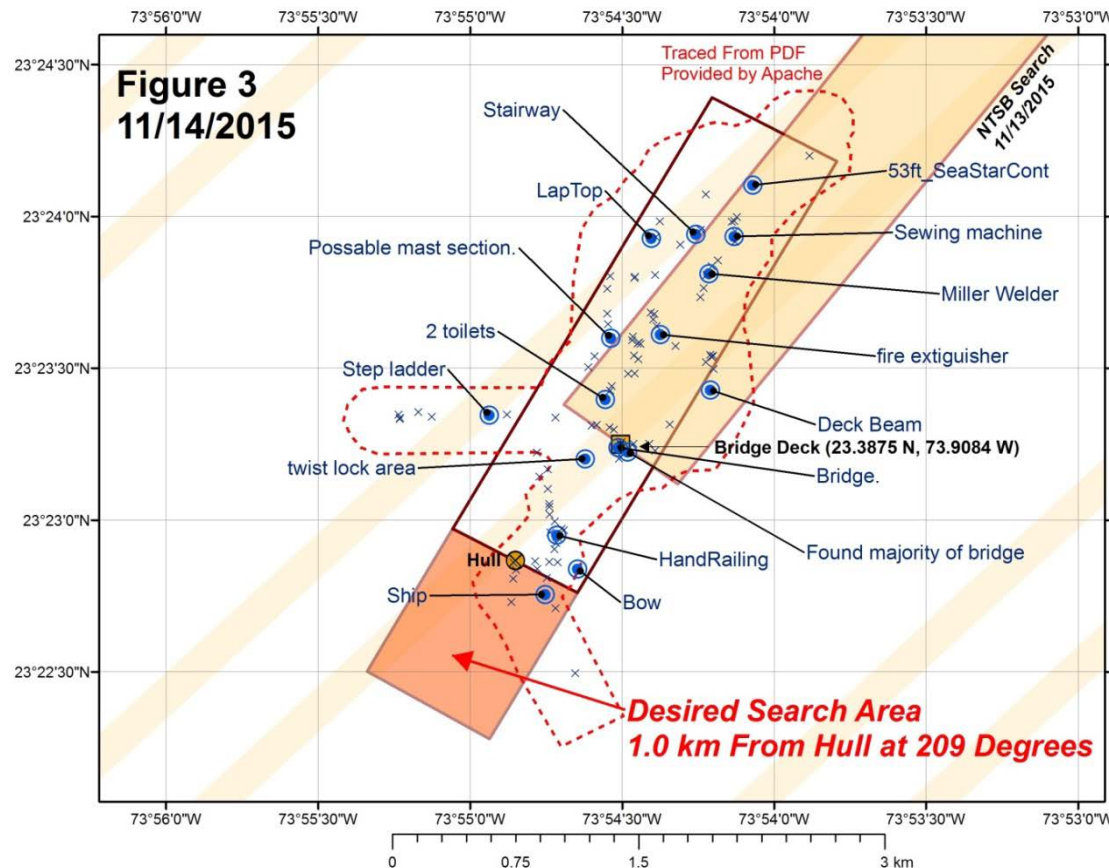
- **2 – 11 Nov: Continued search for the wheelhouse, mast and VDR alternating between CURV and Orion (depending on weather)**
 - **Bridge section found north of the hull.**
 - **VDR and mast still missing – torn from Bridge**



Search Suspended

- 12 – 15 Nov: Continued searching for the VDR with the CURV ROV
- An area 3.5-nm x up to 1-nm was searched
- The decision was made to suspend this phase of the El Faro search

VIDEO



Phase-II: WHOI Search

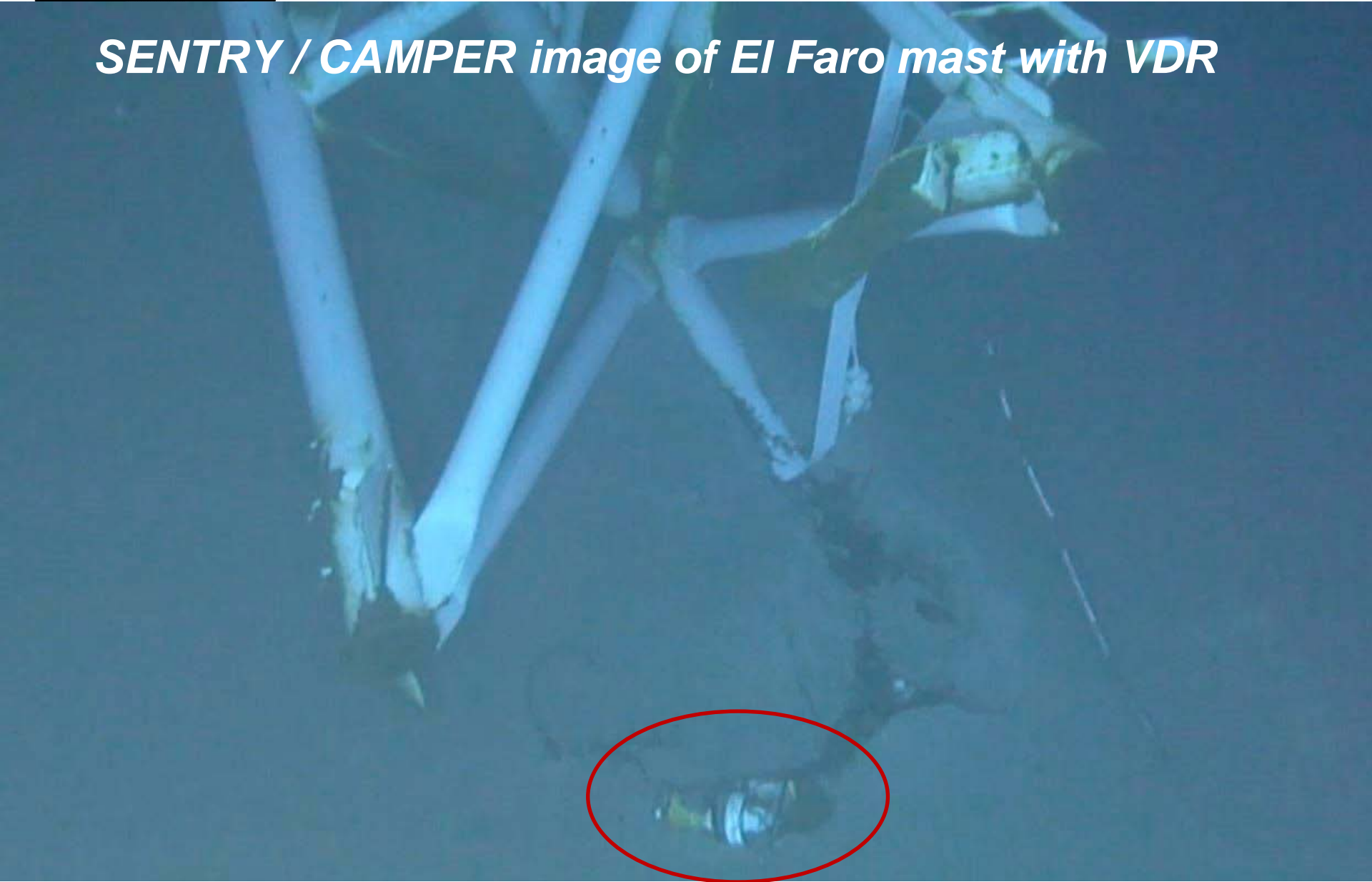
“A search area of approximately 35 square kilometers (13.5 square miles) will be photo- and video-documented by SENTRY, an autonomous underwater vehicle (AUV) that will be launched from the research vessel Atlantis, which is owned by the U.S. Navy and operated by the Woods Hole Oceanographic Institution (WHOI). SENTRY can work at depths of nearly 20,000 feet and can be equipped with a wide array of sonar, camera and other sensors.”

From the NTSB on 11 Feb 2016



Phase-II: WHOI Search

SENTRY / CAMPER image of El Faro mast with VDR



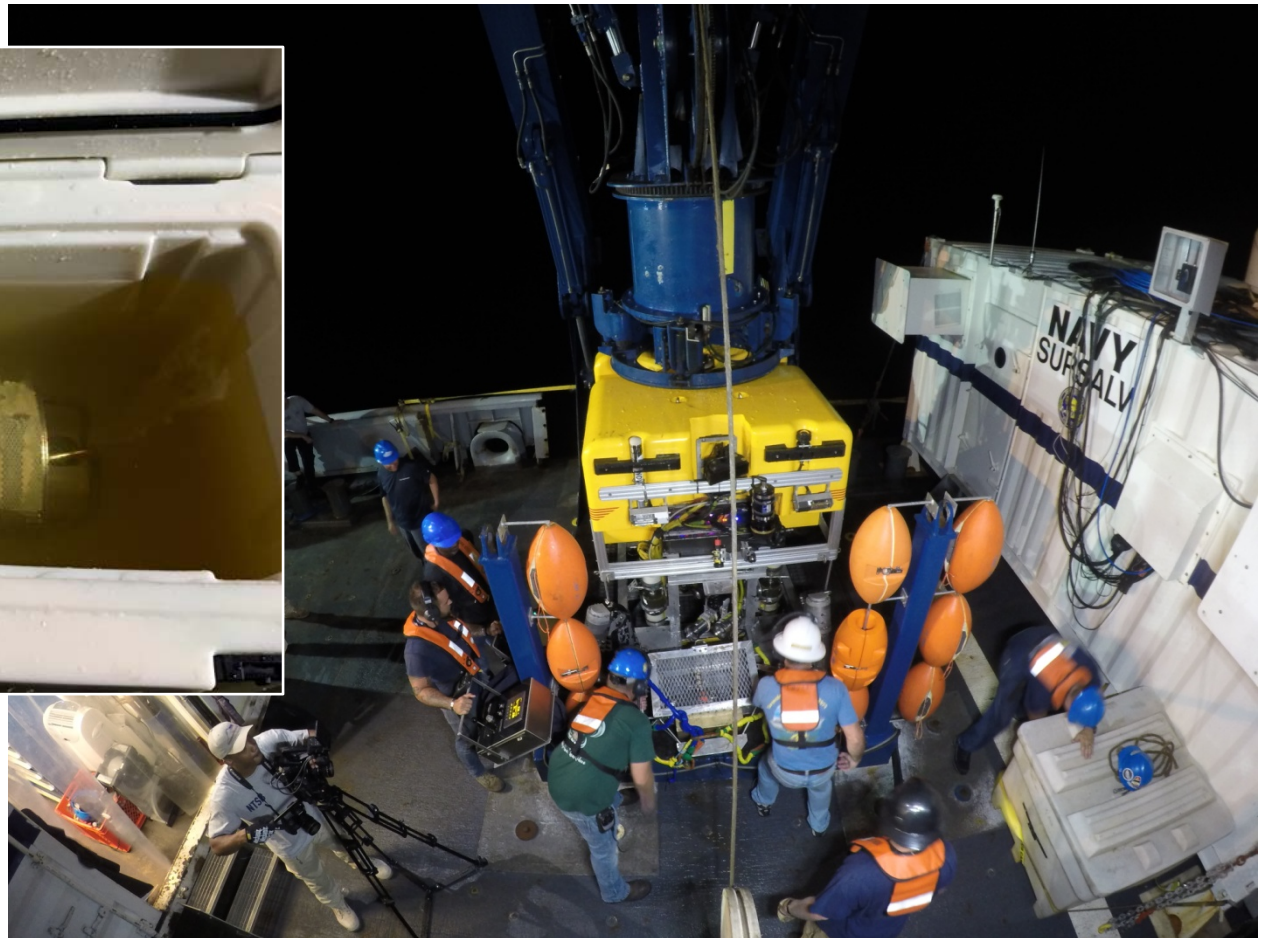
Phase-III: VDR Recovery

- ***SUPSALV deployed aboard the USNS APACHE a second time in August 2016:***
 - 2-5 Aug: Vessel mobilization in Little Creek Va.
 - 5-7 Aug: Transit to site.
 - 8-9 Aug: CURV ROV operations.
 - 10-12 Aug: Transit to Mayport FL (mission complete).
- **Systems: CURV21 ROV without the Orion SSS**
- **15-person team: (3) NTSB, (1) USCG, (1) SUPSALV, (10) Phoenix**



VDR Recovery

- ***After a 10 hour dive down to 15,500 FSW, CURV recovered the El Faro VDR which was transferred to NTSB custody on 8/8/2016.***



El Faro Hull inspection

- *Completed a detailed high resolution video survey*



Mayport Return

- ***NTSB held a pier side press conference upon reaching port***



26-hours of “exceptional data” recovered from the VDR

Questions?

