

Woods Hole Oceanographic Institution



Woods Hole Oceanographic INSTITUTION

WHOI: Advancing Knowledge about the Ocean

- Mission: to advance and communicate our knowledge of the ocean
- How do we do this?
 - ▣ Attract great ocean scientists and engineers
 - ▣ Provide the resources
 - ▣ Respond and adapt to change
 - ▣ Ask questions, find solutions
 - ▣ Collaborate and lead



WHOI by the Numbers

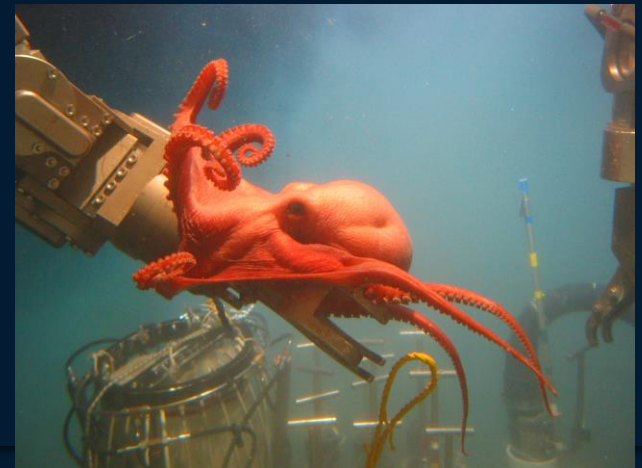
- ❑ Founded in 1930
- ❑ 2 campuses
- ❑ 6 academic departments
- ❑ 1000 employees and 400 affiliates
- ❑ \$225,000,000 annual turnover



WHOI Characteristics

- Independent
- Non-Profit
- Entrepreneurial
- Agnostic
- Focus on science, engineering, operations and education
- Globally recognized brand

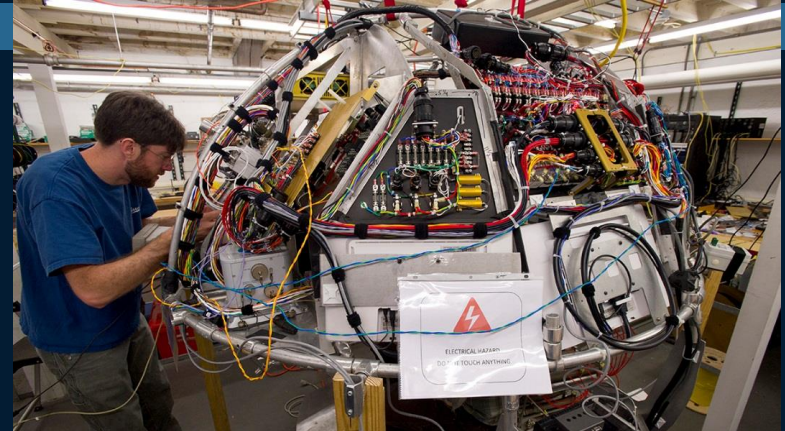
We are hands-on and seagoing



Core Strengths



Research



Engineering



Education



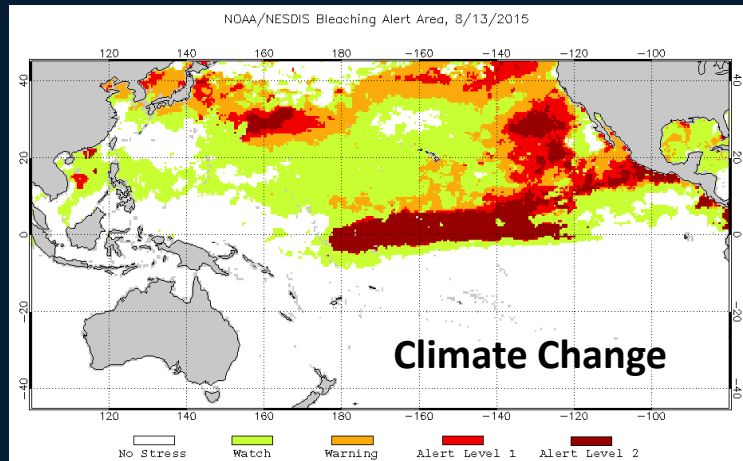
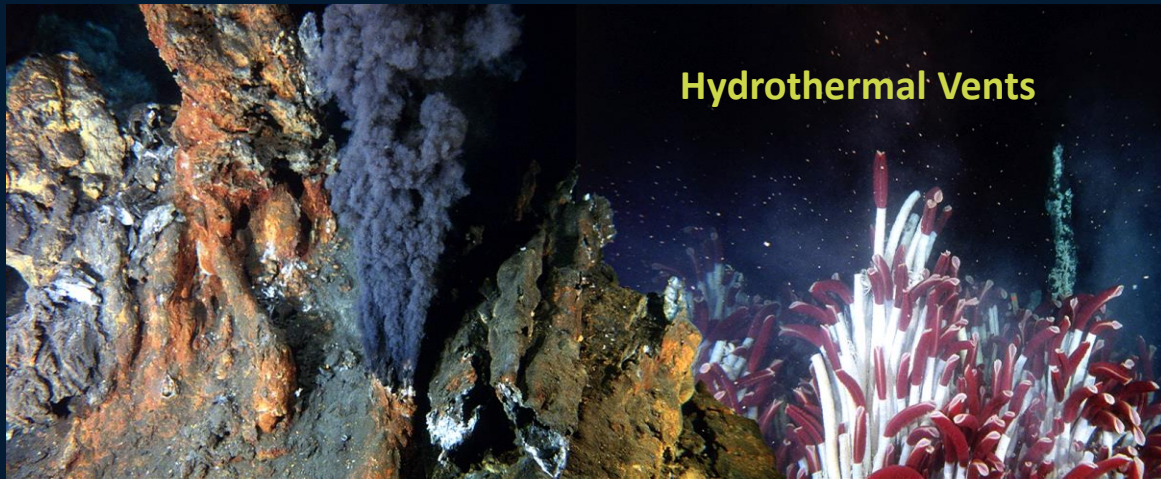
Operations

WHOI Business Model

- “Soft” money; preponderance of the budget is “at risk”
- Funding primarily from competitively awarded grants from US federal agencies
- Joint PhD Program with MIT
- Contracts for major programs, vessel and vehicle operations
- Other funding from foundations, private philanthropy and industry



Basic Research



Major Programs

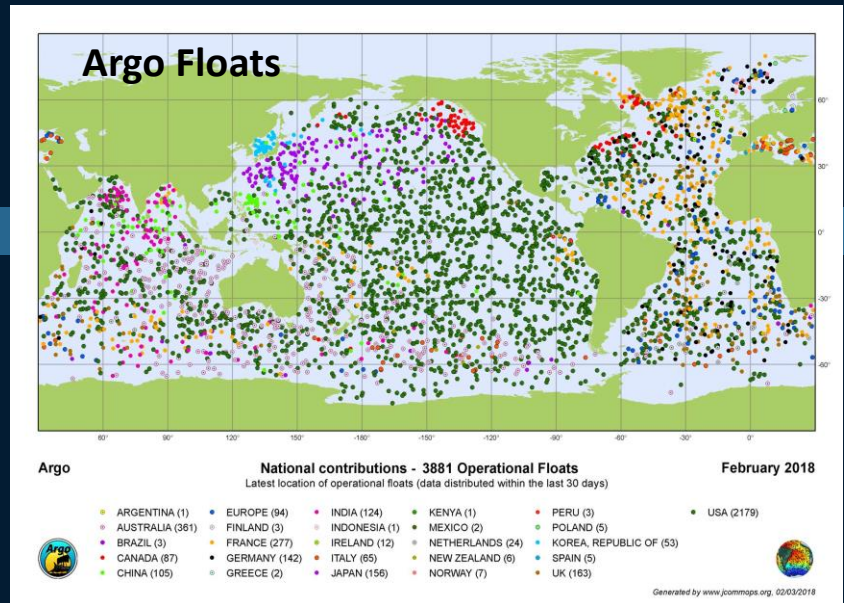


Ocean Observing Initiative



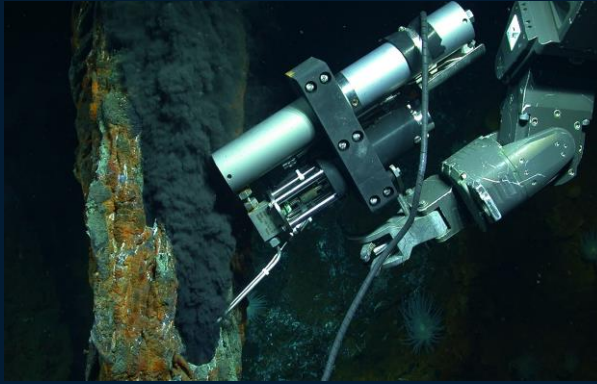
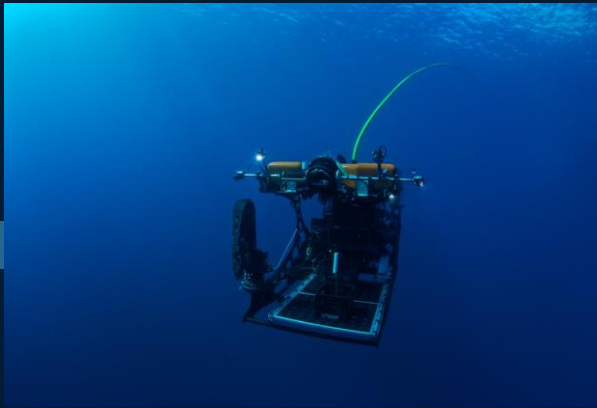
Twilight Zone

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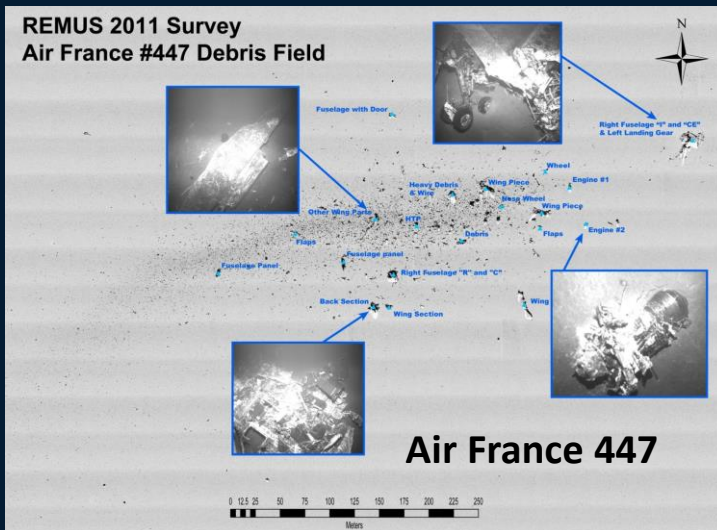


Global Rivers Observatory

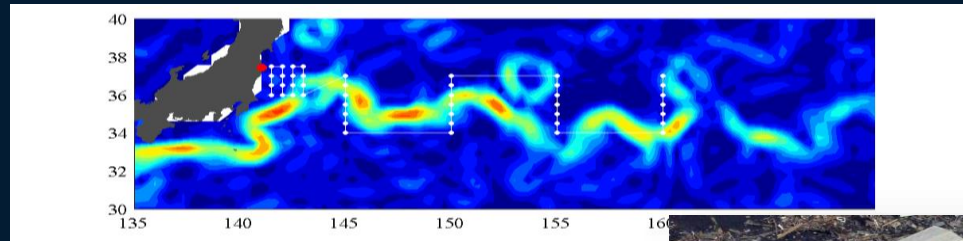
Technology



Response to Emerging Events



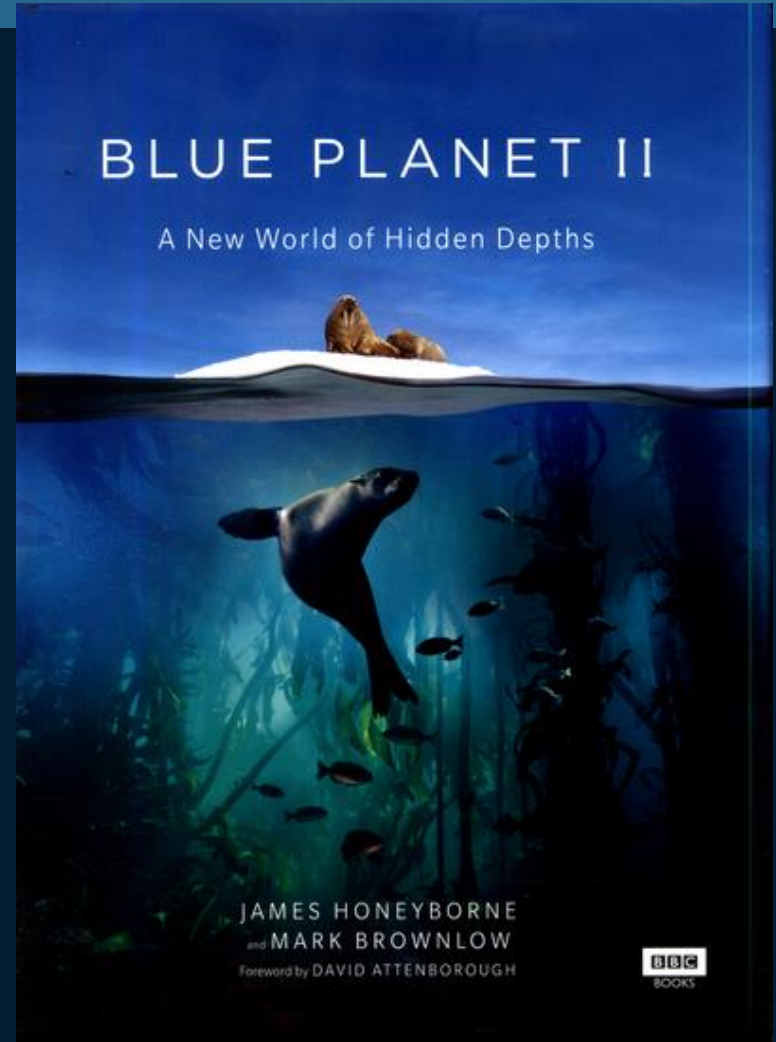
Container Ship *El Faro*



Fukushima

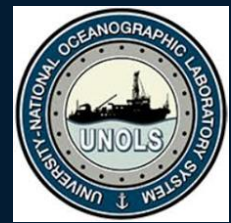


Outreach and Exciting the Public





R/V Atlantis



- US Navy ONR
- WHOI bareboat charter
- Home port: Woods Hole, MA
- US Academic research fleet
- UNOLS oversight

- OP AREA Eastern Pacific, Atlantic
- HOV Alvin mothership
- Vents, general purpose oceanography, OOI
- Mid-Life 2020-2021





R/V Neil Armstrong



- US Navy/ONR owned
- WHOI bareboat charter
- Home port: Woods Hole, MA
- US Academic research fleet
- UNOLS oversight
- OP AREA North Atlantic
- General purpose oceanography; OOI



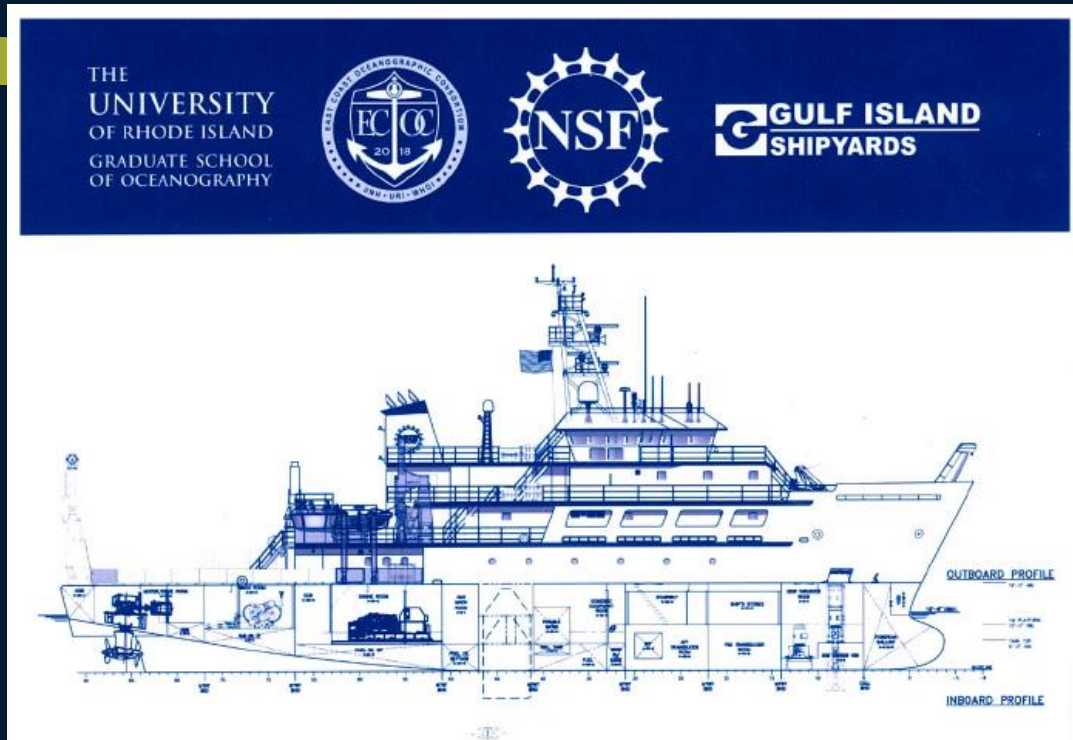
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R/V *Tioga*

- **WHOI-owned**
- **Home port: Woods Hole, MA**
- **Coastal research**
- **Education**
- **Internal (WHOI) and external users**
- **Repowered 2019**



East Coast Oceanographic Consortium (ECOC)



Regional Class R/V *Resolution*

- URI UNH WHOI
- URI as lead operator
- Joint planning, scheduling
- Technical support
- Ship time
- Associate members

M/V *Alucia*



- Owned by OceanX
- WHOI bareboat charter
- Science & Media
- Global operations since 2012

National Deep Submergence Facility



Alvin – 4500m HOV



Jason – 6500m ROV



Sentry – 6000m AUV

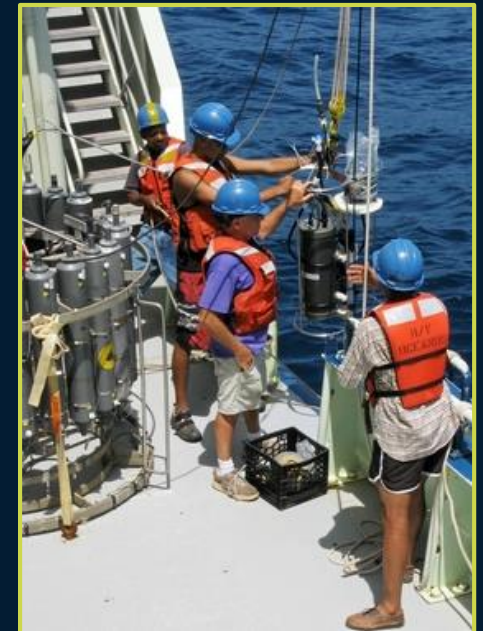
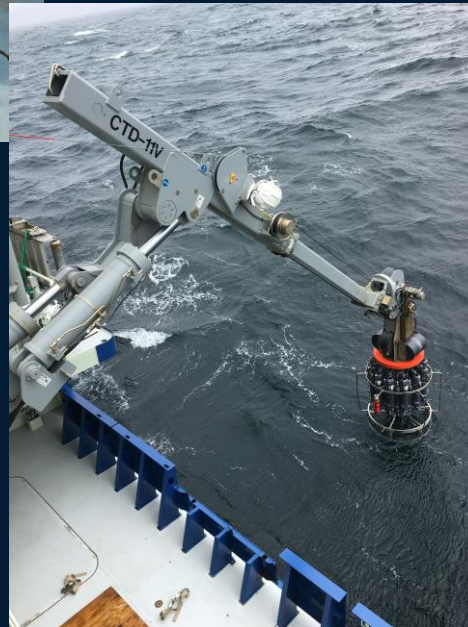
- Hundreds of ops days/year
- Steady funding and operations

- Standard data management protocols
- UNOLS scheduling process

Shipboard Scientific Services Group (SSSG)



- Shipboard technicians
- East Coast Winch Pool
- Scientific equipment
- IT/Communications

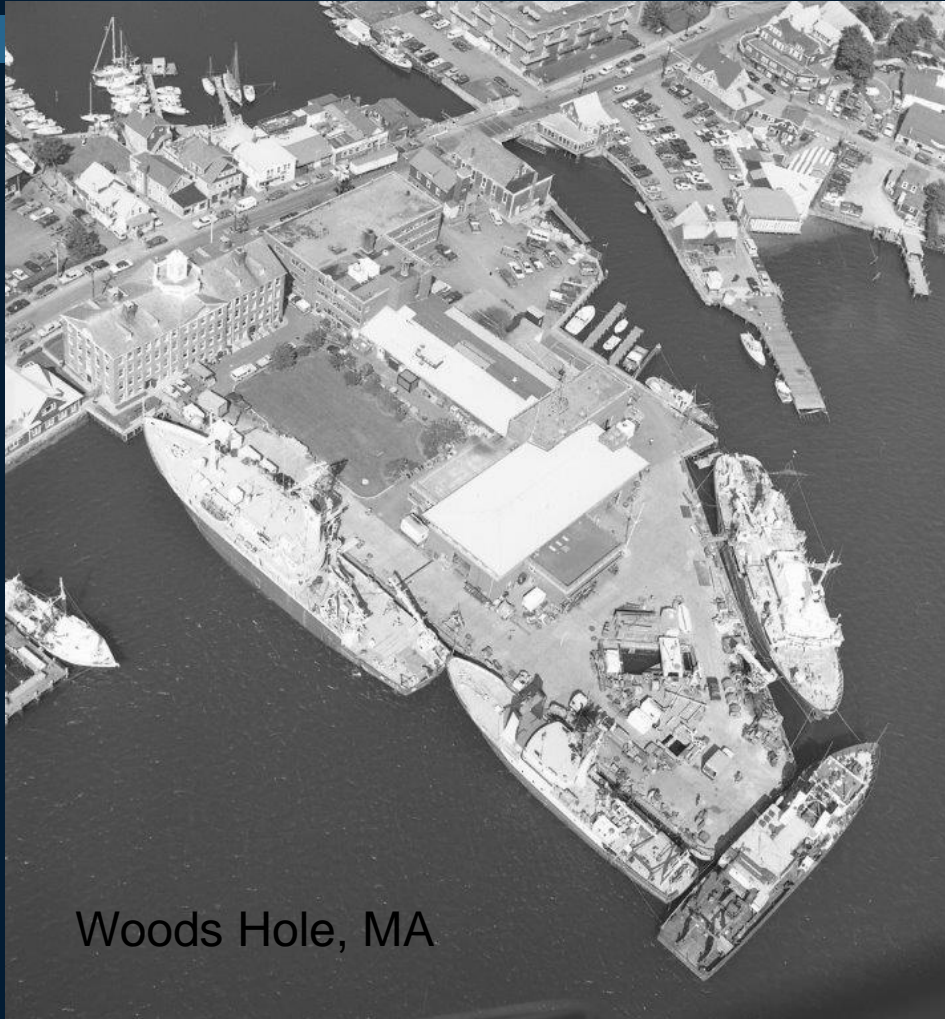


Diving



- AAUS
- Dive safety officer
- 50+ certified divers
- 1200+ dives per year

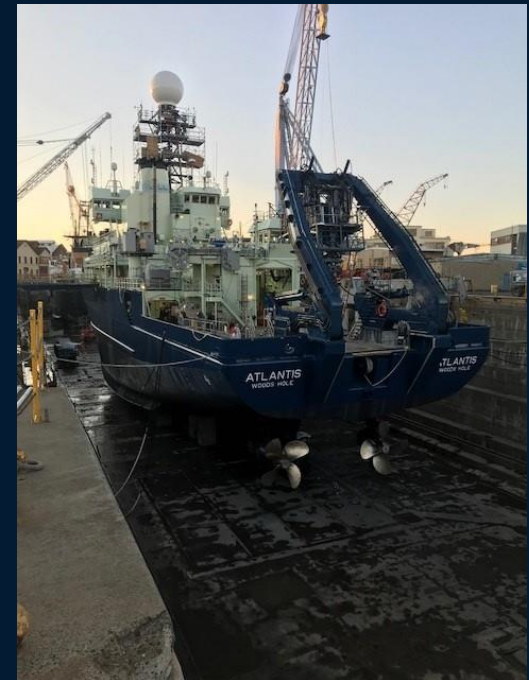
Marine Operations



Woods Hole, MA

Port Office

- Port engineering
- Logistics support
- Fleet Broadband
- Shipyard management
- Scheduling



WHOI Vessel and Vehicle Utilization (days)

Ships	Armstrong	Atlantis	Alucia
2016	187	279	146
2017	232	298	198
2018	252	283	71
2019	226	284	127

Vehicles	Alvin	Jason	Sentry
2016	127	117	139
2017	87	177	132
2018	100	124	99
2019	85	198	100

Projects

R/V *Atlantis* Mid-Life Upgrade



Purpose

- Modernize
- Extend service life

Commercial

- Primary funding by ONR
- Managed by WHOI

Scope

- Repower
- New controls/power mgmt
- New bow thruster
- Upgrade key systems
- EK 80 sonar system

Timing: Mid 2020-Mid 2021

Budget: \$35+ million



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Projects

HOV *Alvin* 6500 M Upgrade

Complete 2018-2019

- Engineering
- Fabrication and testing of syntactic foam blocks, motor controller, salt water pump and thrusters

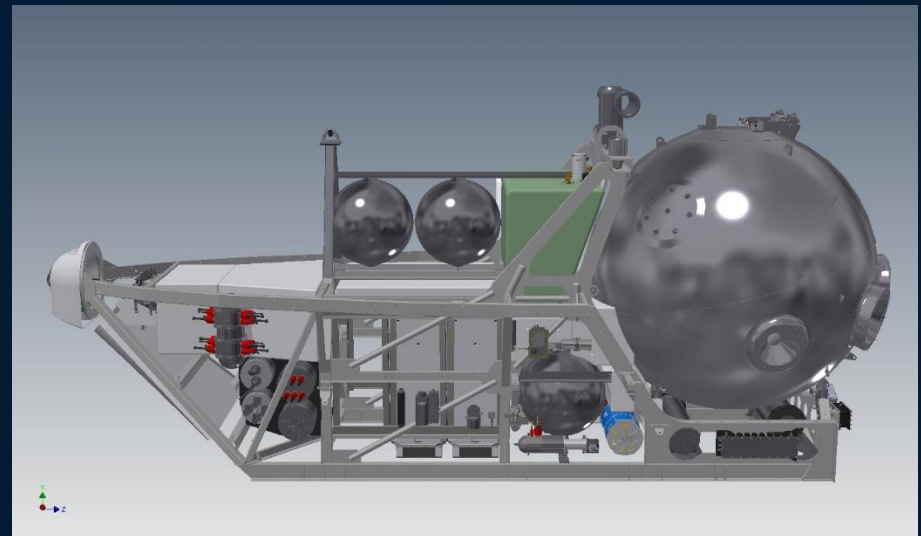
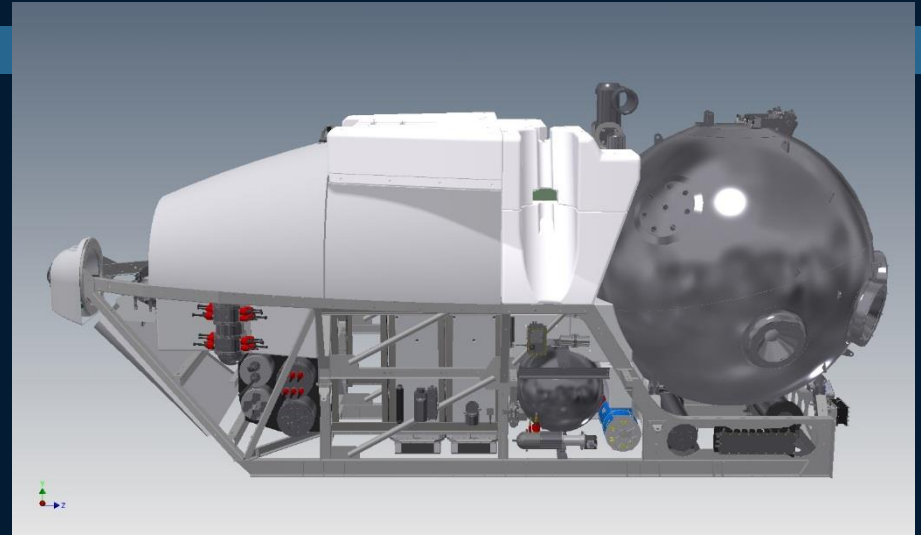
Planned 2019-2021

- Foam shape fabrication
- Ballast sphere fabrication
- Life support system testing
- NAVSEA approval of designs
- Assembly, testing, sea trials
- Science verification

Budget

- Funding \$8.4 million

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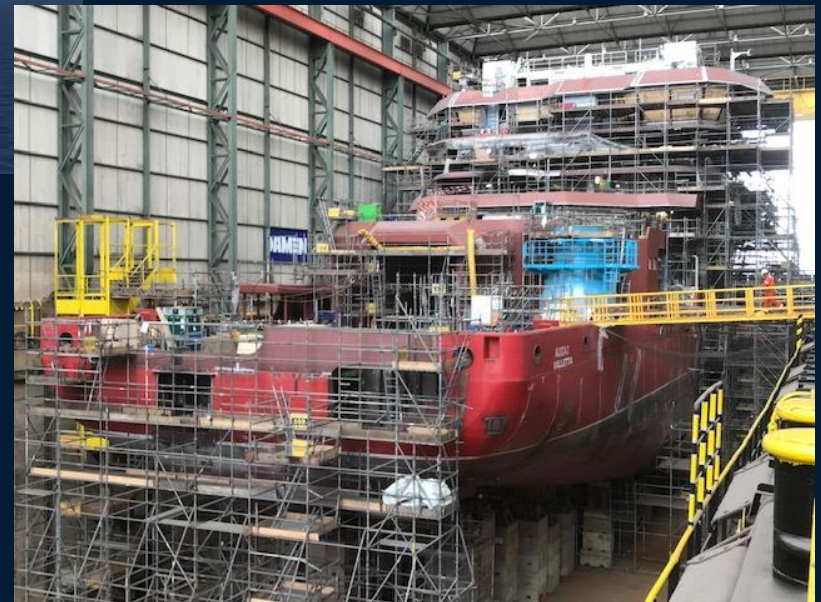
Projects

OceanXplorer¹



- Owned by OceanX
- Ex-Volstad Surveyor
- Conversion at Damen Rotterdam
- WHOI technical support

- Science & Media
- BBC and Discovery Channel series
- Indian Ocean Q3 2020



Complex for Waterfront Access to Exploration & Research



Goal: Rebuild WHOI's waterfront research complex

- New dock and laboratory complex
- Accommodate activities requiring direct access to the sea (ships, AUV labs, test wells, small boats, shop, high bays)
- Resiliency a key design requirement
- Complex to serve WHOI and the greater community
- Feasibility study complete: \$75 million (2018) and 7 years
- Working Phase II planning, design, engagement and permitting

Thank you!

