



ONR Research Facilities

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Agency Update to UNOLS 2021

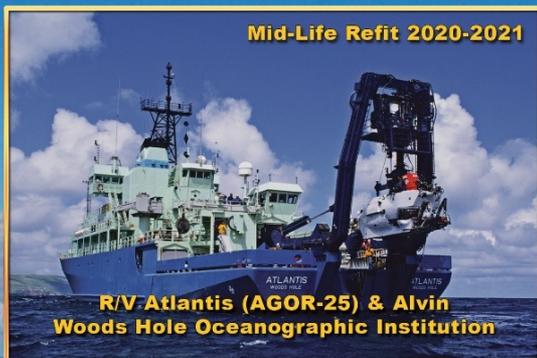
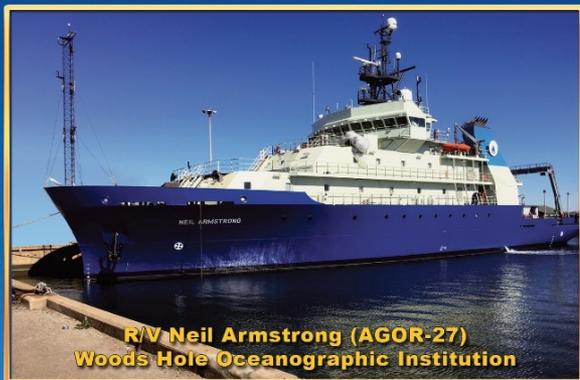
- Navy support to at sea basic and applied research: Stable
- Growth areas: Arctic and Acoustics
- Concern areas: Manpower, Cybersecurity (potential Congressional Add)



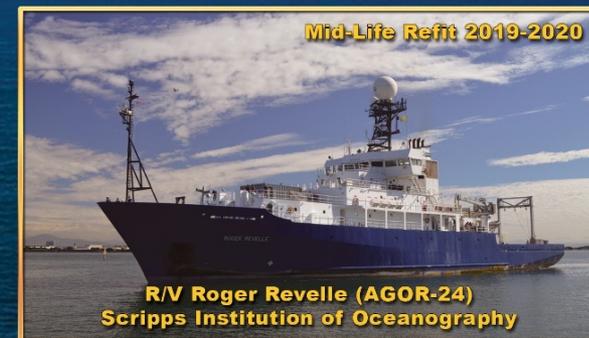
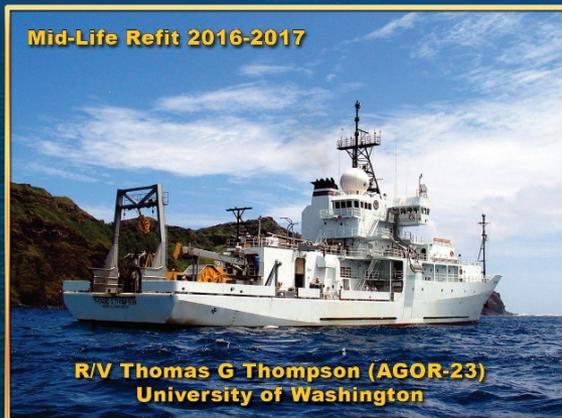
Agency Update to **UNOLS 2035**

- Update/refinement Global Class requirements
 - Add Military Useful Features for servicing remotely/autonomously operated craft to accommodate the Navy's expanding 'unmanned' fleet.
 - Planning 4 ships w/ option for 5th to replace AGOR 23-25 and NOAAS Ronald Brown
 - Consider extended R/V Thompson to 49 years of service smooth new build profile
- Update National/DoD Arctic Strategy based on changes in climatology conditions. Globals enhanced to work in the 'new' Arctic and supplement the Polar Security Cutters and remotely manned craft.
- Added Data Management Science position to coordinate the advances in AI, Big Data, and proliferation of unmanned systems, cube-sat, buoys, and data from systems installed on commercial vessels that provide oceanographic data. Supports UNOLS committee on Data Management
- Added Strategic Sealift Officer Reserve billets and Navy funded ETO's to new Global Requirements to address continuing Cyber challenges.
- Strategic Sealift Officers also trained as liaisons/observers for foreign research vessels working in US EEZ: leverage efforts of international performers.
- DSV Alvin completes dive 6000
- Planning "midlife" refits of Ocean Class after Congress approves of Global
- US Academic Research Fleet formally designated in US Law icw National Oceanography Partnership Program re-authorization bill

NAVY VESSELS OF THE U.S. ACADEMIC RESEARCH FLEET



- **Global reach - 2-year missions**
- **Ships operate 280-300 days/year**
- **Science teams rotate to ship for 18-25 day projects**
- **Daily operations costs paid by research agency (e.g., National Science Foundation, Navy, NOAA, USGS, DOE)**
- **Crewed by professional mariners and university employees**





ONR Research Fleet; DSV-2 ALVIN



Deep Submergence Vessel – ALVIN (1964)

- Woods Hole-built, operated and maintained as part of **National Deep Submergence Facility**
- NAVSEA-certified, ONR, Owner and Navy Program Manager
- NSF funds major use, overhaul and upgrade
- Ongoing upgrade to 6500m; completion Late-Fall 2021

NPS-CIRPAS Twin Otter Metrological Research Aircraft

NPS Center for Interdisciplinary Remote Piloted Aircraft Studies (CIRPAS) Airborne Research Facility



- **Primary Mission (80%):**
 - To meet ONR’s ongoing need for specialized, instrumented research aircraft to conduct atmospheric and oceanographic measurements for “innovative basic and applied research in the broad thrust areas of atmospheric prediction, atmospheric effects, air-sea interaction, (and) marine boundary layer processes”¹.
- **Secondary Mission (20%):**
 - Airborne research support to broader community: NASA, NOAA, NSF, DOE, Army, Air Force

In-house Instrumentation



Cabin: Nephelometer, Sootphotometer, CPCs, UFCPC, Data System Racks for ‘Research’ and ‘Guest’ Instruments. Satcom system



Wings: CAPS, FSSP, PCASP, CIP, PIP ... Hard points and pods for ‘research’ or ‘guest’ instruments



Nose: Temperature, Dew Point, Pressure (Static, Dynamic Sideslip Attack angle), GPS/INS, IR Temperature, Liquid Water Content, Aerosol Inlet

1. From the ONR Marine Meteorology and Space webpage (<https://www.onr.navy.mil/Science-Technology/Departments/Code-32/all-programs/marine-meteorology-space>)



Transitioning Data into Knowledge: Means, Ways, and Ends Model

Means: Research Vessels other sensors, tools and platforms

Ways: UNOLS, NOPP, community of Interest

Ends: Oceanographic Data

Support functions

Geostrategic Setting:
Scientific Diplomacy
STEM Education
AI, "Big Data", MetaData
Multi-disciplinary
Collaboration
International Data
Database Management

Is there a gap? Does this area require specialized skillset?

Means: Analytical Data

Ways: Basic/APPLIED Research Techniques

Ends: Basic/APPLIED Research Knowledge

Basic and Applied Research Programs



49 Vessels
8,383 Cruises
40,233 Data Sets



ONR Research Fleet; Local & Global Reach

Each year 7th Grade Students from a Title 1 school visit USCD-SIO ships. In 5 year period, USCD-SIO submitted 105 Foreign Clearance request in 29 countries. Roger Revelle first U.S. R/V to visit Vietnam since the war.



Argentina	Australia	Cook Island	Ecuador
France	French Polynesia	Fiji	Galapagos
India	Indonesia	Japan	Kerguelen
Kiribati	Mexico	Micronesia	Marshall Islands
New Zealand	Nauru	Philippines	Papua New Guinea
Palau	South Africa	Samoa	Solomon Islands
Taiwan	Tonga	Tuvalu	Thailand
UK/Falklands	UK/Gough Island	Vietnam	Western Samoa