Fleet Renewal

Global Class Ships
- Marcus G. Langseth
- Sikuliaq

Ocean/Intermediate Class Ships
- Kilo Moana
- Neil Armstrong
- Sally Ride

Regional Class Ships
- RCRV1
- RCRV2
- RCRV3

2025 2020
Fleet Renewal
Kilo Moana
Marcus G. Langseth
Sikuliaq
RCRV2
RCRV3
RCRV1
Neil Armstrong
AGOR 28

Academic Research Fleet Renewal is part of long-term UNOLS community planning.

RCRVs have been envisioned for 20 years!
**RCRV: The Project**

- The RCRVs are being funded by NSF’s Major Research Equipment and Facilities Construction (MREFC) account that supports the acquisition, construction, and commissioning of major research facilities and equipment that provide unique capabilities at the frontiers of science and engineering.
- Initial planning, design, and shipyard selection were funded through NSF’s Research and Related Activities (R&RA) account (this account also supports ship operations).
- OSU selected as lead for the project in December 2012.
RCRV: The Politics

- FY17 appropriations provided $121.88 M toward the construction of three new Regional Class Research Vessels, one more than requested by NSF.
- A Senate committee report argued that an additional vessel would permit NSF to more efficiently allocate resources between the Pacific, Atlantic, and Gulf coasts.
- FY18 received $105 M increment for Hulls 2&3. Appropriations in FY19 & 20 is also required.
Hull 1: West Coast vessel operated by OSU. Will be proceeded by R/V Oceanus retirement.

Keel Laying Ceremony November 7-8, 2018
Status

• Change Orders
  – 5 Approved, 5 Pending, 5 Contemplated

• Challenges
  – Functional Design Agent
  – EVM
  – Volume/Weight
Shipyard and Key Subcontractors

- [http://ceoas.oregonstate.edu/ships/rcrv/construction/](http://ceoas.oregonstate.edu/ships/rcrv/construction/)
- Siemens: Propulsion and Control
- Rapp: OHS
- Kongsberg: Acoustics
- Beier Systems: Integrated Bridge
- Leblanc and Associates: HVAC
Vessel Description

• Versatile  • Capable  • Efficient  • Desirable
Vessel Particulars

- Length Over All: 192’ 10”
- Beam: 41’
- Design Draft: 12’ 6”
- Science + MarTech Berths: 16
- Crew Berths: 13 (7 single, 3 double)
- Endurance: 21 days (min)
- Range: 5400 nm (min)
Noteworthy RCRV Innovations

• Vessel Advancements
  – Power Generation (Siemens’ Blue Drive Plus C)
  – Schottel Push/Pull Z-Drives
  – Hull Design (optimized modified bulbous bow)
  – U-Tube (stabilization)

• Science Support Advancements
  – Stern Frame and Launch and Recovery System (LARS)
  – Centerboard design
  – Data presence Concept
Bridge: Fore and Aft

- Enclosed wings
- Aft steering station
- Dynamic Positioning
Aft and Side Decks: 2160 ft² (room for 2 vans)
Centerboard (drop keel)

• Centerboard provides a platform for: Evolving suites of sonars; Placing sonars below the bubble layer; Service/changeout of transducers without drydocking.

• Incorporates removable 2-foot bottom section and interchangeable face plates to accommodate a variety of current and future sonars

• Centerboard will carry compact multibeam and ADCPs
  • These require tight repeatability in roll/pitch/yaw
  OR
  • Separate, Centerboard-mounted, Position/Attitude/Time System

• RCRV will incorporate both
“10 Pounds in a 5 Pound Sack” - M Hawkins

- NSF Ship acquisition process is good. It leads to modern, well equipped ships. But…
  - Process inevitably leads to cramming too much into a package:
    - Users say what they want, and want
    - NSF pushes to keep the vessel as small as possible
  - Nobody asked, but here’s my thought on the next go around…
Data Presence Concept:

**RCRV Data Presence**

Integrated real-time system components:
- Flow-through Sensors
- Acoustic Sensors
- Meteorological Sensors
- M2M Telemetry Protocols
- Satellite Communications
- Shoreside Content Distribution
- Ship’s Navigational Display

Enabling Remote Participation:
- Promotes situational awareness for shipboard and shoreside parties
- Facilitates turning observational data into operational information (adaptive sampling)
- Leverages shoreside support personnel and processes for real-time quality control
Conclusions: Operations 2021-2050 and beyond?