

DIRECTORATE FOR
GEOSCIENCES

OFFICE OF POLAR PROGRAMS

Antarctic Research Vessel (ARV)

UNOLS RVOC Meeting

2 May 2024

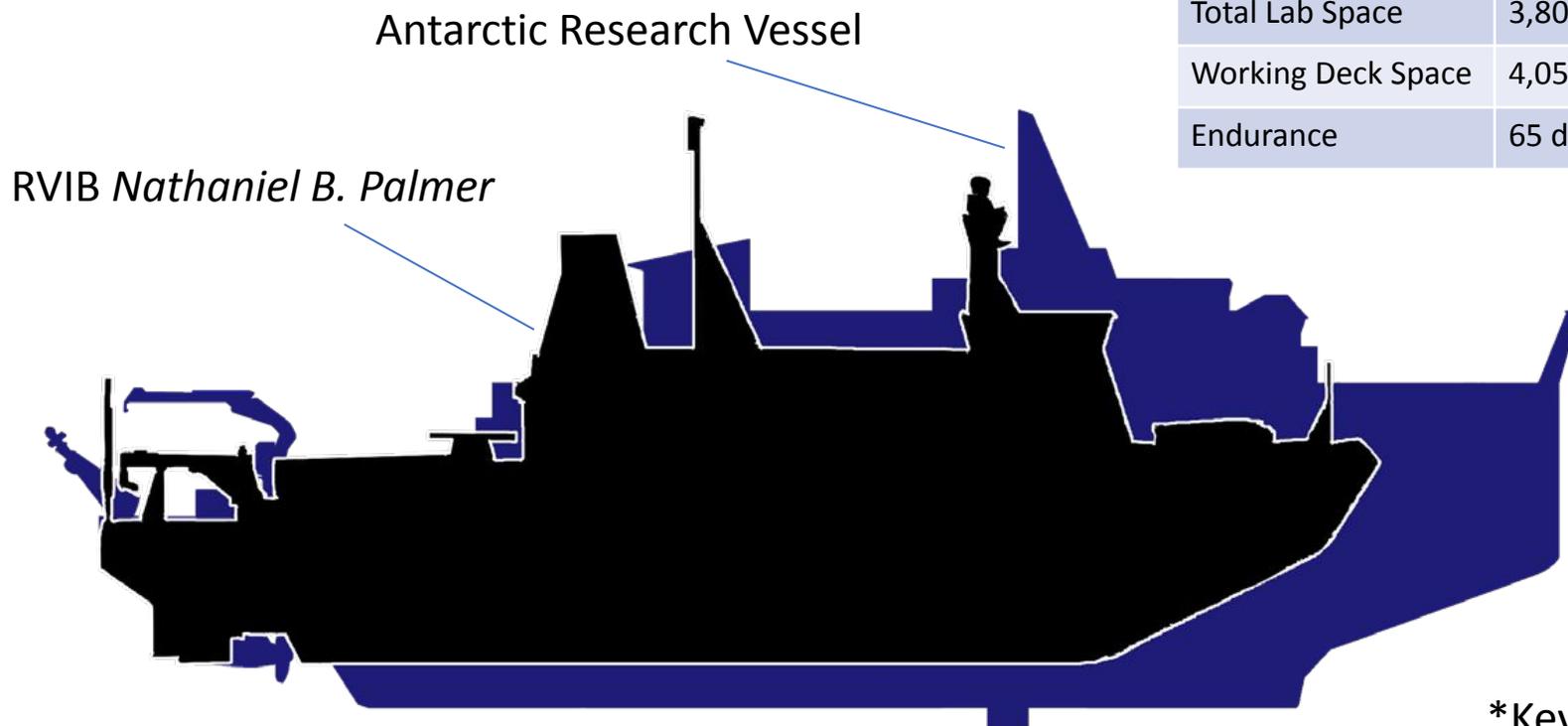
NSF ARV Team

Stephanie Short, ARV Program Lead

Tim McGovern, ARV Program Manager

Caitlin Jarecki ARV Assistant Program Manager (USN PEO Ships)

Mike Prince, ARV Project Manager



	<i>Nathaniel B. Palmer</i>	Antarctic Research Vessel	
Length	309 ft	365 ft	Bigger
Sci/Tech Berthing	45	55*	More scientists
Total Lab Space	3,805 sq ft	4,497 sq ft	More lab space
Working Deck Space	4,054 sq ft	7,197 sq ft	More deck space
Endurance	65 days	90 days*	Longer endurance

**AND greater icebreaking capability
≥4.5 ft @ 3 kts (Polar Class 3)***

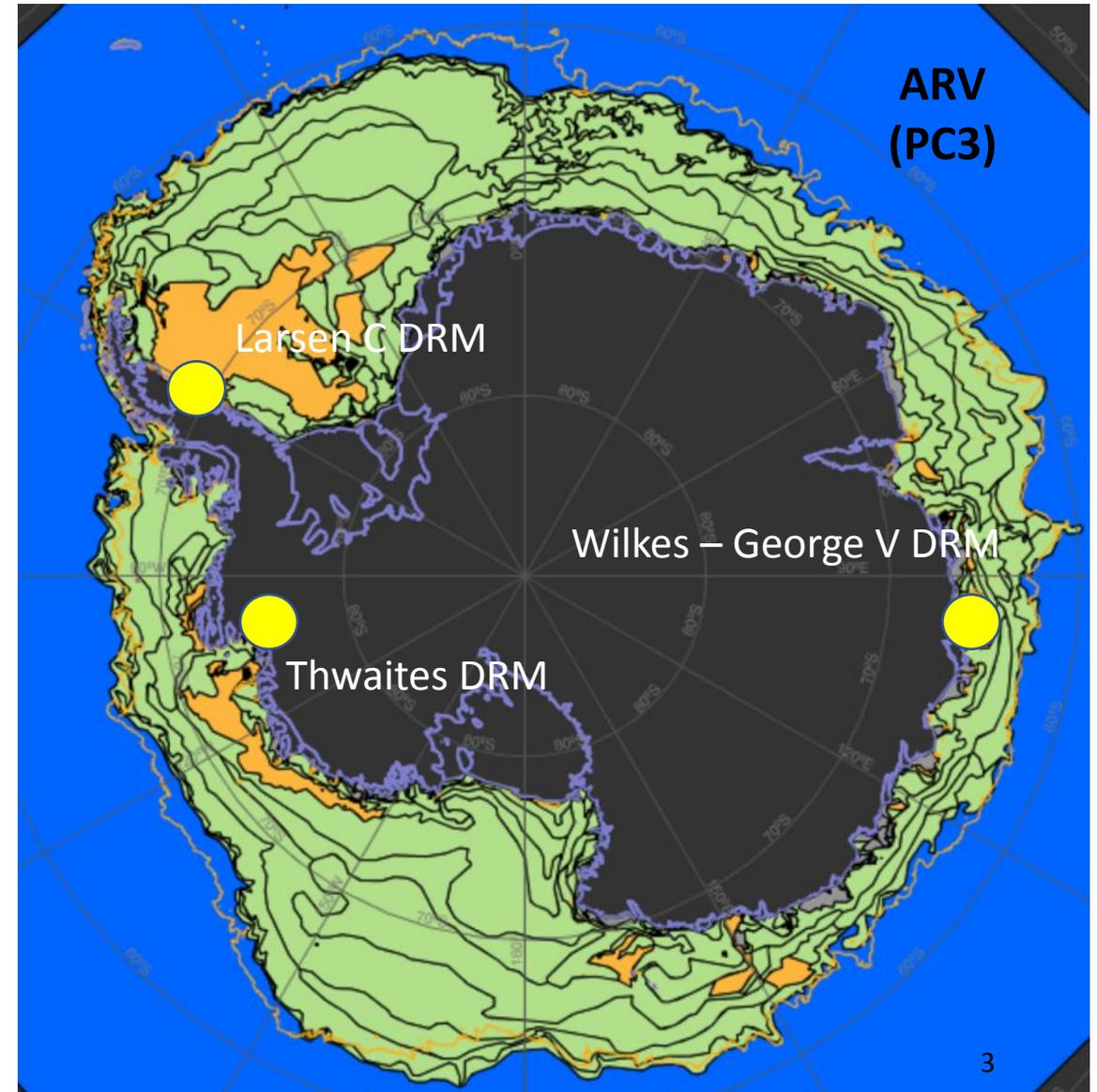
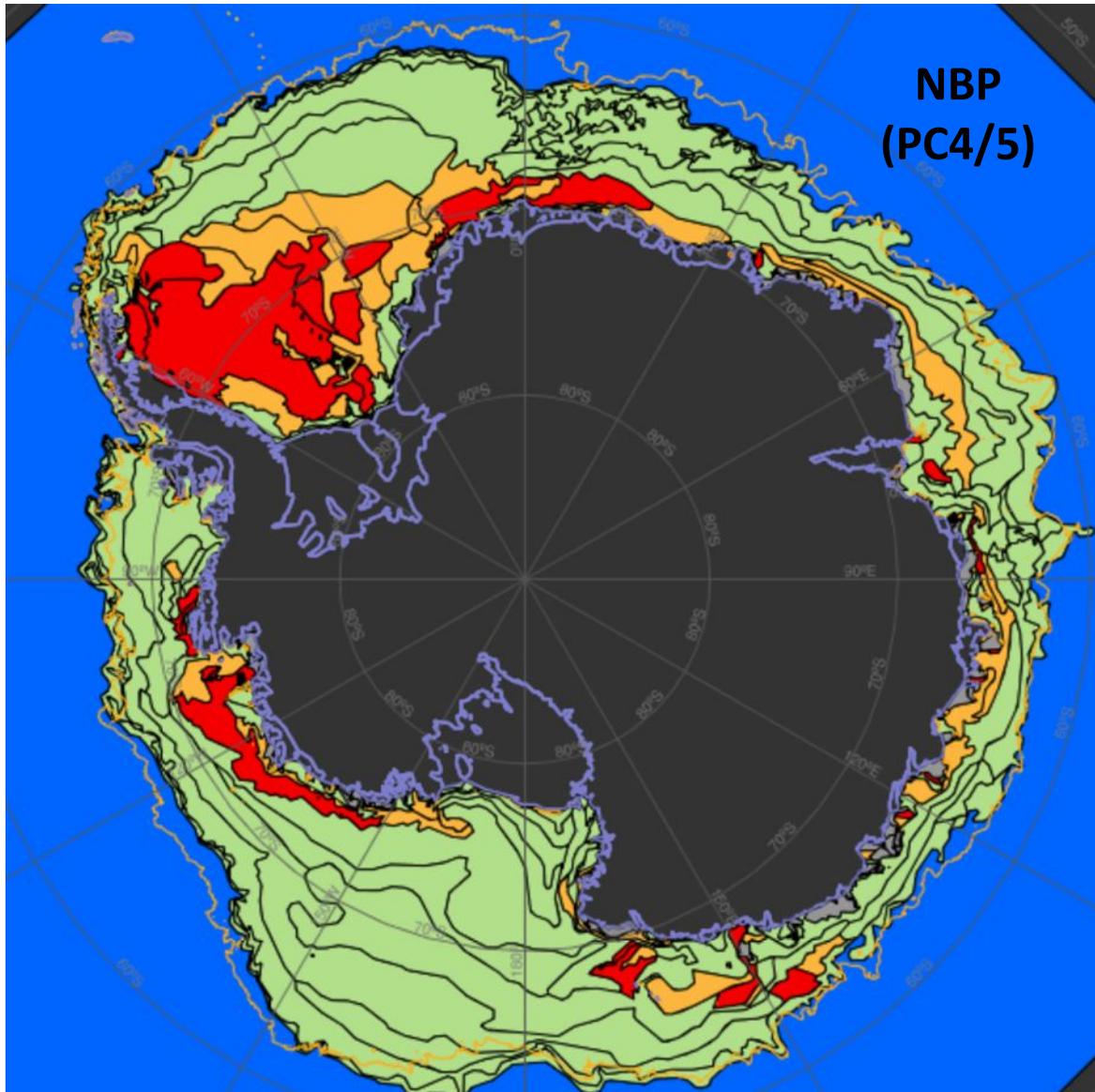
**Key Performance Parameter (KPP)
Current Design & Hull Form meets all KPPs*

PC3 & Icebreaking KPP

Green = accessible; Orange = accessible with difficulty & slower speeds; Red = not accessible



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Model Test Results Showing Ice Management



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Clearing of a pool with thrusters in the HSVA Test Basin (Side Step)

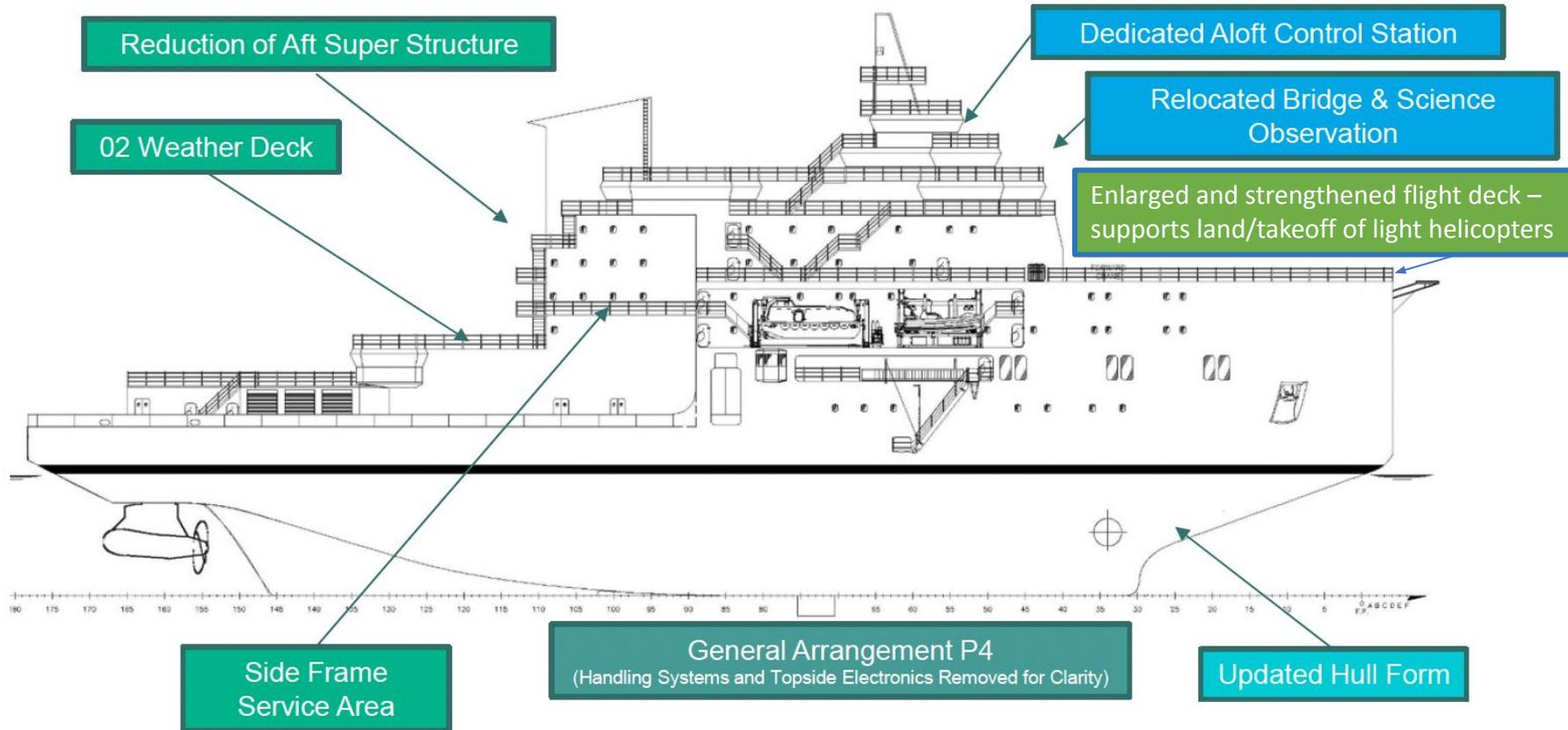


R/V Sikuliaq creating pool in
Ice with thrusters



Ice Management Astern in the HSVA Test Basin (30° toe-in angle)

General Arrangement – Recent Changes



- Sightline Improvements**
- 08 Level Aloft Control Station
 - 07 & 06 Level Relocation

- Superstructure Modifications**
- Improved Incubation Area
 - Creation of Side Frame Servicing Area
 - Improved Range of Motion for Starboard Main Crane
 - Improved Location for Flagging Block to Serve Aft A- Frame

- Improved Hull Form**
- Improved Bubble Sweepdown Performance
 - Improved Fuel Oil Capacity

Preliminary Design Rendering



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Preliminary Design Rendering



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Preliminary Design Rendering



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Science Community Engagement

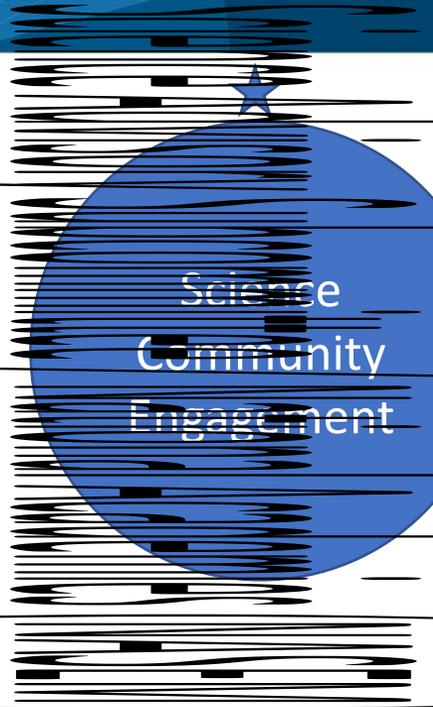


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National Academies of Sciences, Engineering,
and Medicine

**Future Directions for Southern Ocean and
Antarctic Nearshore and Coastal Research**

<https://www.nationalacademies.org/our-work/future-directions-for-southern-ocean-and-antarctic-nearshore-and-coastal-research>



Science Advisory Subcommittee (SASC)

Reports:

<https://future.usap.gov/arv-community-input/>

- Dr. Amy Leventer, (Chair) Colgate University
- Ms. Alice Doyle, UNOLS
- Dr. Kristin O'Brien, UAF; GEO AC Rep

Past Members

- Dr. Carlos Moffatt, Univ of Delaware
- Dr. Deborah Steinberg, VIMS
- Dr. Patricia Quinn, NOAA/PMEL
- Dr. Clare Reimers, OSU
- Dr. Bruce Appelgate, UCSD/Scripps

*** Seeking nominations for 4 new members**



New Antarctic Research Vessel (ARV)

Planning for the Next Generation of Oceanographic Research Vessel



Documents Library

Concept Design

- Conceptual Design Memo
 - [Leidos ARV Conceptual Design Memo](#)
- Concept Design Reports (Glosten Documents)
 - [19136 Concept Design Report](#)
 - [19136 Science Berthing Study Project Memorandum](#)
 - [19136.01 ARV Deck De-icing Systems Study - Status Update 09/29/20](#)
 - [19136.01 ARV Ice Environment Study - Status Update 09/25/20](#)
 - [19136.01 ARV Jumbo Piston Coring Study - Status Update 09/25/20](#)
 - [19136.01 - Manning Study](#)
- Trade Off Studies
 - [19136-000-01 ARV USCG Compliance Study Report](#)
 - [19136-000-02 ARV Propulsor Study Report](#)
 - [19136-000-03 ARV Power Systems Study Report](#)
 - [19136-000-04 ARV Climate Study Report](#)
 - [19136-000-05 ARV Seakeeping Study Report](#)
 - [19136-000-06 ARV Ice Environment Study Report](#)
 - [19136-000-07 ARV Green Ship Alternatives Report](#)
 - [19136-000-08 ARV Autonomous Vehicle Handling Study Report](#)
 - [19136-000-09 ARV Deck De-icing Study Report](#)
 - [19136-000-13 ARV Triple Propulsor Report](#)

Applicable UNOLS Guidelines and Reports

- [American Disabilities Act \(ADA\) Guidelines for UNOLS Vessels](#)

What is Future USAP?



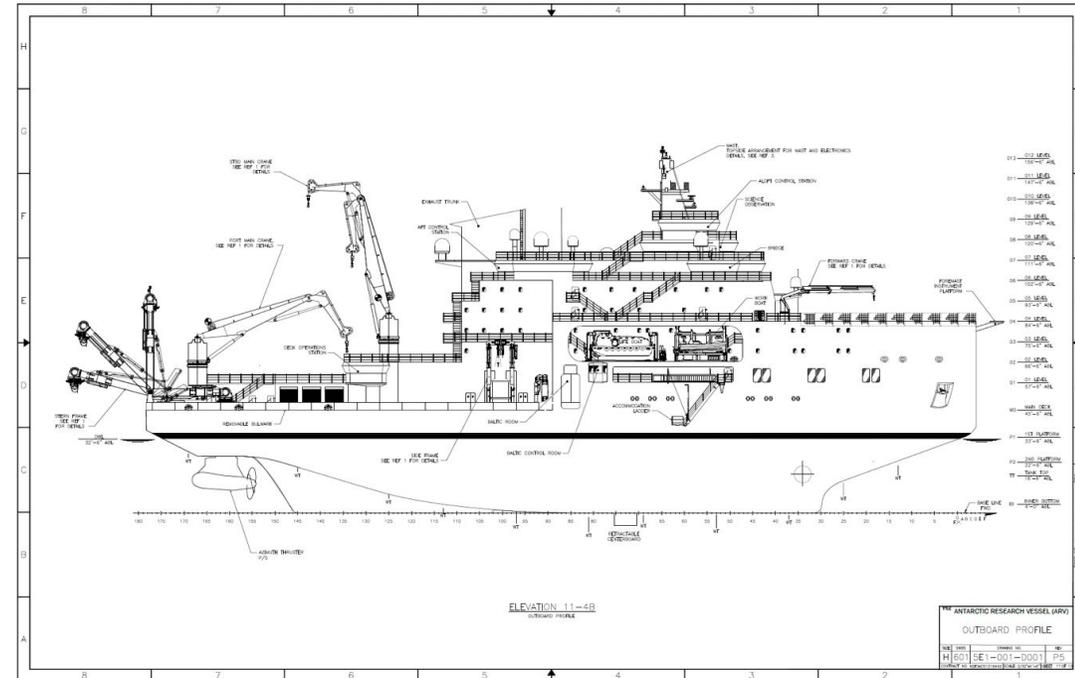
Future USAP is a part of the United States Antarctic Program (USAP). Funded by the National Science Foundation, Future USAP is dedicated to long range investments in Antarctic infrastructure.

News and Updates



Wednesday July 06, 2022
Construction of New Pier at Palmer Station Now Complete

future.usap.gov/arv



Current drawings and reports including SASC Reports

New Antarctic

Planning for the Next Generation of Oceanographic Research Vessel

What's New?

JUL 22, 2021

New Antarctic Research Vessel

Advanced Icebreaking Research Vessel Development Beginning

[Read More](#)



Cont

New Antarctic Re

Planning for the Next Generation of Oceanographic Research Vessel

Ship Design

Current Science Mission

Key performance parameters, operational characteristics and findings are found here.

[Science Mission Requirements \(PDF\)](#)

Placemat

The ARV Preliminary Design Placemat is a drawing of the ARV. It lists overall hull dimensions, installed equipment, and other key information.



DIMENSIONS	
Length Overall	345.31
Length BP	325.31
Beam Overall	75.31
Beam WL	72.31
Depth FLD, Load Line	28.61
Depth Full Load	29.11
Depth Lightship	27.61

PERFORMANCE	
Open Value	11 kt / 1280 G
Cruise	9.31 kt
Ice	Continuous 3 kt
Continuous 6 kt	4.5H
Continuous 8 kt	1.6H
Turning radius	4.5H
Range	17,000 nm

ACCOMMODATIONS	
Ships Crew	29
Deck	15
Engineering	9
Stores	5
NSF Science Party	5
ADA Accessible	3
Scientists	33
Wastewater (days)	20T / 40D

MACHINERY SYSTEMS	
Fixed Pitch Prop	1
Bow Thruster	1
Ship Power Plant	1
Propulsion	1

NAVIGATION	
ADS	1
ECDS	1
S & K Radar	1
Ice Radar	1
CPDPE	1

COMMUNICATIONS	
HF Terminal and Receiver	1
C-Band SATCOM	1
UHF SATCOM	1
GMDSS	1
INMARSAT F	1

AUXILIARY SYSTEMS	
A/C Plants	1
Fire Suppression	1
Batteries	1
Fuel Cargo Capacity	60,000 gal

FOR OFFICIAL USE ONLY May 18, 2022

Design placemat of the new Antarctic Research Vessel

Credit: NSF, Leidos Inc.

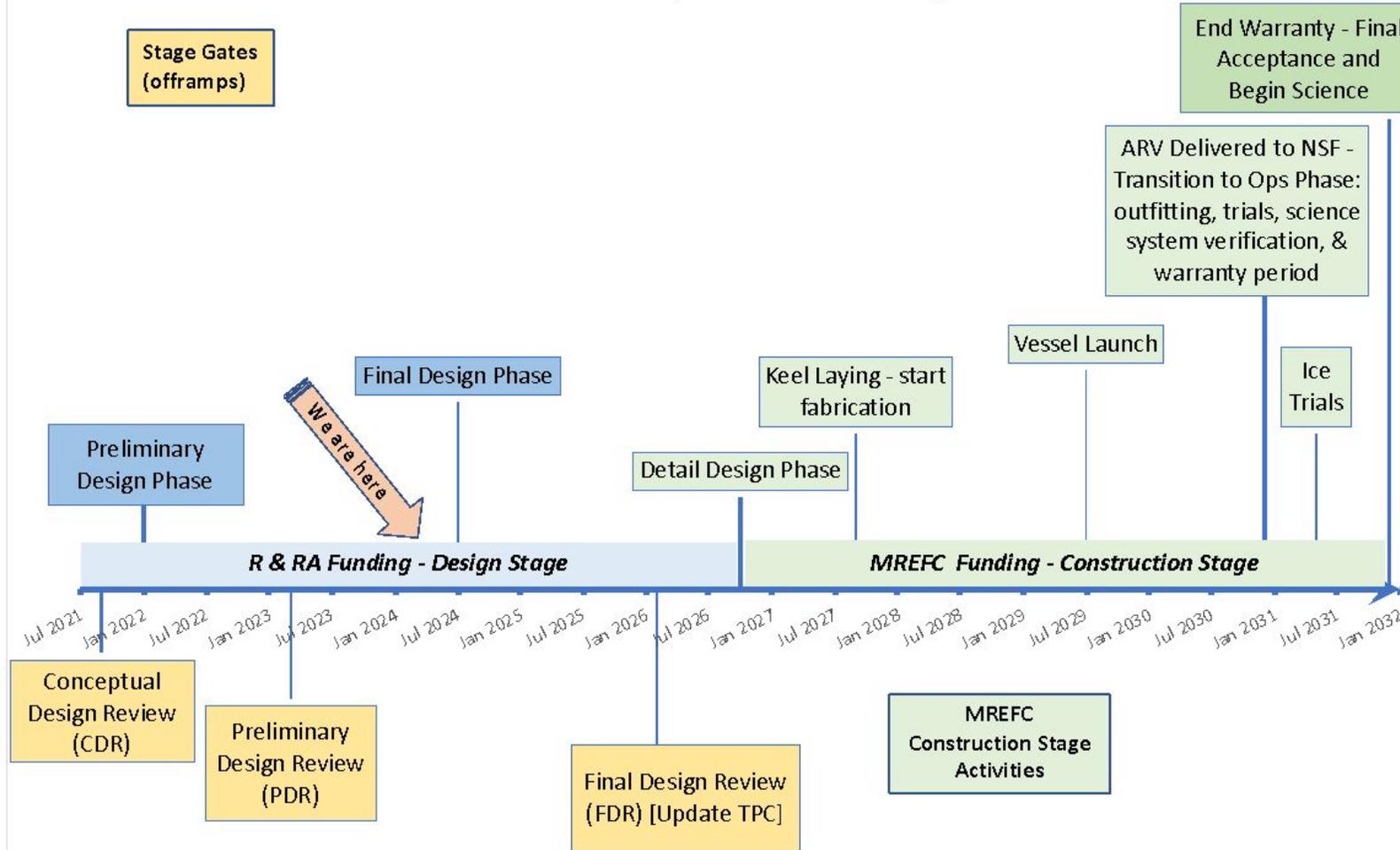
ARV Schedule



ARV Project Timeline

Rev - April 2024

Reflects 6 month delay in start of Final Design Phase



Next Steps:

- RFP and Selection of the Vessel Integrator to complete the project. (CY 24)
 - **VI Proposals Received 4/22/24**
- Final Design Phase (CY 24-26)
- Final Design Review (CY 26)
- Appropriation and Approvals to start Construction Stage (CY 26)

- ❖ ~20 years of sustained scientific demand
- ❖ Continued ability to support cutting edge NSF research for the next 40 years
- ❖ Enhanced capabilities over existing USAP research vessel
- ❖ Strong Teaming with Industry

Questions?

