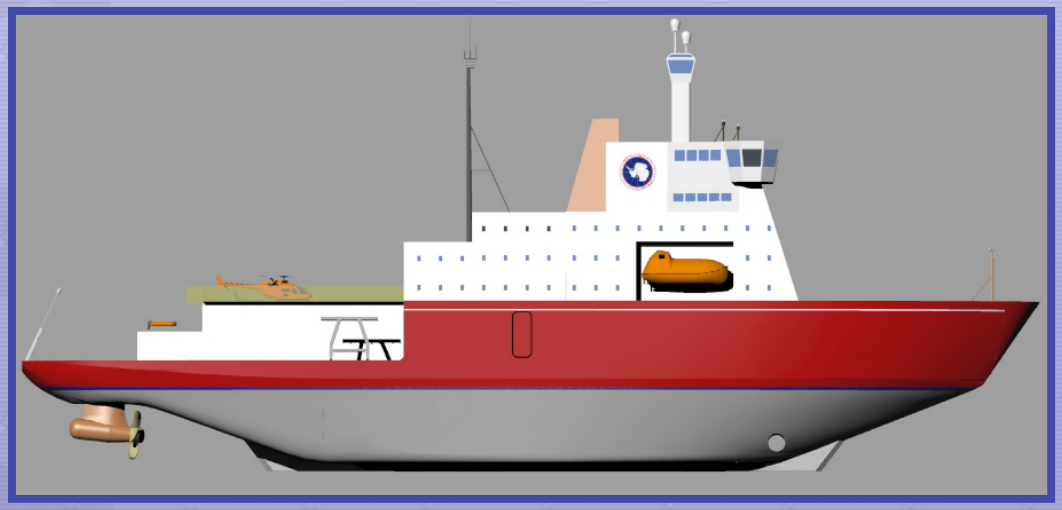
Polar Research Vessel

Past planning and future steps



UNOLS Polar Research Vessel Workshop

February 28 – March 1

Southern Ocean Research: NSF Charters

Laurence M. Gould

- Recently renewed charter for 5 yr (2010-2015) with possible 5 yr (2015-2020) option
- Greater than 20 years old in 2020

Nathaniel B. Palmer

- Current charter expires March 2012
- Request for Proposal vessel with similar capabilities released
- 20 years old in 2012

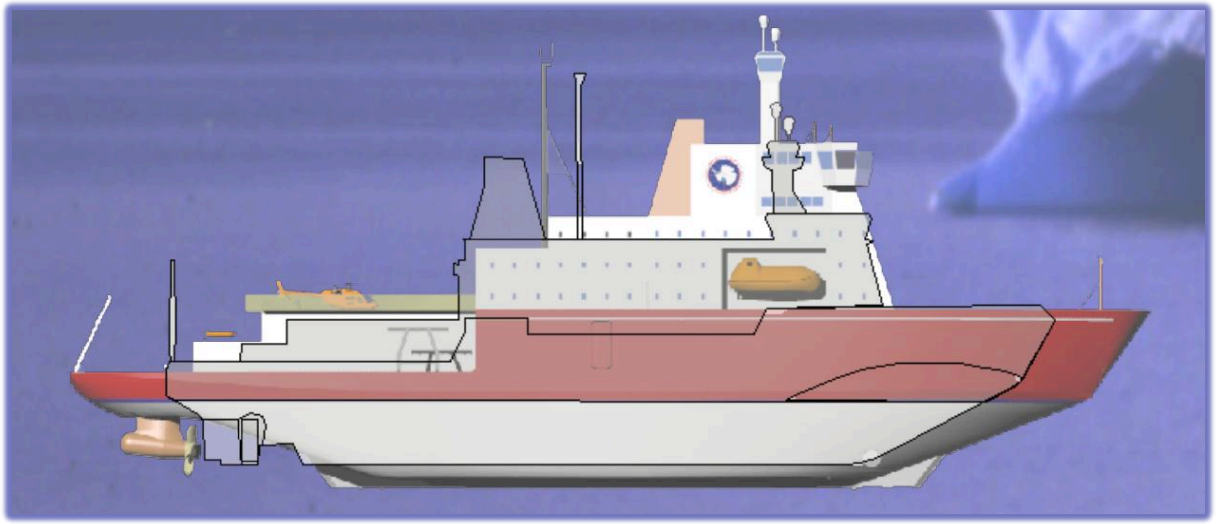
PRV Study
(2002-2006)

Over 270 individuals were involved in the PRV effort

- Two Workshops – Requirements for Southern Ocean Science
- U.S. Maritime Administration and Science Technology Corporation contracted to explore vessel designs
- ARVOC Created a 15-member Committee to assist design process
- ARVOC hosted Town Hall meetings
- ARVOC surveyed the community for input on science requirements

PRV Design Study Documents

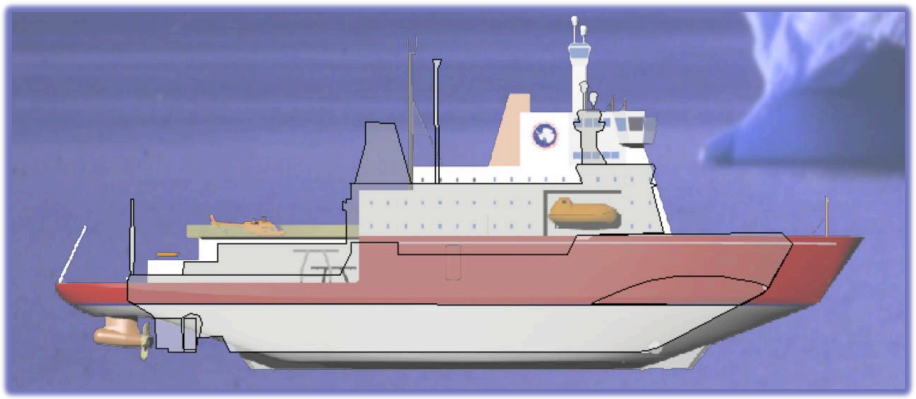
http://www.usap.gov/usapgov/vesselScienceAndOperations/PRVSection.cfm



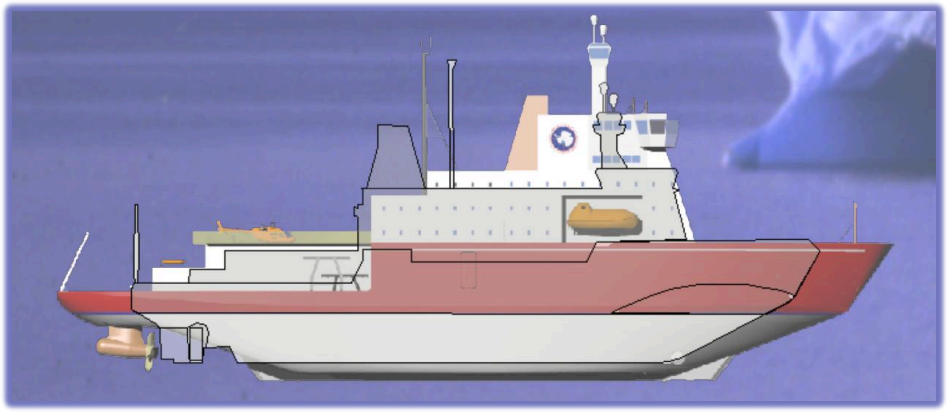
PRV Study
(2002-2006)

- Enhanced ice breaking capabilities (4.5 feet same as USCG Healy)
- Increased endurance (to 80 days)
- Increased accommodation and lab space (50 scientists)
- Moon pool for drilling and access to the water column (no ice, limited surge and turbulence)

- Ability to tow during ice-breaking
- Acoustically quiet
- Capability to conduct autonomous underwater AUV/ROV Operations
- Jumbo piston coring (50m)
- Reduced emissions from diesel engines and incinerator; "greener" ship. Greater fuel efficiency.



PRV Design

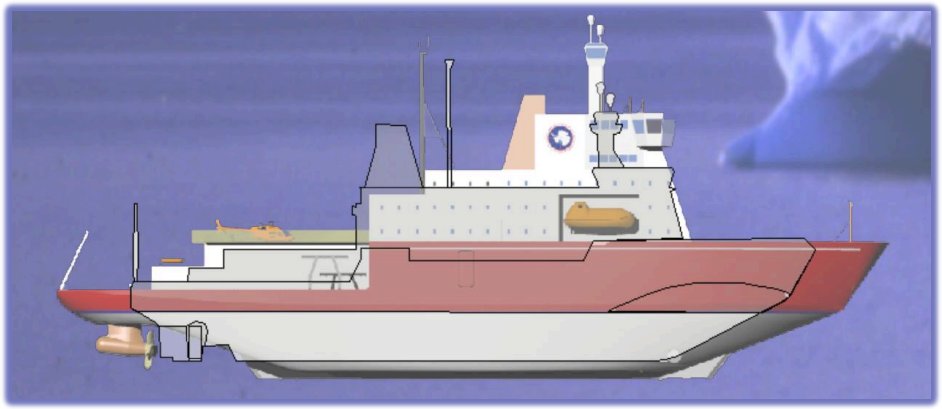


	NBP	PRV
Length	308 ft	378 ft
Beam	60 ft	74.5 ft
Draft	22.4 ft	29.6 ft
Displacement	6,800 LT	11,000 LT
Dry Lab (main)	1121 ft^2	2234 ft^2
Wet Lab	380 ft^2	763 ft^2
Baltic Room/Moon Pool	660 ft^2	2424 ft^2
Endurance	52 days	80 days
Icebreaking (@ 3 knots)	3 ft	4.5 ft
Science Berths	39	50
Operational Costs (including fuel)	$44k per day	$64k per day

Next Steps

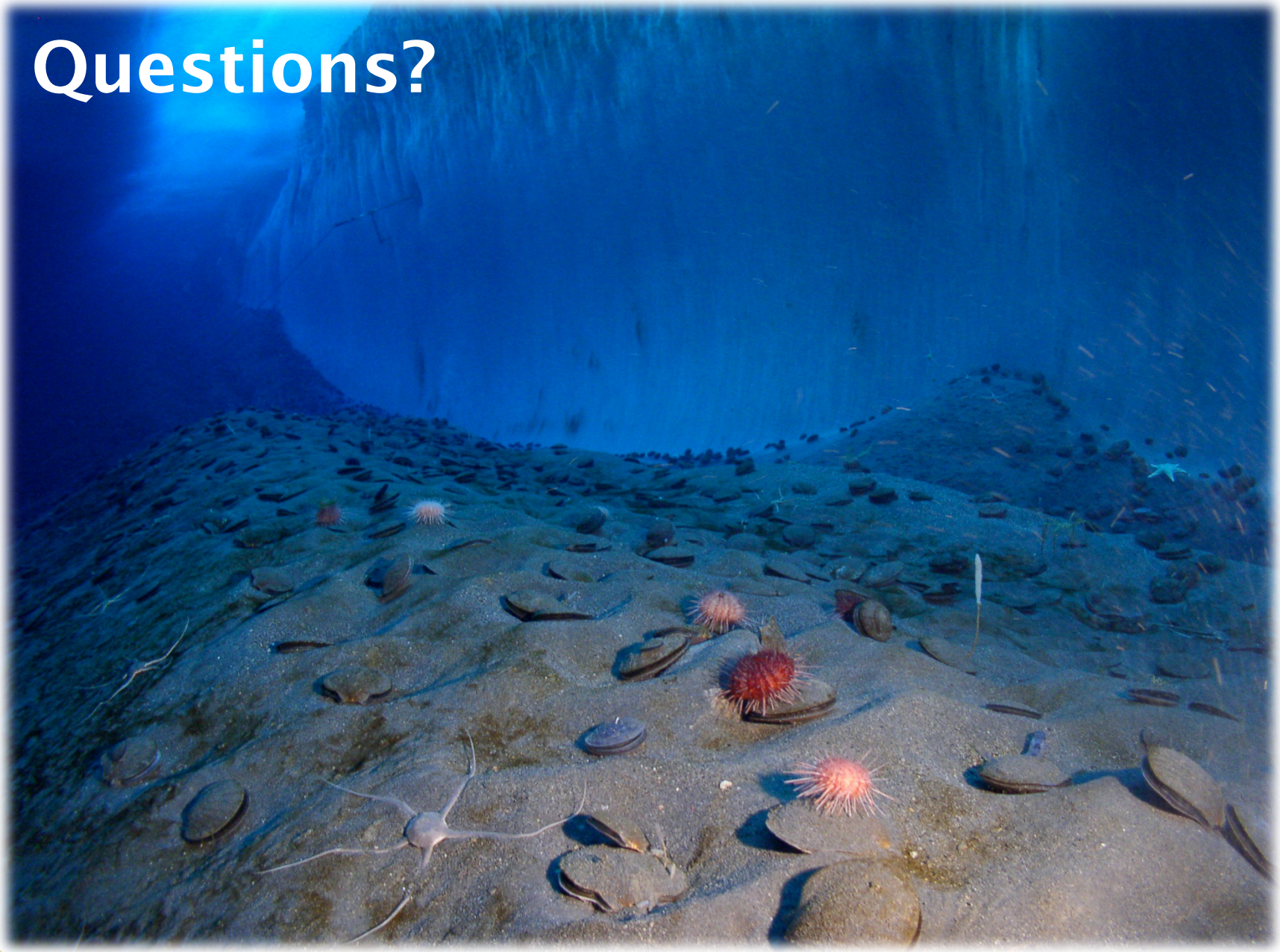
- Establish Project Advisory Team (Spring 2011)
- NRC study completed and initial report from UNOLS study (Summer 2011)
- Brief MREFC Panel (Summer 2011)
- NSB Information Item (August 2011)
- Solicit for Project Office contingent on satisfactory progress (Fall 2011)

Future Planning



	2010				2011				2012				2013				2014				2015				2016				2017				2018			
	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Current NBP charter																																							
Proposed NBP charter renewal																																							
Conceptual Design Phase																																							
Community planning/development of conceptual design																																							
Conceptual Design Review																																							
Readiness Stage																																							
Vessel design																																							
Integrated Baseline Review																																							
NSF Approves Submission to NSB																																							
Construction Phase																																							
Final Design Review																																							
Construction of Vessel																																							
Commissioning, Testing and Acceptance																																							

Questions?



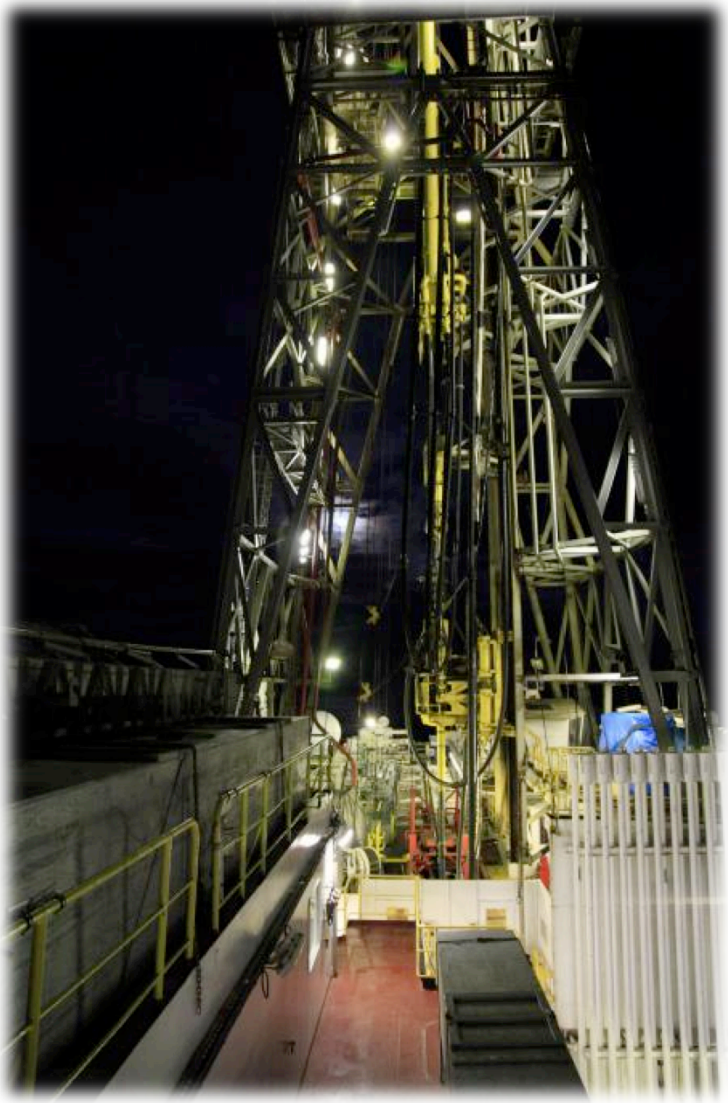
Science Drivers

The most rapid losses of land-ice occur in areas with marine-terminating glaciers and ice streams.

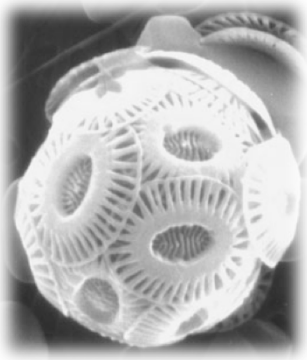
Freshwater inputs from these areas will increasingly influence circulation and contribute to rising sea level.

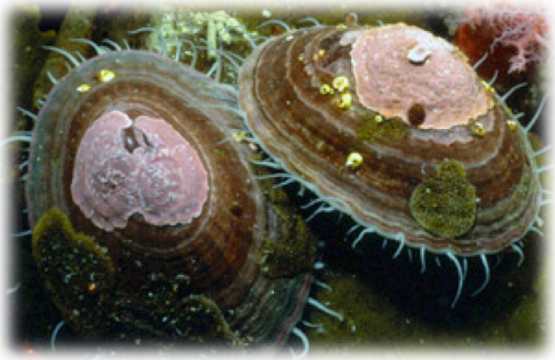
Science Drivers

Polar regions have experienced significant changes in paleoclimate and abrupt transitions in ice-sheet behavior. Impacts of these changes inform modeling of future climate variability.



Science Drivers

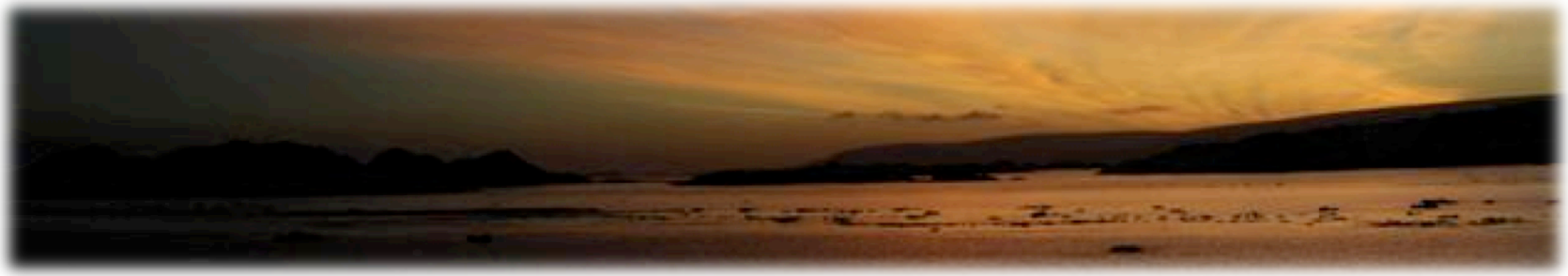





Ocean acidification will have pronounced impacts in Polar latitudes because of the enhanced solubility of CO_2 in cold waters



Science Drivers



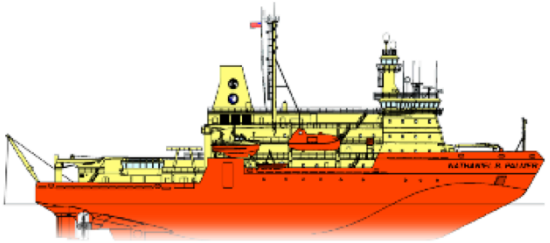
Polar organisms are dependent upon and adapted to cold regions. Dual pressures of increasing ocean temperatures and lowered pH will affect processes essential to life influencing how organisms and ecosystems function at a basic level.

Polar Vessels Available to U.S. Researchers

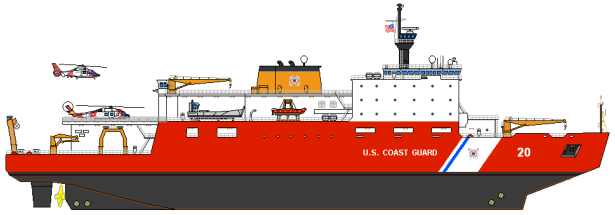
	LMG	Sikuliaq	NBP	Healy	ODEN	Sea/Star
Length (ft)	230	254	308	420	353	399
Icebreaking (ft @ 3 knts)	1.25	2.5	3	4.5	5	6
Science/Crew Berths	28/16	26/20	39/26	52/75	50/26	30/155
Vessel Age (yr)	12	N/A	18	11	12	33
Endurance (days)	42	45	52	53	100	86

RV Laurence M. Gould

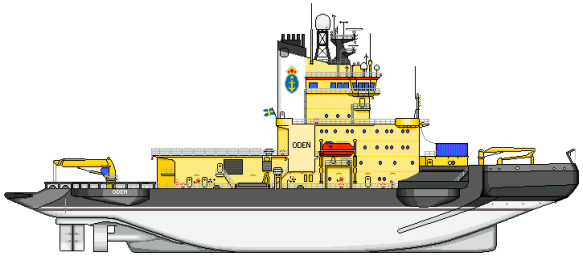
RV Sikuliaq



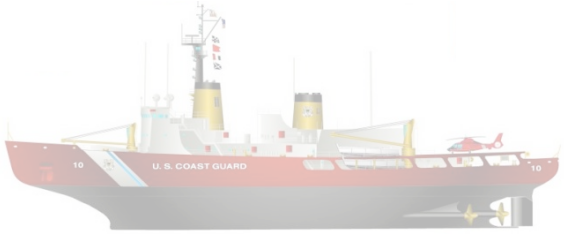
RVIB Nathaniel B. Palmer



USCGC Healy



IB Oden

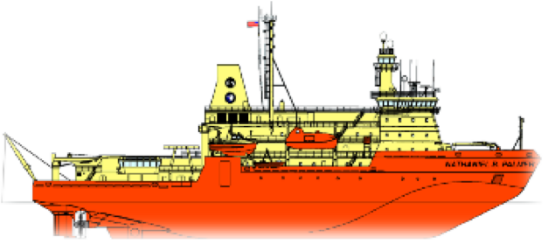


USCGC Polar Sea/Star

Light Ice

RV Laurence M. Gould

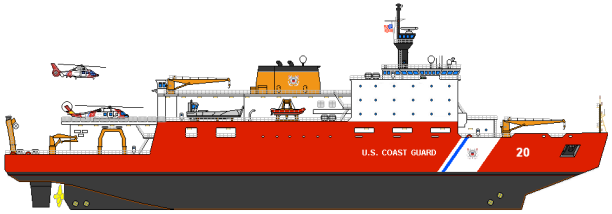
Seasonal Ice



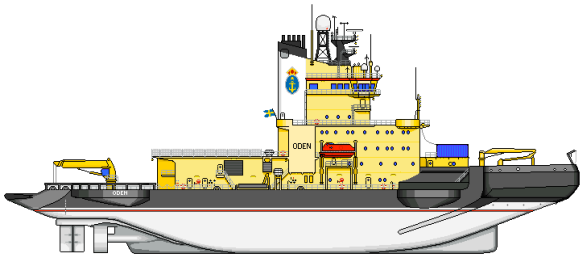
RVIB Nathaniel B. Palmer

RV Sikuliaq

Multi Year Ice



USCGC Healy



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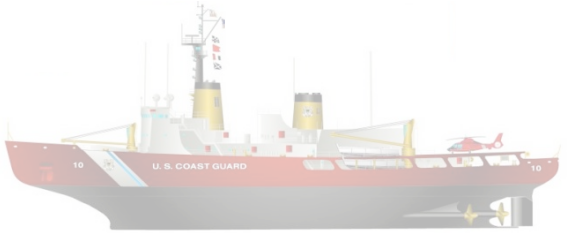

USCGC Polar Sea/Star