

# Supplemental Slides

How do Polar icebreakers work?

Why are operations in Arctic/Antarctic hazardous?

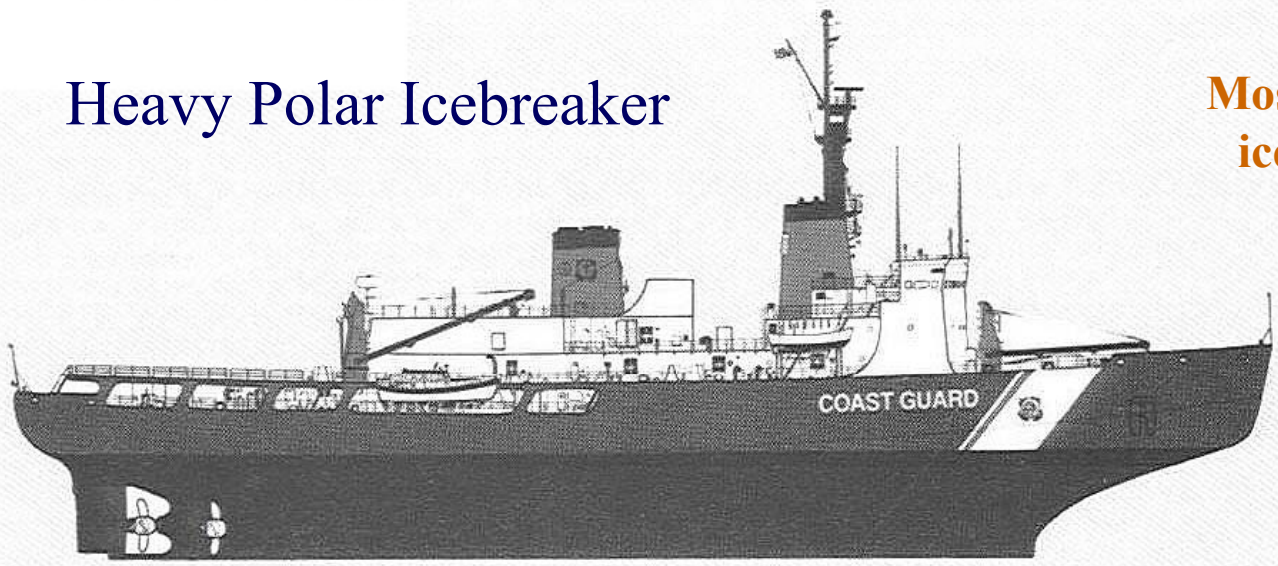
Are USCG polar icebreakers multi-mission vessels?



## Polar Class WAGB 399' Capabilities

- Traditional sloping bow
- Reinforced/thick hull
- Round hull
- High power/weight ratio
- Redundant propulsion systems for fuel efficiency and reliability in polar regions (very complex)
- Variety of diesel-electric & turbine engine configurations w/ 3 shafts
- Large, single rudder
- Capacity for two HH-65 helos & support eqpmt.
- Science support facilities & eqpmt.
- Fuel tanks are ballast tanks
- INMARSAT/IRIDIUM high latitude communications

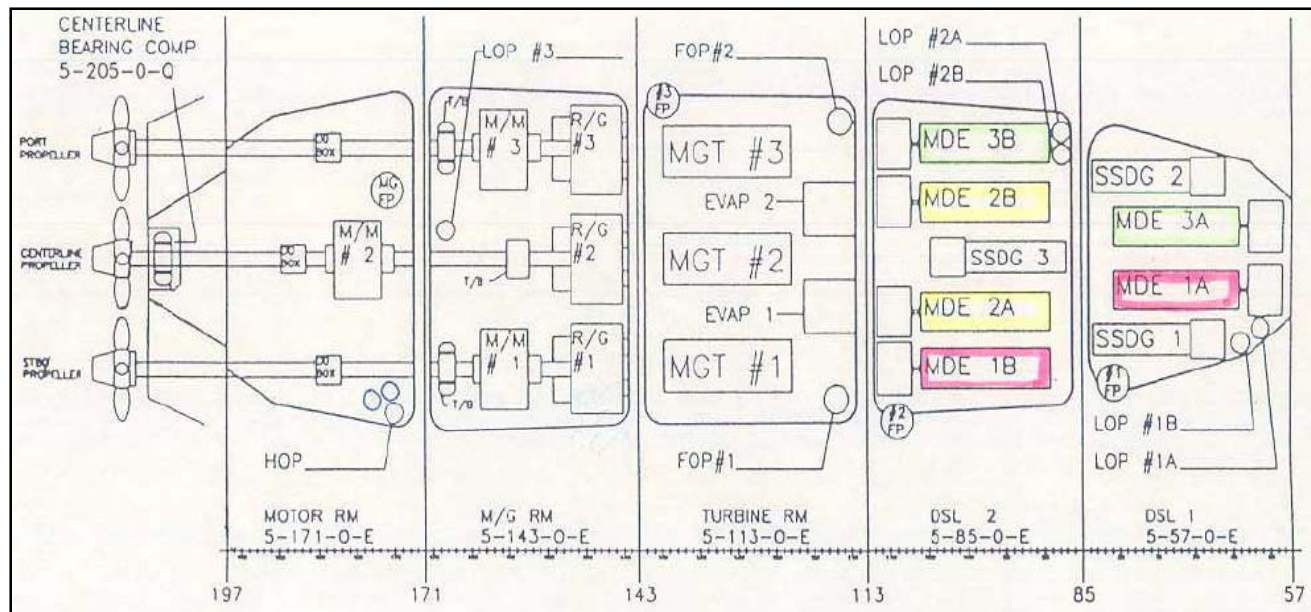
## Heavy Polar Icebreaker



**Most powerful non-nuclear icebreakers in the world**

# Design of the Polar-class

- Operational requirements dictated a 1970's state-of-the-art, complex propulsion plant



# USCGC HEALY – Research Polar Icebreaker



**State of the art  
polar region  
science &  
icebreaking  
platform**



- HEALY designed to be multi-mission capable with focus on Arctic polar research capability
- Fixed pitch propellers (more durable)
- Integrated diesel-electric propulsion & power supply system. (less complex, easier to maintain)
- Two unsupported rudders, two shafts
- Separate ballast & fuel tanks
- State of the art science oceanographic, meteorological & biological equipment and spaces
- Automated for minimal permanent manning
- Cranes - 5 hydraulically operated, 100% coverage of working decks
- Accommodations for two HH-65 aircraft
- Dynamic positioning system
- Integrated Bridge System for minimal manning
- INMARSAT/IRIDIUM high latitude communications



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**Light/Medium Polar Icebreaker**

# U.S. statutes/policies that govern USCG polar icebreakers

- **General Title 14 authorities for all USCG missions:** Search & Rescue, Enforcement of Laws and Treaties, Marine Safety etc.
- **General Title 10 authorities pertaining to support for National Security – 1965** Johnson Administration decision to move all polar icebreaker responsibilities to USCG.
- **14 USC 2** – CG is tasked with developing, maintaining, and operating icebreaking facilities for the US.
- **14 USC 93** – Authorizes maintenance of icebreaking facilities
- **14 USC 94** – Authorizes conduct of oceanographic research
- **14 USC 141** – Utilization of CG personnel and facilities in assisting other federal and state agencies, including icebreaking
- **15 USC 4101** – Arctic Research and Policy Act of 1984
- **16 USC 2431** – Antarctic Marine Living Resources Convention
- **1990 Presidential Memo** – affirmed CG's need for three icebreakers, NSF one ice strengthened vessel
- **1996 PDD 26 (U.S. position on Arctic & Antarctic policy)** – Safety, Security, Stewardship



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# Existing U.S. polar icebreaker policy

- 1990 Presidential Memo stated: “as the polar regions grow in environmental [and economic] importance, so must the United States have the capability to protect its interests and project its presence in this arena, not only as an Arctic nation with self-interests, but as a world power concerned with a broad spectrum of security, scientific and international political issues”.
- The U.S. Coast Guard is the right agency to manage the U.S. polar icebreaker fleet because it can enforce all aspects of U.S. sovereignty as well as support polar research. The Coast Guard considers this still to be the overarching reason why the Coast Guard should continue to operate, maintain, and manage the nation’s polar icebreaker fleet.
- 1994 Presidential Decision Determination (6 priorities): Protect Environment, Manage economic development, Security in Arctic (maintain peaceful use of Antarctica), Int’l Cooperation, Indigenous Peoples, & Research.



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# National Research Council Recommendations

1. The United States should continue to **project an active and influential presence in the Arctic** to support its interests. This requires U.S. government polar icebreaker capability to assure year-round access throughout the region.
2. The United States should continue to **project an active and influential presence in the Antarctic** to support its interests. The nation should reliably control sufficient icebreaking capability to break a channel into and assure the maritime resupply of McMurdo Station.
3. The United States should **maintain leadership in polar research**. This requires icebreaking capability to provide access to the deep Arctic and the ice-covered waters of the Antarctic.
4. National interests in the polar regions require that the United States immediately program, budget, design, and **construct two new polar icebreakers to be operated by the U.S. Coast Guard**.
5. To provide continuity of U.S. icebreaking capabilities, the **POLAR SEA should remain mission capable and the POLAR STAR should remain available** for reactivation until the new polar icebreakers enter service.
6. The **U.S. Coast Guard should be provided sufficient operations and maintenance budget to support an increased, regular, and influential presence in the Arctic**. Other agencies should reimburse incremental costs associated with direct mission tasking.
7. Polar icebreakers are essential instruments of U.S. national policy in the changing polar regions. To assure adequate national icebreaking capability into the future, **a Presidential Decision Directive should be issued** to clearly align agency responsibilities and budgetary authorities.

# Enforcement of Laws & Treaties Capability

- Alaskan EEZ living marine resource enforcement (historic ties to early Alaskan history)
- Drug Enforcement
- Commercial & Recreational Boating Safety Enforcement
- Enforce border and Customs laws



**WANTED**  
INFORMATION  
LEADING TO THE CONVICTION OF  
**TOOTHFISH PIRATES**

**US\$100,000**  
**REWARD**

COLTO (The Coalition of Legal Toothfish Operators) offers a reward of up to \$100,000 to the person who provides information leading to the conviction of a toothfish pirate fishing vessel (or vessels, companies, directors or companies acting in violation of their legal fishing prohibitions in the Patagonian Southern Ocean). These rewards cover illegal and unpermitted activities in any sector of global fisheries (whale, shark, and seal).

Send your information to [wanted@colto.org](mailto:wanted@colto.org) or visit the COLTO website [www.COLTO.org](http://www.COLTO.org)

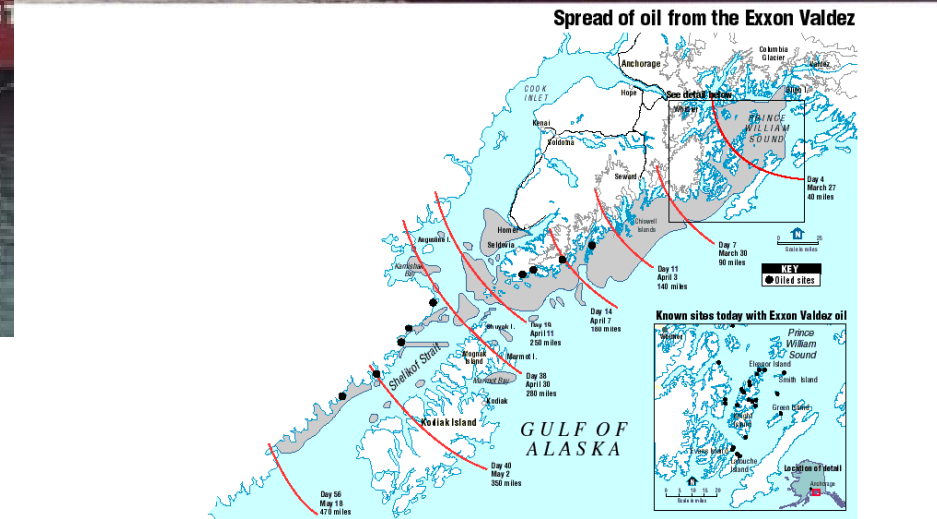


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# Marine Pollution Prevention/Response Capability

- Is the U.S. capability to respond to pollution incidents in the Arctic adequate?

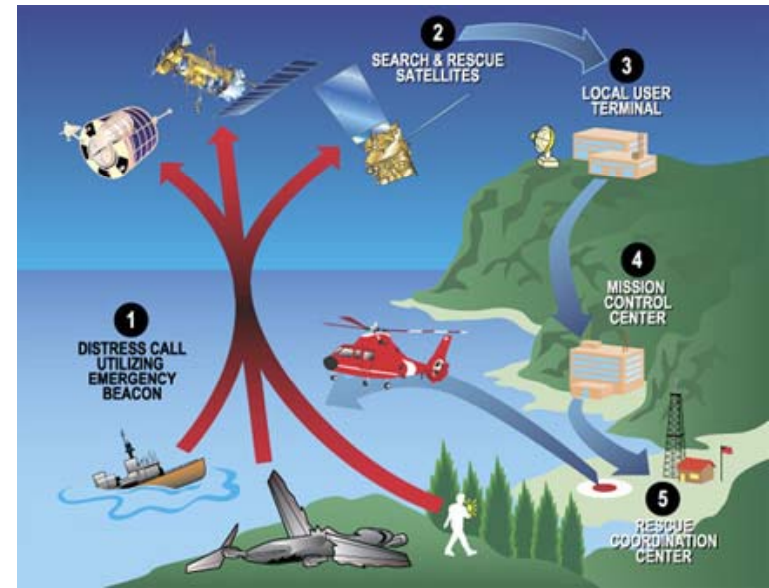


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# Search & Rescue Capability



- USCG crew trained marine SAR procedures
- SAR equipment
- Aircraft increases range to 150 nm
- Typically secondary mission



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# Command, Control, Communications: Operations Coordination Capability



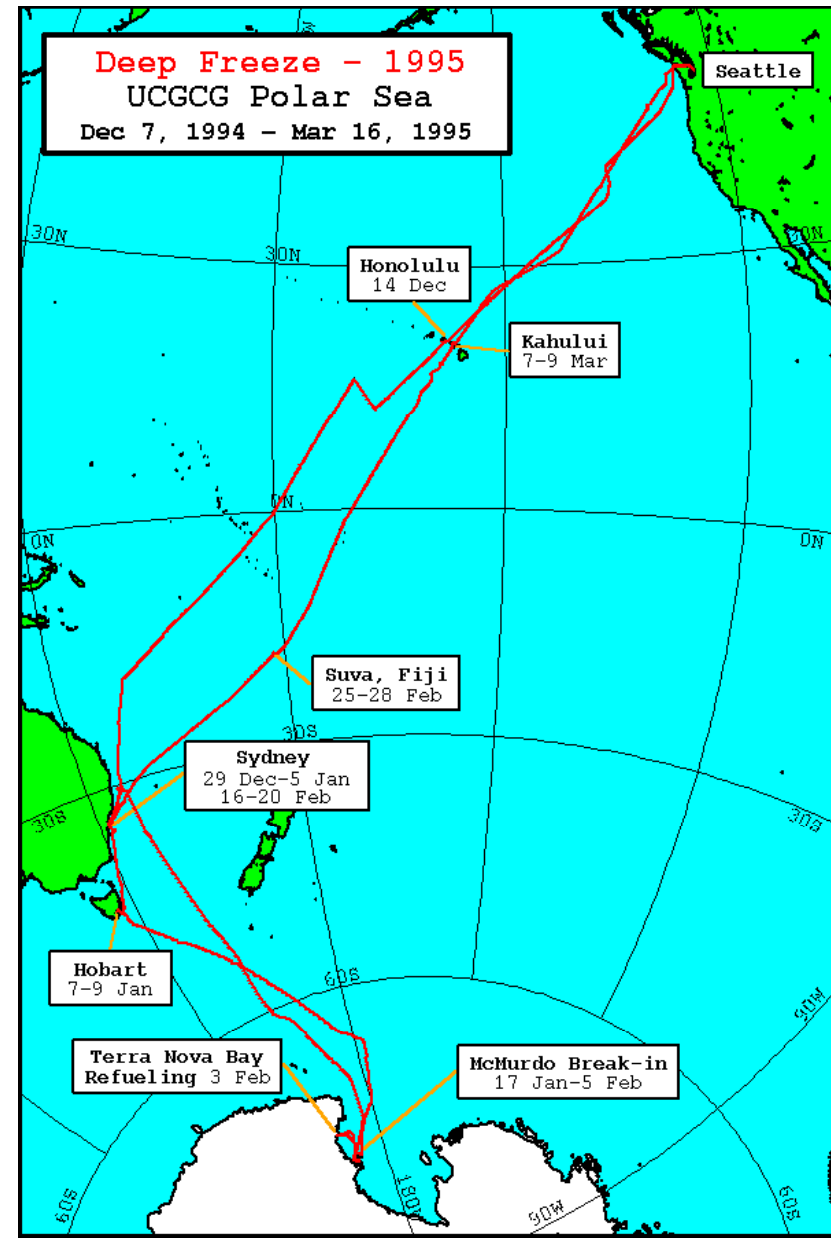
- INMARSAT
- HF
- DoD SATCOM
- IRIDIUM
- VHF



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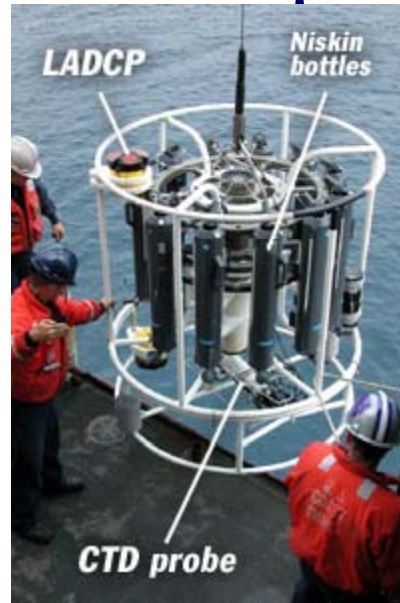
# Disaster/Humanitarian Relief Support Capability

- Polar Icebreakers have capability to provide significant amount of disaster/humanitarian relief supplies and support
- Function as command and control ship to coordinate relief efforts as necessary
- American Samoa Typhoon Relief (2005)

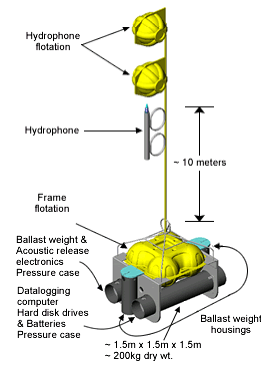
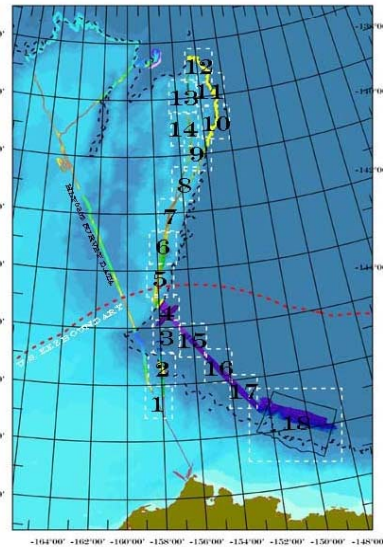


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# Polar Research Capability



- Acoustic Doppler Current Profiler (ADCP)
- Seabeam 2112 Bottom Mapping Sonar
- Sub Bottom Profilers
- Bathy 2000
- Knudsen 320 B/R
- Pingers
- Expendable Bathy Thermograph (XBT)
- Expendable Oceanographic Probes
- CTD
- Thermosalinograph
- Fluorometer
- Weather Data/Balloon Launch
- Buoy/Mooring launch & recovery
- ROV deployment
- Box coring equipment



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# Escort Capability

Escort other vessels to polar regions. Other vessels may be supply vessels, research vessels or drilling vessels.

## Methods of Escort:

- Close escort
- Towing
- Coupled towing (notched stern)

Escorted vessels could have many other capabilities



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# Logistics Support Capability



Ability to transport supplies  
& fuel to remote polar locations

- Transport via airlift
- Transport via small boat
- Transport over the ice

Marble Point Re-Fueling Facility



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