

***6th Symposium on the Impacts of an Ice-Diminishing Arctic
on Naval and Maritime Operations***

**U.S. Navy
Arctic Roadmap Update**



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Arctic Ice Minimum Projection

Sea Routes



Northern Sea Route

2025: 6 weeks open
41' controlling draft



Transpolar Route

2025: 2 weeks open
Deep ocean transit



Northwest Passage

2025: intermittently open
33' controlling draft

Sea route distances:
Distance from the
Bering Strait to
Rotterdam





Key Missions – Navy in the Arctic

- **Ensure U.S. sovereignty**
 - **Defend the homeland**
 - **Contribute to maritime domain awareness**
- **Ensure freedom of the seas**
- **Support the Coast Guard and other partners**
 - **Search and Rescue *in support of missions led by USCG and as directed in support of international partners***
 - **Environmental Response**
 - **Disaster Response/Defense Support of Civil Authorities**

In the near to mid-term, the Navy will concentrate on improving operational capabilities, expertise, and capacity, extending reach, and will leverage interagency and international partners to achieve its strategic objectives



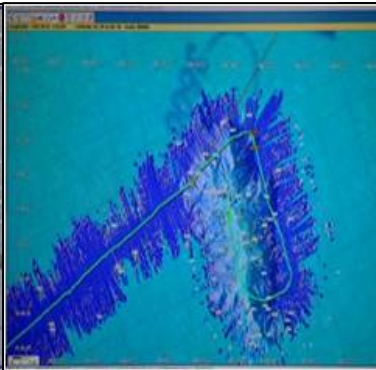
Arctic Challenges

Lack of:

- Aids to Navigation
- Ocean Bottom Surveys for Charts
- Accurate Weather Forecasts & Sea-ice Prediction
- Reliable Satellite Communications
- Fuel and Supply Depots
- Medical Facilities
- Search & Rescue Capabilities & Infrastructure
- Oil Spill Response Capabilities



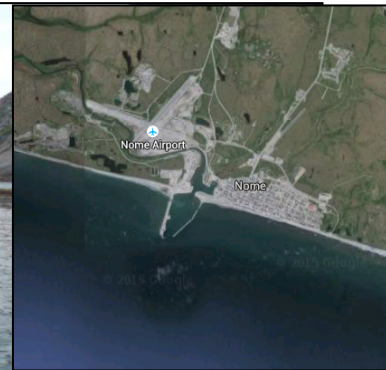
Limited ice- breaking capabilities



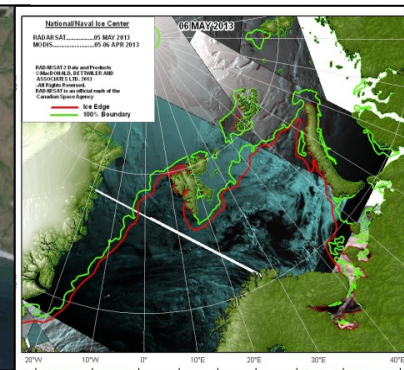
Incomplete charting



Limited SAR assets



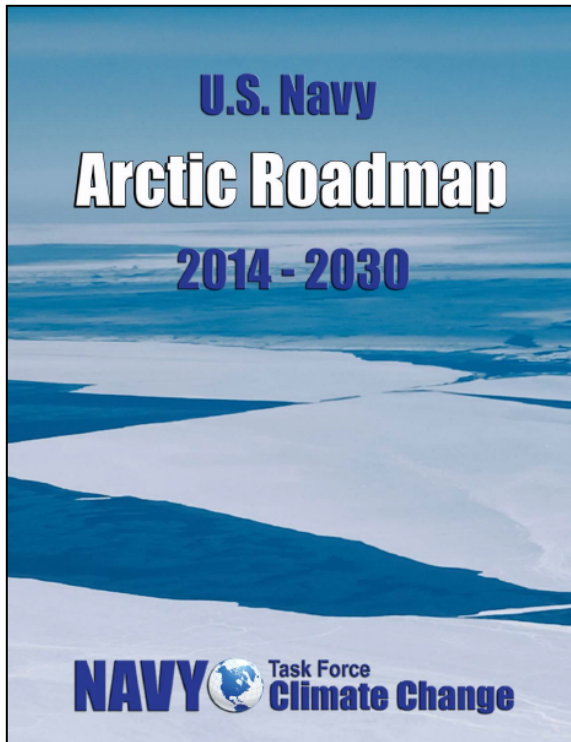
Limited Infrastructure



WX & Ice Prediction



Arctic Roadmap Update



Goal: Sustainable, Arctic-capable force recognizing partnerships are the foundation

- **Near-term** (2014-2020)
 - Refine doctrine, operating tactics & procedures
 - Enhance relationships
 - Joint international exercises, science & personnel exchanges
- **Mid-term** (2020-2030)
 - Provide operational support
 - Transition Arctic operations capability to sustained missions
 - Improve capabilities by participating in complex exercises
- **Long-term** (2030 and beyond)
 - Provide trained and equipped personnel and capabilities
 - Increased potential for SAR
 - Focus on maritime security and freedom of navigation





Arctic Roadmap Implementation



Highlights:

- Arctic Maritime Capability Requirements
- Arctic Engagement
- Update Fleet Guidance for Arctic Operations & Training
- ICEX Accelerated to Bi-annual Event
- Science and Technology Plan
- Identify / Evaluate U.S. & International Infrastructure
- Arctic Hull, Propulsion and Engineering Requirements
- International Arctic Region Hydrographic Commission → Charting Plan





Navy's National Role

Implementation Plan
for
The National Strategy for the Arctic Region
January 2014

Executive Order 13689
21 Jan 2015
Established Arctic ESC

DOD Lead:

Develop a Framework of Observations and Modeling to Support Forecasting and Prediction of Sea Ice

- Objective: Improve sea ice forecasts and predictions at a variety of spatial and temporal scales

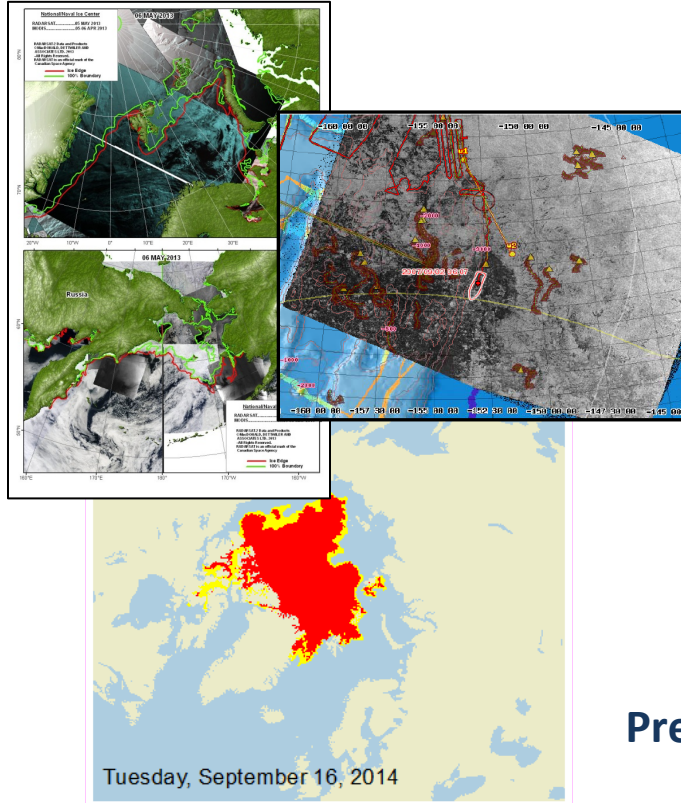
DOD Support: Charting, Models, Maritime Domain Awareness, Observations, etc.

Under Title 10 the Navy is responsible “for safety and effectiveness of all maritime vessels, aircraft, and forces of the armed forces by means of: marine data collection, numerical modeling and forecasting hazardous weather and ocean conditions. As well as the collection and processing of Hydrographic Information.”



Roadmap to Improved Arctic Forecasting Capability

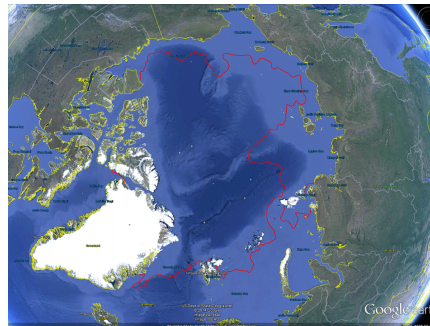
Analyze: Ice edge position and MIZ extent



Predict: Arctic Cap Nowcast/Forecast System (ACNFS)



Predict: 2-Day Ice Edge Outlook





International Engagement



Increase Arctic capabilities by leveraging opportunities for mil-mil and gov-gov collaboration with Arctic partners through:

- Improved Communication & Relationships with Arctic Neighbors
- Increased Cooperative Projects, Trainings, Operations & Exchanges by Removing Obstacles





Partnerships



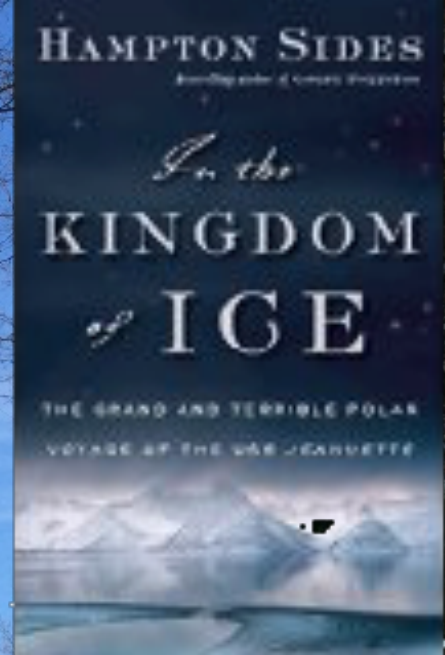
Navy Strategic Partnerships

- Assured Access
- Maritime Domain Awareness (MDA)
- Safety of Maritime Activities
- Search and Rescue (SAR)
- Law Enforcement
- Oil Spill Response





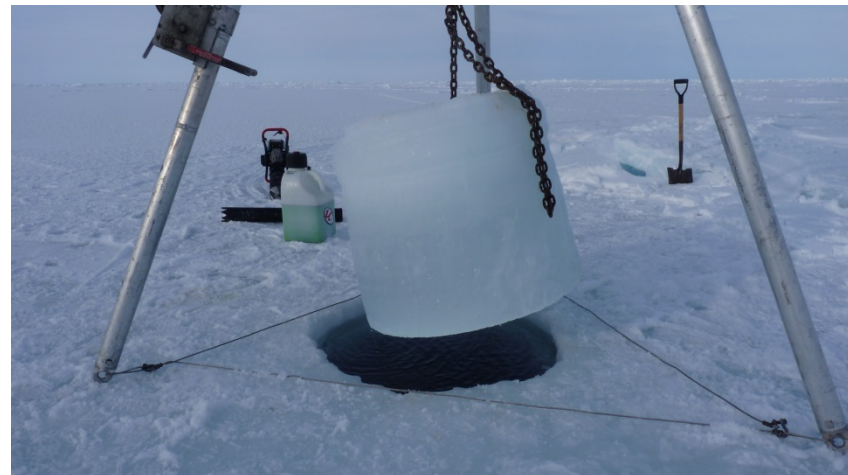
Jeanette
Expedition
1879 - 1881



The U.S. Navy has a long history in the Arctic



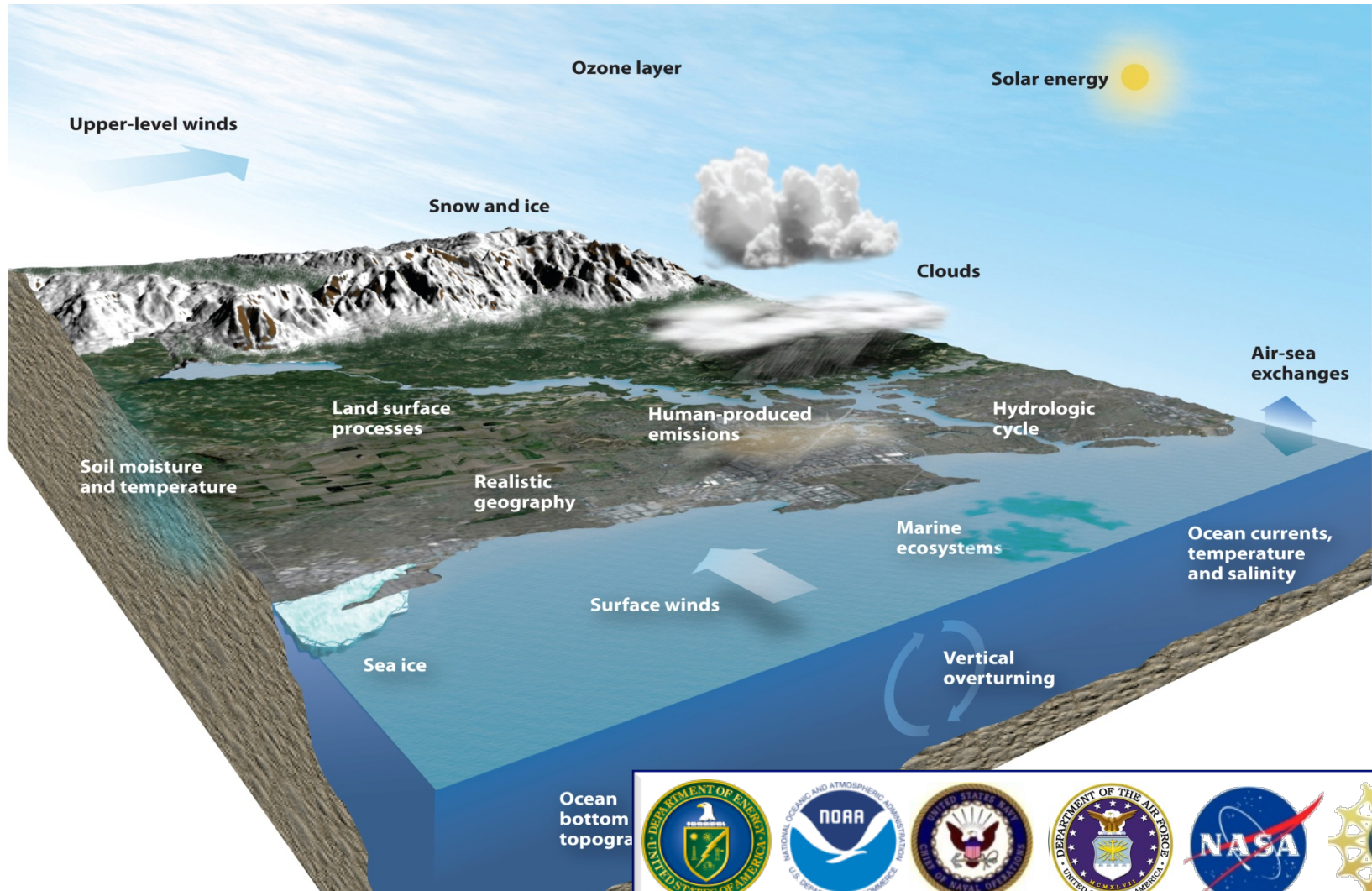
ICEX 2014





Earth System Prediction Capability (ESPC)

0 hours → 30 years: Weather, Ocean, Climate, Ice



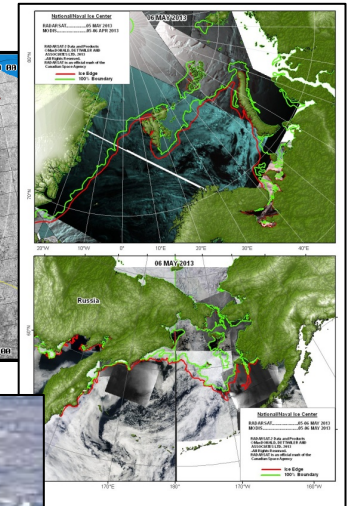
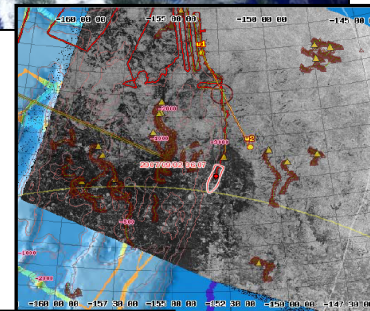
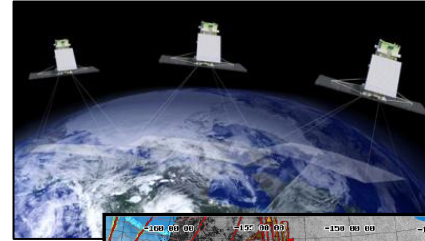
ESPC: A unifying NATIONAL effort → one “BEST” operational “model”



Enablers



- Improved Sea Ice & Weather Forecasts
- High-Resolution Arctic System Models
 - Coupled ocean/wave/ice/atmosphere
- Expanded Forecasts (7 days, 1-3 months, 1 yr, 5-10 yrs)
 - Detailed ice location, thickness, age, movement
- Platform & Sensor Development (buoys, hydrographic sensors, UAV/UUVs)
- Earth System Prediction Capability (ESPC)
- Improved Charting

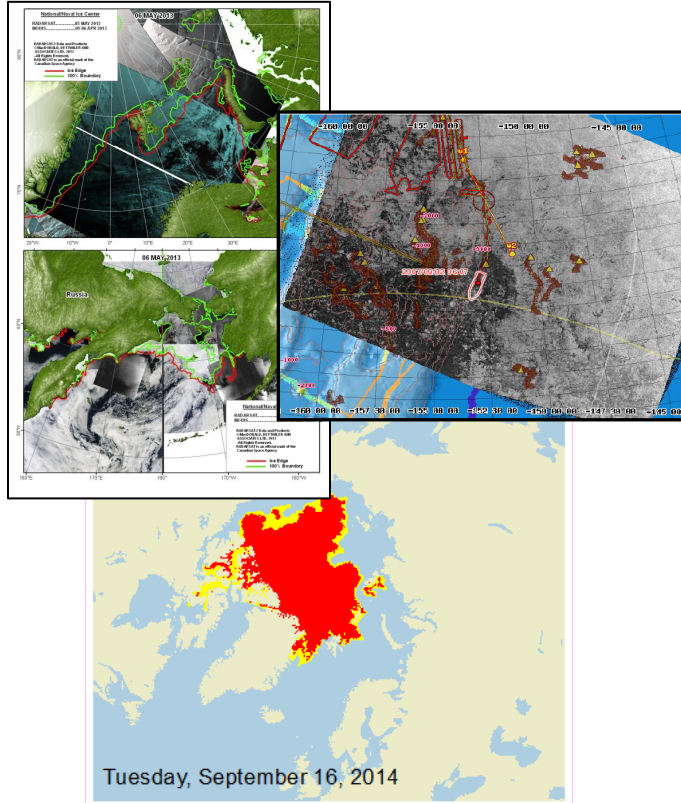


Improving forecasts and predictions to support Navy operations



Roadmap to Improved Arctic Forecasting Capability

Analyze: Ice edge position and MIZ extent



Predict:
**ESPC Regional Arctic
Coupled Model
FY 2022**



Predict:
**2 week sea ice forecast
(location, thickness, age & movement)
+
30/60/90 day Outlook**



The map displays the Arctic region, centered on the Arctic Ocean. The Arctic Circle is marked with a dashed line. The surrounding landmasses are color-coded: the United States (Alaska) is green, Canada is orange, Greenland (Denmark) is brown, Russia is yellow, and the Soviet Union is light yellow. Major cities and locations are labeled, including Anchorage, Fairbanks, Barrow, and various Russian cities like Yakutsk, Verkhoyansk, and Urengoy. The map also shows the Arctic Circle, major cities like Anchorage, Fairbanks, Barrow, and various Russian cities like Yakutsk, Verkhoyansk, and Urengoy. The map is labeled 'USNORTHCOM' and 'USEUCOM'.



Task Force Climate Change



Ensure informed decisions for policy development and naval operations

TFCC efforts include:

- Strategic Guidance Development
- Advocacy across DoD
- Investment Strategy
- Inter-agency & International Partnerships

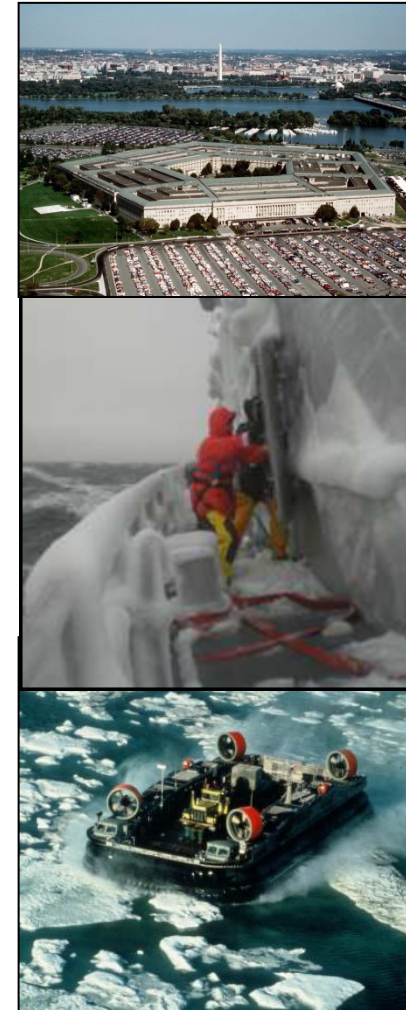


Photo Credit: Master Sgt. Ken Hammond, USAF