

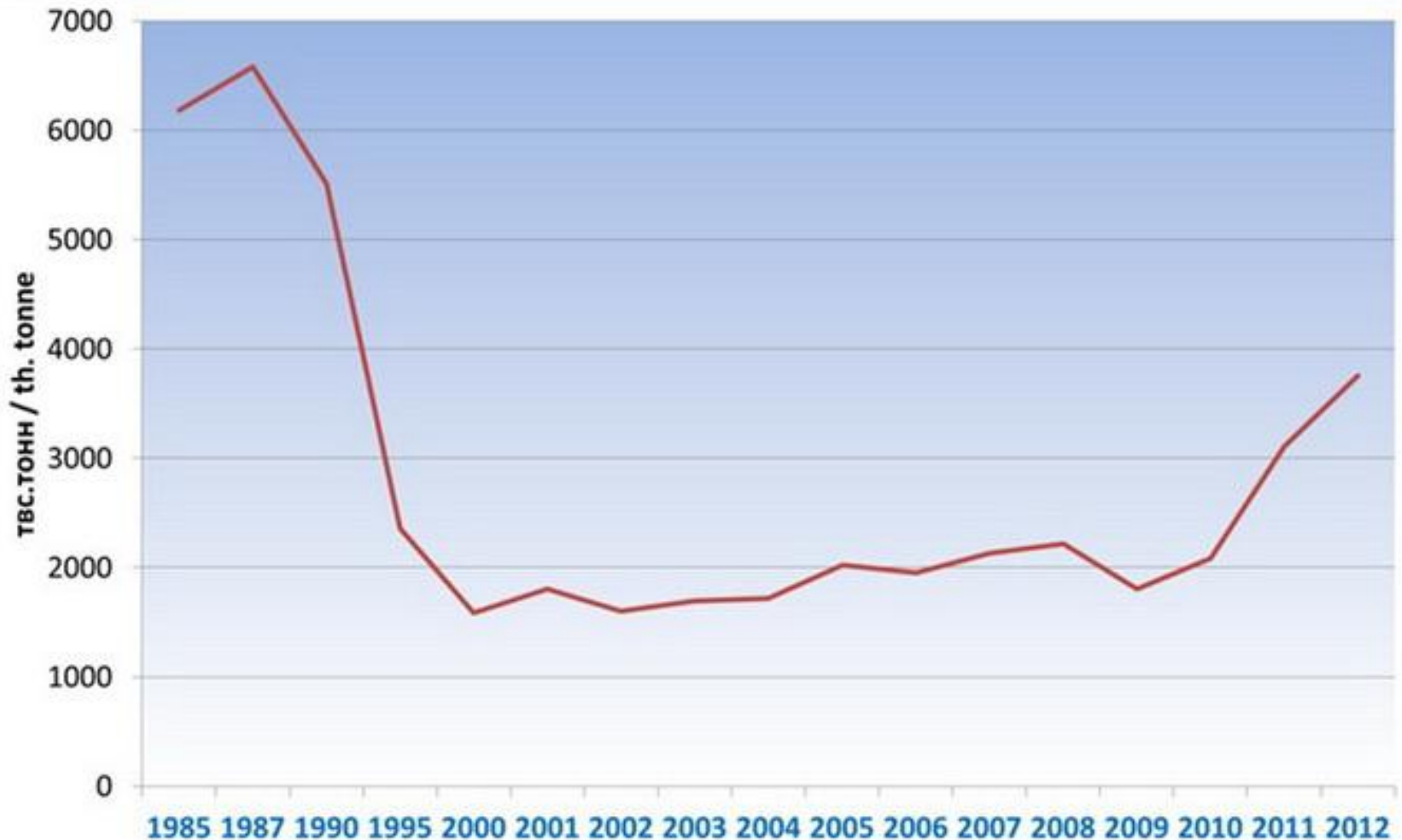
***USN Arctic Roadmap 2014-2030***  
***SCICEX SAC meeting***



**CDR Nick Vincent**  
**21 May 2014**



# Northern Sea Route (Transit and Domestic Cargo )



***Polar routes will gradually open. Transit season is short. Maritime activity growth only 2-4% of global shipping. Will not replace the Suez or Panama Canals as primary shipping routes.***



# Arctic Ice Coverage

## Sea Routes



### Northern Sea Route

2025: 6 weeks open  
41' controlling draft



### Transpolar Route

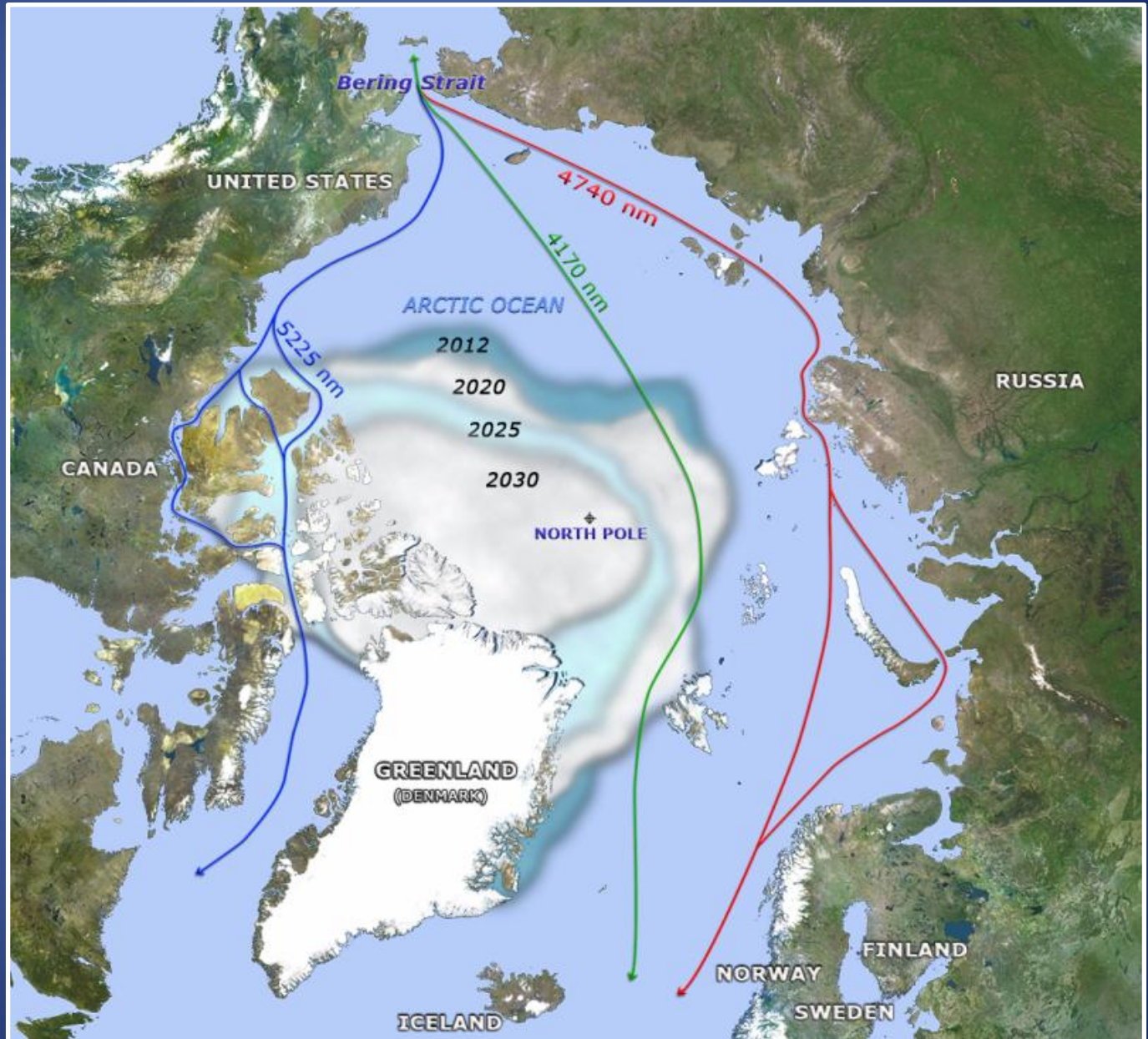
2025: 2 weeks open  
Deep ocean transit



### Northwest Passage

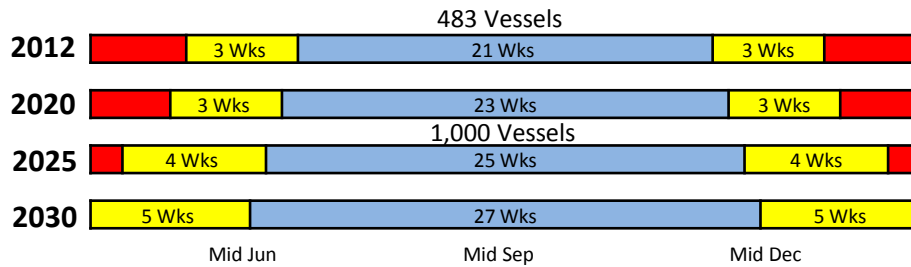
2025: intermittently open  
33' controlling draft

Sea route distances:  
Distance from the  
Bering Strait to  
Rotterdam

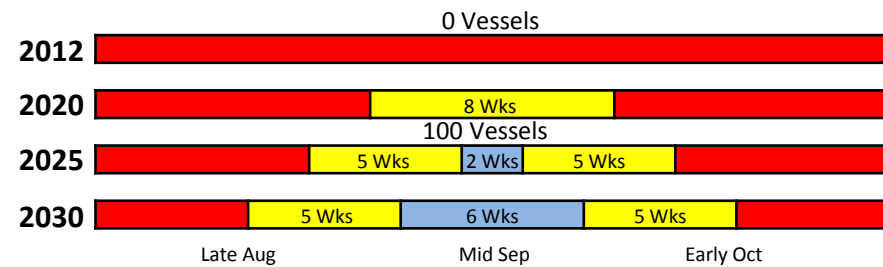


# Arctic Sea Route Navigability

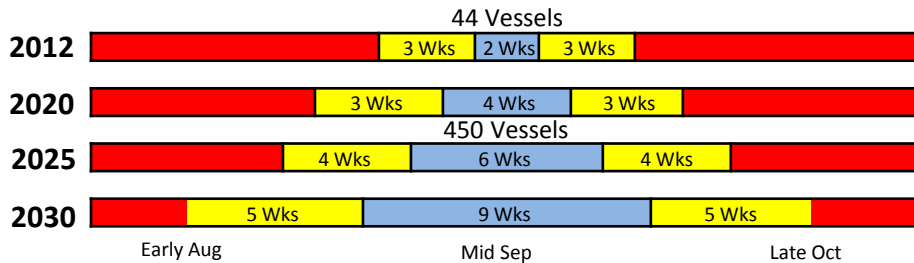
## Bering Strait (BS)



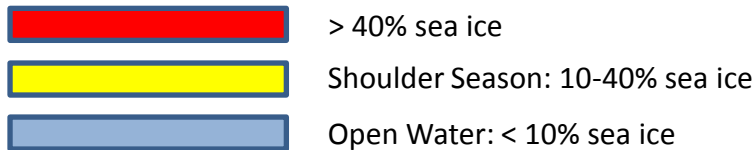
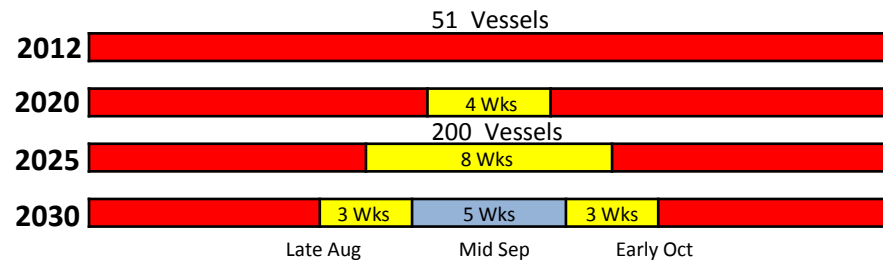
## Transpolar Route (TPR) (4,170 NM)



## Northern Sea Route (NSR) (4,740 NM)



## Northwest Passage (NWP) (5,225 NM)



Vessel data from ONI

**Polar routes will gradually open. Transit season is short. Maritime activity growth only 2-4% of global shipping. Will not replace the Suez or Panama Canals as primary shipping routes.**



# Informing the Roadmap

## Current Strategic Guidance

- A Cooperative Strategy for 21st Century Seapower (Oct 2007)
- National Security Presidential Directive – 66 Arctic Region Policy (Jan 2009)
- Quadrennial Defense Review (Feb 2010)
- U.S. Navy Strategic Objectives for the Arctic (May 2010)
- National Security Strategy 2010 (May 2010)
- National Strategy for the Arctic Region (May 2013)
- U.S. Coast Guard Arctic Strategy (May 2013)
- DoD Arctic Strategy (Nov 2013)
- Implementation Plan of National Strategy for the Arctic Region (Jan 2014)

## Recent Activity

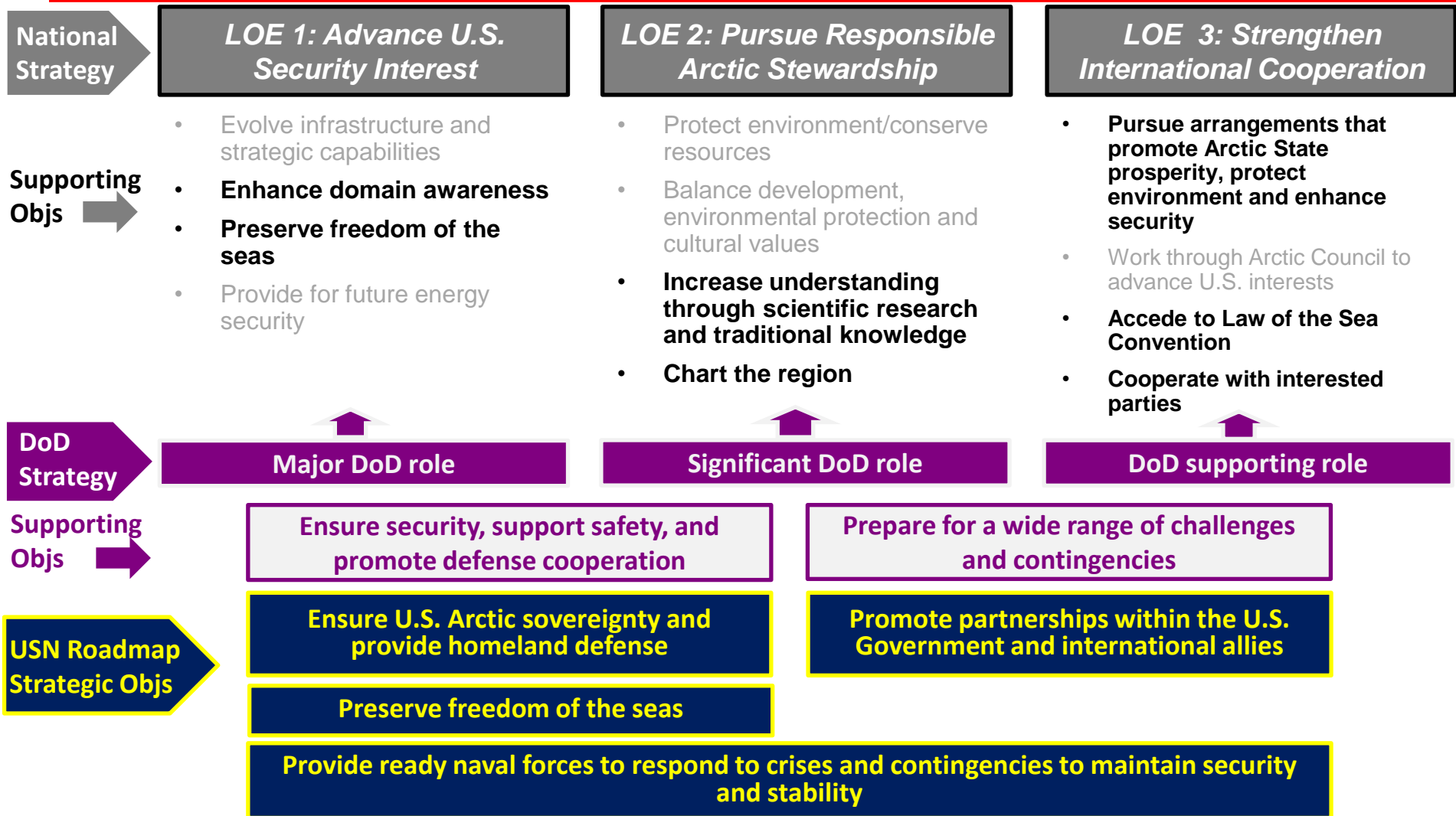
- USN-USCG Warfighter Talks
- ONI – Arctic geostrategic assessment
- Two Naval Studies Board sessions
- N3/N5 Strategy and Mission Analysis
- National Fleet Plan (March 2014)
- NORTHCOM Maritime Mission Requirements Quicklook

***“...an Arctic region that is stable and free of conflict, where nations act responsibly in a spirit of cooperation, and where economic and energy resources are developed in a sustainable manner.”***

***Desired strategic end state, National Strategy for the Arctic Region***



# Arctic Strategies - Aligned



**A secure and stable region where U.S. national interests are safeguarded, the U.S. homeland is protected, and nations work cooperatively to address challenges.**



# Navy's National Role?

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

## ***DOD Lead:***

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

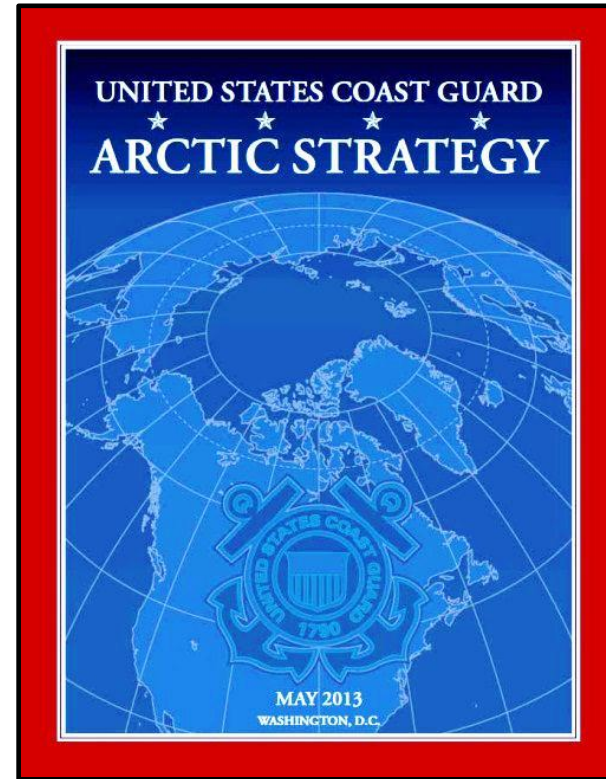
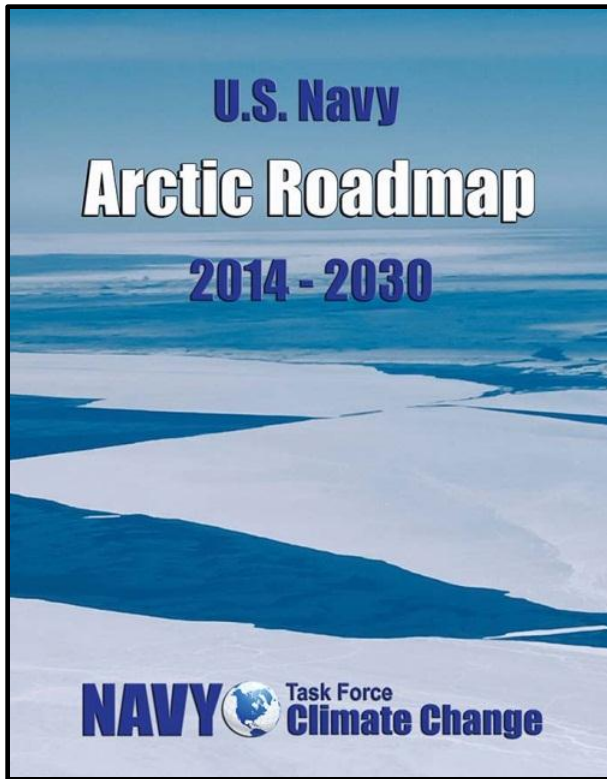
- Objective: Improve sea ice forecasts and predictions at a variety of spatial and temporal scales

***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.”***



# USN/USCG Arctic Strategies



***U.S. Navy is increasing its coordination with the U.S. Coast Guard, to include a joint USN/USCG Arctic Working Group***





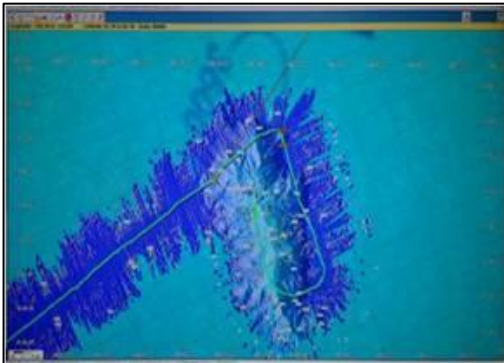
# U.S. Arctic Region Challenges

- Harsh operating environment
  - Non-ice hardened ships and limited ice breaking capability
- Limited comms and satellite sensors
- Limited Arctic experience
- Incomplete charting
- Limited ice- breaking capabilities
- Limited SAR assets
- Limited infrastructure
- High cost of operations



## Identified Capability Gaps

- Sense environment parameters
- Forecast environmental parameters
- Predict impact of environmental conditions on naval systems

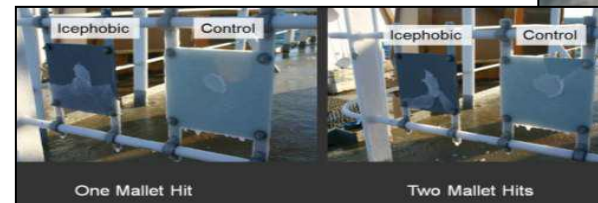
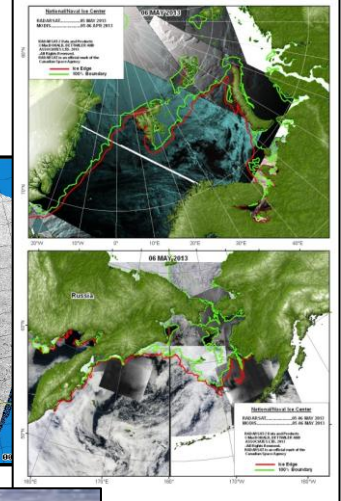
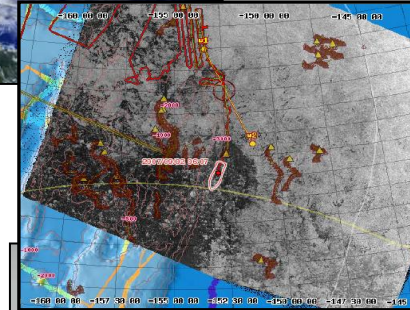
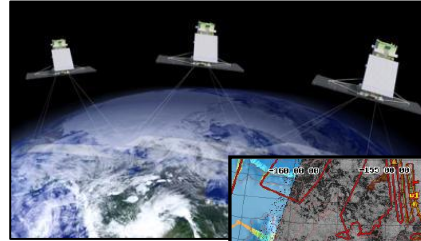


**Improving operational capabilities, expertise, and capacity to operate in the region.....Just like every other ocean around the world**



# The Way Ahead

- Improved sea ice and 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)
- Remote sensing exploitation and algorithm development
- High resolution Synthetic Aperture Radar (SAR) imagery
- Data Assimilation techniques
- Mitigate Effects of Sea Ice Impacts and Ice Loading
- Arctic Center of Excellence



**Improving forecasts and predictions to support Navy operations worldwide**



# Opportunities

## A National Earth System Prediction Capability



TC Forecasts

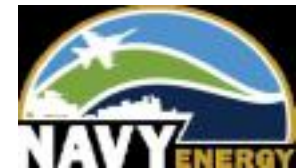
Sea Level Rise

Aerosols & GHG



Extreme Weather  
Floods, Droughts

Arctic Operations    National Security



**The time is now to accelerate research into operational capabilities for improved global medium range (10-90 days) and long range (seasonal to decadal) forecasting skill to address national security and societal impacts of the environment through collaboration between the Research and Mission Agencies in the Dept. of Defense, NOAA, DoE, NASA and NSF.**



# Near-term (present-2020)

- Sea ice decreases - Major waterways increasingly open
- Shipping remains light - Harsh weather, high sea states, and economy-of-scale limitations
- Presence primarily undersea and air. Surface operations limited to open water
  - Specify Requirements
  - Investment decisions
  - Gain experience/expertise
  - S&T, Exchanges, Exercises
  - Update CONOPS, TTPs
  - Strengthen Partnerships

