

# Arctic Marine Shipping Assessment (AMSA): Responding to Changing Arctic Marine Access



**Resource Development  
Northern Transportation  
Whitehorse ~ 29 May 2007**

**Ross MacDonald  
[www.pame.is](http://www.pame.is)**

**PAME**

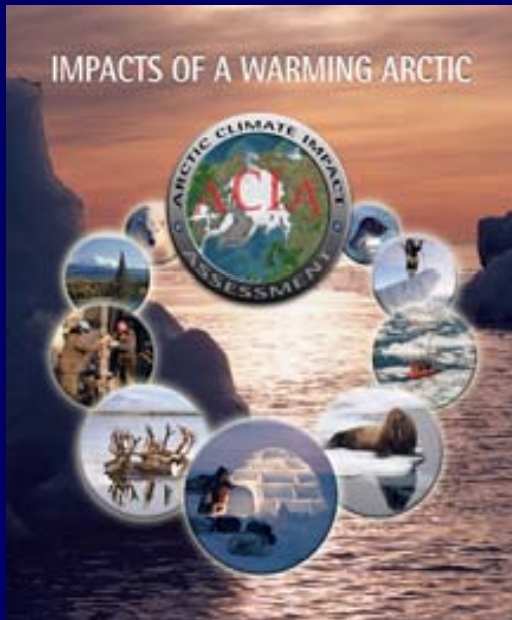
# Arctic Council

## Arctic Marine Shipping Assessment (AMSA)

Reykjavik Declaration, 4<sup>th</sup> Ministerial (Nov 2004)

*“ Request PAME to conduct a comprehensive Arctic marine shipping assessment as outlined in the AMSP under the guidance of **Canada, Finland, and the United States as lead countries** and in collaboration with the EPPR working group and other working groups of the Arctic Council and Permanent Participants as relevant.”*

# Arctic Marine Shipping Assessment (AMSA) Key Points



- AMSA Natural Follow-on to:
  - Arctic Climate Impact Assessment (ACIA)
  - Arctic Marine Strategic Plan (AMSP)

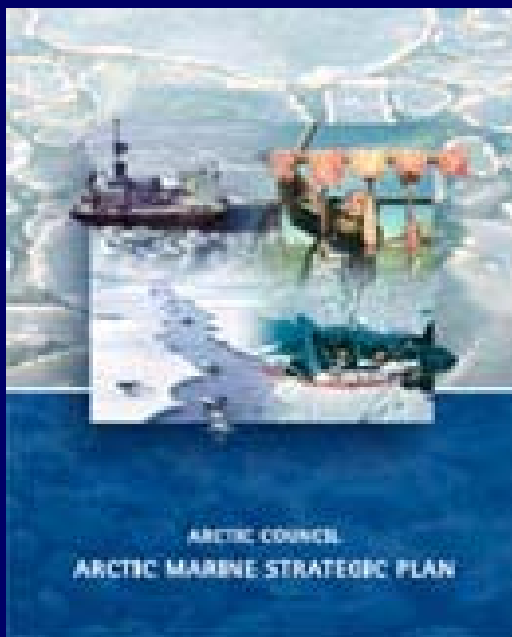
- Circumpolar, yet Regional (Large Marine Ecosystems) *and* Local Focus

- Report results in 2009

- Lead Countries: Canada, Finland, and USA

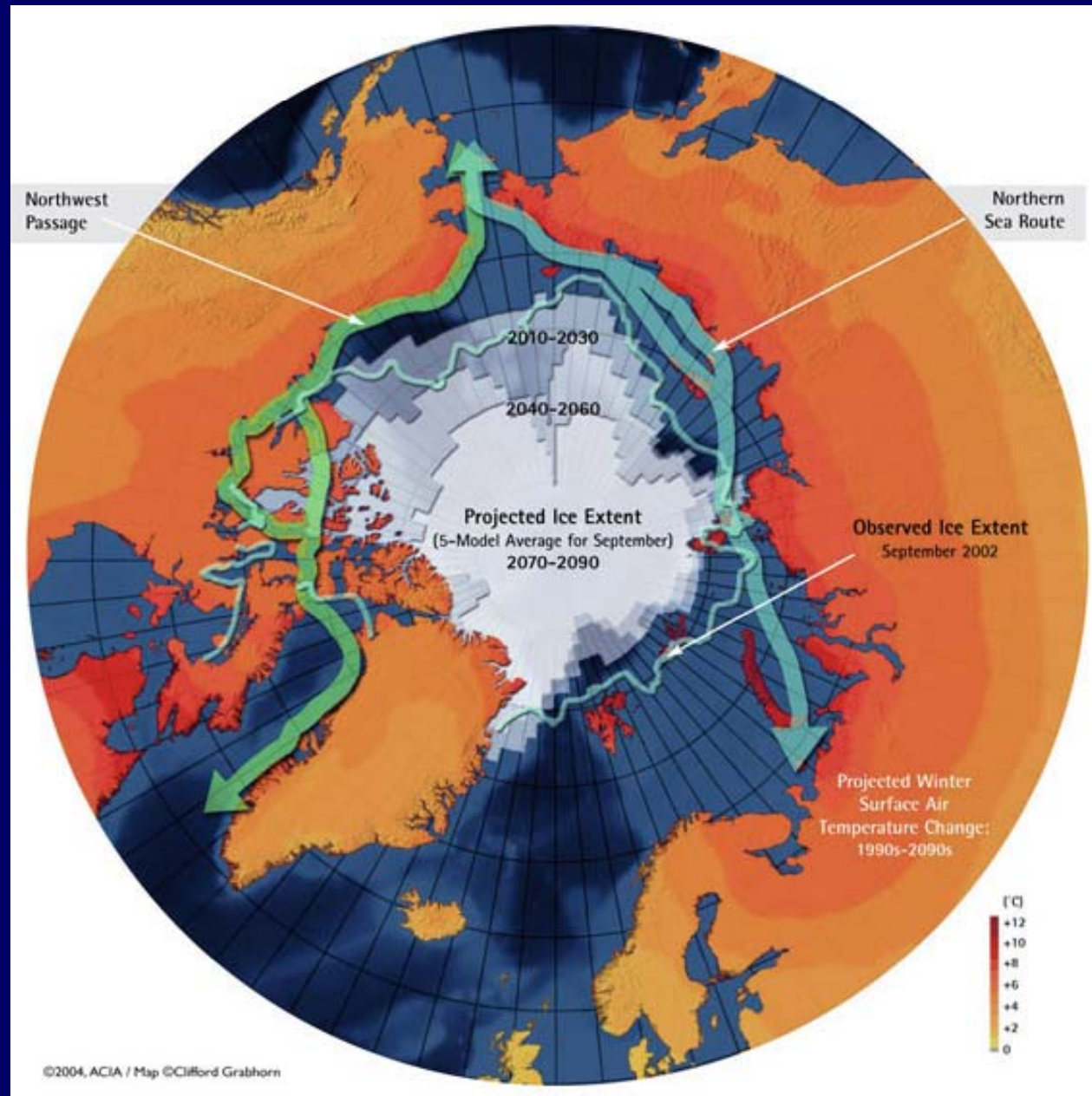
- AMSA web site: [[www.pame.is](http://www.pame.is)]

- ACIA web site: [[www.amap.no](http://www.amap.no)]



## Arctic Climate Impact Assessment Key Finding #6:

**Reduced sea ice is very likely to increase marine transport and access to resources.**

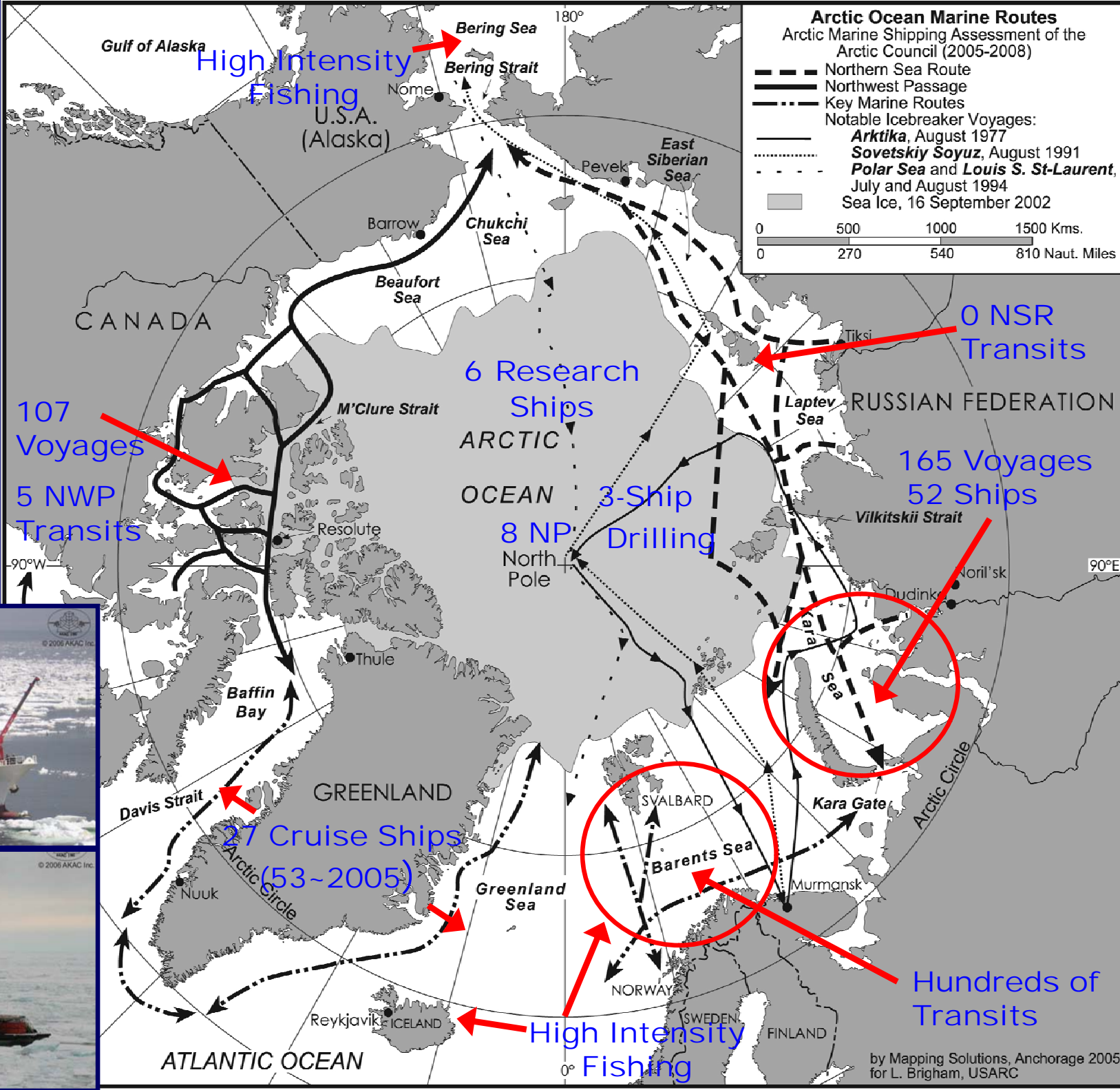


# The Maritime Arctic of Today

## Snapshot of Summer 2004 Traffic

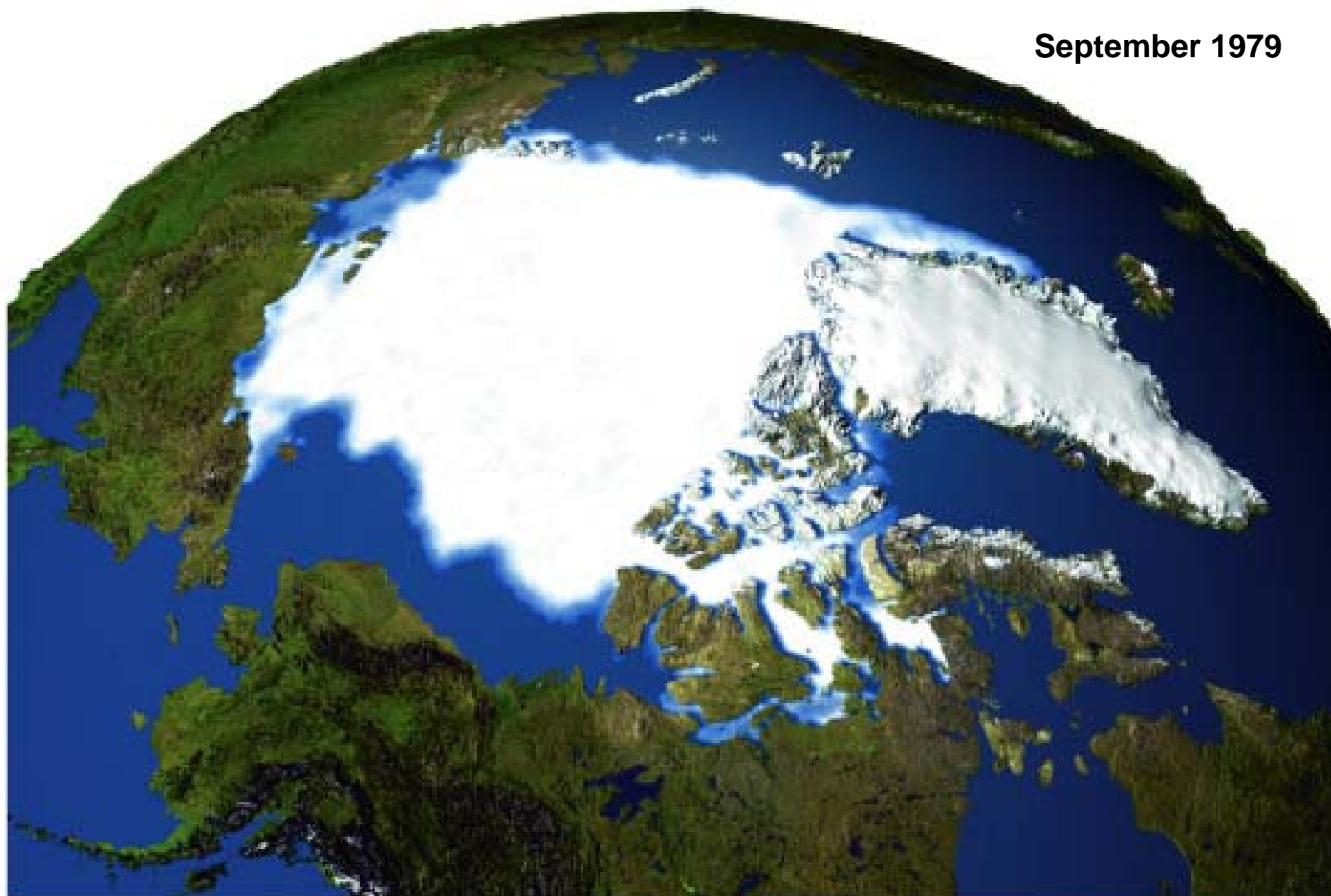
### Modes of Arctic Marine Transport

- Destinalional / Regional
- Trans-Arctic
- Trans-Arctic with Transshipment
- Intra-Arctic



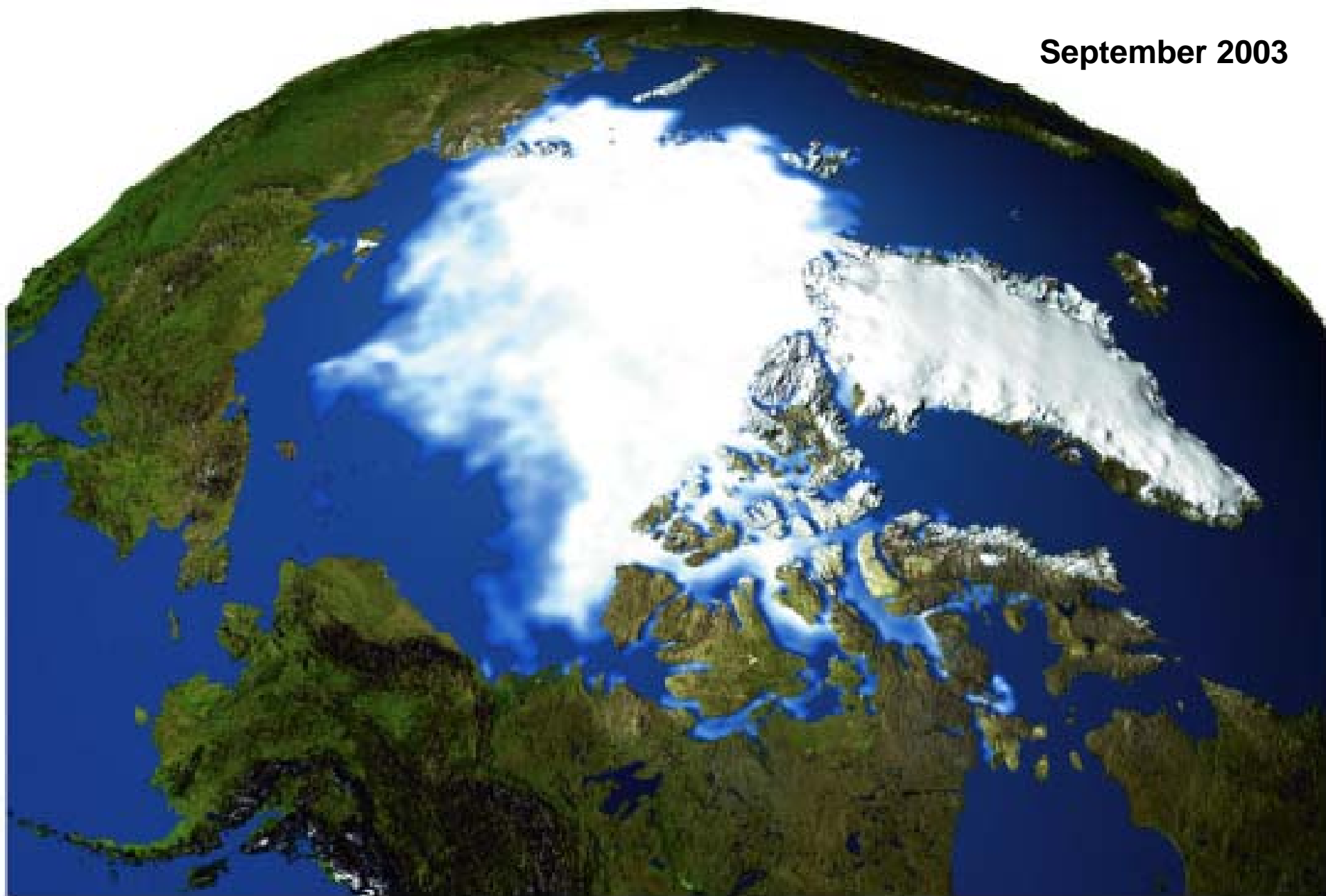
by Mapping Solutions, Anchorage 2005 for L. Brigham, USARC

September 1979



©NASA

September 2003



NASA

Year- round  
Navigation



Distance (Nautical Miles)  
Hamburg to Yokohama

Northern Sea Route ~ 6,920

Suez Canal ~ 11,073

Panama Canal ~ 12,420

Cape of Good Hope ~ 14,542

INSROP (1999)

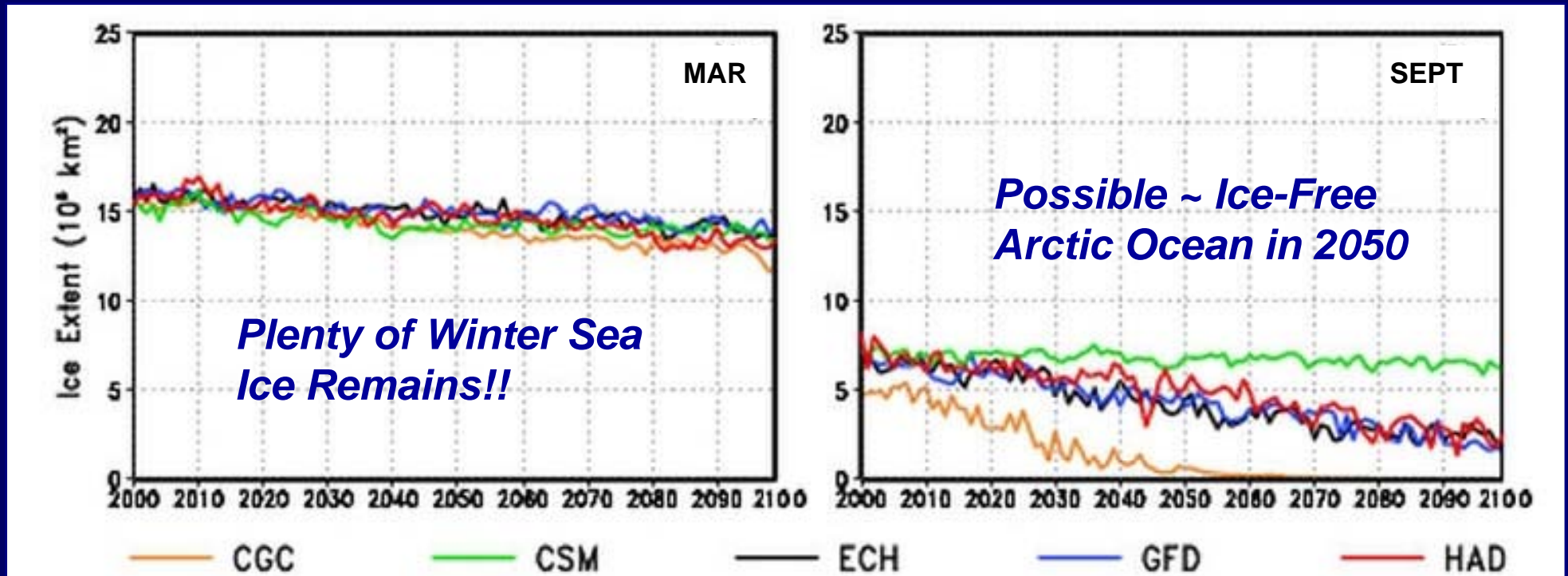


# Arctic Climate Impact Assessment

## Climate model projections of sea ice extent: 2000 - 2100

March

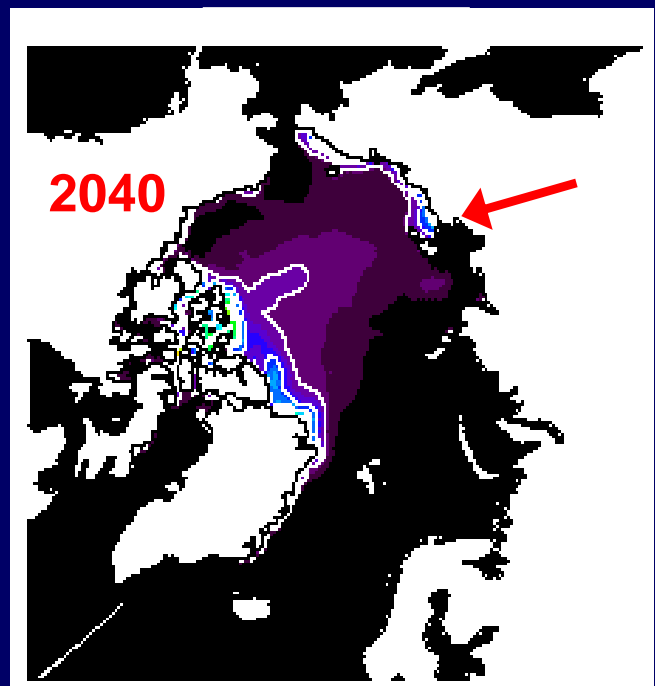
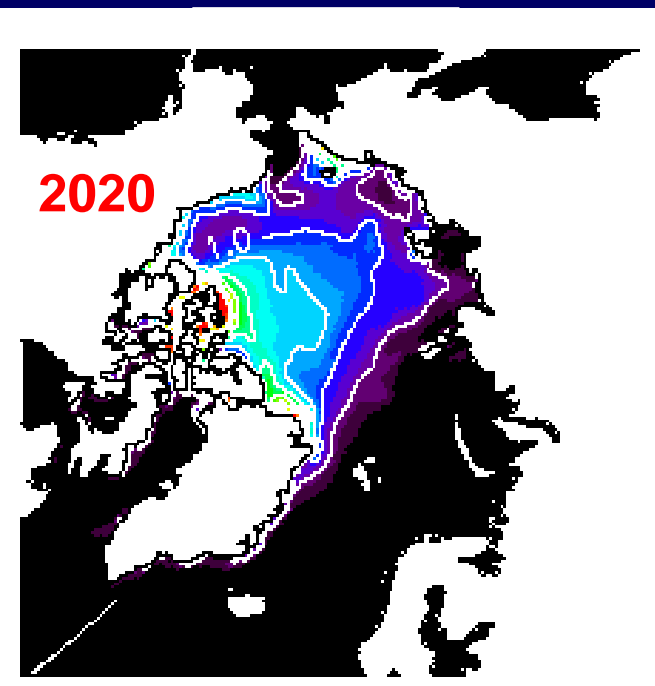
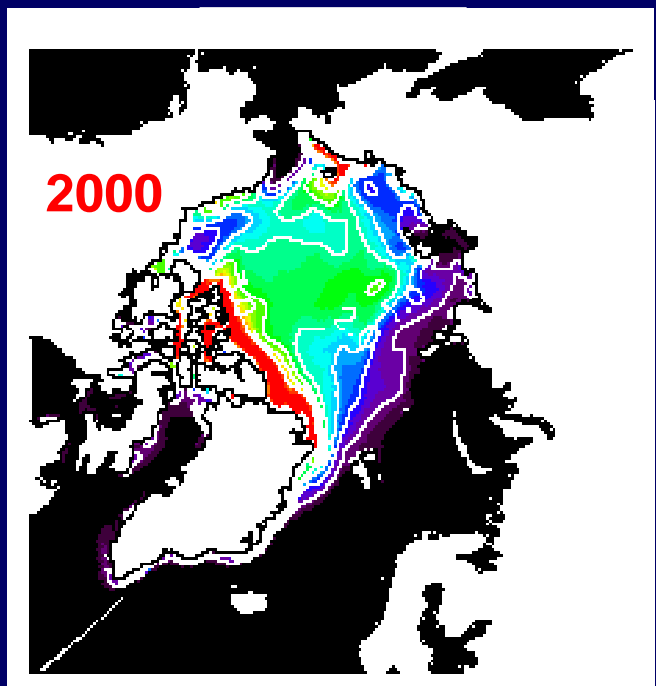
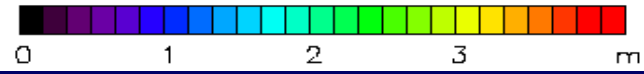
September



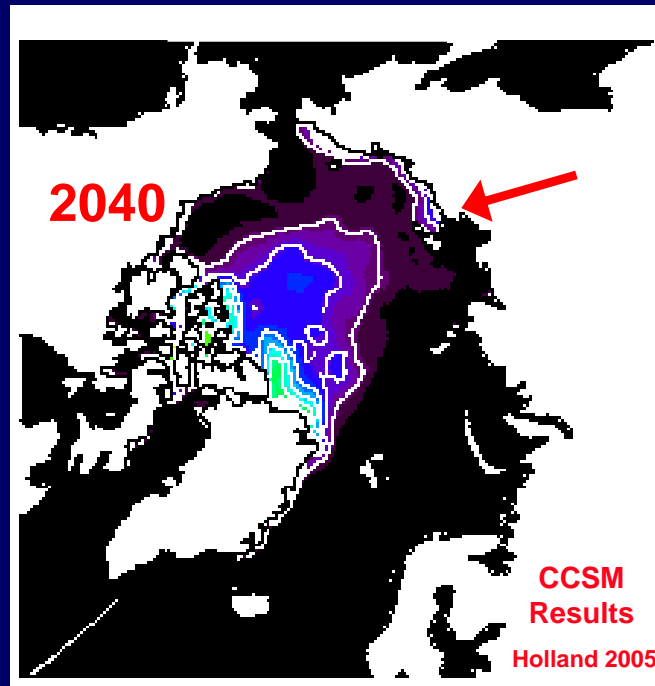
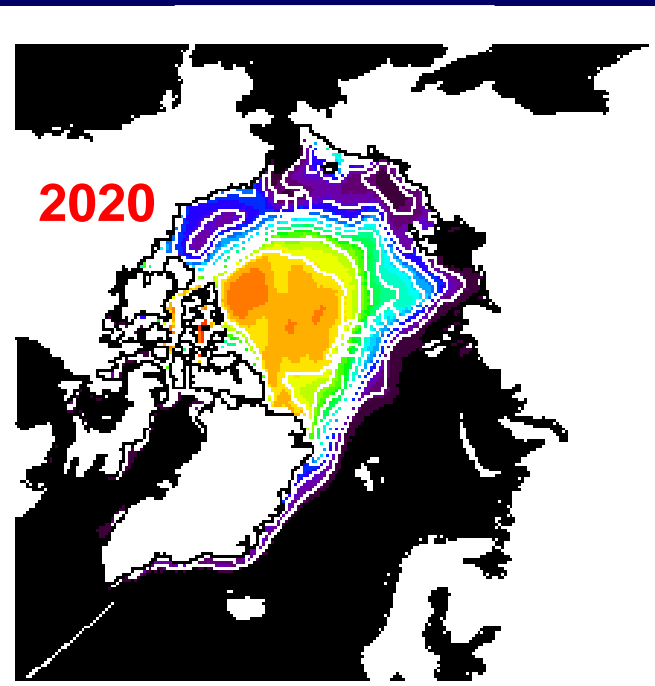
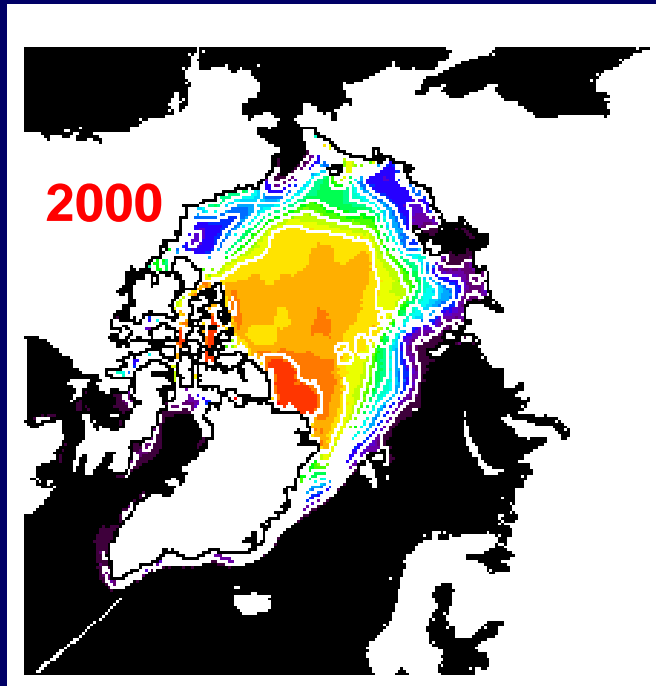
B2 IPCC Moderate Global Scenario

PAME

# Recent Model Results September Ice Thickness



# September Ice Concentration



CCSM  
Results  
Holland 2005

# Arctic Marine Shipping Assessment

**Task** - View of Today's Arctic Marine Shipping Situation (Data from Arctic Coastal States for 2004)

**Task** - Review of Current Traditional ~ Indigenous Marine Use

**Task** - Projections of Maritime Activity Based on ACIA ~ Regional Climate & Economic Scenarios (2020 & 2050)

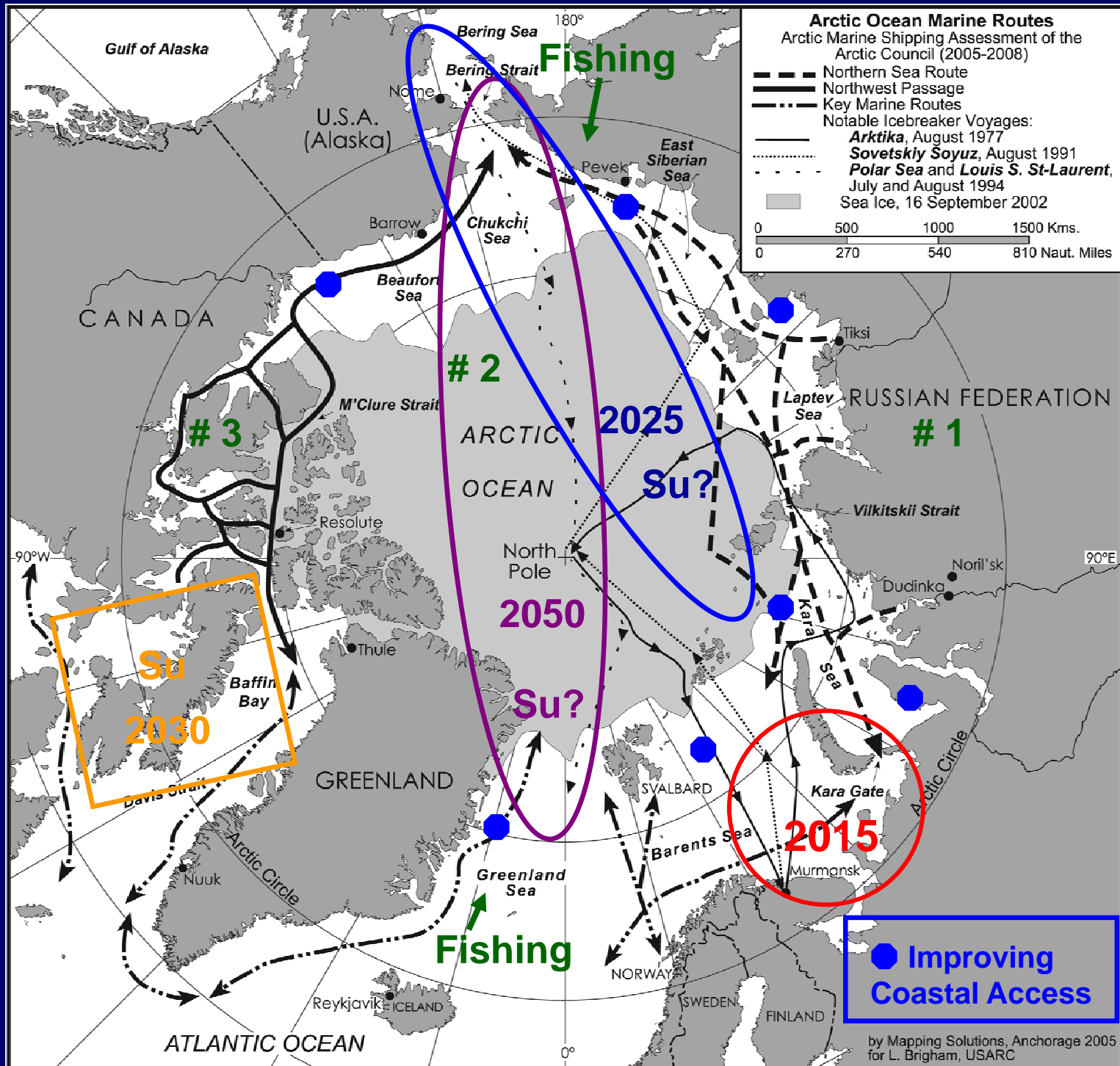
**Task** - Impacts (Social, Environmental, Economic) of Today's and Future Arctic Marine Activity

**Task** - Risk Analyses, Accident Scenarios, Responses

## Findings of the Assessment

Arctic Council ~ PAME Recommendations for the Member States and the International Maritime Community

# The Maritime Arctic of the Future?





**Icebreaking (Double Acting) Container Ship  
*Norilskiy Nickel* in the Kara Sea  
March 2006**

Aker Arctic

**PAME**



## **Arctic Marine Vessel Activity ~ AMSA Types**

**Tankers ~ Bulk Carriers**

**Container Ships ~ Tug-Barge Combinations**

**Fishing Vessels ~ Ferries ~ Passenger Vessels/Cruise Ships**

**Research Vessels ~ Offshore Supply Vessels**

**Icebreakers (Government & Commercial) ~ Others**



