



# US Govt. Perspective on Arctic Research

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**Executive Director, USARC**



# Report Documentation Page

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## U.S. GOVERNMENT PERSPECTIVE ON ARCTIC RESEARCH

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The Arctic region and Alaska—America’s Arctic—provide tremendous value to the United States. Without a significant Arctic Research Program, however, those things we value in and from the Arctic—energy, food, security, biodiversity, fresh water, carbon sinks, pristine wilderness, more direct transport routes, rich indigenous cultures—cannot contribute as well or be sustained. There is little human activity we know of in the Arctic that is not “knowledge based.” The Arctic continues to be rich in mysteries that can only be solved with pioneering, exploration and research. With greater knowledge, the Arctic region can contribute more to both the global economy and the environment. Knowledge about Arctic processes can help protect the world from expensive, unnecessary, and destructive climate change.

The U.S. Arctic Research Program must strengthen its efforts on five central and crosscutting themes:

1. Environmental Change of the Arctic, Arctic Ocean, and Bering Sea
2. Arctic Human Health
3. Civil Infrastructure
4. Natural Resource Assessment and Earth Science
5. Indigenous Languages, Cultures, and Identities

*“The opening of the ‘fifth ocean,’ the Arctic, for longer periods of time, will provide new access to resources, migration of fishing stocks and eventually new trade routes, that can’t be overstated.”*

**-Chief of Naval Operations  
Adm. Gary Roughead**

**Remarks at University of Chicago  
Conf. on Terrorism & Strategy  
October 12, 2010**



# Arctic region defined in US law







# U.S. Arctic Policy (NSPD-66/HSPD-25)

- National/Homeland Security Interests
- International Governance
- Extended Continental Shelf and Maritime Boundaries
- Promoting International Scientific Cooperation
- Maritime Transport
- Economic/Energy
- Environmental Protection

Seven policy areas – one overarching legal dynamic – relationship between international law, mainly the law of the sea and national sovereignty



# US ARCTIC RESEARCH COMMISSION



## What is the USARC?

- Independent federal agency of presidential appointees that works with Congress and Executive branch
- Sets nation's Arctic research goals and objectives
- Develops an integrated national Arctic research policy
- Helps create a national Arctic research program plan
- Facilitates cooperation among federal, state and local governments, and other nations with respect to Arctic research, both basic and applied





US ARCTIC RESEARCH  
COMMISSION

REPORT ON  
GOALS AND OBJECTIVES FOR  
ARCTIC RESEARCH 2009–2010



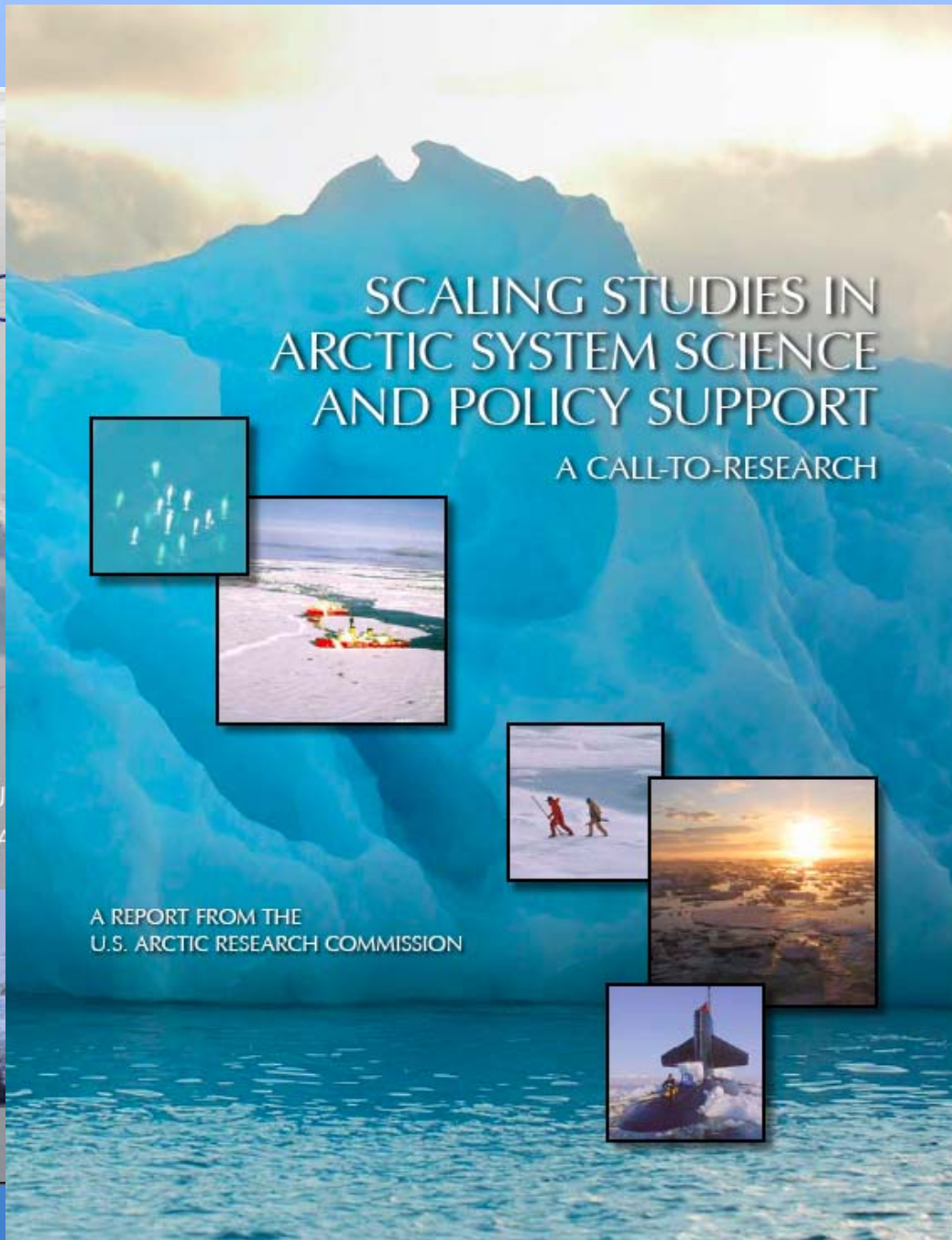
FOR THE US ARCTIC RESEARCH PROGRAM PLAN

USARC sets  
nation's Arctic  
research goals

SC



PART 1: TECHNICAL GUIDANCE FOR SCIENCE ACCOMMODATION



# SCALING STUDIES IN ARCTIC SYSTEM SCIENCE AND POLICY SUPPORT

## A CALL-TO-RESEARCH



A REPORT FROM THE U.S. ARCTIC RESEARCH COMMISSION



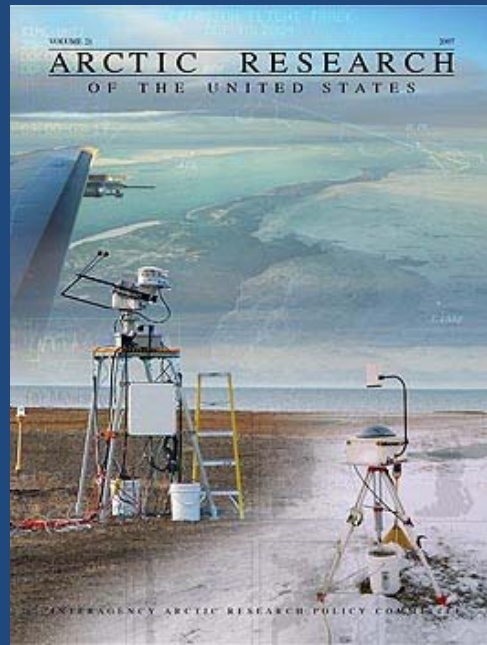
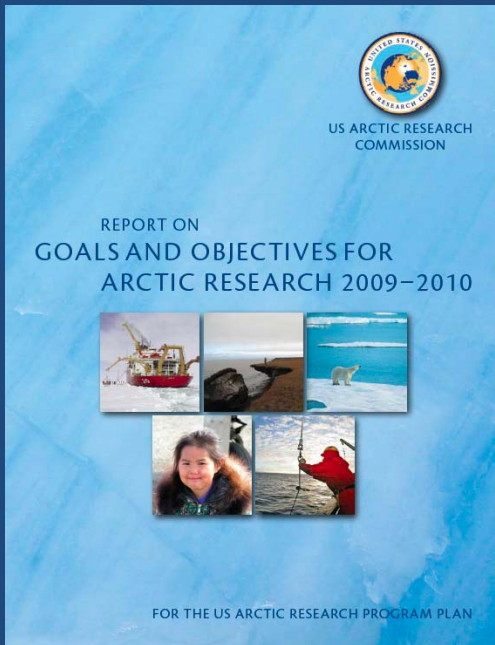
WHITE PAPER

COMMISSION ON THE EFFECTS OF CLIMATE CHANGE ON THE U.S. ARCTIC REGION AND U.S. FUNDING FOR

# ARCTIC RESEARCH



Oil drilling ships with towers frozen in the pack ice covering on the Beaufort Sea with an icebreaker nearby, Northwest Territories, Canada.



USARC:  
establishes  
research  
goals & sets  
research  
policy



IARPC:  
adopts  
goals,  
creates  
research  
plan

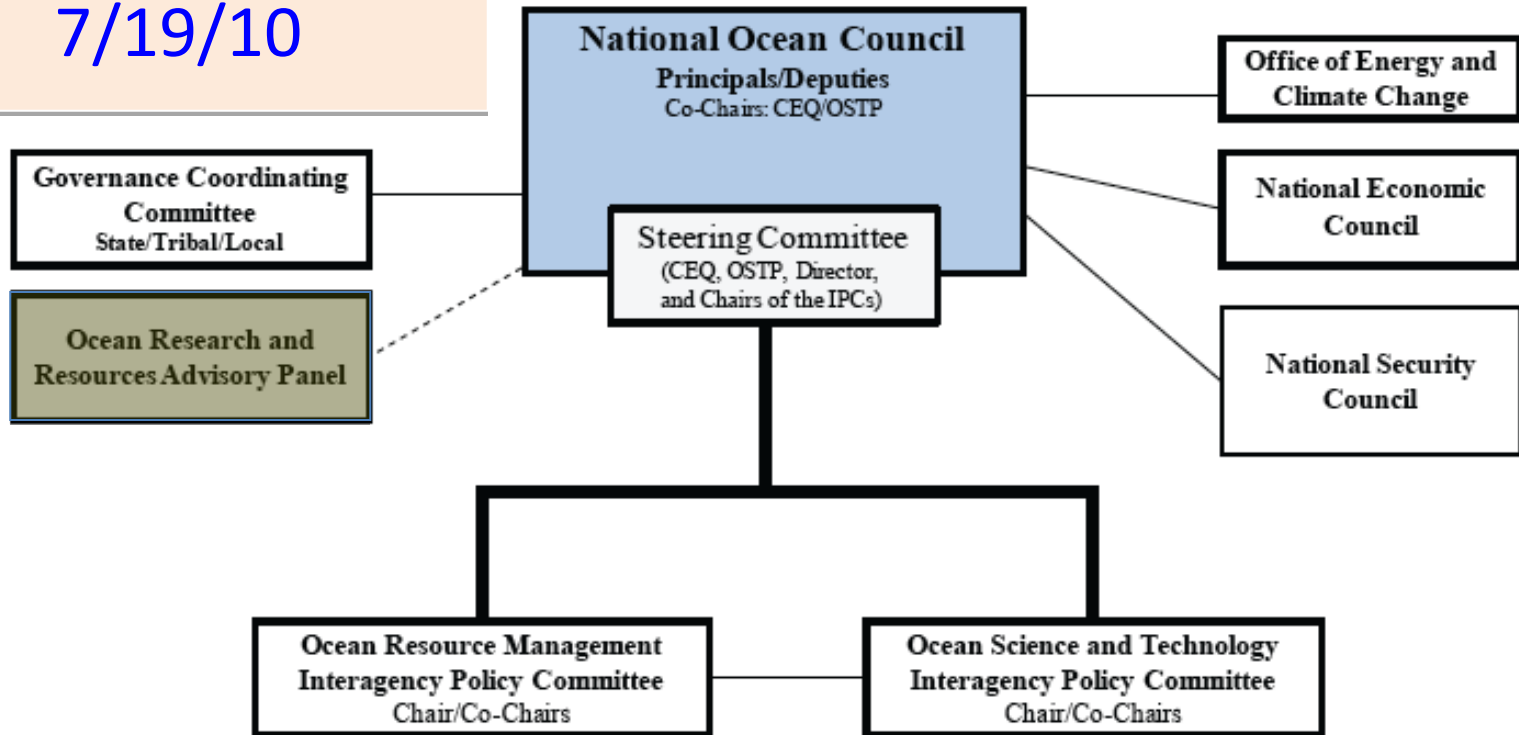


White House:  
OMB/OSTP  
Congress:  
authorizers &  
appropriators

USARC comments on budget to Congress

Policy Coordination Framework

New ocean policy  
7/19/10



1 of 9 national priority objectives:  
“Changing conditions  
In the Arctic”

Working and Marine Regional I  
The External Committee

Coastal Adaptation,  
ering

- Reporting
- Coordination
- - - - - Communication

THE WHITE HOUSE  
WASHINGTON

July 22, 2010

President  
reassigns Arctic  
research  
coordination from  
NSF to NSTC

MEMORANDUM FOR THE DIRECTOR OF THE OFFICE OF SCIENCE  
AND TECHNOLOGY POLICY

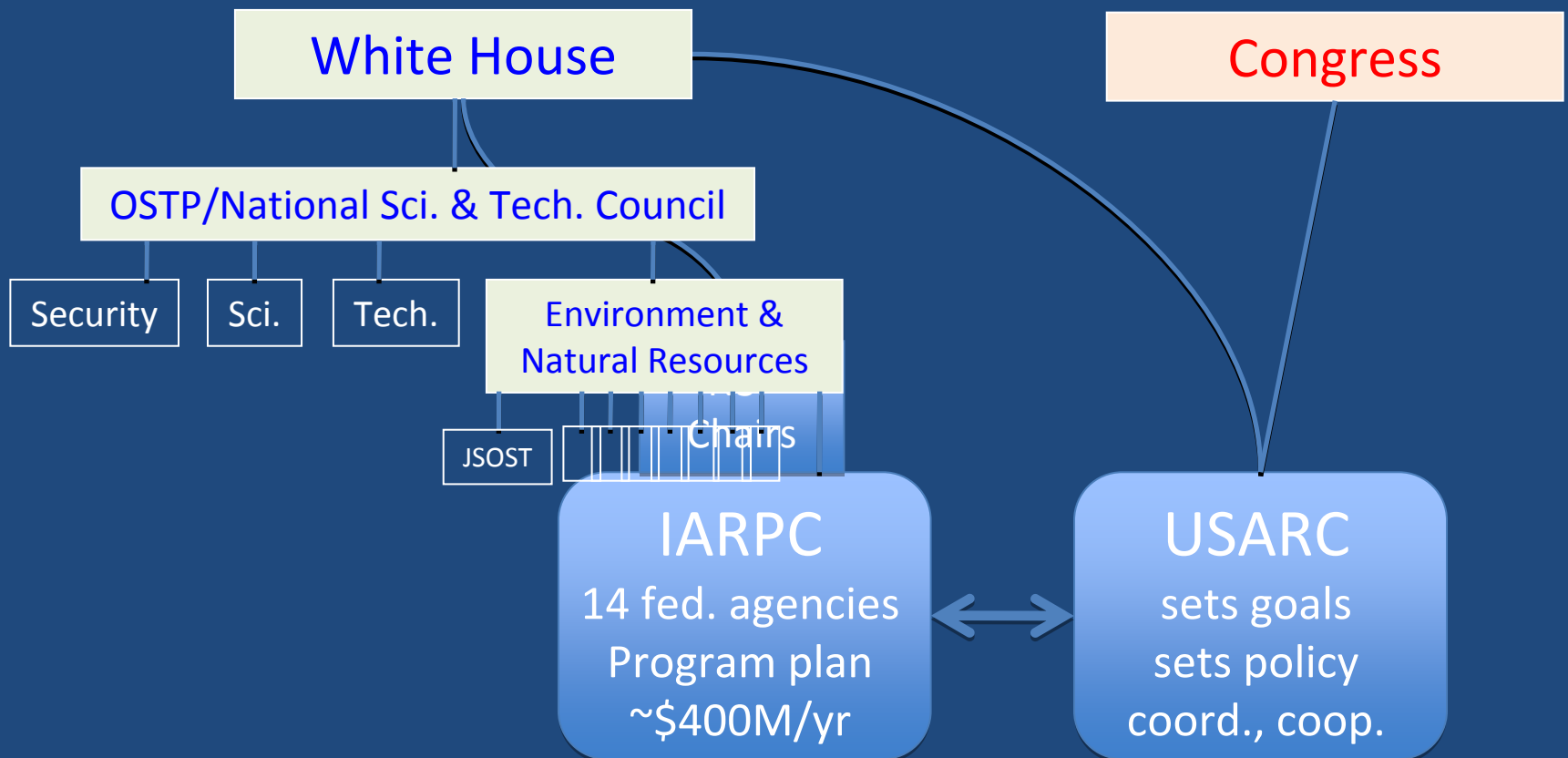
SUBJECT: Designation of the National Science and  
Technology Council to Coordinate Certain  
Activities Under the Arctic Research and  
Policy Act of 1984

By the authority vested in me as President by the Constitution and the laws of the United States, including the Arctic Research and Policy Act of 1984 (Title I of Public Law 98-373) (the "Act"), I hereby assign to the National Science and Technology Council (NSTC) responsibility to coordinate activities assigned in sections 107 and 108 of the Act to the Interagency Arctic Research Policy Committee, including through committees of the NSTC.

The Director of the Office of Science and Technology Policy is authorized and directed to publish this memorandum in the *Federal Register*.



# Impact on Arctic Research Coordination From 7/22/10 Presidential Memo



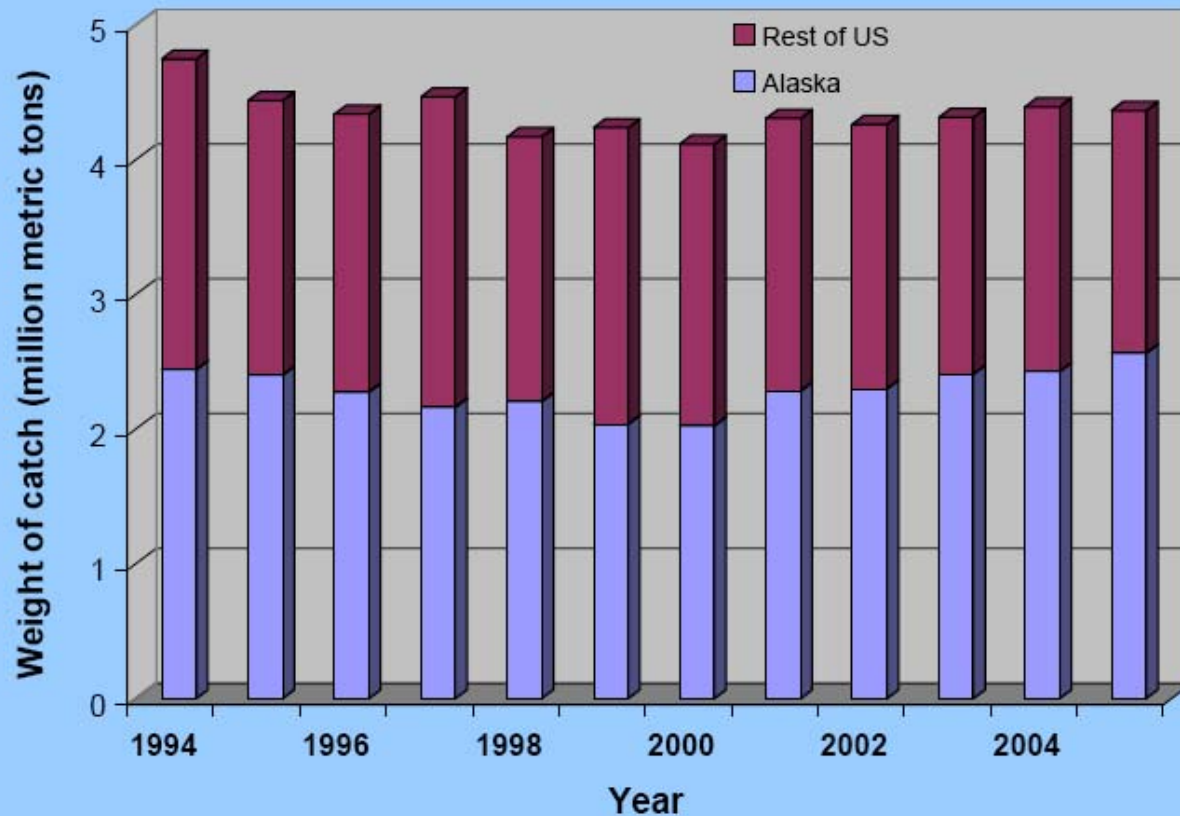


# Alaska Feeds the Nation

Largest private sector employer in Alaska



## US Domestic Commercial Fisheries





Arctic has much of world's remaining "undiscovered" fossil fuel

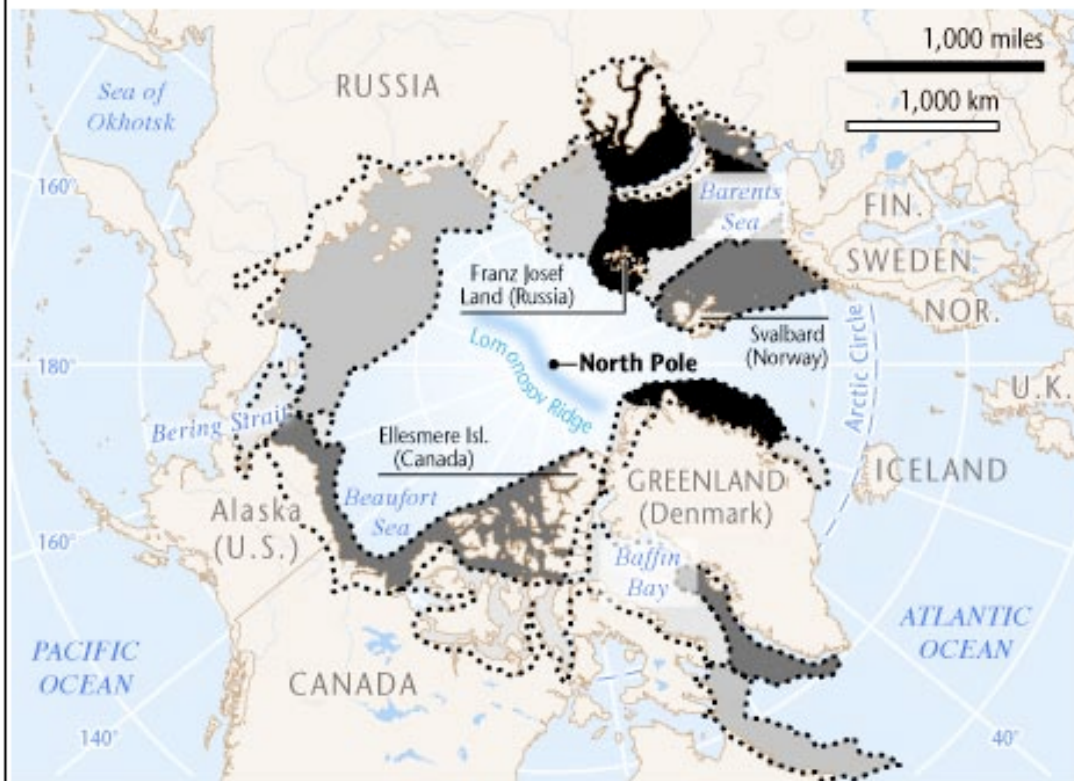
13% oil

30% natural gas

20% natural gas liquids

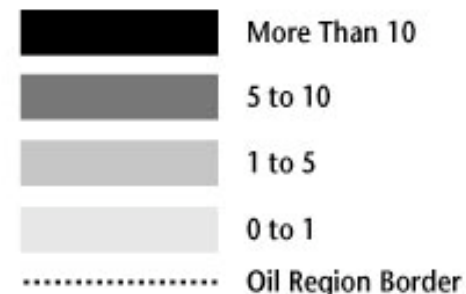
2009 USGS CARA report

## Arctic Oil and Gas Potential



### Estimated Oil, Gas Yet to Be Found

In billions of barrels of oil equivalent

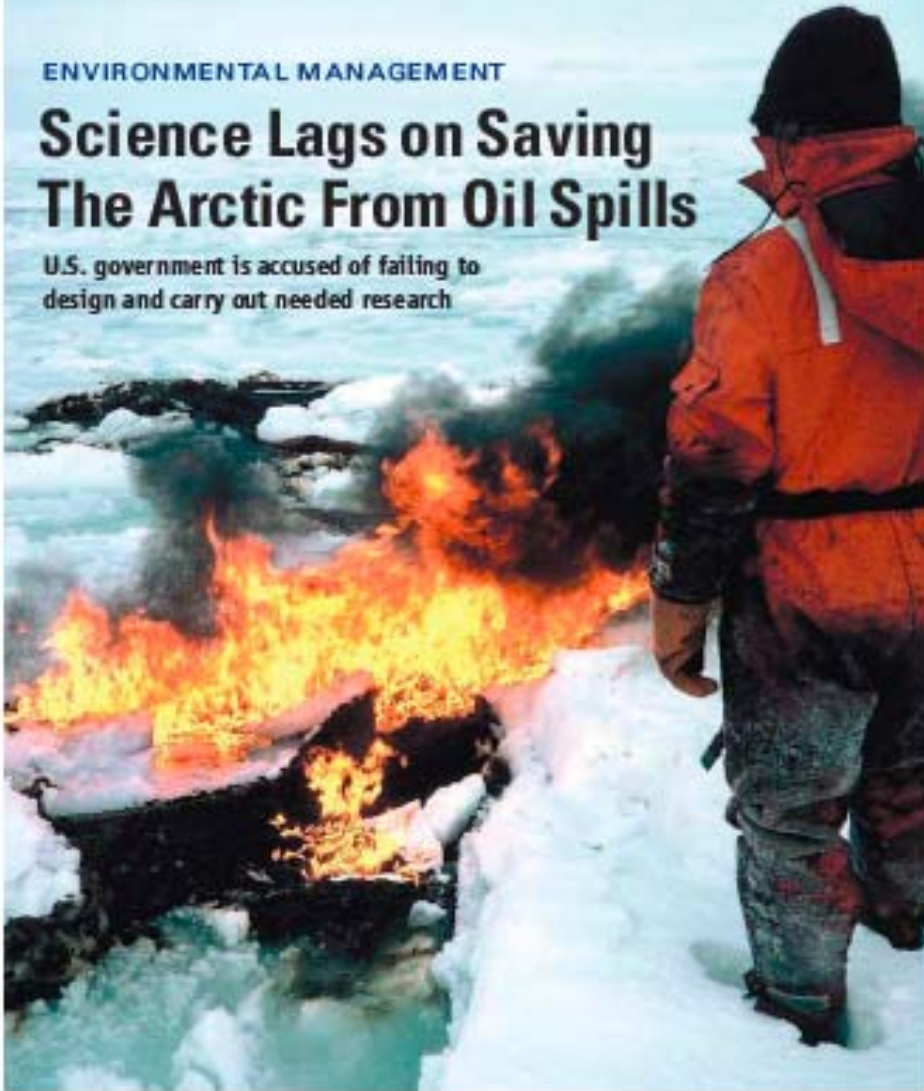


SOURCE: Wood Mackenzie  
Map based on a *Financial Times* graphic

ENVIRONMENTAL MANAGEMENT

## Science Lags on Saving The Arctic From Oil Spills

U.S. government is accused of failing to  
design and carry out needed research



# Oil-spill-in-ice research

- Interagency Coordinating Committee on Oil Pollution Research (ICOPR).
- National oil-spill research plan not updated since '97

Arctic Council  
**Arctic Marine Shipping  
Assessment 2009 Report**



AME  
Arctic Marine Shipping Assessment

# Select AMSA Findings

- UNCLOS and IMO ~ fundamental frameworks. Need to ratify.
- Winter sea ice remains but multi-year ice won't
- No specific, mandatory IMO enviro. standards for Arctic vessels
- Nearly all vessel traffic (thus far) is destinational
- Key drivers ~ natural resource development & regional trade
- Arctic residents ~ concerns & recognition of benefits
- Greatest threat ~ oil release through accidental or illegal discharge
- General lack of marine infrastructure

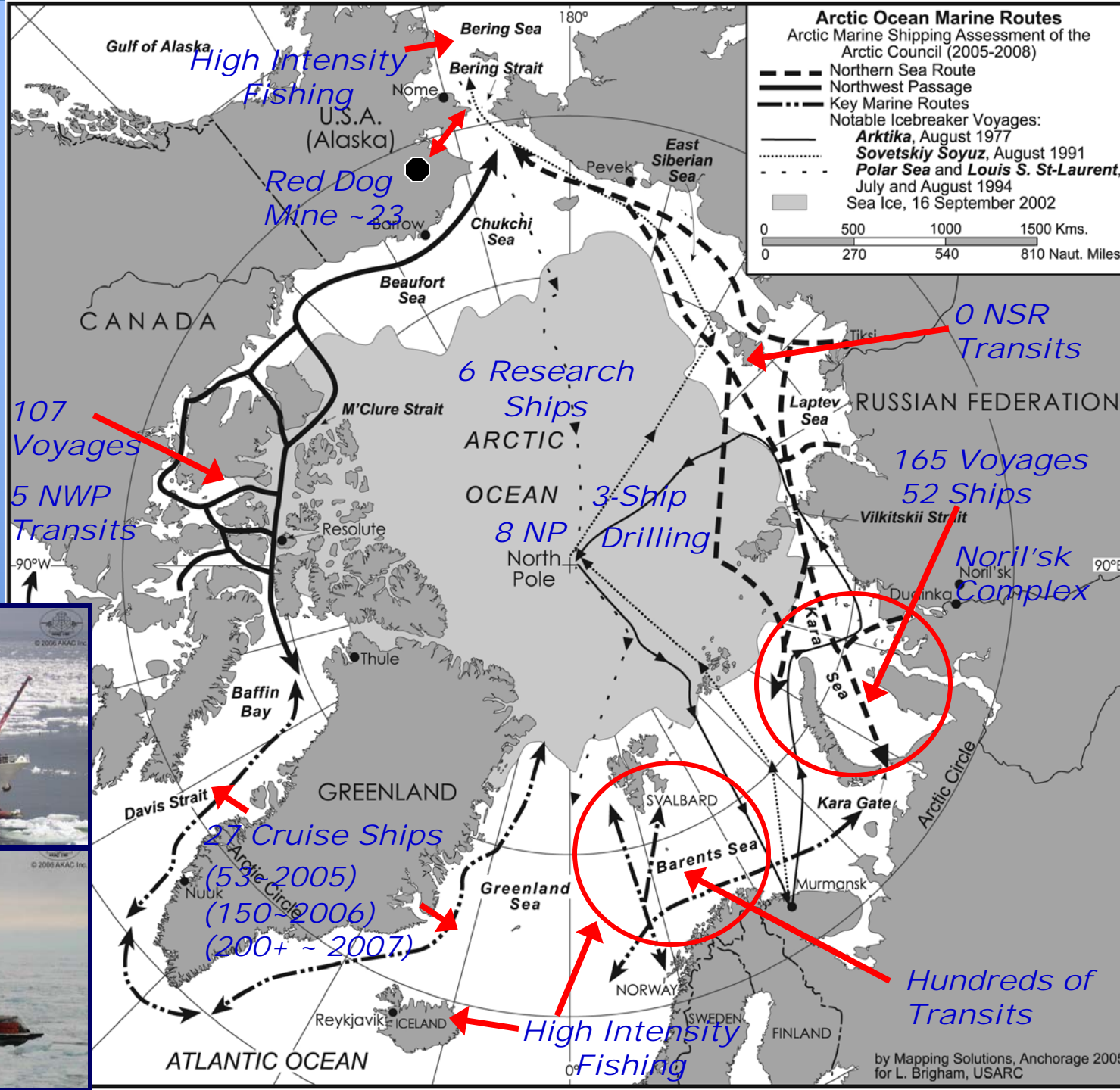
# The Maritime Arctic of 2004

Snapshot of Summer

## 5475 Ships

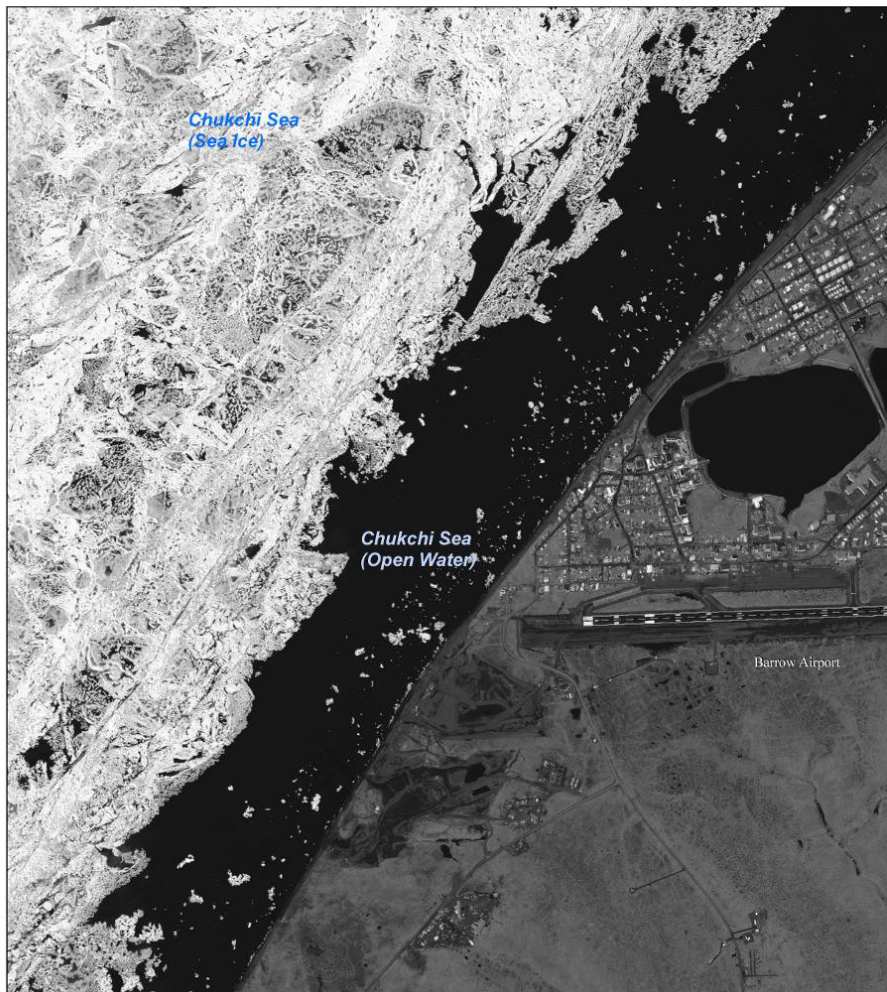
### Modes of Arctic Marine Transport

- Destinational & Regional
- Trans-Arctic
- Trans-Arctic with Transshipment
- Intra-Arctic

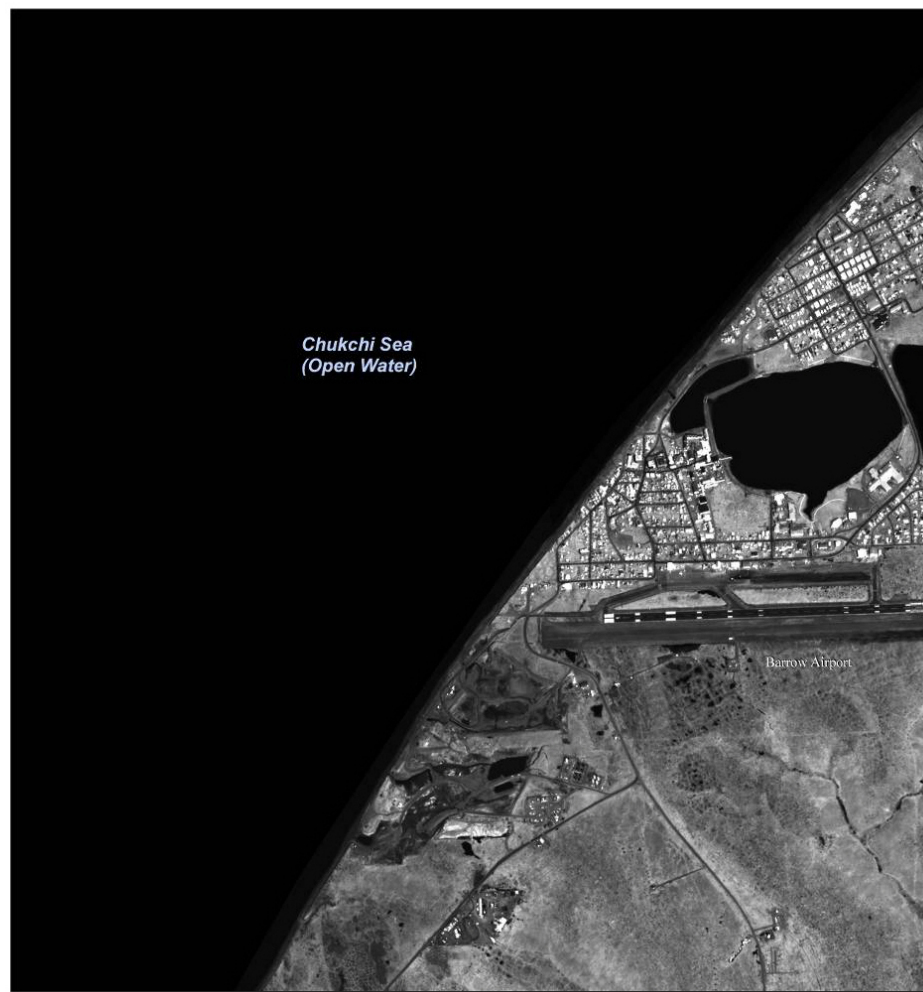


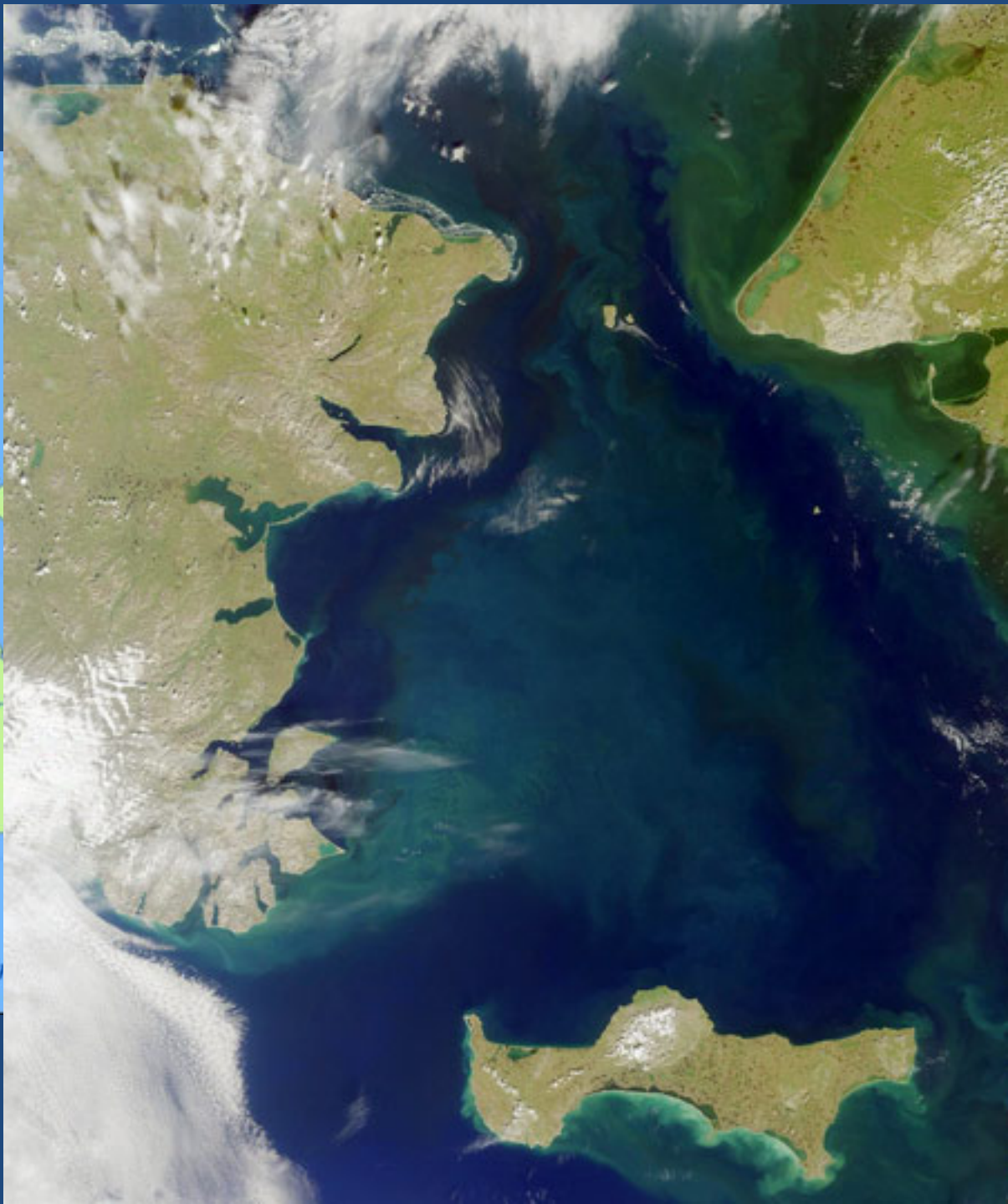
# Barrow, Alaska

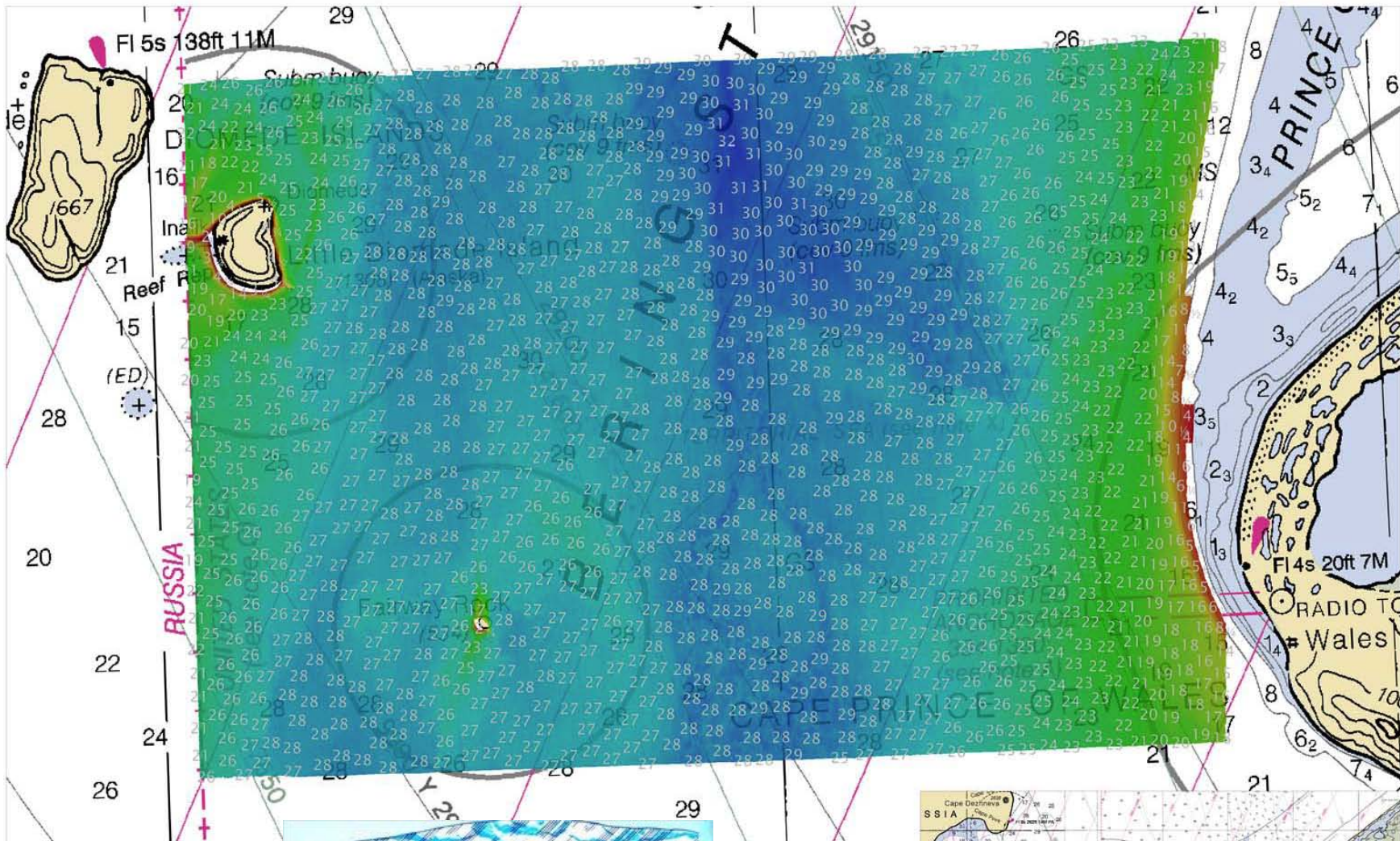
July 2006



July 2007







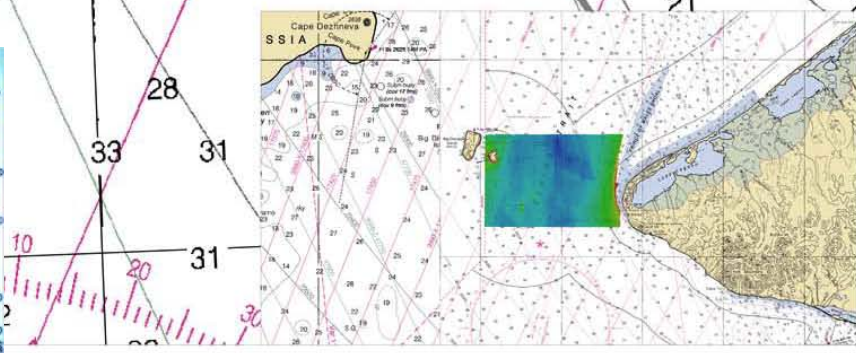
**NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION**  
**NATIONAL OCEAN SERVICE**

PROJECT: OPR-5333-FA-10	HORIZONTAL DATUM: North American Datum 83
SURVEY: H5228 & H5229	PROJECTION: UTM Zone 2 North
STATE: Alaska	VERTICAL DATUM: Mean Lower Low Water
LOCALITY: Bering Strait	VERTICAL DATUM CORRECTION: Predicted Tides
SUBGULF: 120000	VERTICAL UNITS: Fathoms
SCALE: 1:20000	DATE OF SURVEY: July - September 2009

**REMARKS:**

- Data collected with Reson 7125 SV and Reson 7111 FR multibeam echosounder systems.
- Data processing and gridding performed in CARIS and SIPS.
- Data reflect the state of the sea floor in existence on the day and at the time the survey was conducted.
- Data have not been updated for inclusion of the latest Local Notice to Mariners. Preliminary data only.
- Mention of a commercial company or product does not constitute an endorsement by NOS.
- Survey. Use of information from this publication concerning proprietary products, or the advertising purposes, is prohibited.
- For further information contact: Fisheries Field Operations Officer: [lop@noaa.gov](mailto:lop@noaa.gov)

**NOT FOR NAVIGATION**



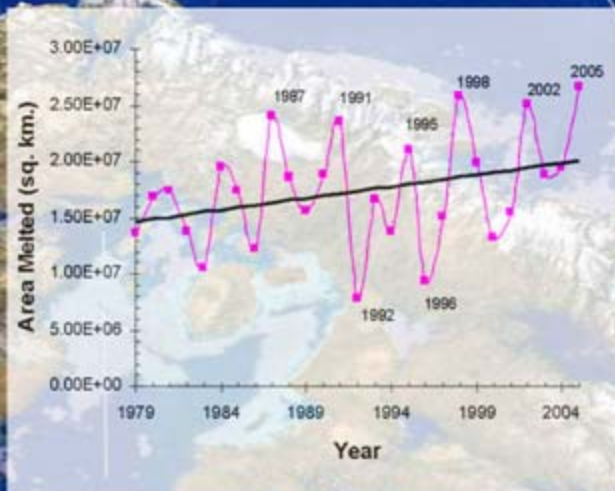


# GREENLAND 2005 MELT EXTENT

Total Greenland ice sheet melt area increased on average by 20% from 1979 to 2006. On the western part of the ice sheet the melt area increased by 30%

■ 2005 MELT EXTENT  
— MEAN MELT EXTENT (1979 - 2005)

The increasing trend in the total area of melting bare ice is unmistakable at 13% per year

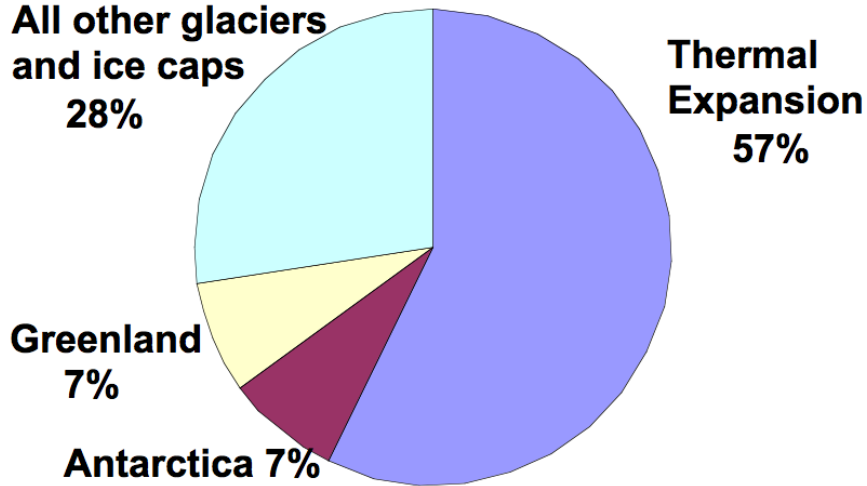


AASIAAT  
KANGERLUSSUAQ  
SISIMIUT  
NUUK  
PAAMIUT  
QAQORTOQ  
NARSARSUAQ  
SWISS CAMP  
TASIILAQ

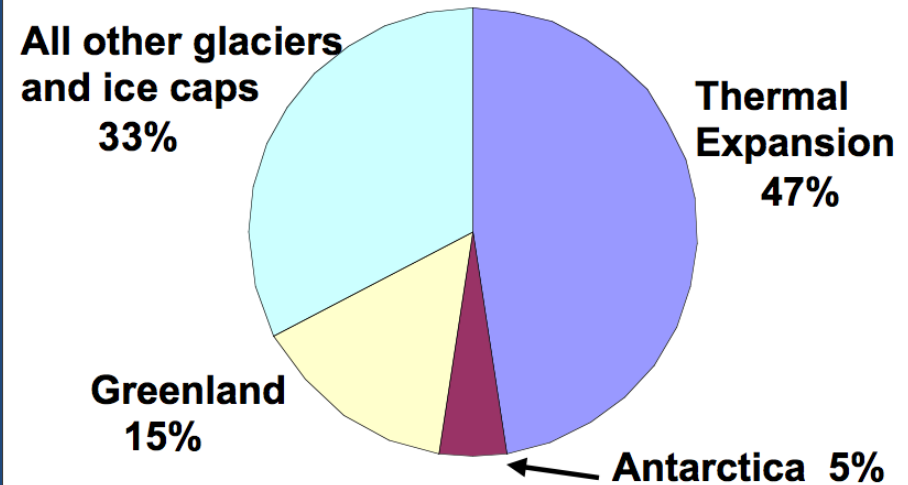


# Sea Level Rise – Present day contributions

**IPCC 4th Assessment  
Sea Level Rise (1993 - 2003)**

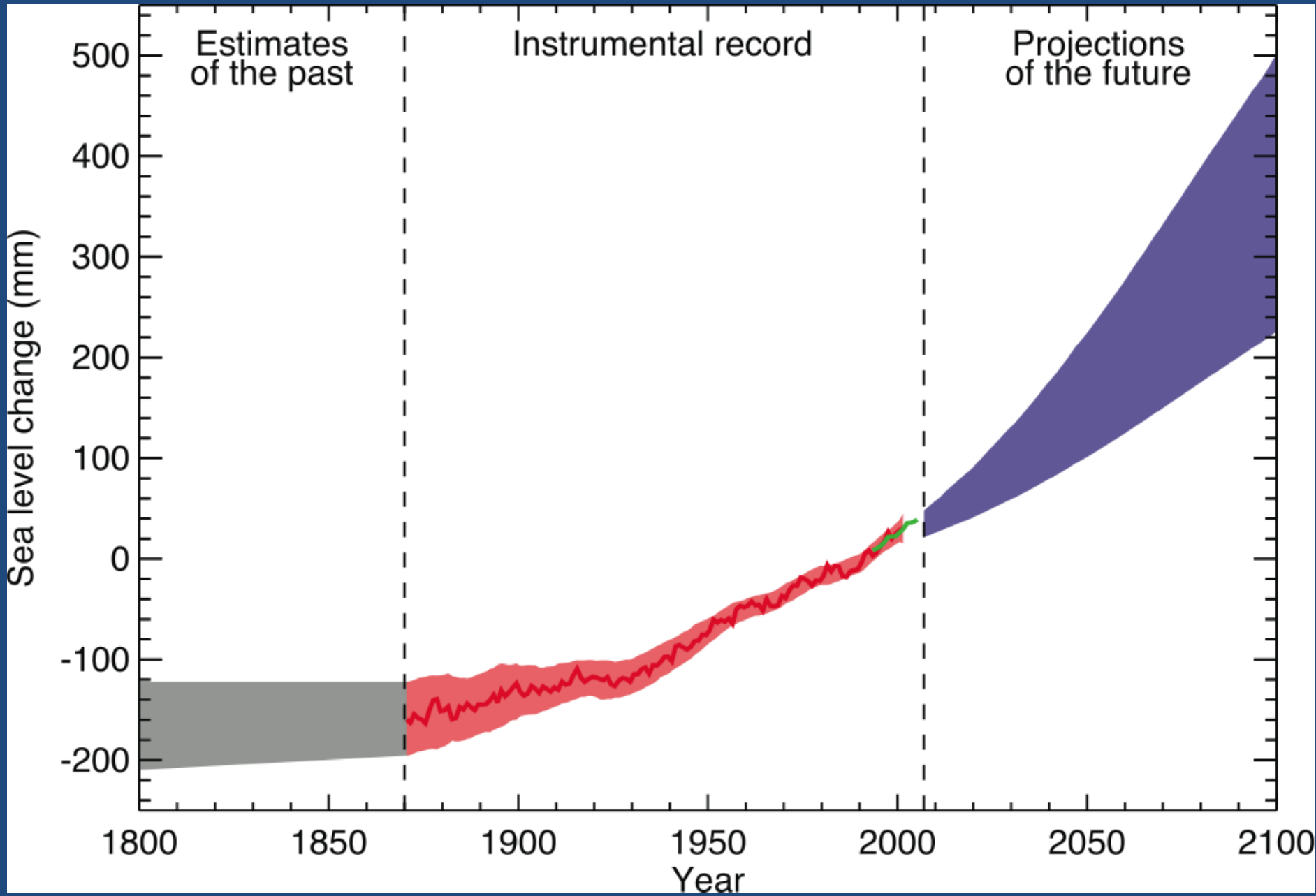


**Meier et al\*  
Sea Level Rise (2006)**

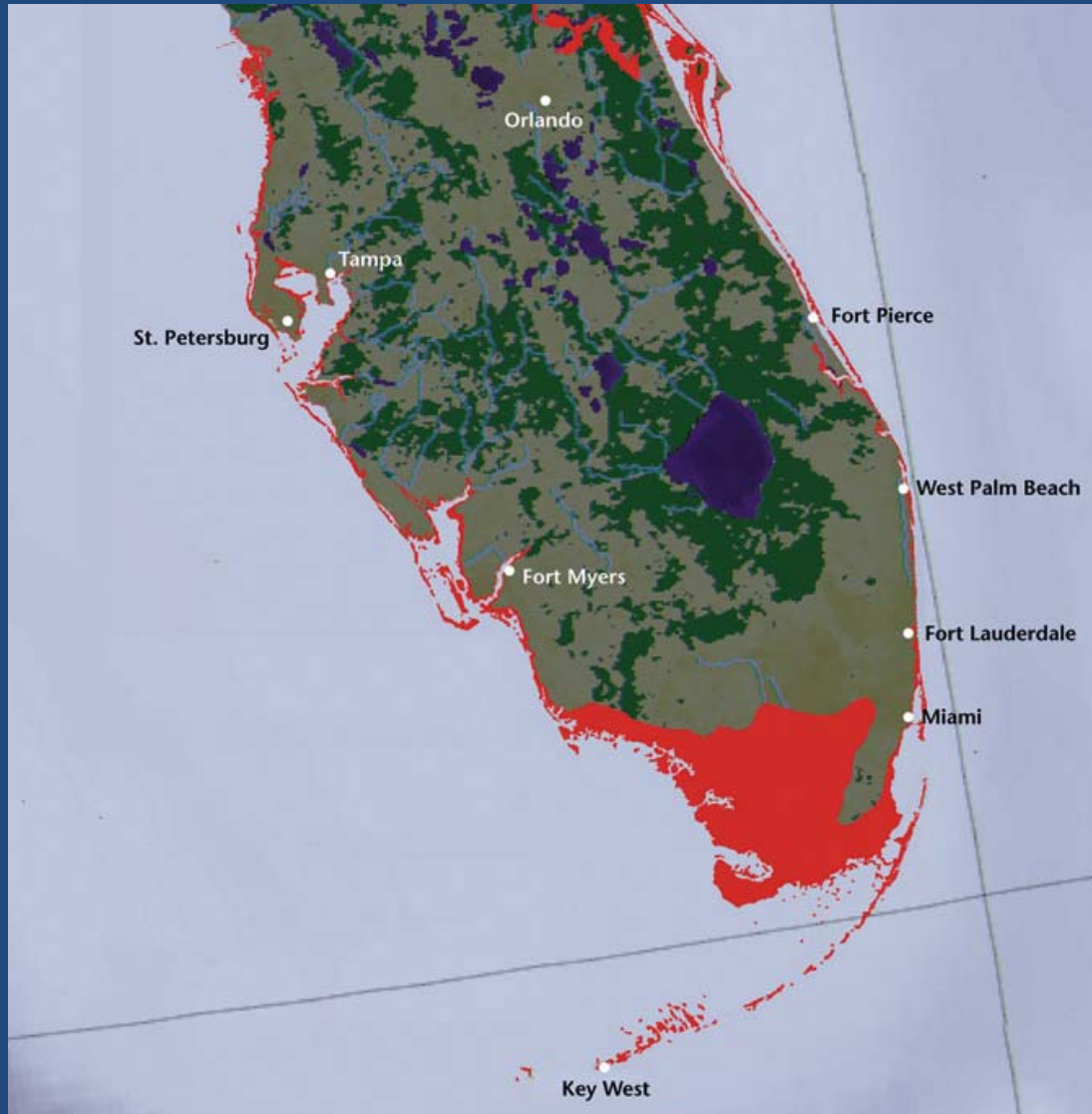


*Let's get the physics right, and evaluate the dynamic discharge from ALL sources*

\*Meier et al, *Science*, 21 July, 2007 Small Glaciers Dominate Sea Level Rise in the 21<sup>st</sup> Century



# Florida inundation 1 meter (3.3 ft) sea level rise





# Miami Beach

1-m sea level rise

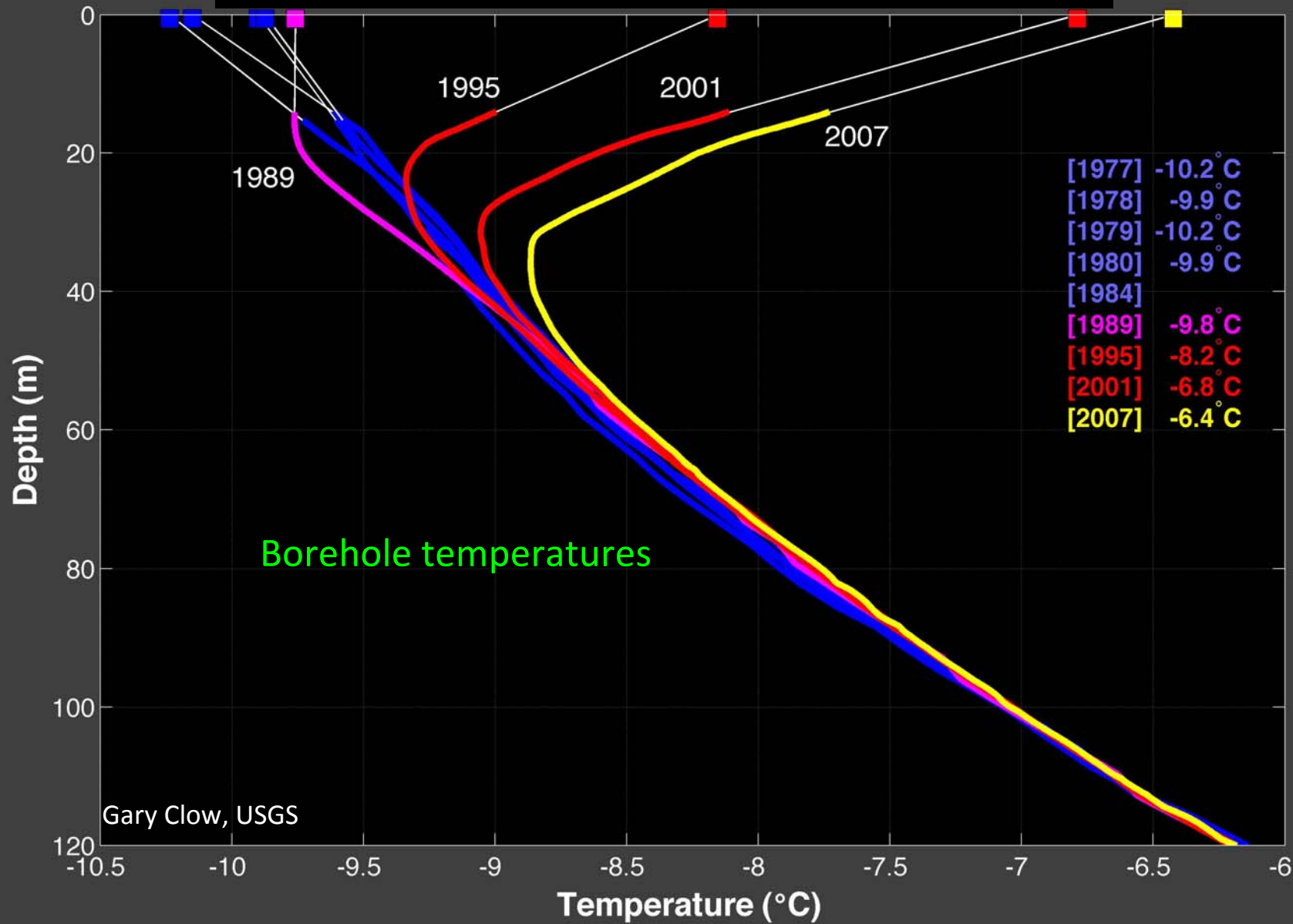
Population:

87,933



©2007 2030, Inc.  
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# Permafrost warming: Arctic Coastal Plain



Measured temperature profiles with extrapolated surface temperatures.  
Surface temps were ~ **3.6°C warmer** during 2007 than during the late-70's, early-80's.

# Permafrost Degradation – North Slope, AK



Gary Clow, USGS

July 2003

Gary Clow, USGS

J.W. Dalton Wellsite

1998 Shoreline

September 2004 = 324' Erosion

100 m of Arctic coastal erosion summer 2004

July 2001 Shoreline

July 2003 = 115' Erosion



Sept 2004



Arctic Ocean

S. Flora, BLM





# Alaskan Arctic coastal villages

Two-hour time lapse showing storm damage in Shismaref, Alaska





## Qanuqtuurungnarniq

...the concept of being resourceful,  
demonstrating adaptability and flexibility in  
response to a rapidly changing world.

Nettie Foxglove  
Selawik, AK  
Nikki Kahn/TWP photo

# Boost infrastructure for Arctic Research

- Sustainable Arctic Observing Network (intl' coop.)
- Cabled (fiber optic) observatories
- Icebreakers
- Alaska Region Research Vessel (Yes)
- Barrow & Intl' Arctic Research Centers
- Advance use of robotic remote sensing (sea, air, space)
- Satellites (NASA's ICESat-II, GRACE-II, others)
- Declassify US intelligence data, mapping, imagery
- Nuclear submarines (SCICEX), ice camps



# Recommendations today

- Improve interagency Arctic research efforts & dovetail with new ocean policy efforts
- Get serious on Arctic Observing Network
  - Environmental research (wx, climate, sea ice, perma.)
  - Ice sheet and glacier dynamics
- Oil-spill-in ice research
- Ocean research infrastructure
  - US icebreakers (psst... we're down to one)

If implemented, the results will help Navy achieve Arctic missions in:

- Strategic deterrence
- Force Projection
- Maritime Security
- Maritime Domain Awareness
- Search and Rescue
- Regional Security Cooperation
- Humanitarian Assistance/Disaster Relief



9/23/10  
Blake McBride, USN  
USCG C-130  
ADA flight

# Thank you

