



An Update

From 2007 to 2009: What We've Learned and What We've Done

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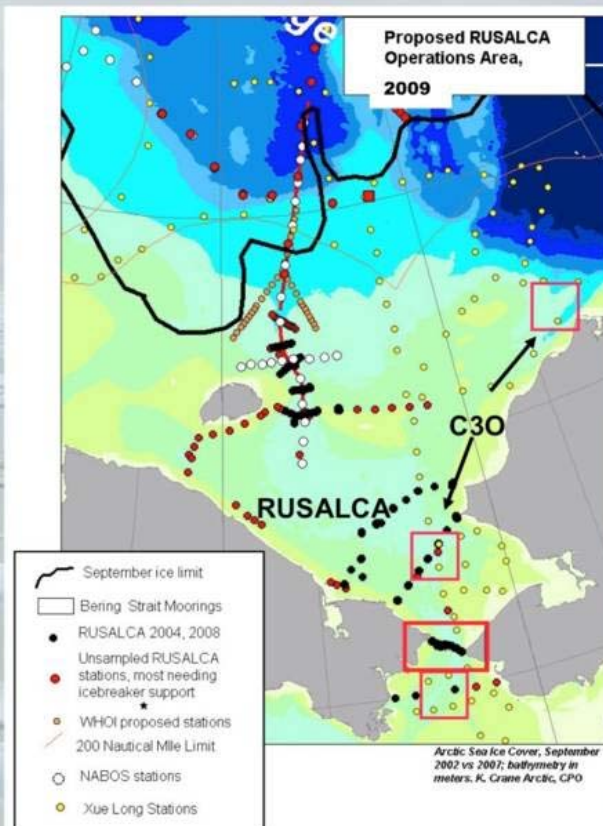


NOAA's Arctic Research



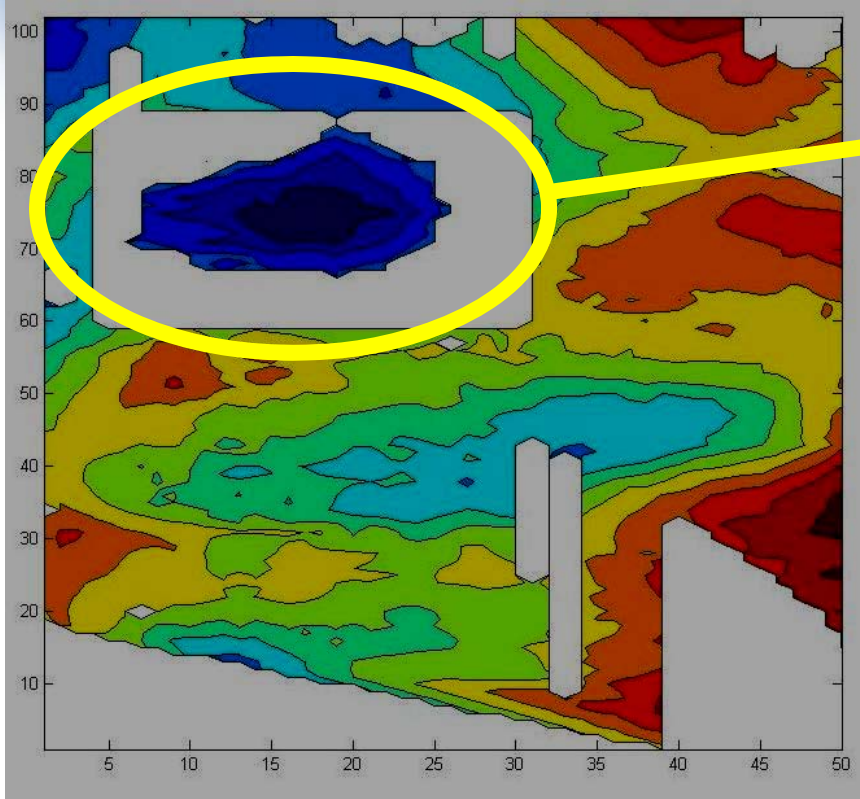
NOAA Arctic Research: 2009 Coordination

RUSALCA (Russian-American Long-term Census of Marine Life) and C30 (Canada's Three Oceans) working in Pacific sector of Arctic

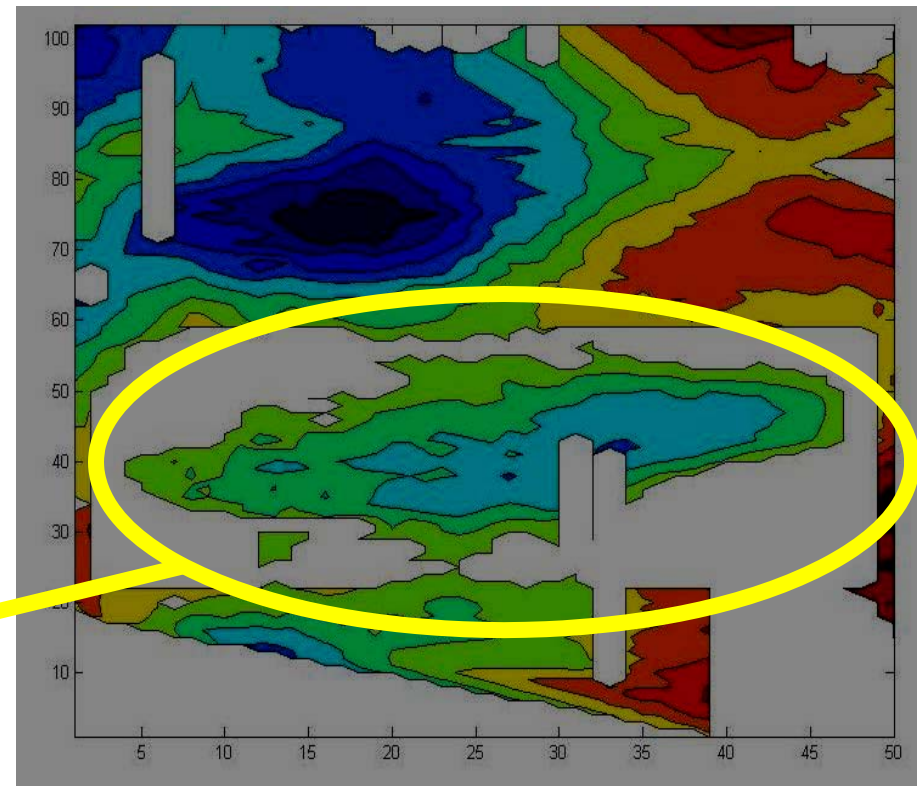




Unmanned Aircraft Systems (UAS)



The upper lake volume (left) is $.017 \text{ km}^3$ and its physical area is approximately $\frac{1}{3}$ of the lower lake, it has a maximum depth of 16.3 meters.



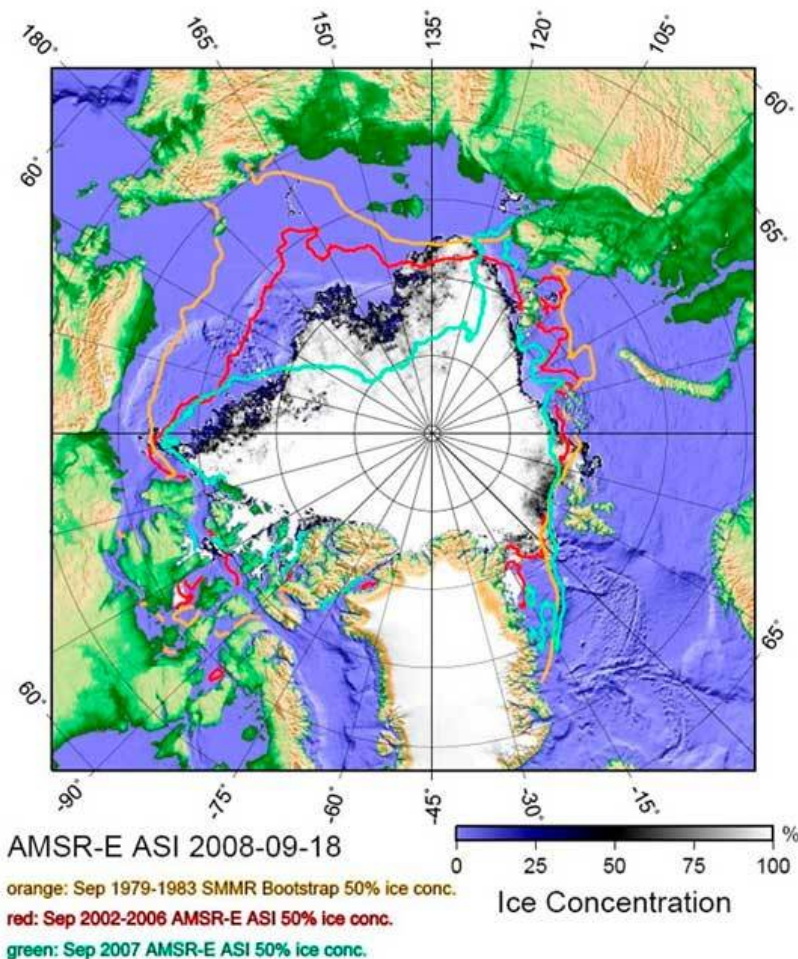
North lake volume (right) is $.043 \text{ km}^3$ which compares well with reported volume of $.044 \text{ km}^3$ by on-site researchers in 2006 (Das et al. 2008). The maximum depth is 16.7 meters.



Climate Change: Sea Ice Loss

Geophysical Research Letters
 16 APRIL 2009
 Volume 36 Number 7
 American Geophysical Union

• Arctic could be nearly free of ice in 30 years • Temperature changes in recent past affect forest carbon balance • Deep-ocean internal wave patterns reproduced in numerical simulation • The pacemaker of major climate shifts





Climate Change: Ecosystem Impacts



- Ribbon Seal – Bering Sea spring ice
- Beluga – Pan Arctic; various ecotypes
- Narwhal – Davis Strait winter ice?

Ref: Laidre et. Al. 2008



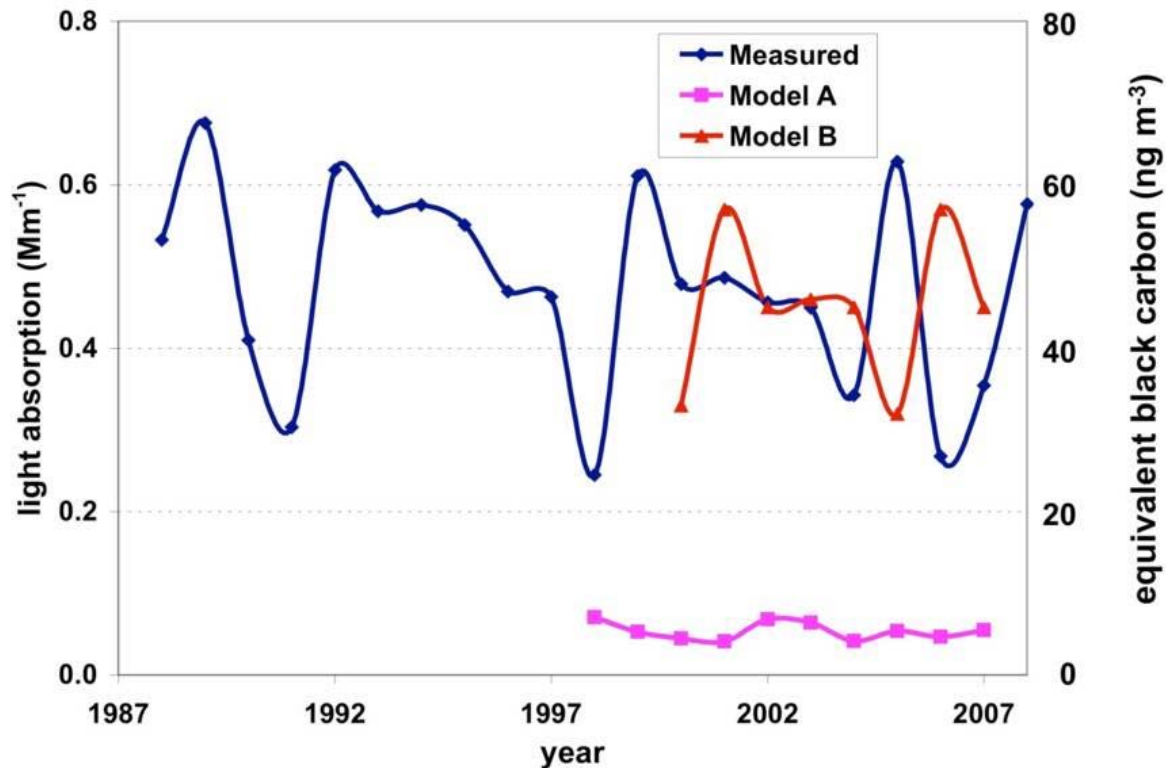
International Arctic Systems for Observing the Atmosphere





Arctic Haze: Black Carbon Observations

Evaluating Models of Black Carbon in Arctic with NOAA Data



Parameter plotted is April-average aerosol light absorption coefficient at Barrow





Arctic Report Card 2008

www.arctic.noaa.gov/reportcard



Atmosphere

5° C temperature increases were recorded in autumn



Ocean

Observed increase in temperature of surface and deep ocean layers



Sea Ice

Near-record minimum summer sea ice extent



Greenland

Records set in both the duration and extent of summer surface melt



Biology

Fisheries and marine mammals impacted by loss of sea ice



Land

Permafrost temperatures tend to increase, while snow extent tends to decrease

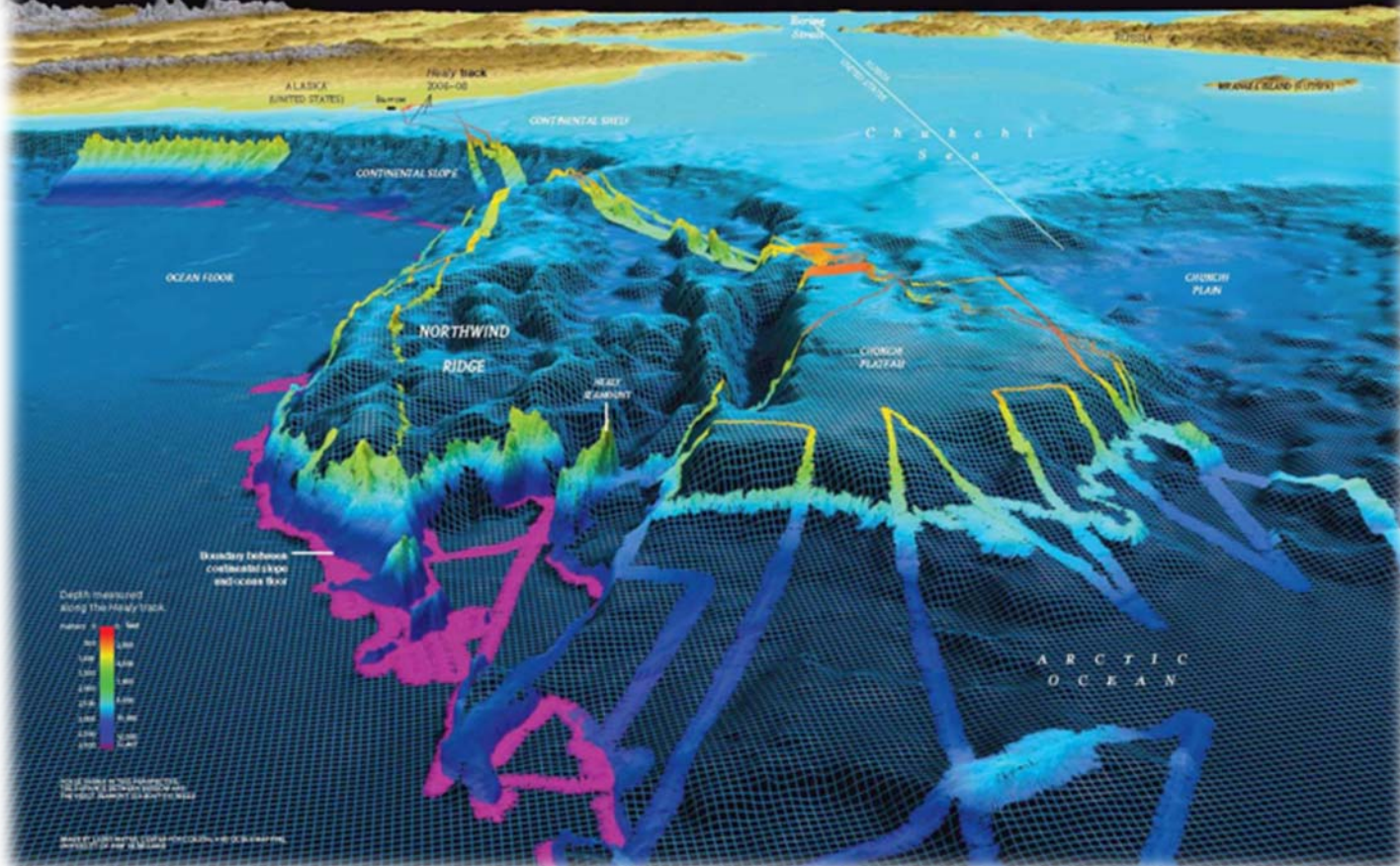
Seafloor Mapping

Extended continental shelf



In four trips out of Barrow, Alaska (at upper left), the *Healy* used multibeam sonar to map the eastern slope of the Northwind Ridge. This and other continental formations under the Chukchi Sea may allow the U.S. to claim 200,000 square miles of additional territory.

THE VIEW IS FROM THE NORTH LOOKING SOUTH





Where NOAA is Headed

- We are developing a comprehensive & coordinated NOAA Arctic effort.
- NOAA is working with partners now to develop official long-term sea ice projection products.
- NOAA is proposed to be the U.S. Government single authoritative source for climate information – *National Climate Service*.





Thank You.

