

Arctic Resources and Climate Change



A brief review of Climate change....



Finally able to drill....



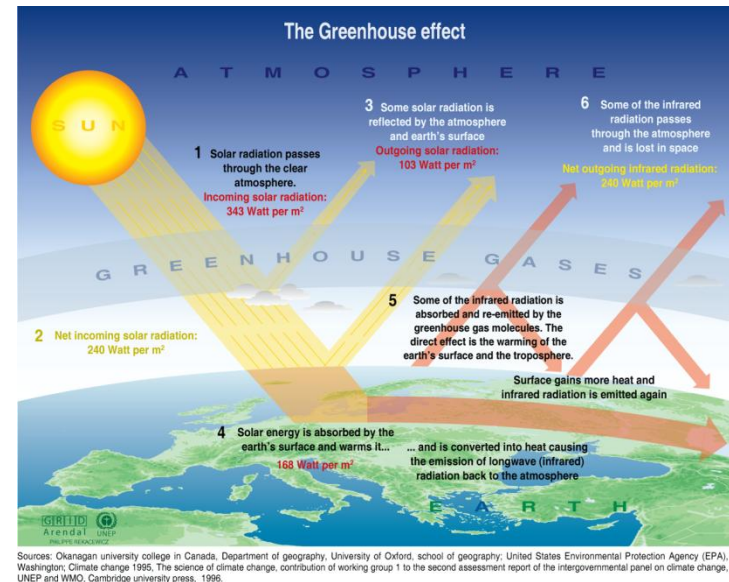
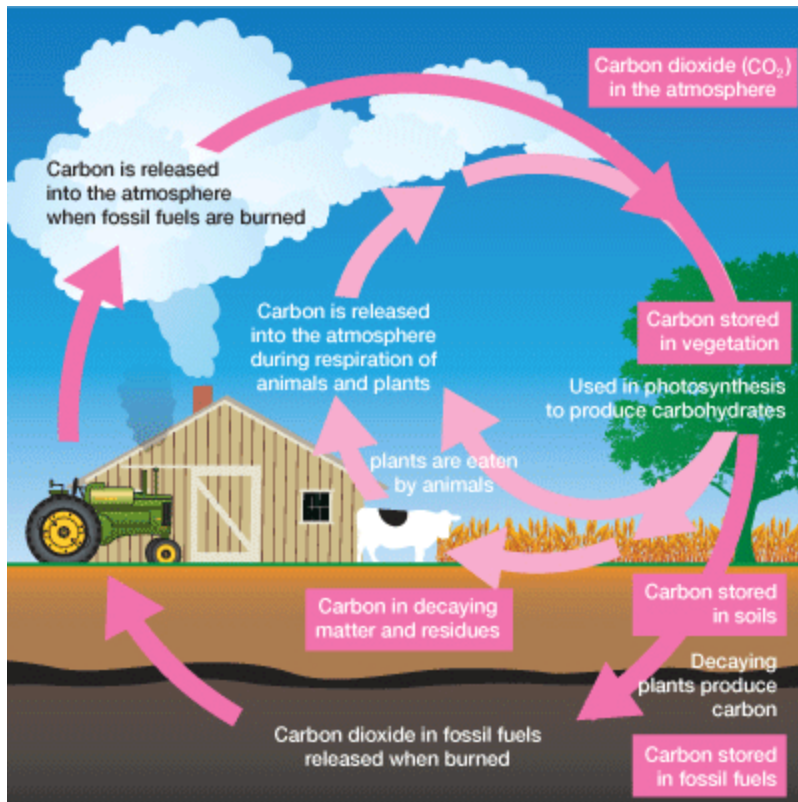
Recall that On average Arctic temperatures have risen twice as fast as in the rest of the world.



The Ice-Albedo effect



The vicious circle of Global Warming: the carbon cycle meets the sun



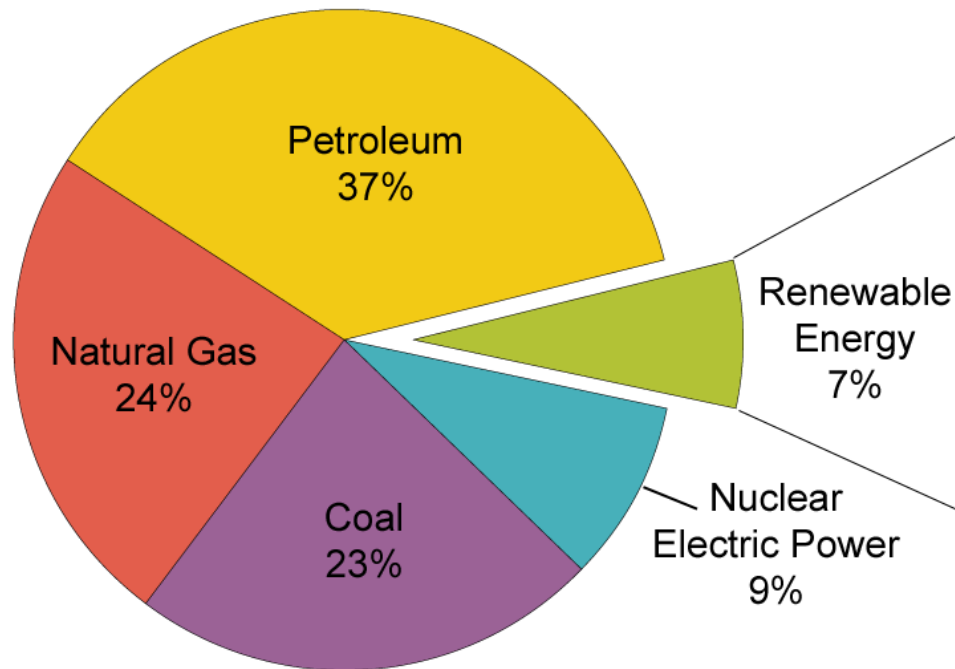
Climate change and the Arctic



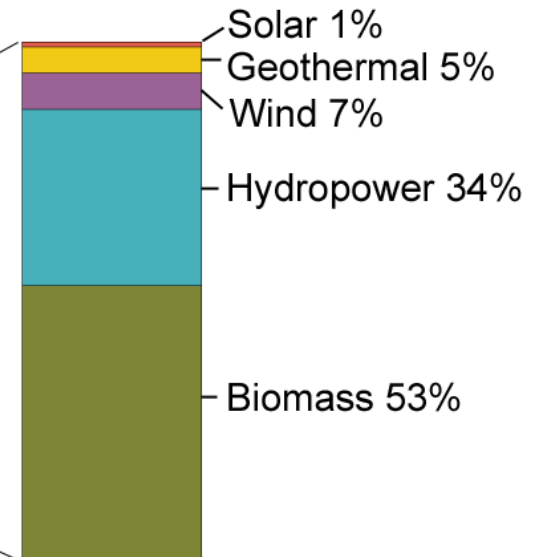
Oil

U.S. Energy Consumption by Energy Source, 2008

Total = 99.305 Quadrillion Btu



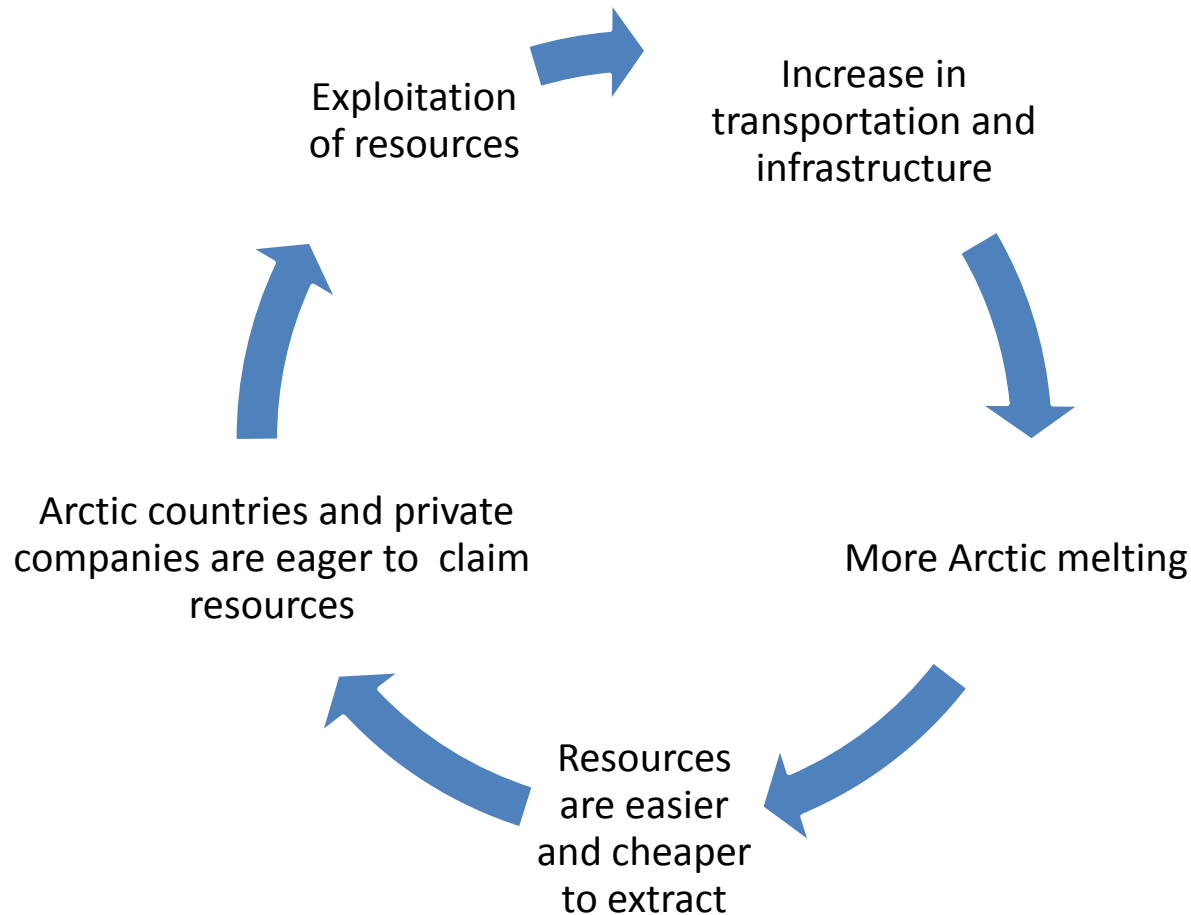
Total = 7.301 Quadrillion Btu



Note: Sum of components may not equal 100% due to independent rounding.

Source: Energy Information Administration, *Renewable Energy Consumption and Electricity Preliminary Statistics 2008*, Table 1: U.S. Energy Consumption by Energy Source, 2004-2008 (July 2009).

Arctic warming is “self-propelling”

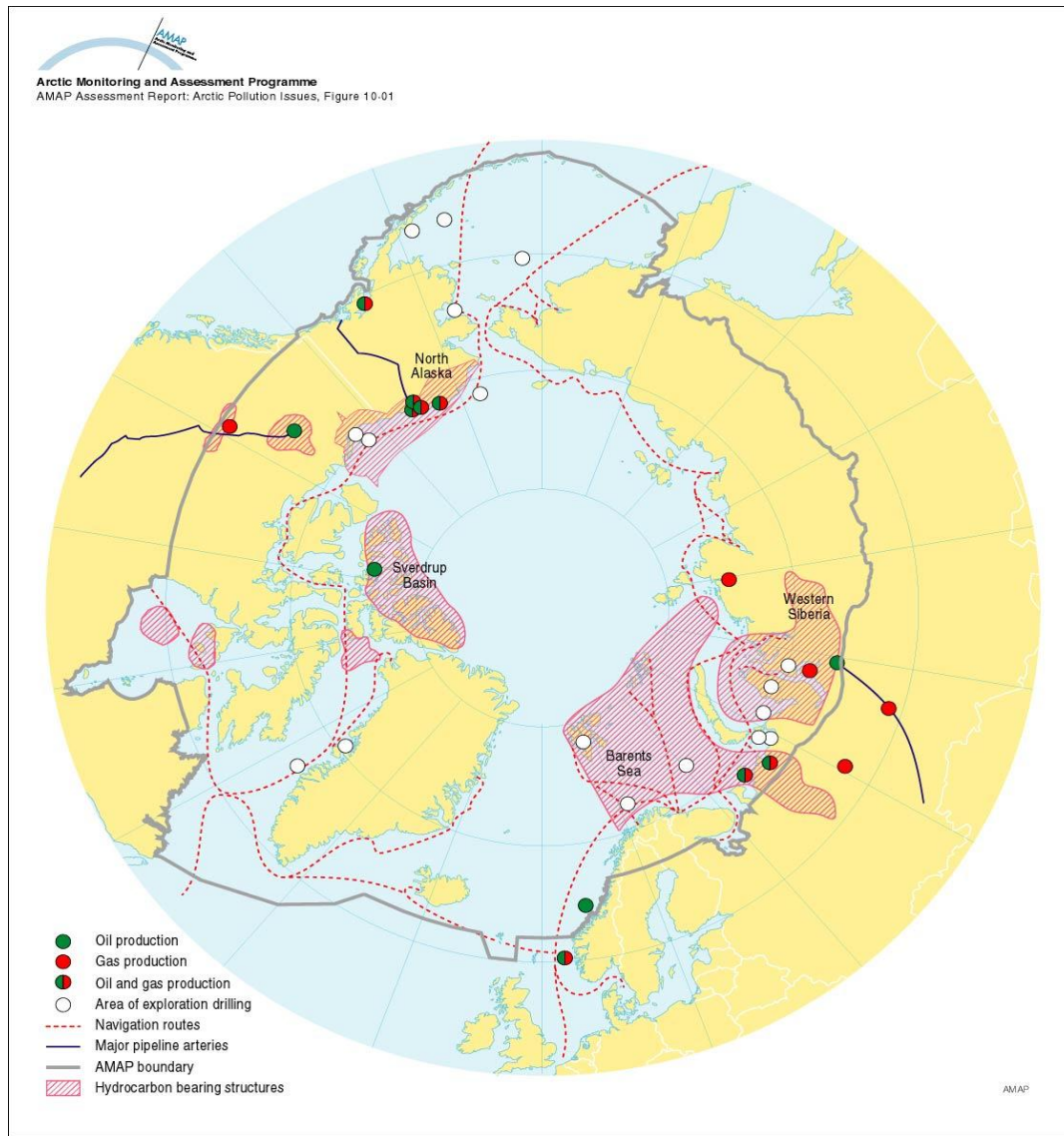


Oil in the Arctic ?

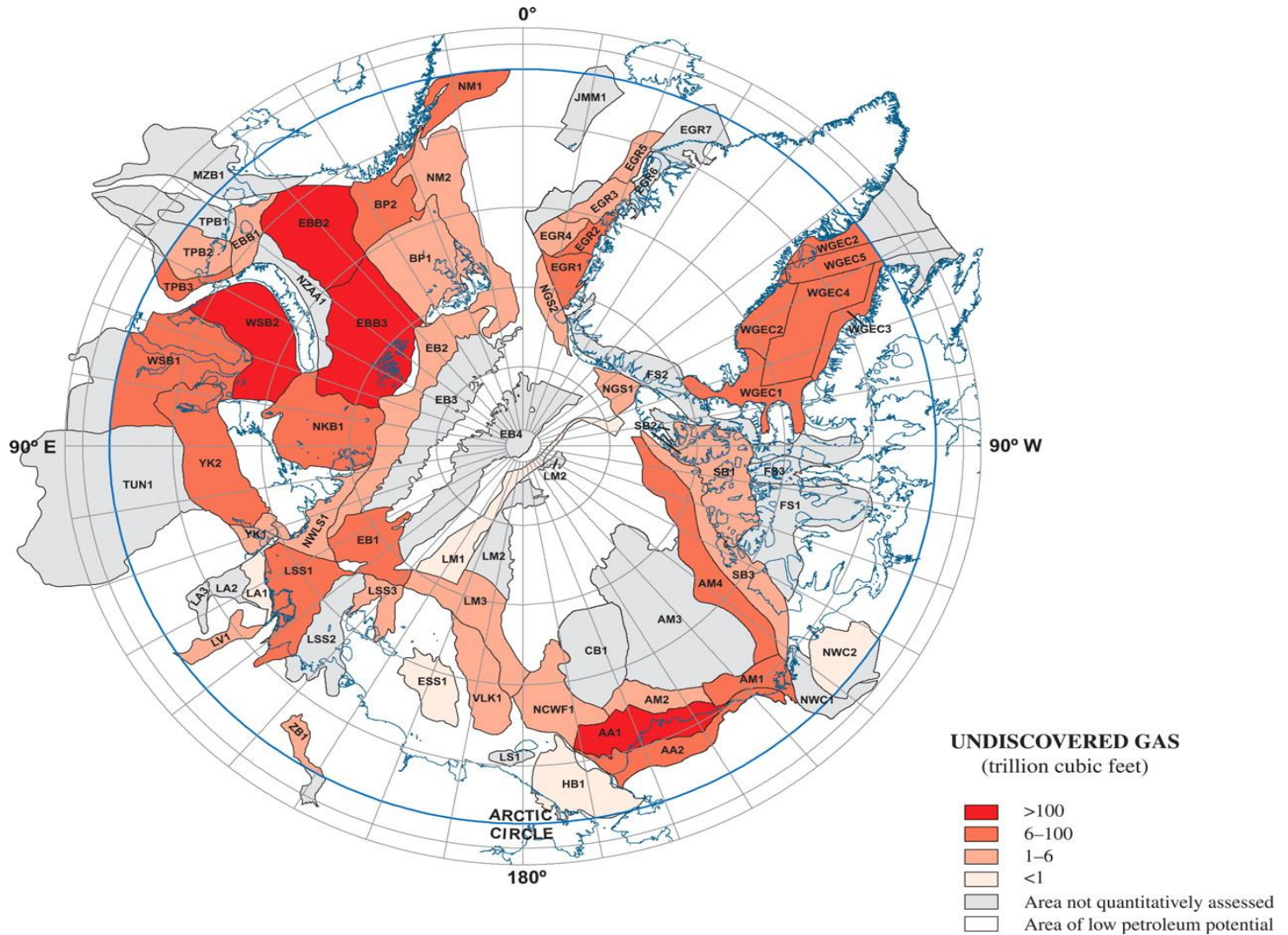


CIDS, Glomar Beaufort Sea II, Japan

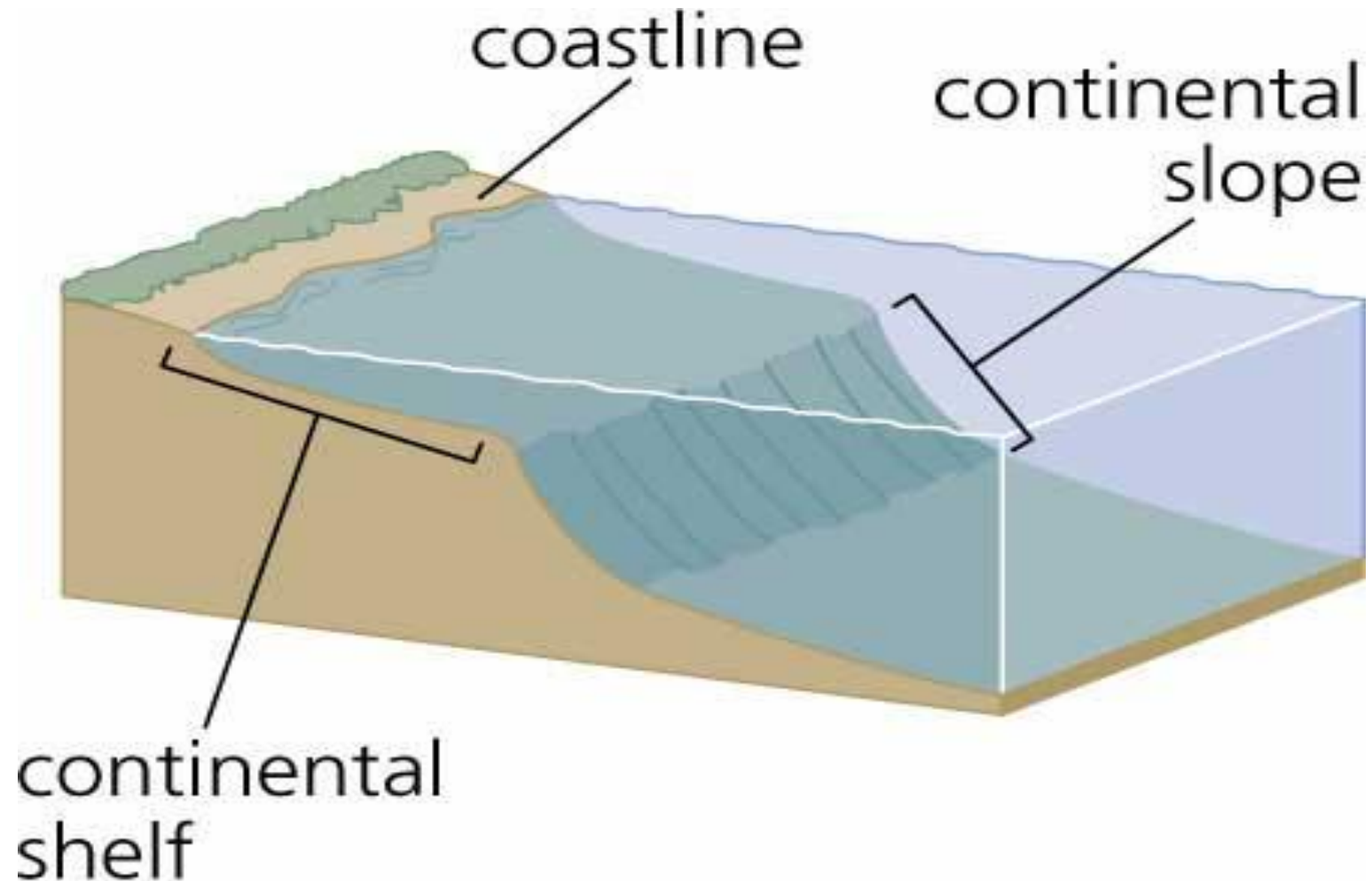
Oil and Gas Production



Undiscovered Gas



Global warming yields more of the commodities that are causing it!



Climate scientists have helped to
discover it....



Canada



Russia



Natural gas in Arctic Russia



Norway

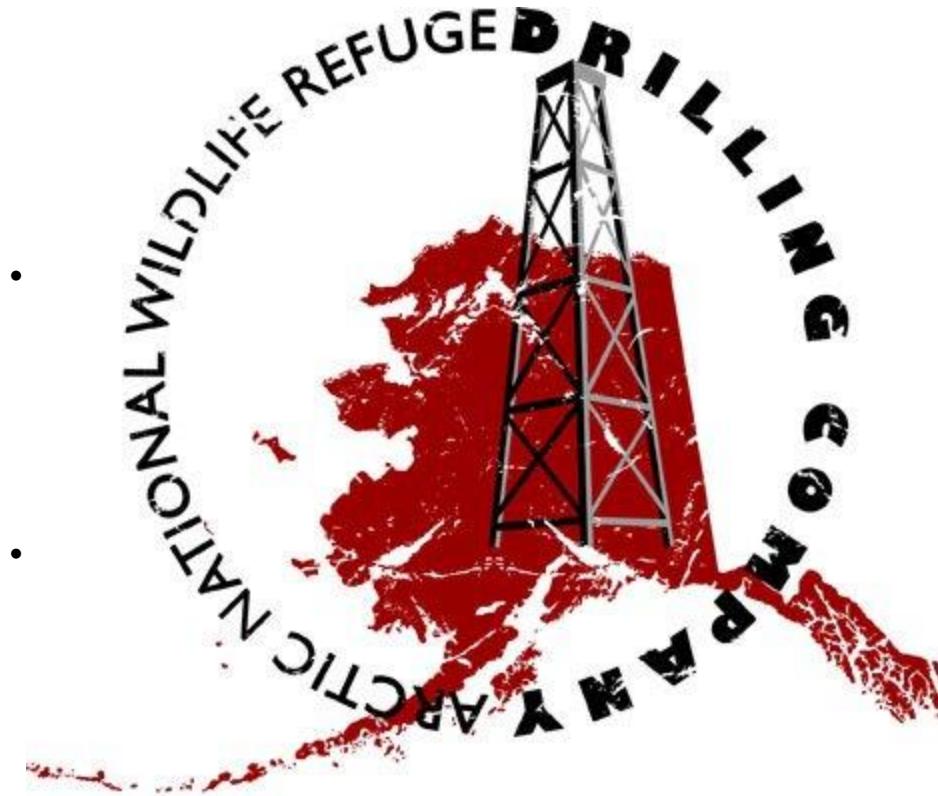


The United States: Private Initiatives



Arctic Oil And Gas

Drilling in ANWR: ANWR Logo



ANWR



Would ANWR reduce dependence on foreign oil
and yield more natural gas for the U.S.?



Offshore drilling.....



The Alaskan coast might one day look like the shores of Louisiana, in the Gulf of Mexico, lit up at night by the millions of sparkling lights from offshore oil platforms.

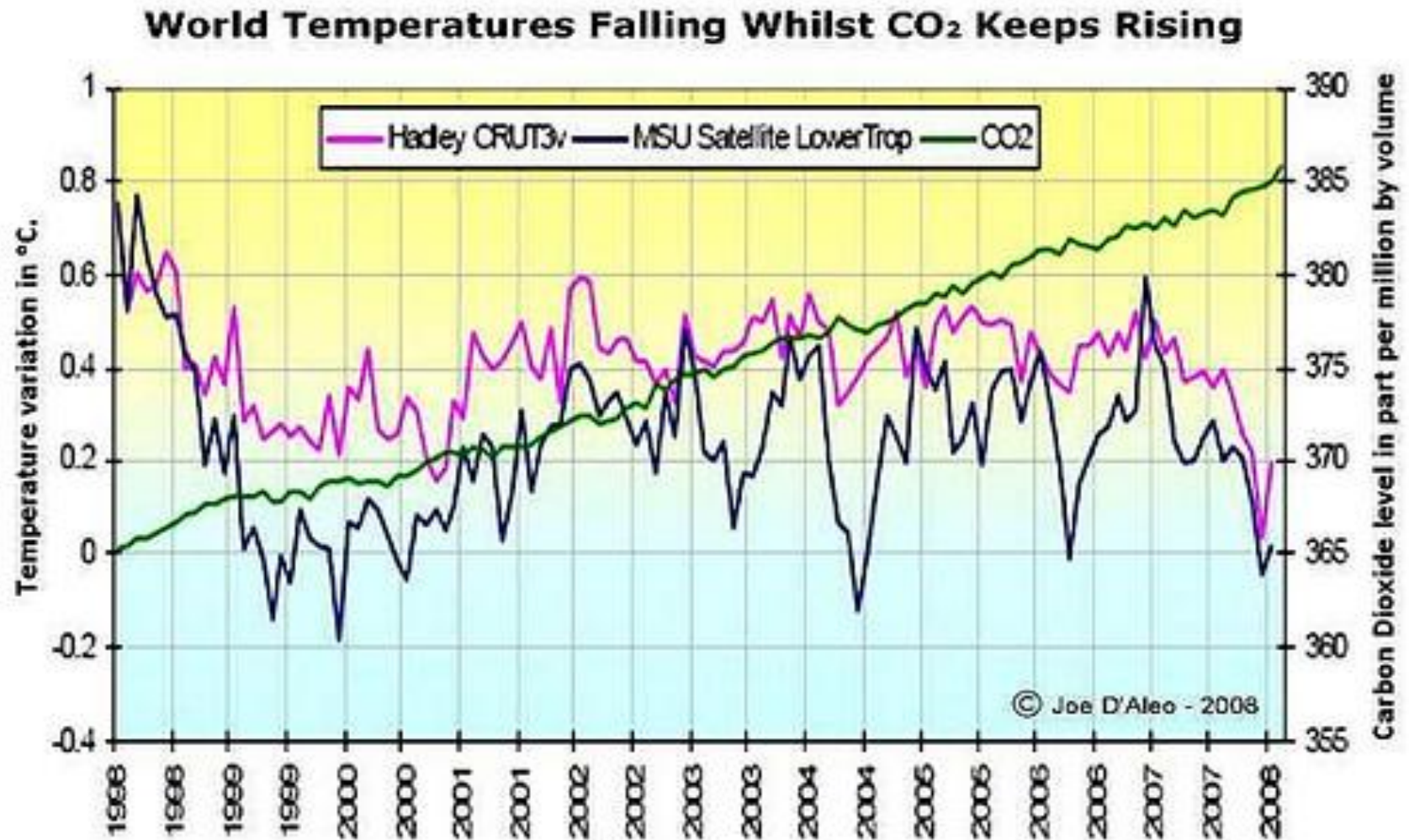


scientific discovery inadvertently aids oil exploration



Three ships, seen here on location, that worked together on the Arctic coring expedition: the icebreaker/drillship *Vidar Viking*, and the ice-breakers *Oden* and *Sovetskiy Soyuz*.

And...there is overt Scientific support for oil exploration:
“Polar Bears of Western Hudson Bay and Climate Change”



Oil Industry Funded this study

- One co-author of the paper, Willie Soon, completed the study with funding from **ExxonMobil** - which has oil operations in Alaska's North Slope - as well as from the **American Petroleum Institute** and the **George C Marshall Institute**, which a

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holars were cited. One was Syun-Ichi Akasofu, formerly
director of the International Arctic Research

GEORGE C.
Marshall
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SCIENCE FOR BETTER PUBLIC POLICY

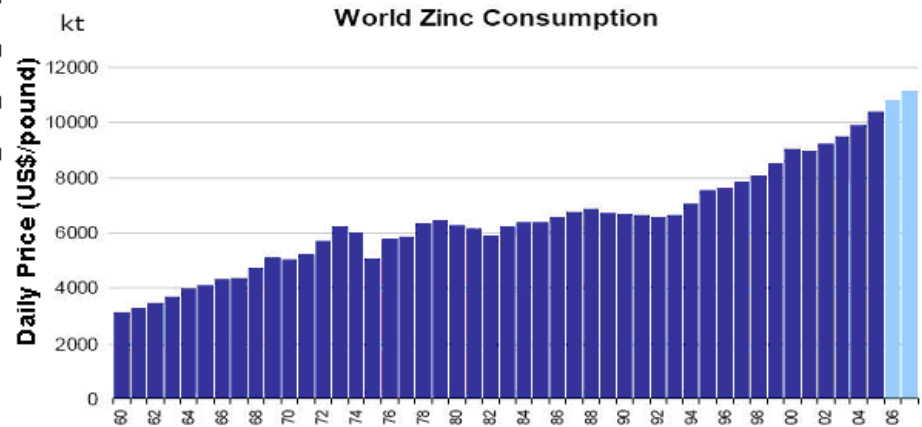
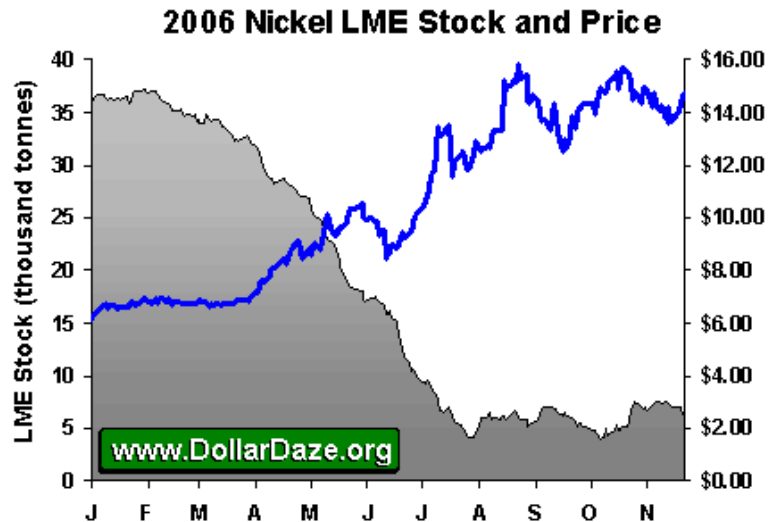
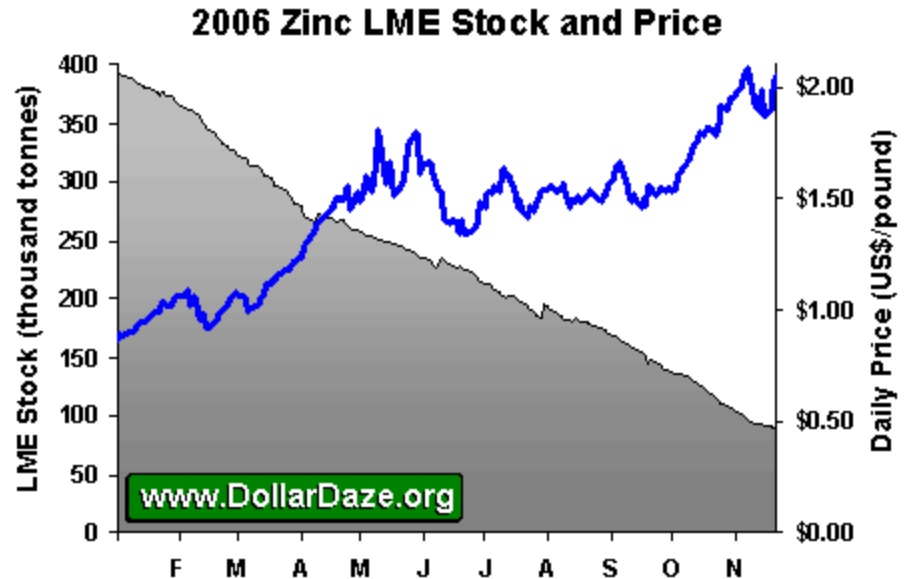
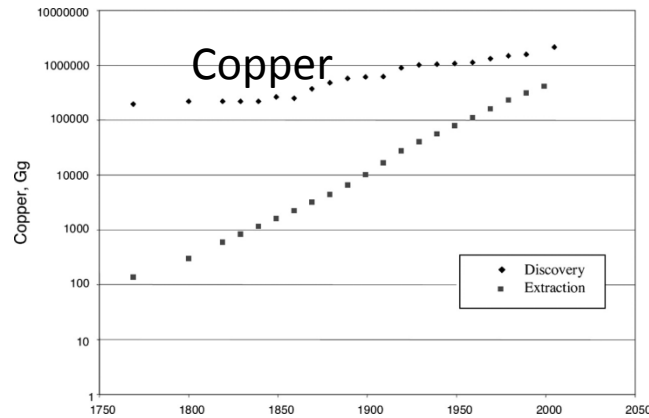
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Less Ice.....More Resources than Oil

- Less ice also means increased access to Arctic fish, timber, and minerals, such as lead, magnesium, nickel, and zinc -- not to mention immense freshwater reserves, which could become increasingly valuable in a warming world.

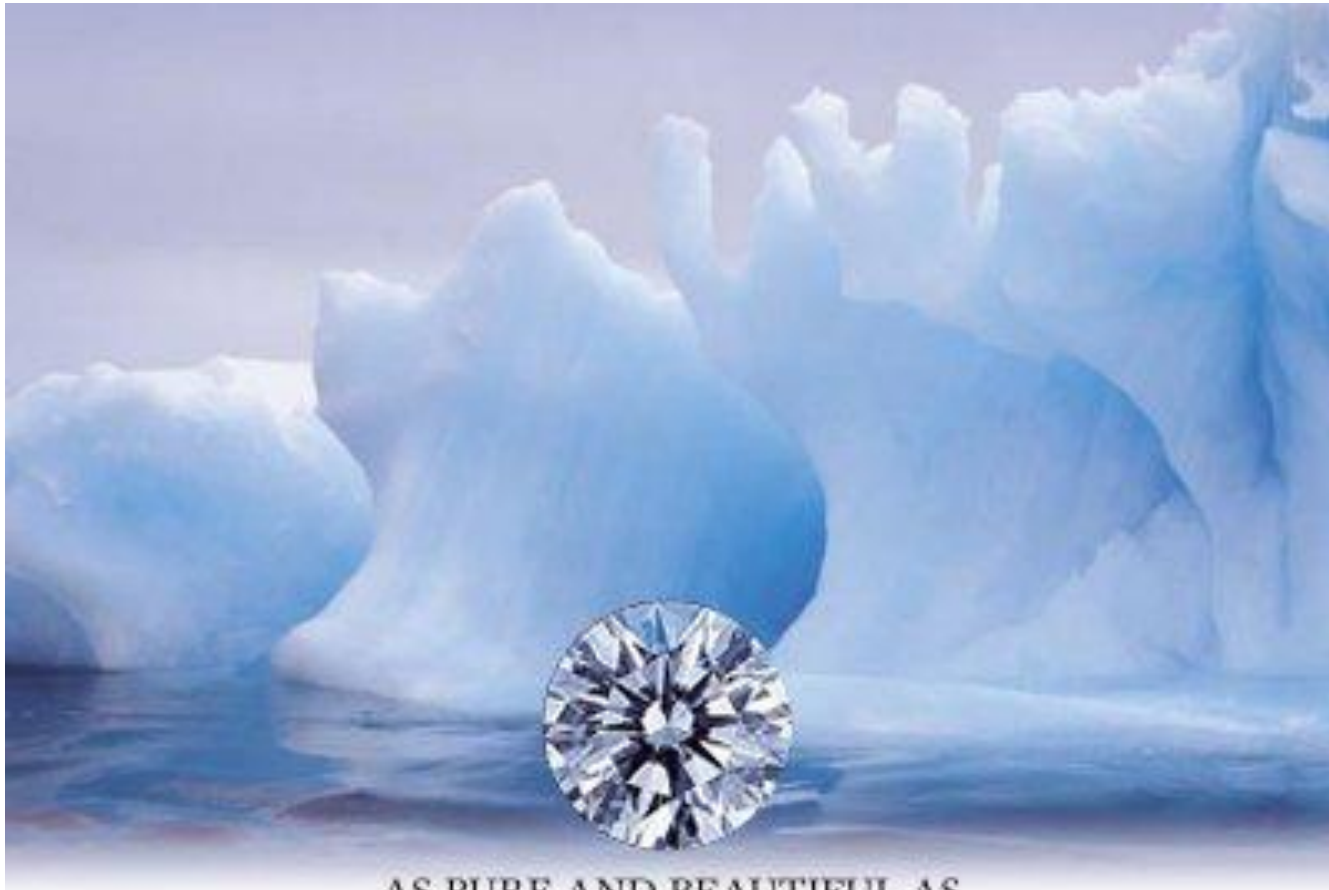
Depletion of global metal supplies



Arctic Alaska mineral resources



Diamonds

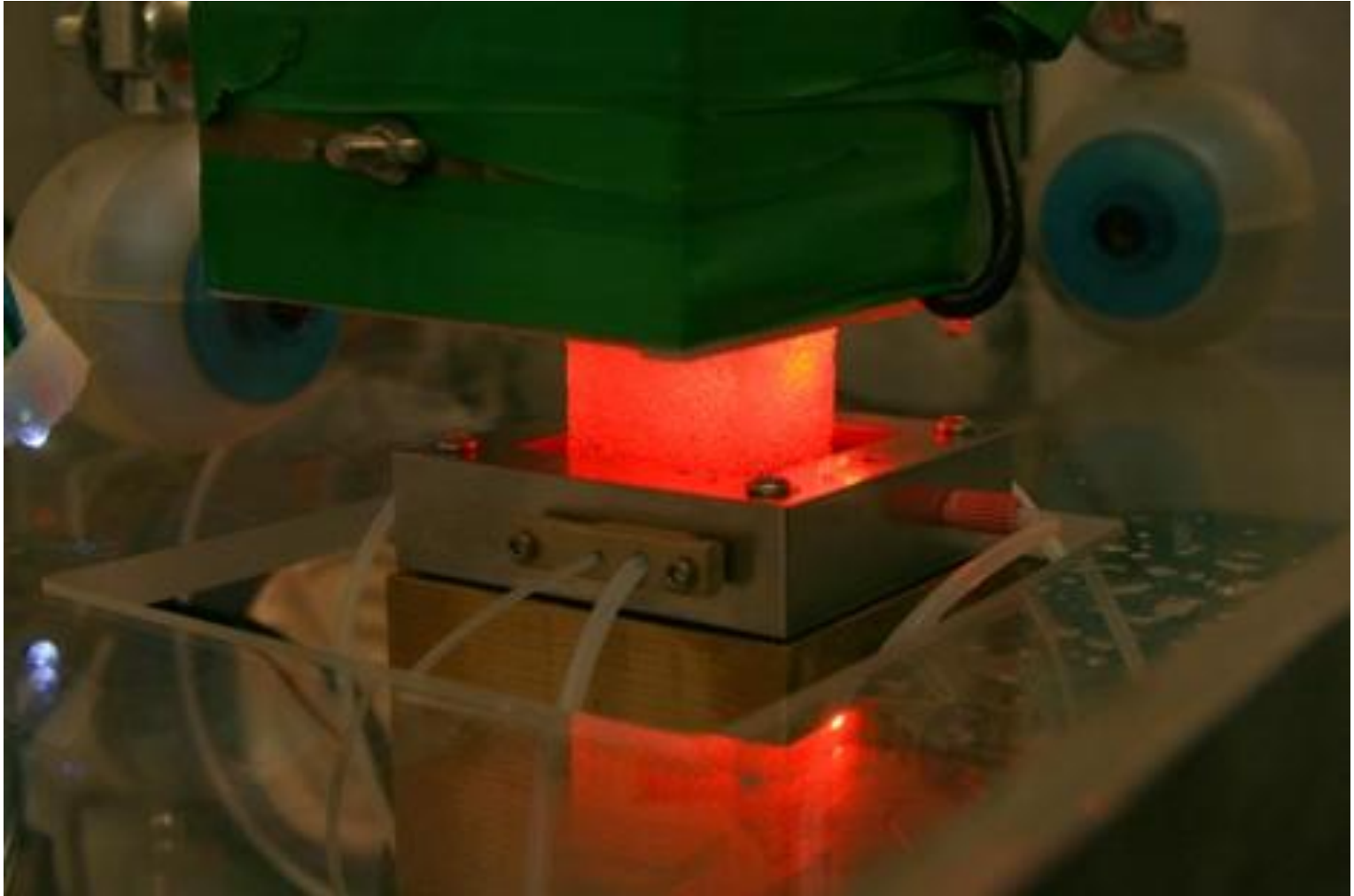


AS PURE AND BEAUTIFUL AS
THE ARCTIC ITSELF

Arctic as a sink for heavy metals



And mining contributes to Arctic Pollution



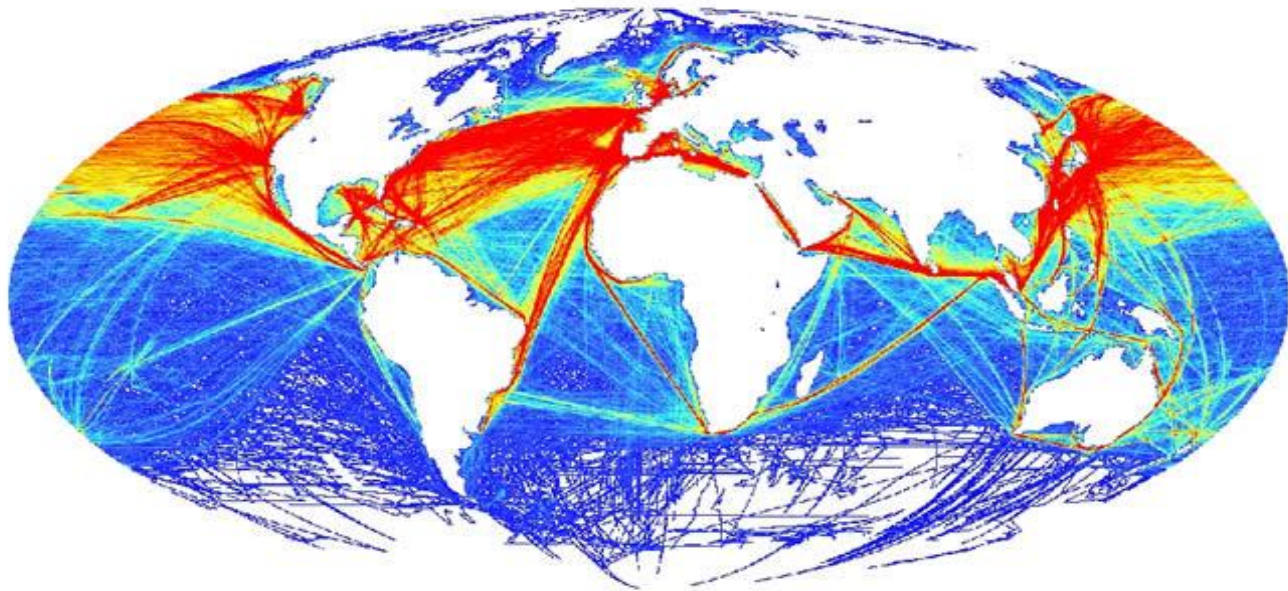
An even greater prize ... new sea-lanes created by the great melt.



A large icebreaker ship is seen from a high angle, sailing through a dense field of sea ice. The ship's hull is yellow, and its deck is green. It is moving towards a large glacier and dark mountains in the background. The ice consists of many small, irregular floes. The ship's shadow is cast onto the ice to its right.

Open year found in 2013
]Like Baltic Sea
Open in 2013
Increased traffic from Asia to Europe

Benefits of Northwest Passage shipping



The SS Manhattan



Icebreakers now make Arctic waters commercially viable

- In order to navigate these opening sea-lanes and transport the Arctic's oil and natural gas, the world's shipyards are already building ice-capable ships. The private sector is investing billions of dollars in a fleet of Arctic tankers. In 2005, there were 262 ice-class ships in service worldwide and 234 more on order.



New Kinds of Icebreakers.....



In sum: **This is a double tragedy of the Arctic Commons**

- The Climate tragedy has unleashed the **resource exploitation** Globally, states pursue their individual economic growth, while their carbon emissions collectively contribute to **greenhouse warming**, melting arctic ice
- As the ice melts, new energy resources become available; new transportation modes developed
- **Next week: resource scarcity** leads to competition and conflict, both depleting resources and exacerbating greenhouse warming

Making the resource tragedy worse: new enclosure movement

- Arctic countries will unilaterally grab as much territory as possible and exert sovereign control over opening sea-lanes wherever they can. They are already laying down sonar nets and arming icebreakers to guard their claims.
- Enclosures exacerbate the tragedy of the climate commons.
- They also may lead to international conflict

The End

