



**UNCLOS
AND
BATHYMETRY
IN THE
ARCTIC OCEAN**

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HOW WELL ARE THE OCEANS CHARTED

- 70% of the earth's surface is ocean
- 10% of the world's oceans are < 500 meters deep
- Thus, > 60% of the earth's surface is DEEP ocean
- Estimates are that between 1% and 10% of the world ocean's bottom have ever been directly measured (for public release)*

*Monahan (GEBCO) 2007



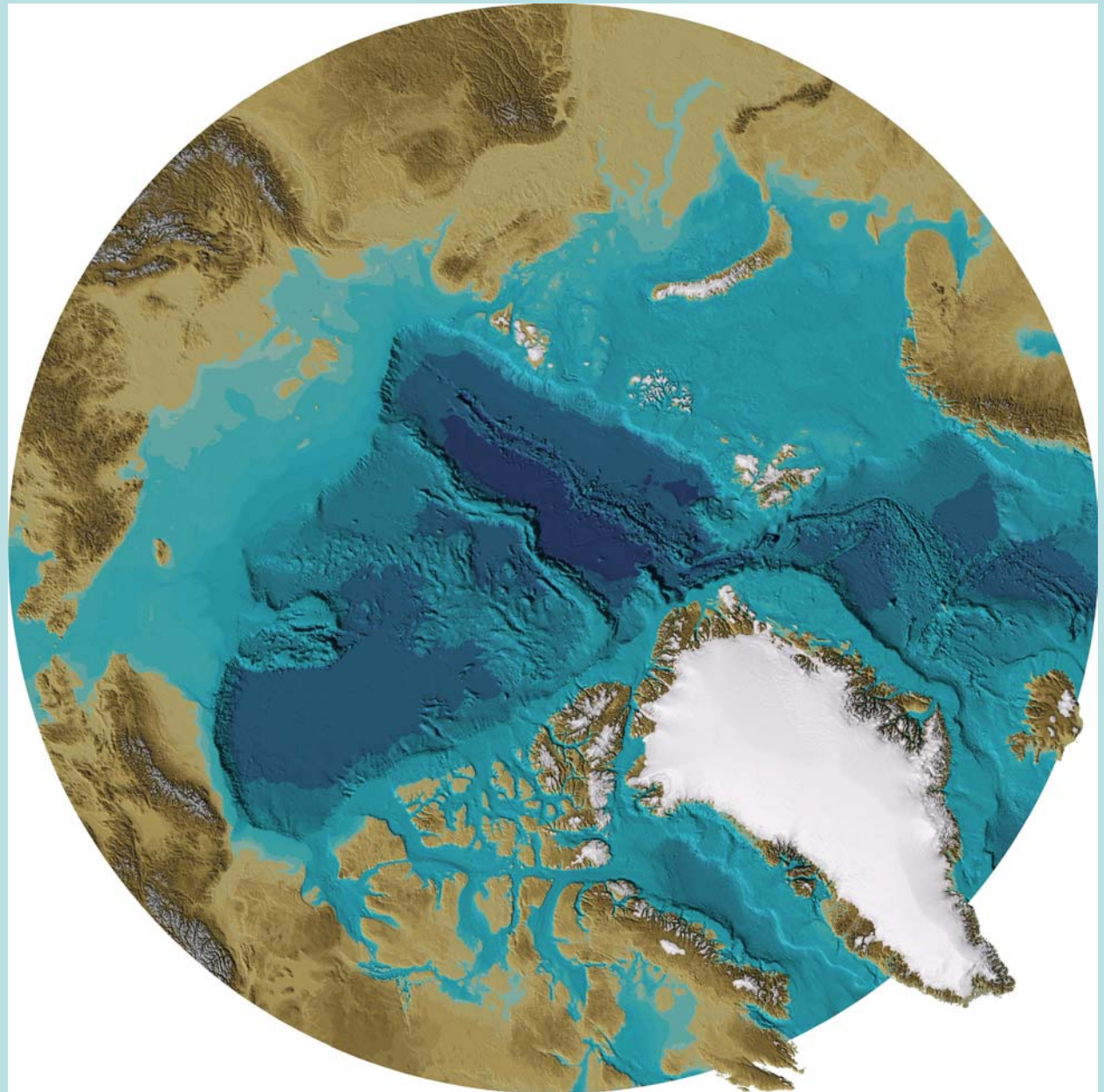
ARCTIC BATHYMETRY

- Primarily submarine data
 - 1957-1997 (so far)
 - Approximately 300,000 (track) miles
 - Some multi-beam (1998 & 1999) ~21,000 nm
- Less quantity and quality of data in the Arctic Ocean than in temperate waters
- GEBCO Chart of the Arctic is pretty and appears convincing but.....



THE ARCTIC OCEAN*

*Jakobsson, et al
(2004)



THE ARCTIC OCEAN WITHOUT ANY LINES DRAWN ON IT

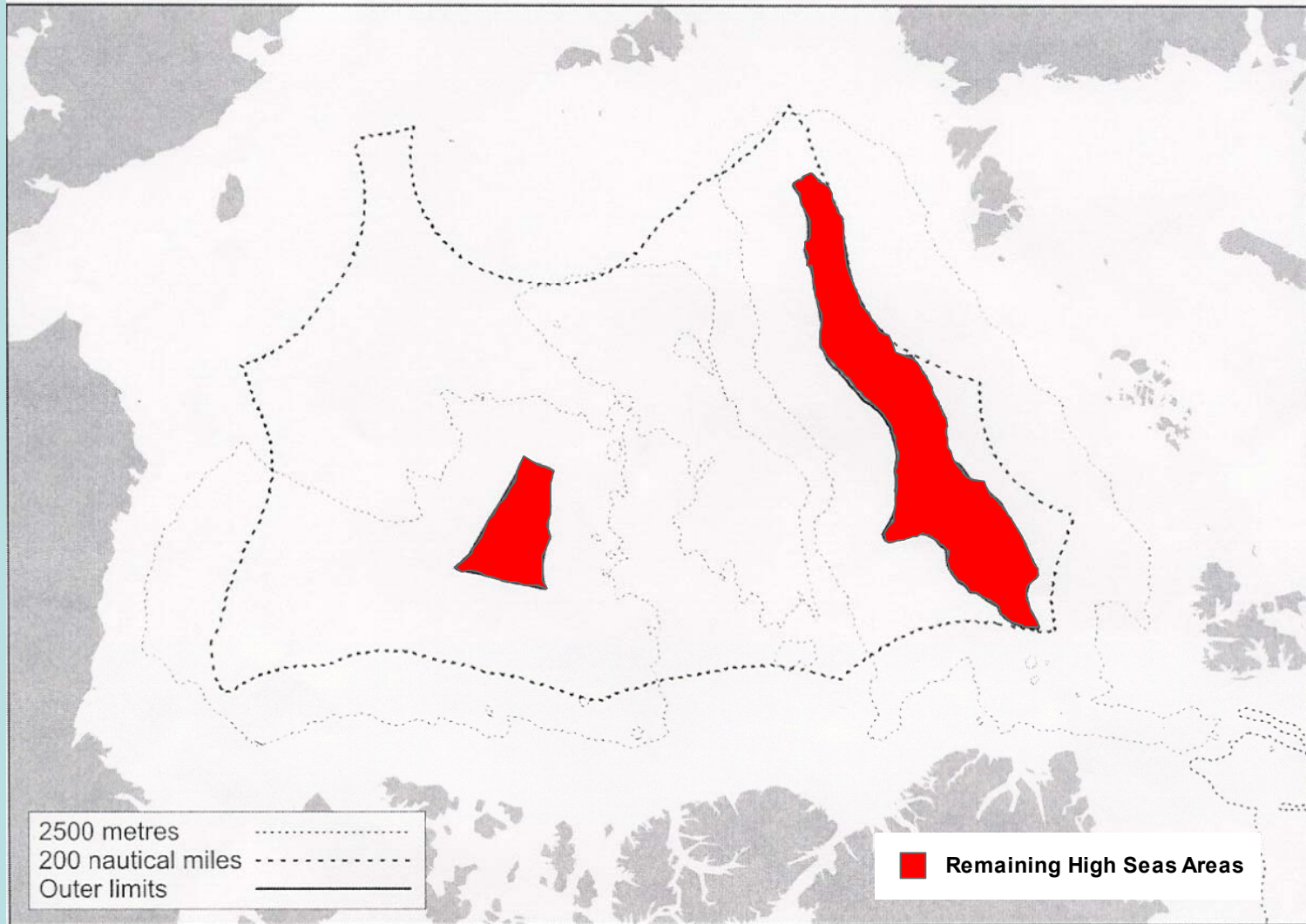


UNCLOS IMPACT

- Article 76 interest
 - Estimated ~25% of the world's undiscovered fossil fuel reserves are in the Arctic
- Lots of bathymetry (and seismic) data required
 - One may find an Arctic ridge belongs to their continent, but...
 - The devil is in the (data) details
 - 10-year window for claim submission
- Access to the ocean bottom is vital
- UNCLOS may inhibit international ocean research
 - Total water column, bottom and sub-bottom (EEZ)
 - Bottom & sub-bottom (ECS)



THE ARCTIC OCEAN AFTER ALL THE CLAIMS ARE IN: (ESTIMATED)





ARCTIC ACCESS ALSO MEANS OTHER IMPACTS EMERGE FROM & THROUGH UNCLOS

- More maritime hazards
 - Research moorings
 - Other unknowns (e.g., oil drilling, AUVs, seamounts)
- Notices to mariners
- Ice forecasting critical
 - Needs will grow with activity
 - Near real time information will be critical
- Safety and Casualty response
 - Emergency liaison centralized
- National rules for (mainly) ice covered areas (Article 234)
- **There is a lot to do!**