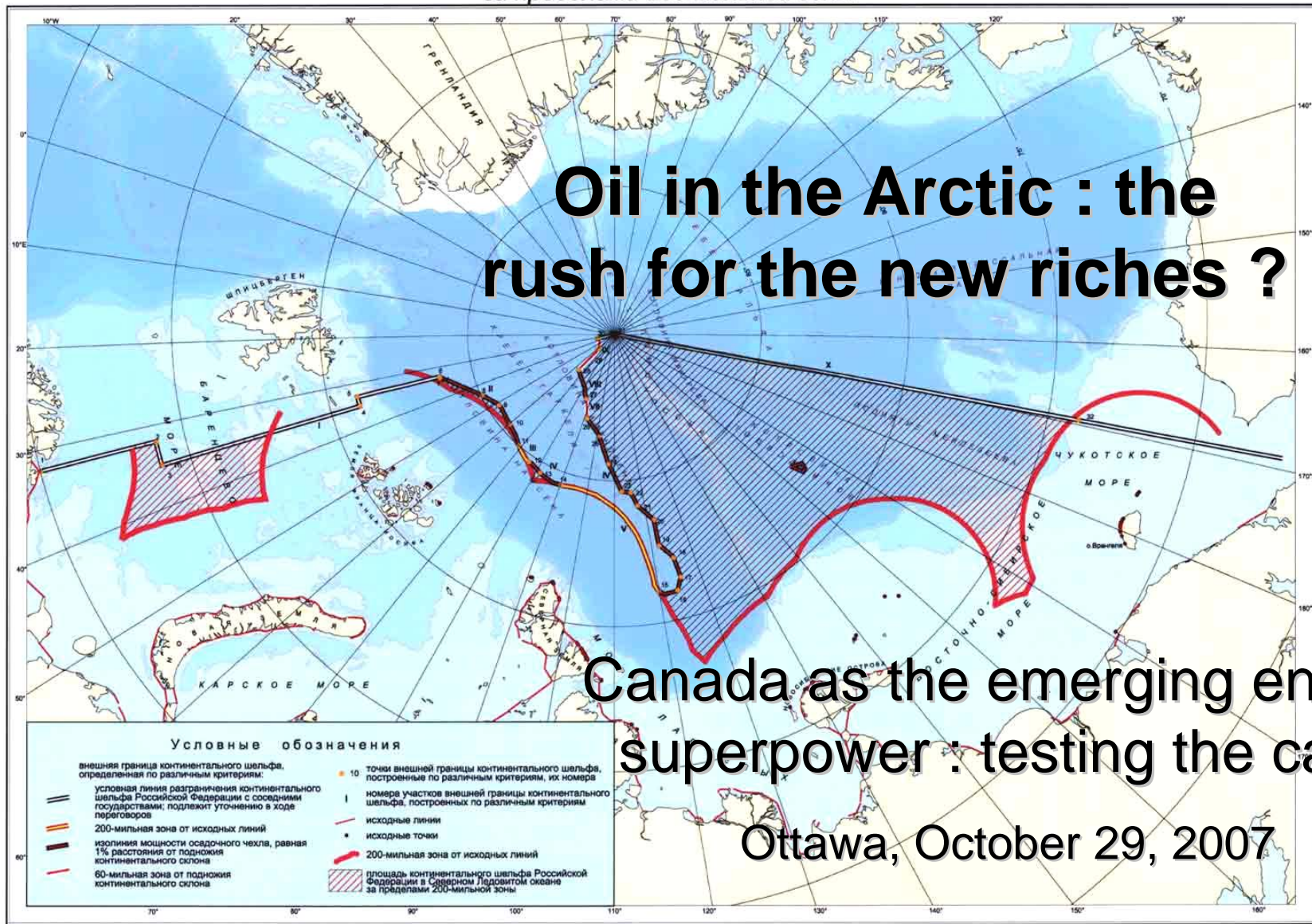


# Oil in the Arctic : the rush for the new riches ?

Canada as the emerging energy  
superpower : testing the case

Ottawa, October 29, 2007

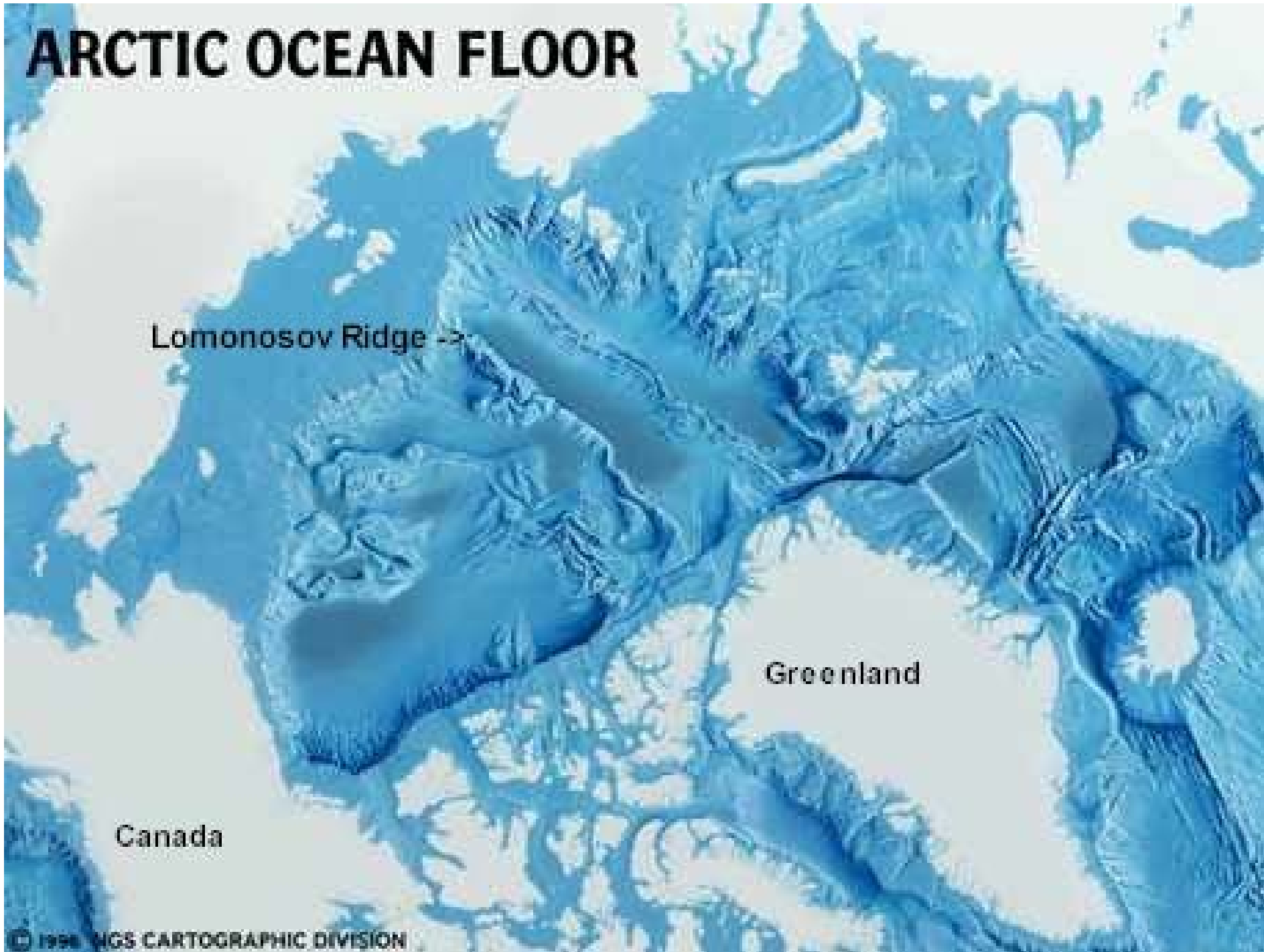


# ARCTIC OCEAN FLOOR

Lomonosov Ridge →

Greenland

Canada



# A new Eldorado ?

- About 25% of oil to be discovered would be in the Arctic according to USGS (2000).
- Discovered reserves 20 billion barrels of oil and 8 000 billion m<sup>3</sup>
- According to present estimations, the Arctic shelf contains about 80 percent of Russia's potential hydrocarbon resources.
- Arctic's estimated reserves : 200 billion barrels and 80 000 billion m<sup>3</sup>
- Alaska's North Slope : estimated 50 billion barrels – USGS 2000
- Eastern Greeland, Fram Strait and Svalbard area : about 110 billion barrels, half of Saudi Arabia's reserves (*Blog Finance* July 19, 2006)
- More than 22% of all known reserves of gas in the world are reportedly located in only one area in the north, in the Yamal peninsula (Rune Rautio, Barents Secretariat, BBC News, Aug. 13, 2006)

# A comparison...

## **Oil reserves** (2006, billion barrels)

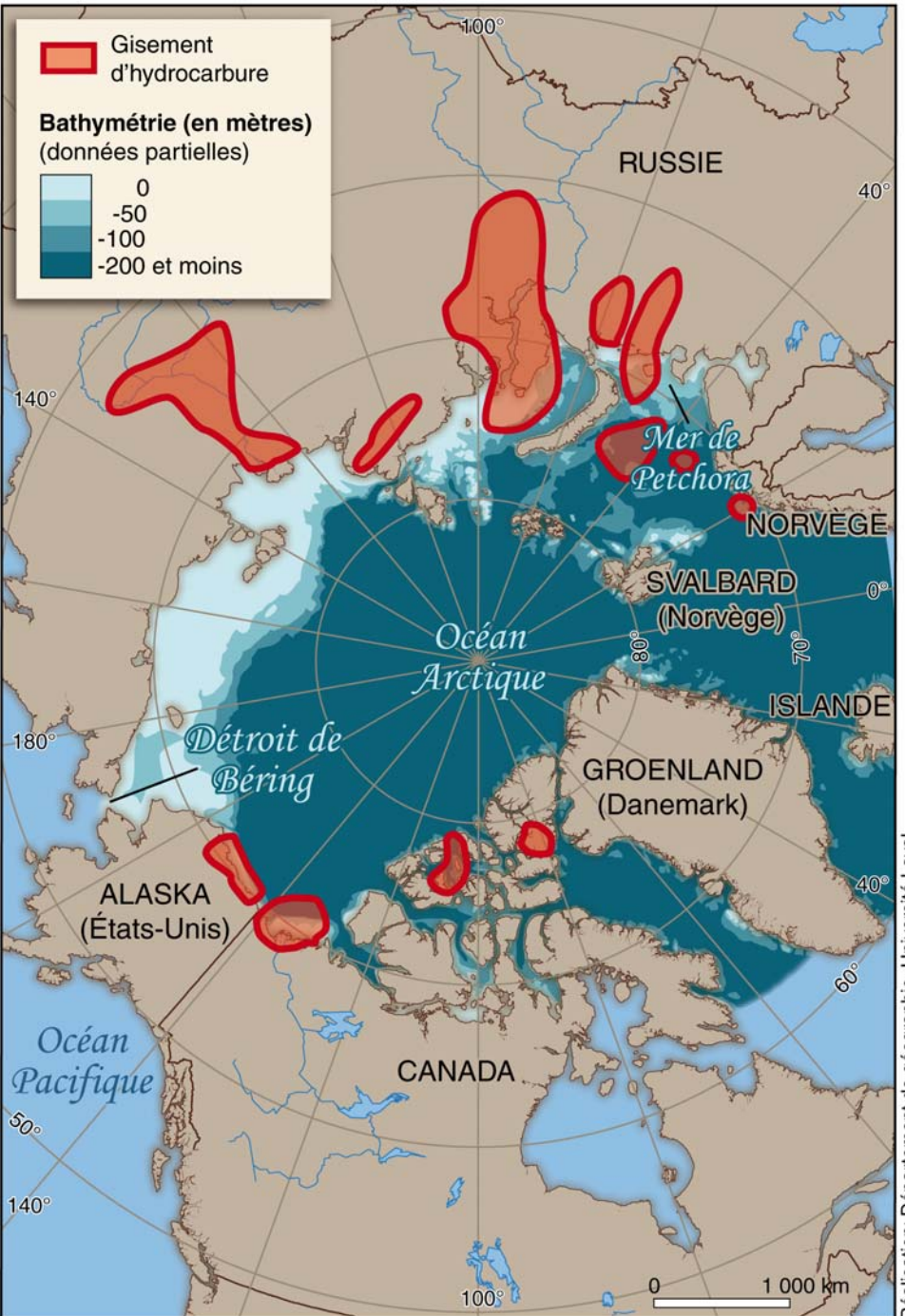
- Saudi Arabia : 264,2 -> 27,1% of world total
- Venezuela : 80,1 -> 6,6%
- Russia : 79,2 -> 6,6%

## **Gas reserves** (2006, billion m3)

- Saudi Arabia : 6 838
- Russia : 47 592



Figure 12 Gisements d'hydrocarbures et bathymétrie de l'océan Arctique



Hydrocarbon deposits  
all along the margins of  
the Arctic ocean

# Norway

- Snohvit : 161,5 billion m<sup>3</sup> gas
- Disputed area in Svalbard sea zone :  
12 billion barrels oil equivalent – dispute  
ended in June 2007 so as to ease  
investments.

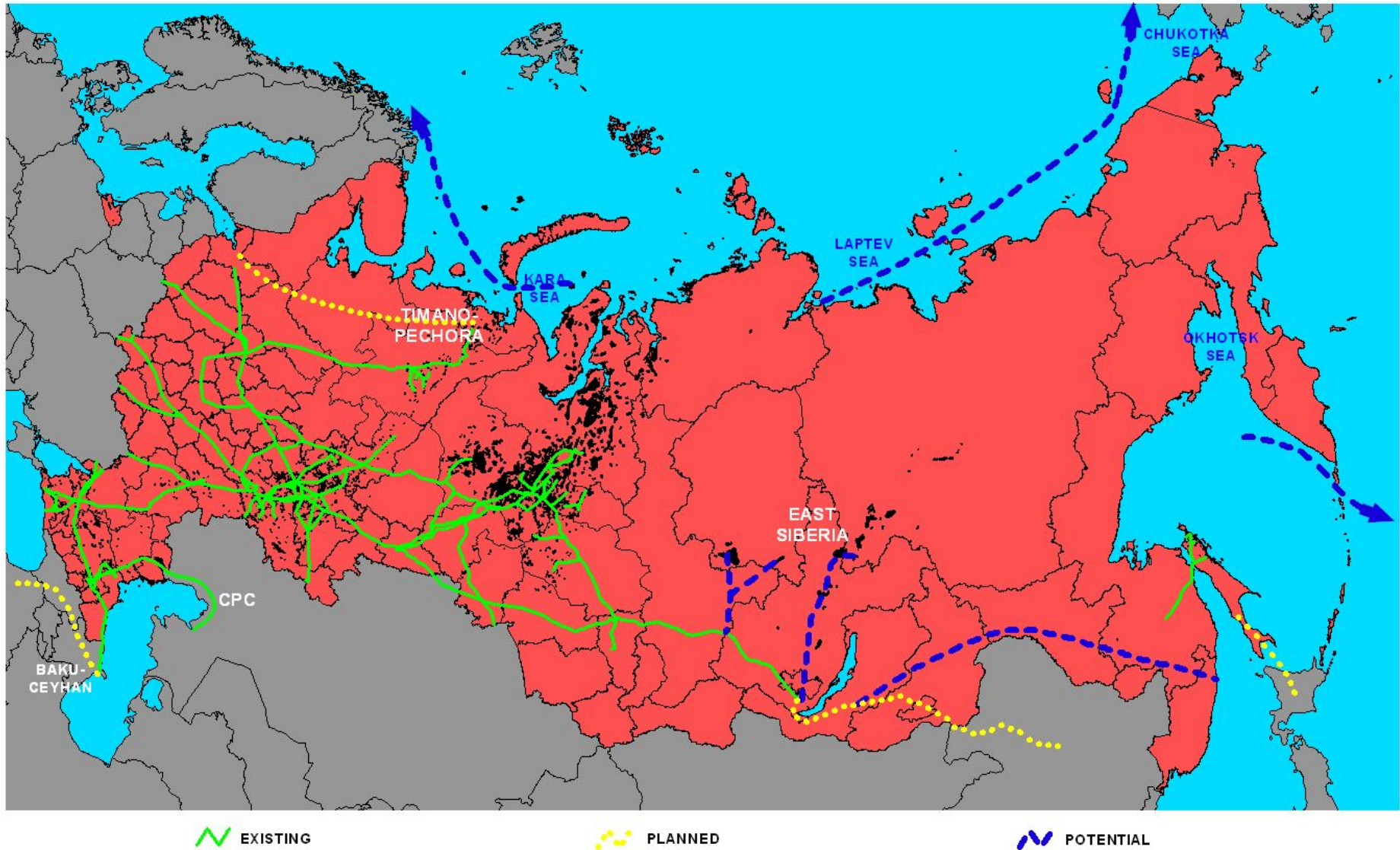
# Russia

- Barents and Kara Seas contain potential resources of :
  - between 50 (Institute of Energy Policy, Moscow) and 100 billion barrels (Society of Petroleum Engineers)
  - 3 200 billion m<sup>3</sup> of gas.
- Shtokmanovskoe gas field is probably the world's largest known offshore gas field. Its reserves total about 3 000 m<sup>3</sup> of gas and more than 20 million tons of gas condensate.
- BP signed a 17 billion \$ exploration agreement with Russia

- Eastern Siberia (Laptev Sea, Lena basin) is one area where little exploration has taken place.
- Only four or five oil and gas fields have been discovered up to 2006.
- A 1996 Petroconsultants study (the latest available) estimated that
  - around 35 billion barrels of oil (3 billion proven in 2006) and
  - 141,6 billion m<sup>3</sup> of natural gas exist in the region.



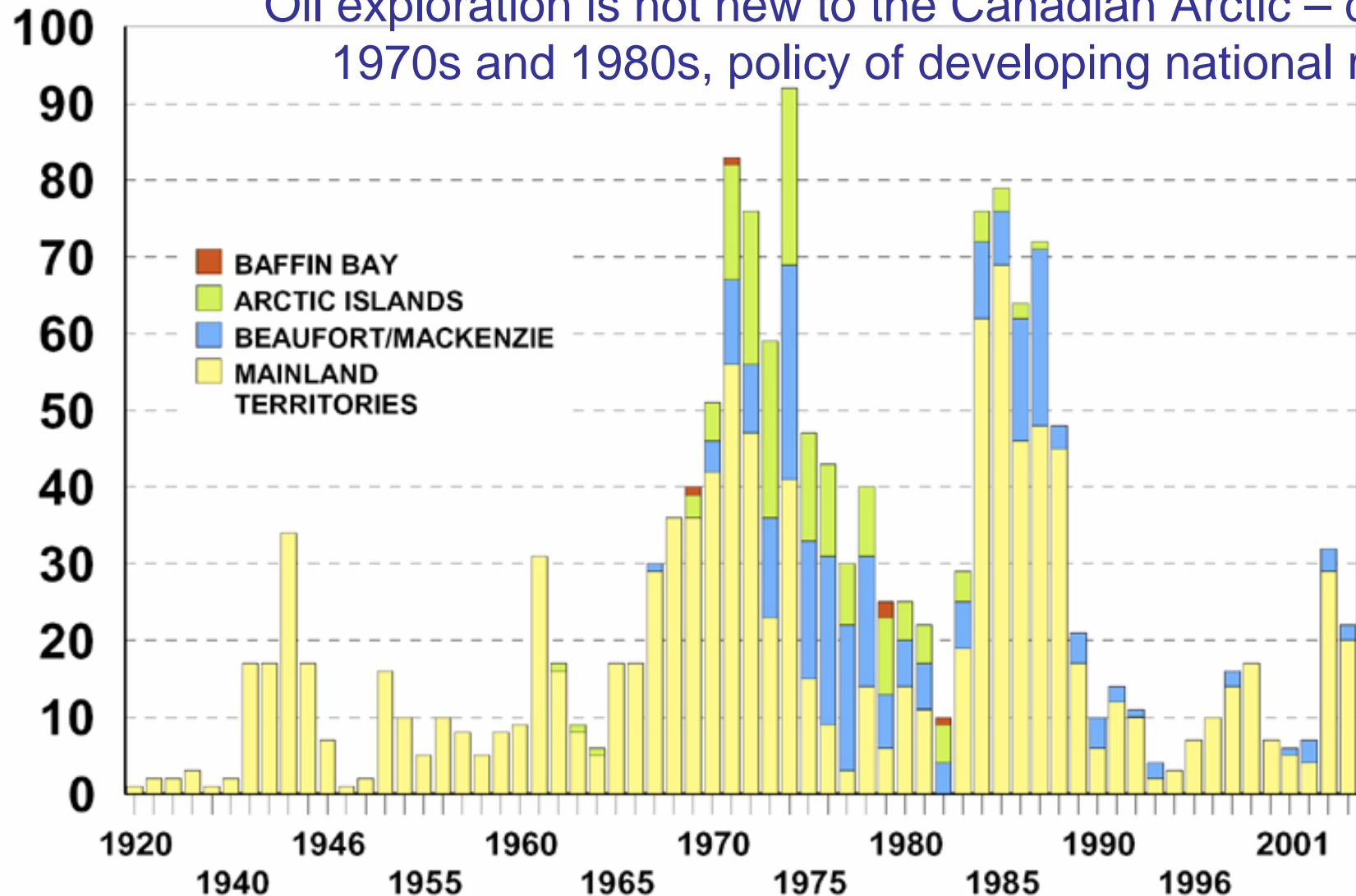
# A need for new export routes



# Canada

## NORTHERN CANADA - TOTAL WELLS DRILLED

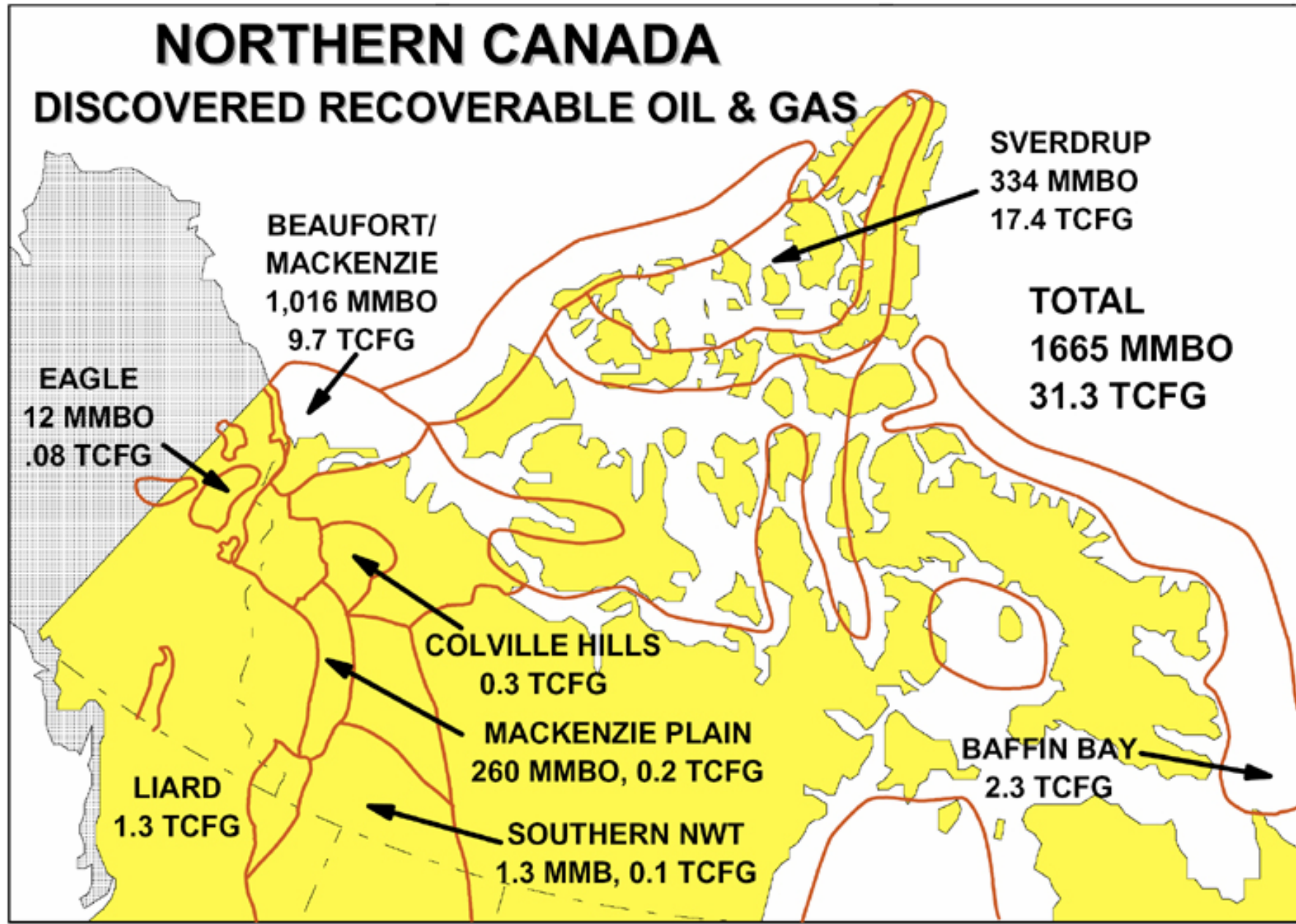
Oil exploration is not new to the Canadian Arctic – during the 1970s and 1980s, policy of developing national resources



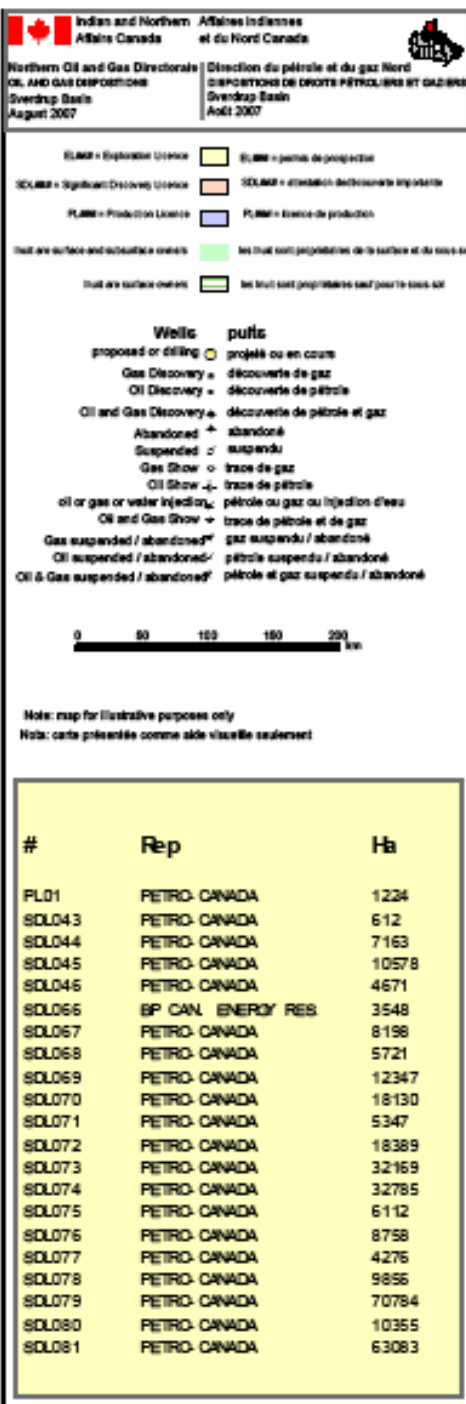
*Canada's Discovered Oil and Gas Resources North of 60\**

Kenneth J. Drummond

The Canadian Arctic islands (Sverdrup basin) have reserves of 334 million barrels of oil, 493 billion m<sup>3</sup> of gas.





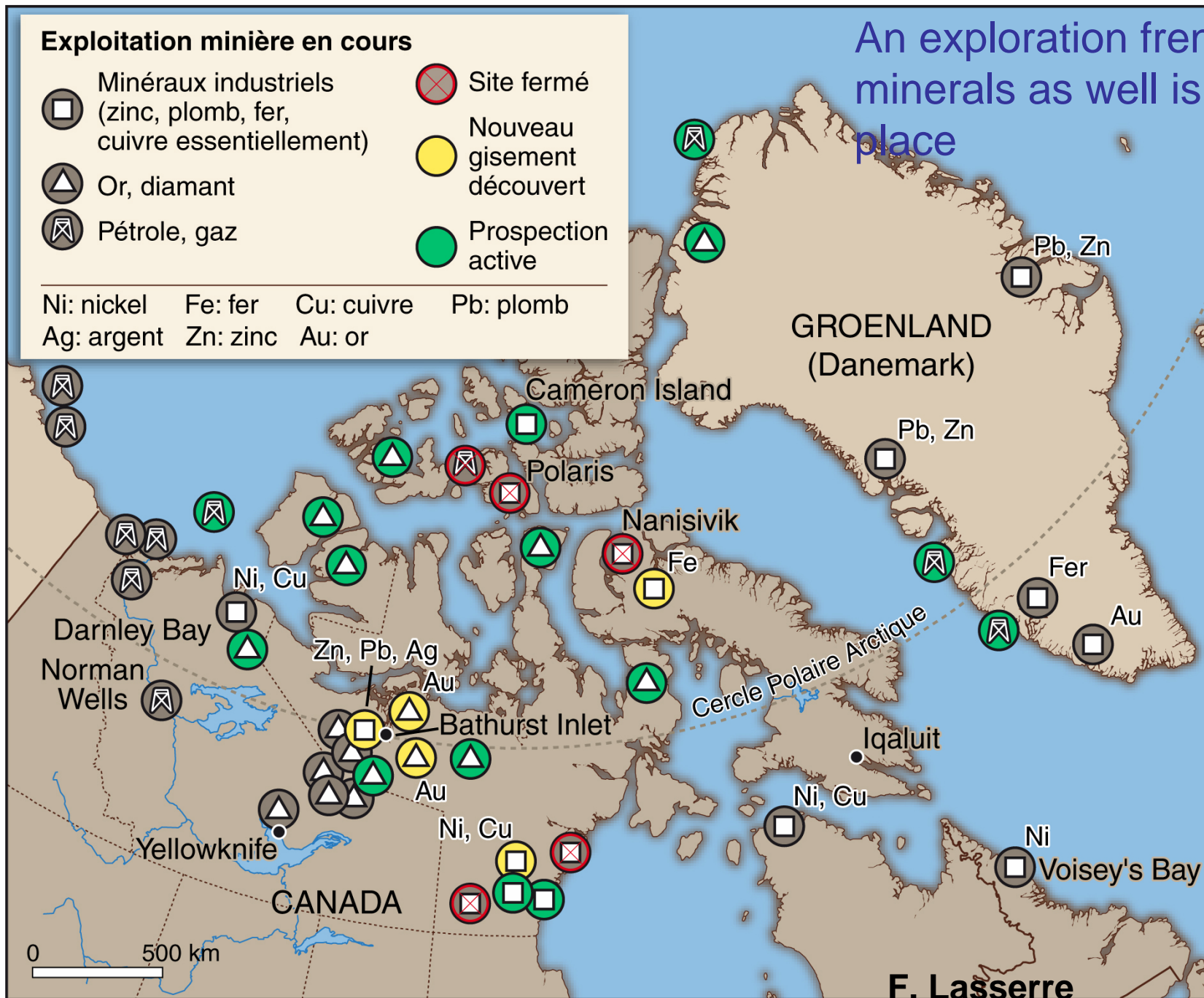


August 2007

Exploration is well under way now in the Canadian Arctic islands : example here of Sverdrup basin.



**Figure 4 Exploitation et exploration minière dans l'Arctique canadien**



An exploration frenzy for minerals as well is taking place

# Exploration is well under way

- Oct. 2007 : Imperial Oil and Exxon paid 600 million \$ for an exploration block in the Beaufort Sea, 120 km offshore.



# Promising reserves... but not enormous

- Total Canadian Northern oil reserves :  
1 665 million barrels,
  - Of which 20,1 % in Arctic islands
  - 0,9% of Canadian oil reserves (incl. tar sands) ;  
9,7% without
  - 0,6% Saudi Arabia's reserves.
- Total Canadian Northern gas reserves :  
886,7 billion m3
  - 55,3 % of Canadian gas reserves
  - 1,9 % Russia's reserves

# But then...

- Devon Energy in Paktoa well (180 km north of Inuvik), 2006 : 240 M bbl, but not the billions of m<sup>3</sup> of gas the firm had targeted

- According to a 2006 study by Wood Mackenzie and Fugro Robertson (energy research firms), the Arctic contains much less undiscovered oil than previously estimated, including the often-cited estimate from the 2000 U.S. Geological Survey report that said 25% of all the world's remaining oil would be found there...
- The U.S. Alaskan North Slope would have an estimated 6 billion barrels of oil equivalent in undiscovered reserves, compared with a USGS assessment of more than 50 billion barrels.
- The Arctic will more likely end up producing something closer to 3 percent of the world's oil when it is explored and developed in the coming decades, the report says.

# Conclusion

- Several more oil and gas fields are discovered as exploration is eased with the melting ice... and rising world prices
- Arctic oil and gas remain difficult and costly to extract
- Reserves may not be as dramatic as first thought.