

# Future of the Arctic and potential impacts of climate change

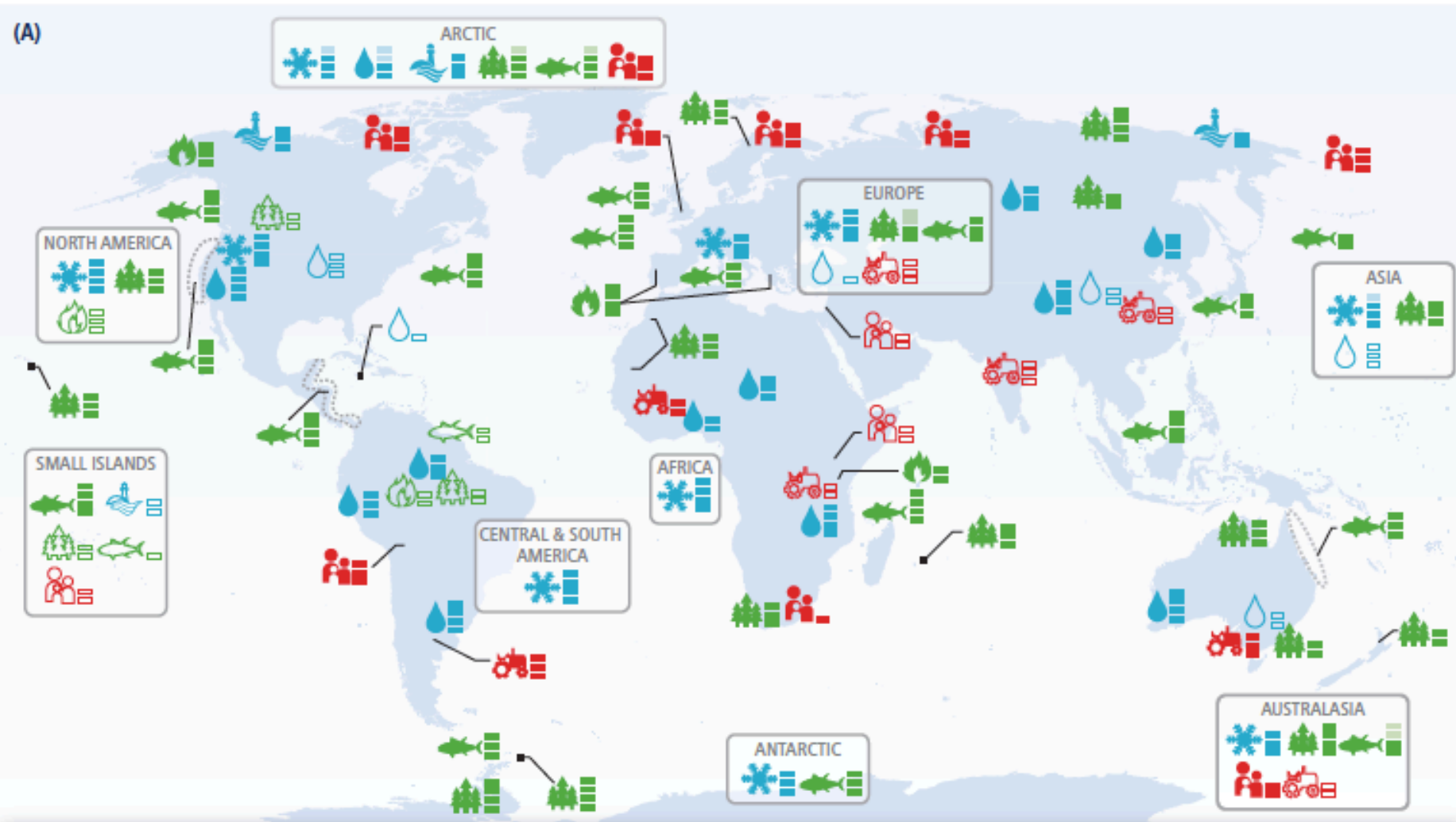
SIT – Iceland and Greenland: Climate Change and the Arctic

Friday, 3 March 2017

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(A)



**Confidence in attribution to climate change**



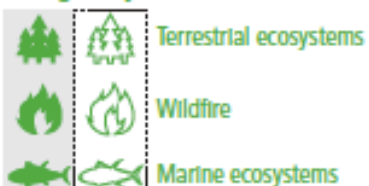
Indicates confidence range

**Observed impacts attributed to climate change for**

**Physical systems**



**Biological systems**



**Human and managed systems**



Regional-scale impacts

Outlined symbols = Minor contribution of climate change  
Filled symbols = Major contribution of climate change

# Health

- Rapid snowmelt and thawing resulting in slumping and detachment of active layer -> rock falls, debris flows, and avalanches.
- Injuries, accidents, and diseases from cold exposure will be reduced
  - Russian study: cold temperature-social stress link -> cardiomyopathy
- Increased POPs, radioactivity, and heavy metals
- Psychological and mental distress and anxiety

# Agriculture and forestry

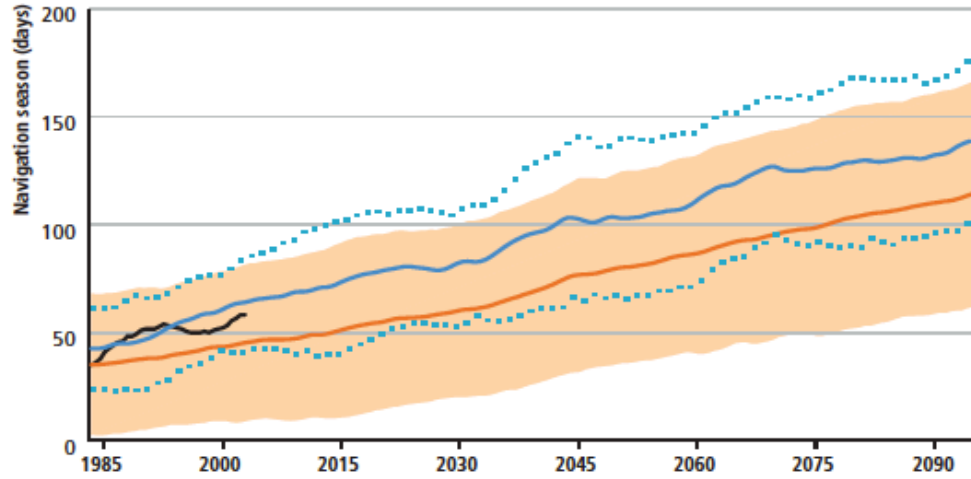
- Increased grain production and forestry opportunities
  - Increased pests

# Fisheries

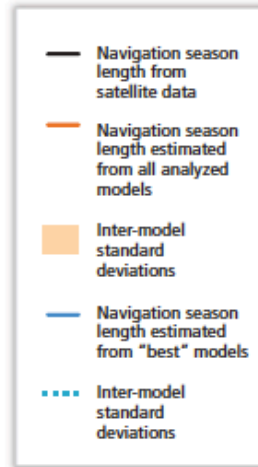
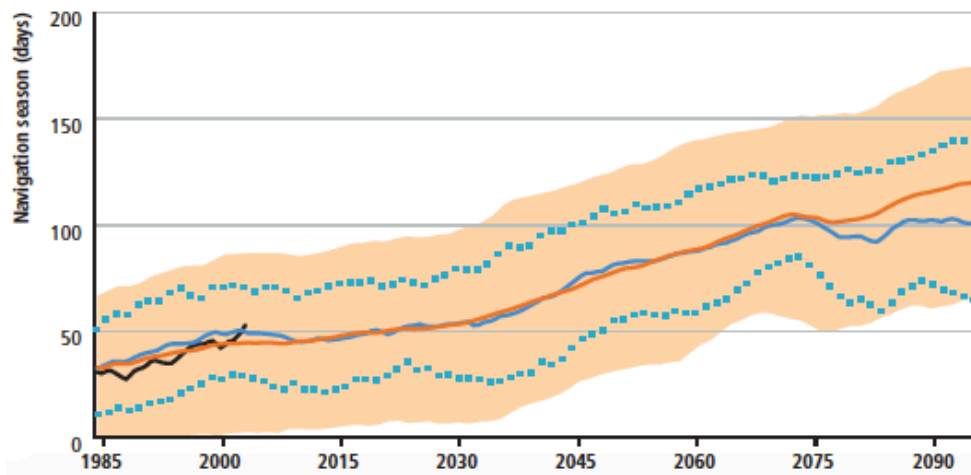
- Fishing ban
  - US, Canada, Russia, Norway, Denmark signed to ban unregulated fishing in the Arctic
  - 2.8 million km<sup>2</sup> of international waters
  - 40% uncovered in 2012
  - Non-signatory nations could still send fishing fleets
- Species shifts in subsistence fisheries for native peoples

# Navigation

(a) Northern Sea Route



(b) Northwest Passage



	Change (%) in winter road-accessible land area (km <sup>2</sup> ) (2000-kg GVWR vehicle)	Change (%) in maritime-accessible ocean area (km <sup>2</sup> ) (type A vessel)—current EEZ
Canada	-13	19
Finland	-41	0
Greenland	-11	28
Iceland	-82	<1
Norway	-51	2
Russia	-13	16
Sweden	-46	0
USA (Alaska)	-29	5
High seas	n/a	406
Total	-14	23

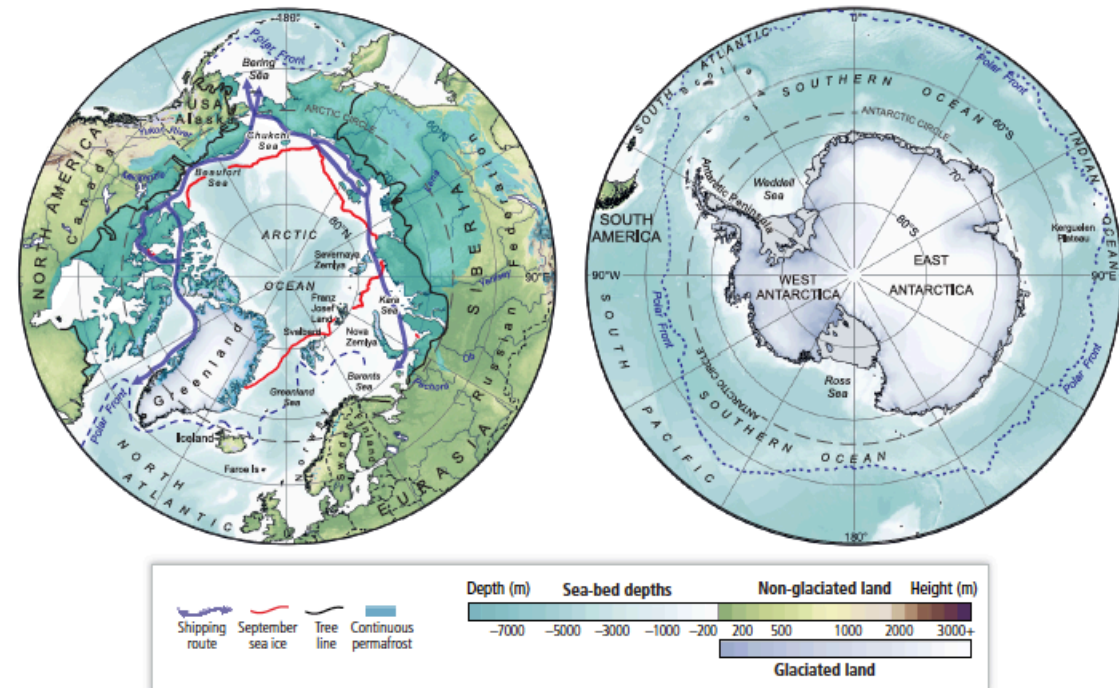


Figure 28-4 | Projected duration of the navigation period (days) over the Northwest Passage and Northern Sea Route (Khon et al., 2010).

Figure 28-1 | Location maps of the north and south polar regions (courtesy of P. Fretwell, British Antarctic Survey).

# Resource exploration

- Potentially undiscovered raw minerals, oil, and gas
- Reduction of pastureland and adaptation opportunities for reindeer and use by indigenous communities