The Impact of Arctic climate change on the CCG Icebreaking program and marine transportation

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History

• **1880**: Britain transfers sovereignty of Arctic to Canada
• **1880-1903**: Exploration voyages to Hudson’s Bay
• **1903**: Marine Department establishes permanent stations in Eastern Arctic
• **Oceans Act**
  - section 41 gives CCG the legislative authority to provide services for the safe, economical and efficient movement of ships in Canadian waters

• **Canada Shipping Act**
  - some sections have Minister of DFO as lead, ex: SAR

• **Arctic Waters Pollution Prevention Act (AWPPA) and associated regulations**
  - NORDREG (Arctic Canada Traffic System) vessel monitoring support is provided by CCG. NORDREG is currently a voluntary reporting system
  - Arctic Ice Regime Shipping System (AIRSS) support
CCG Arctic Programs

- Ice routing & information / ship escorting / harbour breakout
- Maritime search and rescue (SAR)
- Marine navigation services
- Marine communications and traffic services (MCTS)
- Environmental response to marine spills
- Arctic resupply: fuel and cargo trans-shipment (Eureka, Nanisivik, Kugaaruk, Thule)
- Arctic ports program
- CCG Auxiliary (Rankin Inlet, Iqaluit, and Kimmirut)
- Fleet support to DFO (and other) science
- Fleet support to OGD’s: GN, EC, DND, US Military Strategic Command
- No formal security role – but a major Arctic maritime player and platform provider
Icebreaker Deployment and Commercial Traffic

Western based ships

Eastern based ships
Ships (July to Nov deployment)
- 1 heavy icebreaker – CCGS Louis S. St-Laurent
- 4 medium icebreakers – CCGS Henry Larsen, Terry Fox, Pierre Radisson, Des Groseilliers
- 1 light icebreaker / multi-purpose vessel – CCGS Sir Wilfrid Laurier
- 1 dedicated science icebreaker – CCGS Amundsen – externally funded on a project basis
- 2 river class aids vessels – CCGS Dumit and Eckaloo (Mackenzie River only)
- 1 dedicated science river class vessel – CCGS Nahidik – externally funded on a project basis

Aircraft
- 4 helicopters carried aboard St-Laurent, Henry Larsen, Pierre Radisson and Des Groseilliers
- 2 shore based helicopters from Parry Sound and Quebec City available to support Arctic fixed aids – for short periods during summer months
- CCG funded Ice Reconnaissance aircraft
Commercial Traffic
2004 Arctic Voyages

• **Total:** 107 voyages from 61 different vessels

• **Canadian government vessel voyages:** 8 (7 CCG, 1 Canadian Navy)

• **Commercial vessel voyages:**
  - Canadian vessel voyages (cargo ships, tankers, tug/barges): 62
  - Foreign cargo vessel voyages: 18 (14 Churchill)
  - Foreign cruise ship voyages: 7
  - Foreign research vessel voyages: 7
  - Foreign and Canadian pleasure craft voyages: 5 (all over-wintered)

• **NWP transits**
  - CCG: 2
  - Foreign cruise ships: 1
  - Foreign pleasure craft: 2 (2 years each to complete voyages)
Arctic Oil and Gas Exploration

Canada’s Northern Basins
1450 wells
Other commercial activities

- Long term mining interests in Eastern Arctic
- Port of Churchill
- Increasing Beaufort sea presence/activity
- Increased traffic along Mackenzie River
- Bathurst Inlet Port project (possible revival of interest)
- Diamond mines in NWT
Climate Change and the Arctic

- variability in weather patterns
- melting of polar ice masses
- sea level changes
- increased thawing of permafrost
- increased coastal erosion
- changes in extent & thickness of sea ice
- displacement of aquatic, marine, and terrestrial wildlife
- Lengthening of navigation season
Northwest Passage

Distance: Germany to Japan
Panama 15,600 n.m.
Suez 13,000 n.m.
NW Passage 9,800 n.m.
NSR 7,000 n.m.
Ice - A Navigational Hazard

Ram Ice

Growler
Impacts on Government Operations

- Longer Arctic patrols by CCG icebreakers
- Need to replace aging Icebreaker Fleet
- Need for improved Arctic marine charts and aids to navigation
- Improved Arctic port infrastructure (fuel, water, supplies, repair facilities)
- Improved monitoring of marine traffic
- Increased Traffic = Increased Risks
- Resolution of disputed areas
- UNCLOS ratification: surveys, declaration by 2013
- Review and update/strengthen legislation, standards etc
Research & Development

- Improved Ice information systems
- Improved radar detection of multi-year ice
- Arctic Ice Regime Shipping System: better science, more accurate evaluations, more useful in anticipation of increased traffic
- Multi-agency involvement
International Polar Year

- Science activities planned over 2 year period: 2007/08 and 2008/09
- CCG is providing ship-time for projects on a cost-recovered basis
- Main focus on: Climate Change impacts and Health & Well-being of northern communities
Arctic Outlook & Issues

- Current Federal Government has reinforced its commitment to the North
- Arctic shipping is currently steady-state. Increase will be gradual, yet continuous.
- Most shipping will continue to be south-north (re-supply) and north-south (resource extraction).
- Increase in cruise shipping (esp. “ecotourism”), recreational and F/V traffic
- Climate change: crews have seen greater variability in ice seasons
- CCG experience has seen very heavy ice years in the Northwest Passage and Canadian Archipelago
- NWP transits are not common. Although voyages by “adventurers” are increasing.
Conclusion

• Shipping is, and will continue to be, driven by local supply demands as well as global resource markets.

• The Federal and Territorial Governments are committed to the North.

• Commercial economic activity is encouraged, and is increasing.

• Inclusion of local population/organizations is encouraged and provides an indispensable resource.