

Northern opportunities: a strategic review of Canada's Arctic icebreaking services



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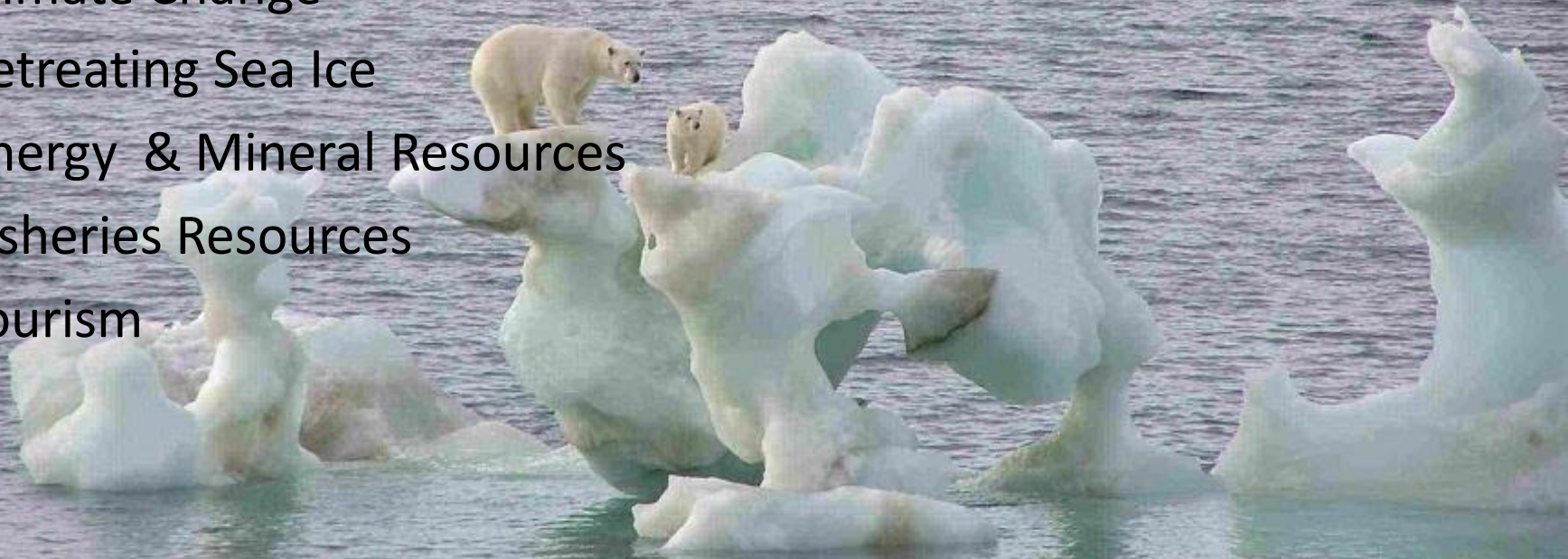
Presentation Outline

- Introduction
- Earlier Research
- Quantitative Survey
- Results
- Conclusion & Recommendations



Introduction

- Interest in the Arctic due to:
 - Increasing Local Population
 - Climate Change
 - Retreating Sea Ice
 - Energy & Mineral Resources
 - Fisheries Resources
 - Tourism



UNCERTAINTY as to
when, not if.

Introduction - Reliable Transportation

- Economic development and exploration of Canada and the Arctic has and will continue to be heavily dependant upon a reliable transportation infrastructure
- Canada's involvement and activity in the Arctic is anticipated to increase and with this will come an anticipated greater demand for an efficient and effective transportation network.

Earlier Research



Iceberg

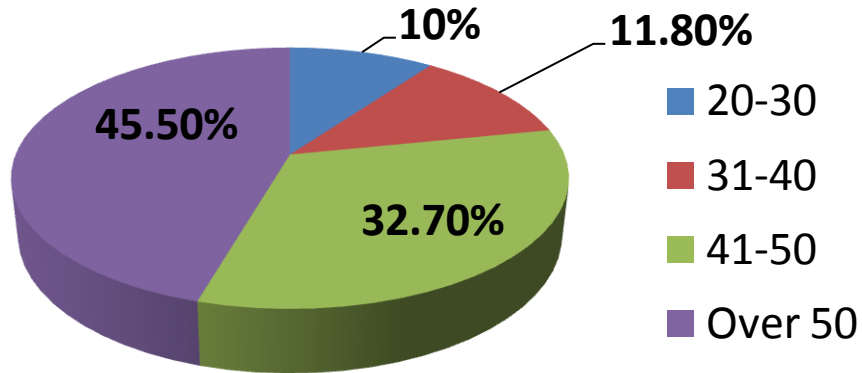
Quantitative Survey

Quantitative Survey

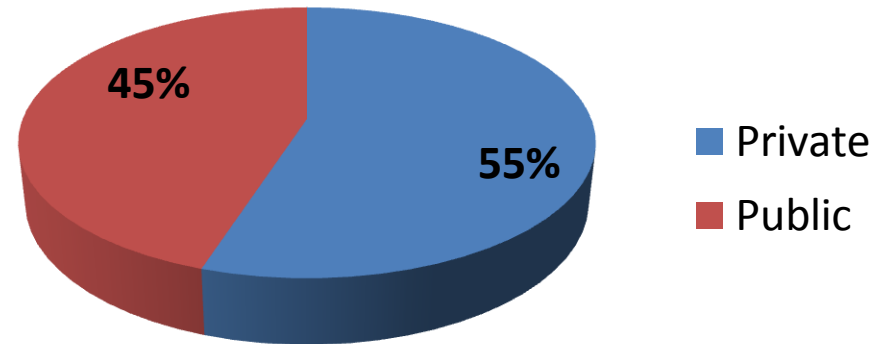
- In attempting to triangulate earlier research findings, the hypotheses and relationships formulated from inductive and deductive analysis were tested using a Likert style quantitative survey with 110 participants and were analysed using appropriate quantitative analysis.

Survey Participant Profile

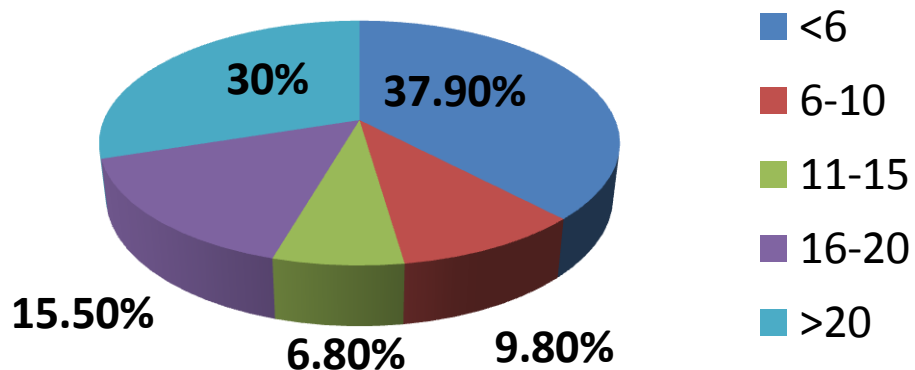
Age Profile of Sample



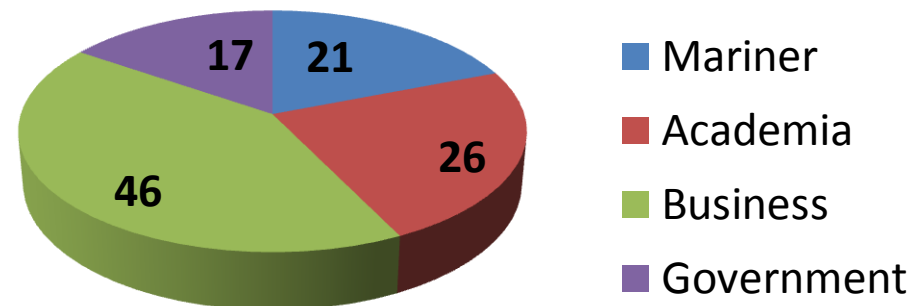
Business Background



Years of experience dealing with Arctic matters



Professional Background



Quantitative Survey

- Part A of the survey was used to try and gain insight with respect to the varying levels of business risk that survey participants were willing to accept
- Part B of the survey, the main focus of this paper, comprised of 45 statements that were founded on the hypotheses and relationships developed during the earlier grounded theory component of the research

Survey Results (1)

- Descriptive statistics (non random, non-parametric)
 - avails of quantitative measures to describe data and include frequency distributions, measures of central tendency, and measures of dispersion
 - allows for description and summary of the data or the relationships between variables in the data

Survey Results (2)

No.	Survey Statement	Count	% Agree
1a	Canada's military and civilian roles in the Arctic should be combined.	102	58.8
1b	Canada's military and civilian roles in the Arctic should be managed by a newly created maritime organization.	98	66.3
2	Separating CCG Hardware from CCG Services will aid in setting clearer terms of reference for the CCG.	93	43.0
11	Canada's Arctic would develop sooner if greater I/B capability were available on a year round basis.	108	74.1
21	Canada needs to enhance its Arctic expertise.	110	96.4
22	The local residents of Arctic regions need to be significantly involved in future Arctic developments.	109	95.4
27	Private involvement in the delivery of CCG services in the Arctic will result in less tax dollar spending.	100	67.0
30	The Canadian public in general will object to only privatizing icebreaking services in the north and not in the south.	92	44.6

Survey Results (3)

No.	Survey Statement	Count	% Agree
23a	Private ship management companies operating in the Arctic would be more cost efficient than government.	102	87.3
23b	Private ship management companies operating in the Arctic would be more risk averse than government.	102	54.9
24	Private firms are able to manage CCG I/Bs more efficiently than the CCG through Public Works & Treasury Board.	95	65.3
25	Private management of the CCG fleet will resolve critical manning issues.	98	45.9
42	Canada's Arctic development would best be accomplished by having a private local company to manage and crew I/Bs that are built outside of Canada and leased to the CCG for year round operations in the Arctic.	100	49.0
45	Canadian taxpayers would benefit from having a fleet of competitively built, in Canada, Polar Class I/Bs that will be managed by competitive private firms.	99	64.6

Survey Results (4)

No.	Survey Statement	Count	% Agree
34	It would be more efficient for the CCG to use a proven I/B design than to have a new I/B designed in Canada.	104	74.0
36	Private firms are able to design & build I/Bs more efficiently and effectively than the CCG through Public Works.	100	91.0
37	Canadian shipyards are unable to build a I/B as quickly as other experienced shipyards in Europe and the Far East.	100	83.0
38a	Other countries are able to build an I/B more effectively than Canada.	100	71.0
38b	Other countries are able to build an I/B more efficiently than Canada.	101	87.1
40	Unless Canada decides to build a substantial fleet of Polar Class I/Bs, it will cost less to have them designed and built in European or Far East yards.	98	90.8
43	The CCG would benefit from the acquisition of I/Bs designed and built by European or Far East yards to manage themselves.	102	59.8

Survey Results (5)

No.	Survey Statement	Count	% Agree
26a	Private Canadian ownership of a fleet of vessels used by CCG, Canadian Military, and oil companies in the Arctic will increase Canadian presence.	105	63.8
26b	Private Canadian ownership of a fleet of vessels used by CCG, Canadian Military, and oil companies in the Arctic will not jeopardise Canada's sovereignty.	102	67.6
28	Chartering out of private I/Bs to the Canadian Government will necessitate long term time charters.	100	89.0
39	Canadian taxpayers would benefit from the CCG and the military committing to charter a fleet of newly constructed and privately owned multi-functional ice class vessels that have the modular capability to meet their particular interest and will be time shared with oil companies operating in the Arctic.	98	69.4
41	In the absence of increased funding for the CCG, Canada's maritime requirements would be better served by setting up a Maritime Administration office which would be responsible for the development of CCG and DFO programmes and would avail of the existing CCG fleet, the leasing of private hardware and/or the contracting out of services.	93	64.5
44	Without its own fleet of Polar Class I/Bs the CCG will need to engage in a long term time charter for I/B services in the	100	85.0

Survey Results (6)

- In attempting to gain further insight into the opinions expressed by the four prime classes, the statements noted in the tables above were analysed using appropriate statistical tests including:
 - *Chi-Square*
 - *Mann-Whitney*
 - *Kruskal Wallis*
 - *Spearman rho*

Further Analysis

- In order to probe further, and attempt to triangulate earlier findings, factor analysis and principal component analysis was conducted on the results of the quantitative survey

Principal Component Analysis (highlights)

- Numerous potential benefits that could possibly be achieved from increased private involvement in developing the Canadian Arctic
- Current and future availability, and appropriate use, of resources will be paramount
- Political and administrative challenges are hindering Arctic development and the level of services that the CCG is capable of providing as a SOA
- The taxpayers of Canada would benefit from the construction of new, and much needed, icebreaking capacity outside of Canada.

Conclusions and Recommendations (1)

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- Canada needs to pay more attention to Arctic development
 - There is significant potential for the private sector to be involved in this development with respect
 - to the management and crewing of CCG icebreakers
 - the design and construction of icebreakers for the CCG
 - the leasing and/or chartering of icebreakers to the Canadian government or other interested groups

Conclusions and Recommendations (2)



- Further research involving more of Canada's Arctic stakeholders is required to canvass the in-depth opinions of local experts relating to various models which may underpin the ownership, organisation and management of relevant infrastructure. This research will require more government involvement at all levels and may well be supported by a quantitative survey to triangulate the findings and estimate the extent of support for new initiatives.

Thank you -
Any questions?



Summary of Delphi Study:

The exercise was carried out independently by participants using an e-mail based survey.

The questions put forward in the first round of Delphi were founded on the results of the literature review.

Questions for the two later rounds of Delphi were compiled from the comments of previous rounds of Delphi.

	Round 1	Round 2	Round 3
Participants	32	27 of 32	23 of 27
Questions	32	44	21
APMO (%)	49.26	41.90	37.18

1. Future ice conditions in Arctic waters:
Considerable uncertainty surrounds the extent to which perennial Arctic ice will retreat in terms of geographic location and when the Arctic Ocean may experience ice free summers
2. Transit traffic through the NWP:
By 2050, Panamax vessels of approx. 60K DWT would be able to traverse the NWP for 9 months of the year with I/B assistance

3. Arctic traffic and icebreaker capabilities:
2020 traffic volumes will double that of 2006 and Arctic nations currently do not have I/B capabilities to meet anticipated 2020 traffic demands
4. CCG levels of service:
While current ice routing and information services would be suitable for 2020 shipping activity the current level of route assistance would not
5. Organizational and operational aspects of the CCG:
Given that the six CCG I/B used for Arctic operations are operated out of four different regions, slightly more panellist agreed that this decentralization led to underutilization of the vessels. However, there was strong agreement that it is important for Arctic I/B to be coordinated from one central control point.
6. Merchant vessel movement in the Canadian Arctic:
There was strong agreement that the rigid Zone/Date Shipping Safety Control Scheme is inappropriate for current day Arctic shipping activity and that the flexible Arctic Ice Regime Shipping System (AIRSS) is more appropriate
7. Icebreaker deployment in the Canadian Arctic:
While there was no overall agreement that Canada should immediately acquire ice breaking capability for year-round winter navigation in the Arctic, more panellist agreed with the statement than disagreed

8. Privatization of CCG services in the Arctic:

There was overall agreement that while private involvement would not weaken Canada's sovereignty position in the Arctic, it would not be appropriate for the ice breaking component of the CCG range of services in the Arctic to be privatized

9. Arctic hardware and human resources:

There was overall agreement the vast geography of the Arctic poses significant challenges to Canada and other maritime nations in terms of human resource management on board I/Bs working in the Arctic

Results of Principal Component Analysis

(8 Components/Factors)

Privatization

- 27 0.787 Private involvement in the delivery of CCG services in the Arctic will result in less tax dollar spending.
- 24 0.785 Private firms are able to manage CCG I/Bs more efficiently than the CCG through Public Works & Treasury Board.
- 26a 0.758 Private Canadian ownership of a fleet of vessels used by CCG, Canadian Military, and oil companies in the Arctic will increase Canadian presence.
- 26b 0.707 Private Canadian ownership of a fleet of vessels used by CCG, Canadian Military, and oil companies in the Arctic will not jeopardise Canada's sovereignty.
- 23a 0.683 Private ship management companies operating in the Arctic would be more cost efficient than government.
- 25 0.658 Private management of the CCG fleet will resolve critical manning issues.
- 39 0.652 Canadian taxpayers would benefit from the CCG and the military committing to charter a fleet of newly constructed and privately owned multi-functional ice class vessels that have the modular capability to meet their particular interest and will be time shared with oil companies operating in the Arctic.
- 42 0.614 Canada's Arctic development would best be accomplished by having a private local company to manage and crew I/Bs that are built outside of Canada and leased to the CCG for year round operations in the Arctic.

Resources

32	0.767	Canada needs to be at the forefront of icebreaking technology.
33	0.766	Canada would benefit from regaining its expertise in designing and building I/Bs and becoming less dependent on other shipbuilding nations.
20	0.725	Due to Canada's geographical expanse and ensuing political bureaucracy the CCG fleet is grossly inefficient and underutilized.
31	0.585	Canada is capable of building ice strengthened supply vessels.
45	0.502	Canadian taxpayers would benefit from having a fleet of competitively built, in Canada, Polar Class I/Bs that will be managed by competitive private firms.
15c	0.488	Limited attention from Federal MPs has resulted in the CCG's poor operation.
44	0.382	Without its own fleet of Polar Class I/Bs the CCG will need to engage in a long term time charter for I/B services in the Arctic.

Politics

- 13 0.800 Canada's low public interest in marine matters has contributed to the low public profile of the CCG.
- 14 0.799 The low public profile of the CCG results in very limited attention being given to it by Federal Members of Parliament.
- 15a 0.760 Limited attention from Federal MPs has resulted in the CCG's low funding.
- 15b 0.555 Limited attention from Federal MPs has resulted in the CCG's poor management.
- 19 0.459 Political intervention impedes the CCG from achieving more commercial-like efficiencies.
- 21 0.417 Canada needs to enhance its Arctic expertise.

Shipbuilding

38b 0.835 Other countries are able to build an I/B more efficiently than Canada.

38a 0.826 Other countries are able to build an I/B more effectively than Canada.

37 0.817 Canadian shipyards are unable to build a I/B as quickly as other experienced shipyards in Europe and the Far East.

40 0.747 Unless Canada decides to build a substantial fleet of Polar Class I/Bs, it will cost less to have them designed and built in European or Far East yards.

36 0.483 Private firms are able to design & build I/Bs more efficiently and effectively than the CCG through Public Works.

Development

9	0.777	I/B support will be necessary for the development of the Arctic region.
10	0.761	Political will and I/B support will be necessary to expedite future development of the Arctic region.
11	0.739	Canada's Arctic would develop sooner if greater I/B capability were available on a year round basis.
12b	0.492	Canada's Arctic sovereignty claim and environmental stewardship would be bolstered if CCG I/Bs were stationed in the Arctic on a year round basis.

Special Operating Agency (SOA)

4a	0.858	Separating the CCG from the Department of Fisheries & Oceans (DFO) will strengthen its Special Operating Agency (SOA) status.
5	0.795	As a SOA, outside of DFO, the CCG would have more flexibility to operate more efficiently and effectively in the Arctic.
4b	0.721	Separating the CCG from the Department of Fisheries & Oceans (DFO) will help reduce crewing cost.

Administration

1b	0.748	Canada's military and civilian roles in the Arctic should be should be managed by a newly created maritime organization.			
1a	0.682	Canada's military and civilian roles in the Arctic should be combined.			
41	0.440	In the absence of increased funding for the CCG, Canada's maritime requirements would be better served by setting up a Maritime Administration office which would be responsible for the development of CCG and DFO programmes and would avail of the existing CCG fleet, the leasing of private hardware and/or the contracting out of services.			
2	0.425	Separating Canadian Coast Guard (CCG) Hardware from CCG Services will aid in setting clearer terms of reference for the CCG.			

Services

18	0.721	Increased political demands on the CCG have resulted in the CCG neglecting private sector service requests.			
17	0.541	New southern security and science matters are shifting the workload of the CCG away from icebreaking in the Arctic.			
3	-0.526	A single national organizational approach would reduce CCG crewing costs.			