

..... Strategies for Managing
..... Arctic Pleasure Craft Tourism:
..... A Scoping Study

REPORT TO TRANSPORT CANADA

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August 2013



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Disclaimer

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Executive Summary

- The purpose of this report is to provide information to Transport Canada to aid in the management of the growing pleasure craft sector in Arctic Canada. The specific objectives are:
 - to report on the state of pleasure craft tourism in Arctic Canada;
 - to outline knowledge gaps regarding adaptation to and management of the observed increase in pleasure craft tourism in Canadian Arctic waters; and,
 - to make recommendations for Transport Canada regarding management and research related to this sector.

The report is based on material gathered through a literature review, an examination of data sources, and a series of stakeholder interviews. Analysis of the material is aimed at understanding the nature of the sector and potential management strategies.

Key findings include the following:

- Pleasure craft vessel numbers have increased dramatically since 2010. Vessel numbers more than doubled between 2009 and 2012 and are expected to continue to grow.
- Data sources are available to help in understanding the sector, though there is no single comprehensive data source. NORDREG data available through the Canadian Coast Guard (CCG) provide the best picture of vessel numbers and daily positions.
- Stakeholders express concern about the nature of the sector and potential problems stemming from increasing numbers. Particular concerns are noted in relation to the preparedness of visitors, the government capacity for systematic monitoring and regulation of pleasure craft in the Arctic, and the availability of supporting infrastructure such as search and rescue and port facilities.
- Little specific information is known about pleasure craft vessels beyond the NORDREG numbers and very little is known about passengers and their behaviour in the Arctic.
- Models exist in other polar regions that may provide assistance for assessing possible management responses.

The report concludes that considerable research is needed to understand the nature of pleasure craft travel in the Canadian Arctic and notes that Transport Canada has access to a range of potential management strategies, including some already in use in other polar regions. Recommendations for Transport Canada are provided in four categories (management, research, information provision, and regulation) and they include the need to examine all possible strategies, to coordinate with other managing bodies, and to support further research and/or data collection efforts.



Sommaire

Étude de la portée du projet visant à examiner les stratégies de gestion du tourisme en embarcations de plaisance dans l'Arctique

Le présent rapport vise à fournir des renseignements à Transports Canada dans le but d'aider à gérer le secteur en pleine croissance des embarcations de plaisance dans l'Arctique canadien. Les objectifs spécifiques sont les suivants :

- rendre compte de l'état du tourisme en embarcations de plaisance dans l'Arctique canadien;
- décrire les lacunes dans les connaissances sur l'adaptation à la hausse observée du tourisme en embarcations de plaisance dans les eaux de l'Arctique canadien et la gestion de cette dernière;
- formuler des recommandations à Transports Canada sur la gestion de ce secteur et la recherche à cet égard.

Le présent rapport est fondé sur les documents recueillis au moyen d'un examen de la documentation, d'un examen des sources de données et d'une série d'entretiens avec des intervenants. L'analyse des documents vise à comprendre la nature du secteur et des stratégies de gestion potentielles.

Les constatations principales comprennent notamment ce qui suit :

- Le nombre d'embarcations de plaisance a augmenté de façon considérable depuis 2010. Le nombre de bâtiments a plus que doublé entre 2009 et 2012, et ce nombre devrait continuer d'augmenter.
- Les sources de données sont disponibles en vue de comprendre le secteur, mais aucune d'entre elles n'est exhaustive. Les données du NORDREG qui sont mises à notre disposition par l'entremise de la Garde côtière canadienne (GCC) fournissent une meilleure vue d'ensemble du nombre de bâtiments et de leur position quotidienne.
- Les intervenants soulèvent des préoccupations sur la nature du secteur et les problèmes qui pourraient découler du nombre à la hausse. Des préoccupations sont particulièrement prises en note en ce qui concerne l'état de préparation des visiteurs, la capacité du gouvernement d'assurer une surveillance systématique des embarcations de plaisance dans l'Arctique et de réglementer ces dernières, et la disponibilité de l'infrastructure de soutien comme les activités de recherche et de sauvetage et les installations portuaires.
- Il y a très peu d'information précise sur les embarcations de plaisance au delà des chiffres fournis par NORDREG ainsi que les passagers et leur comportement dans l'Arctique.

- Des modèles dans d'autres régions polaires pourraient nous aider à évaluer des mesures de gestion potentielles.

Selon la conclusion du rapport, des recherches importantes sont nécessaires pour comprendre la nature des voyages en embarcations de plaisance dans l'Arctique canadien. Il est également précisé que Transports Canada a accès à une variété de stratégies de gestion potentielles, et certaines d'entre elles sont déjà utilisées dans d'autres régions polaires. Les recommandations à l'intention de Transports Canada sont divisées en quatre catégories (gestion, recherche, transmission de renseignements et réglementation), et elles incluent notamment le besoin d'examiner toutes les stratégies possibles, d'assurer la coordination avec d'autres organismes de direction et d'appuyer des recherches approfondies ou des efforts de collecte de données.



Objectives

- The objectives of this project are to report on the state of pleasure craft tourism in Arctic Canada and to outline knowledge gaps that impede our ability to effectively adapt to and manage the observed increase in this sector in Canadian Arctic waters. The report includes recommendations for Transport Canada regarding management and research related to this growing sector.

Background

Research has demonstrated the ways in which changing climate conditions in the Canadian Arctic are influencing ship travel, particularly in relation to greater accessibility of the Northwest Passage. The nature of tourism transport presents substantively different concerns for management and adaptation than shipping for cargo and it is imperative that tourism transportation be addressed by stakeholders in the region. Recent work has explored the implications of this changing environment for expedition cruise ship tourism which occurs via commercial vessels that typically carry 100 to 200 passengers. This research identified changing routes and patterns of travel (see Stewart, Draper, and Dawson 2010) and related management issues for the cruise industry and for governments (Dawson, Johnston & Stewart, 2013). The research recommended management priorities for adapting to these new patterns and to prepare for potential developments in this segment of the passenger vessel sector. Although some of the management strategies identified for larger expedition style cruise ships are relevant for the smaller pleasure crafts, these small vessels present different challenges and will require overlapping and individualized management approaches. Appendix A describes the key adaptation strategies prioritized through the cruise tourism research project.

Much less is known about how increased access in Canadian Arctic waters has affected the smaller tourism vessels such as sail boat and motor yacht traffic. At its broadest, the category includes small vessel commercial tourism expeditions, commercial yacht charters, and expeditions of privately owned sailing and motor yachts (Orams, 2011). The definition used here is more narrowly focused, following the Canadian Coast Guard and the Arctic Marine Shipping Assessment (ASMA) definition that includes sail and row boats, pleasure crafts, and home made boats (Arctic Council, 2009) that are not registered or identified as commercial vessels. Small vessel tourism poses particular concerns in the realms of safety, security, sovereignty, environmental sustainability and cultural impacts while also presenting potential economic benefits, albeit minor in comparison to resource and other development in the region.

This scoping study is aimed at providing sufficient and relevant information so that managers may understand the scope of the challenges of Canadian Arctic pleasure craft tourism as well as the existing knowledge gaps as a precursor to more fully examining potential adaptation strategies.

State of the Pleasure Craft Sector

There is currently limited information available about the state of pleasure craft travel in Arctic Canada, particularly in an accessible format. Table 1 identifies the existing sources of data that, collectively, could be used to generate an accurate picture of vessel traffic growth, vessel routes, passenger behaviour and variability over time (Table 1). Limitations of the data are noted and they reflect the lack of a system for gathering comprehensive data on the pleasure craft sector in the Arctic.

Table 1

Sources of Data about Pleasure Craft in the Canadian Arctic)

Source	Description	Types of Information	Limitations
NORDREG (reporting system)	Northern Canada vessel traffic services (run by the CCG)	Vessel name, country of registration, year of entry, geo-located position information	Incomplete data Reporting is not mandatory for vessels of this tonnage Position based reporting data is not isolated within Canadian boundaries
Federal and territorial agencies (direct contact for information or permitting)	Government of Nunavut, Northwest Territories, Quebec and Newfoundland. CanNor, Parks Canada, Transport Canada, Canadian Coast Guard, etc.	Various	Incomplete and sporadic sources of information, personnel turnover, incomplete inter-agency sharing of information some information not publicly available
Nunavut Tourism (direct contact for information)	Marketing and member association	Vessel name, route plans and passengers	Incomplete and inconsistent data
Government of Canada – Marine Security Operations Centre Reports	Arctic Shipping Annual Reports	Statistics on Arctic shipping volume annually	Summary data based largely on NORDREG data set and supplemented with Internet searches and satellite imagery. Reports are unclassified but are not publicly available
Arctic communities (e.g., Hamlet personnel, Visitor Centre employee)	Individuals who do not necessarily have a formal role in managing yachts	Communities and sites visited, behaviour of passengers, interactions with wildlife, vessel name, passengers	Inconsistent between communities and annually, personnel turnover, anecdotal

continued...

Table 1 (continued)

Sources of Data about Pleasure Craft in the Canadian Arctic)

Source	Description	Types of Information	Limitations
Web Logs (voluntary reports)	Visitors' personal logs (blogs/websites) about their travel	Communities and sites visited, behaviour of passengers, interactions with wildlife, vessel name and route	Inconsistent, temporally limited, not a permanent record, can be unreliable
Yacht tourism operators (direct contact for services and information)	Businesses offering private tours on pleasure craft vessels	Historic and planned route information Concerns and needs for industry development, sustainability, and safety	Difficult to identify, might be difficult to confirm as commercial
Newspapers and magazines (provision of information to public)	<i>Nunatsiaq News</i> , <i>News North</i> , etc., national newspapers, <i>Up Here</i>	Record of notable events, comments from public	Incomplete and sporadic record
Automatic Identification System (AIS) data	Automatic tracking system used on ships for identifying and locating vessels. Electronic exchange of data with nearby ships, AIS Base stations, and satellites	Vessel names, locations, routes	Limited number of vessels outfitted, not mandatory for vessels, data are not always publicly available
Satellite data	Canadian Ice Service Canadian Coast Guard Canadian Border Services and other agencies	Vessel names, locations, routes	Poor resolution for this application, limited range, insufficient scale
Tourism agents	Businesses offering logistics services to pleasure craft owners (e.g., Arctic Kingdom)	Detailed records of ship itineraries and planned activities, contact details of pleasure craft owners	Business based information sometimes proprietary, limited number of agents working in Canada, agents capture very small portion of the market

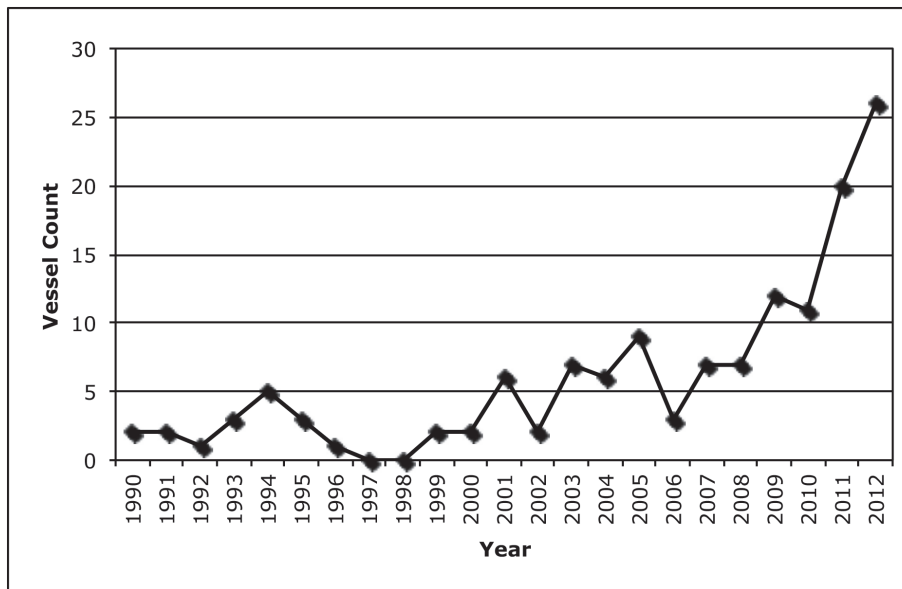
The most comprehensive single source of information currently available to track pleasure craft vessel activity in Arctic Canada is the Canadian Coast Guard's NORDREG (northern Canada vessel traffic monitoring services) annual dataset. Because smaller vessels are not required to report to NORDREG when operating in Canadian Arctic waters the dataset cannot be considered completely accurate. However, given the navigational information provided freely by NORDREG to mariners in the region (Appendix B) and the potential search and rescue benefits, many vessels do choose to report to the agency and thus the data likely only slightly underestimate pleasure craft vessel activity.

Figure 1 shows annually recorded pleasure vessel activity in Arctic Canada from 1990 to 2012 in the NORDREG dataset. Data are available beginning in 1980; however, information is inconsistent until about 1990. Research, including ground truthing, should be undertaken using other potential sources of information such as those described in Table 1 to compare against NORDREG data to confirm the accuracy of these estimates of pleasure craft vessel activity. For example, an internet and newspaper search for small boat travel in the Canadian Arctic for 2011 found three additional vessels not listed in the NORDREG dataset, but it is possible that such searches will not find all additional vessels for any particular year. Further, it might be possible that some vessels in the annual dataset are actually commercial passenger vessels rather than independently owned and operated pleasure crafts.



Figure 1:

Annual Counts of Recorded Pleasure Craft in the Canadian Arctic (1990–2012) from NORDREG dataset.



Analysis of the full NORDREG dataset shows that in recent years the category of pleasure craft vessels is the fastest growing maritime sector in comparison to all other marine activity in Arctic Canada (Pizzolato et al., 2013). For pleasure craft, a consistently low level of activity is apparent from 1990 through to 2008, with 9 or fewer vessels appearing in the dataset annually and none in some years (Figure 1). The following years show dramatic increases in pleasure craft activity, with the highest increases in 2011 and 2012 and a doubling from 2009 to 2012. Numbers are expected to continue to grow (Pizzolato et al., 2013).

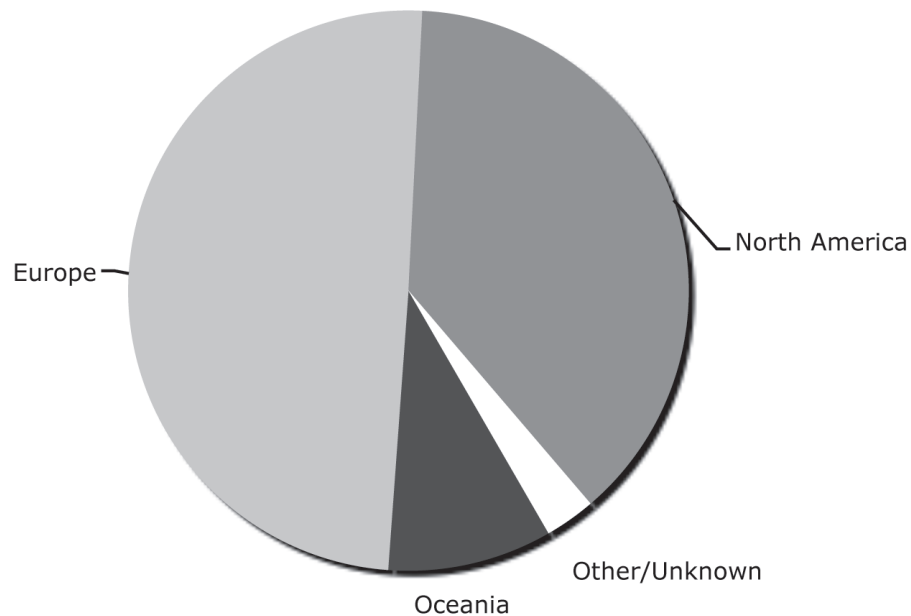
The identified pleasure craft vessels operating in Canadian Arctic waters from 1990 to 2012 are registered in a range of countries. Unlike expedition cruise vessels, which are all ‘foreign flagged,’ pleasure craft vessels are normally flagged to their country of ownership. Table 2 outlines the countries of registration for the vessels in the NORDREG dataset. The countries with the largest numbers of vessels registered are: Canada, U.S.A., United Kingdom, and France.

Table 2**Country of Registration for Pleasure Craft Vessels (1990–2012) from NORDREG dataset**

Country	Number	(%)
Australia	6	4.4
Austria	1	0.7
Belgium	3	2.2
Canada	21	15.3
Cayman Islands	10	7.3
Croatia	1	0.7
Denmark	2	1.5
Finland	2	1.5
France	14	10.2
Germany	7	5.1
Greece	1	0.7
Ireland	1	0.7
Italy	1	0.7
Marshall Islands	2	1.5
Netherlands	2	1.5
New Zealand	5	3.7
Norway	3	2.2
Poland	2	1.5
Russia	3	2.2
Spain	1	0.7
South Africa	1	0.7
Sweden	4	2.9
Turks Island	1	0.7
United Kingdom	20	14.6
U.S.A.	20	14.6
Unknown	3	2.2
TOTAL	137	100%

Figure 2

Regional Origin of Pleasure Craft Vessel Flags (1990–2012) from NORDREG dataset



Management Concerns with the Emerging Pleasure Craft Sector

In spring 2013 a series of 20 interviews was conducted with key informant stakeholders involved in managing or supporting the pleasure craft vessel sector in Arctic Canada, including individuals in federal and territorial government agencies (e.g., decision makers, regulators and inspectors) and those involved in tourism marketing and provision. Interviewees can not be identified in this document, in accordance with research ethics protocol. The interviews for this project represent the systematic examination of the situation in order to explore management concerns, sources of data and proposed management strategies. Table 3 presents a list of management concerns identified through these interviews.

Table 3**Management Concerns regarding Pleasure Craft Travel in the Canadian Arctic as Identified by Interviewees**

Category	Concerns Identified
Visitor safety system	<ul style="list-style-type: none">• Limited search and rescue infrastructure• High cost of SAR• Unknown route plans• Incomplete tracking of vessels• Insufficient traffic for quick response• Incidents might not be reported
Preparation of visitors	<ul style="list-style-type: none">• Lack of knowledge about Arctic environment and limitations of infrastructure and services for Arctic marine travel• Incomplete understanding of regulations and multi-party jurisdiction• Lack of awareness of acceptable behaviour in communities and environment• Lack of Arctic experience and ice navigation competence• Inadequate insurance coverage
Preparations of vessels	<ul style="list-style-type: none">• Lack of appropriate equipment• Non ice-strengthened hulls
Sovereignty	<ul style="list-style-type: none">• Lack of domain awareness• Incomplete reporting to authorities• No mandatory mechanism to identify who is travelling and where they are planning to travel• Limited means of reinforcing sovereignty on water• Minimal Government of Canada presence (limited CCG vessel patrols)
Behaviour control, regulations, monitoring, enforcement	<ul style="list-style-type: none">• Insufficient oversight opportunity• Insufficient capacity to monitor and enforce regulations• Some vessel regulations not applicable on private vessels (e.g., security)• Commercial vessels that report or identify as private• No recognition by repeat visitors of changing rules over time
Interaction with residents	<ul style="list-style-type: none">• Can be negative for both residents and tourists• Incidents can affect safety and security of residents• Potential for trafficking/smuggling

continued...

Table 3 (continued)**Management Concerns regarding Pleasure Craft Travel in the Canadian Arctic as Identified by Interviewees**

Category	Concerns Identified
Interaction with environment	<ul style="list-style-type: none">• Inappropriate contact with wildlife• Dumping/discharge of waste in ocean
Re-supply (fuel, food, etc.)	<ul style="list-style-type: none">• Food and fuel might not be available in communities• Re-supply is not arranged in advance• No established re-fueling ports
Facilities and infrastructure	<ul style="list-style-type: none">• No port facilities• Limited to no supporting infrastructure
Parks and sensitive areas	<ul style="list-style-type: none">• Might not have permit to enter• Might not recognize park boundaries• No signage indicating where National Parks, historic sites, or other culturally significant locations are• Limited to no recognition or knowledge of guidelines
Economic return	<ul style="list-style-type: none">• Opportunities to provide services and goods not well understood• Services should not be provided free of charge
Communication – Agencies	<ul style="list-style-type: none">• No clear structure for supporting industry growth and development• No protocol for sharing information among agencies
Communication – Visitors	<ul style="list-style-type: none">• No way to channel inquiries from potential visitors and provide information about rules, regulations and travel in Arctic waters• Widely dispersed information
Knowledge/ understanding of the market	<ul style="list-style-type: none">• Limited understanding of vessel numbers and sector needs• Poor understanding of distinctions within the sector (type of vessel, size of vessel, nature of passengers)• Inadequate response to diversification of market• Extent to which commercial vessels report as pleasure craft

In addition to the concerns raised by stakeholders interviewed in this scoping study, other issues have emerged in recent years including those related to national security and the protection of remote environments and Arctic wildlife. Earlier research on the expedition cruise ship industry in Arctic Canada revealed the need to examine management of the smaller pleasure craft vessels because of concerns about their impacts on the environment and in regional communities (see Stewart et al., 2012). Also, several known incidents involving yachts have occurred, including illegal entry into Canada, transportation of illegal firearms, liquor and fireworks, disturbing wildlife and chasing Arctic marine mammals (Appendix C) (also see Stewart & Dawson, 2011; Hodgson, 2010; Teeple, 2010).

Identification of Knowledge Gaps and Preliminary Recommendations

Based on the findings of this scoping study, and through a review of relevant literature, a number of knowledge gaps can be identified that provide a blueprint for future research in the pleasure craft sector in Arctic Canada.

There is limited or no understanding/knowledge of the pleasure craft sector and its management in relation to:

- vessel numbers, diversification, growth potential, and projected future activity;
- tourist motivations, expectations, previous experience, and satisfaction;
- visitor behaviour, especially at remote and sensitive sites, including interactions with wildlife and residents of communities, and discharge of waste;
- variation and distinction in the sector: pleasure craft typology based on size/type of vessel, categorization of trips/passengers, and vessel and passenger needs;
- extent to which commercial vessels are being counted as pleasure craft;
- passenger and crew numbers and demographics;
- safety, preparedness, self-rescue capacity, and perceptions/knowledge of risk among passengers and crew;
- nature of non-reported incidents and close calls;
- vessel construction, equipment, and operations, especially in relation to safety;
- specific tourist site attributes suitable for preparing site guidelines for pleasure craft visitation;
- strategy for an appropriate regulatory and monitoring framework with specific pleasure craft legislation;
- attributes of a communications strategy for pleasure craft visitors; and,
- strategy for an appropriate yacht management policy and plan in Nunavut.

The available data, the concerns identified by management stakeholders and the knowledge gaps present a picture of the nature of the problem and key areas for action. Analysis of this picture with reference to more general developments in polar tourism management leads to preliminary recommendations for management stakeholders. These recommendations are placed into four categories below, but it is important to note that the categories are related and the actions under each category support actions in others. The approach to management must be planned comprehensively, though certain actions might be completed independently.

Table 4

Recommendations for Management Stakeholders

Management

- Develop territorial and federal pleasure craft management plans
- Develop pleasure craft/yachting guidelines
- Establish site guidelines similar to Antarctica and Svalbard (<http://www.aeco.no/guidelines/site-guidelines/>) (www.ats.aq/e/ats_other_siteguidelines.htm)
- Develop codes of conduct for pleasure craft travel (community visit, site visits, marine wildlife viewing)

Research

- Conduct a needs assessment of pleasure craft tourists
- Undertake a comprehensive data gathering program of vessels, including a provisional vessel count to compare against existing NORDREG data
- Undertake studies of visitors, specifically in relation to knowledge gaps noted above

Information Provision

- Examine the approach used by the International Association of Antarctica Tour Operators (IAATO) in providing information for yachts (<http://iaato.org/yachts>)
- Establish a pleasure craft information website using a one-window approach for all relevant information related to preparation, travel, and regulation.

Regulation

- Require all vessels to report to NORDREG
- Examine the policy context of private expeditions in the Antarctic for further regulatory development (guidelines for tourists including contingency plans, SAR, insurance and liability, environmental impact, permitting/authorization)

As an initial starting place, it will be helpful to examine the situations in Antarctica, Alaska, Greenland, Russia, Svalbard or Newfoundland to see what yacht management approaches work and what does not. Related to this approach is the question of determining whether it is appropriate to attempt to concentrate traffic around new port facilities, re-supply centres, preferred routes and sites in order to better control and monitor vessels. In order to manage the strategic development and management of the pleasure craft sector, Transport Canada should identify a pleasure craft liaison position for inter-agency consultation and planning. Transport Canada may also need to establish a working committee to plan its management approach and to coordinate with territorial governments on regional management and regulation plans.

Yacht Management in Antarctica and European Arctic

Insight can be gained through examining the yacht management approaches in Antarctica and in Europe (Appendix D). A series of incidents involving private yachts, not dissimilar to the incidents we are beginning to witness in the Arctic, has led to greater emphasis on management in Antarctica. Following the sinking of *Berserk* in the 2010/11 season, more attention has been paid to the provision of information for potential tourists and the regulation of the technical aspects of yachting in the Antarctic through national permitting (Krakau & Herata, 2013). However, it must be noted that *Berserk*, similar to some other incidents, did not have a national permit to visit, raising the question of how feasible and effective the national permitting system is as a method of control (Krakau & Herata, 2013).

Alongside the approach of national permitting and regulations among Antarctic Treaty Consultative Parties is the approach of information provision through the International Association of Antarctica Tour Operators (IAATO), the industry self-regulation body. IAATO provides information to potential yacht tourists on its website (<http://iaato.org/yachts>), directly accessible through the main page, thereby providing some prominence to the issue. Details include information about safety, self-sufficiency, preparedness and permitting/authorization (<http://iaato.org/prep-and-responsibilities>) and about yacht construction, equipment and operations (<http://iaato.org/helpful-guidelines>).

In the European Arctic, the self-regulation body for expedition cruise ships is called the Association of Arctic Expedition Cruise Operators (AECO), a body founded in 2003 whose membership includes many of the members of IAATO. AECO was established to support “environmental-friendly and safe expeditions...[that have] respect for and benefits to local communities” (AECO, 2011: 1). AECO offers information, guidelines and voluntary member

policies for operating cruise ships in the Arctic. AECO was instrumental in developing site guidelines for Svalbard. There is interest within the Association in expanding to Arctic Canada, but there are divisions in opinion among the industry and tourism management sector about whether this is a feasible option.



Conclusions

- The pleasure craft sector continues to grow in Arctic Canada. Given the nature of stakeholder concerns about this growth, its implications for affecting the Arctic, and noted deficiencies in the existing management structure, there is a need to explore potential management strategies based on a solid foundation of knowledge. In addition to making use of existing information sources, there is a need to target the collection of additional data. Further, work is required to assess management approaches in other polar regions experiencing increasing pleasure craft travel. The approach taken by Transport Canada should involve coordination with other managing bodies to support research, information provision, regulation and comprehensive management of the sector.



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Appendices

- **Appendix A:** List of Prioritized Adaptation Strategies for Expedition Cruise Ship Tourism in Canadian Arctic (Source: Dawson, Johnston & Stewart, 2013)

Appendix B: Map of NORDREG Reporting Zone

Appendix C: List of Recent Incidents Involving Pleasure Craft

Appendix D: Information from the Broader Context of Polar Yachting

Appendix A

List of Prioritized Adaptation Strategies for Expedition Cruise Ship Tourism

in Canadian Arctic (Source: Dawson, Johnston & Stewart, 2013: available at www.arctictourismandclimate.lakeheadu.ca/)

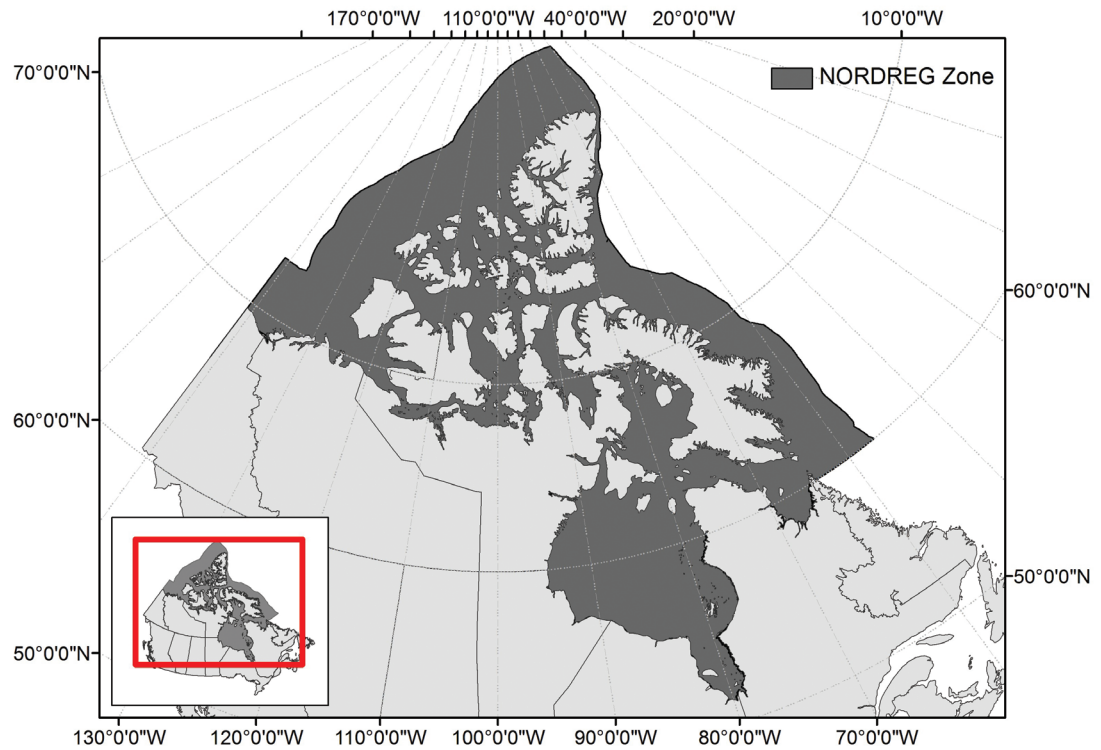
A policy Delphi study was undertaken to examine priorities for adaptation strategies to manage the growth and change in the expedition cruise ship industry in Arctic Canada. These strategies were ranked highest in terms of their desirability and feasibility and have a high level of consensus among the respondents.

Rank	Strategy	Feasibility
1	Inform visitors about import laws and wildlife products before tours begin (i.e. to allow time for permitting process).	Definitely Feasible
1	Develop a code of conduct for cruise tourists that guides visitor behaviour when in communities (i.e. request permission to take photographs of people, etc).	Definitely Feasible
2	Require up to date technology and navigation systems on ships.	Probably Feasible
2	Create specific disaster management plans related to the cruise tourism industry (e.g., fuel spill, ship grounding, etc.).	Probably Feasible
2	Enforce fines for non-compliance of environmental regulations (i.e. sewage, grey water, ballast discharge).	Probably Feasible
3	Appoint a cruise liaison officer at the Territorial/Provincial scale (i.e. to provide a single point of contact).	Probably Feasible
4	Require better soundings and marine mapping resources.	Might or Might Not Be Feasible

Further detail on the top ranked adaptation strategies and other recommended strategies is provided in Dawson, Johnston, and Stewart (2013) and is organized in the following categories: 1) policy and regulation, 2) infrastructure and technology, 3) services, economic development and planning, 4) communication, coordination and outreach, and 5) environmental and cultural sustainability.

Appendix B

Map of NORDREG Reporting Zone (darker shade)



Source: Pizzolato et al., 2013

Appendix C

List of Recent Incidents Involving Pleasure Craft

Year and Vessel Name	Incident Details and Sources
2012 <i>Fortrus</i>	<p>Australian luxury yacht in Cambridge Bay; community concerns about passenger behaviour; investigation under Nunavut Liquor Act resulted in several liquor violations and fireworks violation; concerns about interactions with wildlife</p> <p>Sources:</p> <ul style="list-style-type: none"> • http://news.nationalpost.com/2012/10/02/australian-tycoon-facing-thousands-in-fines-after-sailing-booze-filled-yacht-through-northwest-passage/ • http://www.sail-world.com/cruising/usa/Australians-run-riot,-face-liquor-charges-in-Northwest-Passage-transit/102490 • http://www.nunatsiaqonline.ca/stories/article/65674private_yacht_visitors_to_nunavut_create_mixed_impression_in_cambridge/
2011 <i>The Old Pulteney</i>	<p>Expedition picked up by plane</p> <p>Source: NORDREG data</p>
2010 <i>Tico</i>	<p>Stuck in ice</p> <p>Towed to Cambridge Bay by CCG auxiliary boat</p> <p>Source: NORDREG data</p>
2009 <i>Blue Shadow Two</i>	<p>Ran out of gas between Churchill and Arviat</p> <p>Source: NORDREG data</p>
<i>Fiona</i>	<p>Trapped in ice and requested icebreaker assistance</p> <p>Source: NORDREG data</p>
<i>Perithia</i>	<p>Lost sails and engine in storm</p> <p>Rescued by Coast Guard after leaving Cambridge Bay</p> <p>Sources:</p> <ul style="list-style-type: none"> • NORDREG data • http://www.explorersweb.com/oceans/news.php?id=18782
2008 <i>Geraldine</i>	<p>Engine repairs</p> <p>Source: NORDREG data</p>

continued...

Appendix C (continued)

List of Recent Incidents Involving Pleasure Craft

Year and Vessel Name	Incident Details and Sources
2007 <i>Berserk II</i>	<p>Vessel made its way from Greenland to Cambridge Bay; 'Wild Vikings' charged with immigration offences; had failed to report to immigration officials and attempted to hide two crew members; concerns about behaviour</p> <p>Sources:</p> <ul style="list-style-type: none"> • Teeple, 2010 • http://en.wikipedia.org/wiki/Jarle_Andhøy • http://www.berserk-expeditions.com/ • http://www.wildvikings.com/ • http://www.facebook.com/pages/Berserk-Rockn-Roll-Expeditions/101634540870 • http://www.nunatsiaqonline.ca/stories/article/65674canadas_arctic_communities_unprepared_for_cruise_ship_visits/ • http://www.arcticwandering.com/pacificyachting.htm
<i>Luck Dragon</i>	<p>Vessel eventually abandoned in Bering Sea</p> <p>Sources:</p> <ul style="list-style-type: none"> • NORDREG data • http://www.arcticwandering.com/pacificyachting.htm
2006 <i>Arctic Wanderer</i>	<p>Problems with Immigration Canada – officials believed he had been living in Canada illegally at Cambridge Bay</p> <p>Sources:</p> <ul style="list-style-type: none"> • NORDREG data • http://www.arcticwandering.com/sailmagazine.htm • http://www.arcticwandering.com/pacificyachting.htm • http://www.arcticwandering.com/icemansailth.htm
small motorboat	<p>Romanian national who had been deported re-entered Canada from Greenland by motorboat; apprehended by RCMP and charged with immigration offences</p> <p>Sources:</p> <ul style="list-style-type: none"> • Teeple, 2010 • http://www.cbc.ca/news/canada/north/story/2006/09/21/deport-romanian.html • http://www.thefreelibrary.com/Who+controls+the+Northwest+Passage%3F-a0213777361 • http://www.ctvnews.ca/excerpt-from-intent-for-a-nation-by-michael-byers-1.255807 • http://www.cbc.ca/news/canada/north/story/2006/09/20/romanian-boater.html

continued...

Appendix C (continued)

List of Recent Incidents Involving Pleasure Craft

Year and Vessel Name	Incident Details and Sources
2005 <i>Fine Tolerance</i>	Escorted by CCGS <i>Sir Wilfrid Laurier</i> Sources: <ul style="list-style-type: none"> • NORDREG data • http://www.arcticwandering.com/log1.htm
<i>Idlewild</i>	Struck ice, freed by CCGS <i>Sir Wilfrid Laurier</i> Sources: <ul style="list-style-type: none"> • NORDREG data • http://www.arcticwandering.com/log1.htm
<i>Jotun Arctic</i>	Trapped in ice near Arctic Bay, overwintered, then continued on to third attempt at Northwest Passage Sources: <ul style="list-style-type: none"> • http://www.uphere.ca/node/220 • http://www.nunatsiaqonline.ca/archives/50930/news/features/50930_01.html • http://www.arcticwandering.com/log1.htm
<i>Cloud Nine</i>	Trapped in ice and rescued by CCGS <i>Sir Wilfrid Laurier</i> Source: http://www.arcticwandering.com/pacificyachting.htm
2001 <i>Nauya</i>	Mechanical problems, towed to Iqaluit by CCGS <i>Pierre Radisson</i> Source: NORDREG data
1999 <i>NO 1 2</i>	Reported adrift, towed to Iqaluit by CCGS <i>Pierre Radisson</i> Source: NORDREG data
1995 <i>Roger Henry</i>	Stopped in ice Source: NORDREG data
1994 <i>Cloud Nine</i>	Medical evacuation of crew members to Resolute Bay Source: NORDREG data
1993 <i>Dagmar Aaen</i>	Stuck in heavy ice Source: NORDREG data

Appendix D

Information from the Broader Context of Polar Yachting

Polar Regions in General

- Growth in sector over last three decades had led to management challenges (Orams, 2011).
- Issues exist related to search and rescue needs, communication difficulties, and a general lack of preparedness (Stonehouse & Snyder, 2010).

Arctic Region

- Yacht numbers are growing, but no reliable data exist on numbers and types of yachts (Orams, 2011).
- It is difficult to regulate and monitor adventure tourists because they tend to be independent, self-reliant and widely dispersed (Stonehouse & Snyder, 2010).
- Marine expeditions, including yachts, could be vectors for the spread of invasive species, leading to a biosecurity concern (Hall, James & Wilson, 2010).

Antarctic Region

- More attention has been paid to expedition cruise ship management than to yachts (Krakau & Herata, 2013).
- The increase in private yacht travel in the Southern Ocean (Antarctica and the sub-Antarctic islands) requires management (Hall & Wilson 2010).
- Good records exist of cruise ship numbers and movements, but there are poorer records about yachts (Krakau & Herata, 2013).
- The Antarctic Treaty System requires that permits are obtained for all vessels entering the Antarctic; the registry of permits provides some indication of numbers, especially the great increase in numbers since 1990 (Orams, 2011).
- It remains difficult to build accurate numbers and a picture of the destinations, routes and behaviour because yachts might not be observed as they travel (Hall & Wilson 2010).
- Tourism, including cruise tourism and yacht tourism, is diversifying into more active and adventure-oriented activities (Lamers, Stel & Amelung, 2007).
- Problems with private yachts include lack of knowledge of requirements, lack of national permits for visiting Antarctica, and insufficient preparedness for polar yachting challenges (Krakau & Herata, 2013).