

2008

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Stewart, E.J., Howell, S.E.L., Draper, D., Yackel, J. & Tivy, A. "Cruise tourism in a warming Arctic: Implications for northern National Parks". Contributed paper for the Canadian Parks for Tomorrow: 40th Anniversary Conference, May 8 to 11, 2008, University of Calgary, Calgary, AB.

<http://hdl.handle.net/1880/46913>

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# Cruise tourism in a warming Arctic: Implications for northern National Parks

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**Abstract:** This research examines patterns of cruise travel through the Canadian Arctic between 1984-2008 with an emphasis on shore visits to the northern National Parks of Sirmilik, Auyuittuq and Quttinirpaaq. Given the warming effects of climate change, we investigate claims regarding accelerated growth of cruise tourism in Arctic Canada, and the implications this anticipated 'growth' may have for northern National Parks. We also caution that as the transition to an ice-free Arctic summer continues, the prevalence of hazardous, multi-year ice conditions likely will continue to have negative implications for cruise travel in the Canadian Arctic, and in particular for tourist transits through the Northwest Passage and High Arctic regions.

## Introduction

With a goal to protect natural areas representative of Canada's ecoregions (Marsh, 2000), three National Parks have been established in Nunavut, Canada's most northerly territory (see Figure 1). Auyuittuq National Park on Baffin Island was established in 1976, Sirmilik National Park also on Baffin Island was designated in 1999 when Nunavut was created, and Quttinirpaaq National Park, (established initially as Ellesmere Island National Park Reserve in 1988), had its name changed to Quttinirpaaq in 1999 and became a national park in 2000. For a variety of reasons, northern parks attract relatively few visitors compared to other national parks in Canada (Marsh, 2000). However, protected natural areas (including national parks and wildlife areas) are attractive destinations for cruise operators and their clients, not only because of their natural and cultural interest, but because all of Nunavut's National Parks have a shoreline, making them accessible to cruise vessels (Marquez & Eagles, 2007). In recent years, with the steady growth in the polar cruise sector, visitation to Canada's northern National Parks has been sporadic, but visitor numbers are anticipated to increase in the future.

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<sup>5</sup> In 2007, a small exploratory study of cruise tourism activity in Sirmilik, Auyuittuq and Quttinirpaaq National Parks was conducted, but results have yet to be finalised (Maher & Meade, 2008).

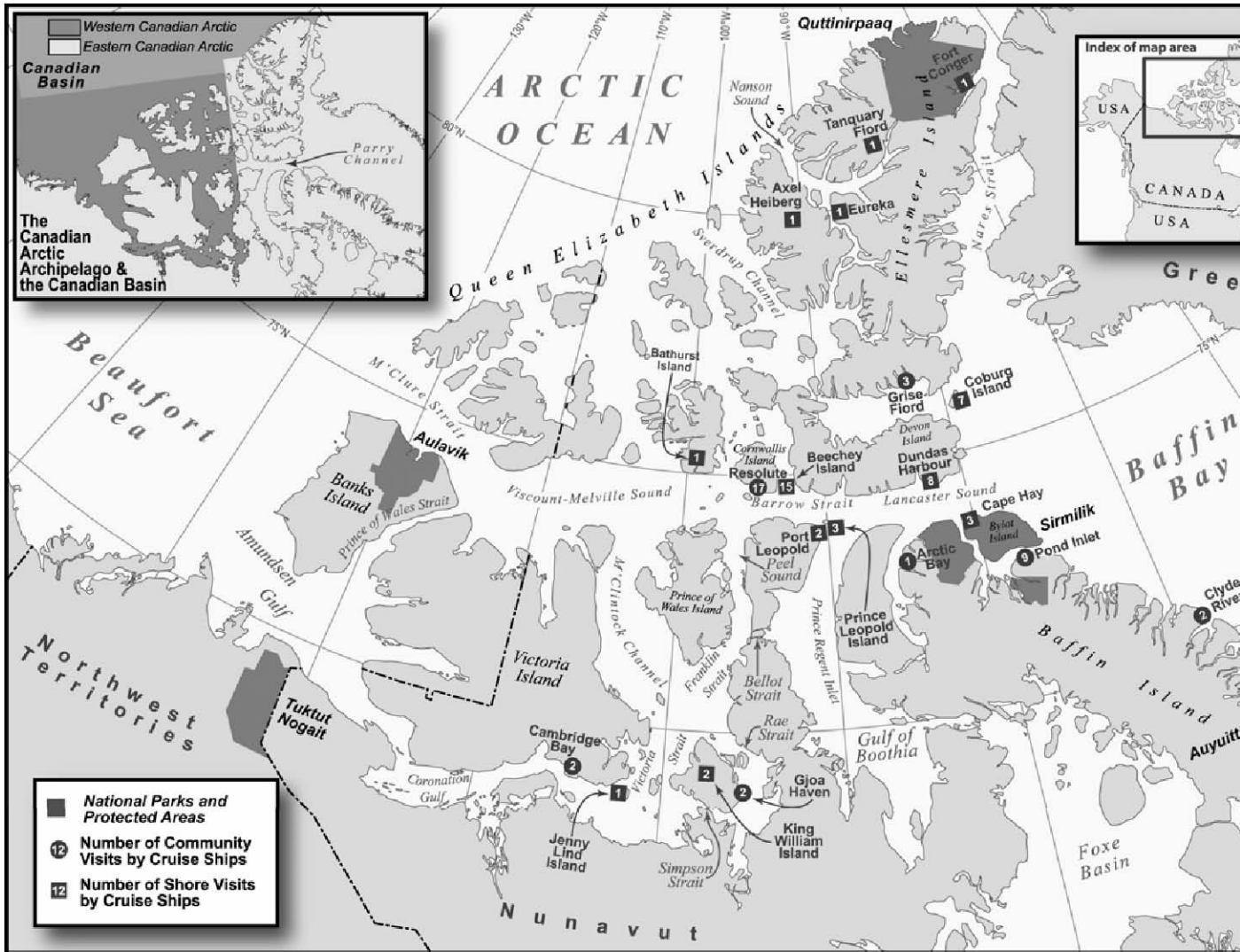
<sup>6</sup> Source: (Stewart *et al.*, 2007)

<sup>7</sup> Source: (Nunavut Tourism, 2007) and Parks Canada (Nunavut)

The Arctic Climate Impact Assessment (ACIA) report predicts a trajectory of growth for the Arctic cruise sector due to better ship access facilitated by a warming climate (ACIA, 2004). Providing a regionally-focused assessment of climate changes that have occurred in the Arctic over past decade the ACIA reports that average Arctic temperatures have risen at almost twice the rate of the rest of the world, leading to observed melting of glaciers and sea ice, thawing of permafrost, and shifting patterns of flora and fauna (ACIA, 2004). During the previous 30 years there has been an eight percent reduction of Arctic sea ice and over the past 20 years sea levels have risen by approximately 8 centimetres (ACIA, 2004). Later freeze-up and earlier break-up of sea ice is claimed to cause significant challenges for seabirds, marine mammals and ice-dependent species such as walrus, seals and polar bears (ACIA, 2004). Additionally, in this paper, we claim that under climate warming, hull penetrating, multi-year ice may still present navigational hazards for cruise ships operating in some regions of the Canadian Arctic (Howell & Yackel, 2004; Stewart, Howell, Draper, Yackel, & Tivy, 2007).

Our primary objective is to examine how warming in the Canadian Arctic may impact future cruise tourism. We begin with a discussion about the changing sea ice conditions in Canadian Arctic waters. We then outline past and present (1984-2008) patterns of cruise travel through the Canadian Arctic, with an emphasis on shore visits to the northern National Parks of Sirmilik, Auyuittuq and Quttinirpaaq. Given the warming effects of climate change, we investigate claims regarding accelerated growth of cruise tourism in Arctic Canada, and the implications this

anticipated 'growth' may have for northern National Parks.



**Figure 1: National Parks of Northern Canada and planned cruises to selected destinations for 2008.**

### Changing sea ice conditions in the Canadian Arctic

The widely reported recent decreases in extent of Arctic Ocean sea ice have been linked to longer melt seasons compared to previous decades (Stroeve, Holland, Meier, Scambos, & Serreze, 2007) and have attracted the attention of the cruise tourism industry. While decreases have been observed within the sea ice covered waters of the Canadian Arctic (Falkingham, Chagnon, & McCourt, 2001; Laine, 2004; Parkinson & Cavalieri, in press), considerable regional variability is apparent. Moore (2006), for example, found significant reductions in sea ice of between 10-20 percent per decade from 1979-2004 for the region around southern Baffin Island. The western Beaufort Sea has experienced sea ice decreases; conversely, the eastern Beaufort Sea (adjacent to Banks Island) has experienced increases from 1969-2004 (Galley, Key, Barber, Hwang, & Ehn, in press; Howell & Yackel, 2004). The northern regions of the Queen Elizabeth Islands (QEI), in addition to the western regions of Viscount-Melville Sound and the M'Clintock Channels, exhibited virtually no change in sea ice from 1968-2006 (Alt, Wilson, & Carrieres, 2006; Howell,

Tivy, Yackel, & McCourt, in press). Considering the regional variability of sea ice present within Canadian Arctic waters, caution is extended to cruise operators in certain regions of the Canadian Arctic.

As the transition to a summer-time ice free Arctic continues, the prevalence of hazardous, thick multi-year ice (MYI) conditions likely will continue to be problematic for cruise travel in the Canadian Arctic. This is because large-scale sea ice dynamics continuously force MYI from the Arctic Ocean up against the western Canadian Arctic Archipelago (CAA) (Agnew, Alt, Abreu, & Jeffers, 2001; Melling, 2002). The exchange of MYI between the Arctic Ocean and the CAA normally is blocked by thick landfast MYI barriers, however, the effect of a longer melt season in the CAA might weaken these ice barriers allowing more MYI to enter the CAA (Melling, 2002). Kwok (2006) quantified sea ice exchanges between the CAA and Arctic Ocean from 1997-2002 and found them to be minor. However, from 2000-2004 the CAA exhibited increases in MYI attributed to both *in situ* formation and dynamic import (Howell *et al.*, in press; Howell, Tivy, Yackel, & Scharien, 2006); there also is evidence for the weakening of these MYI barriers during this time frame (Alt *et al.*, 2006).

Climate model predictions of future sea ice conditions within the Northern Hemisphere as far ahead as 2040 still exhibit high concentrations of MYI within the CAA (Holland, Bitz, & Tremblay, 2006). For nearly four decades heavy ice conditions within western portions of the CAA have persisted because the region acts as a cyclic “drain-trap” mechanism for MYI; this mechanism likely will continue to operate well into the future (Howell *et al.*, in press). Recent evidence points to climate model simulations being far too conservative in predicting a summertime ice free Arctic compared to observational records (Stroeve *et al.*, 2007). Despite this, as long as sea ice remains within the Arctic Ocean it likely will continue to enter the CAA and flow southward into the shipping lanes of the Canadian Arctic and remain a threat to transiting ships.

### **Cruise tourism in Nunavut**

Historically, ice conditions have prohibited most commercial shipping in the Canadian Arctic and it was not until 1984 that cruise tourism got under way when the ill-fated cruise ship, the MS Explorer, first transited passengers through the Northwest Passage (Jones, 1999; Marsh & Staple, 1995). Since 1984, the number of cruise vessels operating in Canada’s northern region has increased steadily, albeit in a haphazard and ad hoc manner (Stewart & Draper, 2006; Stewart *et al.*, 2007). Despite modest early developments, from 1992 to 2005 a more regular pattern of cruise activity emerged; not only were between one and three successful voyages of the Northwest Passage completed each year, but also cruise ships visited other locations in the Canadian Arctic such as Baffin Island, Hudson Bay and Ellesmere Island. During the 2007 season, 23 separate cruises, run by six different companies, brought approximately 2,110 visitors to the Canadian Arctic (Nunavut Department of Economic Development and Transportation, 2007). This estimate of visitor numbers concurs with data collected in 2006 as part of Nunavut’s first visitor exit survey, when a total of 2,096 cruise tourists were accounted for on 22 cruises (Datapath, 2006). We estimate that for the 2008 cruise season, six vessels will operate in the Canadian Arctic (Kapitan Khlebnikov, Ioffe, Polar Star, Lyubov Orlova, Bremen and the Hanseatic) and carry passengers on 26 separate cruises (although four of these cruises either are re-positioning tours or cruises predominately based in the Newfoundland and Labrador region).

However, determining the actual number of cruise ships, the destinations visited and routes taken,

as well as the number of passengers on board the cruise vessels, is problematic as there is no agency monitoring or collecting this data. Parks Canada collects a limited amount of information on visitors to the three National Parks of northern Canada. Unfortunately, this data is not comprehensive and provides only a partial evidence base from which to evaluate cruise visitation to the northern parks. With this in mind, in the following section we outline what is known about the number of cruise visitors to Sirmilik, Auyuittuq and Quttinirpaaq National Parks.

For Auyuittuq and Quttinirpaaq National Parks, Parks Canada collected total visitor numbers from 1994-2000. The figures for Auyuittuq National Park reveal that visitor numbers have fluctuated between 349 and 1191 visitors per year, while for Quttinirpaaq National Park, the figures range from 192 to 508 visitors per year. The 1998 summer season was the busiest for visitors recorded by both these parks (see Table 1) but the information does not indicate what proportion of those visitors were cruise tourists.

<b>Year/National Park</b>	<b>Auyuittuq National Park</b>	<b>Quttinirpaaq National Park</b>	<b>Sirmilik National Park</b>
<b>1994</b>	349	454	<i>Not yet a park</i>
<b>1995</b>	507	462	<i>Not yet a park</i>
<b>1996</b>	470	462	<i>Not yet a park</i>
<b>1997</b>	355	450	<i>Not yet a park</i>
<b>1998</b>	1191	508	<i>Not yet a park</i>
<b>1999</b>	467	192	<i>Not yet a park</i>
<b>2000-2004</b>	<i>not available</i>	<i>not available</i>	<i>not available</i>
<b>2005</b>	482	117	230
<b>2006</b>	404	110	216

**Table 1: All visitors to Nunavut’s national parks (1994-2006)**

In addition to the data illustrated in Table 1, Parks Canada reported that the cruise ice-breaker, Kapitan Khlebnikov, made one visit to Quttinirpaaq National Park in 2003, but the number of visitors who landed onshore is unknown. Data presented on the 2006 cruise season by Stewart et al. (2007) indicated that the Kapitan Khlebnikov had intentions to visit Quttinirpaaq National Park via the Tanquary Fjord. This concurs with Parks Canada data that of the 110 visitors recorded at Quttinirpaaq National Park in 2006 (see Table 1), 80 were passengers from a cruise ship. In the same year, the community of Pond Inlet expected to host 12 cruise ships. Pond Inlet (and to a lesser extent Arctic Bay) is the access point for visits to Sirmilik National Park. Although it is unknown how many of these 12 cruise ship operators had intentions to disembark visitors to the national park, we suggest only a few would have made this excursion since the majority of cruise visitors spend approximately 3 to 5 hours visiting Pond Inlet which might limit

additional excursions in the area.

According to information from Nunavut Tourism, 9 cruise ships were expected to visit Pond Inlet in 2007 including the Lyubov Orlova, owned and operated by the Inuit of Nunavik (see Figure 2). The community of Pangnirtung, one of the main entry points into Auyuittuq National Park, anticipated 4 cruise ships in 2006 and, according to information from Nunavut Tourism, expected 7 vessels in the 2007 summer season. Auyuittuq National Park was identified explicitly as a destination on 4 cruise itineraries, although it is unknown how many visitors actually disembarked. Qikiqtarjuaq (formerly Broughton Island) which lies just outside the boundary of Auyuittuq National Park, expected to host 2 cruise vessels in 2006, and according to Nunavut Tourism, anticipated the same number in 2007<sup>5</sup>.



**Figure 2: The Lyubov Orlova visiting Pond Inlet with Sirmilik National Park in the background, August 2007 (photography by Emma J. Stewart).**

A review of polar tourism websites for the 2008 cruise season (Polar Cruises, Hapag-Lloyd, Cruise North, Adventure Canada, Polar Star Expeditions and Zegraham Expeditions) reveals an overall stabilization of cruise activity in the Canadian Arctic (22 planned separate cruises occurring in Nunavut) with a slight decline in cruise activity in some parts of Arctic Canada, and a small increase in activity elsewhere in the region. In part this variability is due to the absence of the MS Explorer who, before her sinking in Antarctica in November 2007, was a regular visitor to Arctic Canada. For example, in the 2006 cruise season the Explorer operated three different cruise tours in Arctic Canada, including shore visits to the communities of Arctic Bay, Grise Fjord, Pond Inlet, Kimmirut, Cape Dorset, Pangnirtung, Clyde River and Iqaluit.

From the review of polar tourism websites, the number of community and shore visits planned by cruise vessels in Arctic Canada for the summer of 2008 has been plotted on Figure 1. As the map reveals, Pond Inlet can expect to host 9 cruise vessels (although anecdotal evidence suggests that the community also receives at least one unexpected cruise ship every year), Pangnirtung can anticipate 6 cruise ships, and Qikiqtarjuaq can expect 3 cruise ships in 2008. The planned itinerary of the Kapitan Khlebnikov includes visits to Quttinirpaaq National Park on two occasions, first in August via Tanquary Fjord and, immediately following this cruise the ice-breaker will transit passengers along the east coast of Ellesmere Island to Fort Conger. As Table 2 illustrates, since 2006 there has been a slight decline in cruise activity in the community of Pond Inlet and Auyuittuq National Park, a small increase in cruise visits to Qikiqtarjuaq and a stabilization of cruise visits to Quttinirpaaq National Park.

<b>Location/year</b>	<b>2006<sup>6</sup></b>	<b>2007<sup>7</sup></b>	<b>2008</b>
<b>Pond Inlet</b>	12	9	9
<b>Tanquary Fjord</b>	1	1	1
<b>Ellesmere Island</b>	1	1	1
<b>Pangnirtung</b>	4	7	6
<b>Qikiqtarjuaq</b>	2	2	3

<b>Auyuittuq National Park</b>	4	3	2
<b>Total:</b>	<b>25</b>	<b>23</b>	<b>22</b>

**Table 2: Cruise ship visits to northern National Parks and nearby destinations.**

If each of the ships anticipated for the 2008 Arctic cruise season were to carry an average of 100 tourists, and if all visitors were to disembark from their ships, then it is conceivable that Pond Inlet could host approximately 900 cruise tourists, Quttinirpaaq might expect 200 passengers (via two separate cruises to Tanquary Fjord and Fort Conger), the community of Pangnirtung could anticipate 600 cruise visitors, Qikiqtarjuaq could welcome approximately 300 visitors, and Auyuittuq might expect about 200 cruise tourists. It appears, however, that cruise operators have been avoiding visiting the northern National Parks, preferring to visit locations nearby. For Sirmilik National Park, for example, cruise visitation is low compared to the number of visits cruise ships make to the nearby communities of Pond Inlet and Arctic Bay; for Auyuittuq National Park the neighbouring communities of Pangnirtung and, to a lesser extent, Qikiqtarjuaq appear to be favoured over destinations in the national park.

### **Discussion**

Although Parks Canada does not yet have a formalized cruise tourism policy, in recent years the agency has recognized the potential for more visitors and has put in place a series of measures to ensure that cruise visitation proceeds with conservation in mind. Parks Canada requires that all businesses operating in National Parks, including cruise operators, hold a current business license and undergo an environmental assessment every five years if their activities in the park do not change. Operators planning visits to more than one park require a license for each park. The current business license guidelines require a certified guide to accompany passengers into the parks. According to Parks Canada, cruise operators found it difficult to rely on local guides and their on-board guides either were not certified or did not meet the qualifications to be certified. As a response, interpreter-attendant courses were developed by Parks Canada in Nunavut, for both local people and existing cruise ship guides. The intention was that trained local people could be hired by the cruise operator to accompany their passengers on short day hikes in the national parks, with the condition that the ship doctor was nearby. In 2007, Parks Canada certified 27 local people and at least five of them received one day of employment with cruise passengers. One cruise operator also trained all of their guides in this interpreter-attendant course. Parks Canada anticipates extending the course into other communities for the 2008 cruise season. All cruise ship passengers visiting national parks must undertake the same orientation process as regular park visitors; specifically, each visitor must attend a mandatory orientation session and complete a registration form (Parks Canada, personal communication, 2008).

Given that the cruise tourism industry in Arctic Canada has moved beyond its infancy, and is now entering a maturing phase with a reasonably stable number of vessels (Stewart et al., 2007), we suggest that destinations in Nunavut's national parks will attract more interest from cruise operators than they have in the past, because operators will be looking to forge new and more demanding routes, as well as seeking out desirable locations at which to disembark visitors. With potentially more visitors in the future, it is vital that Parks Canada continue to streamline existing policy arrangements for cruise passengers and engage in effective monitoring of visitor numbers and the effects of visitation on the parks themselves. Currently, an overall lack of data

undermines our collective knowledge about past and current trends concerning cruise tourism activity in Arctic Canada. Without improved monitoring of the cruise tourism phenomenon in the Canadian north it is hard to know how managers and decision-makers can ensure that the future development of cruise tourism is sustainable and safe. An inadequate knowledge base regarding cruise tourism in the northern regions of Canada means that conservation, sustainability and safety objectives are unlikely to be realized.

### **Conclusion**

With a trajectory of growth predicted for the cruise industry in Nunavut, we suggest that decision-makers in Arctic Canada be mindful of the explosive pattern of cruise activity development in Antarctica (IAATO, 2008), and be aware of the implicit dangers associated with commercial travel through polar waters. The importance of such awareness is highlighted by the November 2007 sinking of the MS Explorer along the Antarctic Peninsula, apparently as the result of a fatal encounter with hazardous ice. As we illustrated, cruise operators should exercise caution in their activities in the western Canadian Arctic because the sea ice mechanisms in place facilitate a continued presence of thick multi-year ice as the Arctic transitions to an ice-free summer (Howell *et al.*, in press; Melling, 2002). The seasonal first year ice regime in the Eastern Canadian Arctic is likely to be more favourable for safe navigation as significant decreases in sea ice extent have been reported around Baffin Island (Moore, 2006; Stewart *et al.*, 2007). Individual, cultural and environmental safety and sustainability issues need to remain at the forefront of planning efforts so that tourists can continue to enjoy and learn from the eco-regions of northern Canada, and that Inuit and other local people can benefit from the economic possibilities cruise tourism presents (Stewart & Draper, 2006).

### **Acknowledgements**

The authors wish to thank Pauline Scott and Kristy Frampton of Parks Canada in Nunavut for their generosity in providing tourism statistics, as well as useful comments on an early draft of the paper. Emma Stewart would like to thank the Pierre Elliot Trudeau Foundation for support in her doctoral programme. Also, the authors would like to express thanks to Robin Poitras and Shawn Mueller in the Department of Geography at the University of Calgary for creating the map used in this work.

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