Chapter 6

The Evolution and Relative Competitiveness of Global Arctic Cruise Tourism Destinations

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1. Introduction

Traveling and vacationing onboard a cruise ships has become one of the most popular forms of tourism over the past few decades (CLIA 2018). A 2018 Passenger snapshot prepared by the Cruise Line International Associations (CLIA) outlined the continually increasing number of passengers in the last 10 years (CLIA, 2018). For example, the survey found that there were more than 450 cruise ships in 2017 and 2018 that carried more than 27 million passengers and that this number had increased from just 17,8 million passengers in 2009 (Ibid.). The increase in cruises internationally reflects global trends in globalization, infrastructure development including deep-water ports that can accommodate larger vessels where the economy of scale enables more affordable cruise options, and overall improvements to global transportation infrastructure related to increasingly well-connected airports, ferries and rail and roadways. Historically speaking, the cruise tourism industry is oriented toward the North American market, but in recent years there has been more and more cruise ship activities in Europe, in the Mediterranean and Baltic Seas, as well as in South America, the Caribbean and in emerging markets such as South-East Asia and China.

In recent decades, melting of sea ice in the Arctic region has played an important role in the emergence of a cruise tourism industry in that region. Although the increase in Arctic cruise tourism has certainly been influenced by various forces of change such as global trends, commodity prices, demographics, and globalization (Stewart et al. 2015), the effects of climate change and the melting of summer sea ice in the Arctic, has facilitated greater overall accessibility to the region and has thus further enabled new cruising opportunities over the last 25 years (Stewart et al. 2010; Tivy et al. 2011; Stewart et al. 2013; Pizzolato et al. 2014; 2016; Lasserre and Têtu, 2015; Bystrowska and Dawson, 2017; Dawson et al. 2014; 2018). One of the challenges facing researchers and regulators of this industry is the fact that trends data on cruise ship traffic is difficult to obtain and compare due to a variety of definitional, methodological, and geopolitical factors. What are the present trends in the Arctic cruise market?

2. The contrasted development of the Arctic cruise market

First, there are many definitions of ‘the Arctic’ and this in and of itself makes data collection on cruise tourism in the Arctic region challenging. The three types of boundaries most often cited in the literature on polar tourism include: 1) the limit of the continuous

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permafrost, 2) 10° Celsius isotherm in July, and 3) the treeline. The Arctic is often corresponded to the areas of higher latitude and typically it is outlined as the geographic region that is above the Arctic Circle (66° 34'). This is the boundary utilized by both the Arctic Human Development Report (AHDR) (Nymand and Fondahl, 2014) and the Arctic Monitoring and Assessment Program (AMAP) (Arctic Council 2019a) and as such is also the delineation we have chosen to use in this chapter.

Second, prior to 1990, there was little information available to describe the evolution of the Arctic cruise tourism sector, which at the time was inconsistent, ad hoc, and limited. Over the past 25 years the Arctic cruise industry has evolved significantly and more regular and to some extent more consistent statistics are now being kept by relevant authorities, which can be used to compare and contrast national scale development trajectories (Lasserre and Têtu, 2015; AECO 2018; Dawson et al. 2018). Data that are now available for Canada typically comes from the Canadian Coast Guard. However, this data only includes ships that fall under certain regulatory categories such as those vessels that are over 300 gross tons, and therefore it may not capture all tourism vessels operating in the region. In Greenland, despite the fact that data are freely available through the Statistics Greenland's website, there is only information about the number of passenger landing by Greenlandic harbours for three years (2015 to 2017). A discussion with experts on the website underlined the fact that additional data does exist, but it is not freely available online. Data for Alaska are available for only a few ports. In Alaska and in Norway, data that has been used previously be academics has not typically come from an official government database, but rather is often acquired online from Alaskacruises.com, or in the case of Norway from the Environmental monitoring website for Svalbard and Jan Mayen, which is part of the Norwegian Polar Institute. Data for Svalbard were very difficult to obtain apart for Longyearbyen port, the main settlement in Svalbard. Data for the Russian Arctic are also very limited; they are often obtained from two main publications on cruise tourism in Russian waters and only include reliable information for the Arctic Russian National Park of Franz Josef Land and the Port of Murmansk (Pashkevich and Stjernström, 2014; Shirokiy, 2015).

Third, most regions across the Arctic do not have a homogenous definition of cruise tourism or of a cruise ship. For example, the average size of ships operating in Greenland, Iceland and Svalbard tend to be large expedition style vessels (i.e. around 700 passengers) and also larger standard-sized cruise vessels that are typically used in more southern locations (i.e. above 2 000 passengers). In comparison, the number of cruise ships, the size of ships, and the total number of passengers visiting the Canadian and Russian Arctic are much smaller. When trying to understand the size of the Arctic cruise tourism sector, and to make comparisons nationally, it is important to consider 1) the number of voyages on offer, and 2) the number of total passengers. For example, if a particular region attracts a high number of small vessels with >200 passengers than the overall impact of the industry may differ greatly from another region that may attract fewer overall vessels but with much greater capacity (i.e. >2 000 in some cases).

Overall, when one combines all of these definitional inconsistencies with the lack of regular data collection methods or analysis procedures means that it is very difficult to accurately analyze cruise tourism trends across the global Arctic. This data trends challenge is

likely to change in the near-term future as the Arctic Council is currently working on a major initiative called the Arctic Ship Traffic Data (ASTD), which aims to collect and share data on all types of Arctic marine vessel trends (Arctic Council 2019b) based on Automatic Information System (AIS) satellite data. However, this technology is fraught with challenges including the necessity of all vessels to be carrying transponders, which is currently not legally mandated meaning that only some vessels will be captured via this method. Until it becomes mandatory internationally to carry an AIS transponder on all cruise ships (small and large) the best approach to understanding traffic trends and related implications of the industry is to examine existing national level data that is available.

Based on available data from INNAV (XST 2019) between the years 2000 and 2017 there was an average of 14 cruise ships visiting Arctic Canada annually with peaks between 2007 and 2010 and again between 2015 and 2017. However, it should be noted that these numbers are lower than those reported by the Canadian Coast Guard and likely slightly underestimate the total number of cruise ships operating in Arctic Canada (Dawson et al. 2018). In Greenland, there was an average of 12 cruise ships annually in the late 1990s, but this number more than doubled in 2004 (29) and 2005 (25), peaked in 2008 (105) and again in 2016 (104). For comparative purposes, the average number of vessels in Greenland between 2000 and 2017 was 57, which is more than four times the number of vessels in Arctic Canada. The numbers of cruise vessels in Iceland's two main ports (Reykjavik and Akureyri) are similar to Greenland with more than one hundred in 2017. However, overall, the average number of cruise vessels visiting Iceland is higher than both Canada and Greenland considering that the average number of vessels to Reykjavik between 2011 and 2017 was 96 per year. The Arctic locations that are host to the largest Arctic cruise industry are Svalbard, northern Norway and Alaska. Although their total average annual voyages were lower compared to Greenland and Iceland, the overall size of the cruise industry is bigger in both Svalbard and Alaska because they are able to accommodate large traditional style cruise ships because of the availability of appropriate port and other infrastructure. The average number of cruise ships visiting these regions annually between 2007 and 2017 was 48 in Svalbard, and 58 in Alaska (Fig. 1).

Passenger number data is more challenging to obtain compared to voyage data but some information is available from a few of the major Artic cruise destinations that can be examined. As noted above Svalbard, Norway attracts some of the largest number of cruise ship passengers internationally, with over 70 000 visitors in 2016 (Fig. 2). The only other region that rivals Svalbard in terms of passengers numbers is Alaska, which reported more than 1 million cruise passenger visits in 2018 (CIN 2018). Comparatively, Greenland has attracted around 30 000 cruise passengers annually in 2012 and 2011 but in recent years their numbers have been closer to 25 000 (Dawson et al. 2017); Government of Greenland 2016). In Canada, cruise passenger numbers are the lowest internationally and have ranged between an estimated 3 500 and 6 000 in recent years. The lack of infrastructure, including port facilities, wharfs, and other tourism infrastructure limits the market in Arctic Canada to smaller expedition style cruise vessels and the occasional medium sized vessel such as the *Crystal Serenity* (with visits in 2017 and 2018) and the *World* (with a visit in 2012) (Table 1). By data mining the available sources of information it is also possible to draw a more nuanced picture of the Arctic cruise sector by nation state (Table 2).

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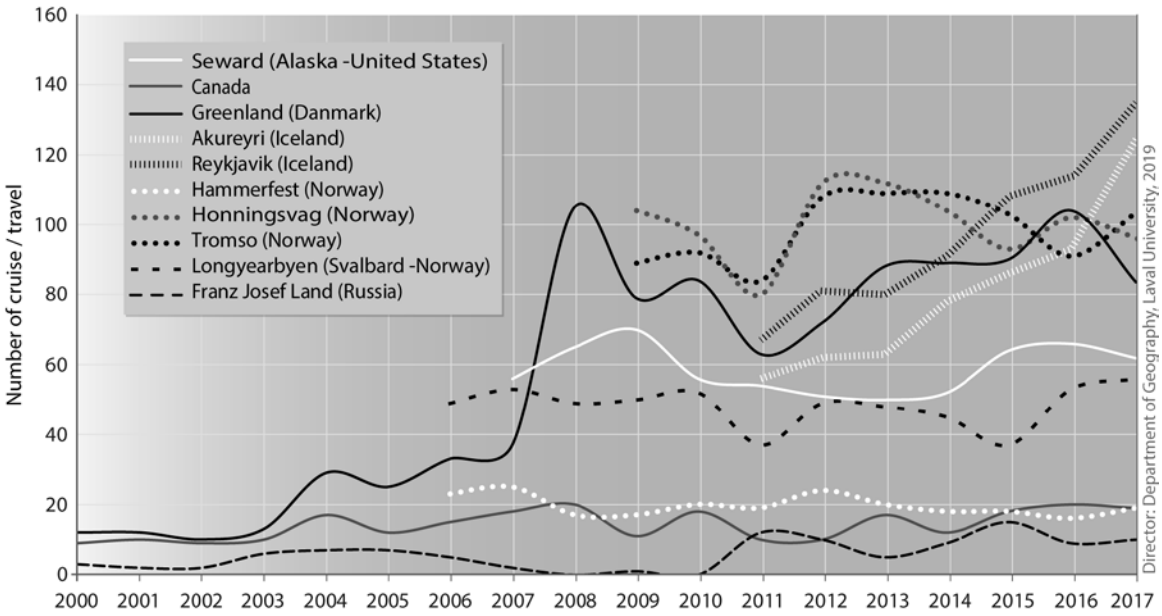

Figure 6.1. Estimated Number of Cruise Ships Operating in the Arctic, 2000-2017

Sources: AECO 2019; and estimations based on Nunavut Tourism 2011 Government of Nunavut 2013 and Dawson et al. 2018

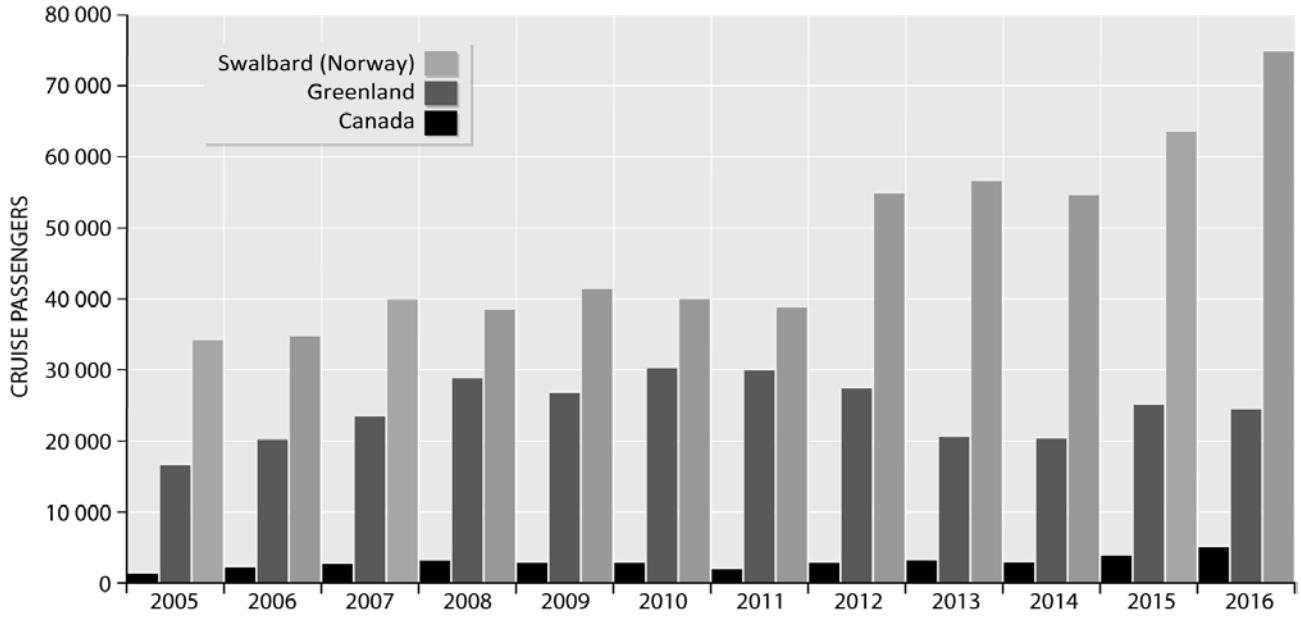

Fig. 6.2: Estimated number of annual cruise passengers to Canada, Greenland, and Svalbard (2005-2016).

Sources: AECO 2019; and estimations based on Nunavut Tourism 2011 Government of Nunavut 2013 and Dawson et al. 2018

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Table 6.1. List of data collected on cruise passenger landings and port of calls for seven Arctic destinations inside the AMAP border

Destinations	*Canada*	*Alaska*	*Greenland*	*Svalbard*	*Russia*	*Norway*	*Iceland*
	By community (n=7) and shore locations (n=152)	By Port (n=9)	By harbor (n=19)	Longyearbyen Settlement only (n=1)	By shore location (n=1) and by Port (n=1)	By Port (n=10)	By Port (n=9)
Number of passenger landing by community/town/port/shore locations	1990-2017 (7 communities, 152 shore locations)	2007-2016	2008-2017	2017	2013-2017	2010-2017	2015-2017
Number of cruise ship/port of call	7 communities (2017)	2007-2017	No data	2006-2017	2000-2017	2006-2017	2015-2017
Source of data	Canadian Coast Guard (NORDREG) Database	Alaska Cruises Website	Statistics Greenland Website	Norwegian Polar Institute	Pashkevich and Stjernström, (2014) Shirokiy (2015);	Cruise Northern Norway and Svalbard (CNNS) & Cruise Norway Websites	Cruise Iceland Website

The cruise tourism industry can bring both risks and opportunities to regional Arctic communities. For example, the industry can be an important source of primary or supplementary income for local settlements and towns, but it can also be a disruptive element of environmental degradation, and can have negative impacts on culture and social (Graeger, 1996; Stewart et al. 2007; Marquez and Eagles, 2007; Stewart and Draper, 2008; Lamers and Amelung, 2010; Fay and Karlsdottir, 2011; Stewart et al. 2011; Lemelin et al. 2012; Dawson et al. 2014; Johnston et al. 2017; Dawson et al. 2018). The effects of a large influx of passengers to Arctic Canada, Svalbard, Greenland and more recently to the small Franz Josef Island in the Russian Arctic are well known (Hagen et al. 2012; Stewart et al. 2011). The perceived environmental impacts of Arctic cruise tourism are similar across national regions and often include concerns related to the potential for fuel spills, bilge water release, groundings, and invasive species introduction. Similarly, there are common human safety and security concerns including those related to accidents, human-drug-firearms trafficking, and others. There are also some common cultural concerns across the regions including those related to the impact of tourism on local cultural practices, or intrusions to privacy and livelihoods. However, there are additional and unique concerns in Arctic Canada and across some parts of Greenland and other areas where there are either settled land claims or strong Indigenous populations. Indigenous groups in these regions practice im-

portant cultural activities along shorelines and within the marine environment. For example, in Arctic Canada, where there are settled Inuit land claim areas and where Inuit and other northerners regularly travel and hunt in maritime regions there are increasing concerns related to cruise ships disturbing a hunt or disrupting the breeding, feeding, or migration patterns of marine mammals that are an essential part of the diet and cultural practices of local peoples.

The growth in polar travel in recent decades has also been matched by an intensification of scholarly activity related to many aspects of polar tourism (Stewart et al. 2017). Much of the focus of this research body has been on tourism development, management, and experiences. Another way of understanding tourism development is taking a closer examination of the underlying factors that contribute to tourism development and the relative successes of different geographic areas or tourism sectors such as Arctic cruise tourism. There has been limited attention paid to understanding the 'determinants' or factors that have led to the successful development of cruise tourism in the global Arctic. Bystrowska and Dawson (2017) examined historical and geographic elements explaining the competitiveness or attractiveness of Svalbard, Iceland and Greenland compared to the less visited Canadian Arctic pointing to major elements related to geography, infrastructure, and government policy. This chapter provides additional attention to this question of how Arctic cruise destinations have evolved and what their relative competitiveness is globally. In this chapter we highlight major historical trends and factors affecting the success, or attractiveness of certain Arctic cruise destinations.

3. Determinants of success: examining factors affecting the historic development of cruise tourism across the global Arctic

The first cruise ship to visit the Polar Regions occurred at the end of the 19th Century (1880), when a German chartered ship visited Spitsbergen in Svalbard (Dawson et al. 2014). Experienced by a history of political, geographic and climatic barriers, the very first cruise ship to visit the Russian Arctic – on Franz Josef Land – took places in 1931 (Ibid.). In the Canadian Arctic, the Hudson's Bay Company supplied a ship – *Nascopie* – in the early 1930s and set aside 22 of her 150 passenger berths for 'official tourists'. The very first cruise ship to transit the Northwest Passage did not occur until 1984 (Stewart et al. 2007; Pashkevich et al. 2015) but already, in 1974, the *Lindbald Explorer* visited the Canadian Arctic but did not fully transit the Northwest Passage (Dupré, 2009).

There are a number of determinants or factors that have include this historic development and which will continue to influence the success of certain Arctic regions as polar cruise tourism continues to grow and develop. Based on a review of literature and expert understanding of the sector we outline and overview of these potential factors affecting the development including discussions on drivers and limiters such as climate change and sea-ice reduction, global economic trends, and national policies. Current research needs and challenges are also outlined. Below we discuss 1) the role of assets like icebreakers, 2) the role of geography and sea ice, 3) the role of infrastructure, and 4) the role of governance, policy, and management.

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3.1 The Role of historical assets: ports and icebreakers

Since the collapse of Soviet Union and the end of the Cold war, the Arctic has experienced a dramatic shift from a sensitive buffer area between the United States and Russia to include a range of initiatives involving transnational cooperation (Young, 2005). During the Cold war, the waters of the Arctic served primarily as a strategic buffer between the two Great Powers, the United States (U.S.) and the USSR (Dean et al. 2014). While the Arctic's role during the Cold War may have been peripheral, the Cold War did have a profound impact on the North, stimulating its economic and political development but not in a homogenous way. In the Canadian and US Arctic, a network of Arctic air bases and DEW line[1] sites were constructed along the entire Arctic coast. Despite the establishment of this military presence in the North American Arctic during the Cold war, the region had been largely ignored in terms of development of economic infrastructure, which has severely limited maritime capabilities. Conversely, in the Soviet Union, the government established a controlled economic system and deliberately invested large sums to develop the Arctic, building ports and railways to foster the control of the area and exploit natural resources.,. This political and historical difference resulted in an impressive development of infrastructure (Têtu et al. 2015). In this perspective, the Soviet Union developed its Arctic regions very differently from geographically comparable areas such as northern Canada or Alaska. Russia built full-scale industrial facilities especially east of the Urals, near the mining town of Norilsk (Lasserre and Têtu, 2018); large permanent settlements and ports exist along the Northern Sea Route such as Pevek, Tiksi and Dudinka, and the towns of Arkhangelsk and Murmansk are both equipped with mechanized ports and international airports with multiple international connections. Murmansk is host to the Russian North Fleet where nuclear icebreakers such as the Yamal (1992–) or *50 Let Pobedy* (2007–) are stationed. The *50 Let Pobedy* (50 Years of Victory) transported cruise passengers from Murmansk to the North Pole in a 14-day voyage with Quark Expedition with an average of $50 000 per passenger (Lasserre and Têtu, 2015). Moreover, Russia has the most impressive fleet of icebreakers in the world with 46 in-service icebreakers, 11 under construction and four planned. Despite an ageing fleet, Russia is still the leader, well beyond Canada (7 icebreakers), Finland (10), Sweden (7), USA (5), Denmark (4), China (3) or Norway (1) (U.S. Coast Guard, 2017). This icebreaker fleet partly explains the higher densities in shipping traffic along the NSR. Some of these Russian icebreakers are indeed chartered by Canadian cruise operators, such as Quark Expedition and One Ocean Expedition, which offer these operators the opportunity to visit remote locations of the Arctic with their passengers. Because there are often high sea-ice concentration areas in some parts of the Arctic, these more robust icebreakers allow passenger to visit some of the most unknown and untouched parts of the Northern hemisphere.

Of the vessels coming to the Canadian Arctic there is a large variety of origin, flag state, and strength of ships. For instance, Russian vessels tend to be stronger than vessels from

[1] The DEW line (Distant Early Warning) is a series of radar sites built in the 1950s to detect potential incoming Soviet bombers or missiles.

others origins, and there are a large number of weaker vessels sailing in the Canadian Arctic. For instance, the Russian-flagged vessel *Kapitan Khlebnikov* is a strong Polar class 3 vessel that since at least 1990 has been operating as a cruise vessel in the Canadian Arctic, but which was requisitioned by its owner, the Far East Shipping Company (FESCO) in 2015 for bulk shipping in the Russian Arctic. In the 1990s and early 2000s sea ice was thicker and it was an asset to have powerful icebreakers that enabled voyages to new areas that had never been explored before by tourist ships.

Yet, despite the heritage from the Soviet planned economy, the presence of a series of Siberian ports and an impressive fleet of icebreakers, it is not the Russian cruise market that is the most flourishing. If the Russian icebreakers were indeed strong assets, they were mostly employed elsewhere when engaged in cruise activities, and only Murmansk seems to develop a significant market base for cruises in the Russian Arctic. Assets are thus not enough to develop a significant cruise shipping market.

3.2 The Role of Geography and Sea Ice

The development pathway and the success of Arctic cruise operations depend greatly on a number of fundamental factors including: attractiveness of the port of departure / or arrival of the cruise; the itinerary and route; seasonality and weather conditions; and the presence of physical and tourism infrastructure (i.e. ports with passenger terminals, shops, museums, etc.). The presence or absence of these factors has led to the competitive advantage of certain destinations over others. Other important factors that have been identified, which contribute to destination competitiveness include things such as local leadership, political will, tourism operator advocacy investment in tourism-specific facilities, availability of events and programs, accessibility of visitors services, and availability of a local liaison or point of contact to assist external organizations (Bornhorst et al. 2010; Bystrowska and Dawson 2017).

The sea ice in the Arctic and its spatial distribution partly explain the success and cruise ship trends in the region whether it is summer or winter sea-ice (figures 3 & 4). Generally speaking these past years, the shipping season in the Canadian Arctic extended during three to five month from June/July to September/October. The shipping season in Greenland, whether it is East or West coast, also took places during these months, but just like Svalbard, coastal Norway, Iceland or southern Alaska, these regions are ice-free for most of the year. This being said, the number of stopovers and passenger landings in the Canadian Arctic remain low in comparison with other destinations of the Arctic where sea-ice is not a significant constraint. In a survey conducted by Lasserre and Têtu (2015) and based on informal discussions with cruise operators operating in the Canadian Arctic, sea-ice conditions remain an important risk associated with marine tourism in the Arctic as well as inexperienced captains and crew when shipping in a sea-ice environment. However, the perceived risks vary from one company to the other where these risks can be managed or represent a more or less important challenges but if in summer shipping season, it seems to be a manageable risk. The harsh, unpredictable and changing weather, the lack or limited communications in the Canadian Arctic make this area very expensive for the consumer compared to other Arctic regions.

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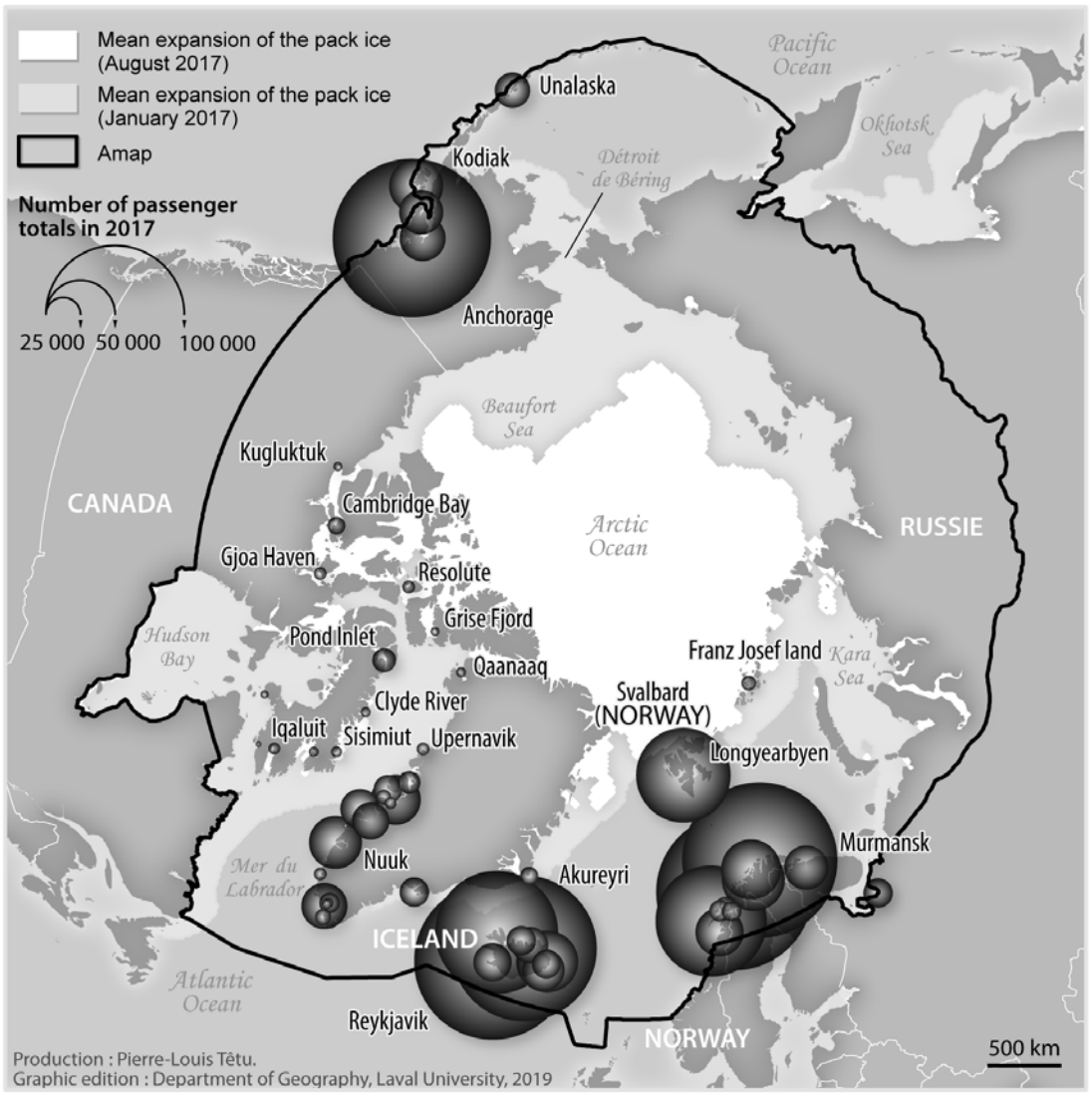

Figure 6.3. Number of passenger landings, 2017
Note: There was no data for Alaska in 2017 so we used 2016 figures. Murmansk and Arkhangelsk are based on data of 2015.

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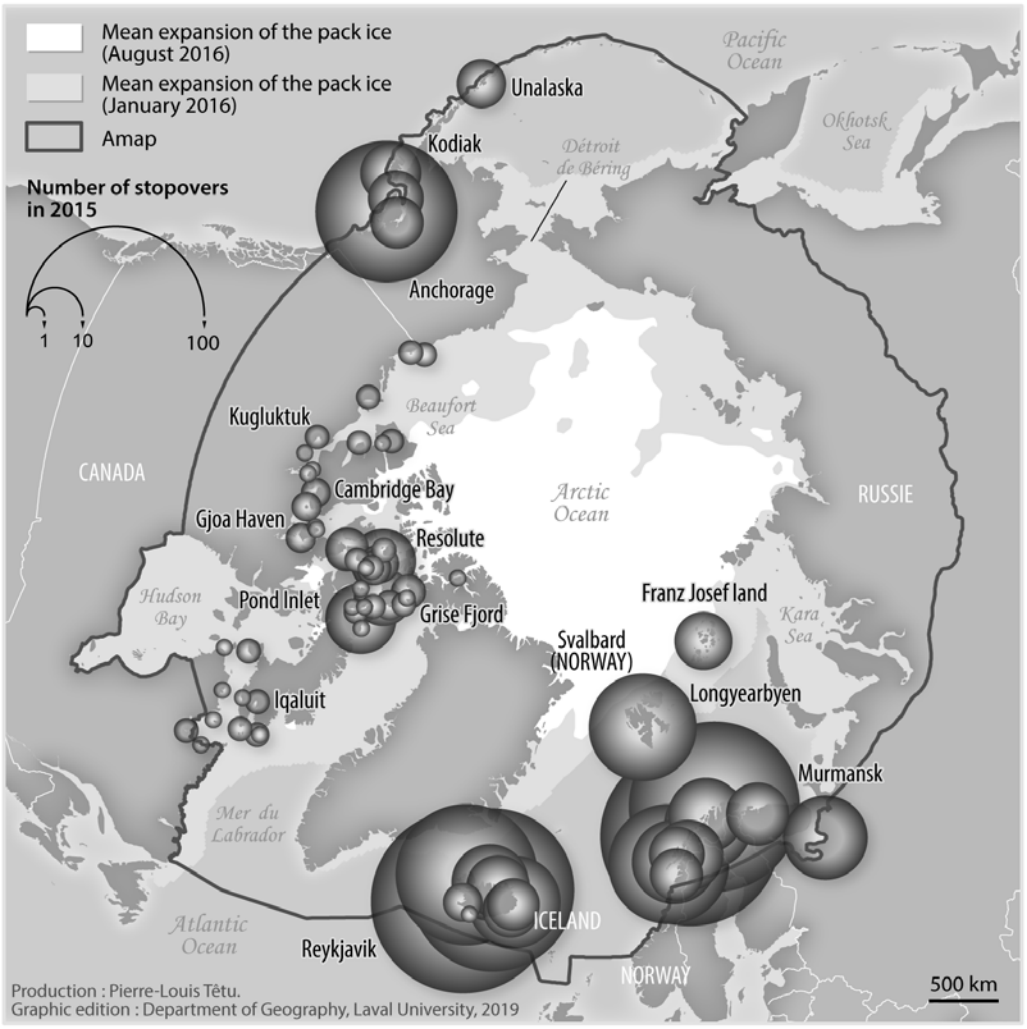

Figure 6.4. Number of Arctic Cruise Ship stopovers, 2015
Note: there was no data available for Greenland at the port level.

Severely restricted in their movements, vessels without or with a low polar class and carrying more than 1 000 passenger such as the *Crystal Serenity* (1D) in the Canadian Arctic in 2016 and 2017 shows the flexibility of Canadian legislation in its Arctic waters – others see the *Crystal Serenity* journey as resulting from loopholes in the regulation. The costs associated with the construction and operation of ice-strengthened ships, the limited availability of such vessels, the cost of fuel as well as the global economic crisis or worldwide economic health are serious challenges for several operators already offering cruises in the Canadian Arctic, but also for those that would like to in the future (Lasserre and Têtu, 2015). There are still significant concerns related to sea ice and these were exemplified with an incident occurring in the 2018 summer cruising season in the Canadian Arctic where the *Akademik Ioffe*, a Russian ice-strengthened vessel ran aground in the western Gulf of Boothia near Kugaaruk, Nunavut causing the voyage to be cancelled and over 200 passengers needing rescue. Heavy ice and poor marine charts may have been responsible

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for the 2018 grounding; the 2010 grounding of the *Clipper Adventurer* was clearly caused by poor marine charts as the ship ventured out of the well-known navigation corridors.

The Canadian government through the Canadian forces and various other agencies and departments are already prepared and trained in case of emergencies such as the grounding of the *Ioffe*, but many observers still agree to say that a major catastrophe is only a matter of time. Whether the risks associated with Arctic shipping is manageable by cruise operators must differ from one operator or strategy to the other, but the fact that Crystal Cruise gave up Arctic cruises after two years underlines that shipping in the area is not risk-free (Coppes 2017).

3.3. The Role of Infrastructure

Discussions with cruise operators already operating in the Canadian Arctic underline the fact that the lack or limited airstrips constitute an important challenge for cruise operators in comparison with other Arctic destinations. In the Russian-European Arctic (Greenland, Iceland, Svalbard and Russia), cruise companies often start their trips from a port that is well connected to air services such as Helsinki, Murmansk, Reykjavik or Tromsø for example. Pashkevich and Stjernström (2014) argue that while the tourism industry is dependent on infrastructure, accessibility, transport, hotels, etc. while those industries are reliant on a vibrant tourism industry. A survey conducted by Lasserre and Têtu (2015) shows that operators disagree on the impact of poor infrastructure on the Arctic cruise market growth in Canada. The French company Ponant does not see the lack of maritime infrastructure in the Canadian Arctic as a major constraint since part of their broader business strategy is to offer a unique experience to their guests through zodiac excursions (Ibid.). On the other hand, Adventure Canada has been quoted as saying that the lack of infrastructure is a limiting factor for the introduction of larger ships. The logistics of transporting 100-200 passengers back and forth to the main cruise vessel by zodiacs is feasible, however, it is not the case with 1 000 passengers or more. Other companies, such as One Ocean Expedition, already present in the region, further see the lack of deep water ports with refueling and water bunkering facilities as a major limitation to the expansion of their activities. CLIA expressed a similar opinion as well as AECO members Holland America and Silversea. They claim that there is not enough available refueling facilities, and that marine infrastructure in the region is inadequate to berth large passenger vessels, and finally that adequate infrastructure for search and rescue operations is lacking in Arctic Canada. In this regard, once new infrastructure is completed, it is possible that tourism will expand, as has already been witnessed in Greenland and Svalbard (Dawson et al. 2017). Indeed, Greenland, Svalbard, Iceland, Norway and Alaska can all accommodate large passenger vessels (≥1 000 passengers) as these ships can be more easily accommodated thanks to existing maritime infrastructure.

Many of the cruise operators surveyed signal the lack of maritime infrastructure as a barrier to increasing their activities and organizing the itineraries of large capacity vessels. In order to increase the number of vessels and tourist visitors to the Canadian Arctic to the same level as other Arctic destinations such as Svalbard or Greenland, the region would most certainly need to expand and invest significantly in maritime infrastructure. Indeed, economics tells us that the current cruise prices are limiting the growth of demand for these

cruises. The development of maritime infrastructure in the Canadian Arctic could stimulate the interest of companies, which own large capacity vessels that presently operate in the Russian or European Arctic. However, the lack of port infrastructure in Nunavut is blatant, and there are only three ports with berths in the Canadian Arctic, Deception Bay/Raglan, Nanisivik and Churchill, the first two being industrial ports and the third being remote from classical cruise routes. All other places are serviced with barges and provide no facility for ships to dock. It is expected that the construction of a deep water port in Iqaluit and Rankin Inlet as well as small craft harbors in the communities are initiatives that, once completed, might increase the attractiveness of certain locations and might promote the development of tourist shipping (Stewart et al. 2012). In addition, improving maritime infrastructure would facilitate cruise ship calls in ports of communities that received no ship would also facilitate stopovers by private yachts. A deep water port in Rankin Inlet would thus increase the potential attractiveness of the Hudson Bay region and neighbouring communities and consequently could allow Chesterfield Inlet, Clyde River, Kugaaruk and Repulse Bay to expect visits from cruise ships and further develop their touristic services. Historical factors such as the past economic history of an area thus bear an impact on the infrastructure available for Arctic cruise shipping. Northern Norway and the Kola Peninsula have been developed since the 18th century, for instance.

The industry could also gain from investments already made in other activities. For example, Pashkevich and Stjernström (2014) underlined that military airstrips could be used to bring in civilian visitors to an area, a military health care service in a remote location could provide other visitors with basic emergency services, and a transportation network built for natural resources exploitation could be used to develop a tourist destination. In the Canadian Arctic, there are no public ports with berths except Churchill and while air connections do exist to most communities, air fares are very expensive and represent another limiting factor. Moreover, most infrastructures in the Canadian arctic were put in place in the 1950s to build the DEW line based on the aircraft of the time. As a result, many northern settlements still have 2 500 or 3 000 foot gravel air strips ideal for DC-3s but ill-suited for Boeing 737s that Canadian North, First Air and Air Yukon use. Unlike the neighbouring state of Alaska or even Greenland, Iceland, Norway, Svalbard or Russia, the Canadian Arctic has few paved and long runways, limiting the type and size of aircraft that northern carriers can use. For instance, there are very few airfields in the Canadian Arctic that are used to embark or disembark cruise passengers at the exception of Resolute Bay, Kugluktuk, Kuujjuaq or Iqaluit. Canadian International airports such as Edmonton, Toronto and St John are much more developed, but it is Ottawa International Airport that is the busiest.
It will be discussed later how the Canadian Coasting Trade Act of Canada, by prohibiting foreign vessels to operate from a voyage embarking one Canadian port and ending that same voyage in Canadian waters without leaving the territory has an impact on the modus operandi of companies and this has an impact on the choice of airports and airliners. Contrary to the trends that we observe in the Arctic in comparison with Canadian airports such as Iqaluit or Kugluktuk but not Ottawa or Edmonton, airports in Bergen (Norway), Kangerlussuaq (Greenland), Reykjavik (Iceland) and Longyearbyen in Svalbard are much busier.

3.4. The Role of Governance, Policy, and regulations

Despite a polar class certification, incidents can happen because of poor charts, weather or sea-ice, even with ice-strengthened vessels, as the sinking in 2007 of the Polar Explorer reminded the industry. In comparison, the low concentrations or absence of sea-ice in most other areas of the Arctic allows cruise operators to organize voyages on vessels with a carrying capacity of more than 1 000 passengers. Arctic destinations such as Svalbard, Iceland, Norway or Alaska are regularly visited by vessels owned or operated by CLIA members and without a polar class, such as Carnival Cruises, Princess Cruises, AIDA Cruises, etc. However, new environmental regulations that have been or could soon be implemented such as Heavy Fuel Oil (HFO) Ban and CO_2 emissions regulations could pose more important challenges for cruise operators. For example, the ban on heavy fuel oil that was introduced for Svalbard with full effect from 2015 and compulsory pilotage, also introduced in 2015, has meant that ships using heavy fuel oil and those without a pilot on board are no longer permitted to sail in Svalbard's protected areas.

Whether it is linked to these new environmental regulations and global awakening, several cruise tourism operators operating in the whole Arctic are slowly replacing older vessels with new ones that will more easily comply with current regulations. For instance, Hapag Lloyd, while it is too early to assess their polar classification, will add three new vessels in the coming years: the *Hanseatic Spirit* built by Norwegian shipyard Vard is expected to be launched in the second quarter of 2021; the *Hanseatic Nature* in Spring 2019 and the *Hanseatic Inspiration* scheduled for Fall 2019. The French company Ponant announced that its new polar exploration vessel, the world first hybrid electric icebreaker powered by liquefied natural gas (LNG) will be named *Le Commandant Charcot* after the notable French polar explorer Charcot, and should be launched in 2021. Finally, the Canadian company, already operating in the Canadian Arctic, One Ocean Expedition, added a new vessel to its fleet – the *RCGS Resolute* – in November 2018. A document from the Maritime Executive website presents an impressive list of expedition ships intended for polar waters and informs that many new operators are seeking to get into the business while existing players are enlarging their fleet (The Maritime Executive, 2018).

The Canadian permitting requirements process is complex and in some cases incredibly inefficient (Dawson and Pashkevich, 2015), but its robustness is essential and important in ensuring the safety of shipping in Canadian waters despite its loopholes enabling ships like the *Crystal Serenity* to ply Arctic waters. There are similarly also a high number of requirements to sail in Russian Arctic (Shirokiy, 2015). From the industry perspective, the convoluted permitting system is a major development barrier for the Canadian Arctic (see Dawson et al. 2014; 2017). A U.S. provisional AECO member mentioned that despite their high interest for Arctic expedition cruises in Canada, the permitting process was too complex. "The requirement to work with various territories with inconsistent requirements and departments within the Canadian government make getting permits for the Canadian Arctic the most complexes and tedious in the world. Going the route of IAATO or AECO would help hugely" (Dawson and Pashkevich, 2015). The permitting process appears to be their biggest challenge and enough of a reason for them to not currently go to Canadian Arctic. For instance, a discussion with a company then present but now out of the Canadian Arctic market, underlined that it would return when permitting becomes easier. For example, the process in Greenland seems to be more streamlined in comparison with Canada where the requirement to work with various territories with inconsistent requirements and

departments within the Canadian Government makes getting permits for the Canadian Arctic the most complex and tedious in the world (Dawson et al. 2017).

These regulatory challenges for expedition cruise operators in the Canadian Arctic highlight the need, from the industry perspective, to streamline the number of permitting, licensing, clearance, inspection, review, certification, impact, registration and reporting requirements and the costs associated to them. This permitting system could be a serious concern for operators because they could easily oversee one or more requirements, which could result in a company unintentionally being non-compliant – a situation that has happened on several occasions over the past decade. In 2017, an update to the 2005 Transport Canada document, Guidelines for the Operation of Passenger Vessels in Canadian Arctic Waters (TP 13670E) was released and this could assist new operators better understand the complex permitting system in Arctic Canada. However, no effort was made to streamline regulations or the regulatory process, rather the document provides an outline of all of the required permits and an updated (but static) list of contact persons. Although updating this information document is a good start, it would be more useful to create centralized permitting system or one-window electronic approach in which operators facilitate the permitting process (Dawson et al. 2017; Kostin, 2017).

Another factor that limits cruise tourism development in Arctic Canada is the Coasting Trade Act (1992, c. 31), which imposes a significant tax on foreign flagged vessels that engage in an itinerary that only occurs within Canadian waters. Since all cruise ships operating in Artic Canada are foreign-flagged, the net result of this legislation is that cruise operators always begin or end their voyages outside Canada (typically Greenland) in order to avoid paying this tax (Dawson et al. 2014; Lasserre and Têtu, 2015). There are local economic ramifications considering the ships spend additional time in outside of Canada and spend money in communities there (Ibid.). The side effect of avoiding paying the tax associated to the Coasting Trade Act is that cruise operators must arrange for their passengers to cleared by customs (Canadian Border Service Agency – CBSA) when they enter the country from Greenland considering there are no permanent border services in the high Canadian Arctic. Cruise operators must pay for CBSA agents to fly to and stay in the community of entry in order to clear passengers into Canada. However, there is a recent example of a Canadian cruise operator requesting exception from the Coasting Trade Act tax for operating a voyage solely within Canadian waters with some success. One Ocean Expeditions Inc. made a request to the Canadian Transportation Agency in February 2018 for a license to use the *Akademik Ioffe* to offer a cruise starting and ending in Canada from Cambridge Bay to Iqaluit. The company asked the Canadian Transportation Agency whether there was a Canadian ship available to provide the service, and identical or similar adequate marine service available from any person operating one or more Canadian ships. Canadian Transport Agency staff gave notice of the application to the Canadian marine industry and no Canadian ships were offered. Therefore, the Agency determined that there were no suitable Canadian ships available and that there is no identical or similar adequate marine service available. As a result, in February 2018 and according to the Canadian Transportation Agency, One Ocean Expeditions Inc. was granted a Coasting Trade License beginning on June 27, 2018 and ending on September 25, 2018. This process was incredibly arduous and

most operators, especially new to Canada, would be challenged to navigate existing regulatory systems. Requiring special permits for foreign flagged vessels to operate across the Arctic is not unique to Canada. In the Russian Arctic, foreign flagged vessels must also obtain permission and the permitting system is also challenging. Most cruise companies operating in Russia prefer to get a Russian agent to deal with officials and the required paperwork for cruise because of the amount of time and the lack of clarity with respect to the Russian permitting process. For example, only the Russian prime minister signs permission applications for foreign cruise ships or any other vessels coming in Russian internal waters (Pashkevich et al. 2015).

4. Discussion and Conclusion

Merchant networks and industries have developed in northern Scandinavia and Iceland for several centuries now; Svalbard was actively developed from the end of the 19th century while Denmark sought to develop Greenland since the 18th century. In the Soviet Union, central planning enabled the government to develop infrastructures in Siberia. These are key elements partly explaining the competitiveness of the euro-Russian Arctic cruise tourism destinations. Partly, since it was pointed out Siberian ports did not transform into a large cruise market. Also influential are melting sea-ice and the opening of the Arctic passages, infrastructure differences and policy and regulatory mechanisms that are often designed to enhance protections but which have side effects of limiting development.

In Canada, there are current plans to develop small craft harbors, and a wharf is under construction in Iqaluit due for completion in 2020, but the equipment lags far behind port infrastructure that can be found in Greenland. Arctic communities that invested in port facilities have increased their attractiveness and competitiveness for cruise tourism.

Influenced by various forces of change among them the effects of climate change and melting of summer sea ice in the Arctic, all these factors contributed to the emergence of a cruise tourism industry in the Arctic, expanding accessibility throughout the over the last 25 years but not without important contrasts. The risks associated with sea ice, ice ridges, multi ice year accidents and spills, intense cold and damage to vessels are viewed as manageable risks by cruise operators offering voyages in Svalbard, but in the Canadian Arctic, sea-ice remains an important physical hazard (Stewart et al. 2007; Pizzolato et al. 2014). Melting of sea ice in the Arctic at a faster speed than predictions in last decades then played an important role in the emergence of a cruise tourism industry. Sea-ice is a major constraint for cruise tourism in the Arctic and various policies of Arctic States as well as International Regulations such as the International Convention for the Safety of Life at Sea (SOLAS) of 1974 and the recently International Maritime Organization's Polar Code have specific provisions for vessels operating in polar waters that must respect hull standards better known as polar classification requirements. However, there are various level of sea-ice concentration in the Arctic and well popular cruise destinations such as most destinations of Alaska, even in the North, in Iceland and along the Coast of Norway experience a high level of cruise activity due to low concentration of sea ice or absence of such a constraint. In Svalbard, Franz Josef Land and in southern Greenland, sea-ice conditions allow bigger vessels to sail without or with weak polar hulls. In the Canadian Arctic archipelago, sea-ice dynamics and highly variable trends are a concern for safety and security and a

major physical barriers for most cruise operators to expand their business activities whether it is the cost of ice-breakers or double strengthened-hull, insurances, etc. All these factors contribute to increasing the cost of doing business in the north.

While various Arctic states have their own regulations regarding shipping in their respective waters, the customs clearances and translation fees associated to the permitting process are also often underlined as time consuming. The scientific community has underscored how time-consuming the permit process is in the Canadian Arctic and this itself is one of the major limiting factors for cruise tourism development in that region. This consuming permit process in the Canadian Arctic is also pointed out by several cruise operators operating in the Canadian Arctic, who have complained that the existing permit process failed to take into account the fact that itineraries are always changing due to weather and ice which make the Canadian Arctic very expansive for the consumer compared to other Arctic regions. The Canadian Coasting Trade Act of 1992 that prohibits foreign vessels, even if it is a Canadian company, from operating a voyage embarking in one Canadian Port and ending that same voyage in Canadian Waters without paying significant duty taxes is also seen as an important barrier by several cruise operators. Admitting the presence of world-class ports and airports in the Canadian Arctic, the coasting trade act regulations would prevent them from fully benefiting from the economic benefits of the cruise industry. However, the granting for a rare occasion to the Canadian company One Ocean Expeditions a Coasting Trade License to operate a voyage starting and ending in Canadian ports this summer/fall of 2018 is promising.

Historical events can explain the development evolution and resultant competitiveness of a cruise tourism destinations across the Arctic. The current trends in melting of sea-ice in the Arctic is also another important factor driving the attractiveness of a destination and give a good indication of the intensity the traffic would be. This is also true even the fact that a homogenous definition of a tourist among Arctic states is still lacking and different data collection time line are collected. The presence of the AECO in the Euro-Russian arctic is a good way to manage impacts of cruise tourism and its expansion to the Canadian Arctic and Greenland would be another way to enhance monitoring of cruise tourism in the Arctic. The specificities of the Canadian Arctic and Greenland at some extent, by the presence of Indigenous communities that historically live and travel in the Area require broader consultations when establishing such guidelines. By aiming for a sustainable and respectful regional development of communities and societies, investments will be needed in transportation infrastructure, enhancing environmental, historical and cultural education of visitors as well as locals can improve safety and security, and improvement of capacity building, reduction of time-consuming permit process and improving reliable and extensive data collection will be the next challenges. Senior researchers (Johnston et al. 2017; Huijbens and Lamers, 2017) have also pointed out the urgent need to improve marine tourism data collection to bring the Canadian Arctic up to date with other Arctic tourism region that already collect key tourism statistics to facilitate better decision making and to support sustainable development in the region. The identification of these needs also underlines the need for more studies focusing on cruise tourism trends across the Arctic using comparable and reliable data. Currently, tourism statistics are collected using very different methods in each Arctic region and in a very ad hoc manner across Arctic Canada in particular.

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