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Report of the Commissioner of the Environment and Sustainable Development

CHAPTER 3

Marine Navigation in the Canadian Arctic



Office of the Auditor General of Canada

OAG

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CHAPTER 3

Marine Navigation in the Canadian Arctic

Performance audit reports

This report presents the results of a performance audit conducted by the Office of the Auditor General of Canada under the authority of the *Auditor General Act*.

A performance audit is an independent, objective, and systematic assessment of how well government is managing its activities, responsibilities, and resources. Audit topics are selected based on their significance. While the Office may comment on policy implementation in a performance audit, it does not comment on the merits of a policy.

Performance audits are planned, performed, and reported in accordance with professional auditing standards and Office policies. They are conducted by qualified auditors who

- establish audit objectives and criteria for the assessment of performance,
- gather the evidence necessary to assess performance against the criteria,
- report both positive and negative findings,
- conclude against the established audit objectives, and
- make recommendations for improvement when there are significant differences between criteria and assessed performance.

Performance audits contribute to a public service that is ethical and effective and a government that is accountable to Parliament and Canadians.

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Introduction

Arctic Council—A high-level intergovernmental forum that provides a means for promoting cooperation, coordination, and interaction among the Arctic states, with the express involvement of Arctic indigenous communities, on common Arctic issues—in particular, issues of sustainable development and environmental protection. Member states are Canada, Denmark (including Greenland and the Faroe Islands), Finland, Iceland, Norway, the Russian Federation, Sweden, and the United States of America.

3.1 The Arctic is a fundamental part of Canada’s heritage and national identity and vital to our future. In recent years, the Government of Canada has focused attention on the importance of this region through the development of Canada’s Northern Strategy in 2009 and its Arctic Foreign Policy in 2010. In May 2013, Canada also assumed a two-year chairmanship of the **Arctic Council**, proclaiming safe Arctic shipping as one of the priorities of its chairmanship.

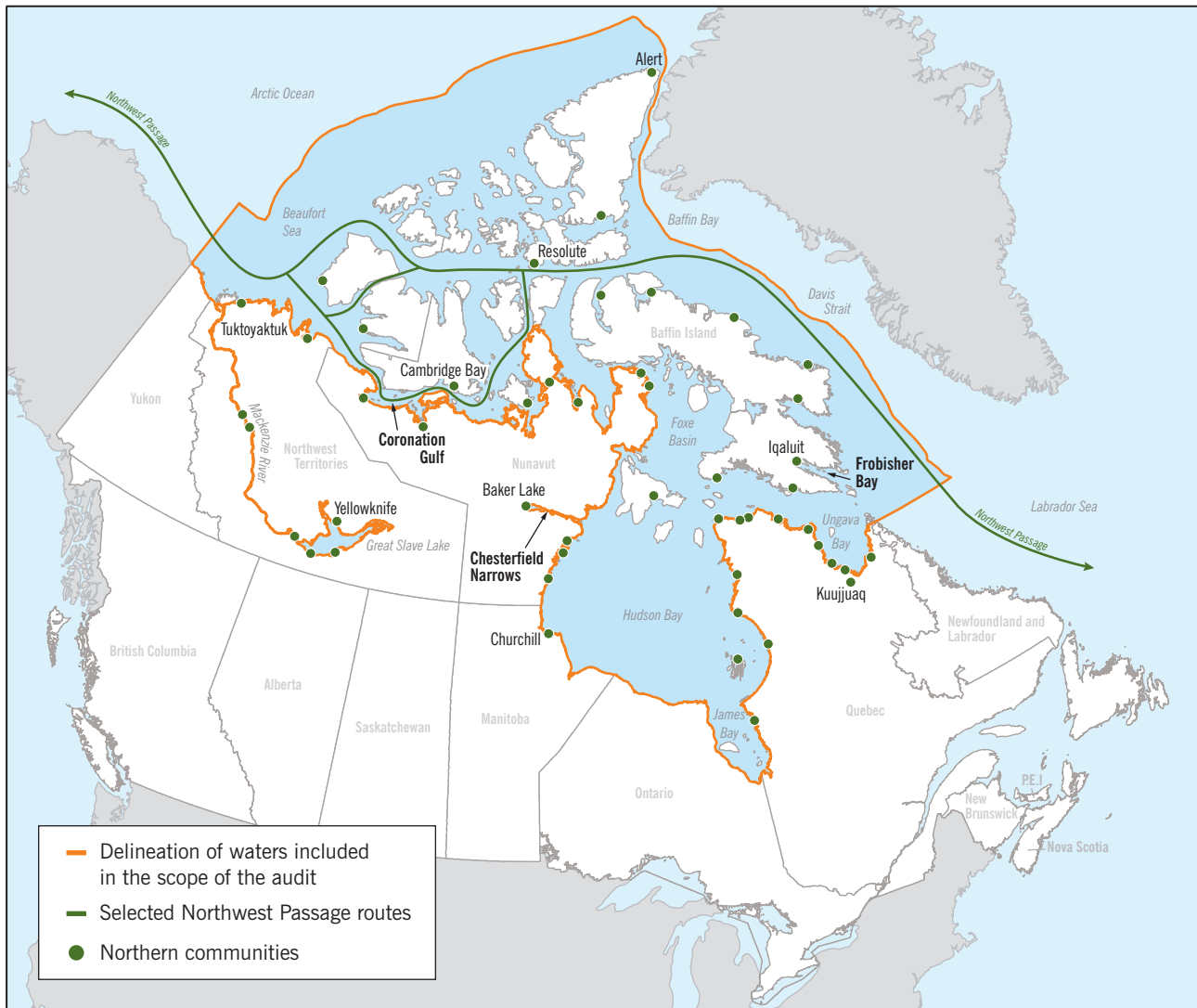
3.2 The Intergovernmental Panel on Climate Change recently reported that Arctic sea ice in summer is declining faster than most models had projected and that it will likely continue declining year-round over the 21st century. This finding is supported by data from Environment Canada, which indicates that ice coverage in Canada’s Arctic declined significantly between 1980 and 2013. A variety of expert reports by the Arctic Council suggest that due to future sea ice retreat, it is likely there will be even greater marine access and longer seasons of navigation across the Arctic.

Marine traffic and navigational risks in Canada’s Arctic

3.3 Marine transportation plays a critical role in the sustainability of the region, as it is the primary means of moving goods to, from, and through Canada’s Arctic (Exhibit 3.1). According to Canadian Coast Guard statistics, there were about 350 marine voyages in 2013. Although this volume of vessel traffic is low compared with Canada’s southern waters, Arctic voyages have been increasing over the last 20 years (Exhibit 3.2). Much of this increase is from fishing vessels as well as tug boats, pleasure craft, research vessels, and passenger vessels.

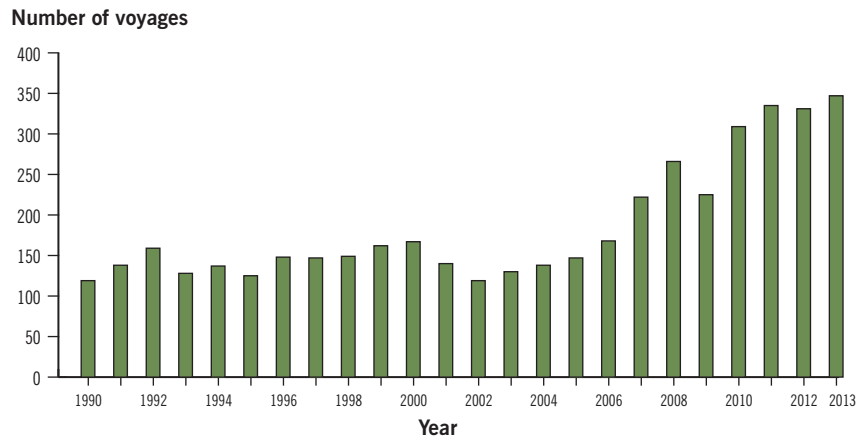
3.4 This trend is expected to continue in coming years, driven largely by growing northern communities, expanding resource development projects, and increasing tourism. For example, renewed interest in oil and gas exploration and development in the Beaufort Sea is expected to lead to more vessel and barge traffic. East of Baffin Island, fishing boats are now able to operate in more northerly areas, and over a longer season. Environment Canada has estimated that new mining projects in the eastern Arctic could result in about 300 new voyages per year by 2020, nearly doubling current traffic levels. The Canadian Coast Guard expects that as resource development projects move forward in Canada’s Arctic region, the size and variety of ships will increase, as will the demand for services.

Exhibit 3.1 Arctic waters included in the scope of the audit



Note: Not all northern communities are represented on the map.

3.5 Increased shipping opportunities in Arctic waters come with increased risks to safety and the environment. The Canadian Arctic waters are vast, remote, and can be hazardous to navigate, with much of these waters covered in ice for many months of the year. The 2009 Arctic Marine Shipping Assessment (AMSA) by the Arctic Council cautions that although sea ice is receding, marine operations will remain challenging. Through 2020, the Northwest Passage is not expected to become a viable, regularly scheduled route across the Arctic for larger commercial ships. The AMSA notes that this is due to the highly variable ice conditions, the complexity of the archipelago, shallow waters in some locations, a lack of adequate charts, and insurance costs.

Exhibit 3.2 Vessel voyages in the Canadian Arctic since 1990

Source: Coast Guard estimates up to 31 December 2013

3.6 Reports from the federal government and international bodies recognize that Arctic marine shipping, if not properly managed, poses a threat to natural ecosystems. Transportation Safety Board of Canada records indicate marine accidents and incidents have occurred in Canada's Arctic that included groundings, capsizings or sinkings, collisions, and damage by ice. If marine traffic continues to increase as expected, marine incidents could become more frequent. Canadian Coast Guard data from 2002 to 2013 identifies about 100 spills from vessels in Canada's Arctic waters, most of which were petroleum products such as diesel fuel and gasoline. None of the spills were estimated to be larger than 30 cubic metres. However, given the fragile environment, harsh weather conditions, limited infrastructure, and the direct dependence of communities on those ecosystems, marine spills as a result of shipping are considered one of the most serious threats to Arctic ecosystems.

3.7 On 18 March 2013, the government appointed a Tanker Safety Expert Panel to review the current ship-source oil spill preparedness and response regime and to propose ways to enhance it. Phase Two of the Panel's work was ongoing during our audit. It focused on ship-source spills in the Arctic, as well as the current status and Canada-wide needs for a system to manage incidents involving hazardous and noxious substances. Recommendations on possible improvements are expected from the Panel in the fall of 2014.

Federal responsibilities

3.8 The federal government has responsibilities and accountabilities for managing risks to the marine environment and for supporting safe and efficient navigation. Transport Canada administers the *Arctic Waters Pollution Prevention Act*, which prohibits the deposit of waste of any type in Arctic waters. Regulations under the Act impose further requirements on ships to ensure safety and protect the environment. Transport Canada is also the lead authority for the *Canada Shipping Act, 2001*, which includes regulations requiring the inspection of vessels and reporting by ships. The Department enforces these acts with the support of Fisheries and Oceans Canada's Canadian Coast Guard Marine Communications and Traffic Services by screening ships and conducting surveillance over Canadian waters to minimize risks and identify marine incidents.

3.9 The Canadian Coast Guard is also responsible for supporting safe navigation by providing icebreaking services and aids to navigation. Fisheries and Oceans Canada's Canadian Hydrographic Service is responsible for providing hydrographic services and products such as nautical charts. Environment Canada provides weather and ice information services. Together these services help to ensure the safe and efficient movement of ships in Canadian waters.

Focus of the audit

3.10 The objective of this audit was to determine whether Transport Canada, Fisheries and Oceans Canada (including the Canadian Coast Guard and the Canadian Hydrographic Service), and Environment Canada adequately support safe marine navigation in Canadian Arctic waters. Safe marine navigation is critical for preventing spills.

3.11 Our audit work included examining whether these federal departments have a shared vision and coordinated strategies to support safe marine transportation in the Arctic. We also audited the services that departments provide to support safe navigation and prevent spills, which include

- producing navigational charts,
- deploying and maintaining aids to navigation,
- providing weather and ice information,
- providing icebreaking services, and
- surveillance and monitoring of marine traffic and spills.

For these services, we examined whether departments have established clear roles and responsibilities; identified gaps in their policies, strategies, programs, and activities; assessed risks associated with these gaps; and developed plans to address identified gaps.

3.12 Scope exclusions. We did not examine ship design and construction, equipment, training, search and rescue, or emergency preparedness and response. Although many of these are also important elements of safe marine navigation, they have either been covered in past audit work by our Office or are the subject of current work by others, including the Tanker Safety Expert Panel and the International Maritime Organization.

3.13 Our examination work covered the period from January 2010 to July 2014, with some variation by specific program area. Audit work for this chapter was completed on 18 July 2014. More details about the audit objectives, scope, approach, and criteria are in **About the Audit** at the end of this chapter.

Observations and Recommendations

Hydrographic surveys and nautical charts

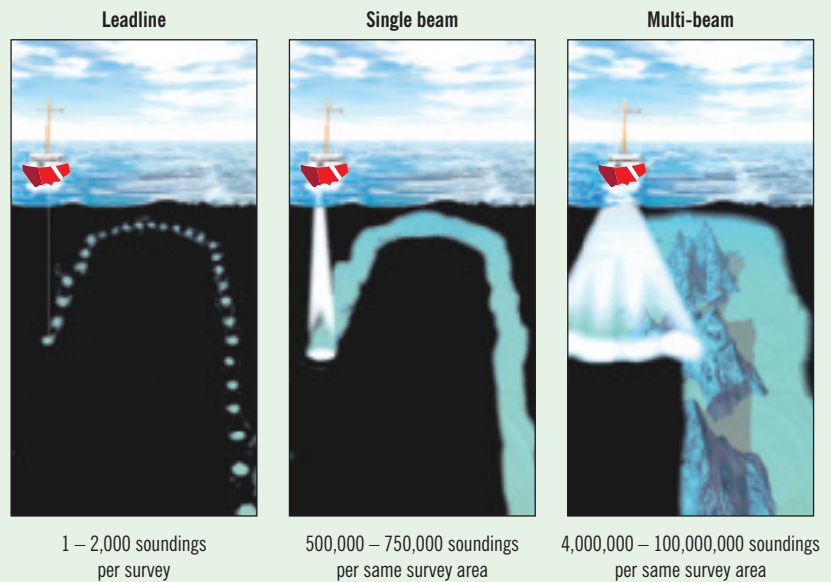
3.14 Nautical charts are essential to safe marine navigation: they provide critical information on water depths and hazards such as shoals and hidden rocks. Regulations under the *Canada Shipping Act, 2001* and the *Arctic Waters Pollution Prevention Act* require the master of each ship to carry on board the most recent editions of charts and nautical publications necessary for the intended voyage.

3.15 In Canada, under the authority delegated to Fisheries and Oceans Canada under the *Oceans Act*, the Canadian Hydrographic Service (CHS) is responsible for providing hydrographic products and services. Through hydrographic surveys (Exhibit 3.3), the CHS collects key data on water depths, geographical features, hazards to navigation, tides, and other important waterway characteristics to produce official nautical charts in paper or electronic format. The CHS also produces supporting publications, such as sailing directions and information on tides and currents.

3.16 Overall, we found that many higher-risk areas in the Canadian Arctic are inadequately surveyed and charted, and that capacity for this work is limited. Only a small percentage of the region has modern hydrography coverage. This means that many charts available to mariners may not be current or reliable.

Exhibit 3.3 Hydrographic survey methods have improved over time

The quality and accuracy of nautical charts depend on the data used to produce them. Modern charts are compiled from hydrographic surveys conducted on vessels equipped with sonar technology that measures water depths, while satellite navigation systems, such as the global positioning systems, determine the precise geographic positions of the vessels' soundings. Data collected through post-1970s technology, including single-beam sonar technology, is referred to as "surveyed to adequate standards." Data collected through multi-beam sonar technology that became commercially available in the 1990s is referred to as "surveyed to modern standards."

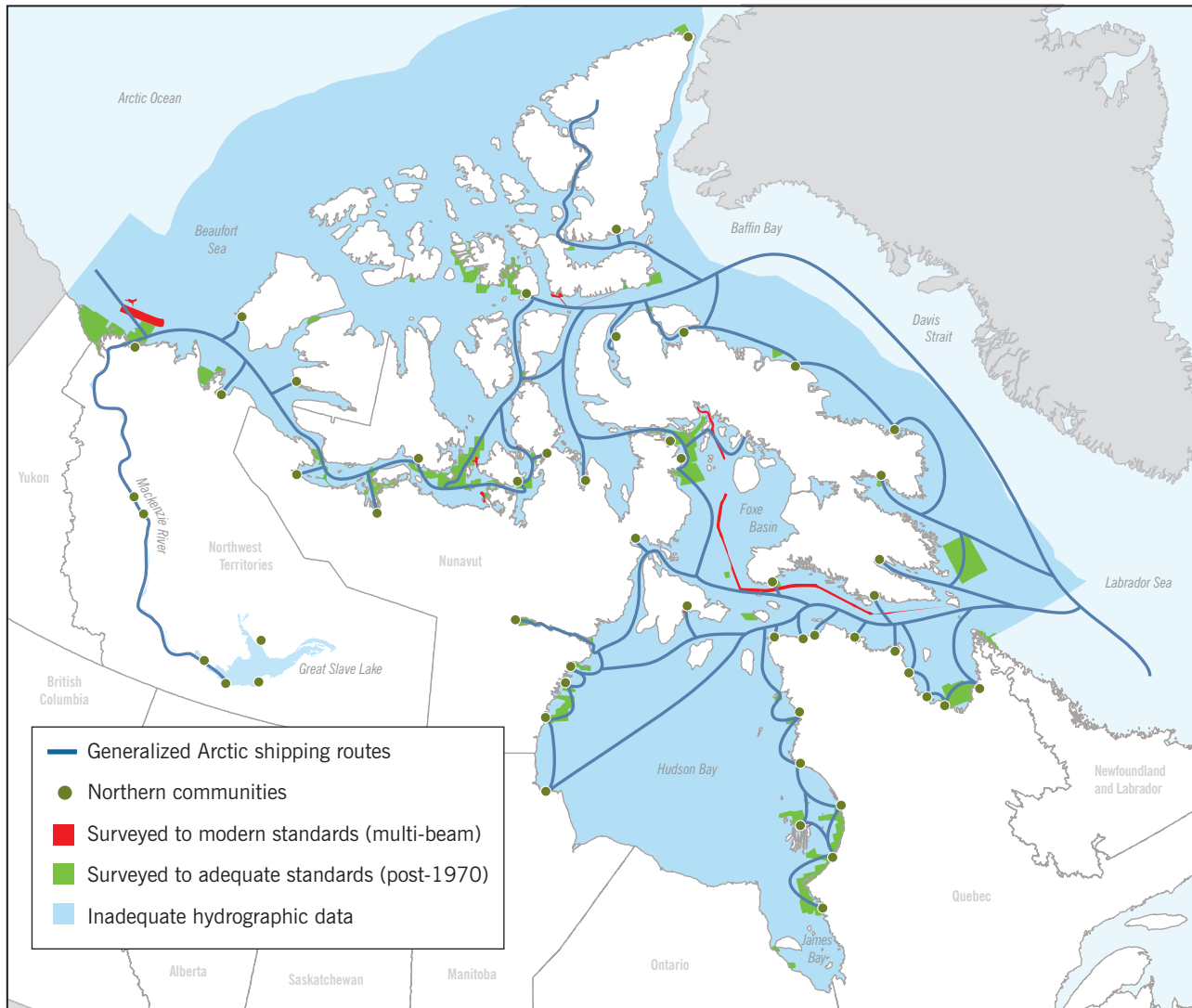


Source: Adapted from the Canadian Hydrographic Service

Canadian Arctic waters are inadequately surveyed and charted

3.17 Hydrographic surveys. Canada's Arctic waters are vast and its coastlines are among the longest in the world. Although it is not reasonable to expect the entire Arctic to be surveyed to modern standards today, we did expect there to be reliable information for the higher-risk areas of the Arctic where vessel traffic is most prevalent, such as approaches to northern communities. However, we found that large areas of Canadian Arctic waters, including many of the main traffic corridors, have either non-existent or inadequate hydrography data coverage. The CHS estimates that about one percent of Canadian Arctic waters are surveyed to modern standards (Exhibit 3.4).

3.18 Nautical charts. The charts based on data collected through hydrographic surveys that do not meet adequate or modern standards generally have a high likelihood of undetected hazards and uncertainty

Exhibit 3.4 Many Arctic shipping routes have inadequate surveys and charts

Note: Not all northern communities are represented on the map.

Source: Adapted from Fisheries and Oceans Canada

in position of the data. The CHS has conducted an assessment of its paper charts in the Arctic, on the basis of factors such as their age (10 percent of charts for the Arctic date from 1970 or before), the reference system used to establish data positions, and whether any more recent information not included in the charts was available. The assessment found less than 25 percent of the paper charts in the Arctic to be “good.” Northern remote communities depend on marine transportation for supplies and fuel, yet many of these communities do not have adequate inshore charts.

3.19 Adequate charts are also important for emergency response and search and rescue activities in Arctic waters. This was evident in August 2010 when, as part of a search and rescue operation for a passenger vessel that was grounded on a shoal in Coronation Gulf (Exhibit 3.1), the CHS was brought in to survey the area to ensure the safety of rescue vessels and to provide safe routes to local ports. Our recommendation on surveying and charting is found at paragraph 3.23.

Capacity to survey and chart Canadian Arctic waters is limited

3.20 The Canadian Hydrographic Service (CHS) conducts surveys in the Arctic mainly based on opportunity and therefore cannot address the higher-risk areas first. The CHS does not have vessels dedicated to data collection in the Arctic and relies primarily on the Canadian Coast Guard's vessels to do so. Coast Guard vessels are used as a platform from which CHS deploys its survey launches. This means that the CHS collects data in areas where the Coast Guard is operating for other reasons; for example, while icebreakers are on standby for ice escorts. The CHS also collaborates with other federal departments, territorial governments, or academic organizations for data collection.

3.21 The Arctic Marine Advisory Board Aids to Navigation and Charting Sub-committee, which is co-chaired by shipping industry representatives and the Canadian Coast Guard, is a means to inform the hydrographic needs in the Arctic. The CHS has indicated that because its data collection activities are dictated by vessels operated by the Canadian Coast Guard, the Royal Canadian Navy, and other organizations, it does not prioritize requests by this Sub-committee.

3.22 While demands for charting in the Arctic are growing, the CHS's resources to do hydrographic work in the Arctic have recently declined. This is an additional challenge on top of a lack of dedicated vessels for conducting surveys, the size and remoteness of the Arctic waters, and the short season in which to carry out the work.

3.23 Recommendation. Fisheries and Oceans Canada (Canadian Hydrographic Service) should identify the areas of the Arctic region that need to be surveyed and charted, and prioritize them on the basis of needs across the country. The CHS should develop a long-term implementation plan with cost estimates, timelines, and options that could include collaboration with partners, alternative service delivery, and the use of modern technologies.

The Department's response. Agreed. A National Charting Priority Planning tool will be designed to prioritize future hydrographic surveying and charting efforts. When developed and implemented, the tool will allow leveraging synergies and maximizing opportunities for missions in collaboration with federal, provincial, and territorial governments. (Target date: September 2016 and ongoing.)

Input from mariners through the Arctic Marine Advisory Board and other venues will continue to be sought on an ongoing basis in order to allow enhanced collaboration with potential partners. (Target date: September 2016 and ongoing.)

The Canadian Hydrographic Service will work to complete a technology study by the 2016–17 fiscal year, in order to evaluate the best and most effective technologies to be used.

The Northern Marine Transportation Corridors Initiative planning phase will be finished in 2017. Subsequently, the Multi-year Operational Plan will be put in place in 2018. Chart development and production will start immediately after the completion of each field survey, as detailed in the Multi-year Operational Plan.

Aids to navigation



A shore light, Cape Hopes Advance, Quebec
Photo: Canadian Coast Guard

3.24 Aids to navigation are devices or systems not located in vessels that are provided to assist mariners in determining position and course, to warn of dangers or obstructions, or to advise them of the location of preferred routes. There are several types of aids to navigation:

- Short-range marine aids to navigation include any fixed or floating visual aids such as day beacons, shore lights, and buoys; audible aids such as bells, whistles, and fog horns; and electronic aids, such as radar reflectors and radar beacons.
- Long-range aids to navigation include the Differential Global Positioning System, which increases the positional accuracy of global positioning system signals.

3.25 Under the *Oceans Act*, the Canadian Coast Guard has authority to provide aids to navigation in Canadian waters to facilitate the safe and efficient movement of maritime traffic. The Coast Guard provides over 17,000 short-range marine aids across Canada. There are 340 aids to navigation in the Arctic outside the Mackenzie River and Great Slave Lake areas. These aids are divided into 43 systems and consist mainly of fixed visual aids such as day beacons, ranges, and shore lights.



An unlit fixed aid, Tibjak Point, Northwest Territories

Photo: Canadian Coast Guard

3.26 Overall, we found that the Canadian Coast Guard has not reviewed systems of aids to navigation in the Arctic according to its program directives, and it has made little progress in reviewing requests by the shipping industry for new or modified aids to navigation. As a result, the Canadian Coast Guard cannot provide assurance to mariners that aids to navigation meet their needs for safe and efficient navigation in the higher-risk areas of the Arctic.

The Canadian Coast Guard has not completed required reviews of aids to navigation in the Arctic

3.27 The conditions under which aids to navigation are to be provided are established in the Canadian Coast Guard's program directives and published service standards, based on various factors, including type and volume of vessel traffic, the degree of risk, and the cost of service. The Coast Guard uses a review process to determine whether aids to navigation are required at a given site; to ensure that aids to navigation meet legitimate user requirements; to identify gaps, risks, and priority areas for action; and to ensure that aids are provided in accordance with the Coast Guard's procedures and directives.

3.28 The Canadian Coast Guard conducts three types of reviews of systems of aids to navigation:

- initial reviews for systems that have never been evaluated under its directives,
- cyclical reviews every five years to confirm that systems are still relevant, and
- ad hoc reviews such as those that could be triggered by a serious incident, or a request from users for a new or modified aid to navigation.

3.29 We found that only 23 of 43 systems in the Arctic outside the Mackenzie River and Great Slave Lake areas have had an initial review, and only 2 of these 23 were reviewed as part of the cyclical review process. We also found that despite repeated requests by the shipping industry for new or modified aids to navigation in 30 locations in the Arctic, reviews of only two of these locations were conducted by the Canadian Coast Guard. Industry stakeholders have expressed concern that there has been little progress in addressing their requests. An example of a request by industry is illustrated in the Transportation

Safety Board of Canada's investigation report on a grounding event in Chesterfield Narrows (Exhibit 3.5). The Canadian Coast Guard acknowledges that it has resources to maintain its existing network of aids to navigation only, not to cover the addition of new aids.

Exhibit 3.5 Aids to navigation enhance safe shipping

On 25 October 2012, while returning from a fuel delivery operation in Baker Lake, Nunavut, the tanker *Nanny* ran aground in Chesterfield Narrows (Exhibit 3.1). This was one of four instances of vessel groundings in the area since 2007. Vessel traffic for the Baker Lake area had increased from an average of 7 transits a year from 2002–2006 to an average of 30 transits a year from 2007–2011, as a result of the construction and operation of the nearby Meadowbank gold mine.

Chesterfield Narrows is a challenging passage, with very small distances between known hazards. To assist vessels, the Coast Guard established two pairs of unlit range beacons. While most transits are made during daylight, some are made during darkness, especially at the end of the shipping season when there are fewer daylight hours.

Given the increased tanker traffic, and the fact that transits are occurring during darkness, industry requested in 2010 and 2011 that the two pairs of range beacons be fitted with lights. At the time of the groundings, the range beacons remained unlit. The Coast Guard has yet to complete a review of the system of aids to navigation at this location to determine a cost-effective and sustainable solution.

3.30 The methodology used by the Canadian Coast Guard for the design and review of aids to navigation systems dates back to 1989 and it is currently being revised. This project, originally scheduled to be completed by March 2014, was unfinished at the time of our audit.

3.31 Recommendation. Fisheries and Oceans Canada (Canadian Coast Guard) should conduct the required reviews of aids to navigation systems to identify where new or modified aids to navigation may be needed. It should then develop an implementation plan with cost estimates, timelines, and options that could include collaboration with partners, alternative service delivery, and use of prospective new technologies.

The Department's response. Agreed. The Canadian Coast Guard will work to review the aids to navigation systems. Priority will be given to the identified corridors, in consultation with affected mariners. The Coast Guard will consider modern and efficient solutions for service delivery, in accordance with international guidelines and regulations. An implementation plan, which includes costs, timelines, and options, will be prepared by March 2018. This will allow the Coast Guard time to implement the new Aids to Navigation System Review Methodology and to conduct reviews that will inform the implementation plan.

**Marine weather
and ice information**

3.32 Under the *Department of the Environment Act*, Environment Canada's Meteorological Service of Canada is responsible for providing weather and ice information services to Canadians, including for the Arctic. It also develops special services for targeted clients, including both domestic and foreign vessels. In the case of ice information, the Canadian Coast Guard is both the main client and a partner with Environment Canada's Canadian Ice Service in providing ice information services.

3.33 Overall, we found that Environment Canada has been actively improving weather and ice information in the Arctic. Obligations to meet international commitments, the service standard for gale warnings, and increasing marine activity in the Arctic will, however, require further work. Environment Canada also needs to monitor and assess any impacts that may arise from new challenges for acquiring satellite data and from the changing relationship with the Canadian Coast Guard. Safe marine navigation in the Arctic depends on accurate and timely weather and ice information to help to minimize the risk of accidents in this challenging operating environment.

Weather and ice information has been improving in the Canadian Arctic

3.34 At the international level, Canada has accepted the responsibility of providing weather and ice information for two regions in the Arctic established under the auspices of the International Maritime Organization, called METAREAs XVII and XVIII. We found that with resources obtained under the program established in the 2010–11 fiscal year to meet Canada's METAREAs commitments, Environment Canada has made significant improvements to weather and ice information for marine clients in the Arctic. For example, the Meteorological Service of Canada has taken steps to improve the accuracy of Arctic weather information by expanding the observation network. It has also begun work to improve the models that use data from the network to inform weather and ice products.

3.35 Despite the progress made by the METAREAs program, there are areas that require further work to improve weather and ice information in the Arctic. Although current funding will end in March 2015, Canada's international commitments to provide information for METAREAs XVII and XVIII will continue for the foreseeable future. In addition, in February 2014 Environment Canada published its standards for gale warnings, which will require improving the timeliness of the warnings. Finally, as new types and greater numbers

of marine vessels begin to travel in the Arctic, Environment Canada will need to continue adapting its products and services to meet client needs.

New challenges in ice information services have emerged

3.36 Environment Canada is currently facing two important challenges that could pose risks to the accuracy and timeliness of ice information. First, acquiring radar satellite imagery from external sources to assess ice conditions has recently become more difficult. Two key satellites ceased operating in 2012 and 2013, while the overall demand from other federal departments for satellite services is increasing. Radar satellites are a crucial resource not only for ice services, but also for detecting accidental spills or illegal discharges of oil from vessels in the Arctic. The Canadian Ice Service is evaluating the suitability of alternate sources of imagery that could help to address its needs.

3.37 Another important challenge is that the partnership arrangements between the Canadian Ice Service and the Canadian Coast Guard are changing. The 2005 Ice Information Services Partnership Agreement between these two entities set out their roles and responsibilities in detail, but it expired in December 2010. A new agreement remains in negotiation. At the same time, by the 2015–16 fiscal year the Coast Guard’s contributions to ice services Canada-wide are scheduled to decline by about 40 percent compared with the average from 2007 to 2012. One important consequence of these reductions is that as of 2014, Environment Canada’s ice service specialists are no longer stationed on Coast Guard icebreakers. The specialists observe, collect, and provide information on ice and meteorological conditions to support navigation decisions. Therefore, alternate ways of observing ice conditions must be found. It is not clear what impacts these changes will have on the accuracy and timeliness of ice information.

3.38 Recommendation. Environment Canada (Meteorological Service of Canada) and Fisheries and Oceans Canada (the Canadian Coast Guard) should monitor and assess any impacts to the accuracy and timeliness of ice information that could arise from

- changes in the cost and/or availability of radar satellite imagery for purposes of ice information; and
- changes in the respective roles and responsibilities of the two departments for ice services in the Arctic.

The Departments' responses. Agreed. Environment Canada and Fisheries and Oceans Canada will continue to evaluate the impacts arising from changes in the cost and availability of radar satellite imagery for the purpose of ice information.

Under a renewed service agreement, both departments will monitor and assess the impacts arising from any changes in their respective roles and responsibilities for ice services in the Arctic. The assessment will begin this fiscal year but will continue through the 2015 Arctic shipping season to be concluded in 2016.

Icebreaking services

3.39 Icebreaking services help to ensure the reliability and predictability of planning and scheduling activities of marine transportation in ice-covered waters. Under the *Oceans Act*, the Canadian Coast Guard has authority to provide icebreaking services to support the safe, economical, and efficient movement of ships in Canadian waters. The Canadian Coast Guard annually deploys six icebreakers that support marine navigation and other programs in the Canadian Arctic, with a seventh icebreaker dedicated to scientific research. The icebreakers typically operate in the Arctic from June to November each year.

3.40 In Canada's North, icebreaking services include

- providing ice information (in partnership with the Canadian Ice Service, as discussed in the previous section) and ice routing advice to other vessels in the Arctic;
- escorting individual vessels and convoys, freeing ships beset in ice (Exhibit 3.6), and maintaining shipping channels and tracks through ice;
- harbour breakout; and
- providing supplies for Arctic communities when commercial services are not available.

3.41 We examined whether the Canadian Coast Guard has identified any gaps in the provision of these services and if there are any risks related to identified gaps. We also examined whether the Coast Guard has assessed if these services are meeting user needs.

3.42 Overall, we found that the Canadian Coast Guard's icebreaking presence in the Arctic is decreasing while vessel traffic is increasing. The Canadian Coast Guard does not know whether the services it provides are meeting the needs of users, and it has not assessed the risks that decreasing icebreaker presence may pose for safe navigation in the Arctic.

Exhibit 3.6 Icebreaking services assist ships stuck in ice

When a vessel becomes trapped in pressured ice, it is called a “besetting incident”; the ship goes wherever the ice goes. Some vessels are damaged during these incidents. Pressured ice has gained increasing recognition as a major threat to navigation in northern regions. During the 2012 shipping season, ice conditions in Frobisher Bay along the route used to supply Iqaluit in Nunavut (Exhibit 3.1) were particularly severe and led to several besetting incidents. A recent study of four cases reported that the vessels were each trapped for several days, and that all four had to be freed by Coast Guard icebreakers. In some of these cases, as soon as the icebreaker escort operations ended, the vessels became beset again.



Coast Guard icebreaker Terry Fox (in foreground) frees a ship from ice in Frobisher Bay, 25 July 2012.

Photo: Denis Lambert, Environment Canada

Mechanisms are not in place to assess whether icebreaking services meet user needs

3.43 The Canadian Coast Guard’s standard for providing icebreaking escorts in the Arctic is to respond within 10 hours to requests for assistance. In cases where an escort was provided, Coast Guard records show that this commitment was met about 88 percent of the time from 2010 to 2013. This result, however, may not accurately reflect user needs or the Coast Guard’s ability to provide icebreaking escort services since the records do not include instances where icebreaking services were requested but not provided.

3.44 The Canadian Coast Guard consults with stakeholders both before and after the seasonal icebreaker fleet deployment in order to develop its plans for the season and share lessons learned for the next season. However, we found that the Coast Guard does not measure performance for the other Arctic icebreaking services, such as freeing vessels stuck in ice or maintenance of shipping channels and tracks through ice. In the absence of a robust performance measurement system, it is difficult for the Coast Guard to know the extent to which it is meeting user needs. Our recommendation on performance measurement is found at paragraph 3.50.

Icebreaker presence in the Arctic is decreasing

3.45 Icebreaker deployment time. The Canadian Coast Guard has decreased the number of days it operates icebreakers in the Arctic. Since 2011, the Coast Guard has decreased by 33 ship days the total time it planned to deploy icebreakers in the Arctic. In addition, in two of the last four years, the Coast Guard operated one less icebreaker in the Arctic than intended due to maintenance issues, and it did not meet its planned deployment times for those two years.

3.46 User demands for longer icebreaking season. The Canadian Coast Guard has not met repeated requests by industry to support an extended icebreaking season. In each year since at least 2007, commercial vessels have entered the Arctic earlier and left later than Coast Guard icebreakers. In the future, user needs are likely to continue to increase as sea ice further recedes and there is greater marine access and longer seasons of navigation across the Arctic. The Coast Guard has noted that while it has resources to address current traffic levels, it does not have sufficient resources to respond to an increasing demand for services.

3.47 Icebreaker refit and decommissioning. The six vessels providing icebreaking services in the Arctic are on average over 30 years old and are approaching the end of their operational lives. Funded plans are in place to extend the operations of five of these vessels by between 8 and 15 years. There are no other icebreakers of equal capability to replace the vessels undergoing refit, which will leave at most five icebreakers available for service nearly every season until 2021.

3.48 The two most capable icebreakers in the fleet are scheduled to be decommissioned in 2020 and 2022. The Government of Canada has announced the construction of one new polar icebreaker, currently planned to be available for full service by 2022. However, this will not result in an increase in the number of icebreakers in the fleet since the new vessel will replace only one of the two icebreakers to be decommissioned.

3.49 In summary. This reduced presence in the Arctic means that icebreakers serving the region may have to cover more territory and may take longer to respond to user requests for icebreaking services. The Canadian Coast Guard is challenged to respond to all the needs of the marine shipping industry, as there are a limited number of icebreakers. These ships are also tasked to other programs throughout

Canada, including search and rescue, environmental response, aids to navigation, fisheries enforcement, and science. We found that the Coast Guard has not assessed the level of risk that a decreased presence in the Arctic may pose for supporting safe navigation.

3.50 Recommendation. Fisheries and Oceans Canada (Canadian Coast Guard) should improve its performance measurement system in order to assess whether its icebreaking services meet user needs in the Arctic. The Coast Guard should also assess the risk associated with the projected increases in vessel traffic, changing environmental conditions, and the capacity of its icebreaker fleet in the Arctic to provide necessary programs and services.

The Department's response. Agreed. The Canadian Coast Guard will complete its review and update of its national Performance Measurement Strategy for Marine Navigation, which includes icebreaking services in the Arctic, by March 2015. The Coast Guard has already performed some preliminary analysis through the Northern Marine Transportation Corridors Initiative. An assessment of the risks associated with changing traffic patterns and fleet capacity, as they relate to programs and services in the Arctic, will be completed through this initiative by March 2016.

Monitoring of marine traffic and spills

3.51 Transport Canada is the lead authority for implementing and enforcing the *Arctic Waters Pollution Prevention Act* and the *Canada Shipping Act, 2001*. In order to discharge its enforcement mandate, Transport Canada is responsible for monitoring Arctic waters and conducting inspections to prevent vessels from entering zones they cannot navigate safely, as well as detecting and deterring spills and illegal discharges of pollution by ships.

3.52 Pursuant to the *Oceans Act* and the *Canada Shipping Act, 2001*, the Canadian Coast Guard is responsible for providing marine communications and traffic services. This responsibility includes implementing the *Northern Canada Vessel Traffic Services Zone Regulations* (NORDREG), which promotes safe and efficient navigation as well as environmental protection. The Regulations require vessels of 300 gross tonnage or more (generally about 30 metres in length), and those carrying pollutants or dangerous goods as cargo, to report information about the vessel and its route. The Coast Guard is also responsible for using automatic tracking tools to obtain additional information about vessels and their locations.

3.53 Overall, we found that Transport Canada and the Canadian Coast Guard have surveillance and monitoring mechanisms in place to support their enforcement of safety and pollution prevention laws for marine traffic in the Arctic. However, the departments could make useful improvements by

- developing tools for detecting hazardous and noxious substances,
- managing risks that could arise from new challenges in acquiring satellite data,
- improving information about risks from vessels not required to report, and
- better managing vessel traffic data.

Making these incremental improvements would help ensure that the departments' capacity for surveillance and monitoring keeps pace with future increases of marine traffic in the Arctic.

Transport Canada and the Canadian Coast Guard have mechanisms for surveillance and monitoring of most marine traffic in the Arctic

3.54 Transport Canada and the Canadian Coast Guard use a wide range of mechanisms for surveillance and monitoring of marine traffic in the Arctic. The NORDREG reporting system is the primary means for this, but the departments also make extensive use of tools for automatically tracking vessel movements, as well as a vessel inspection regime. Apart from these regular and routine mechanisms, the departments may obtain information about vessels from ad hoc means such as monitoring online blogs and receiving tips from the public or other government agencies. Overall, gaps in any one specific mechanism are usually covered by one or more of the others, and the diversity of the tools allows the departments to cross-check information for greater assurance.

3.55 Transport Canada detects spills of petroleum products using other mechanisms. The National Aerial Surveillance Program (NASP) is the primary program for this purpose, consisting of one Dash 7 plane dedicated to Arctic surveillance during the shipping season (Exhibit 3.7). In addition to spill detection, the Program is capable of combining multiple objectives in each flight mission, such as ice reconnaissance and monitoring ships. Transport Canada also uses Environment Canada's Integrated Satellite Tracking of Pollution (ISTOP) program to help scan Arctic waters for potential spills and other incidents to be investigated further by a NASP plane. Both NASP and ISTOP have been steadily increasing their activities in the Arctic over the past decade.

Exhibit 3.7 The National Aerial Surveillance Program's Dash 7 plane is equipped for multipurpose missions



Some aspects of surveillance and monitoring warrant further attention

3.56 Although the existing surveillance and monitoring mechanisms are generally adequate to the current context of marine activities in the Canadian Arctic, there are four areas that warrant further efforts to improve the system. These are opportunities for targeted efforts in the short and medium term to prepare for future increases in vessel traffic.

3.57 Detecting hazardous and noxious substances. Transport Canada has no mechanisms in place for detecting hazardous and noxious substances, such as ammonium nitrate, lead concentrate, and naphthalene, which could be spilled in Canadian Arctic waters. While historically the number of shipments of these types of substances has been low, this could change if new resource development projects go forward in the future. Transport Canada is working with international partners on a project to develop detection capability for selected hazardous and noxious substances.

3.58 Accessing satellite imagery. Through its partnership with ISTOP, Transport Canada relies on the same radar satellite data to detect oil spills as Environment Canada uses to assess ice conditions. The concerns we raise in paragraph 3.36 regarding the challenge of obtaining sufficient satellite imagery could also pose risks for Transport Canada's capacity to detect spills from vessels in the Arctic.

3.59 Detecting vessels not required to report. There are certain cases where NORDREG and the automatic tracking mechanisms do not apply. For example, some small pleasure craft, tug boats, and research vessels are not required to report to NORDREG, and they are not required to carry equipment for automatic tracking. Transport Canada believes that this gap does not pose significant environmental risks relative to its enforcement mandate, but there is no documentation to support this position.

3.60 Managing vessel traffic data. Transport Canada and the Canadian Coast Guard do not have a coherent and reliable account of the characteristics of all marine traffic in the Arctic. Different sources of data used by the departments are inconsistent with each other and contain gaps. We are concerned that this information is not sufficient for making good policy decisions regarding ongoing improvement of the surveillance and monitoring regime to meet the needs of the future. In recent years, Transport Canada and the Coast Guard have formed new partnerships with other federal entities in the Marine Security Operations Centres that may begin to improve the reliability and coherence of Arctic marine traffic data.

Vision and strategies

3.61 The Government of Canada has recognized the importance of the Arctic region in its publication of Canada’s Northern Strategy in 2009 and in its Statement on Canada’s Arctic Foreign Policy in 2010. As chair of the Arctic Council for 2013–2015, Canada has identified “safe Arctic shipping” as one of the three priorities of its chairmanship. Parliamentary committees, both in the House of Commons (2013) and the Senate (2009), have also studied marine transportation issues in the Arctic and have recognized that limited infrastructure and support services represent challenges to safe marine navigation. The committees recommended that a long-term strategic vision is required to guide future departmental activities and to focus infrastructure and services on the most critical needs.

3.62 We examined whether three federal departments that have key roles in supporting safe marine transportation—Transport Canada, Fisheries and Oceans Canada, and Environment Canada—have strategies in place to guide their respective policies, initiatives, activities, and legislated responsibilities as they pertain to the Arctic. We also examined whether the departments have coordinated their strategies, and whether the strategies are aligned toward a common vision for marine transportation in Canadian Arctic waters. The examination also involved comparing elements of Arctic marine transportation, as found in Canada’s key Arctic policy documents

(Canada's Northern Strategy and Canada's Statement on Arctic Foreign Policy), with the national strategies of other Arctic nations.

3.63 Overall, we found that there is no long-term national vision or coordinated departmental strategies to support safe marine transportation in the Arctic. The government has recognized that a strategic and coordinated approach is important to aligning federal efforts and supporting responsible development of the North. A vision for the Arctic would provide the coherent direction needed to address emerging risks as maritime traffic increases in the region.

Canada's Northern Strategy does not provide a vision for marine transportation

3.64 Canada's Northern Strategy contains few elements related to supporting safe marine transportation, in comparison with the national strategies of other Arctic nations, including the United States, Denmark, Norway, Finland, and Sweden. Key elements related to marine transportation that we looked for in the strategies included references to charting and hydrography, aids to navigation, weather and ice information, icebreaking, vessel detection, and ship design and construction standards. Some other national strategies identified responsibilities, timelines, and specific targets. Canada's Northern Strategy does not provide such clear commitments.

3.65 Canada's Statement on Arctic Foreign Policy has more references to elements that support safe marine transportation, but the document focuses on Canada's contributions to international initiatives, rather than on the government's domestic activities or plans.

3.66 We found that the lack of elements related to marine transportation in Canada's Northern Strategy is inconsistent with its priority as current chair of the Arctic Council. In our view, this is a significant gap, given the importance of marine transportation to economic development and to communities in the North.

No department has a coordinated strategy for safe marine transportation in the Arctic

3.67 We found that none of the departments we examined had a strategy in place to support safe marine transportation in the Arctic. Transport Canada is currently developing a Northern Transportation Action Plan, which is intended to serve as an umbrella for all of the Department's activities related to transportation in the Arctic. In 2011, the Canadian Coast Guard and Fisheries and Oceans Canada drafted a vision for the Arctic, which included key elements related to safe marine transportation, but this was never published or finalized.

3.68 Transport Canada, the Canadian Coast Guard, and the Canadian Hydrographic Service, in consultation with other federal organizations, including Environment Canada, recently began working together on the Northern Marine Transportation Corridors Initiative. This initiative aims to identify transportation corridors for Canadian Arctic waters, which will help to focus departmental efforts and resources on the basis of historical and projected marine traffic patterns, navigation risk, environmental sensitivity, and cultural significance.

3.69 While this initiative is not expected to be complete until 2022, the departments have proposed preliminary traffic corridors. These initial results have been presented to some stakeholders, but the planned consultation process had not yet begun by the time our audit was completed.

3.70 The Corridors Initiative is a first step toward focusing and coordinating departmental resources in developing safe and efficient marine transportation corridors in the Arctic. While the Initiative is not intended to address the full range of issues facing marine transportation in Canada's North, it could nevertheless serve as a cornerstone for the development of a national vision on marine transportation and Arctic development.

3.71 Marine transportation in the Arctic has been increasing, and is expected to continue to increase in the coming decades. A long-term national strategic vision for safe marine transportation in the Arctic could help facilitate the responsible development of the region, and provide more certainty to support business investment. A strategic vision, developed in consultation with northern residents, communities, territorial governments, civil society, and industry, could also provide a framework for addressing the gaps and recommendations we identified in this audit, including opportunities for collaboration, partnerships, and alternative service delivery. It would provide clear direction to departments to help focus resources to best address priorities. It could also address other critical issues that we did not examine in this audit, such as marine transportation infrastructure in the North.

3.72 More broadly, a strategic long-term vision for Arctic marine transportation could contribute to clarifying the government's position with respect to questions such as the following:

- Are the appropriate controls in place to continue to manage vessel traffic in a manner that supports efficient, safe, and environmentally responsible navigation?

- What types and level of navigation support services, including infrastructure, is it appropriate for the federal government to provide in the Canadian Arctic?
- To what degree should other levels of government, industry, and other users contribute to services and infrastructure that support efficient, safe, and environmentally responsible marine transportation in Canada's Arctic?
- How will this vision relate to, and support, other existing initiatives, such as Canada's Northern Strategy?

3.73 Recommendation. Transport Canada, in consultation with Fisheries and Oceans Canada, Environment Canada, other federal departments and agencies, as well as partners and other stakeholders as appropriate, should lead the development of a long-term vision and strategy for safe Arctic marine transportation. This could be aligned with Canada's Northern Strategy and could build on the work already underway by departments such as the Northern Marine Transportation Corridors Initiative and the Northern Transportation Action Plan.

The Department's response. Agreed. In consultation with other federal departments and agencies as well as other stakeholders as appropriate, Transport Canada will develop a long-term approach for marine transportation in Canada's Arctic waters to support marine navigation that continues to be safe, secure, clean, and efficient and that facilitates responsible economic development and essential services to communities in Canada's Arctic.

The approach would potentially address regulatory, service, environmental information, and infrastructure improvements. As well, Transport Canada would consider opportunities for collaboration and partnership.

The approach would align with the overall objectives of Canada's Northern Strategy and would incorporate, and possibly build upon, initiatives already identified or being developed, including the Northern Transportation Action Plan and the Northern Marine Transportation Corridors Initiative. Completion date: Spring 2016.

Conclusion

3.74 Marine traffic in Canada's Arctic is increasing as sea ice retreats. Although the volume of traffic in the region is low compared with southern Canadian waters, some projections indicate that mining projects in the eastern Arctic alone could result in nearly doubling the annual number of marine voyages by 2020. In addition, the ongoing growth of northern communities and increasing tourism is expected to drive further marine traffic increases.

3.75 For the areas that we examined, we concluded that Environment Canada, Transport Canada, and Fisheries and Oceans Canada adequately support safe marine navigation in the Arctic, in the context of current levels of vessel traffic.

3.76 For example, Environment Canada has been actively improving weather and ice information in the Arctic. In addition, Transport Canada and the Canadian Coast Guard have surveillance and monitoring mechanisms in place to support their enforcement of shipping-related safety and pollution prevention laws in the Arctic. The departments have recently begun working together on the Northern Marine Transportation Corridors Initiative, which will help to focus their efforts and resources in developing safe and efficient marine transportation corridors in the Arctic.

3.77 However, we found gaps and emerging risks that, if left unaddressed, will only grow as marine traffic increases in the region. These gaps and risks are exacerbated by the lack of a long-term strategic vision for marine transportation in the Arctic, which would help to prioritize, direct, and coordinate plans and investments for this vast frontier.

3.78 For example, we found a significant gap in the area of surveying and charting—a foundational requirement of safe navigation. While some surveys and charts are improved each season in the Arctic, many higher-risk areas remain inadequately surveyed and charted, and capacity to conduct this work is limited. As well, the Canadian Coast Guard has not reviewed systems of aids to navigation in the Arctic according to its program directives, and it has made little progress in reviewing requests by the shipping industry for new or modified aids to navigation. Furthermore, the Coast Guard has not assessed the risks associated with its icebreaking capacity and increases in vessel traffic in the Arctic.

3.79 In the dynamic and operationally challenging context of the Canadian Arctic, Transport Canada and Environment Canada will need to continue adapting their programs to keep pace with increasing marine traffic and demands for new services and products. There are opportunities for Transport Canada to make incremental improvements to its surveillance and monitoring programs, and Environment Canada will need to continue to work toward meeting its existing commitments to improve marine weather and ice information. Environment Canada also needs to assess and monitor any impacts that may arise from new challenges for acquiring satellite data and from its changing relationship with the Canadian Coast Guard.

3.80 Although the services included in our audit work currently work together to support safe navigation at existing vessel traffic levels, we are concerned that the Government of Canada may not be prepared to deal with increased ship traffic in the future. In our view, a long-term vision and strategy for marine transportation in the Arctic, developed in consultation with northern residents, communities, governments, civil society, and industry, is important to meet the challenges and opportunities in the changing Arctic.

About the Audit

The Office of the Auditor General's responsibility was to conduct an independent examination of departmental programs and services that support safe marine navigation in Canada's Arctic to provide objective information, advice, and assurance to assist Parliament in its scrutiny of the government's management of resources and programs.

All of the audit work in this chapter was conducted in accordance with the standards for assurance engagements set out by the Chartered Professional Accountants of Canada (CPA) in the CPA Canada Handbook—Assurance. While the Office adopts these standards as the minimum requirement for our audits, we also draw upon the standards and practices of other disciplines.

As part of our regular audit process, we obtained management's confirmation that the findings reported in this chapter are factually based.

Objective

The objective of this audit was to determine whether key federal departments adequately support safe marine transportation to mitigate the risks of spills in Canadian Arctic waters.

Scope and approach

This audit examined whether Transport Canada, Fisheries and Oceans Canada (including the Canadian Coast Guard and the Canadian Hydrographic Service), and Environment Canada have adequately supported safe marine navigation to mitigate significant environmental risks in Canadian Arctic waters.

Our audit work included an examination of whether these key federal departments have coordinated strategies to support safe marine navigation in the Arctic. Our audit work also focused on the supporting services that departments carry out to help prevent or deter accidents and releases into the marine environment. These include the

- production of navigational charts,
- deployment and maintenance of aids to navigation,
- provision of weather and ice information,
- provision of icebreaking services, and
- use of mechanisms to detect and track marine traffic and spills.

For each line of enquiry, we examined whether departments have established clear roles and responsibilities; assessed gaps in their policies, strategies, programs, and activities; and developed plans to address any identified gaps.

Items that were not part of the scope of this audit included

- provisions for ship construction, design, equipment, crewing, training, and operations, aimed at the safety and protection of the Arctic environment;

- Arctic marine infrastructure, such as port services and reception facilities for ship-generated waste; and
- emergency preparedness and response, and spill remediation.

In carrying out our audit, we interviewed officials at Environment Canada, Fisheries and Oceans Canada, and Transport Canada, as well as stakeholder organizations. We also reviewed and analyzed departmental documentation.

Criteria

Criteria	Sources
To determine whether key federal departments adequately support safe marine transportation to mitigate the risks of spills in Canadian Arctic waters, we used the following criteria:	
<p>Fisheries and Oceans Canada, Transport Canada, and Environment Canada have a shared vision and coordinated strategies to support safe marine transportation in Canadian Arctic waters.</p>	<ul style="list-style-type: none"> • Letter by the Clerk of the Privy Council and Secretary to Cabinet addressed to the Deputy Minister of Aboriginal Affairs and Northern Development Canada with the Terms of Reference for an Ad Hoc Committee of Deputy Ministers on the Arctic, 26 November 2007 • Recommendation 10 of <i>Rising to the Arctic Challenge: Report on the Canadian Coast Guard</i>, Standing Senate Committee on Fisheries and Oceans Canada, April 2009 • Government response to recommendation 12 of the May 2013 Report of the Standing Committee on Foreign Affairs and International Development – Canada and the Arctic Council: <i>An Agenda for Regional Leadership</i>, October 2013 • <i>Developing Results-based Management and Accountability Frameworks for Horizontal Initiatives</i>, Treasury Board of Canada Secretariat, 2002 • Section 40.(2), <i>Oceans Act</i> • Section 4.(1)(f), <i>Department of the Environment Act</i>
<p>Transport Canada and Fisheries and Oceans Canada (Canadian Coast Guard) have the mechanisms in place to detect and track all marine traffic and spills in Canadian Arctic waters.</p>	<ul style="list-style-type: none"> • <i>Arctic Waters Pollution Prevention Act</i> • Arctic Shipping Pollution Prevention Regulations, <i>Arctic Waters Pollution Prevention Act</i> • Federal Sustainable Development Strategy (FSDS) 2010–2013 Target 3.8.7; and FSDS 2013–2016, Target 3.8.2 • Treasury Board decision and submission: <i>Health of the Oceans</i>, 2007 • Program 2.2—Clean Water from Transportation, 2013–2014 Report on Plans and Priorities, Transport Canada • Program 3.2—Marine Communications and Traffic Services, 2013–2014 Report on Plans and Priorities, Fisheries and Oceans Canada • Section 41.(1), <i>Oceans Act</i> • Section 126, <i>Canada Shipping Act, 2001</i> • Northern Canada Vessel Traffic Services Zone Regulations, <i>Canada Shipping Act, 2001</i>

Criteria	Sources
To determine whether key federal departments adequately support safe marine transportation to mitigate the risks of spills in Canadian Arctic waters, we used the following criteria: (continued)	
<p>Fisheries and Oceans Canada (Canadian Hydrographic Service) provides hydrographic products and services to support safe navigation of ships in the high-priority areas of Canadian Arctic waters.</p>	<ul style="list-style-type: none"> • Section 4.(1), <i>Department of Fisheries and Oceans Act</i> • Sections 40.(2), 42, 43 and 45, <i>Oceans Act</i> • Sections 4–7 of Chart and Nautical Publications Regulations, 1995 • Chapter V Safety of Navigation, Regulation 20, International Convention for the Safety of Life at Sea, 1974 • Program 3.7—Hydrographic Products and Services in 2013–2014 Report on Plans and Priorities, Fisheries and Oceans Canada • Recommendations III. A and D from Arctic Council’s Arctic Marine Shipping Assessment Report, 2009 • Recommendation 3 from Arctic Council’s Arctic Ocean Review Project, 2013
<p>Environment Canada (Meteorological Service of Canada) and Fisheries and Oceans Canada (Canadian Coast Guard) have the mechanisms in place to provide ice and weather information to support safe marine transportation in Canadian Arctic waters.</p>	<ul style="list-style-type: none"> • Section 4.(1), <i>Department of the Environment Act</i> • Chapter V Safety of Navigation, Regulation 4 Meteorological Services, International Convention for the Safety of Life at Sea, 1974 • Treasury Board decision and submission: Canada’s provision of meteorological services and navigational warning services for defined regions of the Arctic Ocean, 2010 • Recommendations III. A and D, Arctic Council’s Arctic Marine Shipping Assessment, 2009 • Arctic Council’s report on Snow, Water, Ice and Permafrost in the Arctic, 2011
<p>Fisheries and Oceans Canada (Canadian Coast Guard) has aids to navigation in place to support safe navigation of ships in the high-priority areas of Canadian Arctic waters.</p>	<ul style="list-style-type: none"> • Section 41.(1), <i>Oceans Act</i> • Section 128, <i>Canada Shipping Act, 2001</i> • Chapter V, Safety of Navigation, Regulation 14 Aids to Navigation, International Convention for the Safety of Life at Sea Convention, 1974 • Article 43, United Nations Convention on the Law of the Sea, 1994 • Program 1.8—Marine Navigation, in the 2013–14 Report on Plans and Priorities, Fisheries and Oceans Canada

Criteria	Sources
To determine whether key federal departments adequately support safe marine transportation to mitigate the risks of spills in Canadian Arctic waters, we used the following criteria: (continued)	
<p>Fisheries and Oceans Canada (Canadian Coast Guard) has the mechanisms in place to provide icebreaking services to support safe marine transportation in the high-priority areas of Canadian Arctic waters.</p>	<ul style="list-style-type: none"> • Section 41(1), <i>Oceans Act</i> • Section 12, <i>Arctic Waters Pollution Prevention Act</i> • Program 1.8—Marine Navigation, 2013–14 Report on Plans and Priorities, Fisheries and Oceans Canada • Recommendation III. A, Arctic Council's Arctic Marine Shipping Assessment, 2009 • Recommendation 7 of Controlling Canada's Arctic Waters: Role of the Canadian Coast Guard, Standing Senate Committee on Fisheries and Oceans, December 2009

Management reviewed and accepted the suitability of the criteria used in the audit.

Period covered by the audit

Our examination of departmental programs, initiatives, and activities covered the period from January 2010 to July 2014. However, this time frame varied with specific programs. Audit work for this chapter was completed on 18 July 2014.

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Appendix List of recommendations

The following is a list of recommendations found in Chapter 3. The number in front of the recommendation indicates the paragraph number where it appears in the Chapter. The numbers in parentheses indicate the paragraph numbers where the topic is discussed.

Recommendation	Response
<p>Hydrographic surveys and nautical charts</p> <p>3.23 Fisheries and Oceans Canada (Canadian Hydrographic Service) should identify the areas of the Arctic region that need to be surveyed and charted, and prioritize them on the basis of needs across the country. The CHS should develop a long-term implementation plan with cost estimates, timelines, and options that could include collaboration with partners, alternative service delivery, and the use of modern technologies. (3.17–3.22)</p>	<p>The Department’s response. Agreed. A National Charting Priority Planning tool will be designed to prioritize future hydrographic surveying and charting efforts. When developed and implemented, the tool will allow leveraging synergies and maximizing opportunities for missions in collaboration with federal, provincial, and territorial governments. (Target date: September 2016 and ongoing.)</p> <p>Input from mariners through the Arctic Marine Advisory Board and other venues will continue to be sought on an ongoing basis in order to allow enhanced collaboration with potential partners. (Target date: September 2016 and ongoing.)</p> <p>The Canadian Hydrographic Service will work to complete a technology study by the 2016–17 fiscal year, in order to evaluate the best and most effective technologies to be used.</p> <p>The Northern Marine Transportation Corridors Initiative planning phase will be finished in 2017. Subsequently, the Multi-year Operational Plan will be put in place in 2018. Chart development and production will start immediately after the completion of each field survey, as detailed in the Multi-year Operational Plan.</p>

Recommendation	Response
Aids to navigation	
<p>3.31 Fisheries and Oceans Canada (Canadian Coast Guard) should conduct the required reviews of aids to navigation systems to identify where new or modified aids to navigation may be needed. It should then develop an implementation plan with cost estimates, timelines, and options that could include collaboration with partners, alternative service delivery, and use of prospective new technologies. (3.27–3.30)</p>	<p>The Department’s response. Agreed. The Canadian Coast Guard will work to review the aids to navigation systems. Priority will be given to the identified corridors, in consultation with affected mariners. The Coast Guard will consider modern and efficient solutions for service delivery, in accordance with international guidelines and regulations. An implementation plan, which includes costs, timelines, and options, will be prepared by March 2018. This will allow the Coast Guard time to implement the new Aids to Navigation System Review Methodology and to conduct reviews that will inform the implementation plan.</p>
Marine weather and ice information	
<p>3.38 Environment Canada (Meteorological Service of Canada) and Fisheries and Oceans Canada (the Canadian Coast Guard) should monitor and assess any impacts to the accuracy and timeliness of ice information that could arise from:</p> <ul style="list-style-type: none"> • changes in the cost and/or availability of radar satellite imagery for purposes of ice information; and • changes in the respective roles and responsibilities of the two departments for ice services in the Arctic. (3.36–3.37) 	<p>The Departments’ responses. Agreed. Environment Canada and Fisheries and Oceans Canada will continue to evaluate the impacts arising from changes in the cost and availability of radar satellite imagery for the purpose of ice information.</p> <p>Under a renewed service agreement, both departments will monitor and assess the impacts arising from any changes in their respective roles and responsibilities for ice services in the Arctic. The assessment will begin this fiscal year but will continue through the 2015 Arctic shipping season to be concluded in 2016.</p>

Recommendation	Response
<p>Icebreaking services</p> <p>3.50 Fisheries and Oceans Canada (Canadian Coast Guard) should improve its performance measurement system in order to assess whether its icebreaking services meet user needs in the Arctic. The Coast Guard should also assess the risk associated with the projected increases in vessel traffic, changing environmental conditions, and the capacity of its icebreaker fleet in the Arctic to provide necessary programs and services. (3.43–3.49)</p>	<p>The Department’s response. Agreed. The Canadian Coast Guard will complete its review and update of its national Performance Measurement Strategy for Marine Navigation, which includes icebreaking services in the Arctic, by March 2015. The Coast Guard has already performed some preliminary analysis through the Northern Marine Transportation Corridors Initiative. An assessment of the risks associated with changing traffic patterns and fleet capacity, as they relate to programs and services in the Arctic, will be completed through this initiative by March 2016.</p>
<p>Vision and strategies</p> <p>3.73 Transport Canada, in consultation with Fisheries and Oceans Canada, Environment Canada, other federal departments and agencies, as well as partners and other stakeholders as appropriate, should lead the development of a long-term vision and strategy for safe Arctic marine transportation. This could be aligned with Canada’s Northern Strategy and could build on the work already underway by departments such as the Northern Marine Transportation Corridors Initiative and the Northern Transportation Action Plan. (3.67–3.72)</p>	<p>The Department’s response. Agreed. In consultation with other federal departments and agencies as well as other stakeholders as appropriate, Transport Canada will develop a long-term approach for marine transportation in Canada’s Arctic waters to support marine navigation that continues to be safe, secure, clean, and efficient and that facilitates responsible economic development and essential services to communities in Canada’s Arctic.</p> <p>The approach would potentially address regulatory, service, environmental information, and infrastructure improvements. As well, Transport Canada would consider opportunities for collaboration and partnership.</p> <p>The approach would align with the overall objectives of Canada’s Northern Strategy and would incorporate, and possibly build upon, initiatives already identified or being developed, including the Northern Transportation Action Plan and the Northern Marine Transportation Corridors Initiative. Completion date: Spring 2016.</p>

