

Report 6

Reports of the Auditor General of Canada
to the Parliament of Canada

Arctic Waters Surveillance



**Independent Auditor's
Report | 2022**



Office of the
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Introduction

Background

Increasing accessibility of Arctic waters

6.1 The Canadian Arctic has more than 162,000 kilometres of coastline—75% of Canada’s total coastline (Exhibit 6.1). Over the past 50 years, average summer sea-ice coverage in the Canadian Arctic has dropped by about 40% because of climate change. This decline in sea ice, combined with new technologies, is making the Canadian Arctic more accessible to ships.

6.2 From 1990 to 2019, the number of voyages in Canadian Arctic waters more than tripled (Exhibit 6.2). The number of ships, particularly foreign-flagged vessels, navigating the Canadian Arctic also increased significantly. Vessel traffic declined in 2020 and 2021 because of temporary bans on entering the Canadian Arctic made in response to the **coronavirus disease (COVID-19)**¹ pandemic. Traffic will likely increase again, because these restrictions have been lifted in March 2022.

6.3 Increased accessibility to Canadian Arctic waters generates opportunities for new economic activities, such as mining, commercial fishing, and tourism. In turn, this promotes international interest and competition in the region. It also increases the risk of unauthorized or unregulated vessel transits and illegal activities (Exhibit 6.3).

¹ **Coronavirus disease (COVID-19)**—The disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2).

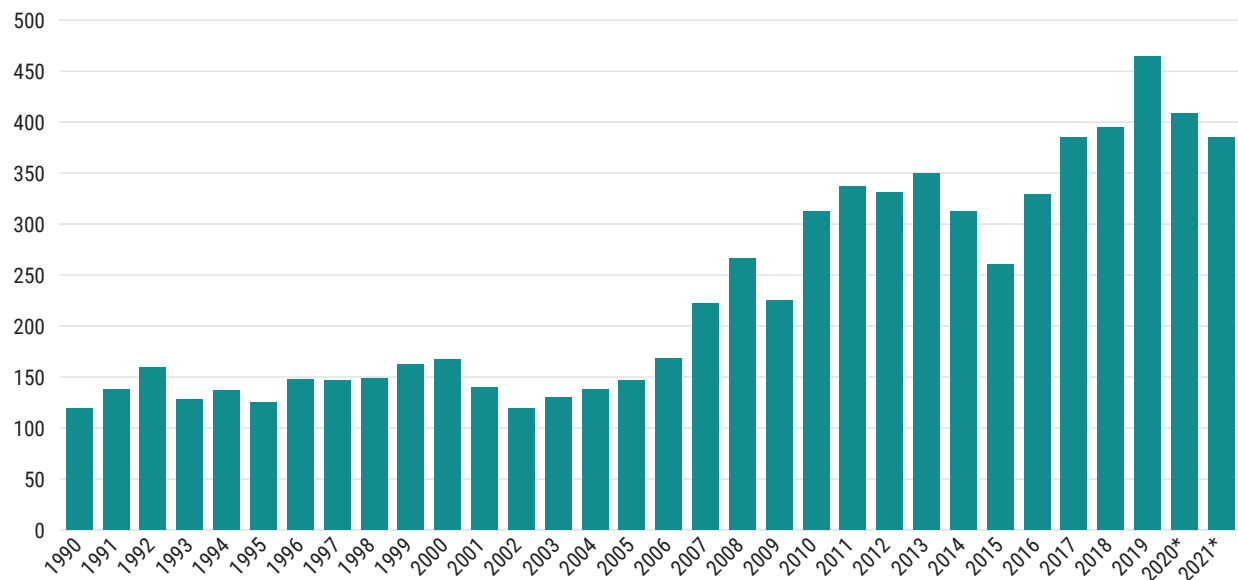
Exhibit 6.1—Map of Canadian Arctic waters



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

Exhibit 6.2—Maritime traffic increased significantly in the Canadian Arctic over the last decades

Number of voyages



* In 2020 and 2021, navigation in Arctic waters was restricted because of the COVID-19 pandemic.

Source: The Canadian Coast Guard for data from 1990 to 2013, and Marine Security Operations Centres for data from 2014 to 2021

6.4 To be able to assess safety and security risks adequately and respond appropriately, Canada must be aware of what happens in Arctic waters, particularly in terms of vessel traffic. Known as “maritime domain awareness,” the focus of this audit, this involves having an effective and comprehensive understanding of all factors associated with the maritime domain that could affect security, safety, the economy, or the environment. It includes Canada’s surveillance and awareness efforts in maritime areas, combined with liaison and coordination with Canadian and international bodies to integrate, develop, and disseminate data related to maritime security.

6.5 The surveillance of Arctic waters is complex. The territory is vast and isolated, and its climate is harsh. Waters are largely not charted to modern or adequate standards. Furthermore, the surveillance involves all levels of government, local and Indigenous communities, and trusted international partners. Within the Government of Canada, several organizations are responsible for ensuring the Arctic maritime region’s safety and security. Their ability to fulfill their responsibilities depends on their capacity to build and maintain maritime domain awareness.

Exhibit 6.3—Risks to people and resources posed by increased accessibility to the Arctic

<p>Unauthorized access</p>	<p>A variety of restrictions are in place to protect Arctic and northern communities. For instance, at the start of the 2020 navigation season in the Arctic, Canada restricted the access of foreign pleasure craft to the Canadian Arctic to protect northern communities from exposure to COVID-19.</p> <p>Some vessels may try to breach such restrictions. For example, during that summer, a foreign sailing vessel entered the Canadian Arctic without approval or exemption. It was identified in the vicinity of Cambridge Bay by an Inuit monitor. Once the foreign vessel was confirmed, Transport Canada officials directed it to depart Canadian Arctic waters and to not make landfall.</p>
<p>Safety incidents</p>	<p>Navigating the Arctic is risky, and safety-related incidents can put a burden on search and rescue resources and local communities.</p> <p>Cruise ships have been identified as presenting significant and increasing risks. They often carry large numbers of passengers, travel long distances by indirect routes, and approach small coastal communities.</p> <p>For example, in 2018, a passenger vessel carrying about 160 people on board ran aground near the coast of Kugaaruk, a village of about 1,000 people in Nunavut. The Canadian Coast Guard and the Canadian Armed Forces deployed 2 icebreakers and 5 aircraft to help, at a cost of more than \$500,000. The vessel was eventually refloated, and passengers were safely transferred to a sister ship.</p>
<p>Illegal fishing</p>	<p>The presence of fishing vessels, and their share of overall traffic, has increased significantly in the Arctic. Illegal, unreported, and unregulated fishing in the Arctic has been a rising concern, especially because of its potential effect on fragile marine ecosystems and the economy and the risk of increased tensions among fishing nations.</p>
<p>Marine pollution</p>	<p>Maritime traffic increases marine pollution. To protect the Arctic, Canada prohibits discharge of most waste in Arctic waters. Discharges, such as oil spills, can result from mechanical problems, grounding, or collisions and have long-term negative environmental consequences.</p>

Roles and responsibilities

6.6 In Canada, no single federal organization is responsible for the surveillance of Arctic waters. Rather, the government uses a whole-of-government approach. The following federal organizations have primary surveillance roles. They all contribute to and depend on maritime domain awareness of the Arctic:

- **Fisheries and Oceans Canada.** This department is responsible for policies and programs related to oceans, which includes provisioning hydrographic services, navigational charts, and other information on maritime limits and boundaries and enforcing and regulating fisheries in Canada.
- **Canadian Coast Guard.** This special operating agency reports to the Minister of Fisheries, Oceans and the Canadian Coast Guard. It is responsible for services for the safe, economical, and

efficient movement of ships in Canadian waters (the territorial sea and internal waters of Canada) through the provision of aids to navigation systems and services (such as beacons and shore lights). The agency is also responsible for marine communications, traffic-management services, ice management, and icebreaking services. It is also responsible for the marine component of the federal search and rescue program and for the appropriate response to marine pollution from ships.

- **Environment and Climate Change Canada.** This department is responsible for providing weather forecasts and information on water and climate conditions.
- **National Defence.** This organization includes the Canadian Armed Forces and the Department of National Defence and is responsible for detecting, deterring, and defending against threats to Canada and North America, including those coming from Arctic waters. It is also responsible for coordinating aeronautical and maritime search and rescue services and for providing assistance to civil authorities in support of national security and responses to major domestic disasters and emergencies.
- **Transport Canada.** This department is responsible for developing, administering, and enforcing legislation, regulations, and subsequent direction to ensure marine safety and security and to protect the marine environment.

In addition, **Public Services and Procurement Canada** supports the previously mentioned organizations by being the central purchasing and contracting agent for items such as equipment and platforms (for example, ships and aircraft).

6.7 Interdepartmental mechanisms have been put in place to support collaboration among organizations that have maritime responsibilities, including the surveillance of Arctic waters. The main ones are as follows:

- **Interdepartmental Marine Security Working Group.** This working group, created in 2001, is responsible for
 - maintaining awareness of evolving and new threats to the maritime domain
 - conducting analysis and providing recommendations to mitigate risks to Canada's marine security
 - establishing and periodically updating strategic policy documents
 - facilitating interdepartmental awareness and collaboration

It is composed of director general-level representatives from 17 federal organizations, including those subject to this audit, and is chaired and administered by Transport Canada.

- **Marine Security Operations Centres.** These centres were created in 2005 to detect and assess marine-related security threats and incidents and to support a whole-of-government response. More specifically, the centres were created to collect, analyze, and disseminate accurate, coherent, relevant, and timely situational awareness of Canada's maritime domain. The centres bring together a smaller number of federal organizations, including the ones subject to this audit: National Defence, the Canadian Coast Guard, Transport Canada, and Fisheries and Oceans Canada. Three centres cover the country's maritime domain. The centre in Halifax, Nova Scotia, covers the East Coast and the Arctic.

Other forums and working groups share information and collaborate on Arctic-related safety and security matters among the federal government, territorial governments, and non-governmental organizations.

Focus of the audit

6.8 This audit focused on whether key federal organizations built the maritime domain awareness needed to respond to safety and security risks and incidents associated with increasing vessel traffic in Arctic waters. The federal organizations deemed key to the surveillance of Arctic waters and included in the audit scope were Transport Canada, Fisheries and Oceans Canada, the Canadian Coast Guard, National Defence, and Environment and Climate Change Canada. We also included Public Services and Procurement Canada for its support role in central purchasing and contracting for items such as vessels.

6.9 We focused on domestic activities. Therefore, we did not audit the international collaborative aspects of maritime surveillance.

6.10 This audit is important because vessel traffic in Arctic waters is likely to continue to increase in the coming decades. While this opening of Arctic waters presents economic opportunities, it also puts at risk a delicate ecosystem, which Canada must safeguard. At the same time, increasing interest in the Arctic includes renewed interest in the region for strategic and military purposes, and Canada's decisions about surveillance of Arctic waters today may have long-term effects on our sovereignty.

6.11 More details about the audit objective, scope, approach, and criteria are in **About the Audit** at the end of this report.

Findings and Recommendations

Overall message

6.12 Overall, the federal government has not taken the required action to address long-standing gaps affecting its surveillance of Canada's Arctic waters. As a result, the federal organizations that are responsible for safety and security in the Arctic region do not have a full awareness of maritime activities in Arctic waters and are not ready to respond to increased surveillance requirements. These requirements are growing as a warming climate makes our Arctic waters increasingly accessible to vessels and as interest and competition for this region grows.

6.13 The long-standing issues include incomplete surveillance, insufficient data about vessel traffic in Canada's Arctic waters, poor means of sharing information on maritime traffic, and outdated equipment. The renewal of vessels, aircraft, satellites, and infrastructure that support monitoring maritime traffic and responding to safety and security incidents has fallen behind to the point where some will likely cease to operate before they can be replaced. For example, the Canadian Coast Guard and Transport Canada risk losing presence in Arctic waters as their aging icebreakers and patrol aircraft near the end of their service lives and are likely to be retired before a new fleet can be launched. Compounding this issue is the useful service life of satellites, which are also nearing their end and currently do not meet the needs of federal organizations. Delays in renewing this equipment coupled with the lack of a contingency plan could significantly compromise these organizations' presence in Arctic waters. Furthermore, some of the government's investments in support of Arctic surveillance, such as the Nanisivik Naval Facility, provide little value.

6.14 Action is needed to close gaps and put equipment renewal on a sustainable path to provide a full picture of what happens in the Arctic, which is essential to developing the actions needed to monitor maritime activities and respond to threats and incidents.

Arctic maritime traffic surveillance

Federal organizations' actions did not address long-standing gaps in the surveillance of Arctic waters

What we found

6.15 We found that federal organizations had identified gaps in Arctic maritime domain awareness and potential mitigation measures but have not taken sufficient action to address these gaps. Some measures initiated to address these gaps had progressed slowly.

6.16 We also found that, while the Marine Security Operations Centres helped federal organizations collaborate on building maritime domain awareness, weaknesses in the mechanisms that support information sharing, decision making, and accountability affected the centres' efficiency.

6.17 The analysis supporting this finding discusses the following topics:

- Insufficient action taken to address gaps
- Lack of integration among organizations

Why this finding matters

6.18 This finding matters because the lack of awareness about vessels in the Arctic creates vulnerabilities that, if left unaddressed, could lead to incidents that would affect Canada's security, safety, environment, and economy. A comprehensive understanding of what happens in the Arctic is essential to developing the actions needed to manage maritime activities and respond to threats and incidents.

Context

6.19 Canada's maritime domain awareness in the Arctic enables organizations to assess maritime safety and security risks. It is at the core of a layered approach to collecting, fusing, analyzing, and disseminating actionable information to decision makers so that they can identify and manage maritime risks and take a coordinated approach to addressing them.

6.20 In addition to the requirement under the *Canada Shipping Act* to obtain clearance before entering Arctic waters, larger vessels are required to report information before and during navigation in Canadian Arctic waters:

- The *Marine Transportation Security Regulations* generally require that vessels provide information to Transport Canada at

least 96 hours before they enter Canadian waters. This information includes a ship's registration, security certification, destination, course, speed, and most recent ports of call.

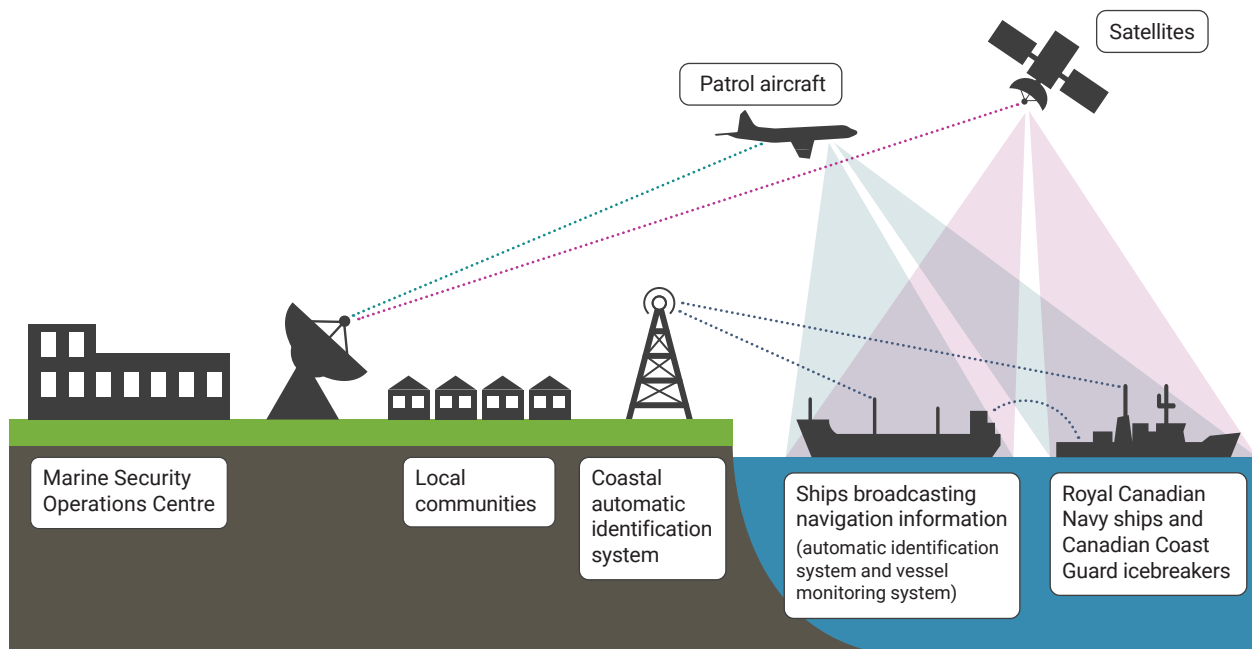
- The *Northern Canada Vessel Traffic Services Zone Regulations* require that vessels send their sailing plans to the Canadian Coast Guard and regularly report their positions, any deviation from their plans, and their arrivals at their docking sites.

Larger vessels include, for example, vessels carrying more than 12 paying passengers. Vessels smaller than this, and some specific categories of ships irrespective of size, are generally exempt from these requirements.

6.21 Maritime domain awareness information on the Arctic is obtained from various sources, including the presence and regular activities of federal organizations (Exhibit 6.4):

- Maritime traffic is largely monitored remotely. This is mainly accomplished by the Automatic Identification System, a digital positional tracking system. When a ship activates its Automatic Identification System transponder, it broadcasts its position and other information, such as its identification, destination, course, and speed. The signals can be received by ships, satellites, planes, or coastal stations. This system is used for collision avoidance, search and rescue, and maritime surveillance more broadly. The system is generally mandatory for large ships, but, as with the reporting requirement, small vessels are usually exempt. The similar National Vessel Monitoring System, mandatory for vessels of certain fisheries, is used to monitor compliance with fishery regulations. Satellites also provide other types of information, including imagery, on maritime activities.
- Ships and aircraft patrolling the Arctic also contribute to maritime domain awareness. For example, as part of Operation Limpid, the Canadian Armed Forces collect surveillance information on Arctic waters through satellites, aircraft, and ship patrols, among other means. In addition, the Canadian Coast Guard icebreakers maintain a presence in Arctic waters throughout the navigable season each year, and Transport Canada has 1 airplane dedicated to maritime surveillance during this season. Furthermore, the Canadian Armed Forces conduct a series of annual exercises in the Arctic, known collectively as Operation Nanook, in collaboration with several Canadian and international partners. Participants in these exercises periodically gather and exchange information that contributes to maritime domain awareness.
- People on shore also gather information on maritime traffic. For example, a network of local Inuit monitors tracks ships using Automatic Identification System signals and records visual observations on vessel activities in coastal areas.

Exhibit 6.4—Overview of sensor systems that monitor maritime traffic



Analysis to support this finding

Insufficient action taken to address gaps

6.22 We found that the main interdepartmental forum responsible for maintaining awareness of evolving threats in the maritime domain—the Interdepartmental Marine Security Working Group—had repeatedly identified gaps and mitigation measures, but the partner federal organizations had taken limited actions to resolve the gaps.

6.23 In 2011, the working group adopted Canada’s Maritime Security Strategic Framework and Canada’s Maritime Domain Awareness Strategy. These documents highlighted what were then considered the most challenging gaps in maritime domain awareness:

- limited capabilities to build a complete and uninterrupted picture of ship traffic in a region as remote as the Arctic
- the inability to reliably track, monitor, and identify non-emitting vessels, notably small vessels and those not complying with requirements on identification and tracking equipment
- challenges in sharing information among organizations

6.24 In 2014, the working group performed a maritime domain awareness gap assessment that focused on the Arctic. This assessment inventoried capabilities and activities in maritime domain awareness, along with gaps and mitigation options. In 2015, the working group developed a work plan to prioritize and address these gaps. This included actions to reduce the gaps identified in 2011 in areas such as

- the radar coverage in Canadian waters, including choke points in the Arctic, which was considered to be a high priority given the lack of capacity for surveying small and non-emitting vessels in the Arctic
- the requirements of the Automatic Identification System or other reporting systems for vessels then outside the scope of these requirements

6.25 The work plan did not include implementation timelines, and the working group did not systematically monitor progress in implementing this plan. In 2016, the working group started to develop an Arctic maritime security strategy but did not complete it. At the end of 2021, it reactivated this project to finalize the strategy by March 2023 so that the partnering federal organizations would take concrete actions over 15 years to address the gaps in maritime domain awareness in Canada's Arctic.

6.26 At the departmental level, we found that some efforts were made to improve maritime domain awareness, such as the following:

- In 2021, Defence Research and Development Canada, an agency of National Defence, which advises several federal organizations on safety and security matters, completed a 6-year research program on Arctic surveillance, with a maritime component. This component focused on reviewing maritime domain surveillance requirements, identifying capability gaps, and assessing current and potential technologies that could be used to fill these gaps, with an emphasis on satellite technology. At the time of the audit, this program had not led to operational changes in the maritime surface domain.
- Also in 2021, a joint project to improve communication capabilities between National Defence and Canadian Coast Guard ships was completed. These ships can now exchange timely maritime domain awareness information with each other and with land-based operational centres, which can facilitate the coordination of actions between federal organizations operating in the Arctic.
- National Defence undertook an initiative to modernize the remote communication capabilities used to operate in remote regions, including in the High Arctic.

6.27 Other measures that could help mitigate gaps in maritime domain awareness have progressed slowly:

- In 2012, the federal government launched a project on shipping corridors to guide maritime traffic toward areas of lower risk, in terms of navigation, environmental protection, and cultural sensitivity. The concentration of traffic in specific sectors of a vast territory such as the Arctic could facilitate its surveillance. By 2014, the government had identified preliminary corridors and engaged with Indigenous groups and northern communities in the following years. However, 10 years after the initiation of this project, the government has not yet formally designated low-impact shipping corridors or established how these will be governed with northern communities.
- In 2016, as part of the Oceans Protection Plan, the federal government committed to working with coastal communities in the Arctic to develop better information-sharing systems to improve access to information on marine shipping activities. In 2017, Transport Canada launched the Enhanced Maritime Situational Awareness initiative to meet this goal. It enables a few Arctic coastal communities to monitor local vessel traffic, get historical information on vessel positions, and receive alerts when ships enter predetermined zones. It also provides access to other information—for example, on ice, wind, weather, and hydrography. The initiative was developed in collaboration with Inuit communities, who identified the nature and sources of information that the system should provide and carried out ongoing improvements. However, the initiative did not receive ongoing funding until March 2022, 5 years later. The funding is also intended to support the development and the expansion of the system for the next 5 years.

6.28 Ultimately, although the federal government has been assessing gaps and trying to develop a strategy, it has not taken enough action. The gaps identified in 2011 still existed at the time of our audit. Our recommendation for this area of examination is in paragraph 6.36.

Lack of integration among organizations

6.29 We found that the Marine Security Operations Centre in Halifax provided a valuable collaboration forum to provide situational awareness of significant maritime events, assess risks, and develop concrete responses when warranted. However, we also found some weaknesses in its governance and information-sharing mechanisms that lessened partner organizations' abilities to integrate their contributions to form a common understanding.

6.30 The mission of the Marine Security Operations Centres is to generate maritime domain awareness by combining the knowledge and skills of the partner government organizations to detect and assess marine security threats and incidents and to support a coordinated response.

6.31 The centres are overseen by committees at respective levels of authority: assistant deputy ministers, directors general, and directors. For most of these committees, decisions are made by consensus. For the facilities' day-to-day management and main administrative functions, each centre is led by a federal organization. The centre in Halifax is led by National Defence.

6.32 Governance of the centres has been a long-standing issue. In 2015, the Interdepartmental Marine Security Working Group identified as a high priority the need to integrate the centres into a unified program with an appropriate governance structure. Another internal review of the centres, which started in 2016 and concluded in 2021, indicated that the governance committees were not sufficiently active, the reporting structure needed to be formalized, and accountability mechanisms needed to be enhanced. In 2020, the partners adopted a framework to provide high-level direction on the centres' administration. At the time of the audit, other planned documents to set out the centres' processes had not yet been developed. In our opinion, weak governance limits the centres' ability to provide strategic guidance and make decisions on interdepartmental issues.

6.33 We found that, at the Halifax centre, the partner organizations shared relevant information and had regular and frequent communications. These included discussions and reports providing warnings and updates on potential incidents.

6.34 However, at the same centre, we found that the processes required to reconcile and integrate the information from various sources into a more complete picture of vessel traffic were inefficient. We also found that the centre did not have adequate procedures to enable partner organizations to share information. In the 2021 review, the partners identified a need to specify the information-sharing barriers and to develop operating procedures. These are important to ensuring rigour and efficiency in the collection and sharing of information.

6.35 In fall 2021, the partners decided that another review would be undertaken by an independent party to examine in more detail the centres' functions and outputs, to identify existing and potential gaps that affect the centres' capacity to generate maritime domain awareness, and to make recommendations to improve the centres' long-term effectiveness. Officials informed us that this review was expected to be completed in September 2023, but at the time of our audit, it had not yet started. In our opinion, it is important that this review lead to action.

6.36 **Recommendation.** National Defence, Transport Canada, Fisheries and Oceans Canada, and the Canadian Coast Guard, working together, should take concrete actions to address the long-standing gaps in Arctic maritime domain awareness, particularly the following:

- the inability to track vessels continuously and to identify non-emitting vessels
- the barriers that prevent efficiently sharing and integrating relevant information about vessel traffic in Arctic waters

Response of each entity. *Agreed.*

See **Recommendations and Responses** at the end of this report for detailed responses.

Fleets, equipment, and infrastructure used for monitoring maritime traffic need timely replacement and enhancement

What we found

6.37 We found significant risks that there will be gaps in Canada's surveillance, patrol, and presence in the Arctic in the coming decade as aging equipment reaches the end of its useful service life before replacement systems become available. We also found that existing infrastructure improvement projects were behind schedule and that the Nanisivik Naval Facility will not effectively support the vessels that operate in the Arctic.

6.38 The analysis supporting this finding discusses the following topics:

- Weaknesses in satellite surveillance capabilities
- Icebreakers reaching the end of their useful lives
- Further delays in procuring Arctic and offshore patrol ships
- Patrol aircraft reaching the end of their useful lives
- Inadequate infrastructure for patrol equipment

Why this finding matters

6.39 This finding matters because, when federal organizations are unable to get the surveillance information they need remotely through satellites, they mainly rely on vessels or aircraft to gather and report the required information. This requires a fleet of vessels and aircraft capable of operating in the Arctic and covering this vast territory.

Context

6.40 Maritime surveillance in the Canadian Arctic relies largely on satellites that provide radar imagery and relay Automatic Identification System signals. These satellites pass periodically over the Arctic and relay data to ground stations, where it is processed, integrated with data from other sources, and used by federal organizations for various purposes, including detecting and tracking vessels. For maritime surveillance, the federal government relies primarily on the Canadian RADARSAT-2 and RADARSAT Constellation Mission satellites.

6.41 In addition to information obtained from satellites and through ships' pre-arrival reports, surveillance information is gathered by federal organizations' vessels and aircraft that patrol the Arctic. These vessels and aircraft also provide services in the area.

6.42 In Canada's defence policy and the Arctic and Northern Policy Framework, adopted respectively in 2017 and 2019, the government stated its intention to enhance Canada's presence in the Arctic to monitor and control activities that may pose threats, thereby exercising sovereignty and upholding national interests. Consequently, the government has announced plans to replace and expand its fleet of icebreakers. Through the National Shipbuilding Strategy, the Government of Canada is acquiring the following ships:

- 6 Arctic and offshore patrol ships to provide a new capability to the Royal Canadian Navy to patrol Arctic waters (3 of these vessels have been delivered so far)
- 2 Arctic and offshore patrol ships of a different model for the Canadian Coast Guard to replace some offshore patrol ships
- 6 icebreakers to replace older icebreakers of the Canadian Coast Guard
- 2 polar icebreakers to enable the Canadian Coast Guard to operate farther north in the Arctic and for longer periods than is feasible with the current icebreakers

6.43 As it will take several years for these ships to be built, the government also launched a project to extend the lives of its current icebreakers to the planned in-service dates of the new icebreakers. It also purchased 3 second-hand commercial icebreakers to backfill its old icebreakers when they will need to be taken out of service temporarily for life extension and maintenance. Exhibit 6.5 shows timelines of expected end of service life and replacement for the equipment addressed in this report.

**Analysis to support
this finding****Weaknesses in satellite surveillance capabilities**

6.44 We found that current Canadian satellite-based surveillance capabilities do not meet the needs of National Defence and other federal organizations for earth-observation data. The RADARSAT Constellation Mission satellites, already used at full capacity, cannot accommodate all the demands of federal organizations for radar imagery of Canada's territory. Every time a priority request is made, the imagery acquisition plan must be reviewed to determine which other needs will be delayed or not met.

6.45 We also found that these radar imagery satellites are at or will reach the end of their expected service lives long before the planned launch dates of the replacement satellites:

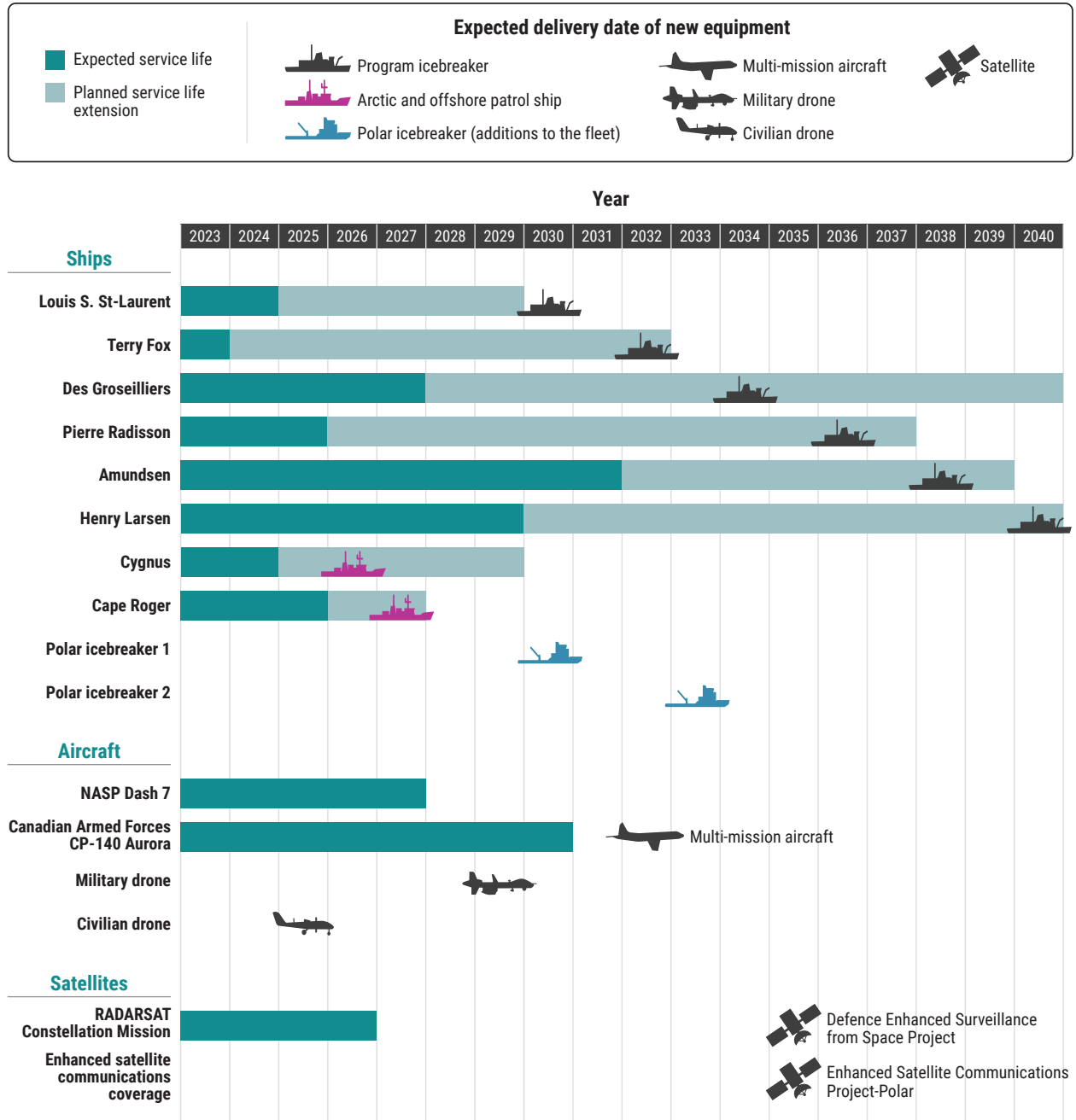
- The RADARSAT Constellation Mission consists of 3 satellites that were launched in 2019. These satellites were built by MDA Ltd. (also known as MacDonald, Dettwiler, and Associates), a Canadian space technology company, for the Canadian Space Agency and are owned and operated by the federal government. The constellation provides radar imagery to many federal organizations that rely on this data for various operations and activities, including monitoring sea ice and icebergs and detecting and tracking vessels. The 3 satellites were designed to operate for at least 7 years, so their performance is expected to gradually degrade at some point after spring 2026.
- The RADARSAT-2 satellite is the predecessor of the RADARSAT Constellation Mission. This satellite was launched in 2007. It was jointly financed by the Canadian Space Agency and MDA Ltd., which owns and operates the satellite. It was designed to operate at least until 2015, but it is still in operation. National Defence continues to purchase radar imagery from RADARSAT-2 through MDA Ltd. for surveillance purposes to supplement the imagery data it receives from the RADARSAT Constellation Mission.

6.46 The government acknowledges that it will take another decade for the Canadian Space Agency to launch a successor to the RADARSAT Constellation Mission and that an interruption of satellite earth-observation services past 2026 is therefore a significant risk. Budget 2021 allocated \$9.9 million over 2 years to the agency to plan the next generation of earth-observation satellites. At the time of our audit, the agency was developing options to replace the constellation's capabilities and to fill gaps in earth-observation services that could emerge after 2026. Options being considered include better leveraging access to free and open data, expanding the purchase of commercial data, enhancing collaboration with existing international partners, and developing new national satellites. A combination of options may be

selected, depending on what capabilities can be provided and when. The agency’s goal was to set a course of action by 2023.

6.47 National Defence has also started a project to have its own dedicated radar imaging satellite constellation. However, the new satellite system is expected to become operational in 2035, well past the expected useful life of the RADARSAT Constellation Mission (Exhibit 6.5).

Exhibit 6.5—Existing equipment may reach the end of its service life before new equipment is ready, and equipment for new capabilities will not be ready for some time



NASP: National Aerial Surveillance Program

6.48 Should the RADARSAT-2 or the RADARSAT Constellation Mission cease functioning or suffer performance limitations before new satellites become operational or other sources of satellite data are secured, National Defence and other federal organizations could be left with limited Canadian surveillance capabilities in the Arctic for years. This could significantly degrade Canada's ability to detect and track vessels in its Arctic waters and would likely increase Canada's reliance on its allies for surveillance information. Furthermore, should any delay occur in launching the new satellite systems, this capability gap would last even longer.

6.49 Other types of satellites are also used for communication purposes. Satellite communications above the 65th parallel are currently limited and dependent on commercial providers. National Defence identified this capability gap in 2009 and is developing a project to launch a government-owned communications satellite system for the Far North. This satellite system is expected to begin operations in 2035–36, more than 25 years after the capability gap was identified (Exhibit 6.5). Until then, federal organizations that operate in the Arctic and monitor the growing activities in this region will remain limited in their ability to communicate when conducting operations in the Far North. Our recommendation for this area of examination is in paragraph 6.66.

Icebreakers reaching the end of their useful lives

6.50 The Canadian Coast Guard's fleet includes 6 icebreakers that are suitable to operate in the Arctic. These icebreakers are between 35 and 53 years old and are becoming increasingly prone to breakdowns and expensive to maintain. As it will take several years before these ships can be replaced, the federal government launched a project to extend their service lives. Over the past 10 years, it spent about \$162 million for the 6 icebreakers and plans to spend about \$800 million more until 2030. In 2018, the Canadian Coast Guard purchased 3 second-hand commercial icebreakers, built in 2000–01, to maintain its icebreaking capabilities while the icebreaker fleet undergoes maintenance and life extension. These ships have been refitted. The first 2 entered into service in 2018 and 2020 respectively, while the third was expected to enter into service by the end of 2022.

6.51 The government plans to replace its 6 older icebreakers that operate in the Arctic with 6 new icebreakers built by Chantier Davie Canada Inc., the third shipyard to be added to the National Shipbuilding Strategy. This shipyard is also expected to build 1 of the 2 polar icebreakers to enhance the Canadian Coast Guard's capabilities (Exhibit 6.5). In our 2021 audit of the National Shipbuilding Strategy, we found that it took about 7 years from signing an agreement with the government for the 2 shipyards originally included in the strategy (Vancouver Shipyards Co. Ltd. in Vancouver and Irving Shipbuilding Inc. in Halifax) to delivering their first ships. At the time of this audit,

an agreement was being negotiated between the government and Chantier Davie Canada Inc. Its signing was delayed as a result of the government's decision to add 1 polar icebreaker to the shipbuilding strategy after the shipyard's pre-qualification. Because of this, the government extended both the time allowed for the shipyard to submit its proposal and the assessment process. The first new icebreaker is expected to be delivered in 2030, and after life extensions, the current icebreakers are expected to start reaching the ends of their service lives by 2029, leaving little room for further delay if a gap in icebreaking capacity is to be avoided.

6.52 In July 2021, the government awarded a contract to Vancouver Shipyards Co. Ltd. to complete a design check and begin construction engineering for the first polar icebreaker to lay the foundations of an eventual contract to build this ship. At that time, this icebreaker was expected to be delivered by 2030, but awarding the follow-on contracts has been delayed. This will likely delay the delivery of this polar icebreaker beyond 2030, but Canadian Coast Guard officials indicated that they would review the ship delivery schedule in fall 2022.

6.53 As well as examining the renewal of its icebreaking fleet, we also examined whether the Canadian Coast Guard had implemented the recommendations we made in our 2014 report on marine navigation in the Canadian Arctic. We recommended that the Canadian Coast Guard assess the risks associated with changing traffic patterns and icebreaking fleet capacity and update its performance measurement information for icebreaking services.

6.54 We found that the Canadian Coast Guard monitored the performance of its icebreaking services. The agency deployed icebreaking services in a way that was consistent with the commitment made in its 2017–22 icebreaking plan. This plan aligned with the requirements that had been identified through consultation with its clients and other stakeholders. However, we found that the Canadian Coast Guard had not assessed how the anticipated future increase in traffic in the Arctic would affect icebreaking requirements. Such an assessment would help to determine whether the icebreakers that are expected to be delivered over the next 20 years will provide a sufficient presence in the Arctic in the long term. Our recommendation for this area of examination is in paragraph 6.66.

Further delays in procuring Arctic and offshore patrol ships

6.55 Through the National Shipbuilding Strategy, Canada is acquiring 8 Arctic and offshore patrol ships: the first 6 for the Royal Canadian Navy and the subsequent 2, of a different model, for the Canadian Coast Guard.

6.56 For the Royal Canadian Navy, the 6 Arctic and offshore patrol ships will enable the navy to patrol previously inaccessible areas of the Arctic. They will allow the navy to exercise Canada's sovereignty through northern maritime operations and to contribute to the wider efforts of other federal organizations in the North. At the time of this audit, the first 3 ships had been delivered. The first ship patrolled the Arctic during summer 2021, the second one did so during summer 2022, and the third was undergoing sea trials to demonstrate that it can operate as expected. The remaining 3 were at various stages of construction. In our 2021 audit of the National Shipbuilding Strategy, we found that delivery of the ships was behind schedule. Since then, it has been further delayed. The delay is largely attributed to the COVID-19 pandemic: Disruptions of supply chains and the labour force have adversely affected Irving Shipbuilding Inc.'s operations.

6.57 For the Canadian Coast Guard, in 2019, the government was planning to approve the construction contract for the Canadian Coast Guard's Arctic and offshore patrol ships in spring 2020, but it missed this deadline. At the time of this audit, the approval was expected by the end of 2022, delaying delivery of these vessels by 2 years to 2026 and 2027. After service life extension, the offshore patrol ships that these vessels are intended to replace are expected to reach the end of their lives in 2027 and 2029, respectively. The delays in delivering Arctic and offshore patrol ships increase the risk of capability gaps in Arctic surveillance (Exhibit 6.5). Our recommendation for this area of examination is in paragraph 6.66.

Patrol aircraft reaching the end of their useful lives

6.58 Transport Canada operates the National Aerial Surveillance Program, established in 1991, to perform surveillance patrols to protect the maritime environment from pollution from shipping. Over the years, this program was expanded to support other government organizations in areas such as surveillance of traffic, fisheries, and ice. Sensors on the aircraft enable the detection, classification, and tracking of vessels of potential interest and marine oil spills. The program is important for identifying vessels that are not subject to reporting requirements or that could not be identified by other means. The 1 dedicated aircraft used to oversee the Arctic region operates out of Iqaluit from July to November.

6.59 In 2016, the federal government launched the Oceans Protection Plan, which provided dedicated funding of \$23.1 million over 5 years for the National Aerial Surveillance Program. This funding was expected to enable up to 500 hours of flight per year over the Arctic. We found that hours flown reached this target in 2018–19 but decreased afterward, with 214 hours flown in 2021–22. This was caused by restrictions imposed on travel to the North, because of the COVID-19 pandemic and a shortage of available pilots. We also found that in 2020, Transport Canada estimated that the funding received was no longer enough to

deliver 500 flight hours. In 2022, it received additional funding until March 2031, but the funding received was approximately \$25 million less than would be needed to maintain the flying hours. In addition, in 2021, Transport Canada completed an obsolescence study on the aircraft used for Arctic surveillance, which identified several issues that, combined, present a significant risk to the serviceability and availability of the aircraft. No strategy has been put in place to renew the aircraft (Exhibit 6.5).

6.60 The Royal Canadian Air Force also conducts aerial patrols in the Arctic using CP-140 Aurora long-range patrol aircraft. These aircraft support a variety of roles, including maritime intelligence, surveillance, and reconnaissance. They also support other federal organizations in the fulfillment of their enforcement roles. The fleet of 14 aircraft has recently been upgraded and had its estimated life expectancy extended to 2030 (Exhibit 6.5). National Defence's Canadian Multi-Mission Aircraft project, which aims to replace the CP-140, started in 2021–22 and plans to deliver its first aircraft in 2032–33. National Defence is examining the feasibility of further extending the CP-140 fleet's life to minimize any capability gap until a new fleet is delivered. In 2019, National Defence also approved a project to increase its aerial surveillance capabilities, including in the Arctic, by buying several long-endurance, remotely piloted aircraft equipped with Automatic Identification System sensors and maritime surveillance radar. At the time of this audit, these new aircraft were planned to begin operating in 2029–30. Both projects are at an early phase. Our recommendation for this area of examination is in paragraph 6.66.

Inadequate infrastructure for patrol equipment

6.61 We found that infrastructure projects to support the Royal Canadian Navy's Arctic and offshore patrol ships and Transport Canada's surveillance aircraft were deficient and behind schedule. This affects Transport Canada's ability to maintain its patrol aircraft. It also puts the replenishment of the patrol ships at risk.

6.62 In 2007, the federal government announced that the deep-water port at Nanisivik would be converted into a naval facility—a logistics hub to support navy and other government vessels during the navigation season in the Arctic. As defined by National Defence in 2010, this facility was expected to provide vessels with docking space, fuel and other goods, as well as shelter, work areas, and amenities for personnel. The cost of the project was estimated at \$258 million. In 2012, after revising the scope of the project to reduce its costs, National Defence received a budget of \$130 million to proceed with the conversion. Work started on site in 2015, and the project was expected to be completed in 2018, but completion was delayed. No progress was made in 2020 and 2021 because of the COVID-19 pandemic. Furthermore, during summer 2019, the jetties where ships tie up, built in 1976, were found

to be severely corroded. In January 2022, a \$37.5-million budget was approved to repair these jetties. The navy expects to start using the Nanisivik Naval Facility in 2025. This will be 4 years after the first Arctic and offshore patrol ship voyage in the Arctic.

6.63 We also found that the Nanisivik Naval Facility will be of much more limited use than first expected. As a result of the decision to scope down the project, the facility will not be equipped to heat its fuel tanks. This will reduce its period of operation to about 4 weeks per year. For the rest of the navigation season, the ships' refuelling will continue to depend on commercial options or allies' cooperation. This leaves the navy at risk of not getting replenishment for its ships where and when needed.

6.64 The lack of adequate infrastructure is also a problem for the National Aerial Surveillance Program. From July to November, Transport Canada's Dash 7 maritime patrol airplane is located in Iqaluit, but the department does not have the infrastructure needed to maintain its aircraft or house its personnel in the Arctic. While operating out of Iqaluit, the aircraft must stay outdoors or in a rented hangar if availability permits. This limits Transport Canada's ability to perform maintenance and conduct extended operations in the Arctic into late fall or winter. Transport Canada plans to construct a hangar and an accommodations unit for the National Aerial Surveillance Program in the Arctic. The project was originally estimated to cost \$29.7 million and be completed in 2022–23. The expected costs have so far increased to \$64.4 million, covered by budget approval, and completion has been delayed to 2024–25. The delays and increase in forecasted cost are a result of supply chain interruptions, increasing material costs, and issues with contractor availability. As of March 2022, \$3.2 million had been spent on this project.

6.65 Transport Canada is also investing in the procurement of a remotely piloted aircraft system to provide additional safety and security surveillance in the Arctic and provide capabilities beyond those available from traditional manned surveillance flights. The unmanned aircraft is intended to increase National Aerial Surveillance Program capability by providing up to 500 flight hours per year in the Arctic and by allowing for simultaneous aerial surveillance with the existing aircraft. A \$32-million contract was awarded at the end of 2020 to acquire the system, which is expected to be delivered in 2023. The aircraft is intended to operate mainly out of Iqaluit, but this cannot happen until the hangar is complete. As a result, the intended increase in Arctic surveillance capability will be delayed by 2 years (Exhibit 6.5).

6.66 **Recommendation.** To address delays in the delivery of equipment to replace and improve the key federal capabilities used for maritime surveillance in the Canadian Arctic and the risk that several types of equipment may cease operating before being replaced, National Defence, Transport Canada, Fisheries and Oceans Canada, the Canadian Coast Guard, and Public Services and Procurement Canada should

- identify options and take action to acquire equipment in a timely manner
- develop and approve contingency plans to address the risk of having reduced surveillance capabilities in the event that key satellites, ships, or aircraft cease to operate before they are replaced

Response of each entity. *Agreed.*

See **Recommendations and Responses** at the end of this report for detailed responses.

Conclusion

6.67 We concluded that the federal organizations we audited—Fisheries and Oceans Canada, the Canadian Coast Guard, Environment and Climate Change Canada, National Defence, and Transport Canada—had not taken the action required to build the maritime domain awareness they collectively needed to respond to safety and security risks associated with increasing vessel traffic in Arctic waters. While these organizations had identified gaps in maritime domain awareness, they had not taken sufficient measures to address them. Moreover, some measures taken had progressed slowly and, in the case of the Marine Security Operations Centres, were not efficient. Furthermore, the existing satellite services and infrastructure did not provide the capacity that the federal organizations needed to perform surveillance of Arctic waters. Delays in the renewal of satellites, ships, and aircraft risks compromising the presence of these organizations in Arctic waters.

About the Audit

This independent assurance report was prepared by the Office of the Auditor General of Canada on the surveillance of Arctic waters. Our responsibility was to provide objective information, advice, and assurance to assist Parliament in its scrutiny of the government's management of resources and programs, and to conclude on whether key federal organizations built the maritime domain awareness required to respond to safety and security risks and incidents associated with increased vessel traffic in Arctic waters.

All work in this audit was performed to a reasonable level of assurance in accordance with the Canadian Standard on Assurance Engagements (CSAE) 3001—Direct Engagements, set out by the Chartered Professional Accountants of Canada (CPA Canada) in the CPA Canada Handbook—Assurance.

The Office of the Auditor General of Canada applies the Canadian Standard on Quality Control 1 and, accordingly, maintains a comprehensive system of quality control, including documented policies and procedures regarding compliance with ethical requirements, professional standards, and applicable legal and regulatory requirements.

In conducting the audit work, we complied with the independence and other ethical requirements of the relevant rules of professional conduct applicable to the practice of public accounting in Canada, which are founded on fundamental principles of integrity, objectivity, professional competence and due care, confidentiality, and professional behaviour.

In accordance with our regular audit process, we obtained the following from entity management:

- confirmation of management's responsibility for the subject under audit
- acknowledgement of the suitability of the criteria used in the audit
- confirmation that all known information that has been requested, or that could affect the findings or audit conclusion, has been provided
- confirmation that the audit report is factually accurate

Audit objective

The objective of this audit was to determine whether key federal organizations built the maritime domain awareness required to respond to safety and security risks and incidents associated with increased vessel traffic in Arctic waters.

Scope and approach

The audit covered federal maritime surveillance activities in Canadian Arctic waters. The following federal organizations were included in the scope of the audit:

- Transport Canada
- Fisheries and Oceans Canada and the Canadian Coast Guard
- National Defence and the Canadian Armed Forces

- Environment and Climate Change Canada
- Public Services and Procurement Canada

Evidence was obtained primarily through interviews, analysis of documents collected from the organizations included in the scope of the audit, and site visits of the Maritime Security Operation Centre and the Royal Canadian Navy base, both located in Halifax, Nova Scotia, and the Royal Canadian Air Force base in Greenwood, Nova Scotia.

We did not examine the following:

- the international collaborative aspects of maritime surveillance
- surveillance mechanisms aimed at building awareness of subsurface activities
- the activities of other federal organizations that have smaller surveillance roles
- the management of the equipment acquisition projects

Criteria

We used the following criteria to determine whether key federal organizations built the maritime domain awareness required to respond to safety and security risks and incidents associated with increased vessel traffic in Arctic waters:

Criteria	Sources
<p>The information required to build maritime domain awareness on Canada's Arctic waters has been defined.</p>	<ul style="list-style-type: none"> • Arctic and Northern Policy Framework: Safety, Security and Defence Chapter, Crown-Indigenous Relations and Northern Affairs Canada, 2019 • Strong, Secure, Engaged: Canada's Defence Policy, National Defence, 2017 • Canada's Maritime Security Strategic Framework 2020, Interdepartmental Marine Security Working Group, 2011 • Canada's Maritime Security Strategic Framework 2022–2037, Interdepartmental Marine Security Working Group, 2021 • Policy on Results, Treasury Board • Agreement Between the Government of Canada and the Government of the United States of America on the North American Aerospace Defense Command, 2006 • United Nations Convention on the Law of the Sea • International Convention for the Safety of Life at Sea • Transforming Our World: The 2030 Agenda for Sustainable Development, United Nations, 2015

Criteria	Sources
<p>Surveillance capabilities, including systems and platforms services and processes, have been analyzed, and plans to resolve gaps, if any, have been developed, approved, funded, and implemented.</p>	<ul style="list-style-type: none"> • Arctic and Northern Policy Framework: Safety, Security and Defence Chapter, Crown-Indigenous Relations and Northern Affairs Canada, 2019 • Strong, Secure, Engaged: Canada’s Defence Policy, National Defence, 2017 • Canada’s Maritime Security Strategic Framework 2020, Interdepartmental Marine Security Working Group, 2011 • Canada’s Maritime Security Strategic Framework 2022–2037, Interdepartmental Marine Security Working Group, 2021 • Policy on Results, Treasury Board • Directive on the Management of Projects and Programmes, Treasury Board • National Shipbuilding Strategy, Public Services and Procurement Canada
<p>Collaboration with Indigenous communities is integrated in the development of maritime domain awareness on Arctic waters.</p>	<ul style="list-style-type: none"> • Arctic and Northern Policy Framework: Safety, Security and Defence Chapter, Crown-Indigenous Relations and Northern Affairs Canada, 2019 • Oceans Protection Plan, Transport Canada, 2016 • Arctic Marine Strategic Plan, 2015–2025, Arctic Council, 2015 • Arctic Council Strategic Plan, 2021–2030, Arctic Council, 2021
<p>Effective coordination mechanisms have been put in place to enable selected federal organizations to share information and respond to safety and security risks and incidents in a timely manner.</p>	<ul style="list-style-type: none"> • Arctic and Northern Policy Framework: Safety, Security and Defence Chapter, Crown-Indigenous Relations and Northern Affairs Canada, 2019 • Strong, Secure, Engaged: Canada’s Defence Policy, National Defence, 2017 • Canada’s Maritime Security Strategic Framework 2020, Interdepartmental Marine Security Working Group, 2011 • Canada’s Maritime Security Strategic Framework 2022–2037, Interdepartmental Marine Security Working Group, 2021 • Oceans Protection Plan, Transport Canada, 2016
<p>Sufficient information on ice, hydrography, and maritime traffic is communicated, and icebreaking services are provided to support safe navigation in Canadian Arctic waters.</p>	<ul style="list-style-type: none"> • <i>Canada Shipping Act</i> • <i>Oceans Act</i> • Oceans Protection Plan, Transport Canada, 2016

Period covered by the audit

The audit covered the period from 1 April 2021 to 31 March 2022. This is the period to which the audit conclusion applies. However, to gain a more complete understanding of the subject matter of the audit, we also examined certain matters that preceded the start date of this period.

Date of the report

We obtained sufficient and appropriate audit evidence on which to base our conclusion on 20 October 2022, in Ottawa, Canada.

Audit team

This audit was completed by a multidisciplinary team from across the Office of the Auditor General of Canada led by Nicholas Swales, Principal. The principal has overall responsibility for audit quality, including conducting the audit in accordance with professional standards, applicable legal and regulatory requirements, and the office's policies and system of quality management.

Recommendations and Responses

In the following table, the paragraph number preceding the recommendation indicates the location of the recommendation in the report.

Recommendation	Response
<p>6.36 National Defence, Transport Canada, Fisheries and Oceans Canada, and the Canadian Coast Guard, working together, should take concrete actions to address the long-standing gaps in Arctic maritime domain awareness, particularly the following:</p> <ul style="list-style-type: none"> • the inability to track vessels continuously and to identify non-emitting vessels • the barriers that prevent efficiently sharing and integrating relevant information about vessel traffic in Arctic waters 	<p>Response of each entity. Agreed. National Defence, Transport Canada, and Fisheries and Oceans Canada and the Canadian Coast Guard will continue taking steps to reduce gaps in Arctic maritime domain awareness and limitations of existing surveillance capabilities, including that of small vessels, and barriers to information sharing.</p> <p>We will take a risk-based approach to maritime domain awareness in the Arctic as we do for the east and west coasts, Great Lakes, and St. Lawrence Seaway. As part of the Marine Security Operation Centre Information Sharing Protocol and third-party review, we will incorporate measures to identify gaps in monitoring, assessing, and reporting on maritime domain awareness and way forward on operational flexibility, options, and tools. Legislative, regulatory, and other impediments will also be considered in renewal efforts. The Interdepartmental Marine Security Working Group’s Maritime Domain Awareness and Arctic Maritime Security implementation strategies will further focus our collective efforts for the development of a risk management approach that defines significant risks and corresponding mitigation measures. We will prepare action plans that clearly identify our respective responsibilities in this regard.</p>
<p>6.66 To address delays in the delivery of equipment to replace and improve the key federal capabilities used for maritime surveillance in the Canadian Arctic and the risk that several types of equipment may cease operating before being replaced, National Defence, Transport Canada, Fisheries and Oceans Canada, the Canadian Coast Guard, and Public Services and Procurement Canada should</p> <ul style="list-style-type: none"> • identify options and take action to acquire equipment in a timely manner • develop and approve contingency plans to address the risk of having reduced surveillance capabilities in the event that key satellites, ships, or aircraft cease to operate before they are replaced 	<p>Response of each entity. Agreed. National Defence, Transport Canada, Fisheries and Oceans Canada and the Canadian Coast Guard, and Public Services and Procurement Canada agree that it is important to acquire equipment in a timely manner and manage capability risks associated with Arctic water surveillance.</p> <p>National Defence. National Defence will continue to engage with partners and central agencies as part of ongoing efforts to ensure continuous capability sustainment including, but not limited to, the timely acquisition of equipment. Our management action plans developed in response to the 2021 audit on the National Shipbuilding Strategy identify a number of efforts currently underway to address the risks associated with surveillance vessels.</p>

Recommendation	Response
	<p>National Defence’s cyclical planning and approval of operational plans will include risks associated with reduced surveillance capabilities of Arctic waters in the event that existing key satellites, ships, or aircraft are no longer operable or replaced. Operational plans will be adjusted to integrate interim capability as these capabilities evolve.</p> <p>Transport Canada. Regarding Transport Canada’s air asset capacity, the department currently uses the Dash 7 aircraft to perform surveillance in the Arctic and has not developed a lifecycle replacement plan. However, the department is in the process of procuring a remotely piloted aircraft system, which is scheduled for delivery in early 2023. The system is expected to augment the department’s surveillance capacity in the Arctic.</p> <p>Fisheries and Oceans Canada and the Canadian Coast Guard. As previously highlighted, the Management Action Plan developed in response to the 2021 audit of the National Shipbuilding Strategy addresses a number of key issues to ensure that future Canadian Coast Guard ships to support maritime surveillance in the Canadian Arctic are delivered in a timely manner. In concert with Public Services and Procurement Canada and under the auspices of the National Shipbuilding Strategy, measures are in place to identify potential equipment capability shortfalls and mitigation measures have been put in place to address these shortfalls such as the Vessel Life Extension program, the procurement of interim icebreaking ships, the chartering of commercial vessels, and the expansion of the National Shipbuilding Strategy to include a third shipyard. These measures are in addition to those measures identified in the National Shipbuilding Strategy Management Action Plan. This collection of proactive measures in conjunction with Canadian Coast Guard new vessel procurement projects form the Canadian Coast Guard Fleet Renewal Plan and are designed to provide a capability-based approach to its future Arctic-capable fleet rather than a straightforward one for one ship replacement plan.</p> <p>Public Services and Procurement Canada. The Management Action Plan, developed in response to the 2021 audit of the National Shipbuilding Strategy, identified a number of efforts to improve delivery and accuracy of schedules and ensure more disciplined reporting of progress toward milestones.</p>

Recommendation	Response
	<p>Public Services and Procurement Canada has completed many of these actions, including a review of new and existing shipbuilding contracts to ensure the inclusion of Earned Value Management and schedule-related obligations and deliverables; adding cost, schedule, and risk management as a regular, recurring agenda item at governance committees; and ensuring completeness of mitigation strategies for all National Shipbuilding Strategy risks and implementation of approaches to track and report on progress. In addition to the implementation of this Management Action Plan, efforts have progressed with regard to the identification and integration of a third National Shipbuilding Strategy shipyard to support Canadian Coast Guard program delivery inclusive of the provision of icebreaking capability in the North. These activities support Public Services and Procurement Canada’s ongoing and dedicated efforts to acquire equipment in a timely manner.</p>

