Search and Rescue, Climate Change, and the Expansion of the Coast Guard Auxiliary in Inuit Nunangat / the Canadian Arctic

Peter Kikkert[1] and P. Whitney Lackenbauer[2]

Brian Mulroney Institute of Government, St. Francis Xavier University[1]

Trent University[2]

Author Note:
We have no known conflict of interest to disclose.
Correspondence concerning this article should be addressed to Peter Kikkert
Email: pkikkert@stfx.ca

Abstract

In Canada's maritime spaces, members of the all-volunteer Canadian Coast Guard Auxiliary (CCGA) provide essential marine search and rescue (SAR) services and promote boating safety. By 2015, however, only nine communities North of 55 possessed Auxiliary units and three of these struggled to remain operational. In 2020, the CCGA counted 20 units in the Coast Guard's new Arctic Region, with 333 members and 31 vessels—the majority of which are located in Inuit Nunangat (the Inuit homeland in Canada) and comprised of Inuit members—and plans for future expansion.

Based on stakeholder engagement, government documents, and media analysis, this article assesses the Coast Guard's Arctic Search and Rescue Project and the concomitant programming under the Oceans Protection Plan that has facilitated the Auxiliary's expansion in the Arctic. Our analysis asks two overarching questions: Why has this program been able to expand the Auxiliary after previous efforts failed? How has this expansion improved the SAR system and marine safety in Canada's Arctic, and are there areas for improvement?

The article makes four primary arguments:

1) The success of the project has been fueled by strong community engagement and relationship-building efforts, effective data collection that has fostered a better understanding of the marine risks facing Arctic communities, and consistent access to the training and equipment required to safely conduct marine SAR operations

2) Members of Arctic Auxiliary units strengthen SAR operations by improving response times, serving as SAR detectives, contributing to marine safety, and, most importantly, by integrating their local and traditional knowledge and skills into the broader search and rescue system.

3) Training and organizational gaps exist that should be addressed as the Coast Guard continues to bolster existing units and establish new ones.

4) The Arctic SAR Project has provided several best practices and lessons that should guide the implementation of additional resilience-building measures in the North and in other Indigenous communities.

Keywords: Search and rescue, resilience, marine safety, Coast Guard Auxiliary, Inuit Nunangat, Canadian Arctic

Acronyms

ANPF	Arctic and Northern Policy Framework
CASARA	Civil Air Search and Rescue Association
CAF	Canadian Armed Forces
CCG	Canadian Coast Guard
CCGA	Canadian Coast Guard Auxiliary
GSAR	Ground Search and Rescue
ICBVPP	Indigenous Community Boat Volunteer Pilot Program
JRCC	Joint Rescue Coordination Centre
MRO	Mass Rescue Operation
RAMSARD	Risk-Based Analysis of Maritime Search and Rescue Delivery
RCAF	Royal Canadian Air Force
SAR	Search and Rescue

Introduction

Members of the all-volunteer Canadian Coast Guard Auxiliary (CCGA) provide essential marine search and rescue (SAR) services and promote boating safety in Canadian maritime zones. The CCGA first established units in Canada's North in the 1980s, but initial expansion proceeded slowly. Despite a concerted effort in the early 2000s to increase the number of Auxiliary units in the newly-formed territory of Nunavut, by 2015 only nine community-based units had been created North of 55, three of which struggled to remain operational. Communities without a dedicated marine SAR unit and/or vessel face challenges in finding the equipment and trained volunteers required to conduct searches, leading to slow response times, the use of unsafe vessels, volunteer burnout, and a reliance on Coast Guard icebreakers and Royal Canadian Air Force (RCAF) aircraft located hours or days away (Kikkert et al., 2020b; Standing Committee on Fisheries and Oceans, 2018). In fall 2015, the Coast Guard launched its multi-year Arctic Search and Rescue Project dedicated to identifying the marine risks facing the region's coastal communities and using this information to guide the strengthening of existing Auxiliary units and the establishment of new ones—the majority of which are located in Inuit Nunangat (the Inuit homeland in Canada) and comprised of Inuit members. By spring 2021, the CCGA counted 20 units in the Coast Guard's new Arctic Region, with 333 members, 31 vessels, and concrete plans for further expansion.

Based on stakeholder engagement, government documents, and media analysis, this article assesses the Coast Guard's Arctic SAR Project and the concomitant programming under the Oceans Protection Plan that has facilitated the Auxiliary's expansion in the Arctic. Our analysis asks two overarching questions: Why has this program been able to expand the Auxiliary after previous efforts failed? How has this expansion improved the SAR system and marine safety in Canada's Arctic, and are there areas for improvement?

The success of the project has been fueled by strong community engagement and relationship-building efforts, effective data collection that has fostered a better understanding of the marine risks

facing Arctic communities, and consistent access to the training and equipment required to safely conduct marine SAR operations. In return, members of CCG Auxiliary units in the Canadian Arctic strengthen operations by improving response times, serving as SAR detectives, contributing to marine safety, and integrating their local and traditional knowledge and skills into the broader search and rescue system. Although training and organizational gaps should be addressed concurrent with ongoing expansion, the Arctic SAR Project yields several best practices and lessons that should guide the implementation of additional resilience-building measures in the Canadian North and in other Indigenous communities.

Background: The CCGA and the Arctic Search and Rescue Project

Across Canada, the CCGA has over 4000 members and access to approximately 1100 vessels, which respond to approximately 25% of an average 7000 marine and humanitarian SAR incidents (CCGA, 2017). A Fisheries and Oceans Canada evaluation of these SAR services found "that every dollar invested by the CCG in the CCGA results in the cost avoidance of approximately $43" and that "without CCGA, the CCG would need to spend $337 million to purchase a similar fleet of vessels and an additional $200 to $300 million annually in salaries and benefits" (Evaluation Directorate, 2012, Table 6.0). Members of the auxiliary receive insurance coverage during authorized activities and reimbursement of certain operational costs, but generally must fundraise to purchase required equipment (e.g. Personal Flotation Devices, GPS, Radios) (CCGA, 2017).

In the 1980s, the CCGA first expanded into the Canadian North, with units established in Yellowknife and Hay River. Under the leadership of Jack Kruger, a former RCMP officer who had served in the NWT and Nunavut, the Auxiliary expanded to Inuvik, Aklavik, and Tuktoyaktuk in the 2000s, and slowly started making inroads into the Eastern Arctic (Kruger, 2000). The creation of Nunavut in 1999 provided greater impetus to improve the new territory's marine SAR capabilities. In 2001, the Government of Nunavut secured $645,000 in federal funding to establish, in cooperation with the Coast Guard, CCGA units in each of Nunavut's twenty-five communities. The ambitious

plan envisaged units made up of two or three local boats and five or six trained members for each vessel (Legislative Assembly of Nunavut, 2001). Unfortunately, lack of funding and community engagement, coupled with crew and vessel standards that were unachievable and inappropriate for the realities of Nunavut's communities, hampered these efforts (Benoit, 2018). Nevertheless, the CCGA established new units in Cambridge Bay, Pangnirtung, Rankin Inlet, and Kugluktuk, although the latter two occasionally struggled to find the crew and equipment necessary to remain operational.

Over the last two decades, marine traffic has grown significantly in the Canadian Arctic as climate change increases the summer accessibility of the region's waters. With maritime activity—from local small craft carrying hunters and fishers to cruise ships, vessels supporting resource development, and pleasure craft—doubling in the region between 1974 and 2015, community-based SAR and emergency response capabilities required enhancement to keep pace (Dawson et al., 2018; Standing Committee of Fisheries and Oceans, 2019). In 2014, an audit report from Canada's Environment Commissioner called on the federal government to take action to improve marine safety in the Arctic, while Nunavut Emergency Management lobbied to have the Coast Guard expand the number of Auxiliary units in the territory (Commissioner of the Environment and Sustainable Development, 2014; Varga, 2014).

In the face of increasing maritime activity and the need to improve marine safety, the Coast Guard developed programming to meet the "unique challenges of SAR in the Arctic." These issues included the region's vast geography, fewer vessels of opportunity that could be tasked to a rescue, the basing of federal SAR assets far away in the South, limited community SAR resources, infrastructure and communications gaps, and inadequate marine monitoring capabilities. To address rising needs, the Coast Guard launched the Arctic Search and Rescue Project, which entailed a two-year study of marine risks and SAR requirements in coastal Arctic communities (Risk-based Analysis of Maritime SAR Delivery—RAMSARD), better support for existing Auxiliary units, and the establishment of new units (Arctic Search and Rescue Project, n.d.). Given the increase in maritime

activity in its waters and the lack of SAR assets in the region, the project focused on Inuit Nunangat, comprised of Nunatsiavut, Nunavik, Nunavut, and Inuvialuit Nunangat. The Coast Guard developed the project around community engagement and sustained relationship building. Starting in 2015, its Arctic RAMSARD team made 14 engagement trips to the North over a two-year period, visiting 45 communities. The service then formed its Arctic Community Engagement and Exercise Teams (ACEET), which began visiting communities in June 2017 to connect with existing Auxiliary units, introduce the program to communities without one, and provide the support and training required for the establishment of new units. With multi-year funding for the project secured under the federal government's Oceans Protection Plan, the Coast Guard optimistically predicted that, "in just a few years, there is the possibility of having over 45 Inuit CGA SAR units in the Arctic" (Arctic RAMSARD, n.d.).

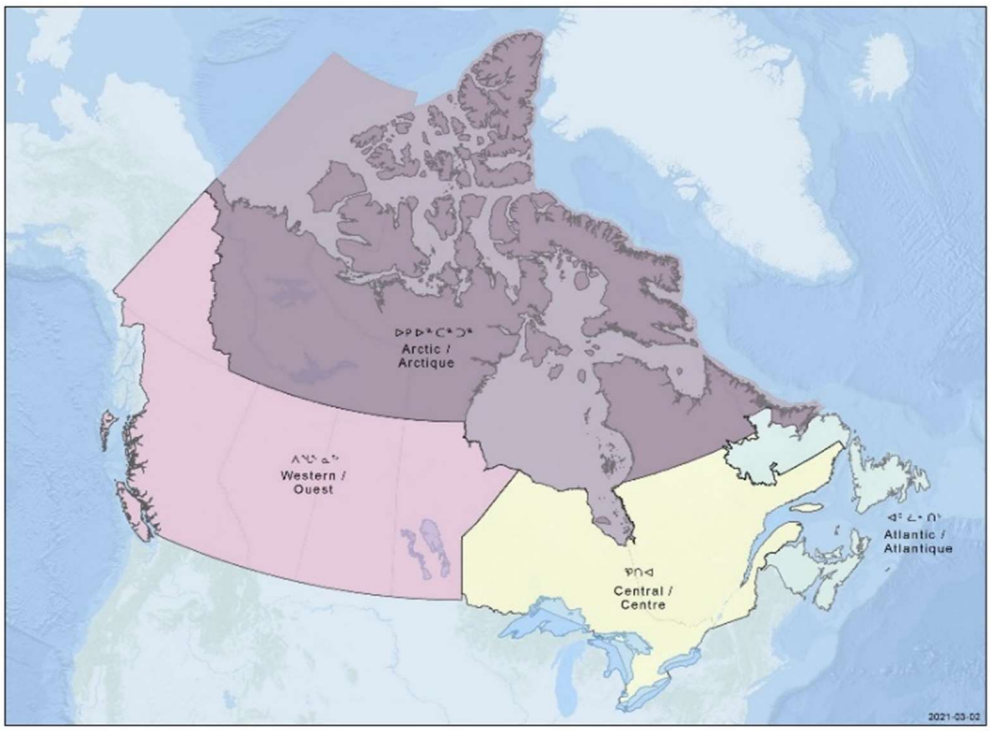

Image 1. Canadian Coast Guard's new Arctic Region. Photo credit Canadian Coast Guard.

Image 2. Inuit Nunangat. Photo credit Inuit Tapiriit Kanatami.

Methodology

Research for this article was conducted as a part of the ongoing community-collaborative Kitikmeot Search and Rescue Project. Launched in 2019, the project focuses on identifying strengths, challenges, and new approaches to community-based SAR in Nunavut's Kitikmeot region, which encompasses the communities of Kugluktuk, Cambridge Bay (Ikaluktutiak), Gjoa Haven, Taloyoak, and Kugaaruk. The Kitikmeot proved to be an ideal setting for the assessment of the Coast Guard's Arctic SAR Project because it had two long-standing Auxiliary units (Cambridge Bay and Kugluktuk) while the expansion led to the establishment of a unit in Gjoa Haven in 2017, with another planned for Taloyoak soon. Although focused on the Kitikmeot, empirical evidence gathering for our research project involved a review, synthesis, and analysis of academic, media, and government sources discussing search and rescue operations in Canada's North. To better understand the Coast Guard Auxiliary expansion, we also submitted access to information requests on the Arctic SAR Project and the RAMSARD study.

Next, we employed a qualitative approach to explore the SAR experiences of community responders. With the Kitikmeot SAR groups' support, the Nunavut Research Institute (license 04 009 20R-M) and the St. Francis Xavier University Research Ethics Board (Certification: 23923) approved the Kitikmeot Search and Rescue Project. In October 2019 and January 2020, the researchers conducted semi-structured interviews with Coast Guard Auxiliary unit leaders, community SAR coordinators, and Canadian Ranger patrol commanders in each community. Following these discussions with the leadership, the researchers conducted informal capacity-mapping workshops with community SAR groups to determine local assets and resources, identify untapped or unrecognized resources, and register collective and individual capacities (Ampomah and Devisscher, 2013, pp. 15-16; McKnight and Kretzman, 1997). This data was then used to facilitate capability-based planning exercises, which determined whether a community has the right mix of assets it requires to respond to the wide array of SAR missions it might face (Public Safety Partners Resource Centre, n.d.; Caudle, 2005). Finally, the Kitikmeot Roundtable on SAR, co-organized by the researchers and Angulalik Pedersen, the second-in-command of the Cambridge Bay Coast Guard Auxiliary, was held at the Canadian High Arctic Research Station (CHARS) in Cambridge Bay from 31 January–1 February 2020. It brought together fifty-five community responders from the five Kitikmeot communities, academics, and representatives of federal and territorial departments and agencies to discuss best practices, lessons learned, and future requirements for search and rescue. While most of the roundtable focused on community-level searches, the culminating Mass Rescue Operation Tabletop Exercise involved a scenario with an adventure cruise ship running aground (Kikkert et al., 2020a, 2020b, 2020c). Throughout the interviews, workshops, and roundtable, members of the Coast Guard Auxiliary units in Cambridge Bay, Kugluktuk, and Gjoa Haven, and the individuals involved in marine

SAR in Taloyoak and Kugaaruk shared their experiences, ongoing challenges, and their engagement with the Arctic Search and Rescue project.

Image 3. Kitikmeot Roundtable on Search and Rescue. Photo courtesy of the authors.

Results

The capacity mapping and interviews conducted for the Kitikmeot SAR Project highlight the challenges faced by CCGA units and marine SAR operations in Inuit Nunangat / the Canadian North: an increasing case load (caused by a changing environment, the loss of land safety knowledge, and unpredictable outside activity); training gaps; equipment shortages; volunteer burnout; troublesome administrative requirements; difficulty coordinating, cooperating, and communicating across the community, territorial, federal levels; and slow response times from southern-based SAR assets (Kikkert et al., 2020a; 2020b; see also Benoit, 2014; Østhagen, 2017; Senate Standing Committee on Fisheries and Oceans, 2019). Communities without a CCGA unit often struggled to find a suitable boat, crew members, and equipment to conduct safe marine SAR missions (P. Ikullaq, personal

communication, October 2019). The lack of support for existing units compounded these challenges. "For years and years it seemed like the government had forgotten about the Coast Guard Auxiliaries up here," explained one unit leader in the Kitikmeot. "In the past, it has been hard to keep the unit up and running" (personal communication, October 2019).

Since the launch of the Arctic SAR Project, community responders have noticed a significant shift in the Coast Guard's approach to, and engagement with, the Auxiliary units. In describing the project's impact, the same unit leader who highlighted the lack of historic support to the Arctic Auxiliary units explained that "we have never received the attention we are getting now. We have training on a regular basis now, funding for a new boat and equipment. We feel supported" (personal communication, October 2019).

Image 4. Map of Canadian Coast Guard Auxiliary Units in the North. Courtesy of Canadian Coast Guard Arctic Region.

Building Understanding and Capacity

The Canadian Coast Guard's attempt to better understand the risks and challenges facing each community, its provision of equipment and training, and its sustained general interest in improving the Auxiliary, have produced more trusting and cooperative relationships. "Before, I'm not really sure they understood what we were facing here, and just how many searches we were doing," an Auxiliary

member from the Kitikmeot explained. "Maybe they didn't know how often we use the boats to go between communities" (personal communication, 30 January 2020).

Through the Arctic RAMSARD study, the Coast Guard worked with communities to identify, estimate, and evaluate marine risks, and then assessed existing and potential risk control measures. The study focused on the waters of the Arctic Ocean, from the Beaufort Sea in the west to the Hudson Strait in the east, as well as the Mackenzie Delta and the Hudson Bay—a total area of 2,200,100 square nautical miles. The Arctic RAMSARD team was comprised of members from the Coast Guard, the Coast Guard Auxiliary, and other key territorial and provincial partners. During community visits, the team met with elected officials, community employees, hunters and trappers, fishers, community SAR responders, Elders, and youths, as well as others interested in marine safety. The Arctic RAMSARD study focused on the level and type of boating around a community, the duration of the boating season, local marine risks, economic and transportation activity, SAR case history and resources, challenges to SAR operations, and the level of community support and enthusiasm for an Auxiliary unit (Community Engagement and Exercise Team, n.d.; Garapick, 2018a). Follow-up visits to the communities were used to validate initial results and assessments. The Coast Guard plans to repeat the RAMSARD study every five years to ensure they are aware of changing conditions and monitor community-level risk control measures (Community Engagement and Exercise Team, n.d.; Garapick, 2018a).

The results of the RAMSARD study provided the Coast Guard with a window into the marine risks and challenges facing northern communities. It highlighted, for example, frequent small vessel traffic transiting between Taloyoak and Gjoa Haven in the Kitikmeot. It determined that Arctic Bay has 50 small craft, Mittimatalik (Pond Inlet) has 300, Pangnurturng has 150, Qikiqtarjuaq has 100, and, on a nice day in any given community, at least 20% of these are on the water. Community members often travel between Mittimatalik and Arctic Bay—a 210-nautical-mile-long route that takes a minimum of 6 hours (Community Engagement and Exercise Team, n.d.). Similar information about

most of the communities in Inuit Nunangat offered salient insights into inter-community connections, transit routes, and safety issues associated therewith. It also concluded that the risk factors connected to climate change are increasing, including changing and unpredictable weather, changing sea conditions and wind patterns, extended boating seasons, and extreme weather events—all of which have increased the marine hazards facing community members (Canadian Coast Guard Arctic Search and Rescue (SAR) Project (n.d.). In general, the study found limited survival gear in communities, few marine charts available, lack of a boating safety culture (particularly among younger people), and determined that the vast majority of SAR incidents occur while people are hunting and fishing or travelling between communities (Canadian Coast Guard 2017; 2019). The RAMSARD study helped to build and enhance relationships between the communities and the Coast Guard, reinforcing that the service was interested in learning about specific local risks while providing essential data to direct its expansion efforts and enable evidence-based decisions on SAR programming.

The Coast Guard's initial community outreach and RAMSARD study concluded that many communities would struggle to find suitable SAR vessels that met all applicable regulatory requirements. As a result, it launched the Indigenous Community Boat Volunteer Pilot Program (ICBVPP) in 2017, with funding from the federal government's Oceans Protection Plan. The program allowed communities to apply to purchase a new SAR vessel, buy required equipment (such as communications and navigation gear), and construct proper storage facilities for their boats (Garapick, 2018a). As of April 2021, sixteen northern communities have benefitted from the program, with the majority using it to purchase a dedicated SAR vessel for their CCGA unit. Auxiliary members are involved in the design and outfitting process, and most vessels have been 28-foot aluminum, twin engine patrol boats manufactured in Canada (Canadian Coast Guard, 2016). With the new boats, communities feel empowered that they can better execute a search and rescue operation and are less reliant on southern intervention (information gathered during the 2019 capacity mapping workshops in Cambridge Bay and Kugluktuk). "[For] many years Pond Inlet SAR struggled to find boats for

search and rescue missions," Eric Ootoovak, a member of the Pond Inlet CCG Auxiliary, told a reporter. "Now with the Indigenous boat funding program, we got funding, we now have a boat and will no longer need to look for a boat for missions" (Nunatsiaq News, 2020, para. 5).

Figure 1. Application of the Indigenous Community Boat Volunteer Pilot Program (Community Boats Program) to Northern Communities.

Community/Government	**Cost**
Uluhaktok, NT	$274,217
Tuktoyaktuk, NT	$307,624
Inuvik, NT	$276,632
Hay River, NT	$255,178
Yellowknife, NT	$256,176
Cambridge Bay, NU	$270,311
Kugluktuk, NU	$246,417
Gjoa Haven, NU	$222,187
Rankin Inlet, NU	$221,572
Pond Inlet, NU	$313,167
Arviat, NU	$305,326
Clyde River, NU	$57,319
Nunatsiavut Government (to purchase vessels for Nain and Makkovik)	$437,000
NunatuKavut Community Council	$197,832
Sheshatsiu and Natuashish, NL	$550,948
Churchill, Manitoba	$319,035
For 2020-2021, the Coast Guard has received applications from the following Arctic communities: Aklavik, NT; Deline, NT; Yellowknife, NT; Naujaat, NU; Arctic Bay, NU; Coral Harbour, NU; Igloolik, NU; Kugluktuk, NU; Sanirajak, NU (Hall Beach); Kinngait (Cape Dorset); Pangnirtung, NU; Kangirsujuaq, QC; Innu Nation, NL	

Image 5. Gjoa Haven's ICBVPP SAR Vessel. Photo courtesy of Winnie Hatkaittuq.

While the new vessels prove a welcome boost to community marine SAR capabilities, they would have limited value without training to use them effectively. A major part of the Coast Guard's Arctic SAR Project has been an ongoing "training blitz" for existing and new units. The Coast Guard holds annual district meetings in Yellowknife, often involving tabletop exercises, and provides summer training in the communities on a rotating basis. Auxiliary members learn how to coordinate with the Joint Rescue Coordination Centres (JRCC), Royal Canadian Air Force aircraft that might be on scene, and other vessels, as well as safe boat handling, navigation, marine first aid, marine firefighting and emergency duties, radio communications, search patterns, and CCG operations. Auxiliarists have found the radio operator training particularly useful, as it provides them with the ability to "speak the same language" as potential partners in search and rescue operations. They also emphasized the utility of learning basic marine SAR search patterns, such as track crawl, expanding square, creeping line, parallel, and sector search, and how to effectively tow disabled vessels (information gathered during the 2019 capacity mapping workshops in Cambridge Bay, Kugluktuk, and Gjoa Haven). Based on community feedback emphasizing the administrative burden placed on an Auxiliary unit (including paperwork to maintain society status, summarizing expenditures with supporting receipts, and

completing all of the actual search paperwork), coupled with an awareness that some community volunteers do not want to play an on-the-water role, the Coast Guard also has prepared a separate administrative course to assist in this vital component of SAR operations (Thompson, 2021).

The Coast Guard's approach to community training focuses on creating opportunities for communities to learn from one another and developing formal positions for Northern Indigenous practitioners. Joint training sessions between communities and district level meetings allow for the establishment and strengthening of "region-wide networks of SAR capacity", thus facilitating the sharing of best practices (Canadian Coast Guard Arctic Search and Rescue (SAR) Project, n.d.). In adopting a "train the trainer" approach, Auxiliary members have indicated their readiness to assume training responsibilities, thus developing skills in their communities. Early in the program, the Coast Guard hired Inuit students to accompany SAR training officers as they engaged with or provided in-community training to units. As a more long-term solution, the Coast Guard's new Arctic region has also hired Inuit SAR response officers to assist in SAR operations, liaise with the Auxiliary units, conduct training and exercise activities in the field, and assist with equipment and vessel maintenance. As one CCGA member pointed out, these kinds of positions represent a "great investment in our communities" (Kikkert et al., 2020b, p. 49).

A Stronger SAR System

In laying out its mission and mandate, a draft Coast Guard Arctic SAR Project report explains that "developing Auxiliary capacity represents an opportunity to marry the strengths, skills, and knowledge of the CCG SAR framework with the strengths, skills and knowledge of the Arctic coastal communities with centuries of local experience" (Canadian Coast Guard, n.d.).

Coast Guard Auxiliary units provide a platform to integrate community responders' intimate knowledge of the land and local environmental conditions into the broader SAR system. A participant at the Kitikmeot Roundtable on SAR explained:

> We know the local weather. We know the conditions. We know the water and ice, the rocks. We know how the ice works. We know the best routes to take, the fastest, the safest routes to take. We know things that you can't get from a GPS or a weather report. We know how the tides work…You have to listen (Kikkert et al., 2020c, p. 4).

Auxiliaries' familiarity with local environmental conditions and marine spaces; as well as their knowledge of safe harbours, on-the-land shelters, and other places of refuge, have already contributed to the success of local SAR operations.

The Arctic SAR Project also seeks to ensure that units are comprised of a mix of younger community members and Elders so that the Auxiliary can "build on intergenerational strengths." During community-based interviews and roundtables, Inuit Auxiliary members in the Kitikmeot highlighted the value of their units in facilitating the transfer of Inuit Qaujimajatuqangit and skill development more generally. One commentator in Kugluktuk noted:

> There is so much emphasis placed on technology and technical skills. All of that is good. Prep before going out is really good. But, people must still know how to read the land, the sky, the water, the ice, in case things go wrong (personal communication, October 2019).

Participation in Auxiliary units encourages skill-building and intergenerational knowledge exchange through training and collective responses on the land. As a new member gains experience, they can pass along their acquired knowledge to another recruit—all of which strengthens the overall SAR system.

Across the country, CCG Auxiliary members play important roles as "SAR detectives" by collecting information about SAR cases and providing it to the Joint Rescue Coordination Centres. In the North, however, this service becomes even more important given the JRCCs lack of familiarity with the region and the hunting, fishing, and travel activities of its residents, alongside few alternative resources to investigate search and rescue cases. Auxiliaries' knowledge of local conditions, marine spaces, and the marine activities of their fellow community members make them

uniquely suited to be SAR detectives. Throughout the boating season, they can gather and disseminate information on changing environmental conditions and emerging marine risks and challenges. During SAR operations, they gather local intelligence on the condition of missing vessels, the skill of crews, and potential travel routes, which they relay to the JRCC. In case of an overdue boat, for instance, Auxiliary members can call the overdue person/persons family, friends, or other witnesses to gather more information, including their travel plans and preferred hunting/fishing areas. Such detective work can also identify false alarms and prevent the JRCC from unnecessarily deploying icebreaker or RCAF assistance, and thus saving resources that can be used for other SAR cases.

The expansion and strengthening of the Coast Guard Auxiliary has led to faster and more effective local responses. Auxiliaries upload all of their vessel, equipment, and membership information through the Canadian Coast Guard Auxiliary Safety Management System, which JRCCs can access. Consequently, when JRCCs require the services of an Auxiliary unit, they can quickly identify with whom they are dealing and the capabilities a unit possesses, thus streamlining and improving the organizational and coordination requirements to conduct a successful SAR mission. Meanwhile, their ability to rapidly deploy, their training, reliable boats, and intimate local knowledge allow these units to effectively deliver SAR services. These efforts are enhanced by unit leaders who ensure that members are always on standby, liaise with Coast Guard and JRCC personnel, direct operations, and can serve as on-scene coordinators. Auxiliary units reduce the reliance of their communities on CCG icebreakers, often situated hours or days away from the location of an incident, and RCAF fixed and rotary-wing aircraft based thousands of miles to the south (Kikkert et al., 2020b). Further, given their presence in the Northwest Passage, these units provide a homeland-based response to the increasing numbers of international vessels transiting these waters and address Canada's broader marine safety objectives (CIRNAC, 2019a, 2019b). In total, Auxiliary units conducted 32 SAR operations in the Coast Guard's Arctic Region in 2020.

CCGA members also make essential contributions to marine safety in their regions and communities. Many units educate their communities about boating safety, the importance of having a sail plan, and the need to bring proper gear. As one Kugluktuk member explained:

> Our biggest success as an Auxiliary, but also for GSAR, has been in the prevention and education angle. We go to the schools. We talk to youth whenever we can. We tell them what they need when they go out on the water or on the land. We tell them what to look out for and be aware of. Lots of those kids than go back to tell their parents what they learned. People are getting better at going out prepared. We even have kids watching where people are going now and reporting this back if those people get into trouble or don't come back on time (information gathered during the 2019 capacity mapping workshop in Kugluktuk).

Auxiliary units have also supported governmental efforts to expand the number of aids to navigation and establish VHF repeaters systems in the North—illustrating that their impact goes far beyond SAR response.

Areas for Improvement

Despite their optimism about the Coast Guard's expansion of the Auxiliary, community responders have identified areas for improvement. For example, unit members seek greater clarity about the CCGA's mandate, which some worry "is made for the south." One member of the Kugluktuk Auxiliary pointed out how:

> If a hunter goes missing on the land, or is hurt, it might be easier to get him by boat, but they won't task us with this. Lots of hunters go up the coastline, or fishers, and it makes sense for the auxiliary to respond to these kinds of situations. What if we can get their faster? Travelling by boat is also often faster for evacuation, getting people back to medical treatment (personal communication, October 2019).

Could an Auxiliary unit be activated in a marine SAR role to find missing hunters or fishers who went up a shoreline on ATVs? Can Auxiliary boats be used to evacuate someone found injured during a

GSAR operation? National CCGA guidelines say that units may pre-position response assets close to where they are most likely needed and can search for vessels that might be in difficulty but were unable to communicate a distress alert. What kind of leeway do Auxiliary units have for this kind of preventative action? Could an Auxiliary unit and boat, for instance, pre-deploy to a popular fishing or hunting spot during the busiest period to be closer if it needed to respond to potential emergencies (Kikkert et al., 2020, p. 37)? As part of this preventative SAR function, could an Auxiliary unit use its SAR vessel to bring children to a traditional camp rather than relying on smaller, less stable vessels, if asked to do so by the community? Confusion over roles and responsibilities also extends to environmental response. Although the Coast Guard has indicated that Arctic oil spill response might involve Auxiliary units, it has provided little guidance or training in this respect. A CCGA mandate specifically tailored to the unique conditions and requirements of Arctic communities could provide clarity to many of these questions.

Auxiliary members also wish to receive more guidance and training on the roles that they might play in a major maritime disaster and mass rescue operation (MRO). The Kitikmeot Roundtable's MRO Tabletop Exercise highlighted the sophistication of community-level understandings of, and plans for, mass rescue operations. It also reinforced the value of community-level perspectives and local information on geography and environmental conditions in planning, preparing for, and executing an MRO. Auxiliary members highlighted a wide array of essential roles they might play during such operations: putting eyes on the situation; providing updates to the JRCC; on-scene coordination; providing information on where to evacuate passengers on the land; shepherding lifeboats or zodiacs to safe havens or the community; helping to offload and track passengers; searching for missing passengers; or establishing a camp to provide warmth and shelter to evacuees (Kikkert et al., 2020c). Auxiliary units want to be viewed as "force multipliers" in an MRO and desire the training, equipment, and guidance required to play these roles effectively.

Although pleased with the increase in training, Auxiliary members in the Kitikmeot indicated that they seek more opportunities for independent local and regional training and exercises. As one unit leader explained, "Local knowledge is essential for their unit and having more members well acquainted with the area is crucial for their search and rescue efforts. Being on the water more will help to accomplish this" (Community Engagement and Exercise Team, 2018). They suggested that more exercises involving the Joint Rescue Coordination Centres would be particularly beneficial, as Auxiliary members still have concerns about their ability to effectively communicate and operate with them. This practice may also help the JRCC and Coast Guard to develop clearer lines of communication through which to interact with communities during SAR cases, and particularly long-lasting ones.

Auxiliary members also seek more opportunities to train and exercise with other community SAR organizations. Coordination and cooperation between community groups remains informal and often limited at the community-level, and there is confusion about the different missions, roles, and responsibilities between the different community-based groups, as well as limited awareness about respective capacities and policies (information gathered during the 2019 capacity mapping workshops in Gjoa Haven and Taloyoak). In scenarios such as a prolonged shoreline search, CCGA, GSAR teams, Canadian Rangers, and Civil Air Search and Rescue volunteers may need to work together. Without opportunities for joint training and exercises beforehand, trying to coordinate the various elements of the local SAR system in a high-pressure, time-sensitive situation can be stressful and detract from efficiency of effort. One community responder explained that:

> Because people in these groups often know one another and there is usually a lot of crossover between them with all the hats people wear, there might be an idea that they can work together, no problem. But in an emergency, when groups have different ways of communicating, different ways of doing things, different mandates from the South, we can quickly run into trouble. We need to practice cooperating. We need to practice working together. And it's not

> just SAR—think about how helpful this would be during other emergencies that we might face in the community (Kikkert et al., 2020b, p. 35).

Regular training, meetings, and exercises between community groups and other governmental agencies can facilitate cooperation and coordination and improve operational effectiveness.

Finding a group of 15-20 Auxiliary members in small communities can be challenging, and volunteer burnout remains a major challenge. In some units, the same people are always on call and respond to all of the searches. This tempo of activity can inhibit their ability to get on the land and hunt and fish for their families, contributing to food insecurity issues. An Auxiliarist from Kugluktuk noted that:

> It can be really hard to keep something like the Auxiliary going. People who are willing to volunteer end up wearing a lot of different hats in the community. People are often willing to go out on rescues, but it is much harder to get them out for meetings, training, practice (personal communication, October 2019).

Responder fatigue was one of the challenges that the Coast Guard hoped to address through the Arctic SAR Project, particularly by reducing the pressure on community GSAR teams, which were also assisting with marine SAR activities (Project Charter, n.d.). The Coast Guard will have to continue its engagement and recruitment efforts to address this ongoing challenge. It also might consider additional incentives to encourage people to volunteer for the Auxiliary, such as new equipment and gear, clothing, or even a small cash bonus for being on call (Kikkert et al., 2020).

While the above challenges represent the most commonly cited by participants in the Kitikmeot SAR Project, Auxiliary members also highlighted other persistent issues. Many community responders refer to geographical features in Inuinnaqtun and Inuktitut, thus providing information unintelligible to JRCC personnel, who rely upon English-language maps. This indicates a need to better integrate Indigenous languages in the SAR framework. Community responders also note that discussing challenges and solutions after a search can lead to significant improvements—turning

lessons observed into lessons learned can have a major impact. They would like more support in establishing the mechanisms required to accomplish this. Finally, as one unit leader insisted:

> What we need the most—and this is the same for the auxiliary, for GSAR, for Rangers on SAR—is debriefing. These searches are often different than what people down south have to do. We know these people. They are often family, loved ones. The whole search can be very emotional (personal communication, October 2019).

Various individuals stressed how inadequate or non-existent access to mental health services to deal with the trauma of SAR operations contribute to "burnout" (Kikkert et al., 2020b, pp. 34-35).

In the end, a new mandate for Arctic Coast Guard Auxiliary units that better reflects the unique contexts of Northern communities, clearly lays out roles and responsibilities, and considers the unique marine safety and preventative SAR roles units may be asked to perform by their communities will improve response times and operational effectiveness. The same goes for increased local and regional training opportunities and mass rescue exercises, particularly if they facilitate engagement with other community groups responsible for search and rescue and emergency management. Such exercises would allow Auxiliary units to gain more experience working with JRCC personnel and would expose southern responders to the traditional languages and place names that might prove vital during a search. Finally, the collection and dissemination of lessons learned and best practices and efforts to combat volunteer burnout, including the provision of mental health services and the further incentivization of volunteers, will ensure that the expansion of the Auxiliary continues in a healthy and sustainable manner.

Discussion: Best Practices and Lessons Observed

The Coast Guard's Arctic SAR Project provides several obvious best practices: intensive community engagement, consistent training opportunities, the provision of new equipment (particularly safe and capable SAR vessels through the ICBVPP), and the integration of local and traditional knowledge into Canada's Arctic SAR System. These practices address several gaps identified

with disaster and emergency management (DEM) practices in Canadian Indigenous communities (Benoit et al., 2016). More specifically, scholars and practitioners have pointed out the need to create space for traditional knowledge and practices in Canada's broader DEM efforts (Mackinaw, 2016). Critics have also underlined the lack of opportunity provided to Indigenous communities to develop their local emergency response capabilities. Many remote Indigenous communities face difficulties in applying larger regional or national emergency response frameworks (such as the Canadian Coast Guard Auxiliary) to their unique contexts, as well as challenges working with outside agencies (including the Coast Guard) stemming from limited interactions and lack of trust (Benoit et al., 2016). The expansion of the Coast Guard Auxiliary represents a community-driven, culturally appropriate solution to many of these challenges.

The federal government's Arctic and Northern Policy Framework (ANPF) has prioritized bolstering "whole-of-society emergency management capabilities in Arctic and Northern communities" (CIRNAC, 2019b). While the expansion of the CCGA represents one key step in this process, others will have to follow. Northern communities certainly welcome training, equipment, and the prioritization of local and traditional knowledge. The general approach taken by the Coast Guard also explains the Arctic SAR Project's success and provides broader lessons and best practices for resilience-building measures in the North, as well as in other Indigenous communities.

Resilience-Building Measures Responsive to Specific Cultural and Social Contexts

Cox (2015) emphasizes that community disaster resilience "is generated from the ground up and resilience enhancement plans, activities, and policies—if they are to be successful—must be participatory and respond to the specific cultural and social context. At its heart, CDR is driven by community-defined priorities and practices." It requires that citizens be acknowledged as "full equity partners and co-designers of solutions" (Cox, 2015, pp. 5-6; see also Cox, 2007 and 2014; Cox and Hamlen, 2015; Bhatt and Reynolds, 2012; Conference Board of Canada, 2014; Murphy et al., 2014;

Public Safety Canada, 2019, pp. 5-6). The success of the Coast Guard's Arctic SAR Project has flowed from its understanding that:

> The Arctic's challenges will always be different. It cannot be governed in the same manner as southern Canada. Northern training requirements will also be unique. However, they should be standardized across the Arctic, regardless of Coast Guard regional boundaries and auxiliary regional boundaries. A 'made in the Arctic' solution is the way forward to ensure a sustainable and capable volunteer SAR organization (Garapick, 2018a).

The Coast Guard's focus on working with communities to co-develop a "tailored strategy" and to implement "innovative, creative approaches," such as the training blitz and the community boats program (Canadian Coast Guard Arctic Search and Rescue (SAR) Project, n.d.), highlights its search for practical solutions rooted in the unique context(s) of Arctic communities.

The Coast Guard also took the time to develop a robust appreciation for each community's strengths, such as its ability to mobilize local and traditional knowledge, situatedness in region-wide networks of SAR capacity, and the dedication of community responders, before actively and intentionally building upon these strengths. Accordingly, the expansion of the Coast Guard Auxiliary represents a prime example of a resilience-building approach that emphasizes "capacities and assets, and how these can be mobilized and/or enhanced in order to reduce vulnerability and risk" (Cox, 2015, p. 6). It fits well with recent calls from Northern Indigenous leaders for policy development to focus on the knowledge and skills possessed by communities "and how the federal government can assist in building upon and supporting these strengths. This means focusing on what we have versus focusing on what we lack, and valuing our existing capacity over voices that tell us we are not capable" (Dene Nahjo et al., 2018, p. 12). Future resilience-building measures should adopt similar holistic community-centred approaches to enhance capabilities, coordinating efforts and bolstering capacity.

"To learn at their feet": An Approach Rooted in Learning and Relationship-Building

The Coast Guard's Arctic Search and Rescue Project's focus on building and maintaining long-lasting partnerships with communities, municipal, territorial, and Indigenous governments represents another major factor in its success (Briefing Note to the Deputy Minister, n.d). In 2018, the CCG Director General, Operations, Gregory Lick, explained that:

> These partnerships afford us the chance to learn at their feet so that we can better serve them and their communities, and to allow the communities to become actively involved in the search and rescue system…one of the big revolutions in our thinking is that we shouldn't be bringing southern solutions to the North. The North should absolutely be asking and developing those solutions with our support, but they should be the leaders in developing those solutions (Lick, 2018).

His comments encapsulate the Coast Guard's approach to the expansion of the Auxiliary—it is not just a "made in the Arctic solution," but a made *with* the Arctic solution. The instructions given to the Coast Guard's Arctic Community Engagement and Exercise teams emphasized this:

> is the key for success – we must present our topics, our areas of expertise 180 degrees from what is normal. Instead of us telling a community what we are doing, we need to think from the community perspective and present the benefits for the community of the service or concept for which we are responsible and ask if they agree with what we see as benefits and if they can suggest better or the best ways we can work together (Garapick, 2019).

Likewise, the instructions guiding the RAMSARD study reinforced that "effective networking is at the heart of the successful delivery" the initiative (Risk Based Analysis of Maritime SAR Delivery, n.d.).

The Coast Guard has effectively operationalized these words throughout its Auxiliary expansion efforts. They have been present in the communities, consistently engaged with new and old Auxiliary units, and remained in contact when visits to the community proved impossible. Furthermore, it has been the *same* people conducting this engagement over time. Angulalik Pedersen, 2nd Unit Leader of the Cambridge Bay Coast Guard Auxiliary, emphasized that "it is important that

the same faces are consistently showing up; it has really helped build the trust required for work like this" (personal communication, October 2019). From the perspective of Nunavut Emergency Management (NEM), the agency that asked for the expansion of the Auxiliary in 2014, the consultation and relationship-building have worked well. In 2018, Nunavut's former Director of Protection Services Ed Zebedee explained that the,

> [the Canadian Coast Guard] have been doing some very good consultation in the last 18 months to two years. We have done a lot of work with them. I have actually sent staff of mine with the Canadian Coast Guard into the communities to smooth the waters, lead the way, do some translations where needed. In the rollout of the Coast Guard Auxiliary program, they listened to what we've recommended, and they have done that (Zebedee, 2018).

The process required effort: there were stumbles at first and a steep learning curve. For example, when the Coast Guard first approached the hamlet of Arviat, the community was still dealing with a negative search outcome and a failed SAR society that saddled the hamlet with a $20,000 debt. When the CCG outreach team tried to convince community members of the benefits of creating a SAR society in which to nest the Auxiliary unit, local residents were worried that the Coast Guard was "trying to change them rather than listen to what works best for their community" (Community Engagement and Exercise Team Reports, 2018). Over time, however, repeat visits, further engagement, and a willingness to listen brought the community on board. Arviat is the latest recipient of community boats funding, and its mayor and council told the news media that they are "very excited with the ongoing support from Canadian Coast Guard Auxiliary…Support like this continues to promote safety and professionalism to all marine traffic in the area. Without this type of support, it is very difficult to deliver this very valuable service" (Nunatsiaq News, 2020, para. 6).

Conclusion

When reflecting on the expansion of the Coast Guard Auxiliary in the Arctic, a long-time member of the Auxiliary noted: "It has not been this good in years. There has not been this many

opportunities in years. People need to apply for training, apply for new boats, start a new auxiliary now, [because] I'm not sure how long this will last (personal communication, April 2019). To reinforce that the Arctic Search and Rescue Project is not another federal program launched with fanfare and then left to wither on the vine, the CCG should consistently reiterate its ongoing commitment to the communities. Conversations with Kitikmeot stakeholders confirm that community responders want the Coast Guard to proceed with its plans to expand the Auxiliary, even if funding pressures related to COVID-19 reduce the budget envelope and extend timelines. In short, our findings suggest that the Arctic Search and Rescue Project should continue to function as a major pillar in the Coast Guard's development of its new Arctic Region, serving as an example of emerging "best practices" in effective co-development of programming with Northern Indigenous communities.

Participants in the Kitikmeot Search and Rescue Project explained that by supporting and facilitating on-the-land (on-the-water) activities, the expansion of the Coast Guard Auxiliary constitutes an essential building block of the physical, mental, social, and cultural health and well-being of Northern Indigenous Peoples, of the Northern economy, and of the overall resilience of their communities. The expansion addresses Inuit demands that the federal government "enhance search and rescue and emergency protection infrastructure and training in Inuit communities" (ICC, 2019, pp. 5, 11), and supports many of the priorities laid out in the federal government's ANPF, including local harvesting of food, community-led food production projects, tourism, commercial fisheries, marine protected areas, mitigation of climate change impacts, and the enhancement of SAR capabilities along the Northwest Passage. This article reveals that the CCG Auxiliary expansion has proven highly effective in securing community support and investing in local capacity. As a result, the Coast Guard's Arctic SAR Project has set a firm foundation for continued expansion of the Auxiliary and should serve as a model for other resilience-building initiatives in Inuit Nunangat and the Canadian North more broadly.

Acknowledgements: This work is the result of the Kitikmeot Search and Rescue Project (https://kitikmeotsar.ca/) supported by the Marine Environment Observation Prediction and Response Network (MEOPAR), Social Sciences and Humanities Research Council (SSHRC), Mobilizing Insights in Defence and Security Program (MINDS), Irving Shipbuilding Inc., the North American Defence and Security Network (NAADSN), and the Canada Research Chairs program. We are grateful to the members of the community-based search and rescue organizations in Kugluktuk, Cambridge Bay, Gjoa Haven, Taloyoak, and Kugaaruk and to all who participated in the Kitikmeot Roundtable on Search and Rescue (see Kitikmeotsar.ca for a full list). In particular, we thank Angulalik Pedersen, Jack Himiak, Roger Hitkolok, Baba Pedersen, Calvin Pedersen, Beverly Maksagak, George Angohiatok, Winnie Hatkaittuq, and Paul Ikuallaq for their ongoing support of the project. We further thank the Canadian Coast Guard, Canadian Coast Guard Auxiliary, Joint Task Force North, 1st Canadian Ranger Patrol Group, 1 Canadian Air Division, and Nunavut Emergency Management for their support.

This project was approved by the Nunavut Research Institute (license 04 009 20R-M) and the St. Francis Xavier University Research Ethics Board (Certification: 23923).

References

Unpublished Government Documents

Canadian Coast Guard. (2019). 2018-2019, Maritime Search and Rescue Arctic Analysis (Area 260). Access to Information and Privacy (ATIP) Request A-2019-00025-DQ-Final.

Canadian Coast Guard. (2018). Arctic Community Engagement and Exercise Program. Access to Information and Privacy (ATIP) Request A-2019-00023-DQ-Final.

Canadian Coast Guard. (2017). Briefing Note to the Assistant Commissioner: Initial Risk-Based Analysis of Maritime Search and Rescue Delivery, Arctic Region. Access to Information and Privacy (ATIP) Request A-2019-00025-DQ-Final.

Canadian Coast Guard. (2016). CCG Arctic SAR Project – Update, 25 January 2016. Access to Information and Privacy (ATIP) Request A-2019-00023-DQ-Final.

Canadian Coast Guard. (n.d.). Draft Report: Canadian Coast Guard Arctic Search and Rescue Project. Access to Information and Privacy (ATIP) Request A-2019-00023-DQ-Final.

Canadian Coast Guard Arctic Search and Rescue (SAR) Project. (n.d.). Partnering with Coastal Communities to Enhance Arctic SAR Capacity. Access to Information and Privacy (ATIP) Request A-2019-00025-DQ-Final.

Community Engagement and Exercise Team. (2018). Community Engagement and Exercise Team Reports. Access to Information and Privacy (ATIP) Request A-2019-00023-DQ-Final.

Community Engagement and Exercise Team. (n.d.). SARRA Coast Guard Community Engagement – Baffin Island Report.

Garapick, P. (Superintendent, Search and Rescue, Central and Arctic Region, Canadian Coast Guard) (2019, January 14). Email. Access to Information and Privacy (ATIP) Request A-2019-00023-DQ-Final.

Garapick, P. (Superintendent, Search and Rescue, Central and Arctic Region, Canadian Coast

Guard). (2018a). Arctic RAMSARD Study Update. Access to Information and Privacy (ATIP) Request A-2019-00025-DQ-Final.

Risk Based Analysis of Maritime SAR Delivery (RAMSARD). (n.d.). Risk Based Analysis of Maritime SAR Delivery: Vol. 1: Strategic Overview. Access to Information and Privacy (ATIP) Request A-2019-00025-DQ-Final.

Secondary Sources

Allen, J. (2005). Community Asset Mapping and Mobilizing Communities. Presentation to the Idaho Governor's 6th Annual Roundtable Coeur d'Alene, Idaho.

Ampomah, G., & Devisscher, T. (2013). Adaptation Toolkit: Guidebook for Researchers and Adaptation Practitioners Working with Local Communities. Stockholm: Stockholm Environment Institute.

Benoit, L. (2018). Testimony to The Standing Senate Committee on Fisheries and Oceans, 19 April 2018. Senate Canada. https://sencanada.ca/en/Content/SEN/Committee/421/pofo/28cv-e.

Benoit, L. (2014a). Perspectives on Emergency Response in the Canadian Arctic: Sinking of the MS Arctic Sun in Cumberland Sound, Nunavut. Part A: Hypothetical Scenario. Munk-Gordon Arctic Security Program. https://gordonfoundation.ca/resource/perspectives-on-emergency-response-in-the-canadian-arctic-part-a//

Benoit, L. (2014b). Perspectives on Emergency Response in the Canadian Arctic: Sinking of the MS Arctic Sun in Cumberland Sound, Nunavut. Part B: Response to the Hypothetical Scenario. Munk-Gordon Arctic Security Program. https://gordonfoundation.ca/resource/perspectives-on-emergency-response-in-the-canadian-arctic-part-b/.

Benoit, L. (2014c). Perspectives on Emergency Response in the Canadian Arctic: Sinking of the

MS Arctic Sun in Cumberland Sound, Nunavut. Part C: Findings of the Hypothetical Scenario. Munk-Gordon Arctic Security Program. https://gordonfoundation.ca/resource/perspectives-on-emergency-response-in-the-canadian-arctic/.

Benoit, L., Murphy, B., & Pierce, L. (2016). *Sharing lessons learned about disaster resilience for First Nations communities: A summary report*. Canadian Risks and Hazards Network. http://haznet.ca/sharing-lessons-learned-about-disaster-resilience-for-first-nations-communities-a-summary-report/

Bhatt, M., & Reynolds, T. (2012). Community-based disaster risk reduction: Realising the primacy of community. In C. Emdad Haque & D. Etkin (Eds.), *Disaster risk and vulnerability: Mitigation through mobilizing communities and partnerships* (pp. 71–92). McGill-Queen's University Press.

Canadian Coast Guard Auxiliary. (2017). National Guidelines. Ottawa: Canadian Coast Guard.

Caudle, S. (2005). Homeland Security Capabilities-Based Planning: Lessons from the Defense Community. *Homeland Security Affairs, 1*(2), 1-21.

Conference Board of Canada. (2014). Building community resilience in Whatì, Northwest Territories. https://www.conferenceboard.ca/e-library/abstract.aspx?did=6097.

Cox, R. (2007). Capacity building approaches to emergency management in rural communities: Recommendations from survivors of the British Columbia wildfires, 2003. *International Journal of Emergency Management, 4*(2), 250-268. https://doi.org/10.1504/IJEM.2007.013993

Cox, R., (2014). Disaster preparedness in Canada's North: What's resilience got to do with it? *Northern Public Affairs*, *2*(3), 43-45. http://www.northernpublicaffairs.ca/index/volume-2-issue-3-arctic-search-rescue/search-rescue-disaster-preparedness-in-canadas-north-whats-resilience-got-to-do-with-it/

Cox, R., & Hamlen, M. (2015). Community Disaster Resilience and the Rural Resilience Index. *American Behavioral Scientist, 59*(2), 220-237. https://doi.org/10.1177/0002764214550297.

Cox, R. (2015). *Measuring Community Disaster Resilience: A Review of Current Theories and Practices with Recommendations*. Report for Defence Research and Development Canada.

Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC). (2019a). *Arctic and Northern Policy Framework, Government of Canada*. Government of Canada. https://www.rcaanc-cirnac.gc.ca/eng/1560523306861/1560523330587

Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC). (2019b). *Arctic and Northern Policy Framework: Safety, Security, and Defence Chapter*. Government of Canada. https://www.rcaanc-cirnac.gc.ca/eng/1562939617400/1562939658000.

Dawson, J., Pizzolato, L., Howell, S.E.L., Copeland, L., & Johnston, M.E. (2018). Temporal and Spatial Patterns of Ship Traffic in the Canadian Arctic from 1990 to 2015. *Arctic, 71*(1), 15-26. https://doi.org/10.14430/arctic4698.

Dene Nahjo, Qanak, Our Voices, & the Gordon Foundation. (2018). *We are One Mind: Perspectives from Emerging Indigenous Leaders on the Arctic Policy Framework*. Gordon Foundation. https://gordonfoundation.ca/wp-content/uploads/2018/02/We-Are-One-Mind-FINAL-Web.pdf

Evaluation Directorate, Fisheries and Oceans Canada. (2012). *Canadian Coast Guard Search and Rescue and Canadian Coast Guard Auxiliary Evaluation Report, Final Report*. Fisheries and Oceans Canada. https://www.dfo-mpo.gc.ca/ae-ve/evaluations/11-12/SAR-CCGA-eng.htm#4.

Garapick, P. (Superintendent, Search and Rescue, Central and Arctic Region). (2018b). Testimony to The Standing Senate Committee on Fisheries and Oceans, 26

April 2018. Senate Canada. https://sencanada.ca/en/Content/SEN/Committee/421/pofo/29cv-e.

Inuit Circumpolar Council Canada (ICC). (2019). Submission to the Special Senate Committee on the Arctic Regarding the Arctic Policy Framework and International Priorities. https://sencanada.ca/content/sen/committee/421/ARCT/Briefs/InuitCircumpolarCouncilCanada_e.pdf

Keim, M. (2013). An innovative approach to capability-based emergency operations planning. *Disaster Health, 1*(1), 54-62. https://doi.org/10.4161/dish.23480

Kikkert, P., Lackenbauer, P.W., & Pedersen, A. (2020a). Kitikmeot Roundtable on Search and Rescue: Summary Report / Qitiqmiuni Katimatjutauyuq Qiniqhiayinit Annaktinillu – Naunaitkutat. Report from a workshop hosted at the Canadian High Arctic Research Station (CHARS) in Cambridge Bay, Nunavut, 31 January – 1 February 2020. Available at Kitikmeot Search and Rescue (Kitikmeotsar.ca).

Kikkert, P., Lackenbauer, P.W., & Pedersen, A. (2020b). Kitikmeot Roundtable on SAR: General Report and Findings. Report from a workshop hosted at the Canadian High Arctic Research Station (CHARS) in Cambridge Bay, Nunavut, 31 January – 1 February 2020. Available at Kitikmeot Search and Rescue (Kitikmeotsar.ca).

Kikkert, P., Lackenbauer, P.W., & Pedersen, A. (2020c). Kitikmeot Roundtable on SAR: Mass Rescue Tabletop Exercise Report. Report from a workshop hosted at the Canadian High Arctic Research Station (CHARS) in Cambridge Bay, Nunavut, 31 January – 1 February 2020. Available at Kitikmeot Search and Rescue (Kitikmeotsar.ca).

Kikkert, P., & Lackenbauer, P.W. (2019). Bolstering Community-Based Marine Capabilities in the Canadian Arctic. *Canadian Naval Review*, 15(2), 11-16.

Kruger, J. (2000, February). "District 9," *Shipmate* (3).

Kruger, J. (1998, January). "District 9," *Coast Guard Auxiliary Newsletter* (1).

Legislative Assembly of Nunavut, 5th Session, 1st Assembly, 20 November 2001.

Lick, G. (Director General, Operations, Canadian Coast Guard). (2018). Testimony to The Standing Senate Committee on Fisheries and Oceans, 26 April 2018. Senate Canada. https://sencanada.ca/en/Content/SEN/Committee/421/pofo/29cv-e.

Mackinaw, C. (2016, Nov. 23-25). *First Nations disaster risk resilience and reconciliation* [Presentation]. 13th Annual Symposium, Canadian Risk and Hazards Network, Hyatt Regency, Montreal, Quebec.

McKnight, J., & Kretzmann, J. (1997). Mapping community capacity. In M. Minkler (Ed.), *Community organizing and community building for health* (pp. 157-171). New Brunswick: Rutgers University Press.

Murphy, B., Anderson, G.S., Bowles, R., & Cox, R.S. (2014). Planning for disaster resilience in rural, remote, and coastal communities: moving from thought to action. *Journal of Emergency Management*, *12*(2), 105–120. https://doi.org/10.5055/jem.2014.0165.

Nunatsiaq News. (2020, October 15). Feds earmark money for new search and rescue boats in three Nunavut communities. *Nunatsiaq News*. https://nunatsiaq.com/stories/article/feds-earmark-money-for-new-search-and-rescue-boats-in-three-nunavut-communities/

Østhagen, A. (2017). *Utilising Local Capacities Maritime Emergency Response across the Arctic*. University of Copenhagen: Centre for Military Studies.

Public Safety Canada. (2019). *Emergency Management Strategy for Canada: Toward a Resilient 2030. Government of Canada*. https://www.publicsafety.gc.ca/cnt/rsrcs/pblctns/mrgncy-mngmnt-strtgy/index-en.aspx

Public Safety Partners Resource Centre. (n.d). "Capability-Based Planning." PSPRC.

Special Senate Committee on the Arctic. (2019). *Northern Lights: A Wake-Up Call for the Future*

of Canada. Senate Canada. https://sencanada.ca/content/sen/committee/421/ARCT/reports/ARCTFINALREPORT_E.pdf

Standing Committee on Fisheries and Oceans. (2018). *When Every Minute Counts: Maritime Search and Rescue*. Senate Canada.

Standing Committee on Foreign Affairs and International Development. (2019). *Canada's Sovereignty in the Arctic*. House of Commons Canada. https://www.ourcommons.ca/Committees/en/FAAE/StudyActivity?studyActivityId=10158962

Thompson, S. (Superintendent, Maritime Search and Rescue, Canadian Coast Guard Arctic Region). (2021, Feb. 18). Virtual presentation to the JABAS - Joint Agile Basing Airpower Seminar.

Varga, P. (2014, March 5). Nunavut Search and Rescue Calls for Added Water Support. *Nunatsiaq News*. https://nunatsiaq.com/stories/article/65674nunavut_search_and_rescue_calls_for_added_land_and_water_support/

Zebedee, E. (Director of Protection Services, Department of Community and Government Services, Government of Nunavut). (2018). Testimony to The Standing Senate Committee on Fisheries and Oceans, 22 May 2018. Senate Canada. https://sencanada.ca/en/Content/Sen/Committee/421/POFO/32ev-54074-e.