

True North Strong and Free: Preparing the Canadian Armed Forces for Arctic Operations

A Monograph

by

MAJ Tim Day
Canadian Army



School of Advanced Military Studies
US Army Command and General Staff College
Fort Leavenworth, KS

2021

Approved for public release; distribution is unlimited

REPORT DOCUMENTATION PAGE				Form Approved OMB No. 0704-0188	
Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing this collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports (0704-0188), 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. PLEASE DO NOT RETURN YOUR FORM TO THE ABOVE ADDRESS.					
1. REPORT DATE (DD-MM-YYYY) 23 05 2021		2. REPORT TYPE MASTER'S THESIS		3. DATES COVERED (From - To) JUNE 20-MAY 21	
4. TITLE AND SUBTITLE True North Strong and Free: Preparing the Canadian Armed Forces for Arctic Operations				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S) Day, Tim, Major, Canadian Army				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) U.S. Army Command and General Staff College ATTN: ATZL-SWD-GD Fort Leavenworth, KS 66027-2301				8. PERFORMING ORG REPORT NUMBER	
9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES) ADVANCED MILITARY STUDIES PROGRAM				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION / AVAILABILITY STATEMENT Approved for Public Release; Distribution is Unlimited					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT The Government of Canada published its <i>Arctic and Northern Policy Framework</i> in September 2019 to serve as a whole-of-government approach to develop and secure the Canadian North. This monograph analyzes how the Canadian Armed Forces can use this policy framework as strategic guidance to influence the development of a Canadian Arctic operating concept. This operating concept is derived as a hybrid model of the Canadian adaptive dispersed operations and the American multi-domain operations concepts. It proposes that the Canadian Armed Forces adopt a multi-domain approach to projecting effects into the Arctic. Using operational art as a framework, this monograph concludes with recommendations on a specific end state for the Arctic, Canada's Arctic operational center of gravity, decisive points, future basing considerations, and where the Canadian Armed Forces and Government of Canada can accept risk in the Arctic.					
15. SUBJECT TERMS Canada, Arctic, climate change, sovereignty, operating concept, multi-domain					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT (U)	18. NUMBER OF PAGES 45	19a. NAME OF RESPONSIBLE PERSON
a. REPORT (U)	b. ABSTRACT (U)	c. THIS PAGE (U)			19b. PHONE NUMBER (include area code) 913 758-3300

Monograph Approval Page

Name of Candidate: MAJ Tim Day

Monograph Title: True North Strong and Free: Preparing the Canadian Armed Forces for Arctic Operations

Approved by:

//signed/4 MAR 21/AEC//, Monograph Director
Anthony E. Carlson, PhD

//signed/4 MAR 21/JP//, Seminar Leader
Jurgen Prandtner, COL

//signed 20 APR 21/BAP//, Director, School of Advanced Military Studies
Brian A. Payne, COL

Accepted this 20th day of May 2021 by:

_____, Acting Director, Office of Graduate Degree Programs
and Research, CGSC
Dale F. Spurlin, PhD

The opinions and conclusions expressed herein are those of the student author and do not necessarily represent the views of the US Army Command and General Staff College or any other government agency. (References to this study should include the foregoing statement.)

Fair use determination or copyright permission has been obtained for the inclusion of pictures, maps, graphics, and any other works incorporated into this manuscript. A work of the US government is not subject to copyright, however further publication or sale of copyrighted images is not permissible.

Acknowledgements

I would first like to thank Major-General Stephen Kelsey for his mentorship and for providing me with the opportunity to pursue this study. My Monograph Director, Dr. Anthony E. Carlson, and Seminar Leader, Colonel Jurgen Prandtner, were very patient and supportive throughout this process.

Contents

Monograph Approval Page.....	ii
Acknowledgements	iii
Contents.....	iv
Abstract	vi
Abbreviations	vii
Figures.....	viii
Tables	ix
Introduction	1
Background to the Study	1
Statement of the Problem	2
Significance of the Study.....	3
Theoretical Approach	4
Definition of Terms	5
Arctic Circle	5
Canadian Arctic.....	5
Canadian North.....	6
Overview of the Hypothesis	7
Limitations.....	8
Delimitations	8
Assumptions.....	8
Organization of the Study.....	9
Literature Review	9
<i>Arctic and Northern Policy Framework, 2019.....</i>	10
<i>Strong, Secure, Engaged: Canada’s Defence Policy, 2017</i>	16
Methodology	19
Discussion & Analysis	21
Discussion	21
Adaptive Dispersed Operations	21
Multi-Domain Operations	25
Analysis	28
Conclusion & Recommendations.....	31
Conclusion.....	31
Recommendations	35

Areas for further research.....	38
Summary	40
Bibliography.....	42

Abstract

True North Strong and Free: Preparing the Canadian Armed Forces for Arctic Operations, by MAJ Tim Day, 41 pages.

The Government of Canada published its *Arctic and Northern Policy Framework* in September 2019 to serve as a whole-of-government approach to develop and secure the Canadian North. This monograph analyzes how the Canadian Armed Forces can use this policy framework as strategic guidance to influence the development of a Canadian Arctic operating concept. This operating concept is derived as a hybrid model of the Canadian adaptive dispersed operations and the American multi-domain operations concepts. It proposes that the Canadian Armed Forces adopt a multi-domain approach to projecting effects into the Arctic. Using operational art as a framework, this monograph concludes with recommendations on a specific end state for the Arctic, Canada's Arctic operational center of gravity, decisive points, future basing considerations, and where the Canadian Armed Forces and Government of Canada can accept risk in the Arctic.

Abbreviations

A2AD	Anti-access and Area Denial Systems
AAC 21	Army Arctic Concept 2021
ADO	Adaptive Dispersed Operations
ANPF	Arctic and Northern Policy Framework
CAF	Canadian Armed Forces
CMBG	Canadian Mechanized Brigade Group
CADIZ	Canadian Air Defence Identification Zone
COG	Center of Gravity
DOTMLPF-P	Doctrine, Organization, Training, Materiel, Leadership & Education, Personnel, Facilities, Policy
DND	Department of National Defence
EEZ	Exclusive Economic Zone
ICEWS	Intelligence, Cyberspace, Electronic Warfare, and Space
ISR	Intelligence, Surveillance, and Reconnaissance
JTFN	Joint Task Force North
LSCO	Large-Scale Combat Operations
MDO	Multi-Domain Operations
MDTF	Multi-Domain Task Force
NORAD	North American Aerospace Defense Command
NWP	Northwest Passage
RCAF	Royal Canadian Air Force
RCM	RADARSAT Constellation Mission
RCN	Royal Canadian Navy
SAR	Search and Rescue
TRADOC	US Army Training and Doctrine Command

Figures

Figure 1. Location of the last ice area	2
Figure 2. Northwest Passage	4
Figure 3. Segments Comprising of the Outer Limits of Canada’s Continental Shelf in the Arctic Ocean.....	6
Figure 4. Political Map of the Territories	7
Figure 5. Elements of Canadian Arctic Sovereignty	11
Figure 6. Adjustment to the Canada Air Defence Identification Zone.....	15

Tables

Table 1. Domain Capabilities by Operational Function	24
Table 2. Chinese and Russian Stand-Off in Competition and Conflict.....	26
Table 3. Phases of Multi-Domain Operations	27
Table 4. Operating Concept Comparison	29
Table 5. Hybrid-Model Canadian Arctic Operating Concept.....	32
Table 6. Canadian Arctic Operational Center of Gravity Analysis	36

Introduction

Through the wide range of activities undertaken by the Government of Canada, its partners and local communities, Canada's enduring sovereignty over its Arctic and northern lands and waters is continually expressed. Canada's sovereignty over the region is long-standing, well-established and based on historic title, and founded in part on the presence of Inuit and First Nations since time immemorial.

—*Canada's Arctic and Northern Policy Framework*

Background to the Study

As a result of climate change, access to the Arctic, as well as the vast natural resources located beneath the Arctic Ocean, has drastically increased. According to *Canada's Changing Climate Report*, “Canadian Arctic marine areas, including the Beaufort Sea and Baffin Bay, are projected to have extensive ice-free periods during the summer by mid-century.”¹ Figure 1 presents what the last permanent Arctic ice area is projected to be by 2050. These extended ice-free periods, along with advancements in cold-weather technologies, are resulting in the Canadian North emerging as “an area of international strategic, military and economic importance, with both Arctic and non-Arctic states expressing a variety of interests in the region's potential.”² As a founding member of the Arctic Council in 1996, Canada has taken a leadership role in the future of the Arctic. Canada's Arctic and Northern regions comprise an area roughly one third the size of Europe, with a population of approximately 111,000.³ Consequently, the Government of Canada has encountered some difficulty in exercising its sovereignty in the Arctic, with such a vast space, small population, and limited resources. In September 2019, the Government of Canada published the *Arctic and Northern Policy Framework* (ANPF), which outlines a Whole-of-Government

¹ Government of Canada, *Canada's Changing Climate Report* (Ottawa: Natural Resources Canada, 2019), 6. https://www.nrcan.gc.ca/sites/www.nrcan.gc.ca/files/energy/Climate-change/pdf/CCCR_FULLREPORT-EN-FINAL.pdf.

² Government of Canada, *Canada's Arctic and Northern Policy Framework* (Ottawa: Crown-Indigenous Relations and Northern Affairs Canada, 2019), 67. <https://www.rcaanc-cirnac.gc.ca/eng/1560523306861/1560523330587>.

³ Government of Canada, “Population and Dwelling Count Highlight Tables, 2016 Census,” (Ottawa: Statistics Canada, 2017). <https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/hlt-fst/pd-pl/Table.cfm?Lang=Eng&T=101&S=50&O=A>.

approach to promote Canada's Arctic sovereignty, employing every aspect of national power to exert influence over its Arctic territory. As part of the Whole-of-Government approach, and as one of the Arctic security stakeholders in Canada, the Canadian Armed Forces (CAF) constitute the Government of Canada's largest resource in securing sovereignty over its Arctic and Northern territories.



Figure 1. Location of the last ice area. Government of Canada, *Canada's Changing Climate Report* (Ottawa: Natural Resources Canada, 2019), 220.
https://www.nrcan.gc.ca/sites/www.nrcan.gc.ca/files/energy/Climate-change/pdf/CCCR_FULLREPORT-EN-FINAL.pdf.

This study will determine if the CAF can use the 2019 ANPF as strategic guidance to prepare for Arctic operations. Specifically, it will analyze *Strong, Secure, Engaged: Canada's Defence Policy* from

2017 and the 2019 ANPF to probe whether or not gaps exist in what is planned for the Canadian Arctic and what has been proposed. It is understood that Canada's existing defense policy predates Canada's latest policy direction regarding the Arctic, which means that the CAF has not yet had the formal opportunity to communicate its response to the ANPF. Whether or not Canada can adapt other operating concepts to function in the Canadian Arctic, such as *The U.S. Army in Multi-Domain Operations 2028*, will also be discussed.

Significance of the Study

Canada has taken a firm stance on recognizing and fighting climate change. *Canada's Changing Climate Report* has clearly illustrated that the effects of climate change are impacting the Arctic and Canadian North at a much faster rate than the rest of the country.⁴ This is resulting in increased access to the Arctic and the valuable natural resources that have previously been either too costly or unavailable for exploitation. Furthermore, the Northwest Passage (NWP) through the Canadian Arctic, depicted in Figure 2, is being seen as a more attractive maritime trade route between Europe and Asia.⁵ The Government of Canada has announced its intent to exploit the natural resources within its Exclusive Economic Zone (EEZ) in a responsible manner, as well as regulating maritime traffic within that same zone. The CAF, as part of Canada's Whole-of-Government approach in the Arctic, will be used to enforce Canada's sovereignty over this EEZ. The results of this monograph will inform CAF leadership on the importance and requirements of improving its Arctic operations capabilities in order to enforce Canada's EEZ and its air and maritime approach routes.

⁴ Government of Canada, *Canada's Changing Climate Report*, 6.

⁵ The Economist, "Breaking the Ice: Everyone wants a piece of the Arctic," *The Economist*, August 19, 2004. <https://www.economist.com/the-americas/2004/08/19/breaking-the-ice>.



Jesse Ferreras, “Canada’s Northwest Passage claim isn’t settled – but it’s not ‘illegitimate,’ like the US says it is,” *Global News*, May 31, 2019.
<https://globalnews.ca/news/5256532/northwest-passage-canada-us-claim-challenge/>.

Theoretical Approach

This study uses the theoretical approach of operational art as a framework with which to qualify operations in the Arctic. The concept of operational art does not exist in Canadian doctrine, so the concept of operational art, as defined in the American Joint Publication (JP) 3-0, *Joint Operations*, will be used to evaluate the CAF’s ability to conduct Arctic operations. According to JP 3-0, *Joint Operations*, “(o)perational art is the cognitive approach by commanders and staffs – supported by their skill, knowledge, experience, creativity, and judgment – to develop strategies, campaigns, and operations to organize and employ military forces by integrating ends, ways, and means.”⁶ Army Doctrine Publication (ADP) 3-0 *Operations* lists the following elements of operational art: end state and conditions, center of

⁶ US Department of Defense, Joint Staff, Joint Publication (JP) 3-0, *Joint Operations* (Washington, DC: Government Publishing Office, 2017), II-3.

gravity (COG), decisive points, lines of operation and lines of effort, tempo, phasing and transitions, culmination, operational reach, basing, and risk.⁷

Definition of Terms

The terms Arctic and North are not synonymous and will not be used interchangeably throughout this study. In the interest of clarity, the following definitions are provided to ensure a common understanding throughout.

Arctic Circle

The Arctic Circle is a geographic latitudinal line at 66°33'N. On the shortest day of the year in the Northern Hemisphere, the center of the Sun does not rise above the horizon at this latitude.⁸

Canadian Arctic

The Canadian Arctic is the Canadian territory, both recognized and claimed, that lies north of the Arctic Circle. It includes some parts of the Canadian mainland, the entire Canadian Arctic Archipelago, and all internal waters located therein. The Canadian Arctic is a part of the Canadian North. Figure 3 illustrates the portion of the Arctic Ocean that Canada has claimed as the northern portion of its EEZ, including the North Pole. As part of its ratification and recognition of the United Nations Convention on the Laws of the Sea, Canada submitted this claim to the Commission for the Limit of the Continental Shelf on May 23, 2019.⁹

⁷ US Department of the Army, Army Doctrine Publication (ADP) 3-0, *Operations* (Washington, DC: Government Publishing Office, 2015), 2-6.

⁸ Chris Burn, *The Polar Night* (Inuvik, NWT: The Aurora Research Institute, March, 1996), 4. <https://nwtresearch.com/sites/default/files/the-polar-night.pdf>.

⁹ Government of Canada, *Partial Submission of Canada to the Commission on the Limits of the Continental Shelf regarding its continental shelf in the Arctic Ocean: Executive Summary* (Ottawa: Her Majesty the Queen in Right of Canada, 2019). https://www.un.org/Depts/los/clcs_new/submissions_files/can1_84_2019/CDA_ARC_ES_EN_secured.pdf.

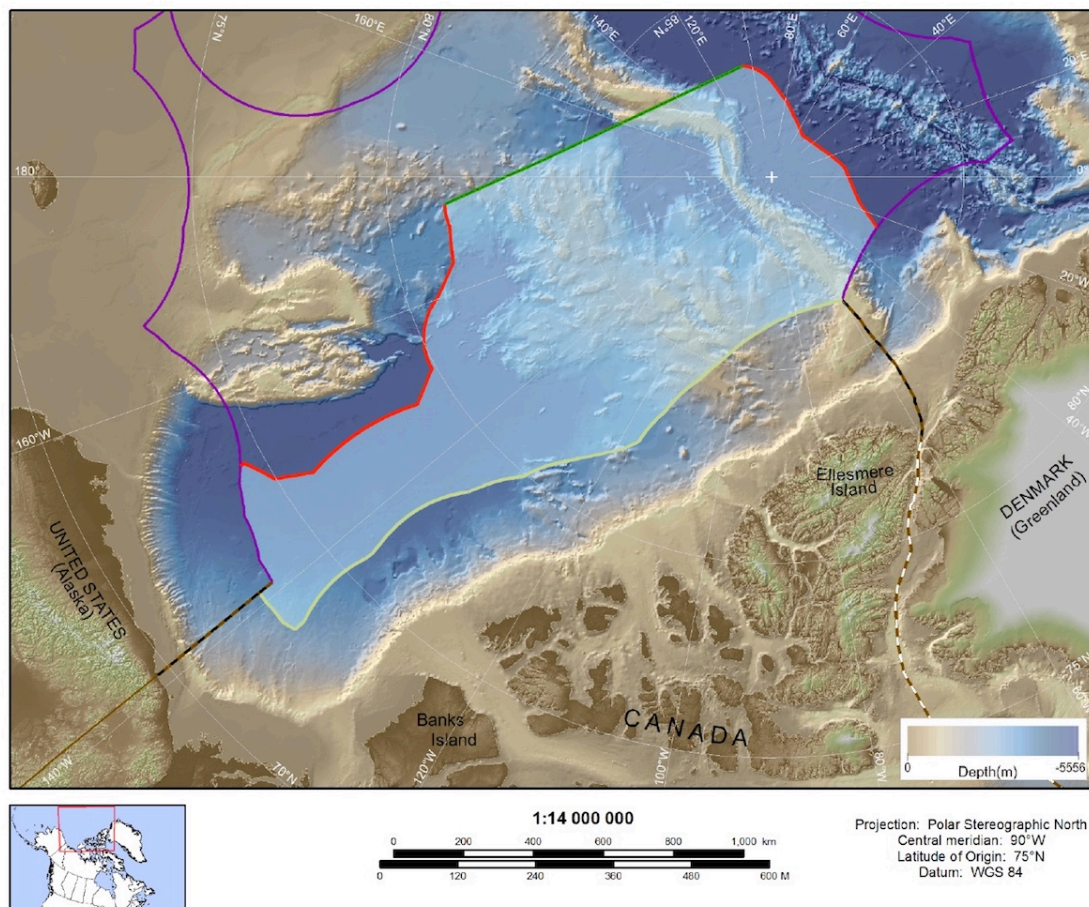


Figure 3. Segments Comprising of the Outer Limits of Canada's Continental Shelf in the Arctic Ocean. Government of Canada, *Partial Submission of Canada to the Commission on the Limits of the Continental Shelf regarding its continental shelf in the Arctic Ocean: Executive Summary* (Ottawa: Her Majesty the Queen in Right of Canada, 2019).
https://www.un.org/Depts/los/clcs_new/submissions_files/can1_84_2019/CDA_ARC_ES_EN_secured.pdf.

Canadian North

The Canadian North includes three territories: the Yukon Territory, the Northwest Territories, and Nunavut Territory.¹⁰ Not all of the Canadian North is north of the Arctic Circle, but everything in the Canadian Arctic is considered part of the Canadian North.

¹⁰ Government of Canada, *Canada's Arctic and Northern Policy Framework*, 12.

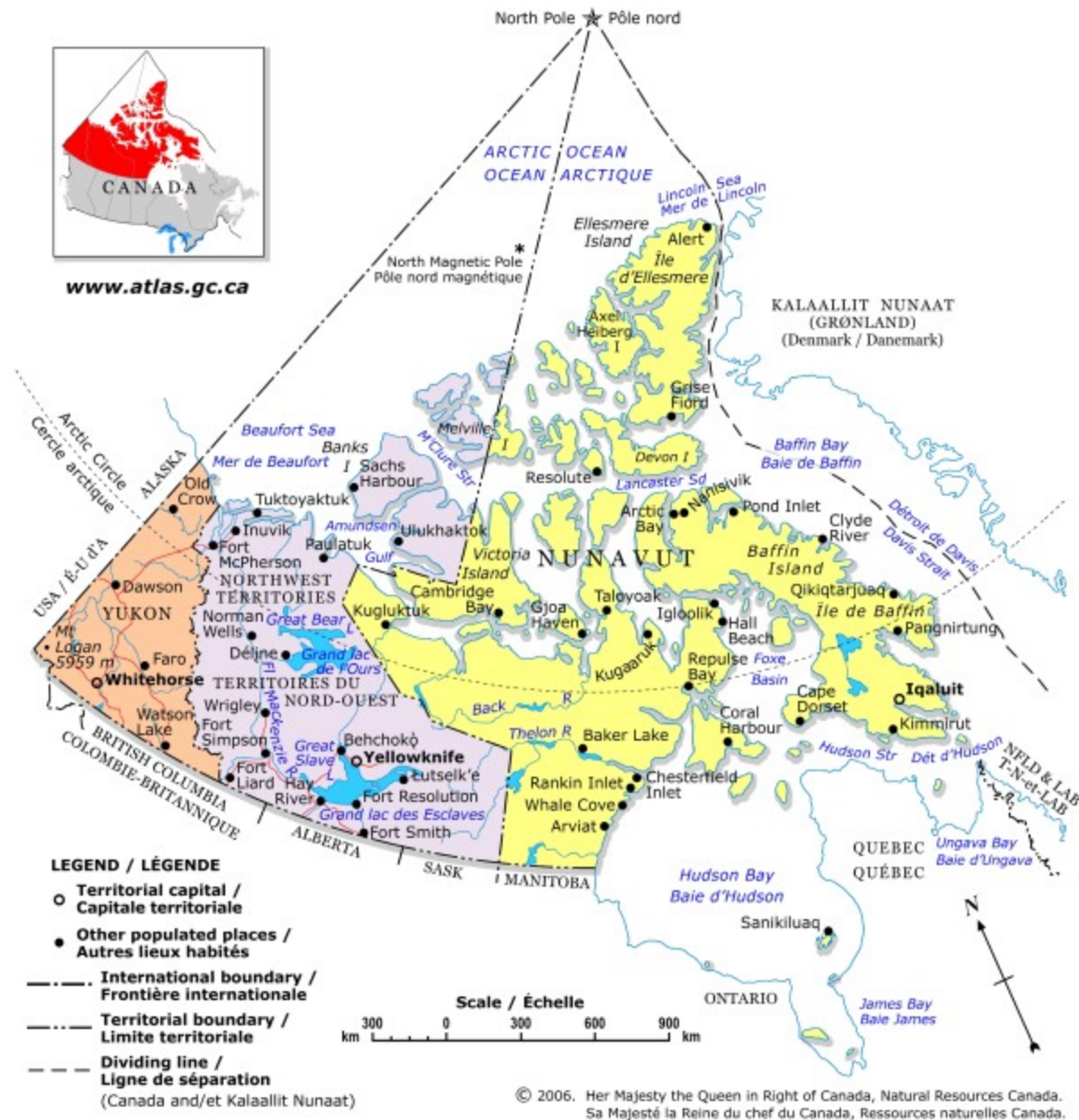


Figure 4. Political Map of the Territories. Natural Resources Canada, *Political Map of the Territories – Bilingual* (Ottawa: Her Majesty the Queen in Right of Canada, 2006).
http://ftp.geogratis.gc.ca/pub/nrcan_rncan/raster/atlas_6_ed/reference/bilingual/territories.jpg.

Overview of the Hypothesis

Based on initial doctrinal readings, this monograph proposes that, in order to achieve the requirements established in the ANPF, the CAF must adopt a multi-domain approach to Arctic operations, within the context of Canada's existing operating concept of adaptive dispersed operations (ADO). Equipment, training, and capabilities will have to be acquired, incorporated, and developed,

respectively, across the land, sea, maritime, space, and information domains in order to effectively exert Canada's sovereignty over its Arctic and Northern territories and approaches.

Limitations

This monograph is limited in terms of time and access. Due to academic requirements, this monograph must be submitted for publication by May 2021, less than two years following the ANPF's publication. It is unlikely that the Department of National Defence will publish another defense policy in the meantime and so this monograph will use *Strong, Secure, Engaged: Canada's Defence Policy*, along with unclassified, open source reports from the Government of Canada, to identify the status of any ongoing procurement and development projects. Any existing, classified CAF contingency plans regarding the Arctic will not be included in this study.

Delimitations

The delimitations of this monograph relate to the geographic scope of Canada and, more specifically, the Canadian North. Although exterior factors influence Canada's Arctic security, namely Russian and Chinese threats, this study adopts an introspective focus.¹¹ This monograph focuses on Canada's ability to project power into the Arctic for the purposes of enforcing sovereignty and deterring any malign influence, not on the execution of any one specific operation. Furthermore, although the whole-of-government approach is central to the Government of Canada's approach to Arctic and Northern development, this monograph will focus on the military component of Canada's policies.

Assumptions

This monograph assumes that the Government of Canada is a rational state actor, acting in its own self-interest to ensure the security of its citizens in the Canadian North and seeking to influence other rational, self-interested regional state actors. As such, this study assumes that "the potential or actual

¹¹ Tim Day, "The Battle for the Far North: An Analysis of Threats to Canadian Arctic Sovereignty" Master's Thesis, (US Army Command and General Staff College, Fort Leavenworth, KS, 2020), 60.

application of force to influence the action of a voluntary agent” is sufficient to deter other rational, self-interested state actors within the Arctic region.¹²

Organization of the Study

This monograph is divided into five sections. The Introduction outlines the monograph’s context, purpose, and research question. The Literature Review will identify the military expectations of the 2019 ANPF and any specific direction identified for the Arctic in *Strong, Secure, Engaged: Canada’s Defence Policy*. The Methodology section will outline how gaps between both Canadian government policies will be identified and analyzed through the lens of Canada’s existing military operating concept and other emerging concepts. The Discussion & Analysis section will evaluate the gaps identified in the literature review and analyze their impact on Canada’s ability to project instruments of national power into the Arctic. Finally, the Conclusion & Recommendations section will summarize the monograph’s evidence, provide recommendations to senior CAF leadership, and highlight areas for further inquiry.

Literature Review

In order to determine whether or not the CAF can use the ANPF as strategic guidance for Arctic operations, this monograph will review the specific direction provided by the Government of Canada’s most recent Arctic policy document. This policy review will outline the ends, ways, and means each policy intends to use to achieve the strategic goals of the Government of Canada, while accounting for risk.¹³ Although chronologically out of order, Canada’s defense policy, *Strong, Secure, Engaged: Canada’s Defence Policy*, will then be reviewed to determine what the CAF is already planning for the Arctic, based on previous direction from the Government of Canada. Finally, a review of these initiatives in terms of their current level of operating capability will determine if any gaps remain since the publication of both policies.

¹² Lawrence Freedman, *Deterrence* (Malden, MA: Polity Press, 2006), 26.

¹³ Harry R. Yarger, *Strategic Theory for the 21st Century: The Little Book on Big Strategy* (Carlisle, PA: US Army War College Strategic Studies Institute, February, 2006), 1.

Arctic and Northern Policy Framework, 2019

In June 2019, Canada published its *Arctic and Northern Policy Framework* after a Liberal Party victory over the Conservative Party in 2015. Although slow to release their platform for Arctic and Northern development, the ANPF constituted a much more comprehensive approach to the Arctic than the previous Conservative Party policy, *Canada's Northern Strategy: Our North, Our Heritage, Our Future*, published in 2009.¹⁴ *Canada's Northern Strategy* was Canada's first specific Arctic policy, which included a specific *Statement on Canada's Arctic Foreign Policy: Exercising Sovereignty and Promoting Canada's Northern Strategy Broad*, and was focused more on traditional security considerations, such as defining Canada's borders in the Arctic and enforcing regional sovereignty.¹⁵ The ANPF includes two supporting chapters, *International and Safety, Security and Defence*, and constitutes a much more collaborative approach to government policy than *Canada's Northern Strategy*, in that it was developed in coordination with provincial and territorial governments as well as various Indigenous groups in the Canadian North, adopting the maxim "Nothing about us, without us."¹⁶ The ANPF represents an ideological shift towards "soft security" and a focus on the security of the individual through policing and emergency management.¹⁷ Of the eight pillars and 18 supporting elements in the ANPF that support Canadian Arctic sovereignty, as depicted in Figure 5, this section will focus on national defense and emergency management, as specific roles of the CAF in Canada.

¹⁴ David Thurton, "After 4 years, the Liberals haven't released their plan for the Arctic," *CBC News*, September 1, 2019. <https://www.cbc.ca/news/politics/after-4-years-the-liberals-haven-t-released-their-plan-for-the-arctic-1.5266507>.

¹⁵ Day, "The Battle for the Far North," 64.

¹⁶ Government of Canada, *Canada's Arctic and Northern Policy Framework*, 14.

¹⁷ Day, "The Battle for the Far North," 64.



Figure 5. Elements of Canadian Arctic Sovereignty. Created by author.

The ANPF outlines Canada’s strategic aim for the Arctic as a “Strong, self-reliant people and communities working together for a vibrant, prosperous and sustainable Arctic and northern region at home and abroad, while expressing Canada’s enduring Arctic sovereignty.”¹⁸ Furthermore, the ANPF identifies eight goals and objectives, which serve as ways to the stated strategic aim, or end:

1. Canadian Arctic and northern Indigenous peoples are resilient and healthy;
2. Strengthened infrastructure that closes the gaps with other regions of Canada;
3. Strong, sustainable, diversified and inclusive local and regional economies;
4. Knowledge and understanding guides decision-making;
5. Canadian Arctic and northern ecosystems are healthy and resilient;
6. The rules-based international order in the Arctic responds effectively to new challenges and opportunities;
7. The Canadian Arctic and North and its people are safe, secure and well-defended; and

¹⁸ Government of Canada, *Canada’s Arctic and Northern Policy Framework*, 14.

8. Reconciliation supports self-determination and nurtures mutually respectful relationships between Indigenous and non-Indigenous peoples.¹⁹

This monograph assumes that Goal 7 applies directly to national defense, however Goal 2, as it pertains to infrastructure, will also be considered relevant for the projection of national power in the Arctic. The ANPF elaborates on Goal 7 in the subordinate *Safety, Security and Defence Chapter*.

The *Safety, Security and Defence Chapter* of the ANPF introduces the means the Government of Canada intends to use to ensure that the people in Canada's Arctic and North are safe, secure, and well defended. The chapter identifies a 22% increase in the amount of maritime traffic in the Canadian Arctic from 2016 to 2017 and warns that "states with interests in the Arctic are using a broad range of military capabilities and other state-controlled assets as they work to collect intelligence and position themselves to access or control sensitive sites, infrastructure, and strategic resources – potentially under the appearance of productive activities."²⁰ Although not explicitly stated, this statement may be a veiled reference to China's interest in the economic development of the Canadian North.²¹ The means identified in the *Safety, Security and Defence Chapter* to support Goal 7 of the ANPF are listed as the following objectives:

1. Strengthen Canada's cooperation and collaboration with domestic and international partners on safety, security and defense issues;
2. Enhance Canada's military presence as well as prevent and respond to safety and security incidents in the Arctic and North;
3. Strengthen Canada's domain awareness, surveillance, and control capabilities in the Arctic and North;

¹⁹ Government of Canada, *Canada's Arctic and Northern Policy Framework*, 69.

²⁰ Government of Canada, *Arctic and Northern Policy Framework: Safety, Security and Defence Chapter* (Ottawa: Crown-Indigenous Relations and Northern Affairs Canada, 2019), 5. <https://www.rcaanc-cirnac.gc.ca/eng/1562939617400/1562939658000>.

²¹ Robin Levinson-King, "Huawei heats up the battle for internet in Canada's north," *BBC News*, September 9, 2019. <https://www.bbc.com/news/world-us-canada-49415867>.

4. Enforce Canada's legislative and regulatory frameworks in the Arctic and North;
5. Increase whole-of-society emergency management capabilities in the Arctic and Northern communities; and
6. Support community safety through effective and culturally-appropriate crime prevention initiatives and policing services.²²

Of these six objectives, the CAF has either a direct or indirect role in all of them except crime prevention and policing services, which are solely the responsibility of the Royal Canadian Mounted Police.

Although this chapter includes other government departments and Arctic security partners, there is specific direction to the CAF to continue annual sovereignty operations, maintain the CAF Arctic Training Centre in Resolute Bay, further develop the Canadian Rangers, and continue its participation in the North American Aerospace Defense Command (NORAD).²³ In terms of capital procurement projects, the *Safety, Security and Defence Chapter* specifically directs the CAF to acquire six ice-capable Arctic Offshore Patrol Vessels, all-terrain vehicles optimized for use in the Arctic, 88 advanced fighter aircraft, and to acquire assets to replace the RADARSAT Constellation Mission system.²⁴ To improve Canada's domain awareness, surveillance, and control capabilities, the CAF is to continue its participation in the Maritime Security Operations Centres, expand the Canadian Air Defence Identification Zone (CADIZ) to cover the entirety of Canada's Arctic archipelago and its approaches, and modernize NORAD through the renewal of the North Warning System, the series of radar installations across the Canadian Arctic that support NORAD's air traffic tracking capabilities in North America.²⁵

The ANPF, and the supporting *Safety, Security and Defence Chapter*, represents Canada's desired strategic end state, or value theory, for the way things should be in the Canadian North, as far as 2030.²⁶

²² Government of Canada, *Safety, Security and Defence Chapter*, 6-23.

²³ *Ibid.*, 7-10.

²⁴ *Ibid.*, 11-12.

²⁵ *Ibid.*, 22.

²⁶ Government of Canada, *Canada's Arctic and Northern Policy Framework*, 3.

Unfortunately, as will be seen in the next section, the ANPF does not provide much strategic direction so much as it reiterates existing government policy. All of the direction to the CAF from the ANPF is either taken out of *Strong, Secure, Engaged: Canada's Defence Policy* from 2017 or has existed from previous Arctic and defense policies. For example, the CAF have been conducting sovereignty operations in the Canadian North, such as Operation Nanook, which has taken place annually since 2007.²⁷ Furthermore, the establishment of the Canadian Armed Forces Arctic Training Centre in Resolute Bay, modernization of the Canadian Rangers, and ongoing participation in NORAD were all outlined in *Canada's Northern Strategy* in 2009.²⁸ The acquisition of Arctic-capable vehicles refers to a 2011 project to deliver 100 silent snowmobiles for Canada's special forces by 2023.²⁹ The CADIZ was aligned with Canada's sovereign airspace in May 2018, as depicted in Figure 6, more than a year before the publication of the ANPF.³⁰ The contract to acquire 88 advanced fighter aircraft to replace the CF-18 Hornet has been active since 2017.³¹ However, due to delays, the decision was made to purchase 25 used F-18s from Australia to further extend the lifespan of the current fleet until 2032.³² The procurement of six Arctic Offshore Patrol Vessels for the Royal Canadian Navy (RCN) is ongoing, with the first ship having been delivered to the

²⁷ Government of Canada, "Operation NANOOK," October 1, 2010. <https://www.canada.ca/en/departement-national-defence/services/operations/military-operations/current-operations/operation-nanook.html>.

²⁸ Government of Canada, *Canada's Northern Strategy: Our North, Our Heritage, Our Future* (Ottawa: Minister of Indian Affairs and Northern Development and Federal Interlocutor for Métis and Non-Status Indians, 2009), 15. <https://www.northernstrategy.gc.ca/cns/cns-eng.asp>.

²⁹ David Pugliese, "Canada's Special Forces to get new vehicles for the Arctic but Army left out in the cold," *Canada.com*, April 18, 2014. <https://o.canada.com/news/national/canadas-special-forces-to-get-new-vehicles-for-the-arctic-but-army-left-out-in-the-cold>.

³⁰ Government of Canada, "Canadian Air Defence Identification Zone now aligned with Canada's sovereign airspace," May 24, 2018. <https://www.canada.ca/en/departement-national-defence/news/2018/05/canadian-air-defence-identification-zone-now-aligned-with-canadas-sovereign-airspace.html>.

³¹ Public Services and Procurement Canada, "Future Fighter Capability Project," August 26, 2020. <https://www.tpsgc-pwgsc.gc.ca/app-acq/amd-dp/air/snac-nfps/CF-18-eng.html>.

³² David Pugliese, "First used Australian fighter jets now flying in RCAF colours with more to come," *National Post*, July 14, 2019, <https://nationalpost.com/news/canada/first-used-australian-fighter-jets-now-flying-in-canadian-colours-plans-underway-to-extend-jet-fleet-to-2032>.

RCN on July 31, 2020.³³ Finally, the RADARSAT Constellation Mission (RCM), Canada's space-based observation system based on three identical synthetic aperture radar Earth observation satellites, was launched on June 12, 2019, three months before the ANPF was published.³⁴

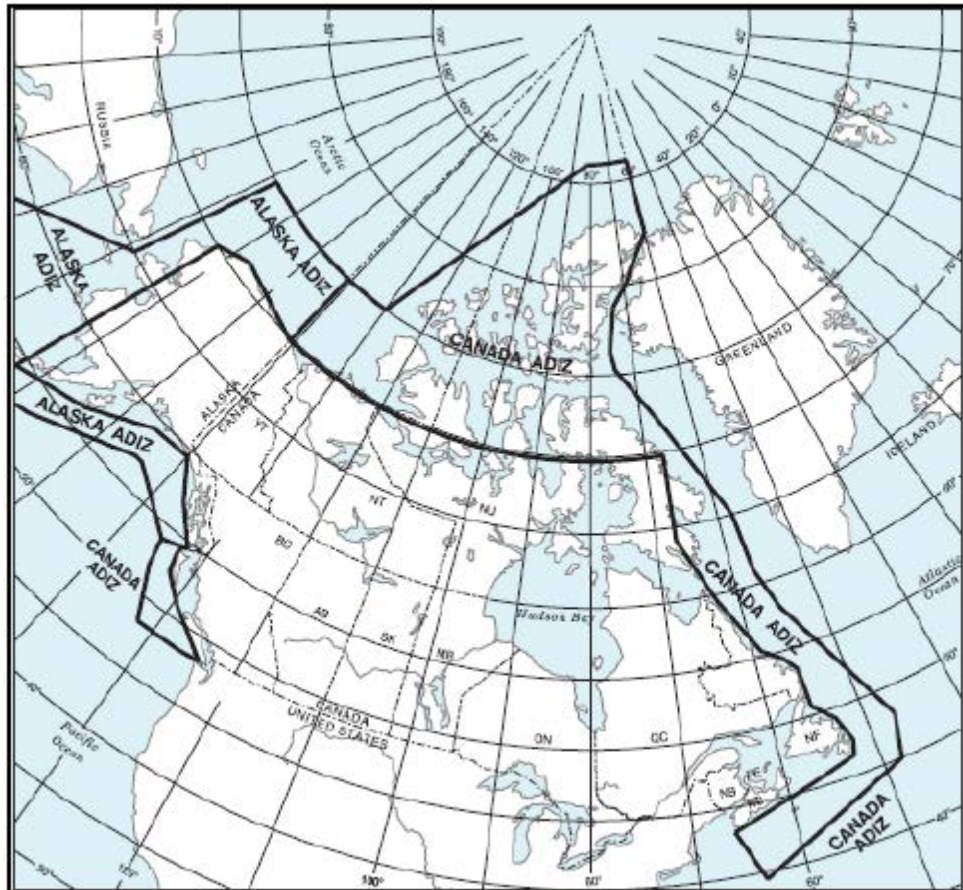


Figure 6. Adjustment to the Canada Air Defence Identification Zone. NAV Canada, “Notice of Change: Adjustment to the Canada Air Defence Identification Zone,” May 24, 2018. <https://www.navcanada.ca/EN/products-and-services/Service%20Project%20Announcements/SPA-2018-ADIZ-EN.pdf>.

³³ Government of Canada, “First Arctic and Offshore Patrol Ship delivered,” July 31, 2020. <https://www.navy-marine.forces.gc.ca/en/news-operations/news-view.page?doc=first-arctic-and-offshore-patrol-ship-delivered/kctmmmjk>.

³⁴ Canadian Space Agency, “Frequently Asked Questions – RADARSAT Constellation Mission (RCM),” August 28, 2019. <https://www.asc-csa.gc.ca/eng/satellites/radarsat/faq.asp>.

Strong, Secure, Engaged: Canada's Defence Policy, 2017

Published in 2017, *Strong, Secure, Engaged* is Canada's current defense policy, with an expected 20-year lifespan.³⁵ The title emphasizes Canada's vision for defense, or strategic ends, as being strong at home, secure in North America, and engaged in the world.³⁶ The ways proposed to achieve these stated ends are through a new Canadian approach to defense to anticipate, through the prioritization of intelligence, surveillance, and reconnaissance (ISR), enhancing defense intelligence, and bolstering academic outreach; to adapt, with a new vision for the Reserve Force, keeping pace with technological developments, modernizing the business of defense, innovation and enhancing Arctic capability; and to act, through the CAF's eight core missions:

1. Detect, deter, and defend against threats to or attacks on Canada;
2. Detect, deter, and defend against threats to or attacks on North America in partnership with the United States, including through NORAD;
3. Lead and/or contribute forces to NATO and coalition efforts to deter and defeat adversaries, including terrorists, to support global security;
4. Lead and/or contribute to international peace operations and stabilization missions with the UN, NATO, and other multi-lateral partners;
5. Engage in capacity building to support the security of other nations and their ability to contribute to security abroad;
6. Provide assistance to civil authorities and law enforcement, including counter-terrorism, in support of national security and the security of Canadians abroad;
7. Provide assistance to civil authorities and non-governmental partners in responding to international and domestic disasters or major emergencies; and

³⁵ Government of Canada, *Strong, Secure, Engaged: Canada's Defence Policy* (Ottawa: Department of National Defence, 2017), 11. <http://publications.gc.ca/site/eng/9.835971/publication.html>.

³⁶ *Ibid.*, 14.

8. Conduct search and rescue operations.³⁷

The policy directs 110 new defense initiatives as the means to exercise the ways to achieve strategic ends; five of which are specifically linked to Enhancing Arctic Capability and another seven have an Arctic nexus.³⁸

The initiatives directed in *Strong, Secure, Engaged* are very similar to the ones directed two years later in the ANPF. The summary of the 12 initiatives either directly or indirectly relevant to the Arctic, of the 110 total, are outlined below:

- 30. Acquire five to six Arctic Offshore Patrol Ships;
- 43. Acquire all-terrain vehicles, snowmobiles and larger tracked semi-amphibious utility vehicles optimized for use in the Arctic environment;
- 44. replace the CF-18 fleet with 88 advanced fighter aircraft to improve CAF air control and air attack capability;
- 45. Acquire space capabilities meant to improve situational awareness and targeting, including replacement of the current RADARSAT system to improve the identification and tracking of threats and improve situational awareness of routine traffic in and through Canadian territory; sensors capable of identifying and tracking debris in space that threatens Canadian and allied space-based systems (surveillance of space); and space-based systems that will enhance and improve tactical narrow- and wide-band communications globally, including throughout Canada's Arctic region;
- 48. Replace utility transport aircraft (CC-138 Twin Otter replacement);
- 69. Prioritize Arctic Joint ISR as a defense research and development priority to produce innovative solutions to surveillance challenges in the North;

³⁷ Government of Canada, *Strong, Secure, Engaged*, 17.

³⁸ *Ibid.*, 113.

85. Invest in and employ a range of space capabilities, including space situational awareness, space-based earth observation and maritime domain awareness, and satellite communications that achieve global coverage, including in the Arctic;
106. Enhance the mobility, reach and footprint of the CAF in Canada's North to support operations, exercises, and the CAF's ability to project force into the region;
107. Align the CADIZ with Canada's sovereign airspace;
108. Enhance and expand the training and effectiveness of the Canadian Rangers to improve their functional capabilities within the CAF;
109. Collaborate with the United States on the development of new technologies to improve Arctic surveillance and control, including the renewal of the North Warning System; and
110. Conduct joint exercises with Arctic allies and partners and support the strengthening of situational awareness and information sharing in the Arctic, including NATO.³⁹

Of these 12 initiatives, eight (initiatives 30, 43, 44, 45, 69, 85, 107 and 108) were subsequently directed by the federal government to the Department of National Defence (DND) in the ANPF (the upgrade of the RCM accounting for initiatives 45, 69, and 85).

The remaining four Arctic initiatives in *Strong, Secure, Engaged* have progressed in some cases, but not in others. Currently, no project has been started to entertain contract bids to replace the CC-138 Twin Otter utility transport aircraft (initiative 48). The current plan is to extend the aircraft's lifespan until 2026, or possibly until 2035, if a suitable replacement cannot be acquired in time.⁴⁰ Initiative 106 is satisfied by the establishment of the Canadian Armed Forces Arctic Training Centre and will be further supported by the completion of the Nanisivik Naval Facility, both in Nunavut Territory. Although the completion of the Nanisivik Naval Facility was supposed to coincide with the delivery of the first Arctic

³⁹ Government of Canada, *Strong, Secure, Engaged*, 108-113.

⁴⁰ Steve Daly, "Converting NAPS to Acquisitions... or, DND attitudes towards Canadian Aircraft Makers," *Defence Muse*, June 9, 2017. <https://defencemuse.wordpress.com/2017/06/09/twin-option-for-the-twin-otters-simple-solutions-are-often-the-best/>.

Offshore Patrol Vessel, unforeseen impacts of the COVID-19 pandemic have imposed delays on an already short construction season.⁴¹ The modernization of the Canadian Rangers (initiative 108) is ongoing, but the acquisition of the C-19 rifle established a commitment to further developing their capabilities.⁴² Finally, training opportunities between Canada and other international partners have started at the Canadian Armed Forces Arctic Training Centre as part of Operation Nanook-Nunavut.⁴³

After reviewing both the ANPF and Canada's defense policy, there is a significant amount of overlap and duplication. A subsequent review of the defense initiatives proposed in both policy documents further outlines that many of the initiatives were either started, or in some cases completed, before the 2019 publication of the ANPF. Furthermore, the ANPF, after a four-year delay, was published two years after Canada's defense policy, which no doubt contributed to confused direction to DND on how to proceed in the Arctic.

Methodology

This monograph will analyze the current Canadian Arctic and defense policies, identify gaps, and recommend remedies. Much has changed in the time between the release of each policy and this monograph establishes what those changes mean for Canada's responsibilities in the Arctic. The literature review provides the context for the analysis conducted according to this methodology.

This monograph undertakes a comparative content analysis to identify the specific characteristics of Arctic and defense policy in Canada.⁴⁴ Coding the content of these policies will facilitate a thematic

⁴¹ Lee Berthiaume, "COVID-19 blamed for delay on Arctic military port first promised in 2007," *The Canadian Press*, August 2, 2020. <https://www.cbc.ca/news/politics/arctic-military-refuelling-station-delay-1.5672360>.

⁴² Kent Driscoll, "Just like the Canadian Rangers, the new C-19 rifle is designed to thrive in Canada's Arctic," *APTN National News*, June 18, 2019. <https://aptnnews.ca/2019/06/18/just-like-the-canadian-rangers-the-new-c-19-rifle-is-designed-to-thrive-in-canadas-arctic/>.

⁴³ Government of Canada, "The Canadian Armed Forces to demonstrate specialized Arctic skill-sets with international partners in Nunavut," February 24, 2020. <https://www.canada.ca/en/department-national-defence/news/2020/02/the-canadian-armed-forces-to-demonstrate-specialized-arctic-skill-sets-with-international-partners-in-nunavut.html>.

⁴⁴ Paul D. Leedy and Jeanne Ellis Ormrod, *Practical Research: Planning and Design*, 8th ed. (Upper Saddle River, NJ: Pearson Education Inc., 2005), 142.

analysis consistent with empirical and value theory; the way things are and the way they ought to be.⁴⁵

Canada's Arctic and defense policies will establish the way things are and Canada's military operating concept, ADO, will serve as they way they ought to be.⁴⁶ *The U.S. Army Concept for Maneuver in Multi-Domain Operations 2028-2040* will be used to establish a military operating concept that the CAF could employ.⁴⁷ These policies and concept papers are all available online through open sources.

As a means of framing the analysis, the context is that of Canadian Arctic security. Whereas the ANPF covers other aspects of life in the Canadian North and Canada's defense policy focuses on multiple regions of Canadian and international defense and security, this monograph will focus specifically on Canada's approach to projecting national power into its sovereign Arctic region for the purpose of security. Other countries will only be incorporated in the context of Canada's bilateral or multilateral engagement in support of its own Arctic security strategy, which is national security through broader regional stability.

The Arctic and defense policies of Canada listed in the Literature Review are subjected to qualitative analysis to determine the ends, ways, and means to assess whether or not they are consistent with each other and support Canada's Arctic strategic objectives. This approach is consistent with qualitative policy analysis.⁴⁸ The sampling for this study is limited and is derived from the Arctic and defense policies currently applicable to Canada.

⁴⁵ James N. Rosenau, "Thinking Theory Thoroughly," *The Scientific Study of Foreign Policy* (London: Francis Pinter, 1980), 31.

⁴⁶ National Defence, B-GL-310-001/AG-003, *Close Engagement – Land Power in an Age of Uncertainty – Evolving Adaptive Dispersed Operations* (Kingston, ON: Army Publishing Office, 2019). [http://armyapp.forces.gc.ca/SOH/SOH_Content/B-GL-310-001-AG-003%20\(En\)%202019.pdf](http://armyapp.forces.gc.ca/SOH/SOH_Content/B-GL-310-001-AG-003%20(En)%202019.pdf).

⁴⁷ U.S. Army Training and Doctrine Command, TRADOC Pamphlet 525-3-1, *The US Army in Multi-Domain Operations 2028* (Washington, DC: Government Printing Office, December 6, 2018). https://www.tradoc.army.mil/Portals/14/Documents/MDO/TP525-3-1_30Nov2018.pdf.

⁴⁸ Yarger, *Strategic Theory for the 21st Century*, 1.

Discussion & Analysis

Canada's defense policy and ANPF both provide guidance to the CAF for operations in the Canadian North and constitute the empirical state of Canadian Arctic security, but in what context? What is the operating concept that the CAF currently employs in the Arctic and abroad? This section will explore different operating concepts and compare them in order to provide context for future recommendations by establishing what Canada's Arctic security environment ought to be and could be.

Discussion

An operating concept is neither a doctrine nor a strategy; it is more of a theory of action. In a military context, an operating concept "guides future force development through the identification of first order capabilities that the Army must possess to accomplish missions in support of policy goals and objectives."⁴⁹ Consequently, an operating concept informs the capital procurement, training, and personnel management of a military force. This section will examine the CAF's current operating concept, ADO, and the U.S. Army's current operating concept, multi-domain operations (MDO), in order to compare and analyze each concept in the next section.

Adaptive Dispersed Operations

Canada has a small (relative to other world powers), but technologically advanced and professional military force. In 2007, after consolidating initial lessons learned from combat operations in Kandahar Province in Afghanistan, the Canadian Army developed and adopted the ADO concept, which "seeks to create and sustain operational advantage over adept, adaptive adversaries through the employment of adaptive land forces alternatively dispersing and aggregating throughout the

⁴⁹ U.S. Army Training and Doctrine Command, TRADOC Pamphlet 525-3-1, *The U.S. Army Operating Concept: Win in a Complex World 2020-2040* (Washington, DC: Government Printing Office, October 31, 2014), vii. <https://www.tradoc.army.mil/Portals/14/Documents/TP525-3-1%20The%20Army%20Operating%20Concept.pdf>.

multidimensional battlespace.”⁵⁰ Essentially, the initial ADO concept instructed Canadian military forces operating in the land domain to disperse in relation to time, space, and purpose in order to most efficiently maximize resources, leveraging technologically advanced communications systems to maintain command and control.⁵¹ When required, those same forces could aggregate and mass effects for combat operations.⁵² The operating concept of ADO is supported by five functional concepts: agility, network-enabled, the ‘Army of Tomorrow Soldier,’ integrated effects, and sustainment.⁵³ This land-centric, domain-specific concept was useful in Afghanistan, where the Canadian Army conducted counter-insurgency operations in southern Kandahar, but the initial ADO concept did not expressly mention or address Canadian military operations in the Arctic.

By 2019, Canada’s military involvement in Afghanistan had ended. The Canadian Army revisited ADO with a view to guide development for the next 10-15 years by “fostering the culture and tools necessary for interoperability with joint, interagency, and multinational partners; organizing, equipping and training balanced, agile, and adaptive formations, units and sub-units in order to effectively form and employ empowered combined arms teams; and establishing pervasive and robust networks, while preserving the ability to operate effectively in a degraded or austere environment.”⁵⁴ This new operating concept incorporates an updated assessment of the security environment and “acknowledges the fact that globalization, social connectivity, climate change and empowered non-state actors are working to blur the distinction between homeland and overseas threats.”⁵⁵ ADO today emphasizes agility, connectivity, modularity, adaptive dispersion, and integration.⁵⁶ Agility is the ability to plan and conduct operations at

⁵⁰ Department of National Defence (DND), *Land Operations 2021 – Adaptive Dispersed Operations: The Force Employment Concept for Canada’s Army of Tomorrow* (Kingston, ON: Directorate of Land Concepts and Design, 2007), 18. http://publications.gc.ca/collections/collection_2009/forces/D2-188-2007E.pdf.

⁵¹ *Ibid.*, 19-20.

⁵² *Ibid.*, 21.

⁵³ *Ibid.*, 11.

⁵⁴ National Defence, *Close Engagement*, 7.

⁵⁵ *Ibid.*, 12.

⁵⁶ *Ibid.*, 17-18.

a rapid tempo. Connectivity, much like the 2007 functional concept of being network-enabled, allows the Canadian land force to develop shared understanding, affords access to the full range of lethal and non-lethal effects, and provide support units to materiel management and distribution systems.⁵⁷ Modularity, also known as task-tailoring, speaks to creating specific task forces, if and when required. Adaptive dispersion, the core of the operating concept, means that land forces must be able to coordinate across widely-dispersed teams to achieve effects in support of an operational design.⁵⁸ Finally, integration means working effectively with joint, interagency, multinational, and public partners. The principle of integration is addressed specifically in the assessment of the future security environment with the statement that “(w)ith the exception of operations to evacuate Canadian non-combatants from a theatre of war during international operations, the Canadian land forces will almost invariably act as part of an alliance or multinational coalition.”⁵⁹ Although there is still no direct reference to the Arctic, the core principles of using communications to connect widely-dispersed teams across large distances remains.

One of the shortcomings of the 2007 ADO concept was its singular focus on the land domain. The 2019 update incorporated land power dependencies from across multiple domains and operational functions. It lists the domains by service (maritime, air, space, and cyber) and by what each can provide to each of the operational functions (command, sense, act, shield, and sustain), as illustrated in Table 1. This serves as Canada’s introduction to considering operations across multiple domains. Once again, although the Arctic is not specifically mentioned in the 2019 ADO concept, operations across each of the domains are still very much applicable to operations in the Canadian North.

⁵⁷ National Defence, *Close Engagement*, 17.

⁵⁸ *Ibid.*, 17.

⁵⁹ *Ibid.*, 10.

Table 1. Domain Capabilities by Operational Function

	Command	Sense	Act	Shield	Sustain
RCN	Afloat C2 Airspace control	Ship-borne and ship-launched sensor platforms Early warning of air and missile threats	Small boat operations and ship-borne helicopter support during littoral operations Naval fires	Sea-based air defense Ballistic missile defense	Sea-basing of medical and logistics elements supporting land operation Port operations
RCAF	SATCOMs including secure voice Radio rebroadcast Air elements at formation-level able to interoperate with allied or coalition HQs	Jamming-resistant position, navigation, and timing Aerospace surveillance with automated threat warning Airborne sensors with integral downlink capability Long-duration, high-fidelity sensor platforms Space imagery	Precision strike in low and high-threat scenarios Close air support and battlefield air interdiction Armed tactical aviation Airmobile capability (with evolution toward air assault capability) A wide variety of air-delivered munitions, including unguided, guided, tuneable yield, and mass effect munitions Airborne capability: the ability to deliver an all-arms sub-unit with supporting arms, wedges and toboggans, etc.	Tactical Air Control Parties Anti-UAS capability Air-to-ground EW: jamming, direction-finding, intercept, and computer network attack	Aerial resupply operational and tactical level by: Fixed and rotary wing Precision aerial delivery Low-altitude air drop Ability to support operations in austere environments
Space	Communication Location Sensing				
Cyber	Boundary between cyberspace and EW will disappear Specific requirements for OCO tools at the tactical level are unclear and warrant further consideration				

Source: Created by author.

In terms of force structure, ADO relies on the Canadian Mechanized Brigade Group (CMBG), which “commands up to four maneuver units, of which one or more may be from allied forces” and “will command integral combat support and CSS (combat service support) capabilities, control aviation assets, and employ higher-level land and joint assets to shape and synchronize battlefield activities.”⁶⁰ Consistent with the small, but professional military force philosophy, ADO can incorporate units from allied forces to compensate for the size of existing CMBGs. Indispensable to this force structure is that each CMBG will be able to manage, control, and coordinate logistics operations internally with its own CSS battalion.⁶¹ The CMBG is a relatively small formation, when compared to similar formations from other allied countries, but what it lacks in size, it makes up for in capability and independence. CMBGs are truly combined arms formations with infantry, armor, artillery, engineers, combat support, aviation, and integral logistics. The CMBG structure is modular and can be adjusted, depending on mission requirements, or subordinate units can be task-tailored into battalion-sized battle groups, as required.

Multi-Domain Operations

In 2018 the U.S. Army Training and Doctrine Command (TRADOC) published *The U.S. Army in Multi-Domain Operations 2028*, which signaled the US Army’s transition from multi-domain battle to multi-domain operations.⁶² Having already recognized the value of adopting a multi-domain focus at the tactical level, TRADOC is now applying the multi-domain concept at the operational level and laying out how the US Army will employ it as part of a joint, multi-national force. The purpose of the transition and expanded scope of the multi-domain concept is to “deter and defeat Chinese and Russian aggression in both competition and conflict.”⁶³ Specifically, TRADOC fears that Russian and Chinese Anti-Access and

⁶⁰ National Defence, *Close Engagement*, 22.

⁶¹ *Ibid.*, 22.

⁶² TRADOC, *The U.S. Army in Multi-Domain Operations 2028*, vi.

⁶³ *Ibid.*, vi.

Area Denial (A2AD) systems create multiple layers of stand-off in both competition and armed conflict, as illustrated in Table 2.⁶⁴

Table 2. Chinese and Russian Stand-Off in Competition and Conflict

Competition	Armed Conflict
Create stand-off by separating the U.S. and partners politically with... - National- and district-level forces - Unconventional warfare - Information warfare - Conventional forces: Long-, mid-, and short-range systems ...to fracture alliances and win without fighting.	Create stand-off by separating the Joint Force in time, spaces, and function with... - National- and district-level forces - Conventional forces: Long-, mid-, and short-range systems - Unconventional warfare - Information warfare ...to win quickly with a surprise <i>fait accompli</i> campaign.

Source: Created by author.

At its core, MDO envisions that the US Army, as part of a larger joint and/or multinational force, will prevail in the competition phase and, when necessary, penetrate and dis-integrate enemy A2AD systems and “exploit the resultant freedom of maneuver to achieve strategic objectives and force a return to competition on favorable terms.”⁶⁵ It is based on a five-phase cycle of compete, penetrate, disintegrate, exploit, and re-compete, as illustrated in Table 3.⁶⁶ Consequently, although the MDO concept is reactive in nature, during the competition phase, it is offensive throughout the penetration, disintegration, and exploitation phases. Although not explicitly stated, it is largely assumed that these offensive operations would occur in the South China Sea and Eastern Europe in response to Chinese or Russian competition, respectively.

⁶⁴ TRADOC, *The U.S. Army in Multi-Domain Operations 2028*, v.

⁶⁵ Ibid., v.

⁶⁶ Ibid., v.

Table 3. Phases of Multi-Domain Operations

Compete to expand the competitive space: - Enable the defeat of information and unconventional warfare - Conduct intelligence and counter adversary reconnaissance - Demonstrate credible deterrence	Penetrate strategic and operational stand-off: - Neutralize enemy long-range systems - Contest enemy maneuver forces - Maneuver from operational and strategic distances	Disintegrate the enemy's anti-access and area denial systems: - Defeat enemy long-range systems - Neutralize enemy short-range systems - Conduct independent maneuver - Conduct deception	Exploit freedom of maneuver to defeat enemy objectives: - Defeat enemy mid-range systems - Neutralize enemy short-range systems - Maneuver to isolate and defeat enemy maneuver forces	Re-compete to consolidate and expand gains: - Secure terrain and populations physically - Enable sustainable outcomes with partners - Set conditions for long-term deterrence - Re-calibrate force posture
--	--	--	--	---

Source: Created by author.

One of the more unique proposals in the MDO concept was the implementation of an experimental Multi-Domain Task Force (MDTF) in the US Army. In 2017, the US Army implemented the design and testing of MDTFs as “forward-stationed formations able to execute aspects of MDO.”⁶⁷ Based on a Field Artillery Brigade “with an augmented headquarters element, a joint intelligence, cyberspace, electronic warfare, and space (ICEWS) component, and other tasked organized formations,” the MDTF is designed to be a theater asset, positioned forward and available to the Geographic Combatant Commander.⁶⁸ Consistent with the MDO concept, the MDTF is not designed to take down entire enemy A2AD networks, but penetrate and disintegrate enough for a joint conventional force to exploit the freedom of maneuver developed by those initial efforts. US Army Pacific was tasked with “building the first experimental MDTF and executing a multi-year joint and combined experimentation

⁶⁷ TRADOC, *The U.S. Army in Multi-Domain Operations 2028*, F-1.

⁶⁸ *Ibid.*, F-1.

program.”⁶⁹ The US Army has since announced, based on the success of this trial, that it will be standing up three permanent MDTFs by 2021; one each in the U.S., Europe, and Pacific.⁷⁰

This section explained how operating concepts drive future force development and reviewed the current military operating concepts of Canada and the United States. The CAF adopted ADO in 2007, during combat operations in Afghanistan, and has since updated the concept in 2019 to better facilitate a return to large-scale combat operations (LSCO). The U.S. Army is in the process of implementing MDO and MDTFs as its primary means of preparing the counter Chinese and Russian aggression. Each of these operating concepts has an accompanying force structure that exists to counter the threat presented in each concept. Despite not referencing the Arctic, these operating concepts were reviewed to provide a baseline for analysis in the next section.

Analysis

This section will present a comparative content analysis of empirical and value theory. In the Literature Review, this monograph presented a review of Canada’s Arctic and defense policies to provide a clear picture of the empirical theory. In the previous section, a review of military operating concepts presented the value theory. Specifically, the Canadian ADO concept representing the way things ought to be and the American MDO concept representing the way things could be if Canada implemented a shift in its current operating concept to specifically address Arctic military operations.

Although neither ADO nor MDO were specifically developed or tailored for Arctic operations, they both have elements that suit operations across multiple theaters, including Arctic military operations. These two operating concepts will be compared and analyzed, using the lens of doctrine, organization, training, materiel, leadership & education, personnel, facilities, and policy (DOTMLPF-P) as a framework. Introduced in 2009 as part of the Joint Capabilities Integration and Development System,

⁶⁹ TRADOC, *The U.S. Army in Multi-Domain Operations 2028*, F-1.

⁷⁰ Sean Kimmons, “Army to build three Multi-Domain Task Forces using lessons from pilot.” *Army News Service*, October 15, 2019, https://www.army.mil/article/228393/army_to_build_three_multi_domain_task_forces_using_lessons_from_pilot.

DOTMLPF-P are the factors used to identify capability gaps within an existing force structure.⁷¹ Table 4 compares ADO and MDO using the DOTMLPF-P framework, emphasizing capability gaps with respect to Arctic military operations.

Table 4. Operating Concept Comparison

	Adaptive Dispersed Operations (Canadian Operating Concept)	Multi-Domain Operations (American Operating Concept)
Doctrine	Full Spectrum Operations	Large-Scale Combat Operations
Organization	Canadian Mechanized Brigade Group	Multi-Domain Task Force
Training	Brigade Training Event	Joint Warfighter Assessment
Materiel	Armor Fighting Vehicles - Infantry Fighting Vehicles - Main Battle Tanks	Long-range precision fires Air and missile defense systems
Leadership & Education	Army leadership Traditional professional military education	Army leadership Exposure to joint professional military education institutions
Personnel	~ 4,500	Task-tailored
Facilities	Central basing	Forward basing
Policy	Developed for counter-insurgency, reframed for large-scale combat operations.	Developed to counter Russian/Chinese competition and, if necessary, win in armed conflict.

Source: Created by author.

Table 4 above outlines the differences between the ADO and MDO concepts using the DOTMLPF-P framework. It is understandable that the two operating concepts differ since they were developed to serve two different purposes for the armed forces of two different countries. Whereas the ADO concept was designed for the Canadian Army to operate across the full spectrum of operations,⁷² MDO was developed specifically with LSCO against either Russia or China in mind.⁷³ The principal

⁷¹ U.S. Department of Defense, Joint Staff, *Joint Capabilities Integration and Development System* (Washington, DC: Government Publishing Office, 2009), GL-5.

⁷² National Defence, *Close Engagement*, 11.

⁷³ TRADOC, *The U.S. Army in Multi-Domain Operations 2028*, 17.

operating organization in ADO is the CMBG, which is a combined arms formation of approximately 4,500 personnel that employs main battle tanks, infantry fighting vehicles, artillery, combat engineers, tactical aviation, and which possesses integral supply, medical, and tactical aviation assets.⁷⁴ Conversely, the MDO concept proposes a much less rigid organization of a MDTF, which is based on a field artillery brigade and incorporates an augmented headquarters and a joint ICEWS component.⁷⁵ The exact size of the MDTF structure is not public, but it is also not firmly established either. The intent of the concept is to incorporate other joint components in the future, as the future operating environment continues to evolve.⁷⁶ Of particular note, there is an opposite approach to basing under each concept. Whereas ADO relies on central basing that supports dispersed elements, MDO relies on forward basing, specifically in Eastern Europe and Southeast Asia.

In order to provide context for future recommendations for Canada's Arctic approach, this section described the current operating concepts of both the Canadian and US Army. The Canadian Army developed the ADO from lessons learned from its experiences in Afghanistan in the early 2000s and reframed the operating concept in 2019 to suit LSCO. The US Army is in the process of incorporating MDO and MDTFs as part of a larger joint effort to counter Russian and Chinese competition. Although neither of these operating concepts specifically address competition or armed conflict in the Arctic, the next section will explore how the CAF should employ elements of each operating concept to prepare for those potential future eventualities.

⁷⁴ National Defence, *Close Engagement*, 22.

⁷⁵ TRADOC, *The U.S. Army in Multi-Domain Operations 2028*, F-1.

⁷⁶ Todd South, "This 3-star Army general explains what multi-domain operations mean for you," *Army Times*, August 11, 2019. <https://www.armytimes.com/news/your-army/2019/08/11/this-3-star-army-general-explains-what-multi-domain-operations-mean-for-you/>.

Conclusion & Recommendations

Conclusion

Canada's defense and Arctic policies outline what equipment, capabilities, and responsibilities the CAF have in the Arctic. In many cases, those policies, instead of directing procurement and development, simply re-state which projects were already in place when those policies were published. Consequently, can the CAF use the ANPF as strategic guidance? Yes, the CAF can use the ANPF to better posture itself to secure Canada's Arctic domains and provide resources to emergency management response. How the CAF does this will be informed by an Arctic operating concept. In 2013, the Canadian Army developed the Army Arctic Concept 2021 (AAC 21), which projected typical missions and proposed many of the capabilities that were developed in *Strong, Secure, Engaged* and the ANPF.⁷⁷ Specifically, AAC 21 projected that the CAF would typically be employed in humanitarian assistance, disaster relief, support to ground-based search and rescue, response to a major air disaster, or response to a major maritime disaster in the Canadian North.⁷⁸ In order to achieve this, AAC 21 outlined eight principle elements: expansion and modernization of the Canadian Rangers, establishment of a Arctic training center, the activation of four Arctic Response Company Groups based in southern Canada, establishment of one company based at Yellowknife, development of short-notice capabilities, revitalization of Arctic training and equipment for the field force, enhancement of existing command elements for employment in the Arctic, and the development of a robust national capacity to sustain unscheduled deployments throughout the Arctic.⁷⁹ As the Canadian Army has fulfilled the elements of AAC 21, it is time to update the operating concept.

⁷⁷ Department of National Defence, B-GL-007-000/JP-003, *Northern Approaches: Army Arctic Concept 2021* (Kingston, ON: Canadian Army Land Warfare Centre, 2013), 24-27.
http://publications.gc.ca/collections/collection_2014/mdn-dnd/D2-323-2013-eng.pdf.

⁷⁸ Ibid., 24.

⁷⁹ Ibid., 27.

Canada can indeed use the ANPF as strategic guidance for operations in the Canadian North, but it needs to identify the way to do it. This monograph reviewed two military operating concepts in use in Canada and the United States. Although neither ADO nor MDO were developed with the Arctic in mind, they each possess elements that would be suitable for operations in the Arctic. Consequently, this monograph proposes the adoption of a hybrid model, as presented in Table 5.

Table 5. Hybrid-Model Canadian Arctic Operating Concept

	Adaptive Dispersed Operations (Canadian Operating Concept)	Multi-Domain Operations (American Operating Concept)	Canadian Arctic Operating Concept (Proposed hybrid model)
Doctrine	Full Spectrum Operations	Large-Scale Combat Operations	Soft security
Organization	Canadian Mechanized Brigade Group	Multi-Domain Task Force	Multi-Domain Formation
Training	Brigade Training Event	Joint Warfighter Assessment	Canadian Armed Forces Arctic Training Centre Joint interoperability training
Materiel	Armor Fighting Vehicles - Infantry Fighting Vehicles - Main Battle Tanks	Long-range precision fires Air and missile defense systems	Arctic Offshore Patrol Vessels Operational airlift
Leadership & Education	Army leadership Traditional professional military education	Army leadership Exposure to joint professional military education institutions	Joint leadership (Joint Task Force North)
Personnel	~ 4,500	Task-tailored	Regular Force units permanently posted to urban centers in the Canadian North
Facilities	Central basing	Forward basing	Forward basing - Airbase - Naval base
Policy	Developed for counter-insurgency, reframed for large-scale combat operations.	Developed to counter Russian/Chinese competition and, if necessary, win in armed conflict.	Search and Rescue focus Russian/Chinese threats

Source: Created by author.

The ANPF represents an ideological shift to soft security in the Arctic, with a focus on individual security instead of territorial security. Consequently, the ANPF focuses more on policing and emergency

management in the Canadian North. The CAF still has a significant role to play within this new framework and should expect to increase its search and rescue (SAR) reach in the region. Despite the shift towards soft security, the ANPF does not completely abandon territorial security. The CAF still has a mandate to enhance Canada's military presence as well as prevent and respond to safety and security incidents in the Arctic and North and strengthen Canada's domain awareness, surveillance, and control capabilities in the Arctic and North.⁸⁰

Although light infantry elements from CMBGs operate in the Canadian North, the terrain is not conducive for the maneuver of an entire CMBG with armored fighting vehicles. In order to strengthen Canada's Arctic domain awareness, the CAF must employ more than just ground forces, as currently stipulated in the ADO operating concept. A multi-domain formation, based on the existing command structure of Joint Task Force North (JTFN) in Yellowknife, Northwest Territories, employing elements across all domains, would be able to increase the CAF's capacity to respond to either SAR events or exert an armed presence in the Arctic. As in the MDO concept, within the MDTF resides an ICEWS component that operates in the cyber and space domains to track adversaries and conduct both offensive and defensive operations. The ADO concept depends heavily on ground forces, with joint participation with the air and maritime domains, but with only limited engagement in the cyber and space domains. Although multi-domain does not necessarily mean all domains all the time, the CAF needs to exploit existing satellite resources and emerging cyber capabilities to maintain domain awareness in the remote Canadian North. Under the proposed Canadian Arctic operating concept, JTFN would act as the multi-domain formation headquarters and would employ sensor data from both space-based and cyber resources, in conjunction with ground, air, and maritime elements, to track threats to Canadian Arctic sovereignty and respond accordingly. Consequently, in order to implement this proposed Canadian Arctic operating concept, CAF leadership would have to seriously consider how many resources it wants to commit to the Arctic. Either each element of the CAF subordinates resources to JTFN, as the regional

⁸⁰ Government of Canada, *Safety, Security and Defence Chapter*, 6-23.

force employment headquarters, on a temporary basis, as is currently the practice, or they consider permanently base air and naval assets in the Arctic.

The CAF Arctic Training Centre in Resolute Bay, Nunavut, remains the ideal place to train multi-domain formations in the Arctic, but its capacity needs to be expanded beyond the current sub-unit structure it can support. The Arctic Training Centre's location in Resolute Bay makes it ideal to initiate joint training across multiple domains. Furthermore, multi-domain training at the CMBG-level under the existing ADO concept that occurs in Southern Canada could also be seen as valuable interoperability training for operations in the Arctic as well.

In addition to the existing technology and equipment currently employed across all domains, the CAF must complete the acquisition of the Arctic Offshore Patrol Ship project and drastically expand its Arctic operational airlift capability through aircraft and airfield infrastructure. Much of the Canadian North is only accessible by air most of the year, so an increased operational airlift capability is required to facilitate troop movements and logistics. Existing airfields need to be expanded to accommodate larger aircraft such as the CC-147 Globemaster currently in service with the Royal Canadian Air Force (RCAF) as strategic airlift.

As of 2017, there were only 120 CAF personnel deployed in the entire Canadian North.⁸¹ However, posting Regular Force units to the Canadian North is problematic on a larger scale. Although there are Primary Reserve units in the Arctic, the infrastructure does not yet exist to support hundreds of more families on a permanent basis in a region that is one third the size of Europe with only 100,000 inhabitants. The only Regular Force unit in the Arctic is 440 Transport Squadron, which is able to transport limited amounts of cargo and personnel to remote locations. There are no other permanent Canadian Army or Royal Canadian Navy units in the Canadian North. This leads to the subject of forward basing.

⁸¹ Scott Gilmore, "The Canadian North is the least defended territory on earth," *Maclean's*, March 17, 2017. <https://www.macleans.ca/politics/the-canadian-north-is-the-least-defended-territory-on-earth/>.

With such a vast territory, the Canadian North is largely unpopulated and, consequently, lacks infrastructure. Much like MDO, the proposed Canadian Arctic operating concept would rely on forward basing to deter Russian and Chinese incursions into Canadian domains, as well as provide a drastically reduced response time for SAR events. Although the Nanisivik Naval Facility was initially planned to act as both a deep-water port and airfield at the Eastern mouth of the Northwest Passage, increased construction costs have reduced it to being a naval refueling facility only open six months of the year.⁸² Presently, CAF elements that operate in the Canadian North are all based in southern Canada and are assigned to JTFN under operational control for specific operational requirements.

The proposed Canadian Arctic operating concept in this study is not as detailed as the AAC 21 that preceded it. This proposal serves as an idea to frame future recommendations and to initiate conceptual design for a new concept in light of the publication of the ANPF and a shift towards soft security. The proposed Canadian Arctic operating concept, in its limited form, serves to provide context for how the CAF can operate in the Canadian North across multiple domains simultaneously to respond to SAR events and deter Russian and Chinese competition.

Recommendations

Based on the conclusion that the CAF needs to update the existing AAC 21 concept for the Arctic to something that incorporates a multi-domain approach, derived from strategic direction provided in the ANPF, this section proposes recommendations within the context of a proposed Canadian Arctic operating concept, using the elements of operational art as a framework.⁸³ Specifically, this section recommends the adoption of an operational center of gravity to guide further operational design for the Canadian North, decisive points to inform future basing considerations, and how to project force into each domain through operational reach.

⁸² David Pugliese, "Nanisivik naval facility was originally supposed to cost \$258 million but DND balked at price tag," *Ottawa Citizen*, September 9, 2014. <https://ottawacitizen.com/news/national/defence-watch/nanisivik-naval-facility-was-originally-supposed-to-cost-258-million-but-dnd-balked-at-price-tag>.

⁸³ US Department of Defense, JP 3-0, *Joint Operations*, II-4.

Consistent with the elements of operational art, a center of gravity “is the source of power that provides moral or physical strength, freedom of action, or will to act.”⁸⁴ In order to be considered valid, a center of gravity must be analyzed to achieve a desired end state against its critical factors: capabilities, requirements, and vulnerabilities.⁸⁵ In the context of Canadian military operations in the Arctic, the desired end state is directed from the ANPF as one of the elements of the Government of Canada’s shared vision: to ensure that Canada and its northern and Arctic residents are safe, secure, and well-defended.⁸⁶ Based on this end state, transportation infrastructure in the Canadian North is the center of gravity that will provide physical strength and freedom of action in the Arctic if Canada chooses to consider it as an operational theater. Table 6 outlines the center of gravity analysis of critical factors that support this recommendation.

⁸⁴ US Department of Defense, Joint Staff. Joint Publication 5-0, *Joint Planning* (Washington, DC: Government Publishing Office, 2020), GL-6.

⁸⁵ US Department of Defense, JP 5-0, *Joint Planning*, IV-25.

⁸⁶ Government of Canada, *Canada’s Arctic and Northern Policy Framework*, 3.

Table 6. Canadian Arctic Operational Center of Gravity Analysis

<u>End State</u> : Ensure that Canada and its northern and Arctic residents are safe, secure and well-defended.	
<u>Center of Gravity</u> : Transportation Infrastructure	<u>Critical Capabilities</u> : - Project force - Reduce response times - Transport personnel, equipment, cargo - Increase access - Facilitate logistics - Forward basing - Mutually supporting facilities
<u>Critical Requirements</u> : - Permanent facilities (airfields, deep-water ports) - Personnel - Housing and life support infrastructure (healthcare, water purification, plumbing, electricity) - Supply chain - Warehousing (food, water, fuels, equipment) - Communication - Fuel	<u>Critical Vulnerabilities</u> : - Climate - Isolation - Communication - Year-round occupation - Resource dependent

Source: Created by author.

According to JP 5-0, *Joint Planning*, “a decisive point is key terrain, key event, critical factor, or function that, when acted upon, enables a commander to gain a marked advantage.”⁸⁷ Much of the interest surrounding the Canadian Arctic surrounds the NWP. The effects of climate change are making the NWP more navigable and for longer periods of time throughout the year. Some predict that the first ice-free Arctic summer year may be as soon as 2034, based on current trends.⁸⁸ This will result in increased commercial traffic and potentially poses an interest for foreign military vessels. As traffic through the NWP increases, so too will SAR requests. The CAF possesses the mandate to exert domain awareness across the Canadian North to track foreign military vessels and aircraft and to respond to SAR

⁸⁷ US Department of Defense, JP 5-0, *Joint Planning*, IV-32.

⁸⁸ Ge Peng, Jessica L. Matthews, Muyin Wang, Russel Vose, and Liqiang Sun, “What Do Global Climate Models Tell Us about Future Arctic Sea Ice Coverage Changes?,” *Climate* 8, no. 1 (January 2020): 22, <https://doi.org/10.3390/cli8010015>.

requests. With the NWP being the focus of commercial traffic, then the decisive points for the CAF are the entrance and exit to the passage on either side, east and west. It is recommended that these decisive points be used to inform future basing considerations for the CAF, consistent with the recommended COG of transportation infrastructure. The Nanisivik Naval Facility, although only open half the year, is already located at the eastern entrance to the NWP. Sachs Harbour, Northwest Territories, located close to the confluence of the three branches of the NWP in the west, depicted in Figure 1, could provide the CAF with a choke point to control the western approach to the NWP.

If the CAF establishes a permanent presence in both Nanisivik and Sachs Harbour, they will dramatically extend their operational reach in the Canadian Arctic. Operational reach, according to ADP 3-0, *Operations*, “is the distance and duration across which a joint force can successfully employ military capabilities.”⁸⁹ In this case, operational reach is measured in the effective range of ships and aircraft, which is drastically affected by the harsh climate in the Canadian Arctic. The approximately 1,350km between both locations is bisected by the CAF Arctic Training Centre in Resolute Bay, Nunavut, so it is conceivable that resources could be positioned to establish the ability for the three facilities to mutually support each other and project military capabilities to dominate the NWP.

Using the elements of operational art and the proposed Canadian Arctic operating concept, this section recommended that the CAF adopt transportation as its operational COG in the Canadian North, based on the end state of Canada and its northern and Arctic residents being safe, secure, and well-defended. Furthermore, this section recommended that the decisive points to securing the NWP are the eastern and western approaches, which informs the recommendation for basing consideration at Nanisivik, Nunavut and Sachs Harbour, Northwest Territories, respectively.

Areas for further research

The scope of this study was limited by time and focus. The findings and recommendations presented lead to other topics within this field that merit further research. The recommendations regarding

⁸⁹ US Department of Defense, ADP3-0, *Operations*, Glossary-7.

future basing considerations in the Canadian Arctic require significant exploration to determine validity. Furthermore, capability development for the multi-domain formation proposed in the Canadian Arctic operating concept would require a study of their own in similar depth and breadth.

At present, there are no ports, military or civilian, located in the Canadian North.⁹⁰ Although infrastructure is part of an overall whole-of-government approach to developing life and the economy in the Canadian North, as per the recommendations in this monograph, the CAF should establish a base in Sachs Harbour, Northwest Territories and further develop the Nanisivik Naval Facility in Nunavut at either end of the NWP. Although the DND developed plans to have more capabilities at the Nanisivik Naval Facility, construction costs became too high to justify the expense under the fiscal environment of 2014.⁹¹ Consequently, plans already exist to further develop the facility and to incorporate an existing airfield 33 kilometers away at Arctic Bay. Further investigation into the feasibility of this development and the incorporation of a deep-water port would require study. Furthermore, similar geological, geographical, and environmental impact analysis would have to take place before the CAF could establish any defense infrastructure in Sachs Harbour, Northwest Territories.

If the CAF is to employ a multi-domain formation based on JTFN headquarters in Yellowknife, Northwest Territories, the capabilities and equipment employed in each domain would benefit from further study. Due to the difficulties involved in sustaining large forces across long distances in harsh climates, determining the size of a ground force and the best delivery mechanism to ensure the timely delivery of effects would also require further examination. In the air domain, modernizing the North Warning System, currently in use by NORAD, and exploring the procurement of unmanned aerial systems to provide surveillance over the NWP would be useful to explore. At sea, controlling the NWP is of vital concern to sovereignty and security in the Canadian North. Determining how to maintain a persistent naval presence and track sub-surface vessels will assert Canada's legitimate control over the

⁹⁰ Gilmore, "Canadian North is the least defended territory on earth."

⁹¹ Pugliese, "Nanisivik naval facility."

passage. Satellites in the space domain can provide ISR and facilitate satellite communications, but how effective are they in polar regions? How can connectivity be improved through the cyber domain to improve communications and the immediate distribution of information?

Research often raises more questions than providing clear answers. In this case, by determining the strategic direction for the CAF found in the ANPF, this study identified areas for further study. Investigations on the environmental impact and operational reach of developing military infrastructure in Nanisivik, Nunavut and Sachs Harbour, Northwest Territories would need to occur prior to any future basing considerations. Furthermore, exploring equipment and capability procurement options across each domain would facilitate the development of a multi-domain formation, based on JTFN.

Summary

The Canadian Armed Forces are able to use the 2019 *Arctic and Northern Policy Framework* as strategic direction to determine how they are to operate in the Canadian North now and into the future. This study reviewed Canada's existing policy direction to the CAF in the form of the *Arctic and Northern Policy Framework* and *Strong, Secure, Engaged: Canada's Defence Policy* to establish how Canada is currently operating in the Arctic. The study then reviewed Canadian and American military operating concepts, adaptive dispersed operations and multi-domain operations, respectively, to establish options for how to approach Arctic operations. The study concludes with the proposal of a hybrid-model operating concept, the Canadian Arctic operating concept, that integrates elements of both the Canadian and American models, and uses operational art to make the following recommendations:

1. Canada's operational end state in the Arctic is to ensure that Canada and its northern and Arctic residents are safe, secure and well-defended.
2. Canada's operational center of gravity is transportation infrastructure.
3. The decisive points in the Canadian Arctic are found at the entrance and exit to the Northwest Passage.

4. The Canadian Armed Forces should establish permanent basing in both Nanisivik, Nunavut and Sachs Harbour, Northwest Territories in order to extend operational reach and control the Northwest Passage.
5. The Canadian Armed Forces should accept operational risk in sustaining permanent bases by air until deep-water ports are constructed.
6. The Government of Canada should accept strategic risk in diverting military resources away from overseas deployment and to domestic security tasks in the Canadian North.

If the CAF is going to extend its operational reach and project more effects into the Canadian North, a significant amount of national treasure will have to be expended. Although the political will currently exists for the CAF to do more in the Arctic, it is unlikely that the funds will be made available for them to improve their capacity and capabilities for Arctic operations. In response to the COVID-19 pandemic, the Government of Canada passed a \$100 billion relief package to revitalize the post-pandemic economy.⁹² In the wake of the global pandemic, Canadian public opinion will likely emphasize economic relief and not on the development of new military capabilities. However, the impact of climate change will continue to extend the navigability of the Northwest Passage, which will only multiply the interest of competitors of using it as an international commercial shipping lane. In the post-pandemic global economy, the use of the Northwest Passage as a more cost-effective shipping route between Europe and Asia will also likely increase. Furthermore, the presence of oil and natural gas in Canada's exclusive economic zone will continue to attract the attention of Canada's competitors. The CAF and the Government of Canada must consider how they will act now in order to ensure Canada and its northern and Arctic residents are safe, secure, and well-defended in the future.

⁹² Kathleen Harris, "Trudeau touts 'historic' \$100B stimulus plan, won't commit to boosting health transfers," *CBC News*, December 1, 2020. <https://www.cbc.ca/news/politics/trudeau-covid19-economic-statement-1.5823212>.

Bibliography

- Berthiaume, Lee. "COVID-19 blamed for delay on Arctic military port first promised in 2007." *The Canadian Press*, August 2, 2020. <https://www.cbc.ca/news/politics/arctic-military-refuelling-station-delay-1.5672360>.
- Burn, Chris. *The Polar Night*. Inuvik, NWT: The Aurora Research Institute, March 1996. <https://nwtresearch.com/sites/default/files/the-polar-night.pdf>.
- Canadian Space Agency. "Frequently Asked Questions – RADARSAT Constellation Mission (RCM)," August 28, 2019. <https://www.asc-csa.gc.ca/eng/satellites/radarsat/faq.asp>.
- Daly, Steve. "Converting NAPS to Acquisitions... or, DND attitudes towards Canadian Aircraft Makers." *Defence Muse*, June 9, 2017. <https://defencemuse.wordpress.com/2017/06/09/twin-option-for-the-twin-otters-simple-solutions-are-often-the-best/>.
- Day, Tim. "The Battle for the Far North: An Analysis of Threats to Canadian Arctic Sovereignty" Master's Thesis, US Army Command and General Staff College, Fort Leavenworth, KS, 2020.
- Department of National Defence. *Land Operations 2021 – Adaptive Dispersed Operations: The Force Employment Concept for Canada's Army of Tomorrow*. Kingston, ON: Directorate of Land Concepts and Design, 2007. http://publications.gc.ca/collections/collection_2009/forces/D2-188-2007E.pdf.
- . B-GL-007-000/JP-003, *Northern Approaches: Army Arctic Concept 2021*. Kingston, ON: Canadian Army Land Warfare Centre, 2013. http://publications.gc.ca/collections/collection_2014/mdn-dnd/D2-323-2013-eng.pdf.
- Driscoll, Kent. "Just like the Canadian Rangers, the new C-19 rifle is designed to thrive in Canada's Arctic." *APTN National News*, June 18, 2019. <https://aptnnews.ca/2019/06/18/just-like-the-canadian-rangers-the-new-c-19-rifle-is-designed-to-thrive-in-canadas-arctic/>.
- Ferreras, Jesse. "Canada's Northwest Passage claim isn't settled – but it's not 'illegitimate,' like the US says it is." *Global News*, May 31, 2019. <https://globalnews.ca/news/5256532/northwest-passage-canada-us-claim-challenge/>.
- Freedman, Lawrence. *Deterrence*. Malden, MA: Polity Press, 2006.
- Gilmore, Scott. "The Canadian North is the least defended territory on earth." *Maclean's*, March 17, 2017. <https://www.macleans.ca/politics/the-canadian-north-is-the-least-defended-territory-on-earth/>.
- Government of Canada. *Arctic and Northern Policy Framework: Safety, Security and Defence Chapter*. Ottawa: Crown-Indigenous Relations and Northern Affairs Canada, 2019. <https://www.rcaanc-cirnac.gc.ca/eng/1562939617400/1562939658000>.
- . *Canada's Arctic and Northern Policy Framework*. Ottawa: Crown-Indigenous Relations and Northern Affairs Canada, 2019. <https://www.rcaanc-cirnac.gc.ca/eng/1560523306861/1560523330587>.

- . *Canada's Changing Climate Report*. Ottawa: Natural Resources Canada, 2019. https://www.nrcan.gc.ca/sites/www.nrcan.gc.ca/files/energy/Climate-change/pdf/CCCR_FULLREPORT-EN-FINAL.pdf.
- . *Canada's Northern Strategy: Our North, Our Heritage, Our Future*. Ottawa: Minister of Indian Affairs and Northern Development and Federal Interlocutor for Métis and Non-Status Indians, 2009. <https://www.northernstrategy.gc.ca/cns/cns-eng.asp>.
- . "Canadian Air Defence Identification Zone now aligned with Canada's sovereign airspace." May 24, 2018. <https://www.canada.ca/en/departement-national-defence/news/2018/05/canadian-air-defence-identification-zone-now-aligned-with-canadas-sovereign-airspace.html>.
- . "First Arctic and Offshore Patrol Ship delivered." July 31, 2020. <https://www.navy-marine.forces.gc.ca/en/news-operations/news-view.page?doc=first-arctic-and-offshore-patrol-ship-delivered/kctmmmk>.
- . "Operation NANOOK." October 1, 2010. <https://www.canada.ca/en/departement-national-defence/services/operations/military-operations/current-operations/operation-nanook.html>.
- . *Partial Submission of Canada to the Commission on the Limits of the Continental Shelf regarding its continental shelf in the Arctic Ocean: Executive Summary*. Ottawa: Her Majesty the Queen in Right of Canada, 2019. https://www.un.org/Depts/los/clcs_new/submissions_files/can1_84_2019/CDA_ARC_ES_EN_secured.pdf.
- . "Population and Dwelling Count Highlight Tables, 2016 Census." Ottawa: Statistics Canada, 2017. <https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/hltfst/pd-pl/Table.cfm?Lang=Eng&T=101&S=50&O=A>.
- . *Strong, Secure, Engaged: Canada's Defence Policy*. Ottawa: Department of National Defence, 2017. <http://publications.gc.ca/site/eng/9.835971/publication.html>.
- . "The Canadian Armed Forces to demonstrate specialized Arctic skill-sets with international partners in Nunavut." February 24, 2020. <https://www.canada.ca/en/departement-national-defence/news/2020/02/the-canadian-armed-forces-to-demonstrate-specialized-arctic-skill-sets-with-international-partners-in-nunavut.html>.
- Harris, Kathleen. "Trudeau touts 'historic' \$100B stimulus plan, won't commit to boosting health transfers." *CBC News*, December 1, 2020. <https://www.cbc.ca/news/politics/trudeau-covid19-economic-statement-1.5823212>.
- Kimmons, Sean. "Army to build three Multi-Domain Task Forces using lessons from pilot." *Army News Service*, October 15, 2019. https://www.army.mil/article/228393/army_to_build_three_multi_domain_task_forces_using_lessons_from_pilot.
- Leedy, Paul D. and Jeanne Ellis Ormrod. *Practical Research: Planning and Design*. 8th ed. Upper Saddle River, NJ: Pearson Education Inc., 2005.
- Levinson-King, Robin. "Huawei heats up the battle for internet in Canada's north." *BBC News*, September 9, 2019. <https://www.bbc.com/news/world-us-canada-49415867>.

- National Defence. B-GL-310-001/AG-003, *Close Engagement – Land Power in an Age of Uncertainty – Evolving Adaptive Dispersed Operations*. Kingston, ON: Army Publishing Office, 2019.
[http://armyapp.forces.gc.ca/SOH/SOH_Content/B-GL-310-001-AG-003%20\(En\)%202019.pdf](http://armyapp.forces.gc.ca/SOH/SOH_Content/B-GL-310-001-AG-003%20(En)%202019.pdf).
- Natural Resources Canada. *Political Map of the Territories – Bilingual*. Ottawa: Her Majesty the Queen in Right of Canada, 2006).
http://ftp.geogratis.gc.ca/pub/nrcan_rncan/raster/atlas_6_ed/reference/bilingual/territories.jpg.
- NAV Canada. “Notice of Change: Adjustment to the Canada Air Defence Identification Zone,” May 24, 2018. <https://www.navcanada.ca/EN/products-and-services/Service%20Project%20Announcements/SPA-2018-ADIZ-EN.pdf>.
- Peng, Ge, Jessica L. Matthews, Muyin Wang, Russel Vose, and Liqiang Sun. “What Do Global Climate Models Tell Us about Future Arctic Sea Ice Coverage Changes?” *Climate* 8, no. 1 (January 2020). <https://doi.org/10.3390/cli8010015>.
- Public Services and Procurement Canada. “Future Fighter Capability Project.” August 26, 2020.
<https://www.tpsgc-pwgsc.gc.ca/app-acq/amd-dp/air/snac-nfps/CF-18-eng.html>.
- Pugliese, David. “Canada’s Special Forces to get new vehicles for the Arctic but Army left out in the cold.” *Canada.com*, April 18, 2014. <https://o.canada.com/news/national/canadas-special-forces-to-get-new-vehicles-for-the-arctic-but-army-left-out-in-the-cold>.
- . “First used Australian fighter jets now flying in RCAF colours with more to come.” *National Post*, July 14, 2019. <https://nationalpost.com/news/canada/first-used-australian-fighter-jets-now-flying-in-canadian-colours-plans-underway-to-extend-jet-fleet-to-2032>.
- . “Nanisivik naval facility was originally supposed to cost \$258 million but DND balked at price tag.” *Ottawa Citizen*, September 9, 2014. <https://ottawacitizen.com/news/national/defence-watch/nanisivik-naval-facility-was-originally-supposed-to-cost-258-million-but-dnd-balked-at-price-tag>.
- Rosenau, James N. “Thinking Theory Thoroughly.” *The Scientific Study of Foreign Policy*. London: Francis Pinter, 1980.
- South, Todd. “This 3-star Army general explains what multi-domain operations mean for you.” *Army Times*, August 11, 2019. <https://www.armytimes.com/news/your-army/2019/08/11/this-3-star-army-general-explains-what-multi-domain-operations-mean-for-you/>.
- The Economist, “Breaking the Ice: Everyone wants a piece of the Arctic.” *The Economist*, August 19, 2004. <https://www.economist.com/the-americas/2004/08/19/breaking-the-ice>.
- Thurton, David. “After 4 years, the Liberals haven’t released their plan for the Arctic.” *CBC News*, September 1, 2019. <https://www.cbc.ca/news/politics/after-4-years-the-liberals-haven-t-released-their-plan-for-the-arctic-1.5266507>.
- U.S. Army Training and Doctrine Command. TRADOC Pamphlet 525-3-1, *The U.S. Army in Multi-Domain Operations 2028*. Washington, DC: Government Printing Office, December 6, 2018.
https://www.tradoc.army.mil/Portals/14/Documents/MDO/TP525-3-1_30Nov2018.pdf.
- . TRADOC Pamphlet 525-3-1, *The U.S. Army Operating Concept: Win in a Complex World 2020-*

2040. Washington, DC: Government Printing Office, October 31, 2014.
<https://www.tradoc.army.mil/Portals/14/Documents/TP525-3-1%20The%20Army%20Operating%20Concept.pdf>.

U.S. Department of Defense. Joint Staff. Chairman of the Joint Chiefs of Staff Instruction 3170.01G, *Joint Capabilities Integration and Development System*. Washington, DC: Government Publishing Office, 2009.

———. Joint Staff. Joint Publication 3-0, *Joint Operations*. Washington, DC: Government Publishing Office, 2017.

———. Joint Staff. Joint Publication 5-0, *Joint Planning*. Washington, DC: Government Publishing Office, 2020.

U.S. Department of the Army. Army Doctrine Publication 3-0, *Operations*. Washington, DC: Government Publishing Office, 2019.

Yarger, Harry R. *Strategic Theory for the 21st Century: The Little Book on Big Strategy*. Carlisle, PA: US Army War College Strategic Studies Institute, February, 2006.