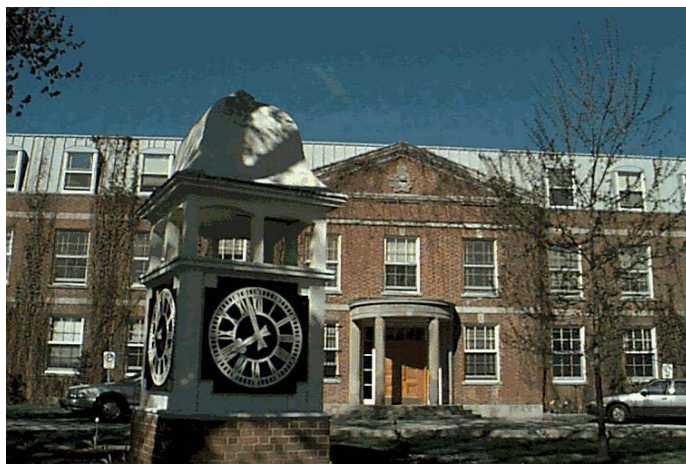


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BACK TO THE FUTURE: NORAD, SOVEREIGNTY AND ANTI SUBMARINE WARFARE IN THE ARCTIC

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JCSP 40

Exercise Solo Flight

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SOLO FLIGHT
**BACK TO THE FUTURE: NORAD, SOVEREIGNTY AND ANTI SUBMARINE
WARFARE IN THE ARCTIC**

By LCDR R.E. Woodards
Par le Capitain de corvette R.E. Woodards

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BACK TO THE FUTURE: NORAD, SOVEREIGNTY AND ANTI SUBMARINE WARFARE IN THE ARCTIC

This decade is not the first to see the vying of national interests play out in the Arctic arena. During the cold war, the Arctic provided the geographic backdrop for a perennial clash of super powers, and as the receding regional ice provides increased access to navigable waters, the Arctic will likely again become the location of a battle of national wills. The majority of the cold war-era, high intensity interactions occurred over Arctic airspace in engagements between North American fighter aircraft and the Union of Soviet Socialist Republics (USSR) newly developed Tupolev TU-95 Bear Bombers. This threat was augmented by continuous covert operations by USSR ballistic missile submarines.

These submarines primary role was nuclear deterrence focusing squarely on the “nuclear decapitation” of the opponent by posturing to strike first at the heart of North America’s command and control centers. In contrast to the subsurface domain, the presence of thick layers of ice stymied the prospects of associated above water activity in the Arctic. Instead, the focus remained on defending the airspace of North America from the threat of both aircraft and intercontinental ballistic missiles, leading to the signature of the North American Air Defence (NORAD) agreement on May 12, 1958. This bi-national arrangement established Canada and the United States as equal partners in a unified command and protected the region from potential Soviet incursion by air.

History has demonstrated NORAD's success in defending against threats from the air, and an attempt was made to translate this success to the maritime environment with the 2006 expansion of the agreement to include Maritime Domain Awareness.¹ Unfortunately, this failed to account for the rapid effects of global climate change or the proliferation of submarines. With the likely economic expansion and increased usage of sea lanes of communication that are expected in the Arctic as the polar ice recedes, submarines will become an increasingly potent tool to exert influence in the region. Absent a viable anti-submarine defense and deterrence mechanism, North America's collective sovereignty and security has the potential to be eroded through concessions in the Arctic maritime domain. The prospect for this is demonstrated by the presence of submarines near every other restrictive sea-lane across the rest of the world and the conjunctive requirements for regional anti-submarine capabilities to ensure maritime stability.

The NORAD vision states, "We will defend North America by outpacing all threats."² To satisfy this vision the effort must extend to maritime approaches and this cannot be accomplished without addressing the subsurface threat in the Arctic. This essay will highlight the antisubmarine warfare capability gap that currently exists in the Arctic, focusing on the necessity to address this requirement on the plains of both equipment and organizational provisions. The requirements will be framed under three of the six

¹ "Framework for Enhanced Military Cooperation among North American Aerospace Defense Command, United States Northern Command, and Canada Command." <http://www.cpcml.ca/publications2012/091002-EnhancedFrameworkNAMilitaryCooperation.pdf> (accessed May/5, 2014).

² "North American Aerospace Defense Command Official Website." <http://www.norad.mil/AboutNORAD/Vision.aspx> (accessed May/7, 2014).

operational functions outlined in the Canadian Forces doctrine; Command, Sense and Act.³ Using this framework the argument will propose NORAD as the structural solution for the function of *command* under which network capability functions as *sense* and asset assignment fosters the ability to *act*. This will be achieved by exploring the Arctic maritime environment, existing and required regional capabilities, potential threats in the Arctic subsurface domain, and lastly the changes that should be instituted to address these issues.

Why the Arctic?

The rise and fall of civilizations are nested in the dominant society's ability to anticipate change and adapt to those changes whether environmental, ideological, or otherwise. A global shift of the commons is upon us, as demonstrated by the steady decline in oil and gas extraction due in part to several of the world's richest oil reserves surpassing their peak performance. Our traditional resource fields are inexorably declining and there is a constant search for new and promising sources of future energy, material and accompanying wealth and prosperity. The area north of the 66th parallel contains less than six percent of the Earth's surface area, yet recent studies by the United States Geological Survey have determined that up to 20% of the world's recoverable

³ R. Charpentier et al., *Coalition Command and Control: A Canadian Perspective*, Vol. 3393; (Orlando, FL, USA), 2-13.

hydrocarbon resources reside undiscovered in the Arctic region.⁴ More specifically that number includes 22% of the world's gas reserves and five percent of oil reserves.⁵

Although this information is not entirely new, recent melting of Arctic ice caps have fostered glimmers of hope in further resource exploitation and the pursuit of new sea-based navigational routes. Waterways within the Canadian Arctic Archipelago running adjacent to the northern coast of North America make up the Northwest Passage connecting the Atlantic and Pacific Oceans. This elusive route has long been a central topic of philosophical debates on alternate global trade routes, which intrigued and inspired famous explorers such as John Cabot and Henry Hudson to pursue its whereabouts.⁶ Considering the recent report by the Center for American Progress, the Arctic "is warming two times faster than any other region on Earth.... Arctic sea-ice volume has shrunk by 75 per cent since the 1980s, and we are likely to see ice-free summers by mid-century."⁷ This will certainly make the once mythically referenced Northwest Passage a viable navigable trade route for at least part of the year. With the ice recession in the Arctic, the Northern Sea Route connecting Asian Markets and eastern Russia with western Russia and Europe is also becoming a more direct route than it has previously been. Better still, the Northwest Passage will enable trans-Arctic ships to

⁴ Rob Huebert, "Welcome to a New Era of Arctic Security," *Globe and Mail*.Le 24 (2010).

⁵ Sten Rynning, "Arctic Security Order: Collective Security, Collective Defense, Or Something New?" *Journal of Military and Strategic Studies* 15, no. 2 (2014).

⁶ L. C. Smith and S. R. Stephenson, "New Trans-Arctic Shipping Routes Navigable by Midcentury," *Proceedings of the National Academy of Sciences of the United States of America* 110, no. 13 (Mar 26, 2013).

⁷ Cathleen Kelly, Michael Conathan and Vikram Singh, "Helping the Arctic Council Find its True North," <http://www.americanprogress.org/wp-content/uploads/2014/04/ArcticPolicyReport.pdf> (accessed April, 2014).

capitalize on a savings in geographical distance of 30 percent in comparison to the Northern Sea Route.⁸

These savings were demonstrated last September when the Panamax vessel Nordic Orion, which is the largest size vessel able to navigate the Panama Canal, successfully transited the Northwest Passageway for the first time.⁹ The owners of the vessel, Nordic Bulk Carriers, were able to deliver 25 percent more cargo while saving over \$80,000 in fuel cost when compared to traveling via the Panama Canal. Although the wider proliferation of technology has driven down the international transportation costs of using both rail and air, international shipping still provides the most dependable and cost effective means to transport goods globally. As such, international shipping still constitutes over 90% percent of all trade-associated transportation according to the International Maritime Organization.¹⁰ The prospects of cheaper shipping and increased profit margins, coupled with the constancy of the sea as the overwhelming solution to global trade, will sooner than later lead other companies to follow the path set by Nordic Bulk Carriers in exploiting the shorter routes through the North.

⁸ L. C. Smith and S. R. Stephenson, "New Trans-Arctic Shipping Routes Navigable by Midcentury," *Proceedings of the National Academy of Sciences of the United States of America* 110, no. 13 (Mar 26, 2013), 2.

⁹ Freddie Dawson, "Bi-National Planning Group the Final Report on Canada and the United States (CANUS) Enhanced Military Cooperation," <http://www.projectwhitehorse.com/pdfs/CANUS%20Military%20Cooperation%20Final%20Report.pdf> (accessed May/5, 2014).

¹⁰ International Maritime Organization, "International Maritime Organization's Official Website: Introduction to IMO," <http://www.imo.org/About/Pages/Default.aspx> (accessed May/3, 2014).

The realization and global acceptance of climate change have fostered a unified purpose amongst Arctic countries, to harvest and protect. The forecasts of both refined trade routes and full-scale resource development have truly made the Arctic the new frontier. With prospects of economic gains comes the necessity to protect those elements that most affect a nation and its interests. The diametric opposition of the altruistic aspirations towards this new frontier, and the narcissistic pursuit of resources make this region a likely area for friction in the future.

Why Submarines?

As goes commerce on the sea, so go the Navies. The Royal Canadian Navy's mission is to "defend Canadian interests and values, and contribute to international peace and security"¹¹ at the direction of the government. Complementarily, the United States Navy's mission is to "secure the United States from direct attack; secure strategic access and retain global freedom of action; strengthen existing and emerging alliances and partnerships and establish favorable security conditions."¹² In order for Navies to complete their missions, they must maintain freedom of maneuver in the maritime domain. Under normal maritime conditions, navies have a range of options to maintain that maneuverability. The ice-filled waters of the Arctic challenge that maneuverability in

¹¹ "Framework for Enhanced Military Cooperation among North American Aerospace Defense Command, United States Northern Command, and Canada Command." , 162

¹² Office of the Secretary of Defense, "ANNUAL REPORT TO CONGRESS Military and Security Developments Involving the People's Republic of China 2013," U.S. Department of Defense, http://www.defense.gov/pubs/2013_china_report_final.pdf (accessed FEB 24, 2014).; Ivan Eland, "Is Chinese Military Modernization a Threat to the United States?" (2012).

various locations because most Navies do not normally possess large quantities of ships with the proper hull integrity to navigate Arctic levels of ice thickness.

It is for this reason that modern history has demonstrated the submarine as the premier vessel of navies that have chosen to operate within the Arctic region up to this point in time, retaining the inherent ability to maneuver freely below the constraints that surface ice imposes. Submarines have a long history of patrolling the Arctic during modern times, but due to their discrete nature, it is hard to determine the entirety of submarine activity there. However, the widely publicized trans-polar submerged crossing completed by USS Nautilus in 1958, remains a historical milestone and precursor to future submarine explorations in the Arctic. Beginning in the 1940's, diesel submarines had been making short trips into the marginal ice zone, but as the first nuclear powered submarine with limitless range, it ushered in a new era. Based on public records of polar visits and relocations, there have been over 80 documented submarine excursions in the arctic.¹³ Additional proof of the rampant submarine activity in the north can be linked to the detailed Russian maps of the Arctic to include specifically the Northwest Passage.¹⁴ In conjunction with satellites and surveillance aircraft, submarines have also been one of the primary tools used to monitor and measure polar ice levels and map the effects of climate change in the region.¹⁵

¹³ Blunden, *The New Problem of Arctic Stability*. Lyon, Waldo K. "The navigation of arctic polar submarines." *Journal of Navigation* 37, no. 02 (1984): 155-179.

¹⁴ Rothrock, Drew A., Yanling Yu, and Gary A. Maykut. "Thinning of the Arctic sea-ice cover." *Geophysical Research Letters* 26, no. 23 (1999): 3469-3472.

¹⁵ Josefino C. Comiso and Dorothy K. Hall, "Climate Trends in the Arctic as Observed from Space," *Wiley Interdisciplinary Reviews: Climate Change* 5, no. 3 (2014), 389-409.

History has thus proven the arctic to be an operating area where submarines are extremely effective. As a result, the recession of the ice sheets caused by climate change will lead to an increase in submarine activity. Freedom of movement and an increase in missions falling within submarines capability will solidify submarines as the maritime tool for Navies that require an increased strategic and operational presence in the North. This logic has driven several nations' recent submarine procurement programs, including in Canada, in order to ensure that naval commanders of all countries have the option space to support the developing political aspirations to exploit the effects of climate change.

China

China's self-reflection as it pertains to global status, casts the past 200 years as a historical anomaly in that China was neither a regional nor a global hegemon. As demonstrated over the last three decades specifically, China has intentions to develop into the worlds' foremost economy in order to support its burgeoning population. In pursuit of these aspirations, China has sourced inspiration from Alfred Thayer Mahan.¹⁶ In his book *The Influence of Sea Power upon History: 1660-1783*, he highlighted the intrinsic connection between national greatness and control of the seas, a lesson occasionally

¹⁶ Office of the Secretary of Defense, "ANNUAL REPORT TO CONGRESS Military and Security Developments Involving the People's Republic of China 2013," U.S. Department of Defense, http://www.defense.gov/pubs/2013_china_report_final.pdf (accessed FEB 24, 2014).; Ivan Eland, "Is Chinese Military Modernization a Threat to the United States?" (2012), 1.

forgotten by present day western nations.¹⁷ His successful strategic approach gained influence amongst politicians, theorists, and even Theodore Roosevelt; now the Chinese leadership also appear to want to reap the rewards of the omniscient council of Mahan.¹⁸

Robert Kaplan a former member of the Pentagon's Defense Policy Board who was identified by Foreign Policy magazine in 2011 and 2012 as one of the *Top Global Thinkers* has stated, "China is on its way to having one of history's great navies."¹⁹

Over the most recent decades, the Chinese People's Liberation Army Navy has undergone an expansive and evolutionary change. Its original auxiliary force was at first only minimally equipped to conduct operations in support of amphibious actions against opponents like the Taiwan Navy. However, it first transitioned to an offshore defensive force in the late 1990s and has since emerged as a burgeoning blue water navy with aspirations to exercise local maritime dominance.²⁰ As with most countries, China's aspirations of economic growth and stability are inherently tied to its flagged vessels ability to retain freedom of movement in the maritime domain.

¹⁷ A. T. Mahan, *The Influence of Sea Power upon History, 1660-1783* (New York: Barnes & Noble Books, 2004), 584.

¹⁸ Analyst, *Russian Submarine Capabilities*, 2

¹⁹ Kedar Pavgi, "The FP Top 100 Global Thinkers," http://www.foreignpolicy.com/articles/2011/11/28/the_fp_top_100_global_thinkers (accessed April/1, 2014).; Nathan Gardels, "Robert Kaplan: The Center of Military Power in the World is Moving to Asia," <http://www.csmonitor.com/Commentary/Global-Viewpoint/2014/0327/Robert-Kaplan-The-center-of-military-power-in-the-world-is-moving-to-Asia> (accessed May/7, 2014).

²⁰ Patrick M. Cronin et al., *Cooperation from Strength: The United States, China and the South China Sea* (2012).

China has historically followed a Naval Strategy of *Offshore Defense*. The peacetime function of *Offshore Defense* places emphasis on “gaining control of China’s near seas and steadily expanding China’s maritime perimeter out to the Second Island Chain”, while wartime calls for, “opposing naval forces as far from the Chinese coast as possible and, if necessary, overwhelming those forces as they approach China.” However, according to a recent research report authored by the United States – China Economic and Security Review Commission, there are several indicators that China may be contemplating a shift in naval strategy towards a *Distant Sea Defense* to facilitate the pursuit of greater complexities and ranges in the expansion of both its missions and roles. This could obviously include and Arctic presence. The distinguishing factors separating *Offshore Defense* and *Distant Sea Defense* is that, “the latter envisions the PLA Navy conducting longer-range surface and submarine patrols, defense of more distant maritime trade routes, and more regular and robust military missions other than war.”²¹

Between 2003 and 2013, defence spending in China was increased by 438 percent from \$40 Billion to \$215 Billion.²² This additional spending was directed primarily towards equipment modernization, and research and development. The increase in spending also correlates with the gradual shedding of out dated submarines in exchange

²¹ Craig Murray, Andrew Berglund and Kimberly Hsu, "U.S.-China Economic and Security Review Commission Staff Research Backgrounder: China’s Naval Modernization and Implications for the United States," <http://www.naval-technology.com/features/featuresea-change-naval-development-in-china-seas-4170658/> (accessed May/5, 2014).

²² Office of the Secretary of Defense, "ANNUAL REPORT TO CONGRESS Military and Security Developments Involving the People’s Republic of China 2013," U.S. Department of Defense, http://www.defense.gov/pubs/2013_china_report_final.pdf (accessed FEB 24, 2014).; Ivan Eland, "Is Chinese Military Modernization a Threat to the United States?" (2012), 1.

for several indigenously developed variants, together with some Russian acquisitions.²³ Until present day, China's increase in its modern submarine inventory continues at a constant rate. China is building more major classes of submarines and ships than every other global nation with the exception of the United States.²⁴ The projection for China's submarine force in the year 2020 is 69-78 total submarines.²⁵ These numbers consist of 59-64 Diesel Attack, six to nine Nuclear Attack, and four to five Nuclear Ballistic submarines.²⁶ With the United States inventory estimated at 72 total submarines, China stands to surpass the United States within the next five years.²⁷ Whereas in the cold war it was Russia's Navy that presented the dominant threat, the significance of the Arctic to global trade means that it could well be China that seeks to be the dominant force in the region, and its navy is slowly becoming capable of achieving such an aim if it is directed to do so.

Unlike previously produced Diesel Attack submarines, many of the newer models have Air Independent Propulsion systems that would permit them to conduct operations under Arctic ice. Included in the total estimate of submarines are the improved variants of the SHANG Nuclear Attack submarine which started production in 2012.²⁸ Also included are the Air Independent Propulsion variants of the Yuan which remain in production, the

²³ Murray, Berglund and Hsu, *U.S.-China Economic and Security Review Commission Staff Research Backgrounder: China's Naval Modernization and Implications for the United States*, 6

²⁴ *Ibid.*

²⁵ *Ibid.*

²⁶ *Ibid.*

²⁷ Staff Writer, "Total Submarine Strength by Country," <http://www.globalfirepower.com/navy-submarines.asp> (accessed May/5, 2014).

²⁸ Murray, Berglund and Hsu, *U.S.-China Economic and Security Review Commission Staff Research Backgrounder: China's Naval Modernization and Implications for the United States*, 6

JIN Nuclear Ballistic submarine and two new classes designated as TYPE 095 and 096.²⁹ The TYPE 95 is a Guided Missile Attack submarine while the Type 96 functions as a Nuclear Ballistic submarine.³⁰ Additionally there is speculation that China and Russia may jointly develop four additional advanced conventional submarines.³¹ This demonstrates China's diverse depth of submarine capability, enabling them to engage in subsurface operations aimed at projection while still defending territorial waters.

Chinese Admiral Zhang Huachen stated in 2010 that, "With the expansion of the country's economic interests, the navy wants to better protect the country's transportation routes and the safety of our major sea lanes."³² The notion that if at any time China's "economic momentum becomes heavily reliant on Arctic resources and shipping lanes, a supply disruption could lead the PRC to deploy significant naval forces to the region" is directly supported by PLA doctrine. This doctrine dictates that, "If 'an enemy offends our national interests it means that the enemy has already fired the first shot', in which case PLA's mission is 'to do all we can to dominate the enemy by striking first.'"

Since the mid-1990s China has consistently invested in Arctic research to include the purchase the ice-breaker Xuelong, a huge ship built in the Ukraine.³³ It first reached the North Pole in 2010 during its fourth Arctic expedition. Since then, it has been on an additional trip, visiting the permanent arctic research station established in 2004 by the

²⁹ *Ibid.*

³⁰ *Ibid.*

³¹ *Ibid.*

³² Shiloh Rainwater, "Race to the North: China's Arctic Strategy and its Implications'," *US Naval War College Review* 66, no. 2 (2013), 66.

³³ *Ibid.*

Chinese Arctic and Antarctic mission.³⁴ Chinese officials are concerned, “over this excessive dependence on foreign energy, the vast majority of which relies on seaborne transportation.”³⁵ As China encircles the Indian Ocean with their “string of pearls”, they simultaneously lobby for a seat at the Arctic council. Iceland became suspicious of China’s aspirations when in 2011 they rejected the proposed sale of a 300 square kilometer plot of land that was to be purchased by a Chinese businessman but later determined to have been sourced from within the Chinese military for a possible Arctic Naval base.³⁶ China’s “energy nationalism” continues to shape its global interaction.³⁷ The alignment of the increased military size and budget, a potential shift in naval strategy, and an unquenchable energy requirement would indicate that it is not a matter of if, but a matter of when China will deploy submarines to the Arctic.

Russia

While the rest of the Arctic countries are contemplating their Arctic exploits, Russia is taking action in the Arctic. Out of the eight Arctic nations, five have borders with the Arctic Ocean, and of these five, Russia possesses the largest coastline by far.³⁸ Whereas the other nations aspire to reap the economic benefits of the Arctic, Russia already receives 20% of its GDP from areas north of the Arctic Circle.³⁹ Of the world’s

³⁴ *Ibid.*

³⁵ *Ibid.*

³⁶ David Curtis Wright, "China's Growing Interest in the Arctic," *Journal of Military and Strategic Studies* 15, no. 2 (2014), 58.

³⁷ Rainwater, *Race to the North: China's Arctic Strategy and its Implications*, 66.

³⁸ Margaret Blunden, "The New Problem of Arctic Stability," *Survival* 51, no. 5 (2009), 122.

³⁹ *Ibid.*

undiscovered natural gas, 30% lies in the Arctic with the majority of it off the Northern shore of Russia in less than 500 meters of water.⁴⁰

Russia places the Arctic at the forefront of its National Security Strategy.

Although it has increased its capacity to operate in the Arctic over the past decade, in general its geographical location and access to seaports has required a relatively higher baseline of Arctic capability when compared to the other nations. In 2007, Russia declared “The Arctic is Ours” after a Russian flag was placed under the ice at the North Pole.⁴¹ In 2008, a Russian General highlighted that, “Wars these days are won and lost well before they are launched,” these comments were made during a revelation that Russia planned to train troops that could be engaged in an Arctic combat mission.⁴² The Russian Arctic Strategy paper, which was released in 2009 by the Kremlin, placed a specific priority on “*securing energy resources in the Barents Sea Shelf and other Arctic regions.*”⁴³ In 2012 Moscow revealed plans to create “infrastructure hubs” to be used by Russian warships as way stations during Arctic transits. During the same year they also repositioned high visibility air units to Novaya Zmlya, an Arctic airfield.⁴⁴ Then in May of 2013 the construction of 11 new border outposts and four new Arctic specific warships was also announced.⁴⁵ All of these actions by Russia in the Arctic are set to culminate

⁴⁰ *Ibid.*

⁴¹ Alan W. Dowd, "The Arctic Becomes a Hotspot," <http://www.american.com/archive/2013/december/the-arctic-becomes-a-hot-spot> (accessed May/8, 2014).

⁴² *Ibid.*

⁴³ Blunden, *The New Problem of Arctic Stability*, 2

⁴⁴ *Ibid.*

⁴⁵ *Ibid.*

this summer, when an Oscar II nuclear submarine, the Smolensk, will raise the Russian flag above the ice at the North Pole.⁴⁶

While the United States and others focus on the increasing naval capabilities of the Chinese, Russia has been silently making its own incremental upgrades to its existing fleet of submarines and manufacturing a small number of new vessels. Russia has upgraded six of the remaining operational Delta IV Nuclear Ballistic submarines while deciding to keep two operational Delta III Nuclear Ballistic submarines as it completes production on the Project 667BDR Nuclear Ballistic submarine delineated as the Delta IIIs replacement.⁴⁷ In January of 2013 the first of “Yuri Dolgoruki”, the new Borei class of Nuclear Ballistic submarines was commissioned.⁴⁸ The Russian Nuclear Ballistic Fleet is comprised of a total of ten, including the December 2013 entry of a second Borei class called Aleksandr Nevsky.⁴⁹

The Russian Nuclear Attack fleet of submarines is comprised of two operational Sierra IIs, two Sierra IIs undergoing modernization and refit, four Victor IIIs, and 12 of their highly capable Akulas.⁵⁰ Although they are the most advanced submarine in the Russian inventory, in 2013 Russia announced that it would be modernizing the Akula class with improved electronics and an improved stealth capability.⁵¹ These submarines

⁴⁶ Rob Huebert, "Is Canada Ready for Russia's Hardball Approach to the North Pole?" <http://www.theglobeandmail.com/globe-debate/is-canada-ready-for-russias-hardball-approach-to-the-north-pole/article16604726/> (accessed May/5, 2014).

⁴⁷ Analyst, *Russian Submarine Capabilities*, 2

⁴⁸ *Ibid.*

⁴⁹ *Ibid.*

⁵⁰ *Ibid.*

⁵¹ *Ibid.*

are also a frequently exported item, with nations like India currently engaged in a 10 year lease contracts for this class of submarine.⁵²

Within the Russian submarine arsenal, there are also various Guided Missile attack submarines. The principal submarine that constitutes this class is the eight Oscar I and II submarines.⁵³ The replacement for Oscar is the Granay of which the first was delivered in December of 2013 under the name “Severodinsk”. In addition to the other listed submarines, Russia continues to maintain a capable fleet of diesel submarines. The entirety of this class is made up by the Kilo type, known worldwide as one of the quietest submarines. The Russians have 20 of these submarines, and much like the Akula, the Kilo is a highly exported submarine.⁵⁴ The other countries that have Kilo class submarines range from China to Venezuela, to name a few.

Prior to the incidents in Ukraine, Russia was believed to be becoming an increasingly predictable member of the international community. The annexation of Crimea and mass of troops on the boarder of Ukraine has caused countries to reconsider their relationship with Russia. A feeling of encirclement resonates among the Russian populous as they rally around their leader Vladimir Putin. A large factor of the friction in Ukraine was derived from Russia’s anti-North Atlantic Treaty Organization sentiment, which was associated with the Ukraine attempting to establish closer economic ties with the European Union. In that context, the long-term stability of relationships within the

⁵² *Ibid.*

⁵³ *Ibid.*

⁵⁴ *Ibid.*

Arctic council, of which five of the eight parties being North Atlantic Treaty Organization members, cannot be guaranteed indefinitely. The stability of the Arctic council will only be determined by time, but the evidence demonstrates that Russia may not be the obedient participant they were originally thought to be. That information, coupled with their genuine ability to operate submarines in the Arctic, requires the ability to both Sense these submarines and Act as a means of deterrence.

Command, Sense, and Act

Command of the sea and the ability to establish sea control at the time and place of choosing are aspiration common amongst naval forces, but given the place of sovereign territory, it becomes a force driving requirement in the fulfillment of national security. The function of command doctrinally incorporates command, sense, act, sustain, and shield. These functions help us to think about and define the problem space, and also to group potential solutions to remedy operational problems across all domains.

Due to the nature of the role of NORAD in commanding, sensing and directing action in the battle space, the focus of this essay will remain on the command, sense, and act functions. Although of note this topic and scenario of discussion, like many other cases, has miniscule nuances between sense and shield, as they are complimentary in nature.

Working the problem set backwards, we will enter the equation with arbitrary cueing data for an unknown sub-surface contact inside United States territorial water. Now that we have sensed a submarine we must engage in action. Under the current construct of Maritime Domain Awareness, NORAD has no ability to act in the maritime domain. This runs contrary to the very precepts of the agreement. “We will defend North America by outpacing all threats” is not upheld when an entity has no means to act.⁵⁵ Under the current construct, the cueing data would be passed to the appropriate national command organization, either Canadian Joint Operational Command or United States Northern Command. These entities would carry out the act portion of the equation. The current process amounts to multiple duplications of effort in both national command structures. Additionally, capability gaps exist within both nations, which may provide reasonably informed adversaries with sufficient maneuverability to compromise the North American defense structure.

An integrated approach to the function would better serve both nations in light of ever decreasing defense spending and budgetary issues. Additionally, cooperation would facilitate the consummation of great minds on truly new ideas. This would enable North America to employ innovative technology that would surpass that of our adversaries. A significant area for prospective improvements is that of network sensors and underwater autonomous vehicles. Incorporating such networks in a concerted effort across the Arctic would provide an advantage in Maritime Domain Awareness. The combination of underwater autonomous vehicle and stationary monitoring devices, could be coupled to

⁵⁵ "North American Aerospace Defense Command Official Website." , 2

satellite and radar cueing data to provide more precise positioning info for potential threats. Additionally the mobility and pattern avoidance would prevent submarines from identifying sensor locations and circumnavigating them. The underwater autonomous vehicles could have multiple solutions for on station deployment whether it be via manned submarine, a unmanned air vehicle, or a maritime patrol aircraft. Unified effort is the road ahead.

The compromising nature of the Maritime Domain Awareness agreement, comes at the direct cost of defense. This dangerous compromise stems from Canada and the United States failing to come to agreement that would empower NORAD to act in the maritime domain, and more specifically against a subsurface threat. The nature of the NORAD agreement is exactly that, sovereign compromise for the greater good. However, the signers of the maritime domain initiative have fallen short of the principles of the original agreement.

Both countries have unique capabilities that should be leveraged across the complex arctic maritime domain to defend North America. NORAD should sense the information through the Maritime Domain Awareness network, evaluate that information, form a plan of action, and then have the command authority to assign appropriate assets to provide an anti-submarine warfare solution. By placing restraints on NORAD purely in the Maritime Domain, both governments are taking a risk with the security of their citizens. Submarines will continue to transit the Arctic, and as the ice recedes, the traffic

will only increase. Compromise at home will ensure our collective sovereignty into the future.

Conclusion

Maritime Domain Awareness has been submitted as the answer to the looming friction in the Arctic. Although embraced by both nations, this extension falls short of total defense due to its nonconventional surface vessel focus and limited functionality. Unlike the subsurface incursions of the cold war, the current and future Arctic environments provide a venue for hostile submarines to subvert freedom of movement in the maritime domain, additionally unchecked subsurface traffic within Canada's claimed territorial waters pose a direct threat to sovereign claims. Unfortunately, both the United States and Canada are behind in establishing a comprehensive approach to Anti-Submarine Warfare in the Arctic. To date, there exists no assignment of areas of responsibility or response plans for unwanted subsurface Arctic incursions. The extant threat from widely proliferated conventional and nuclear submarine technology highlights North America's vulnerability in the underwater domain. As the number of submarines capable of transiting below the Arctic ice increases globally, in the interests of defending North America the United States and Canada must accelerate the development of an acoustic and non-acoustic network focused on anti-submarine warfare that is supported by a thoroughly exercised reaction force able to thwart threats from beneath the sea. Additionally, assignment of appropriate anti-submarine warfare assets and advances in current technology are required to

complete this complex mission in an Arctic environment. This essay has highlighted through ample data the impending influx of submarine operations in the Arctic additionally deducing some of the current and future challenges and vulnerabilities. From the structural perspective of command, if the Arctic's is to be defended against subsurface threats by Canada and the United States, a NORAD monitored integrated network of sensors established to detect, and track subsurface targets is required. An additional requirement is for NORAD to retain the capacity to assign assets able to act upon this cueing data. The establishment of this NORAD commanded network must culminate in annual exercises to demonstrate the extant capability and as an act of strategic deterrence.

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