Introduction.

Alaskan Command is a subordinate unified command reporting to United States Northern Command, (USNORTHCOM). The Arctic Domain Awareness Center (ADAC) is a U.S. Department of Homeland Security, Science and Technology (S&T) Directorate of University Programs, (UP) Center of Excellence in Maritime Research hosted by the University of Alaska. ADAC is a mission partner to Alaskan Command (ALCOM) in support of ALCOM and the planning and execution of Arctic Senior Leader Summit 2019 (ASLS 2019), planned for National Defense University on 18 January 2019.

Purpose.

The following paragraphs are pulled from other ADAC developed studies to characterize the major factors affecting the Arctic landscape in order to understand the associated security challenges, based on historical context compared to current concerns and opportunities. Included in the discussion is a sharper focus to Arctic security matters across North America. In a real sense, this includes describing the range of actors, the range of activities and the spectrum of endeavors...from collaboration to competition to confrontation. “Security” is intended to describe the framework of safety, law enforcement and defense, assessing current challenges and providing solutions to advance improved security, oriented to U.S., Canada and associated defense allies and security partners in the Arctic region. As this overview is intended to describe major trends and sketch the strategic landscape, the author will use generalizations suitable to familiarize the reader to understand “the big picture.”

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A definition of the Arctic.

There are several approaches to defining what constitutes the Arctic. The classic mathematical definition of 66.33 degrees north, is but one description. The multi-national Arctic Council (established by the Ottawa Declaration in 1996) defines the Arctic at 60 degrees north. Further descriptions include establishing the Arctic congruent with temperature climes of associated with summers high temperatures principally remaining below 50 degrees F/10 Degrees C. In 1984, the United States Congress defined the U.S. Arctic as 66.33 degrees North, west to the Yukon River, including the terrain north and west of the Yukon to the Yukon-Kuskokwim delta region, then extending along the shorelines facing the Bering Sea all the way to the end of the Aleutian Islands.

Commensurate with the variation of Arctic regional definition is a congruent understanding of the number of current numbers of Arctic residents. Based on the classic definition, the Arctic is roughly populated at 4 million people, with approximately 50% of these residents living in the Russian Federation, with a large circumpolar plurality of Asiatic/indigenous Arctic heritage. By extending the definition down to 60 degrees North, more than triples the number of people who can claim status as “Arctic residents”...but maintains approximately the same ratio of Russian vs non-Russian citizens living in the Arctic.

1 Multiple sources.
2 Ibid

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An overview and baseline (describing the current Arctic from the “big picture”).

The Arctic region is one of the most fascinating areas on the planet. An expanse remotely populated with enormous distances, and renowned through the centuries for its harsh and unforgiving climate. The Arctic is starkly beautiful...a place where cold, ice, rock, snow and sea, coupled with an ever-changing sense of light...capture the human senses and imagination. For many, this sense of light and the Arctic’s physical environment, can defy a suitable vocabulary to adequately describe, but to be sure, it is a place where the geography and dynamic sense of physical environment, create a memorable and lasting impact to those who visit and to those who live in the region. With few exceptions, the Arctic has a habit of capturing the interests and enthusiasm of people who take the time to come, study and understand this land and ocean space of extremes.

Much of the Arctic is a maritime environment. The Arctic Ocean is in the center of a basin of surrounding seas and sparsely populated littorals with limited marine access from lower latitudes. Marine access to the Arctic basin from the North Pacific is constrained to narrow 51 nautical mile channel at the Bering Straits separating Northeast Asia and North America. While the Atlantic access to the Arctic is considerably wider (comprising access via the Greenland, Norwegian and Barents Seas), Arctic Ocean access remains constrained (and quite opposite to the wide marine access surrounding the Antarctic continent).

As a maritime expanse, the Arctic is remarkably challenging to mariners. While the Arctic is facing ever diminished sea ice per annum, many littoral regions (particularly in Canada’s high North) remain ice-choked with sea ice for most of the year, effectively limiting any vessel that is not at least ice-hardened. Due to remoteness and difficulties imposed by persistent sea ice, Arctic bathymetry remains poorly understood and poorly charted: in late 2018, the pan-Arctic region remains approximately 10% charted to modern standards. Accordingly, the risks to safe navigation remain high and provide valid reason for caution to prudent mariners.

Much of the region...remains wilderness, and much of this wildness remains, in its truest sense...as a trackless expanse. For the coming decades, it is projected and likely that more people will come north, but the region is unlikely realize large-scale population growth within the coming decades. However, as human activity, increases, so does the potential of increased security threats, from both symmetrical and asymmetrical sources.

Accessing this wild and remarkable region to study and research...comprises a significant community of multi-national researchers who see the Arctic as a laboratory, that hold insights awaiting discovery that impact not only the region, but affect the planet in whole. Arctic research collaboration and cooperation between nations and institutions remain one of the more effective tools to counter rising competition across the High North. It is from the community of science researchers that inform of the changes underway in the physical environment of the Arctic. In sum, the Arctic is warming at twice the rate of lower latitudes,
terrain frozen for millennia is thawing, sea ice pack is seasonally diminishing, and weather
dynamics are increasing, with rising storm violence and more.3

Catalyzed by the changes in the physical environment, human activity is in transition. While
most Arctic nations seek to preserve the region as a zone of collaboration and peace, economic
opportunity of an opening Arctic, encourages competition among great powers and among
institutions seeking economic advantage.

The Arctic is a place of unique human culture. Indigenous communities across the region still
exercise subsistence-based lifestyles, largely unchanged through centuries. Millennia ago,
tribal communities migrated to the Arctic from lower latitudes and adapted to the harsh
environment, creating subsistence-based regimes that depend on the flora and fauna of the
land in part, and in larger part...subsistence from the sea. The culture of these indigenous
communities continues to pass between generations by oral and written traditions.
Maintaining culture and language of Arctic indigenous communities are considered critical to
ensure traditions are communicated with purpose to succeeding generations.

Most of the Arctic has limited transportation infrastructure. Road networks across the region
range from meager to non-existent, airports are austere, (with runways often ill- suited to jet
aircraft), seaports which are sparse and offer limited refuge, challenging operating conditions
(due to currents, tides and scant pilot vessels), and often too shallow for many of today’s
ocean-going vessels. As a result of these limitations, the price of logistics in the Arctic remains
approximately 4-5 times the cost above logistics costs in lower latitudes, with a corresponding
drain on government and industry investment, which otherwise could parlay into improved
regional economic gain.

Yet, while the region persists in remoteness, and presents challenges to access, cope and live,
interests are rising in and about the Arctic due to the overall impacts of a real and expanding
diminished sea ice environment. It is largely agreed from those who study the region, the
Arctic is increasing in its appeal to a large and growing community of nations, organizations and
people groups who see the Arctic much less a zone of unique geographic and culture
identity...and much more as an economic opportunity.

As interest in the Arctic increases from lower latitudes, the Arctic is no longer, a region where
those who live there, claiming national or tribal sovereignty, are the exclusive decision makers
exercising control or leveraging the region for economic gain.

Due to the inherent costs, nations with existing sovereign claims to the Arctic, maintain
constrained security capabilities that largely under-govern and largely under-secure their
sovereignty. As a result, Arctic national borders are readily exploited and maritime extended
economic zones are easily violated for those who are determined to so exploit and violate. As

3 Reference from U.S. Arctic Research Commission. See: arctic.gov

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a result, while many who come north are there with good intentions, others come north with malign and illegal objectives and find opportunity. With reduced cost of associated with access...the malign people groups find an Arctic...largely accessible, and readily advantaged.

Maritime security and safety issues that exist in lower latitudes are likely to manifest in the opening of the Arctic maritime spaces, which currently receive a minimal amount of Coast Guard and other law enforcement presence. Patrolling and policing for illicit trafficking, illegal fishing, unregulated mineral extraction, and unsafe tourism practices is already difficult and will likely worsen as criminals see opportunity in the High North. If addressed in a timely manner, with improved mechanisms and capabilities, better securing the Arctic from illicit activity is strategically manageable.

On the other hand, rising great power competition in the Arctic, has the potential of greater concern, and without soberly assessing threat, risk and along with strategies and the means to reduce risks, could result confrontation and conflict. Such conflict can possible range from low-intensity skirmishes to armed combat among militaries comprised of enormous destructive means.

With the preceding paragraphs as backdrop, the remainder of this overview will seek to develop the intertwining details of the characteristics of the Arctic and suggest approaches to reduce negative factors, and in particular, seek to understand and offer mechanisms for securing, protecting and defending the region. This includes exploring approaches to cope with the changes of an increasingly dynamic physical environment, preserve cultural heritage of the region, while seeking to improve futures for Arctic residents understand demands of economic pressures, while comprehending rising competition, malign activity and seek methods to better secure, protect and reduce the chance of conflict.
**Historical context.**

From examining convergence of the physical environment, indigenous oral traditions and the known historical record, analysts suggest the Arctic has been both colder and warmer than it is today. For humankind, the Arctic is a place where to survive can be supremely difficult. The earliest settlers, Asiatic and Northern European Indigenous peoples who immigrated to the far North over a millennia ago, found ways to adapt and to endure, establishing unique cultures and spent less time fighting each other, (compared to lower latitude experiences), perhaps as the Arctic itself proved to be enough of a combatant to survival. In subsequent centuries, explorers from Europe, Asia and North America ventured north, principally to find ease of direct marine transport, discover retrievable riches and wealth.

For later adventurers of the 18th and 19th centuries, the pursuit of transportation access and wealth was eventually overtaken by a desire to simply claim “farthest North.” The price of exploration was high in casualties and in committed treasure, especially for those who did not take the time to prepare and more importantly, learn from indigenous people who had successfully adapted to the Arctic. Even for the well prepared, the Arctic extracted a high mortality rate, unforgiving and relentlessly finding unanticipated ways to deny explorations ease of discovery, and littering the region with the remains of failed attempts in exploration.

The Arctic has been exploited for its wealth for centuries. From sea otters and fur seals to whales and walrus, industrialized nations have harvested and largely decimated Arctic marine
wildlife that only in recent decades have begun to recover. Throughout the centuries as great powers discovered what indigenous peoples had already discovered, claimed lands for territory already inhabited, and harvested resources, with little regard for sustainment (and the association between those resources and subsistence-based lifestyles). The relationship between people of the Arctic with nations and business enterprises from lower latitudes has been difficult, while (in general) mostly resilient. In particular Russian fur harvests along with European and American whaling in Arctic waters in the 18th and 19th centuries, harvested marine mammals with overly effective industrial efficiency. The impacts of those early commercial activities powered wealth for Russia, Europe and the United States, but had a correspondingly negative impact to indigenous people who had previously drawn their livelihood from the sea for centuries.

For most of history, the Arctic has not seen open/unrestrained warfare. In fact, history has plenty of references where combatants avoided warfare in a region, which suggest (at least from a historical vantage) the Arctic environment can often be the deciding factor in the test of arms.

Armed conflict has largely been avoided in Arctic (although fighting has occurred along the fringes of the region, such as the combat operations for control of the Aleutians in World War II). While at the periphery of the Arctic, the Aleutians campaign of World War II demonstrated that difficult and at times, extreme weather of the region compromised fighting ability of both Imperial Japan and the United States.

During the Cold War, the Arctic became a theater of operations between the United States,
Canada joined with European Allies via the North Atlantic Treaty Organization (NATO) against the Union of Soviet Socialist Republics (U.S.S.R). Factors such as the proximity between the U.S. and the U.S.S.R, (in the Bering Straits, a mere 51 nautical miles) and the reality of the geography of the Arctic (due to shorter distanced between continents via polar routes) made the region the “overflight zones conducive to missile and bomber strikes.

On 12 September 1957, North American Aerospace Defense Command (NORAD) was established to provide aerospace warning, air sovereignty, and protection, resulting in successfully defending Canada and the U.S. for decades. NORAD has evolved roles and missions to address current aerospace threats. While the defense of North America from sophisticated and complex aerospace attack, has justified the significant resourcing of NORAD and corresponding Air Forces in Canada and the U.S.

Another facet of the Cold War was establishing the Arctic Ocean as a zone of submarine operations by the nations in confrontation. Additionally, submarine operations and posturing for submarine warfare continued in the North Atlantic, where NATO sought to prevent Soviet fleet’s access from ports in Murmansk on Russia’s Kola Peninsula to threaten North America and Western Europe via the access routes from the Greenland-Iceland-United Kingdom “gap.” The consequence of geography placed the dismal, but thankfully unrealized aspect, of nuclear warfare being waged across the Arctic throughout the decades of confrontation between the NATO and the U.S.S.R.

Following the collapse of the U.S.S.R in 1989, the prospect of armed conflict between great powers across and in the Arctic subsided, while the Soviet Union fractured into a loose confederation of known as the Commonwealth of Independent States, who collectively endured more than a decade of economic malaise and internal security challenges. Largely due to western petrochemical corporation investments rebuilding and revitalizing Russia’s vast natural gas and petroleum resources, the Russian Federation economy rebounded, and with the rebound, a national desire to return to great power status and reassert a muscular approach to contest and confront nations and entities who Russia deemed challenging their national interests. Early stages of Russia’s militarized return in the Arctic was the introduction of what was deemed “Long Range Aviation” of Russian bomber fleets resembling of tactics used in the Cold War in 2007.

While confrontation between great powers leveraged the Arctic for the region’s geographic advantages for much of latter decades of the 20th century, the region also witnessed a new effort in harvesting accessible resources, through oil and natural gas development in largely focused on Norway, the Russian Federation and the United States and mineral wealth in Canada’s high North.

Contrasting nation state geopolitical contest and resource development, through the late 20th century and accelerating in the early 21st century was the community of science has focused attention on the Arctic which discerned and began concerted analysis of changing physical

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environment, discovering warming trends and a diminishing Arctic sea ice pack regime.

Lastly, in a timeframe similar to the discernment and discoveries of the community of science, has been the development of new mechanisms of political and economic controls to the indigenous peoples of the Arctic, (particularly to the North American continent and Greenland), who have advocated and gained greater self-determination and regional political power from their respective national governments.

While refinement and further adjustment is likely to occur in the coming decades, it is important to note, indigenous peoples of the Arctic have a recognized and respected voice on Arctic matters within their national governments and multi-nationally in organizations such as the Arctic Council.

While the preceding paragraphs provide a summary outline of the major factors of the historical context of the Arctic, such a brief discussion, demonstrates the inherent weakness of a highly condensed summary. Accordingly, in order to fully understand the uniqueness of the historic physical and human terrain of the Arctic, the author recommends interested readers to consult the considerable array of written resources to advance knowledge and understanding of the recorded history of this remarkable region.

**A physically changing Arctic environment.**

The Arctic physical environment is increasingly dynamic due to warming trends. As stated earlier, the Arctic has been both warmer and colder than today. However, the community of science have noted that warming trends coincide with sustained rising levels of recorded Carbon Dioxide (CO2) in the Arctic since levels were first observed in the late 1940s at stations such as weather facilities at Point Barrow Alaska. Current weather trends (from multiple accredited sources in the community of Arctic scientific research) reflect that across the Arctic maritime region, sea ice melt is increasing and associated ice pack contraction in terms of area and volume is decreasing and forecast to further diminish in coming decades. As reported through many U.S. and Canadian research and data sources over the past several years, the Arctic Ocean icepack has broken records in seasonal retreat, while recorded Arctic

4 As referenced and recorded at the NOAA observatory, Point Barrow Alaska

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temperatures are rising far faster than temperatures at lower latitudes. In a recent illustration, the Arctic sea ice extent for July 2017 averaged 8.21 million square kilometers (3.17 million square miles).5

The vast majority of the Arctic maritime region experiences at least seasonal sea ice coverage for several months of the year. However, if current trends in Arctic sea ice receding continue, by year 2030 sea ice will diminish to the point that Canada’s Northwest Passage and Russia’s Northern Sea Route will be open seasonally for several months extending from mid-summer into early fall. Such access could facilitate a significant change if commercial maritime traffic begins to take advantage of the significantly shortened route connecting Europe and Asia.

Despite warming trends, the vast majority of the Arctic maritime region experiences at least seasonal sea ice coverage for several months of the year. However, if current trends in Arctic sea ice receding continue, by year 2030 sea ice will diminish to the point that Canada’s Northwest Passage and Russia’s Northern Sea Route will be open seasonally for several months extending from mid-summer into early fall. By the mid to late to 2030s, there is potential that transpolar routes will be navigable.

Accordingly, (for at least the summer season), the historical barriers of ice in the Arctic maritime region continues to shrink, affording improved access to human activity, at lower barriers of access (in sum, diminished sea ice is increasingly enabling non-ice hardened vessels to operate across more of the Arctic in summer and shoulder seasons).

Reduced sea ice in the Arctic Ocean has been accompanied by seasonal increases in storm severity with significantly stronger winds and coastal storm surges battering Arctic shores across Arctic (and in particular, the North American Arctic).

The Arctic warming trends are correspondingly reducing the amount of shore-fast ice that has historically served as a protective barrier from the sea for coastal communities and critical infrastructure along the Arctic coasts.

As the Arctic warms, coastal regions frozen for centuries are now thawing. This recently “unfrozen” terrain is proving vulnerable to erosion, which is of particular impact in coastal Arctic regions. This newly thawed terrain is proving to be vulnerable to erosion, which is of particular impact in coastal regions and the people who live across this fragile region. This is particularly impactful to the North American Arctic.

Arctic warming is affecting associated marine ecosystems and the corresponding food web. As sea-ice diminishes and weather patterns continue to change, there are small but biologically relevant increases in ocean acidification. Changes and potential for loss of lower levels of the food web affect larger and more significant species. Further, iconic Arctic marine mammals

5 http://nsidc.org/arcticseaicenews/

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that depend on the uniqueness of the Arctic ice pack, (such as walrus and polar bear) are being forced to adapt new habits in order to survive, as not only the food web is changing, but so is the effect of diminishing sea ice being seasonally driven farther from terrestrial shorelines. Impacts of course are not only to wildlife, as these same diminished sea-ice and changing weather patterns resulting in ocean acidification can potentially degrade highly productive fishing regions, such as the Bering Sea, which puts the harvest of much needed fish-related proteins at increasing risk.

An increasingly dynamic physical environment in the Arctic is affecting populations whose ancestors have inhabited the region for generations.

Many of these people live close to coastal shorelines that provide access to maritime regions critical for marine mammal subsistence harvests. Across portions of the North American Arctic, these same shorelines are eroding rapidly due to increased storm surges, lack of protective shore ice, and thawing permafrost. Associated village infrastructure is failing (and at times, literally, falling into the sea). As mentioned, Arctic warming is reducing the amount of shore-fast ice that has historically served as a protective barrier from the sea for these native villages along the coastal Arctic.

Environmental changes such as coastal erosion not only affect Arctic residents, but also can affect expensive and difficult to replace infrastructure such as the Canada-U.S. North Warning System.

A warming Arctic is likely contributing to increasing severity of sub-Arctic boreal forests fires. Across the North America and Asian land mass, the scope and severity of these seasonal forest fires, largely go under reported, and exact environmental damage across large swaths of terrain, that exact considerable impact to local and regional flora and fauna.

In sum, the impacts of the changing physical environment of the Arctic are generally negative to flora, fauna and people who are intertwined and rely on an Arctic remaining cold. While Arctic region with large and stable sea ice, along with an ocean more saline than acidic is preferred for these current residents, the reality is the current warming trends will likely continue and compel adaptations. This changing environment will complicate maritime operations, (in part due to factors such as increased storm severity). While disadvantaging those who currently call the Arctic home, these same changes provide advantages to interests from outside the region, which will be addressed in subsequent paragraphs.

**Recent trends...and associated impacts to Arctic residents.**

An increasingly dynamic Arctic is affecting populations whose ancestors have inhabited the region for generations. Subsistence lifestyles proudly continue but are threatened by increased activity (such as marine shipping, tourism and resource extraction), which affect marine mammal activities and populations. Correspondingly, Arctic residents strive to retain culture
and traditional ways of life, ancient traditions, language heritage and cultural fabric of Arctic lifestyles while accommodating development activities that incorporate appropriate mitigation and environmental safeguards. There is a need to factor local populations’ lifestyles, practices, and security interests into the development and conduct of new legal and security activities.

Through centuries, Arctic indigenous communities have proven resilient to challenge, resource exploitation, disease, subordination and assimilation brought from lower latitude industry and nation states who claimed and gained lands claimed by indigenous residents. Resilience, born of the learning to adapt to the difficulties of the Arctic environment, has also been useful to help these communities endure changes imposed by influences from lower latitudes.

In recent decades, through improved approaches to shared governance, many remaining Arctic indigenous communities are now organized, provided a voice and increasingly impactful in shaping their futures within the nations they reside. Key illustrations of these improvements are watershed legislation in the United States associated with the 1971 Alaska Native Claims Settlement Act, Canada’s establishment of policies associated with an array of “First nations” designations, and Denmark’s granting of semi-autonomous self-rule to Greenland. Such legislation and policy changes provide Arctic residents of indigenous origin an opportunity to enact local and regional decisions to benefit fellow residents, but remain constrained, that without corresponding fiscal means to address chronic issues and emerging problems, further actions are needed and likely, needed soon.

Due to an ever increasingly connected world, challenges manifesting across the human terrain in lower latitudes are now having a new and newly corrosive effect on the people of the North. Many Arctic communities are economically stagnated with high unemployment, denying residents with hard cash necessary to improve local circumstances. Many such communities chronically suffer from substance abuse and under-reported crimes such as sexual assault and other abuses against indigenous women. There are increasingly unreconciled differences between modern culture and traditional values. There is disenchantment among younger generations in maintaining interest in subsistence lifestyles in light of the significant amounts physical labor and increasing difficulties in subsistence hunting (which can in part, be attributed to the changing physical environment of the Arctic). These negative factors collectively serve as a sort of forcing function to incentivize people to consider departing the North for an easier, more secure and more economically advantaged life in the lower latitudes.

As discussed previously, the changing physical environment impacts residents of the region,

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6https://www.fws.gov/laws/lawsdigest/ALASNAT.HTML

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diminished sea ice, increasingly difficult weather and the associated changes in the physical terrain collectively affect community infrastructure and the ability to live in regions already at the margin.

While some Arctic communities view new and rising economic interests in the Arctic associated with shipping, tourism and extraction of mineral wealth as an opportunity, many are skeptical of the associated impacts and more than a few believe that economic advantages associated with these activities will largely bypass the Arctic communities all together. Many Arctic residents also view increasing economic opportunities as cause for alarm that could affect the ability to continue subsistence lifestyles (resulting from environmental disasters such as marine oil spills, and toxic wastes from mining). Further,

![Arctic open for commerce](http://static1.businessinsider.com)

There is deep concern that the inflow of activities associated with industrial development will also bring further negative influences, from people conducting new economic activities, affecting northern communities already in distress.

**Economic aspects.**

In light of a warming Arctic, there are three broad categories of legal economic interest,
currently associated with the associated maritime and coastal regions. These are organized along maritime transportation, adventure tourism and extraction of mineral wealth (ranging from rare earth minerals to petrochemicals). It is also noted that while marine fisheries provide an additional avenue of Arctic economic advantage, due to multi-national agreement, the Arctic Ocean remains secured from fisheries activities. However, many of the surrounding seas of the Arctic (in particular, the Bering, Norwegian and Barents Sea) conduct a large and robust fishing activity.

Seasonally ice reduced and ice-free Arctic Ocean spaces provide improved access to sea floors for rare earth and other mineral extraction. Reduced sea ice thickness (in particular, multi-year sea ice) will likely reduce challenges in future oil extraction and offshore mineral extraction. In the modern era, Arctic resources beneath the surface, (both on land and undersea) such as petro-chemicals, and valuable minerals (to include diamonds, gold, iron, copper, bauxite, nickel and more...) are key incentives for nations and industry to secure and extract. Establishing claims for undersea resources in the Arctic is largely based on protocols defined by the United Nations Convention of the Law of the Sea (UNCLOS). Because of UNCLOS, the quest for nations to extract wealth from extended continental shelves, nations have a legal context to claim and conduct resource extraction.

As reported via multiple sources, it is estimated the Arctic basin contains a significant amount of untapped sources of oil and natural gas. While lower overall global crude oil prices currently continue to dampen oil exploration in Arctic waters, (particularly the Chukchi and Beaufort Seas), increasing crude oil prices raise anticipation that oil and gas exploration activities will likely expand across the Arctic in the coming years.

Both the U.S. Navy and the U.S. Coast Guard have described the Arctic as a “new ocean.” This seasonal opening of the Arctic is affording new interest in Arctic maritime tourism, to include cruise ship passages of the Northwest Passage. Reduced sea ice also affords increased access to throughput shipping, in particular, Russia’s Northern Sea Route and eventually, transpolar shipping. Due to shallow and narrow routes, Canada’s Northwest Passage remains a less desired route for polar transshipping traffic. While the Northwest Passage is relatively shallow (at approximately 33 foot “safe draft”, the Northern Sea Route a bit deeper with an approximately 38-40 foot “safe draft”, and a key benefit of the transpolar route is a characteristic of practically an “unlimited” draft). All three routes could facilitate a significant change if commercial maritime traffic begins to take advantage of these significantly shortened routes connecting Europe and East Asia.

Transportation networks across the Arctic circumpolar region remain underdeveloped, particularly in Eastern Russia, Greenland and the North American continent. Conveyance networks across the North American Arctic are principally limited to air and seasonal marine conveyance. Economic development in the region is limited due to remoteness, lack of infrastructure, cost and difficulty of establishing new infrastructure such as roads, ports and facilities, plus a range of complementary factors. There is a need to consider how economic
development can take place in ways that support sustainable development practices and goals, yet at the same time meet broad strategic goals for regional security.

Tourism is a growing economic factor of the Arctic. Adventure class vessels (ranging from several dozen to several hundred passengers) ply Arctic waters of Europe, Greenland and North American continent each summer, providing guests an up-close view of the physical wonders of the region. Larger cruise ships have ventured into the Arctic (to include the sailing of approximately 1700 people aboard the Crystal Serenity through the Northwest Passage in the summer of 2016 and 2017). Despite the challenges of seasonal changes of navigability of routes (due to variances in sea ice) and risks from poorly charted Arctic waters, interest in Arctic adventure tourism is likely to further expand and develop, and with such expansion, increases in commerce between tourists and Arctic communities. Additionally, along with rising legal commerce, increasing tourism provides increased opportunities for malign activities, which exploit gaps and seams of legal commerce.

Airports, seaports, roads, and marine routes are difficult to establish and difficult to maintain. Cost of building infrastructure and associated sustainment logistics remain disproportionally high compared to lower latitudes. As such, the ability to respond to better secure sovereign interests, access new resources, sustain disconnected populaces and respond in times of crisis...all face daunting challenges, due to limited and weakly funded transportation networks. Closely associated with limited transportation networks are Arctic economies, which remain constrained now and likely, well into the future. Particularly in North America, the combination of marginal surface transportation and highly limited Arctic industry, provide little incentive for residents who desire upward mobility and a lifestyle not based on traditional subsistence measures to remain.

Road networks across the region range from meager to non-existent, airports are austere, (with runways often ill-suited to jet aircraft), seaports which are sparse and offer limited refuge, challenging operating conditions (due to currents, tides and scant pilot vessels), and often too shallow for many of today’s ocean-going vessels. As a result of these limitations, the price of logistics in the Arctic remains approximately 4-5 times the cost above logistics costs in lower latitudes, with a corresponding drain on government and industry investment, which otherwise could parlay into improved regional economic gain.

Marine-and riverine-based lines of communications, often require, icebreakers to keep these transportation routes viable in all but the late summer months. Russia uses a large portion of their significant icebreaker fleet to maintain littoral and riverine logistics flows of their northern communities. Establishing new surface roads in the Arctic region, remains difficult due fractured views of the benefit vs potential negative impact of new roads, (and needed permissions) from Arctic residents. Even with permissions, the costs to establish and maintain surface roads remain daunting and likely a net resource loss in terms of economic benefit (at least in the short-term). As a result, aircraft is required for both people movement and transportation of goods and materials, even though such movement is costly and economically

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disadvantageous.

In sum, a diminishing ice environment in the Arctic is causal for rising interest in leveraging the region for advantages in transportation, tourism, and mineral extraction. Economic opportunity is a driver for not only interest by industry, but also interest by illicit actors and an array of nation states, many of which are not Arctic nations. As such, rising economic opportunity also serves as a partial catalyst for competition, in particular, competition among great power nations.

**Implications for safety and security.**

As discussed in preceding paragraphs, the Arctic diminished sea-ice environment is drawing other influences to the region, which can contribute to unconventional and conventional security threats, including increased illicit trafficking and other illegal activities. With the rise of Russia, China, and other nation’s Arctic interests in the era of an Arctic with diminishing ice, the threat of confrontation and conflict – while low – remains present, and potentially more challenging as pressures to seek economic benefit from the region rise. Maritime security and safety issues that exist in lower latitudes are likely to manifest in the opening of the Arctic maritime spaces, which currently receive a minimal amount of Coast Guard and other law enforcement presence. Patrolling and policing for illicit trafficking, illegal fishing, unregulated mineral extraction, and unsafe tourism practices is already difficult and will likely worsen as criminals see opportunity in the High North.

The roles and responsibilities of Arctic security, law-enforcement and military forces are complex, operationally risky, and logistically straining. As human activity increases in the region, the communities of security professionals in Canada, the United States along with allied and partner nations will likely need to increase their Arctic response capabilities and collaborate with other Arctic organizations and communities to effectively respond in emerging challenges and developments to respective sovereign interests.

Security includes law enforcement (both national and international) as well as defense, and associated non-security aspects and human factors that contribute to security. This includes aspects such as the ability to protect sovereign territory, ensure human security, regulate waterways management, and per international agreements (for example, as consistent by the United Nations Convention on the Law of the Sea) enforce national laws within a nation’s exclusive economic zone (EEZ).

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The physical environmental changes of the Arctic are a factor in the challenges faced by security agencies and defense forces. The need to better understand and factor “Arctic environmental security” in the context of protecting national interests, advancing regional cooperation, addressing civil support to citizens, ensuring human security, and providing defense and law enforcement is timely and necessary.

As further context of a diminishing ice environment across the Arctic, from a security and defense vantage, is once again, a region where contest and confrontation from powerful nations can potentially (and likely) jockey for dominance. Today, Arctic and a number of Non-Arctic nations are taking action in the region to respond to increased multi-national and multi-organizational interest to ensure their interests are established and preserved. As such, the Arctic is increasingly a region where great power competition is rising.

The Russian Federation has taken steps to secure and defend its interests in the Arctic by rebuilding forces, procuring new military hardware, refurbishing and adding new military installations across its Arctic frontier. Russia’s “snap” exercise program (a minimum notice program with large scale deployments, ranging from tens to hundreds of thousands of military personnel and associated equipment to regions along Russia’s frontiers has become a normalized fact over the past ten years. This snap military exercise program includes demonstrating ability to deploy to Russia’s Arctic region. While the Russian government described such maneuvers as defensive in nature, the size and scope of such activities in the Arctic seem considerably excessive. Meanwhile, Russia’s ability to project into the Arctic not only by aircraft, but also via icebreaker, is a significant capability.

NATO has recently taken steps to return to conducting Arctic activities that were a relatively normal part of operations in the alliance during the Cold War. A highlight of the return of the Alliance to activities in the High North was the recent participation of approximately 50,000 contingent of Allied forces in Exercise Trident Juncture in Norway that included maneuvers of a U.S. Navy carrier and associated escort vessels in the Norwegian Sea.

The Peoples Republic of China (PRC) has declared itself as a “near Arctic state” stating intentions to expand activities via the “Belts and Roads” initiative, (seeing the Northern Sea Route across the Russian littorals, as the “Polar Silk Road”). The PRC and is actively investing in ice breakers, with two fielded and a reported third vessel to be constructed, and is conducting extended Arctic presence activities via the Ice Breaker “Xue Long” (snow dragon) and investing in Arctic access locations such as Iceland and Russia. Through investment, the PRC has access to port facilities in Reykjavik. The PRC contributed to the large Liquefied Natural Gas (LNG) facility in Yamal Russia (along Russia’s Arctic coast) and is now getting the benefit of Russia LNG. These many activities appear to be aimed to have the effect of “normalizing” Chinese actions in the Arctic (as not only a near Arctic nation, but also a nation where Arctic nations accept and offer little contest to these activities and actions across the region.7

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7 https://www.nato.int/cps/en/natohq/157833.htm
The sum analysis of these activities is the appearance the PRC is an active competitor to the Arctic and is positioning capability and access to resources not yet claimed in Arctic international waters. Due to the understood long range mindset of Chinese strategy, China’s policy aims will likely be undeterred to reduce national efforts at becoming the effect of an Arctic power, and will continue to use its economic levers in creating access and capability to extract resources from the region.

Due to changes brought by a changing physical environment of the Arctic, and incentivized to gain, economic opportunity potentially available in the region is resulting in a rise of rising competition by industry and nation states. Competition without sufficient restraint and respect for multi-national protocols for cooperation can result in confrontation. Further, nations seeking opportunity through exercising their military strength add to the chance of confrontation resulting in armed conflict.

**Factors to consider improving the future security and defense outlook for the Arctic among like-minded nations.**

Respective national strategies and policies for Canada and the U.S. along with Arctic allies and partners in Europe drive implementing approaches and resource decisions affecting regional Arctic security. As like-minded national governments assess threats and risks, needed capabilities and the costs to respond, these nations need to reflect on prevention measures and the need to demonstrate resolve for maintaining a peaceful opening of the Arctic. Such resolve should consider a balanced approach...to address the real problems faced now by Arctic communities, policies that balance economic development with risks to environments, and the impacts of a changing Arctic environment to national interests and obligations.

As much of this overview has highlighted...the Arctic is vulnerable in terms of the physical and human terrain. There is rising economic opportunity, but safely and successfully gaining the advantages offered in the diminishing ice environment, requires accounting and understanding of the array of associated vulnerabilities.

Without appropriate and suitably scoped domain awareness and understanding of the changing dynamics of the physical and human terrain in the Arctic, nations will likely be late to need to preserve respective interests, securing national sovereignty and gaining economic benefit from the diminishing ice environment.

Inclusive frameworks and mechanism of responsible governments, and indigenous groups collaboratively setting conditions for cooperation exist for the Arctic and are largely successful. The Arctic Council, the Arctic Coast Guard Forum, and the Arctic Security Forces Roundtable, provide distinct, separate and respective opportunities to establish and operate collaborative mechanisms for shared approaches in resource management, search & rescue, humanitarian
assistance, disaster response and defense support to civil authorities. In somewhat like manner, the Arctic Circle provides an open forum for industry collaboration.

In sum, these forums provide context and an opportunity to address concerns and opportunities among members. These forums are particularly important as they provide real means to help in small and larger crisis through agreements such as the Arctic Council working groups, such as those associated with Emergency Prevention, Preparedness and Response (EPPR) and Protection of the Arctic Marine Environment (PAME).

Advancing inclusivity is not limited to existing collaborative mechanisms. Through leveraging the power of social media, connecting problems, challenges and opportunities to larger communities of people willing to offer solutions and support their implementation matter. Such citizen volunteer efforts can help offset less than fully effective collaboration and cooperative mechanisms between nations and large institutions.

Meanwhile, NATO and NORAD are proven and tested mechanisms for defense of threats emanating from and through the Arctic region. Both these defense alliances provide ability for Canada, the U.S. allies and partners in Europe are capable to deter and dissuade military aggression in the Arctic. When called to respond, NATO and NORAD can provide the forces, capability with suitable command & control to counter threats in air, land, sea and cyber, but each mechanism may not be fully suited to cope with a more diversified threat picture that could characterize the Arctic in the coming years and beyond.

Today the Arctic remains overall under-resourced by at least several Arctic nations in terms of possessing the means to ensure sovereignty and national boundaries are controlled. In terms of real time sensing, identifying and the ability to respond across much of the Arctic, remains less capable than most Arctic nations would probably prefer. The means to resource people and capability to respond to threats below significant military concerns remain more in concept and desire than reality. To illustrate, the ability to identify malign actors and the ability to intercept illicit activities in a timely manner in much of the Arctic remains scant to non-existent.

The means to cope in response to a large scale challenge...such as a disabled cruise ship in Arctic waters, a foundering vessel with hazardous cargo on a transpolar transit, a large oil spill or a rapid outbreak of a medical illness in Arctic communities would be a difficult to perhaps overwhelming. In particular, most Arctic nations would be significantly challenged to logistically support the response and logistically supporting the responders in most non-militarized major responses. In sum, for most like-minded governments of the Arctic region, coping with the challenges associated with rising human activity, let alone coping with the dynamics of the changing Arctic environment, remain limited and response to such real crisis in the nearer term is potentially, and will likely...be late to need.

8 https://oaarchive.arctic-council.org/
Perhaps a first step to addressing the myriad of challenges across the Arctic begins by seeking ways to integrate existing mechanisms in a way that does not detract from the goodness and value each mechanism provides to its membership. Such an approach can even apply to nations who would otherwise be regarded as Arctic competitors. A goal of such an approach is to seek cooperation where cooperation can be successfully be achieved and provide mutual benefit.

In concert to integrating mechanisms within existing Arctic forums, should be complementary activities to address gaps and seams associated with securing and defending the region. Advancing trusted forums such as NATO and NORAD to more effectively respond...to a wider range of threats is one aspect. Another is addressing the fact there are little to no effective multi-national cooperation framework or associated mechanisms across much of the public safety, security and law enforcement organizations among like-minded nations in the Arctic (particularly below Arctic policy forums such as the Arctic Council).

Creating and resourcing mechanisms for multinational security forces collaboration and cooperation complimentary to defense mechanisms would be one useful step to reduce threats and risk from malign activities, before damage and harm of scale and impact can be delivered from, to and within the Arctic.

Meanwhile, advancing mechanisms and opportunities for Arctic residents to contribute more meaningfully in overall governance of the region is critical and necessary in light of amending historic mistakes. In sum, not only due indigenous voices need to heard, the volume of their message needs to be turned to higher levels.

Increasing conformance, compliance and commitment of industry who seek to develop and extract resources in the Arctic, do so with proven capability to respond when required for disaster or crisis, as national and regional governments will likely not resource enough national or regional means.

Important in establishing approaches to addressing problems and challenges across the Arctic, pivots on the ability to gain advanced domain awareness to capture, correlate, and analyze the range of factors at work across the region, in order to leverage such awareness to increase decision agility to reduce strategic risk.

Looking to future years and decades, decision makers among like-minded Arctic nations are likely to face tough strategy, policy and resource choices. It is a reasonable and fair assumption that as the physical environment of the Arctic warms, enabling greater access and higher levels of human activity, the risk associated with increased activity along with the strategic importance of the Arctic will escalate. Accordingly, decision and actions are needed sooner than later to create a safe and secure opening of an Arctic that is likely drawing increased larger and potentially more aggressive human activities sooner than anticipated.
In many ways anticipating the arriving Arctic is much like risk analysis; while not every potential risk will be encountered for every scenario, accounting, planning, collaborating and resourcing mitigation of risk goes a long way in preventing events or failure to respond to threats from a position of strength to dissuade and deter. Increasing the capabilities of cooperation and collaboration mechanisms, (and creating new mechanisms to address current gaps and seams, could prove pivotal to fostering improved outcomes for the Arctic in the coming years.

In sum, to meet the challenges of a changing Arctic, it becomes imperative to investigate, plan, and prepare for future. Comprehensive challenges...require comprehensive solutions. It is hoped the preceding paragraphs suitably sketched both these factors with at least a reasonable level of accuracy.