TED STEVENS CENTER FOR ARCTIC SECURITY STUDIES

ANCHORAGE SECURITY AND DEFENSE CONFERENCE

FINAL REPORT

ANCHORAGE, ALASKA

November 19-21, 2024

IN PARTNERSHIP WITH:

UNIVERSITY of ALASKA ANCHORAGE

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Executive Summary

Introduction. In November 2024, the Ted Stevens Center for Arctic Security Studies, in collaboration with ADAC- Arctic at the University of Alaska Anchorage, the Ted Stevens Foundation, and the U.S. Department of State, held the inaugural Anchorage Security and Defense Conference (ASDC). This conference provided a comprehensive exploration of evolving Arctic security challenges, all revolving around the theme The 'Decisive' 2020s in Allied North Perspective. Against the backdrop of geopolitical tensions, environmental change, and increasing activity in the region, the Arctic is positioned as a critical focal point for global security discussions.

Sino-Russian Dynamics. Discussions examined the growing implications of Sino-Russian collaboration in the Arctic, highlighting its potential to reshape regional dynamics. Participants noted that Russia's rapid advancements in modern warfare present a significant pacing challenge for NATO and its allies. Economically, Russia dominates Arctic shipping activity, much of which aligns with China's strategic goals under the Polar Silk Road initiative. Recent joint exercises, such as Oceans 24, demonstrated the scale of their collaboration, involving hundreds of assets from both nations. This emerging partnership raises serious concerns about increased militarization and heightened competition for resources in and around the Arctic. Robust intelligence-sharing frameworks among NATO allies were identified as critical for monitoring and countering these developments. NATO Joint Task Force commands were also highlighted as enduring and adaptable mechanisms for maintaining security cooperation and stability in the region.

Arctic Vulnerabilities. The Arctic's limited infrastructure redundancy was identified as a major vulnerability in the face of hybrid threats such as cyberattacks, disinformation campaigns, and sabotage. Participants noted that critical infrastructure response times in remote Arctic regions often exceed 48 hours, underscoring the need for improved resilience and response mechanisms. Concerns were raised about Russia's surveillance and cyber intrusions targeting Arctic infrastructure, particularly in the Nordic countries. Speakers called for robust, multi- layered defense frameworks, emphasizing dual-use or multi-use infrastructure. Finland's demonstration of F-35 operations on public highways was cited as an example of adaptable systems. Advanced technologies, including artificial intelligence and unmanned systems, were identified as critical for enhancing domain awareness. Collaborative, multi-agency exercises were called out as key to addressing these vulnerabilities.

Allied Security Cooperation. Treating the Arctic as a distinct security domain emerged as a central takeaway. Proposals for pan-Arctic exercises, integrated military-civilian operations, and scenario-based workshops were recommended to address gaps in defense frameworks and test operational readiness. Alaska's role as NATO's western flank was highlighted as essential for bridging transatlantic defense capabilities and enhancing Arctic resilience.

Participants also noted that North American Arctic scenarios are not consistently incorporated into NATO exercises, leaving significant room for improvement.

Maritime Defense and Security. Participants highlighted the critical need to close gaps in maritime domain awareness, particularly as non-Arctic states increasingly assert interest in the region. Pressing concerns included monitoring dual-use vessels, mitigating AIS spoofing, and securing critical supply lines. Expanding the U.S. and Allied icebreaker fleets to address growing operational demands was emphasized, alongside calls to foster international agreements like the ICE Pact to enhance shared responsibility and improve maritime governance. Integrating Arctic scenarios into joint military exercises, such as Arctic Edge, was widely supported as a means of enhancing interoperability and addressing interconnected challenges. Nations like Japan and Australia, with their significant experience in managing maritime disputes, were identified as valuable partners for sharing expertise and shaping future Arctic strategies.

Building Arctic Capabilities. Public-private partnerships were identified as essential for building Arctic capabilities, particularly in addressing the unique challenges of remote and resource-scarce environments. Collaborative efforts in Greenland provided a compelling example of success, where microgrids were deployed to reduce energy costs and boost network stability. Participants called for greater integration of advanced technologies, such as renewable energy systems, cybersecurity measures, and sustainable infrastructure tailored to Arctic conditions. The inclusion of dual-use or multi-use infrastructure was identified as a critical strategy for addressing both civilian and military/defense needs effectively. Discussions also stressed the importance of involving the private sector in long-term planning and innovation, with a focus on scalable solutions to close infrastructure gaps in remote Arctic areas. Specific proposals included fostering partnerships to develop hybrid power systems, which combine renewable energy with traditional energy sources, and expanding the use of AI for real-time monitoring and system optimization.

Governance and Societal Trust. Participants emphasized that societal trust underpins Arctic resilience by fostering collaboration, effective governance, and community cohesion in the face of environmental and geopolitical challenges. In Arctic regions, particularly in remote communities, trust in government institutions was identified as critical for ensuring public support for infrastructure projects, emergency response, and sustainable resource management. However, resource shortages, funding gaps for municipal services, and inequitable policy implementation were noted as factors that often erode this trust, increasing polarization and creating vulnerabilities to external influence, such as disinformation campaigns. Discussions highlighted the importance of addressing these systemic challenges by investing in transparent governance, inclusive decision-making, and equitable and sustained resource allocation. To address these issues, conference discussions emphasized the need for transparent governance, inclusive decision-making

processes and equitable resource allocation. By fostering trust between governments and local communities, the Arctic region can better withstand the ever- increasing stresses.

Indigenous Security Leadership. Integrating Indigenous people into Arctic security frameworks was identified as a key theme throughout the conference. Indigenous expertise on environmental changes, ice dynamics, and homeland security was recognized as critical to operational planning. Programs like Canada's Rangers and Greenland's Arctic Basic Education were cited as effective models. However, challenges such as underserved communication networks, particularly in North American Indigenous communities, were noted as barriers to meaningful engagement with national and international stakeholders. Mechanisms to improve communication and trust between Indigenous communities and defense organizations were emphasized.

Environmental Security Risks. Environmental dynamics were identified as a primary driver of Arctic security challenges, accelerating resource competition, migration pressures, and infrastructure demands. Regional change is transforming access to resources and navigation routes. These changes are also contributing to physical risks to Arctic defense infrastructure, including permafrost degradation, increased coastal erosion, and heightened vulnerability to extreme weather events. Participants emphasized that addressing these risks requires adaptive design approaches, using materials and technologies tailored to the Arctic's shifting conditions. Migration pressures, driven by increased accessibility to previously isolated areas, were highlighted as an emerging challenge with implications for governance and resource management. Dual operations—such as pairing patrols with scientific exploration—were suggested as innovative approaches to enhancing knowledge while building Arctic operational capabilities. These evolving dynamics underscore the need for long-term resilience planning that integrates environmental, security, and governance considerations.

Workforce Challenges. Workforce shortages in remote Arctic regions were identified as a growing concern, particularly in supporting defense industries and maintaining all-domain awareness. The outmigration of local inhabitants has heightened challenges related to deterrence through presence and the assertion of sovereignty. Addressing these gaps will require targeted strategies to attract and retain skilled workers in the region. Virtual reality-based training for heavy equipment operation and Arctic-specific cybersecurity initiatives were cited as potential solutions to develop necessary expertise and strengthen regional capabilities. As demand for specialized technical skills continues to rise, there is a growing need for multidisciplinary education programs. Participants emphasized the importance of efficient, coordinated efforts among governments, academic institutions, and industry to build a sustainable workforce capable of meeting Arctic security/defense and infrastructure needs.

Security and Defense Prioritization Risks. The risk of Arctic security and defense being deprioritized in global defense agendas emerged as a recurring concern. Participants

emphasized that conflicts in other regions could divert essential resources away from training and operations needed to build Arctic security capacity. Given the limited focus of NATO's current operational resources on the Arctic, discussions highlighted the need to prioritize Arctic readiness by integrating military, environmental, and civilian strategies. The Arctic was reframed not as a peripheral region but as a critical theater where global security, environmental sustainability, and human resilience converge.

Conclusion. The inaugural Anchorage Security and Defense Conference made clear that the Arctic is no longer a remote, peripheral region but a central theater of global security. As geopolitical tensions rise and reshape the region, the Arctic's security landscape is becoming increasingly complex. To navigate these challenges, the conference called for a collective, NATO-centric approach that emphasizes collaboration across governments, Indigenous communities and the private sector. Building Arctic resilience requires a comprehensive strategy that addresses infrastructure, security and governance issues in tandem. Only through proactive engagement can the Arctic be secured as a space for cooperation, innovation and stability in the face of growing uncertainty The discussions laid a foundation for actionable strategies, emphasizing the urgent need to secure the Arctic's future as a space for cooperation, innovation, and stability amidst increasing uncertainty.

Associate Director Matthew Hickey, TSC, during his opening address at the 2024 Anchorage Security and Defense Conference.

Introduction

The 2022 US National Security Strategy identifies the 2020s as a decisive decade. The strategy outlines geopolitical competition, economic opportunities, and global conflict as those challenges which will prompt the important and transformative decisions before us. In geopolitics, the first half of the decade has borne witness to a return of large-scale war to Europe as well as China's full emergence as a multidimensional power with global aspirations. At the same time, lingering impacts of the COVID-19 pandemic, a changing operational environment, and accumulating advances in artificial intelligence and other technologies have accelerated the transformative effects influencing perspectives on security and defense. Such developments are testing, reinforcing, and reinventing international cooperation in response.

The 'Decisive 2020s' in Allied North Perspective

The inaugural Anchorage Security and Defense Conference (ASDC) chose the theme of the 'Decisive 2020s' as the central conference theme, offering a unique opportunity for midpoint examination of these shifts and their nexus in Arctic, North Atlantic, and North Pacific contexts. In the spirit of military aviation pioneer Billy Mitchell's description of Alaska as "the most important strategic place in the world," exclaimed in the similarly pivotal 1930s, Anchorage presents an ideal vantage point for reflection and dialogue on the scope of change the past five years and ways ahead in the decade's second half.

Conference Overview

Conference Protocol

TSC utilized a modified Chatham House protocol for the conference. Under these guidelines, participants were informed that they were free to use the information received by presenters, but neither the identify nor the affiliation of any speakers or participants could be disclosed. Keynote speakers were the exception, however all attributed have been reviewed and edited by those speakers prior to its public release. The conference was not open to the media.

Conference Structure

At the outset, participants were provided a comprehensive literature review in advance of their attendance, offering them the opportunity to review relevant literature for each panel discussion. These documents are included before each panel's key points in this report.

Agenda

Day 0: Monday, November 18, 2024

Before the official start of ASDC, the International Cooperative Engagement Program for Polar Research (ICE-PPR) Situational Awareness Working Group hosted its quarterly meeting on Monday, November 18, 2024. This public meeting was listed as an optional event on the ASDC registration page.

Day 1: Tuesday, November 19, 2024

The conference began with welcome remarks from Major General (Ret.) Randy "Church" Kee, followed by the ceremonial lighting of the Naniq, led by members of the Bristol Bay Foundation Staff. Additional welcome remarks were provided by Dr. Aaron Dotson, Vice Chancellor for Research at the University of Alaska-Anchorage, and Mr. Richard Porter, Executive Director of the Knik Tribal Council. Keynote speeches addressed U.S. perspectives on northern defense, followed by a morning panel discussing Allied defense perspectives. The afternoon featured a panel on energy and technology in a transforming Arctic. The day concluded with a cultural event and reception, highlighting Indigenous art from across Alaska.

Day 2: Wednesday, November 20, 2024

The second day opened with remarks from Ms. Lily Stevens Becker, President of the Ted Stevens Foundation, and Brigadier General David Moar, Deputy Commander of the Alaskan NORAD Region Command. Panels explored:

- The role of Russia, China, and other adversarial states in the evolving Arctic geostrategic environment
- NATO's role as it marks its 75th anniversary
- The significance of Indo-Pacific allies and partnerships in Arctic security

The official conference program concluded with breakout panels addressing topics such as education, Nordic security, cold weather medicine, and the role of environmental changes in security planning. The day ended with a Women, Peace, and Security event, listed as an additional optional event on the registration page.

Day 3: Thursday, November 21, 2024

The final day opened with welcome remarks from Anchorage Mayor Suzanne LaFrance and Col. Matthew Komatsu (Alaska Air National Guard). The program featured:

- Morning panels on whole-of-society approaches to resilience and defense, as well as critical infrastructure
- An afternoon panel examining the strategic horizons of the Arctic

- A concluding “fireside chat” with U.S. Ambassador-at-Large to the Arctic Region Mike Sfraga, Director Randy Kee, and Julie Kitka, Co-Chair of the Denali Commission

ASDC 2024 provided a comprehensive forum for discussing the security landscape of the Arctic and broader northern regions. The event facilitated meaningful dialogue among policymakers, military leaders, industry experts, and researchers, reinforcing the importance of multinational cooperation in an evolving operational environment.

TSC Director Randy “Church” Kee speaks during the opening session of the 2024 Anchorage Security and Defense Conference.

Day 0 – Monday, November 18, 2024

ICE-PPR Situational Awareness Working Group Quarterly Meeting

Introduction

In conjunction with the Anchorage Security and Defense Conference (ASDC), the International Cooperative Engagement Program for Polar Research (ICE-PPR) Situational Awareness Working Group (SAWG) convened a combined U.S. and multinational in-person quarterly meeting on November 18, 2024. Typically conducted virtually, this in-person gathering allowed for deeper discussions and introduced many ASDC attendees to ICE-PPR for the first time. The meeting emphasized international collaboration in Arctic situational awareness and operational safety, further establishing ICE-PPR as a key forum for multinational Arctic engagement.

Meeting Activities

Opening Remarks

The meeting commenced with remarks from ICE-PPR leaders:

- Maj Gen (Ret.) Randy "Church" Kee, Director of the Ted Stevens Center and U.S. Principal to the SAWG, welcomed participants and underscored ICE-PPR's role in strengthening multinational Arctic engagement. He highlighted the Arctic's significance in global strategic defense and environmental stability.
- Mr. John Woods, ICE-PPR Executive Officer for the Chief of Naval Research, provided an overview of ICE-PPR's progress over the past quarter. He detailed advancements in situational awareness frameworks, improvements in communications resilience, updates on funding pathways, and the introduction of new project management tools for tracking international collaboration.

Key Presentations and Discussions

LT Jack Nugent, Executive Officer for the ICE-PPR SAWG Navigation, Intelligence, Surveillance, and Reconnaissance (Nav/ISR) Sub-Working Group, outlined plans for the next in-person SAWG meeting. He introduced the upcoming Nav/ISR Workshop, co-hosted by the Ted Stevens Center, Office of Naval Research, and the U.S. Army Cold Regions Research and Engineering Laboratory (CRREL) in Hanover, NH, scheduled for April 29 – May 1, 2025.

Dr. Phil McGillivary, SAWG Science Advisor, delivered presentations on:

- High-latitude Positioning, Navigation, and Timing (PNT) systems
- Quantum communication technologies

- Artificial intelligence applications in situational awareness
- Collaboration highlights among international partners

Technical Briefings

Representatives from academia, industry, and research organizations provided technical briefings to showcase ongoing initiatives and collaboration opportunities:

- Andy Glen (Sandia National Laboratories) presented research on high-altitude balloons, detailing their inventory, applications, and data collection capabilities. He also introduced potential collaboration opportunities for SAWG participants.
- Leslie Canavera (CEO, PolArctic) demonstrated an AI-powered modeling system designed to predict sea-ice movement and formation in real-time. She highlighted the system's ability to process extensive datasets, including satellite imagery, oceanographic data, and climate models, to generate highly accurate forecasts.

International Contributions

Multinational SAWG Principals in attendance provided updates on national Arctic initiatives:

- Finland shared progress on Arctic hydrography projects and advancements in rescue technologies.
- Canada announced plans to host the Executive Steering Council leadership in 2025, with a focus on maritime domain awareness.
- Denmark presented developments in subsea asset protection initiatives.

Conclusion and Recommendations

The ICE-PPR SAWG quarterly meeting served as an effective "Day Zero" event for ASDC, fostering collaboration and attracting new participants to the working group. Technical presentations from government, industry, and research institutions provided a representative sample of Arctic security research and emphasized opportunities for future collaboration. The strong multinational representation reinforced ICE-PPR's role as a key platform for Arctic security and defense discussions.

Feedback from attendees was overwhelmingly positive, setting the stage for continued integration of "Day Zero" or after-hour ICE-PPR activities in future ASDC events. Moving forward, maintaining this momentum through sustained engagement and additional in-person meetings will be crucial in advancing situational awareness and operational safety in the Arctic.

About ICE-PPR

ICE-PPR is an agreement among seven partner nations—Canada, Denmark, Finland, New Zealand, Norway, Sweden, and the United States—fostering collaboration in polar research to advance science and technology. U.S. involvement is coordinated by the Office of Naval Research. Participation is open to the Joint community, service branches, service research facilities, Federally Funded Research and Development Centers (FFRDCs), U.S. government agencies, academia (including University Affiliated Research Centers), and industry. The Situational Awareness Working Group facilitates information exchange and collaboration, including through international project arrangements.

Day 1 - Tuesday, November 19, 2024

Welcome Remarks

The Ted Stevens Center for Arctic Security Studies (TSC) Director, Major General USAF (Ret) Randy "Church" Kee and Associate Director for Strategic Engagement, Matthew Hickey, moderated the introduction and welcome remarks. After their remarks, the conference continued with the lighting of a ceremonial seal oil lamp, a "naniq," by members of the Bristol Bay Foundation staff Emily Brockman, Helen John, Aleesha Towns Bain and Megan Donhauser. This ceremony serves as a gesture of respect toward Indigenous peoples and their leadership in Arctic affairs. It reinforces the inclusion of Indigenous perspectives in discussions related to governance, security, and cultural preservation. Symbolically, this lighting at the beginning of an event signifies unity, a collective journey, and the importance of community participation.

Following the lighting ceremony remarks were given by the following speakers:

Dr. Aaron Dotson, Vice Chancellor for Research, UAA

Dr. Aaron Dotson, Vice Chancellor for Research at the University of Alaska Anchorage, pointed out the speed at which security and defense were changing in the Arctic, highlighting the uniqueness of the situation. UAA is working to advance research, and train and prepare future leaders to enforce Alaska's role as a leader in the

Arctic. The University of Alaska has an initiative to harness the capacities of its multiple campuses to build Arctic leaders and shape and secure a sustainable Arctic future.

Mr. Richard Porter, Executive Director of the Knik Tribal Council

Mr. Richard Porter, Executive Director of the Knik Tribal Council, provided a land acknowledgement and thanked the Dena'ina people who are stewards of the land we call Anchorage. Mr. Porter emphasized that members of the First Nations have been the front lines of security and defense since time immemorial, and it is positive to see Indigenous peoples included in these conversations now. He concluded by reminding attendees that all are indigenous to Earth and have a responsibility to take care of it.

Major General USAF (Ret) Randy "Church" Kee

Major General (Ret) Randy "Church" Kee welcomed attendees, emphasizing the opportunity at hand to exchange ideas, address common issues and security concerns, and advance the foundation of cooperation in the Arctic. He noted that working together does not necessarily mean perfect agreement on every issue, but instead moving forward with a rational cadence, and in collaboration with the Arctic's Indigenous Peoples. MG Kee highlighted the conference location as the "doorstep to the Arctic," and thanked attendees for the investment of their time.

Keynotes: US Perspectives on Defense in the North

General Gregory Guillot, Commander, North American Aerospace Defense Command and US Northern Command

General Guillot opened his keynote address emphasizing the opportunity that ASDC presents as a forum to signal commitment to Arctic security. Specifically, he highlighted that defending infrastructure in the Arctic is vital to security and central to NORAD and NORTHCOM mission sets. The General's address communicated three major themes. First, the Arctic is in a state of rapid geopolitical and environmental change which necessitates new security strategies. Second, the development and defense of critical infrastructure in the Arctic is paramount to ensuring successful defense of the homeland. And third, developing new security strategies and achieving effective assurance and deterrence in the Arctic is dependent on cooperation with Allies and partners in the region.

The last five years saw a significant shift in adversary capabilities in the Arctic. As Arctic awareness increases, more parties are attracted to the many things the Arctic offers. The region is a gateway to global competition, and provides access to essential resources, and strategic economic and military routes. Adversaries have become more visible and more capable, demonstrating a desire to operate in all domains: land, sea, air and cyber. Cyber, as it exists today, is a relatively new domain and increases the diversity of threats US allies and partners face. Given the growing activity and complexity of activity in the region, General Guillot called for the development of flexible, multi-domain response capacities.

NORAD-NORTHCOM is integrating concepts such as tailored limited area defense to this end, and General Guillot highlighted that the accession of Finland and Sweden to NATO greatly increases Allied capabilities in the Arctic. Still, while improvement is happening, the US can and must go further in its Arctic investment and strategic preparation. Current operational challenges in the region include aging infrastructure, the harsh environment and the overall vastness of the region. Arctic capabilities need to be enhanced through modernized airfields, port and support facilities, and improved radar and information-sharing, including the use of space-based assets. General Guillot specifically called out the need for improved radar at Clear, a deep-water port in Nome, and the integration of AI and defense against AI into strategic planning.

Infrastructure investment is further necessary for what General Guillot raised as the key to Allied success in the region: cooperation and communication. Successful power projection in the region requires coordination and information sharing networks with NATO and the Arctic Council, in addition to strong bilateral work like that done through NORAD. Combined work is essential in such a vast region. New technology and equipment, alongside joint training, will ensure that infrastructure in the Arctic's demanding environments remains safeguarded, and the region secure.

Overall, General Guillot's keynote stressed the rapid geopolitical changes happening in the Arctic region and underscored the new complexity of the region. He called for the US to match that complexity in its response. General Guillot illustrated the need for modernized infrastructure, improved communication between allies, and cooperation between forces. He concluded by communicating that the Arctic is a key region for homeland defense, and must be made, and kept a priority.

Major General Peter Andrysiak, Chief of Staff, United States European Command

Major General Andrysiak opened his keynote address with a word of appreciation for the 11th Airborne Division, the "Arctic Angels," for which he helped develop the strategy and roadmap to operational capacity. The training and capabilities of the Arctic Angels to operate in extreme conditions are paramount to successfully operating in the Arctic. MG Andrysiak discussed the role of EUCOM in the Arctic problem set and identified areas of success and opportunities for improvement.

First, MG Andrysiak highlighted that while the US is an Arctic nation through Alaska, USEUCOM is central to the Arctic through its ownership of the Russian problem set and the imbalance of military power in Europe. The Russian problem set is evolving, complex, and interlinked with other US priorities. China and Russia are cooperating with joint operations in air and maritime domains. The Democratic People's Republic of Korea (DPRK) has provided equipment and at least 11,000 troops as part of a "no-limits" relationship and security pact with Russia. Russia is also known to cooperate and collaborate with Iran.

Aside from cooperation with other adversaries, Russia must be taken seriously as an Arctic nation. Russia has demonstrated that its military can learn, adapt, scale and reconstitute faster than anywhere in the West. Additionally, its maritime capabilities are still intact, save for those in the Black Sea. Russia has doubled its number of tanks, tripled its artillery, doubled its armored personnel, and is consistently and significantly increasing its artillery rounds. For effective assurance and deterrence then, the US must also be taken seriously as an Arctic nation, which means pushing for continued investment in Arctic infrastructure and training of Arctic forces despite ongoing domestic resistance.

As well as being a security cooperation mechanism, EUCOM has a warfighting planning component and thus is an important tool in both assurance and deterrence in the region. EUCOM is re-writing its US-led plan that bridges forces from campaigning to competing, examining when and how forces transition to crisis outside of NATO's Article 5. While these steps are taking EUCOM and allies in a positive direction, there are still many preparation gaps and areas for improvement. For example, there needs to be more training exercises that get boots on the ground in the Arctic. Another area for improvement is coordination between joint forces and NATO.

MG Andrysiak underscored just how important it is to rebuild Arctic war-fighting capacity to former Cold War levels. He emphasized that this needs to happen in extremely close

collaboration with other forces in the region. NATO crosses combatant command borders and it is critical that all border overlaps and command boundaries are well understood, in peacetime and in war. This ensures support and response roles are clear, enabling quick action when necessary. The overarching message was that there are significant and necessary steps to take in peacetime to ensure proper function and capability in wartime, which will also contribute to deterrence. Despite domestic resistance, there is an obligation to take those steps.

Major General Peter Andrysiak, Chief of Staff, United States European Command, offers his reflections to the audience.

Vice Admiral Andrew Tiongson, Commander, Pacific Area, US Coast Guard

Vice Admiral Tiongson opened his remarks by noting that the Arctic is one of the most consequential regions of our time. He then illustrated the breadth of the work done by the US Coast Guard, covering territory from polar bears to penguins. VADM Tiongson emphasized three major themes in his speech. First, the USCG is a peace- keeping and de-escalatory force in peacetime as much as it is a warfighting resource in wartime. Second, for the US and its allies to see continued peace in the Arctic, and prepare for potential alternatives, a whole-of- government approach to security is imperative, including more ice breakers. Last, VADM Tiongson emphasized that there is a significant need for increased partnership and training opportunities across forces and partner states.

Deterrence is a key component of US national security policy, and the USCG plays a significant role in that mission. This is especially true as Sea Lines of Communication (SLOCs) increase in importance in the Arctic. The USCG mission set is varied, ranging from search and rescue, law enforcement, intelligence and maritime security, to the protection of commerce, fisheries and the environment. With such a wide mission set, the USCG is extremely visible to civil and military parties of other states. This visibility, combined with upholding internationally accepted rules and standards through good maritime governance and behaviors on the sea gives the USCG a unique capability to be a de-escalatory force.

The broad scope of the USCG also provides a unique perspective on how important a whole-of-government approach is when preparing for future threats in the Arctic region. For example, The Healy showcases how good maritime governance, and scientific research can be viable means of diplomacy through efforts like mapping the region for future commercial access. In order to continue fulfilling this de-escalatory role as well as meet strategic goals, the USCG needs more icebreakers, ideally 8-9 more including the new icebreaker coming to port in Alaska in 2026. Russia has over 50, and China has four with more under construction, and both countries are operating in and around US waters. Recognizing this, the USCG needs more infrastructure to meet presence with presence – a key to deterrence – in the north.

VADM Tiongson underlined the point that to further maintain good governance, building trust and increasing partnerships also needs to be a priority. The USCG is a people-oriented business, and increasing trainings, rehearsals, deployments and participation in multi-lateral groups will contribute to the efficacy of the Sentinels. VADM Tiongson specifically mentioned the value of participating in multi-lateral groups that also include Russia and China. Another key aspect of this work is fostering education and awareness both within the US forces, but also in the broader community. This is where partnerships with academia, like the Arctic Fellows program at UAA and TSC, can serve a valuable purpose.

The US no longer has the industrial base to build ice breakers, exacerbated by high costs, nor the institutional knowledge of the Arctic that existed at the height of the Cold War. Thus, the USCG cannot operate at peak efficacy in the Arctic environment, not only for defense of the nation, but also for search and rescue, cruise ship emergencies, oils spills, or shipping route complications. To combat this, VADM Tiongson emphasize the need for increased infrastructure and joint training in the Arctic, the importance of USCG presence in peacetime and wartime, and the need for more work in partnerships in the region.

Vice Admiral Andrew Tiongson, Commander, Pacific Area, US Coast Guard during the keynote addresses on day one.

Vice Admiral Nathan Moore, Commander, Atlantic Area, US Coast Guard

Following VADM Tiongson, Vice Admiral Moore noted that this was the first time that both the Atlantic and Pacific US Coast Guard Commanders were sharing a stage to speak about the Arctic. The US is the only Arctic nation without an Atlantic Arctic, but it does still have a strategy of engagement in the Arctic that uses forums and exercises to enable partners. VADM Moore's attendance was meant to underscore the importance of the Arctic for both sides of the country.

VADM Moore explained that in the Atlantic, the USCG strategy is one where presence equals influence, and the Arctic is a key region in which the US needs influence. The north is not the only place the USCG operates though, and its responsibilities in other domains must also be upheld. Thus, coordination and anticipatory measures must be used alongside reactive measures. Partnerships are necessary for the USCG to uphold its responsibilities in the Atlantic Arctic while also maintaining its responsibilities elsewhere in the world.

Like VADM Tiongson, VADM Moore emphasized that the USCG uniquely operates in the space between conflict and diplomacy. The USCG operates on a continuum where Defense of the North is as necessary in times of peace and prosperity, as the enduring

presence of the USCG is a mechanism for deterrence. For example, the USCG enforces maritime law in peacetime, and operates within accepted international norms. Additionally, the USCG contributes to deterrence efforts and international cooperation via collaborative search and rescue efforts and as a member of the international ice patrol.

Finally, VADM Moore highlighted that there are clear areas for improvement in partnerships, infrastructure and research that need to be addressed, for the USCG to most effectively operate in the Arctic. For example, current navigation and charting are not sufficient for the anticipated increase in traffic in the Arctic. Additionally, as traffic increases the USCG will need more ships to respond to more emergency calls and enforce homeland security. VADM Moore acknowledged the ICE Pact MOU as a positive step toward meeting some of these needs.

Vice Admiral Nathan Moore, Commander, Atlantic Area, US Coast Guard addresses the audience during his keynote address.

Panel 1: Allied Perspectives on Defense in the North

Moderator: Dr. Kate Friedman, North American Arctic Policy Advisor, ACT 1 Contractor
Speakers:

- RAdm Stephen Moorhouse, Assistant Chief of Defense Staff for Operations and Commitments, Royal Navy, United Kingdom

- MG Soren Andersen, Commander, Joint Arctic Command, Kingdom of Denmark (online)
- BG Dan Riviere, Commander, Joint Task Force North, Canada
- Mr. Youssef Mani, Assistant Commissioner, Coast Guard Arctic Region, Canada
- MG Joseph Hilbert, Commander, 11th Airborne Division, US Army

Panel 1 Introduction

The "Allied Perspectives on Defense in the North" panel brought together high-level military and defense leaders from Northern Allies to explore their perspectives on the evolving security environment and set the stage for the rest of the conference proceedings. Against the backdrop of intensifying great power competition and a changing operational environment, panelists examine how traditional security frameworks and military commands need to adapt to address emerging threats and maintain stability in the increasingly contested Arctic. The panel discussion aimed to elaborate upon how security changes are affecting existing command structures and their adaptations, as well as the challenge of maintaining international cooperation despite growing tensions with Russia and China. Allowing for a review of Northern Ally activities in High North, the panel offered credible insight into the current endeavors to build capabilities and regain dominance in the Arctic security landscape.

Panel 1 Summary

The ASDC Panel on "Allied Perspectives on Defense in the North" examined strategic, operational, and collaborative challenges in the Arctic. The Panel featured leaders from the armed forces of Canada, the United Kingdom, Denmark, and the United States. The following paragraphs summarize the international and multifaceted discussions that took place and highlight the key themes that emerged throughout the conversations. These key themes include militarization, the operational environment, Indigenous partnerships, and multilateral cooperation aimed at addressing emerging threats from state and non-state actors in the region.

The first panel of day one of the inaugural ASDC opened with an analysis of the security implications stemming from the Arctic's rapidly changing environment. The region is warming at four times the global average, exacerbating environmental degradation and elevating the risks of natural disasters, including oil spills and wildfires. Panelists emphasized that the reduction of Arctic sea ice facilitates the opening of new sea lanes, which reduce transit times by approximately 20-40 days as compared to traditional routes. While these new passages enhance the region's economic importance—particularly for the oil, gas, tourism, and fisheries sectors—they also introduce new security vulnerabilities. For instance, increased tourism creates logistical challenges, especially in Greenland, and fluctuating ice conditions disrupt navigational forecasts, leading to incidents that

necessitate rescue operations. Additionally, greater accessibility for non-Arctic states intensifies geopolitical competition and places further strain on the environment.

The discussion then shifted to the critical role of multilateral security collaboration in Arctic defense. Existing frameworks like NORAD and NATO provide a foundational structure, yet operational integration remains a challenge. Joint exercises, such as Operation NANOOK, are pivotal in enhancing readiness and interoperability among allies. Operation NANOOK, the Canadian Armed Forces' premier northern operation, involves comprehensive activities aimed at defending Canada's Arctic territories and is conducted annually across the Yukon, Northwest Territories, Nunavut, and Labrador. However, current command structures encounter jurisdictional and bureaucratic obstacles, highlighting the need for simplification and the identification of inefficiencies. Panelists emphasized that effective collaboration must extend beyond military entities to include civilian agencies and Indigenous communities.

All panelists agreed that Indigenous communities are indispensable to Arctic security. The Canadian Rangers, for instance, act as advisors and first responders, leveraging their profound environmental knowledge to support broader defense strategies and emergency responses, such as wildfire management. Collaboration and integration with these communities ensures operational success and sustainability, underscoring the importance of integrating local expertise into defense planning.

The panel also addressed emerging threats, focusing on hybrid warfare and gray zone tactics. To counter these threats, panelists advocated for increased domain awareness and expedited information sharing. This involves fostering a shared understanding and improving classification tools to mitigate vulnerabilities. Leveraging technological advancements and conducting joint simulations were identified as essential strategies to strengthen collective defense capabilities.

National perspectives offered further insights into Arctic defense strategies. The US Army's Arctic strategy focuses on developing Arctic-specific training and deploying the 11th Airborne Division as a globally deployable, Arctic- capable force. Canada's Armed Forces prioritize continental defense through Indigenous partnerships and by enhancing mobility and sustainment capabilities in remote areas. The Canadian Coast Guard's civilian fleet addresses non-kinetic security issues, contributing to search and rescue, pollution control, and regional stability. Meanwhile, the UK's updated Arctic policy framework focuses on ensuring freedom of navigation, protecting critical infrastructure, and fostering collaboration within NATO's Joint Expeditionary Force.

Key questions raised during the panel included how to strengthen collaboration amid challenges posed by Russia and China, optimal command structures for Arctic operations, and strategies for allies to adapt to hybrid warfare in the region. The panel emphasized that collaboration is crucial due to shared challenges, with joint exercises and partnerships

with Indigenous communities enhancing operational effectiveness. Furthermore, simplifying bureaucratic structures and improving information sharing are vital for seamless multilateral action.

In conclusion, the panel underscored the Arctic's increasing strategic importance and the imperative of multilateral cooperation to address environment, security, and geopolitical challenges. Strengthening security collaboration, integrating Indigenous people into security frameworks, and focusing on regional resilience are essential for maintaining stability and security in the region.

(left) MG Joseph Hilbert, Commander, 11th Airborne Division, US Army and (right) BG Dan Riviere, Commander, Joint Task Force North, Canada, converse during panel 1.

Keynote Address

Dr. Leigh E. Nolan Senior Advisor, Homeland Defense and Hemispheric Affairs, Office of the Secretary of Defense, Policy

Dr. Nolan began by underscoring the need for a deliberate and comprehensive approach to Arctic security, driven by deeply concerning trends like Russian and Chinese military collaboration in the Pacific. She cited recent coordinated activity between the Russian Border Guard and Chinese Coast Guard ships operating in the vicinity of St. Lawrence Island in the Bering Sea as one such example. Dr. Nolan explained that DoD is focused on deterring strategic competitors and defending the US homeland in three critical ways:

engaging with Allies and partners, enhancing domain awareness, and exercising tailored presence while campaigning continuously in the Arctic.

Dr. Nolan described engagement with Allies and partners as the center of gravity for US strategy and the bastion of US strength. Allied partnerships strengthen deterrent power. Having seven of eight Arctic nations in NATO presents a unique opportunity for deeper interoperability and more effective deterrence. This bolsters NATO's longstanding success in upholding peace and prosperity. An excellent example of the benefit of these Arctic partnerships is the Arctic Security Policy roundtable. The roundtable provides both North American and European Arctic security practitioners the opportunity to discuss advancing joint capability and prioritizing strategic messaging for Arctic exercises and activities. It additionally promotes a more seamless and comprehensive understanding of the changing threat environment across the entire Arctic region. This work of harnessing respective expertise and strengths is critical as the window to act is diminishing.

Dr. Nolan then pointed out the necessity of enhancing domain awareness and capabilities to ensure a robust response to Arctic challenges. Dr. Nolan's team made the case for resourcing these capabilities within DoD. This would include new analytical work to define requirements, characterize risks for policy makers, and identify options for risk mitigation with timely and targeted investment. Dr. Nolan used the example of long-range capabilities such as over the horizon radars as one important area of investment. NORAD Long Range Radars (LRR), critical to domain awareness, should receive significant investment for repair and modernization to include supporting infrastructure.

Dr. Nolan noted that investment in people is also essential. Installation infrastructure improvements and incentive pay to purchase extra gear for extreme cold weather are well-targeted efforts aimed at improving quality of life for security personnel stationed in Alaska and northern regions. The new 11th Airborne Division, the Arctic Angels, are providing advanced capabilities to master Arctic warfare and operations in extreme cold weather and acquisition of new cold weather all-terrain vehicles provides an excellent example of the required investments needed to ensure readiness.

Next, Dr. Nolan addressed extensive exercising of tailored presence and campaigning continuously in the Arctic. She explained that exercising with allies and partners deepens our understanding of distinct operating environments while enhancing interoperability. One example from this year was the execution of ice camp, a three-week operation in the Beaufort Sea. This provided an excellent opportunity for military testing, scientific observation and experimentation in the Arctic environment. Another example in which the US demonstrated both presence and an iron clad commitment to NATO, was participation in Nordic Response. Hosted by Norway, Sweden and Finland and showcasing NATO's combined capacity to defend its northern flank, the exercise integrated 20,000 military personnel, over 50 ships and 110 aircraft. In August 2025, USNORTHCOM will host Arctic Edge, an annual, joint, multi-domain, large scale field exercise. Focused on the North

American Arctic, Arctic Edge includes joint force training, joint and combined homeland defense operations, and resilience to environmental change.

Looking ahead, Dr. Nolan emphasized that strengthening collective deterrence of strategic competitors is foundational to DoD's work. This focus must continue to drive efforts to enhance and deepen resilience, integrate expertise and capabilities, and shore up vulnerabilities. The security and stability of the Arctic and US homeland depends on this. Dr. Nolan finished by exhorting the participants to use the opportunity presented by this conference to make connections, share expertise and offer new solutions.

Panel 2: Energy and Technology in a Transforming Arctic

Moderators: Dr. Kelsey Frazier, Associate Director for Research and Analysis, Ted Stevens Center, and Dr. Christine Duprow, Lead Curriculum Developer, School for Arctic Security Studies, Ted Stevens Center. Speakers:

- Amb. David Balton, Executive Director, Arctic Executive Steering Committee, White House Office of Science and Technology Policy
- Dr. Erin Whitney, Director, Arctic Energy Office, US Department of Energy
- Dr. Jeremy Kasper, Director, Alaska Center for Energy and Power, University of Alaska-Fairbanks
- Dr. Humberto Garcia, Directorate Fellow and Senior Technical Advisor, Idaho National Laboratory
- Ms. Leslie Canavera, Chief Executive Officer, PolArctic

Panel 2 Introduction

The "Energy and Technology in a Transforming Arctic" panel assembled climate, energy, and technology professionals from academia, national, and international organizations to assess how to pursue energy development and technological advancement while maintaining security in this strategically vital region. Acknowledging the urgency around Arctic energy and technological innovation due to the catastrophic impacts of environmental change, the panel intends to understand how the Arctic's future will be shaped by technological capabilities that are only beginning to be developed. The interconnected challenges facing Arctic energy development were examined against the policy frameworks that either enable or constrain technological innovation to explore the practical aspects of implementing these technologies, offering insights into long-lasting implications for both environmental sustainability and geopolitical stability in the region.

Panel 2 Summary

The 2020s may be a tipping-point decade for accumulating change in the operational environment, energy systems, and emerging technologies. Such interconnected mega-trends promise transformative effects for societies, defense, and security. This session

explores these dynamics through the prism of the impact of artificial intelligence on the energy sector in and beyond the Arctic. It offers insights into the nexus of innovation, risks, geopolitical implications, and possible governance frameworks.

In terms of key priorities that shape the current Arctic energy and technology policy framework specifically regarding the United States, the panelists noted that changes in policy have been gradual, incremental, and nuanced over the past twenty years. Today, however, Arctic policymakers are grappling with two different challenges simultaneously. First, the pace of regional environmental change is accelerating. Second, geopolitics are now more challenging. In the past, the United States and its Allies and partners had problems with Russia (e.g., Syria, election interference, the 2014 Ukraine invasion), however, these were compartmentalized, and cooperation remained, until the Russian invasion of Ukraine in 2022. The key challenge for policymakers is managing these twin challenges. Specifically, panelists discussed the need to move away from reliance on Arctic oil and gas so that an effective energy policy can be established without geopolitical vulnerability. To ensure that policy is effective, policymakers must obtain buy-in. US policymakers must ensure that any new policy responds to the real interests of people that care the most about it—people living in Alaska; they must obtain their input into Arctic energy policy. Policymakers in Washington, DC must reach out to Alaska residents and representatives, as well as US Allies and partners, to create buy-in.

Three trends currently shaping Arctic energy and technology are 1) engagement and investment of the US Department of Energy (USDOE) in the region; 2) innovation taking place in the State of Alaska; and 3) recognition that energy is a security issue. USDOE strongly supports investment in Arctic energy to ensure security and prosperity, as evidenced by significant investments in Alaska over the past two years. The USDOE Arctic Energy Office in Alaska has invested in grid resiliency and rural community renewable projects, which use local energy sources to help communities establish greater security and resilience. In fact, rural Alaska (e.g., Kodiak, Cordova) is leading the way in adaptation of renewables. Also, this office established an Arctic Energy Ambassadors Program, with representatives from each of the 12 Alaskan Native regional corporations, which will enable DOE policymakers to "keep their fingers on the pulse" of what is happening across the state. These programs are successful because officials and staff listen and respond to community needs. The successes of the USDOE Arctic Energy Office are recognized around the Arctic as best practice. For example, the US Department of State has collaborations with other Arctic countries on USDOE Arctic best practice energy projects. Sharing lessons with Allies and partners, and learning from them, is important.

Panelists emphasized that energy is a security issue, i.e., whoever has accessible, reliable plentiful cost-effective energy has the best chance of executing the mission. In addition, it must be recognized that communities in the Arctic are defense assets. The degree to which communities thrive, and support defense activities can determine successes. For example,

the adoption of renewables in rural areas in Alaska relates to security because, notwithstanding upheaval in global energy markets, rural Alaskans will be able to withstand fluctuations and upheavals in global energy markets. The trifecta for policymakers is energy-security-community.

In terms of future trends, emerging technologies include modular reactors for nuclear energy for electricity and heating needs; carbon capture and sequestration combined with oil and gas development; and hydrogen produced from fossil fuels (natural gas) and renewables. All of these discussions are happening very intensely, with it anticipated that successes will become apparent within the next decade.

Other emerging technology developments include using AI in the Arctic. Panelists offered several possibilities for AI to enable innovation in Arctic energy and security. First, AI could aid in better domain awareness—which is central to Arctic security—at the strategic, operational, and tactical levels. For example, regarding the 'Observe, Orient, Decide, Act' military decision-making model, AI could shorter the time between Observe and Orient, e.g., building automated sea ice charts—if charts could be made faster, analysts could turn to other jobs that are more difficult. Second, AI could be used to build multidomain-based modeling to optimize planning for the energy and food needs of communities. In this regard, AI could weave together Western and Indigenous knowledge systems and make diverse perspectives to build robust solution to adapt to regional environmental change and plan for it in ways that could not previously, such as modeling fisheries. Third, potential exists for AI to have dual uses in both the commercial and security spaces. The same AI technology could be used to strengthen domain awareness and be applied in the commercial context to create an operational picture of potential navigable routes and concentration of vessels.

One immediate action that would improve Artic energy and technology policy is to build out better communications technology. This is, in fact, underway, as $1 billion has been set aside for Alaska to build out broadband. Another immediate action would be to connect AI to policy decisions by bringing AI and advanced algorithms in front of policy decisions (e.g., during tabletop exercises) to help frame policy. This would not only allow policymakers and researchers to talk but also promote a common understanding of how things work and may work in the future. It also ensures that policymakers are paying attention to AI, as AI can be used to facilitate the development of new policy and technology and reduce the risk of miscalculation or unintended consequences in the Arctic.

Panel 2 speakers from left to right: Amb. David Balton, Dr. Jeremy Kasper, Dr. Erin Whitney, Dr. Humberto Garcia, and Ms. Leslie Canavera (speaking).

Welcome Reception

The Tuesday night reception was sponsored by the Ted Stevens Foundation, and included an evening of history, performances and cultural celebration focused on the Arctic and Indigenous perspectives on security and heritage.

There was a short introduction by Lily Becker of the Ted Stevens Foundation, followed by welcome remarks from the US Ambassador-At-Large to the Arctic Region Mick Sfraga. Dr. Haliehana Stepetin (Unangax), Assistant Professor of Arctic Security Studies from the Ted Stevens Center, then shared cultural and historical perspectives of Alaska's Indigenous Peoples, taking attendees through history to modern day. Performances included drumming and dancing by the Imamsuat Sugpiaq Dancers, followed by Cup'ik Songs and Stories by Polly Andrews. Deputy Director of the Ted Stevens Center, Craig Fleener, gave closing remarks, and the evening ended with live music by the Marc Brown and the Blues Crew from Fairbanks, featuring their hit song "Indian Rock and Roll."

Day 2 - Wednesday, November 20, 2024

Welcome Remarks

The Ted Stevens Center for Arctic Security Studies (TSC) Director, Major General USAF (Ret) Randy "Church" Kee, and Associate Director for Strategic Engagement, Mr. Matthew Hickey, moderated the morning's welcome remarks. Introductory remarks were given by:

- Ms. Lily Stevens Becker, President, Ted Stevens Foundation
- Brigadier General David Moar, Deputy Commander, Alaskan NORAD Region Command

Introductory Remarks Summary

Ms. Lily Stevens Becker, President Ted Stevens Foundation

Ms. Lily Stevens Becker emphasized the importance of bringing the Arctic to the forefront of national and international discussions, supporting science and innovation in the Arctic, learning from Indigenous people, and contributing to defense and security. Ms. Becker encouraged the Ted Stevens Center for Arctic Security Studies to think out of the box to find solutions to these complex Arctic challenges, following the legacy of Senator Ted Stevens and his 40 years in the US Senate. Senator Stevens brought people to Alaska to showcase the importance of the Arctic and supporting its military initiatives and infrastructure. Sen Steven's legacy also includes deep cooperation, collaboration and bipartisanship. This same approach is needed to address today's challenges in the Arctic. Education, a key aspect of the TSC's work, was also a high priority for Senator Stevens. The Ted Stevens Foundation sees the importance of centering a public servant nature and cooperative spirit in its ongoing work.

Ms. Lily Stevens Becker welcomes ASDC participants back on the morning of day two.

Brigadier General David Moar, Deputy Commander, Alaska NORAD Region

The Alaska NORAD Region (ANR) has the watch here in Alaska for the US and Canadian homeland and the northwest flank for NORAD, and BGen Moar supports Lt Gen Cunningham, ANR Commander, in making sure this space remains strong and free. BGen Moar highlighted common themes he had heard thus far in the conference. These themes included a sense of urgency to act to prevent competitors outpacing the West, a growing complexity and increasing global nature of security concerns, an increasingly limited decision time, an imperative to protect defense critical infrastructure, a need to extend multidomain awareness, the requirement for specialized skills needed in the Arctic and the criticality of partnerships in tackling all these issues.

Addressing these themes, BGen Moar expanded on two main points. First, he pointed out that the current trend in regional volatility and the concomitant increased risk means that tactical actions can have strategic consequences. ANR is focused on aerospace warning and control in the Air Defense Identification Zone (ADIZ) surrounding Alaska. While ANR focuses on tactical work, it is part of a complex, layered system that is globally interconnected. ANR's goal is to plan and execute missions to detect, identify and if necessary, interdict airborne threats in and around or approaching the Alaska mainland. Thus, ANR scrambles fighters, tankers and control aircraft to track inbound potential threats to Alaska. However, even at the tactical, operational planning level, strategic considerations require deliberate consideration. These questions include:

- How does ANR contribute to deterrence?
- How does ANR most effectively campaign in and around the homeland and what structures does ANR create to make best use of limited peacetime resources that can be scaled up when needed?
- How does ANR prioritize defense critical infrastructure?
- How does ANR coordinate multi agencies operations across seams?
- How does ANR manage escalation?

BGen Moar next addressed the criticality of partnerships as well as the significant untapped potential strength in Arctic partnerships. He explained that ANR knows it is challenged and must grow at a pace it cannot do on its own. ANR is concerned about adversaries like Russia outpacing it, particularly as it faces an environment that is rapidly changing. He explained that ANR faces frequent ADIZ incursions. These Russian flight profiles have no other purpose than provocation by showcasing presence, intent and capability. The Russian intent is to intimidate by flying close to Alaska with aircraft capable of attacking North America. This activity is increasing in frequency, intensity and complexity, particularly with the addition of Chinese forces. The partnership with China and exercises together are shifting the axis of concern in the Arctic. Thus, with current partnerships, it is important to move beyond traditional comfort zones and reframe

operations and interactions and increase current knowledge and understanding of adversaries' partnerships and alliances. Responsible planners and operators must fully understand the strategic environment in which they operate and the pathway to that understanding is partnerships and alliances. No one has the full solution on their own.

BGen Moar explained that partnership expansion has been ongoing. NORTHCOM, INDO-PACOM, EUCOM, USCG and Canadian and international forces are integrating in ways they hadn't before with an enhanced operating picture, improved communications and information sharing. This information sharing includes NATO and the Alaska Native community. This integration work led to a new level of nuance and complexity that hadn't been reached before. While not seamless, it was well executed and an improvement from the past. This work highlights the fact that there are multiple layers to the ANR security strategy. This includes Indigenous communities, academic institutions, and science and technology and innovation organizations. Through these connections ANR can find better ways to operate. The bottom line is that each new partnership opens and unlocks new capabilities. This conference offers an opportunity to bring together a team that can inclusively chart a course for a more secure and open Arctic.

Brigadier General David Moar addresses ASDC participants on day two.

Panel 3: An "Axis of Adversaries?" China, Russia, and Others

Moderator: Dr. Matthew Rhodes, Professor of International Security, School for Arctic Security Studies, Ted Stevens Center.

Speakers:

- Dr. Graeme Herd, Professor of Research and Policy Analysis, George C. Marshall Center
- Dr. May-Britt Stumbaum, Professor of Strategic Security Studies, George C. Marshall Center
- CDR Rachael Gosnell, Military Professor of Strategic Security Studies, George C. Marshall Center

Panel 3 Introduction

The "An 'Axis of Adversaries?' China, Russia, and Associated States" panel convened policy and defense strategy experts to analyze how Russia's invasion of Ukraine and China's rising global presence have reshaped global power dynamics and security considerations. Recognizing how the war in Ukraine has fundamentally altered both Russia's capabilities and how other nations perceive Russian power and intentions, as well as China's evolution as a global actor, the panelists offer an evaluation of current Western policy approaches and recommendations for future strategy. The panel contemplates the emergence of a new bloc of aligned authoritarian states, with particular attention to how this will manifest in the Arctic region, requiring carefully tailored policy responses that account for both the region's unique characteristics and its connection to global power competition.

Panel 3 Summary

To open the session, the panelists addressed two questions: what is the current state of affairs in China and Russia and what is the response?

China: In China today it is important to understand that the central concern is regime survival and maintaining a strong grip on power and this affects all other actions. Thus, the Chinese leadership will not allow any peaceful evolution of democracy and no challenges to the Chinese system. Democracy and human rights are red lines for China. The government is driven by the fear of losing power and has constructed a total national security paradigm. Traditional and nontraditional security threats are melded together shaping China's approach to action. National Security is built with political, economic, cultural, social, science, informational and nuclear consideration. The government wants complete autonomy over its actions and decisions and control over all matters with "empire influence" shaping a new world order. Thus, China applies a whole of society approach that will contribute to their efforts to challenge the current world order and replace it with one more favorable to autocratic regimes. An axis of upheaval can help

achieve this as chaos can create room for a new order. China is working across the Middle East, the South China Sea and with an array of countries from the global South that want change.

The Arctic is part of China's global plan. This includes control of sea routes, particularly those the US controls. China is working to increase its influence but not with a collaborative approach or sharing of technologies. Chinese authored articles comprise 10% of Arctic writing, a five-fold increase in the last twenty years. However, this information is published in Chinese journals and not shared with outside researchers. Scientific work and collaboration with Russia; however, is rising. Due to Russia's attack on Ukraine, Russia is increasingly dependent on China. In Europe, there has been a convergence of concern over China's actions and the need to address the challenges arising from China. While there are different views on whether to characterize the growing relationship among China, Russia, Iran and North Korea as an axis of upheaval and the exact nature of the cooperation between Russia and China, there is rising wariness and increasing convergence of concern across Europe and North America. The West requires effective partnership to deal with intensified challenges from China.

Russia: In Russia there has been internal consolidation with an increasingly totalitarian regime. Putin has defined himself with the war in Ukraine and he needs the war to consolidate the elite and bind society. Russia has considerably more assets than Ukraine but the war, nonetheless, threatens Putin's regime also. Fully societal mobilization is risky and elevation to nuclear use risks the global South turning against him. As Russia pursues what it perceives as its national interests, the security architecture of the Arctic is undergoing unique, transformational change. There is an intersection of environment, economic, geopolitical and security concerns and policy underpins all these intersections. Transformational changes evolved after the 1987 Gorbachev speech at Murmansk with Arctic exceptionalism and improved cooperation, but that ended in 2022. Putin determined that cooperation with the West is futile, and China stepped into this gap. China first established its scientific presence in 2004 with the Yellow River Research station on Svalbard and continues investing heavily in the Arctic.

The Russian-China partnership currently serves the mutual interests of China and Russia. Russia does have an advantage with subs and hypersonic capabilities and China wants to benefit. Military cooperation has thus far been more rudimentary but cooperative military activity is on the rise. In 2022, seven Russian and Chinese warships operated in Alaskan waters and in 2024 this increased to eleven. In 2024, the two executed their first joint air patrols. This is reflective of mutual interests. Russia while the junior partner, still has things China wants. Russia's oil and gas is largely located in Arctic. The Arctic accounts for 10% of Russia's GDP and 20% of its exports and Russia needs a market for its exports. Russia also needs technology and investment, and China is helping Russia filling its gaps. The sovereignty and security issues represent a conundrum for Russia. If mutual interests

diverge, the cooperation will likely fall apart as there is a long history of distrust between the two nations. However, currently with the Arctic becoming more accessible, and a common desire to weaken the West, Chinese-Russian cooperation is benefitting both sides. Given Putin's need to hold on to power in the midst of an expensive and potentially destabilizing conflict, could he be close to giving China keys to the Arctic kingdom?

The discussion then turned to the question of whether the Allied policies on the Arctic worked or if they have driven Russia and China closer together. The answer is a bit of a Catch-22. The right policies were in place, but those policies did drive anti-world order counties together. Authoritarian regimes and bottom-up democracies don't go together, and this can lead to systemic conflict. China's current government leaders have a DNA of being always under siege. While not easy, collaboration is important and necessary with China and Russia on issues like changing operational environments. As China has a whole of society approach, good messaging must combine business and security interests. China will try to avoid direct confrontation and wants to present a strong image to the outside world. This should shape the awareness of Arctic allies while working with China; we can't decouple completely and need to bring multiple aspects to dealings with China. Arctic allies and partners don't have economic prowess to force China to bend to their will. Risk, therefore, must be managed with awareness, innovation, and cooperation.

The security architecture of the High North has fundamentally shifted. The Arctic is one piece of a global chessboard, and allies must be mindful of the challenges that poses. The Arctic is unique and needs special cooperation. The first task of operating in the region is survival. But a comprehensive and holistic approach is necessary. The Arctic strategies are a great start and are promoting more cooperation and collaboration with partners, but those strategies are just the beginning of what is needed. The real challenge of strategy is implementation and ensuring proper resourcing to do so successfully. Credibility in capability is key. Domain awareness is critical! Seven of eight Arctic nations are allies; those nations need to share intelligence and need to incorporate new technologies such as AI and unmanned platforms. Questions must be addressed like how to overcome limited infrastructure and the effects of a changing environment (e.g. thawing permafrost)? The supply chain must take into consideration the harsh environment of Arctic.

Arctic and security policies must reestablish deterrence, and support NATO Article 3 and 5. It is also important to diminish the seams that adversaries could exploit. The Chinese Russian partnership is one of mutual interest and not an alliance. Russia respects strength. Thus, the Allies need to demonstrate strength in the Arctic, and clearly signal capabilities. There are very few mechanisms for dialogue, so it is difficult to use them to communicate deterrent capabilities. Allies must be prepared for a competitive Arctic. There need to be set action responses for violations of Article 3 (e.g. cutting of cables). Overall, the Allies must be comprehensive in response, apply a whole of society approach, improve deterrence and communication capabilities, and demonstrate that deterrent capability.

Another point of discussion was the nature of the relationship between Russia and China has changed; to include the increased speed of military developments both within and between the two countries. Russia blocked China's observer status on the Arctic Council until 2013 and then required China to recognize the sovereignty of Arctic nations. After 2014, China started filling an economic void in Russia as western companies left. Exercises between the two have been increasing in complexity and there is increasing activity in "hot spots" in the Pacific. Warfighting capabilities sharing however, is still guarded. Putin views the world as zero sum so incredibly complex exercises are not likely. This activity is a signal to the West of China and Russia's cooperation and ability to work together. If Russia starts sharing underwater platform technology, the West should be very concerned.

China's current leader is the first to really reach out to Russia and progress the relationship further. China's military modernization is advancing quickly and is less reliant on acquiring Russian technology. Russia is also now in a weaker position and less able to say no to Chinese requests. North Korea is also seeking Russian technology and would like sub technology.

Russia has significantly ramped up its military production capability. Russia is a long-term threat, and the Russian industrial base is powerful. Both Russia and China are state driven economies and can demand production from their industrial bases. Across Arctic nations, the West must expedite its response. There is no easy answer to build capabilities. It will be important to create public-private partnerships. The defense apparatus must work with private industry to reduce bureaucracy and expand capabilities. Pressure is mounting as Ukraine is struggling and this is a huge European concern. Russian threats go beyond military to hybrid threats such as attacks on communications infrastructure like sea cables. Information wars are also a threat. The West needs more awareness of challenges it faces and the significance of the threat.

The military is only one part of the threat. Misinformation narratives have the ability to shape reality, and these must be countered. Arctic nations need to give people more awareness about the challenges they are facing, NOT isolating it to the governments. The PUBLIC needs to understand and trust beyond the government and feel ownership of these conflicts. With the addition of Finland and Sweden, NATO's eastern flank has merged with the Northern flank. With the opportunity for misperception growing, NATO needs to maintain strategic narratives and get out the NATO story line: the truth to counter Russian misinformation. This is challenging as it is difficult to get in the space of authoritarian governments. Arctic Allies need to preserve decision making space for leadership by getting ahead of the story. Allies also must use new formats and agreements among NATO Allies to address key issues like maritime security and equipment and infrastructure development.

The discussion concluded with an examination of Russia's current involvement in the Arctic Council. Russia is still part of the Arctic Council and when Norway assumed

chairmanship, the working groups began some very limited work including Russian participation. As Russia comprises 53% of the Arctic coastline, some scientific cooperation is necessary. The Arctic Council offers a lower threat level to resume some collaboration with Russia. Communications from the Cold War offers some examples. For example, red phone hotlines existed between military leaders to share info and prevent misunderstandings.

It is essential to understand the nature of the confrontation—that it is global, that Russia and China are driven by national interests, and that Allied strategies need an honest assessment of gaps and a consistent commitment to resourcing and implementing appropriate capabilities. A successful response to Russia and China necessitates improving communications among Allies, opening appropriate channels for communications with adversaries, and employing effective messaging to counter adversary misinformation and false narratives.

(left) Dr. May-Britt Stumbaum (speaking) and (right) CDR Rachael Gosnell discuss China and Russia during Panel 3.

Panel 4: NATO at 75: New Allies and New Challenges

Moderator: Dr. Matthew Rhodes, Professor of International Security, School for Arctic Security Studies, Ted Stevens Center.

Speakers:

- Dr. Sten Rynning, Director, Danish Institute for Advance Study, University of Southern Denmark
- CDR Dr. Stefan Lundqvist, Pro-Dean, Swedish Defense University
- Ms. Minna Alander, Research Fellow, Finnish Institute of International Affairs
- MG Matthew van Wagenen, Deputy Chief of Staff (Operations), Supreme Headquarters Allied Powers Europe
- Mr. Michael Ryan, former US Deputy Assistant Secretary of Defense

Panel 4 Introduction

The "NATO at 75: New Members, New Challenges" panel assembles speakers from high-level institutions in Northern NATO Allied states to discuss how NATO adapts to new security challenges while maintaining its core mission and values, particularly in light of recent geopolitical developments. Seeking to understand both its historical trajectory and future directions, the panelists assess how NATO's evolution affects different Allies in distinct ways based on their geographic position, security needs, and strategic priorities. While acknowledging the complexity of transforming such a large multinational organization, the panel sets out to determine the most vital principles to fortify the NATO Alliance and approaches to Arctic challenges and operational capabilities. The panel maintained a forward-looking orientation, analyzing future developments that strengthen the alliance's effectiveness in addressing emerging security challenges in the Arctic and beyond.

Panel 4 Summary

The "NATO at 75: New Members, New Challenges" panel assembled speakers from high-level institutions in Northern NATO Allied states to discuss how NATO adapts to new security challenges while maintaining its core mission and values, particularly in light of recent geopolitical developments. Seeking to understand both its historical trajectory and future directions, the panelists assess how NATO's evolution affects different Allies in distinct ways based on their geographic position, security needs, and strategic priorities. While acknowledging the complexity of transforming such a large multinational organization, the panel sets out to determine the most vital principles to fortify the NATO Alliance and approaches to Arctic challenges and operational capabilities. The panel maintained a forward-looking orientation, analyzing future developments that strengthen

the alliance's effectiveness in addressing emerging security challenges in the Arctic and beyond.

The panel discussion revealed both enduring patterns and emerging challenges in NATO's evolution as it adapts to new Arctic security dynamics. Throughout NATO's history, the alliance has consistently operated on what one speaker described as "two legs," maintaining unity among Allies while keeping adversaries at bay. Following the collapse of the Soviet Union, NATO had assumed Europe was "fixed", shifting their focus to Afghanistan and the War on Terror, opening the doors for the annexation of Crimea by Russia, and the current state of global affairs regarding the invasion of Ukraine. The Alliance is now working to catch up to this new reality, developing new plans and force structures since mid-2022, though implementation remains in early stages. This adaptation process is particularly complex for an alliance of 32 members, requiring careful balance between building consensus and maintaining effective deterrence. From this experience, several crucial lessons emerge that directly impact NATO's approach to Arctic security.

First and foremost is the critical importance of maintaining Alliance unity. Speakers emphasized that NATO must avoid subdividing its policy into regional groups or commands, pointing to the experience in Afghanistan where such division led to fragmentation. This has direct implications for Arctic policy, with experts specifically warning against establishing a separate Arctic Command, as proper consensus has not yet been affirmed. While NATO is still developing agreement on their Arctic policy, the panelists signal that lessons can be learned regarding contemporary sea warfare from the conflicts in the Black Sea. Additionally, NATO must ensure its political commitments align with both consensus among members and actual military capabilities. The 2008 promise of Ukrainian membership without underlying consensus and the military interventions in Afghanistan and Libya demonstrate the risks of policy outpacing consensus and capabilities.

While NATO must engage with global geopolitical issues, speakers stressed that it cannot let these overshadow its core regional mission. Historical examples, such as Nixon opening diplomatic relations with China and the War on Terror, show how excessive focus on global issues can create anxiety among European Allies and potential opportunities for Russian influence. This suggests NATO's Arctic strategy should primarily focus on regional security while considering broader global implications. Furthermore, panelists argue that NATO needs to develop a more sophisticated and systematic understanding of Russia as an Arctic, European, and global actor, as the current framework has remained largely unchanged since 1997.

The addition of Finland and Sweden to NATO represents a significant shift in Arctic security dynamics. Finland's unique position as both an Eastern and Northern flank state, combined with its extensive history managing relations with Russia, brings valuable

expertise and strategic capabilities to the Alliance. Furthermore, Finland operates with a disparate Arctic framework than the US, in that there was no separate strategy for Arctic warfare, it was intrinsic in their national defense strategy. The Finnish approach to defense differs markedly from most NATO members, relying heavily on territorial defense and a reserve force system that comprises 95% of its land forces, offering new perspectives on Arctic defense capabilities.

Similarly, Sweden's membership marks a historic shift in its foreign policy, driven by recognition of Russia's ambitions to dominate its neighbors and the increasing strategic importance of the Arctic due to shifting environmental conditions. Both countries emphasize the need to defend democratic values against threats from Russia and China, pointing to incidents like cable cutting in the Baltic Sea as examples of ongoing challenges. Speakers note that the additions of Finland and Sweden to the Alliance allow them to convey defense strategies for Arctic environments and enhance procedural, technical, and human interoperability.

The current operational environment in the High North presents unique challenges that extend beyond traditional military confrontation, including espionage, sabotage, electromagnetic interference, and the weaponization of migration. Looking at tensions in the Barents Sea, panelists note that the challenges for NATO are not of a tactical nature, but of a strategic one. Command and control structures are being adapted to address these challenges, with new arrangements covering Denmark, Iceland, and the Arctic Circle. However, significant challenges remain, including the integration of Alaska as NATO's western flank, which requires improved cooperation between NATO and USNORTHCOM, enhanced protection of critical undersea infrastructure, expansion of industrial capacity to match Russia's military production, and focus on addressing capability gaps among Allies.

The panel highlighted several critical areas for NATO's development, including building a transatlantic defense industrial base, understanding aggregate demand for military capabilities, developing integrated air and missile defense, accelerating innovation in logistics and procurement, bridging the gap between hard and soft security institutions, and incorporating space as a warfighting domain. Ongoing debates emerged during discussion about whether to develop a single transatlantic industrial base or separate North American and European bases, as well as questions about information and intelligence sharing among Allies and the integration of unmanned aerial systems in Arctic conditions. Additionally, concerns were expressed about the future of NATO in the incoming presidency, noting past criticism from President Elect Trump surrounding US financial contributions to NATO.

The implications for Arctic security in the 2020s are significant. NATO faces the complex challenge of balancing regional focus with global implications in the Arctic, where the changing operational environment and great power competition intersect. While the

addition of Finland and Sweden strengthens NATO's Arctic capabilities, it also increases the complexity of coordinating responses to Russian activities. The emphasis on unity and consensus- building suggests that NATO's approach to Arctic security will likely be gradual and carefully considered rather than revolutionary. A point of contention emerged regarding the extent to which NATO should take precedence for those with Arctic security priorities. This disagreement between the panelists and the audience hints at a mismatch of institutional expectations, where some Arctic stakeholders see NATO as just one component of a broader security architecture rather than as the primary framework for regional defense.

The panel discussions reveal a fundamental tension between NATO's traditional operational model and the unique demands of Arctic security in a rapidly evolving global landscape. The introduction of Finland and Sweden has brought about new strategic perspectives that challenge NATO's conventional thinking, particularly Finland's integrated approach to Arctic defense, which contrasts sharply with the compartmentalized strategies typically favored by NATO members. This divergence indicates that NATO's effectiveness in the Arctic may require a fundamental rethinking of its organizational structure rather than simply extending existing frameworks to a new theater. The debate over whether to establish a separate Arctic Command exemplifies this tension, highlighting the challenge of balancing regional specialization with alliance cohesion.

The panel's discussion of industrial capacity and technological adaptation points to a critical gap between NATO's ambitions and its operational capabilities in the Arctic. The emphasis on building a transatlantic defense industrial base, while necessary, exposes deeper questions about NATO's readiness to address immediate Arctic security challenges. The ongoing debate between developing a unified transatlantic industrial base versus separate North American and European bases demonstrate competing visions of regional versus global strategic frameworks.

Another theme emerging from the panel is the evolution of security threats beyond traditional military confrontation. The panel's focus on protecting critical undersea infrastructure and integrating space as a warfighting domain suggests a recognition that Arctic security requires a more comprehensive, nuanced, and modernized approach than NATO's traditional military-centric strategy. Such discussions indicate that while NATO recognizes the changing nature of Arctic security challenges, its institutional framework may not yet be sufficiently evolved to address them.

The high price tag attached to developing necessary capabilities, combined with the technical challenges of operating in Arctic conditions, signifies that significant investment and innovation will be required to establish credible deterrence in the region. NATO's effectiveness in the Arctic will likely depend on its ability to integrate diverse capabilities and approaches, from Finland's territorial defense model to emerging technologies like unmanned systems, while maintaining alliance unity and matching capabilities to political

commitments. The success of this integration, coupled with the alliance's ability to address industrial and technological challenges, will largely determine NATO's ability to maintain security and stability in the Arctic region during this decisive decade.

Looking toward the decisive 2020s, the panel's discussions highlight both opportunities and vulnerabilities in NATO's Arctic strategy. The Alliance's experience with policy outpacing consensus and capabilities, serves as a cautionary tale for Arctic policy development. The panel's emphasis on maintaining alliance unity while developing new capabilities demonstrates a recognition that effective Arctic security requires both political consensus and operational readiness. However, the discussions also revealed significant uncertainties about NATO's future direction, particularly in light of leadership changes and ongoing debates about burden-sharing and capacity-building among Allies. These uncertainties, in concert with the complex challenges of Arctic security, suggest that NATO's ability to develop and implement effective Arctic strategies in the 2020s will depend heavily on its capacity to resolve these fundamental tensions between regional specialization and alliance cohesion, between traditional and hybrid threats, and between political ambitions and operational capabilities.

(left) CDR Dr. Stefan Lundqvist and (right) Ms. Minna Alander (speaking) during the panel 4 discussion.

Panel 5: Indo-Pacific Allies and Partnerships

Moderator: Prof. Michael Burgoyne, Professor, Daniel K. Inouye Center.

Panel Speakers:

- Dr. Narushige Michishita, Executive Vice President, National Graduate Institute for Policy Studies (virtual)
- Dr. Nick Bisley, Dean of Humanities and Social Sciences, La Trobe University
- Prof. Shyam Tekwani, Professor, Daniel K. Inouye Center
- Ms. Susannah Patton, Director, Southeast Asia Program, Lowy Institute (virtual)

Panel 5 Introduction

The "Indo-Pacific Allies and Partnerships" panel brought together experts from academic institutions throughout the Indo-Pacific to compare different states' perspectives and approaches to national security and Arctic ambitions, as well as opportunities for further collective action. In a period of significant transformation in Indo- Pacific security relationships, driven by factors like China's growing assertiveness, changing US engagement in the region, and evolving interstate dynamics, the panelists examine how different regional powers are adapting their security frameworks and relationships and being shaped by multiple overlapping bilateral and regional arrangements. The insight regarding Southeastern Asian security allows the panel to highlight this sub-region's crucial role as a theater where major power competition plays out and examine how that competition creates consequences across the region.

Panel 5 Summary

Many Asian nations identify that research, resource extraction, and shipping are national interests in the Arctic. Several Asian countries have expressed Arctic interests in Arctic policy or strategy documents. Some have expressed a desire for participation in the Arctic Council. In the last decade, five Asian states have been granted Arctic Council observer status: Japan (2013), People's Republic of China (2013), India (2013), Republic of Korea (2013), and Singapore (2013). This panel explored the unique security interests of several Asian nations highlighting differences as the Arctic is viewed through different lenses. Views on China, great power competition, and Arctic policy were discussed.

A common thread among the nations represented on this panel was the desire to manage their relationship with China, avoiding friction, while simultaneously pursuing their own Arctic interests. While the nations discussed by this panel held similar policy views of the Arctic, an important caveat, which was noted by several panel members, is that South Asian and Southeast Asian nations are incredibly diverse. With varied histories, cultures, challenges, and relationships, these nations are not homogeneous, and they do not hold

the same view of the Arctic. These diverse perspectives intersected in their wariness of China's growing power.

Trends:

1. China's growing influence is the primary security challenge for the region.

2. Increasing competition between the US and China is adding to the perception of instability.

3. The Sino-Russian relationship is challenging multilateralism in the region.

Consequences of China's Growing Influence

China's influence in Southeast Asia emerged from the discussion as a shared security challenge with significant influence over the strategic thinking of the represented Asian nations. China challenges the US in trade,

foreign investment, and recently also in security cooperation as seen in Cambodia. A focus on China was clearly illustrated when each panel member initiated their presentation with a discussion of their relationship and vulnerability to China before bringing up the Arctic. Examples of this interpretation included discussions on Chinese interference in their neighbors' domestic affairs, analysis of Chinese missiles capabilities, and threatening Chinese rhetoric. For example, in March of 2024, the Chinese ambassador to Japan said that if Japan was to interfere with China's internal affair with Taiwan, that the Japanese people would be brought under fire. In sum, many Asian nations see the Arctic as a secondary security priority and want access to the Arctic that is equal to China.

While not explicit in policy, some nations identified China's interest in the Arctic as a reason for their own Arctic strategy and growing Arctic interest. This implied that some were less interested in how scientific discovery, Arctic resources, and commerce impacted their own countries, than in how China might gain further advantage in the Arctic.

Perspectives on Competition Between US and China

Great power competition between the US and China has brought anxiety to Southeast Asia. Panel members seemed to agree that there is growing instability in the region as a result of growing strategic competition between the US and China. Tension between the US and China has brought with it a lot of anxiety in Southeast Asia. The November 2024 US Presidential election further exacerbated such concern. Panel members discussed concern over a second Trump administration. In general, the region is waiting to see what the second Trump administration does in Asia, and what that means for the region. One interpretation of anticipated cabinet appointments indicated a hawkish stance. A common opinion was that much will hinge on whether Trump stands up to China or retreats from the region.

Differing viewpoints hinged on the nations' security relationship with the US (e.g. whether the nation represented on the panel had defense treaties with the US). For example, the defense of Japan, South Korea, and Taiwan are linked in agreements between Asian states and the US. As a result, nations with US defense agreements were highly interested in issues such as missile defense, a Chinese invasion of Taiwan, North Korea's nuclear capabilities, risk to US bases in the region, and civil defense. This contrasted with non-aligned nations whose policies suggest that avoiding a commitment keeps these other regional flashpoints at an arm's length. An interpretation of India's policy, for example, sees strategic autonomy as a more assertive approach based on realism with no permanent friends or permanent enemies. A commonality among panel members regardless of alignment was that both US Allies and non-aligned countries have increased defense spending in response to their perceived threat from China.

The Sino-Russian Relationship

Discussion of Russia suggested panel members viewed Russian involvement in the region as much less significant than Chinese influence. Russia continues to be an arms supplier to many non-aligned counties in the Region. Following the Russian invasion of Ukraine, Putin visited Vietnam where Russia provides a counterpoint to Chinese dominance. Moreso than Russia's connection to the region, the Sino-Russian relationship warranted discussion.

The panel members shared diverse viewpoints on the partnership without limits between China and Russia. Panel members pointed out that the Asian perspective on the China-Russia relationship differs from the European perspective in that Asia recognizes that China is not intentionally bolstering Russia but merely acting in its own self-interest. One voice summed up the China-Russia relationship as being responsible for the end of multi-literalism. This viewpoint was explored in different ways by other speakers. Together China and Russia have taken sway in ASEAN, Shanghai Forum and other organizations. ASEAN was discussed as a strategic balance, of sorts, to NATO. Nevertheless, as China grew more antagonistic to its neighbors in the last ten years, many Southeast Asian nations are choosing to diversify their partnerships to hedge against China's dominance. In a way, the Chinese relationship with Russia could explain the Arctic interest among smaller Asian nations, but this seemed less important to the panel than China itself. Security overall, including Arctic Security, was always considered with China in mind while little attention was given to Russa.

In response to questions about connections between the NATO theater and the Asian theater, responses varied. Panel members discussed the use of North Korean troops in Ukraine as a touchpoint. Panel members reflected on NATO's role, responsibility, and influence outside the NATO theater. Questions in response asked if European countries would have the capacity for involvement in Southeast Asia given Russia's revanchist agenda. Connections were pointed out between Asian defense expenditures and Russian

arms. A general agreement arose that these distant theaters are connected in global competition. An illiberal Chinese and Russian vision for a new world order contradicts the Western world order, values, and interests of the West.

Replying to a question about describing the Himalayan region as a third pole, panel members pointed out similar consequences of shifting environmental conditions in the Arctic and the Himalayas. For example, uncertainty in water security compound political tensions as India and others anticipate "water wars".

Conclusion

This panel, which met to explore Indo-Pacific perspectives on the Arctic, was dominated by discussion of China's ambition as a global power, military growth, and increasingly threatening behavior toward its neighbors. In addition to raising awareness of the Pacific connection to the Arctic, this discussion underscored the degree to which China now dominates the region's attention regarding security with and without Russia. The assembly of Arctic scholars, policymakers, and security practitioners were reminded that the rise of China is the most significant global security issue. While the discussion largely departed from the Arctic, the departure underscored the urgency for a secure, peaceful, and prosperous Arctic by shedding light on the grave concerns in the adjacent regions surrounding China.

Break-out Sessions

Investing to Shape the Future of the Arctic - The Evolving Role of Education in Meeting Emerging Challenges

Session Introduction:

The Arctic region has grown in strategic importance due to its abundant natural resources, vital shipping lanes, and increasing geopolitical relevance. To address the region's unique challenges and opportunities, the Arctic Domain Awareness Center organized a session titled "Investing to Shape the Future of the Arctic: The Evolving Role of Education in Meeting Emerging Challenges." This event brought together educators, policymakers, industry leaders, and community representatives to discuss how education can develop a resilient and skilled workforce tailored to the Arctic's specific needs. The discussions focused on six key areas: educational infrastructure, community engagement, transdisciplinary collaboration, cybersecurity, international partnerships, and environmental adaptation.

Panel Discussion:

Central to the session was the imperative to develop a robust educational infrastructure that equips individuals to address the Arctic's unique challenges. Educational investments concentrate on building workforce skills in resource management, technical operations,

and environmental stewardship. For example, the Denali Commission funds K-12 programs such as Alaska Resource Education, which introduce students to careers in resource management, including oil, gas, and renewable energy sectors. This early engagement ensures that students understand the diverse opportunities within the Arctic economy and are prepared to meet its specialized demands.

Innovative educational methodologies help overcome the geographical barriers inherent in Arctic communities. Virtual reality (VR)-based training programs enable remote students to acquire practical skills such as heavy equipment operation and power plant maintenance without relocating. This technology bridges the gap between remote education and hands-on skill acquisition, ensuring that all students have access to high-quality training.

Higher education institutions play a crucial role in this educational ecosystem by offering specialized programs that address the Arctic's critical needs. Institutions such as Alaska Pacific University and the University of Alaska system provide technical training and workforce development programs in fields including marine transportation and disaster resilience. These programs align with Arctic industry needs, enhancing local capacity and supporting regional economic growth. By synchronizing educational offerings with industry requirements, these institutions ensure that graduates effectively contribute to the region's operational stability.

Beyond infrastructure, the session emphasized the importance of resilience and community engagement in Arctic education. Resilience within Arctic communities connects closely to security and disaster preparedness, requiring active community involvement and the integration of local knowledge. The Teaching Through Technology (T3) program at the University of Alaska Fairbanks exemplifies this approach by engaging rural students in projects that address local challenges, thereby enhancing community resilience. Indigenous-led initiatives, such as the Alaska Native Success Initiative, play a crucial role in supporting native students to achieve their academic and professional goals. These programs ensure that educational initiatives remain culturally relevant and inclusive, fostering a diverse and knowledgeable workforce capable of addressing the Arctic's multifaceted challenges.

Partnerships such as NOAA's Energy Ambassadors program highlight the importance of community engagement. By training regional leaders to collaboratively address local energy issues, this initiative promotes a cooperative approach to energy management and resilience, essential for developing sustainable solutions tailored to the specific needs of different Arctic regions. Such collaborations ensure that educational programs not only address immediate community needs but also empower students to take active roles in enhancing their community's resilience.

The session highlighted that addressing the Arctic's complex challenges requires a transdisciplinary approach that integrates environmental science, engineering, security,

and social sciences. Collaborative efforts enhance the ability to develop comprehensive strategies and solutions. A notable example is the Arctic Cybersecurity Working Group, which brings together researchers from the United States, Canada, and Finland to develop cyber resilience strategies tailored to Arctic conditions. Their efforts strengthen regional cybersecurity defenses against emerging threats, ensuring that the Arctic's expanding digital infrastructure remains secure. Another significant collaboration involves the University of Alaska and the Wilson Center, which trains students to monitor nuclear test sensors, directly linking education initiatives to global security needs. By bridging academic training with practical security applications, these partnerships create pathways for students to engage in meaningful and impactful work that benefits both the Arctic and the broader international community.

As the Arctic's infrastructure continues to expand, cybersecurity becomes increasingly critical. Protecting critical systems from emerging threats requires robust cybersecurity measures integrated into educational programs. The Department of Homeland Security's Arctic Center of Excellence exemplifies this effort by offering internships and apprenticeships that incorporate cybersecurity training into broader research initiatives. This approach prepares students to safeguard the region's infrastructure effectively, ensuring that the Arctic's digital landscape remains resilient against potential cyber threats. Moreover, national laboratories partner with universities to secure essential infrastructure to include broadband and power systems. These collaborations develop specialized curricula and bring invaluable expertise to enhance cybersecurity readiness. By developing targeted educational programs, these partnerships ensure that the Arctic's digital infrastructure remains well-protected, addressing the unique cybersecurity challenges posed by the region's remote and harsh environment.

Effective management of Arctic challenges also relies on international and multisector partnerships. Collaborative efforts among nations and sectors foster cooperation and shared solutions, addressing the region's complex and shared issues. For instance, US-Canadian collaborations on environmental adaptation and hydrology have resulted in shared technologies and knowledge transfers that benefit both countries, enhancing regional resilience and operational efficiency. The International Arctic Research Partnership Consortium (IARPC) further exemplifies such collaborative initiatives by facilitating cooperation among 18 federal agencies and international researchers. Through collective research and resource sharing, the IARPC advances priorities such as permafrost dynamics and environmental resilience, driving progress on critical Arctic issues. Universities play a vital role in these partnerships. The University of Colorado's collaborations with local entities such as NORAD, the Space Force, and NOAA ensure that academic research aligns with operational Arctic security needs. This seamless integration between theoretical research and practical application ensures that educational programs remain relevant and directly contribute to regional security and sustainability.

The changing operational environment emerged as one of the most pressing issues facing the Arctic, with significant impacts including ice loss and shifting fish stocks requiring coordinated adaptation strategies. NOAA's Arctic environmental monitoring programs track ice movement and ocean-atmosphere interactions, providing data essential for fisheries management and coastal resilience planning. This information supports proactive measures to mitigate the effects of shifting environmental conditions. Additionally, a permafrost thaw study funded by the Army Research Office employs remote sensing and ecological modeling to predict and mitigate the effects of abrupt terrain changes caused by permafrost thaw. This research safeguards infrastructure and ensures community safety in the face of a rapidly changing environment.

The strategic implications drawn from these discussions emphasize the need for holistic security approaches, workforce development, strengthened cybersecurity, and community-driven solutions. A holistic approach to Arctic security integrates military, environmental, and community perspectives to create an effective security framework. The Arctic Summer Internship Program exemplifies this by allowing students to collaborate with Indigenous communities and federal agencies on security challenges, fostering a comprehensive understanding of security that includes both human and environmental factors.

Workforce development emerged as another critical area, emphasizing the necessity to cultivate a skilled and specialized workforce for Arctic operations. Programs such as HS-POWER offer internships with FEMA, TSA, and the US Coast Guard, providing necessary clearances and Arctic-specific skills. This targeted workforce development ensures that graduates are prepared to meet the unique demands of Arctic operations, thereby supporting the region's sustainability and security.

Strengthening cybersecurity is imperative given the expansion of digital infrastructure in the Arctic. Research funded by the Department of Homeland Security at institutions such as the University of Illinois explores vulnerabilities in supply chains and communication systems, focusing on enhancing the resilience of these critical infrastructures against cyber threats. Continuous innovation and research in cybersecurity protect the Arctic's expanding digital landscape, ensuring operational integrity and security.

Community-driven solutions, particularly those incorporating Indigenous knowledge, are essential for effective problem-solving and resilience in the Arctic. Initiatives where indigenous hunters train university students in field safety by teaching them to interpret environmental cues, such as frost on trees, demonstrate the value of traditional knowledge in enhancing educational programs and resilience strategies. These community-driven approaches ensure that initiatives remain culturally appropriate and sustainable, fostering a sense of ownership and relevance among local populations.

Looking ahead, the session provided several recommendations to sustain and enhance Arctic education and workforce development. Expanding educational pathways is crucial to ensure a continuous pipeline of skilled professionals ready to address Arctic challenges. Programs such as the Alaska Native Science and Engineering Program (ANSEP) facilitate the transition of Indigenous students from elementary education to professional STEM careers, promoting diverse and inclusive participation in Arctic workforce development. Increasing funding and resources for these programs, along with developing new educational pathways that support diverse student populations, particularly Indigenous communities, are essential steps.

Enhancing multilateral cooperation emerged as another key recommendation. Strengthening international collaborations to develop unified cybersecurity frameworks and share expertise will enhance regional resilience against shared threats. Establishing Arctic-specific cybersecurity frameworks through collaborations with, for example, the Arctic Cybersecurity Working Group ensures that expertise from countries such as Canada and Finland contribute to a robust regional defense strategy. This cooperative approach not only enhances security but also fosters solidarity and mutual support among Arctic nations.

Accelerating environmental adaptation initiatives also proved essential. Implementing adaptation programs can mitigate the adverse effects of the changing operational environment on Arctic communities and ecosystems. Collaborative initiatives between NOAA and the University of Alaska, such as joint programs on fisheries management using regional data, provide actionable insights for sustaining marine resources and coastal communities. Allocating resources to such collaborative research projects and integrating data into regional planning and management strategies are critical steps toward ensuring the sustainability and resilience of the Arctic.

This session highlighted the critical role of education in preparing a skilled and resilient workforce for the Arctic's unique challenges. By addressing specialized educational infrastructure, community engagement, transdisciplinary collaboration, cybersecurity preparedness, international partnerships, and environmental change adaptation, the session outlined a comprehensive roadmap. The strategic implications and future

recommendations emphasize a holistic approach to Arctic security, robust workforce development, strengthened cybersecurity measures, and community-driven solutions. These educational strategies are essential for maintaining the region's resilience, security, and sustainable development. As the Arctic continues to evolve, these initiatives will ensure that the United States remains prepared to address emerging challenges and leverage opportunities in this strategically vital region.

Breakout session panel "Investing to Shape the Future of the Arctic."

Nordic Security Now

Session Introduction:

This session analyzed the impacts and implications of the accession by Finland and Sweden to NATO while placing NATO enlargement in the context of respective national interests, regional cooperation, the parallel role of the European Union, strategic competition, and other broader security developments. It was jointly organized by the Norwegian Institute of International Affairs, Fridtjof Nansen Institute, Swedish Defense University, and Finnish Institute of International Affairs.

Panel Discussion:

This session focused on security and defense in the High North from Norwegian, Swedish, and Finnish perspectives. All participants agreed that although the High North has not received significant attention from policymakers in the past, this region plays an increasingly important role in contemporary European security affairs.

From the Norwegian perspective, the High North is characterized by vast distances; sparce population; weak infrastructure from northern Norway to the Russian border; and difficult supply chain conditions. Infrastructure, which has not been updated since WWII, has to be updated to build a resilient and robust region. High North security is a public good that matters; it is essential to maintaining democratic values. Allies and partners need to re-

evaluate their mindsets and collective purpose to achieve security in this region. Although nations prioritize threats differently, and all security is local, collective imperatives related to High North security cannot be impeded.

The Swedish perspective is driven by the evolving security environment. During the Cold War, Sweden maintained a policy of neutrality and non-alignment. It avoided conflict between the US and USSR, as well as becoming a target of nuclear weapons. It was strategically in a defensive posture. The security environment changed in the late 1980s with the collapse of the USSR At this time, the Arctic security and defense environment began to look very promising. Gorbachev demonstrated his commitment to a peaceful and stable Arctic; the remaining Arctic 7 took his statements seriously. This extended into the early years of the 21st century, with Russian Arctic policy focused on economic development and cooperation.

Since 2020, however, a new strategic landscape has evolved (some would argue since 2014). Collaboration and cooperation have weakened. Russia has prioritized the Arctic in its defense policy. The Kremlin has adopted a "bastion defense" outlook, meaning that it wants to compel its neighbors to give way to Russian interests and aims to exercise control over what is now NATO territory. This more militarized Arctic security environment makes it difficult for the Arctic 7 to work on issues with Russia, including environmental challenges.

Sweden's current defense and security priorities include crude oil traffic through the Northern Sea Route; subsea cable disruption in the Baltic Sea; and surveillance. It is focused on space cooperation with the United States and has a new space strategy with four pillars: 1) ensuring freedom of action in and through space; 2) creating a portfolio of space capabilities; 3) being an active and responsible partner in the international space arena; and 4) creating a coherent and knowledge-based space policy. Sweden will be an active and responsible Ally. It has many reservists and a robust military industrial complex.

For Finland, there has been continuity in the security environment, as Russian interests have remained the same for past 1000 years. Finland has three main security challenges: Russia, Russia, and Russia. As a result, maintaining the international rules-based order is paramount.

Russia has enhanced its military activities against the Nordic states in several ways. First, hybrid warfare has been ongoing and intense. The goal is to cause maximum disruption in Western societies but stay below the threshold of triggering a military response. Tactics range from prank calls to Western officials to cutting undersea cables. Russia tests hybrid warfare approaches first in the Arctic to allow the Kremlin to see how its explanations hold up. For example, in 2015, Russia tested migration as a weapon by bringing refugees to the Finnish and Norwegian borders. It is now doing this again at the Finnish border and in other contexts.

Second, cyber-attacks on the part of Russia are very effective. GPS jamming is an attack of choice; in Finland, airport navigation systems remain a single point of failure since there are no alternates, which would make landing impossible if systems were compromised due to cyber-attacks. There are increased satellite disturbances as well. Finland is testing public-private partnerships to supply defense forces. Its near-term future depends on the outcome of Ukraine war.

Finland has multiple strategies for addressing the Russian threat and desire to divide the Nordic nations. Subnational cooperation is important. Regional authorities and municipalities collaborate in many realms, including defense and security. This subnational cooperation is natural, as Norway, Finland, and Sweden share a common regional strategic and geographic area and sense of urgency compared to the national capitals. Finland also added 20 new military exercises in 2022, all of which were international, including Steadfast Defender and Arctic Challenge. There also are plans for a Nordic air force, which would be quite significant to multidomain security in the region.

The session discussed the "European perspective" on defense and security. The current norm of the United States providing Europe with security, and Russia providing Europe with inexpensive energy, has ended. Europe now needs to adjust and build a more independent strategic voice. European countries are putting more resources into defense and security, but it is unclear what this means for the Arctic. Also, how this situation will impact the EU-NATO relationship remains unclear. There are important questions regarding space and energy security. It is not clear that European countries fully understand the profound systematic changes taking place. It is clear, though, that a Nordic bloc is essential, as these countries will be stronger together.

Below Zero Medicine

Session Introduction:

The Below Zero Medicine (BZM) breakout session highlighted familiar topics – the significant role of Alaska in international power projection, US homeland defense, and as the northwest flank of NATO - through a medical lens. As the Arctic moves onto the world stage, there is the possibility of increased military engagements in cold weather environments. Objectives of BZM include developing medical capabilities through research and collaboration with global and local partners to build warfighters that can thrive in extreme cold environments and to competently care for those who are inured in such environments. More specifically, BZM aims to enable practitioners and equipment to react and respond quickly despite cold temperatures, acclimate quickly to extreme temperature changes, and reduce the potential for medical error at every stage of a process.

Panel Discussion:

The 2018 earthquake in Alaska sparked the realization that we may not have the Arctic medical readiness needed in case of significant natural disasters or military engagements. A medical readiness assessment revealed 67 gaps across cold weather training, equipment, supplies and capabilities. These findings stimulated new efforts in cold weather training and research. The outcomes of many of these efforts were tested during the 2024 Arctic Edge exercise, resulting in new data for the BZM community to implement in future training, gear and capability planning. General takeaways included that basic operations could take up to four times as long due to the impacts of extreme temperatures, and that both material integrity of equipment and survival probability of injured patients were at risk due to the extreme cold temperatures. The BZM breakout session presented future-oriented perspectives of challenges and solutions organized into four pillars: equipment, procedures, providers, and protocols.

On the equipment side of the equation, researchers were investigating ways to improve vehicle maintenance in cold weather, developing non-freezing water purification systems, and looking at ways to improve fuel storage and portability, as well as patient and provider hygiene. In cold weather, some metals and plastics become more brittle, fluid viscosity can change, machinery needs more attention to stay fully operable, and basic hygiene becomes challenging, as bare skin exposure can be fatal and waste disposal techniques must be altered. Additionally, freeze-thaw cycles can lead to faster degradation of shelter materials, batteries and other equipment.

One interesting example that contributed toward solving multiple challenges at once is the Total Resource Utilization (TRU) habitat. The system involves four tricons that can be separated, making for easy portability and containment. Two tricons are dedicated to transforming solid waste, including medical waste and human waste, into thermal energy spread about the habitat. A third tricon is used to recycle grey water and prep it for use on-site in laundries and showers. The final tricon is for black water processing that can then be reused in kitchens and latrines. In an environment so cold that water rations must be kept in valuable indoor heated space, this allows for water recycling, reducing the overall storage capacity needed for water onsite. There are also logistical benefits in a contested environment, as the TRU habitat reduces convoys and field fuel use, maximizes site resources, increases reusability and reduces the total weight of supply transport loads. A project like the TRU habitat also contributes to protection of deployed forces by reducing harmful emissions via alternatives to burn pits, raising morale through access to sanitary systems, and general improvements to shelters.

Other research focused more specifically on medical procedures and their level of success in cold weather conditions. Researchers evaluated where failure points were in different procedures, and how to improve equipment and training to avoid such failures in the future. Areas of improvement included developing stethoscope material that continues to

function in temperatures 40 degrees below zero, ensuring plastic containers and tools like oxygen bags and blood pressure cuffs maintain their integrity, identifying which adhesives work in cold weather and can handle sudden temperature changes, and how to improve equipment transport in and out of extreme weather to reduce damage during transport. Researchers tested MARCH protocols (medication, airway, respiration/breathing, circulation, hypothermia), and a newly developed Task Step Analysis Tool (TSAT) to gain data for their research. Participants of the BZM breakout session acknowledged that there is an opportunity for this field to benefit from collaboration with indigenous partners, the mushing community and the mountaineering community.

There is also a subset of BZM research focused on how to improve provider operations in extreme cold. Hand dexterity was identified as a major challenge, as well as the risk of causing harm to the provider or patient due to cold exposure during treatment. This research primarily is focused on understanding the human limits of providers and at which point is it necessary to move patient and provider into warmth to ensure success of treatment. Speed is imperative in emergency medicine, and cold is the enemy of speed. Researchers are using AI and nanotechnology to better understand these limits. Physical and cognitive performance are impacted by cold, and this truth needs to be recognized more widely as a major risk to campaign success in cold temperatures.

Another subset of BZM focuses on protocols and strategies to reduce BZM emergencies from happening at all. Within this, research is focused on thermal and mountain medicine, military nutrition and military performance. The USARIEM Research Mission in Cold Weather is currently writing guidance to these ends, called TB Med 508. TB Med 508 includes chapters on prevention, treatment and management of cold weather injuries, with specifics on physiological responses, frostbite prevention and treatment, hypothermia prevention and treatment, food and fluid intake and clothing and equipment recommendations. Additionally, it considers modifying factors in the environment and of the participating forces, that may impact proper responses in varying situations.

One interesting point made was that often a patient is in transit for over 24 hours before reaching their final destination and can change provider hands up to eight times. Each of these transitions has a potential risk of information loss, exacerbated by the mental and physical impacts of extreme cold weather. A recent success story features Iloprost, a frostbite treatment that was recently approved by the FDA and has the potential to significantly decrease the number of amputations done to treat frostbite. It can be administered up to twelve hours after frostbite takes hold and still be effective, and with further research could be effective up to 72 hours after frostbite occurs.

Finally, there was discussion of BZM veterinary care. Many of the same challenges exist in caring for military working dogs as in caring for human forces. One unique challenge is that dogs dissipate heat through breathing rather than sweating, so hyperthermia must be a concern if breathing is impacted, along with the basic cold weather concern of

hypothermia. Currently, there is no published guidance on cold weather canine operations, but the general consensus reflected the potential value of using animals in cold weather operations, and thus the importance to improve written guidance.

Threats through, to, and in the North American Arctic

Session Introduction:

This breakout session featured Canadian, American, Greenlandic, and Danish experts who critically analyzed defense and security threats through, to, and in the North American Arctic. They carefully parsed current and emerging risks and threats, with attentiveness to acuity in particular sub-regions or areas and identified opportunities for enhanced cooperation among North American Arctic Allies and Indigenous Peoples. It was organized by the North American and Arctic Defense and Security Network (NAADSN).

Panel Discussion:

In conceptualizing Arctic space, it is important to identify and assess security issues and avoid mislabeling or lumping them together. For example, in Canada security versus sovereignty can be a source of friction and activities may not be appropriately categorized. The conference thus far has encouraged us to think at a strategic level and this panel addresses what risk adversaries present to North America. With threats to, through and in the Arctic, it is important to identify the origin and ultimate target rather than bundling everything together as Arctic security. However, even when a threat comes from outside and passes through, it still has implications for the Arctic. Also, threats to the Arctic include shifting environmental conditions, which is not a conventional kinetic threat. Identifying who the security actors best equipped to meet the threat is another important aspect. Thus, Indigenous people as northern rights holders and first responders must not only be at the table but in the driver's seat. They thus serve as an essential component of both assessment and action. This panel will also allow us to broaden this discussion from a national to a North American lens.

It is important to remember that the Arctic is Indigenous, and we should recognize both human and environmental security. This is too often overlooked, as humans are an important part of the ecosystem. Threats to the Arctic should be humanized, as it is not just the ice but people who are affected. 80% of Alaska's Arctic population is Indigenous and they are there protecting the stability and biological environment. Additionally, the people of the North American Arctic are part of a transnational group traversing the Arctic. They have shared values of how to live sustainably with the land. If such rules aren't followed, then nature will exact a price. We haven't been following the time-tested value system that Indigenous people have used to sustain themselves and their environment and keep threats at bay. Sometimes Indigenous people do get some initial help but then are left to pick up the pieces afterward. Wartime practices have negatively affected Indigenous

peoples. It is crucial to maintain and apply Indigenous knowledge to best assess and respond to threats and construct a successful legacy.

Going forward, we must address how the Arctic and the rest of the world has changed. Advances in military technology have changed the threat. The bipolar world has been replaced by a multipolar world in which deterrence theory doesn't work effectively. With the US, Russia, NATO and China all more involved in the Arctic, we need to work to bring together like minded actors and prepare for technology changes that allow weapons to move faster and decrease our reaction time for our detection systems. Cold War systems no longer suffice. Interest in the Arctic is vastly increasing while we face an increased traditional military threat to the Arctic. This is like a back to the future moment—back to focusing on incoming missiles and nuclear subs from the Russian Fleet. The Arctic is undergoing dynamic change. Russia claims they are building Arctic capabilities to secure their most strategic nuclear arsenal on the Kola Peninsula. But their new airbases and new technologies constitute a threat to the North American continent.

Viewed from an environmental security nexus, we have greater activity in northern regions. But do we have the right protocols in place? In the maritime domain we have vessels transiting the Northern Sea Route, and Russia is sending ships not properly equipped for Arctic transit. SAR and emergency response will be the responsibility of countries, but lack of preparation, accessibility and infrastructure will make it difficult to muster an effective and timely response. There are lots of challenges for Arctic allies; we face an evolving Arctic from the Cold War era. We must look at the technology piece, the military piece, the kinetic piece and the commercial threat. We need a whole of society approach to mitigate myriad challenges.

We must also focus on the hybrid threat. Russian hybrid threats are extensive, and Arctic states are not adequately prepared to address them. Cyber and infrastructure threats necessitate a whole of government approach. The recent cutting of sea cables in the Arctic is an example of this. Protecting underwater cables requires significant investment. Information warfare and interference with elections in the Arctic are driven by Russian trolls and cyber-attacks. The energy sector is another area of vulnerability in the Arctic. Our northern communities can be vulnerable to information warfare. For example, Russia created a fake letter from Greenland to a US Senator asking for financial support if Greenland becomes independent. Russia uses such misinformation to create wedges among Arctic allies. Cyber wise, we see lots of activities that would be preparation of the battlespace for a war in the Arctic region. With this threat combined with the actual intent in Ukraine, our Arctic security posture must be revised to improve capabilities and consider how to best ensure protection throughout North America. China also represents a hybrid challenge. In one example, China has attempted to discredit Canadian criticism of China's crimes against its Uyghur population, and this can resonate with certain audiences.

Due to multiple kinetic and non-kinetic threats, North American Arctic nations must not only increase awareness and understanding of the threat posed but seek both comprehensive and agile responses to address security vulnerabilities. Panelists pointed out that the Inuit alliance is older than regional nation states and by empowering communities to build resilience through food, energy, transportation and housing security, we bolster our collective, overall Arctic security. Indigenous Knowledge, combined with a stronger role as the eyes and ears in the Arctic can help to address kinetic, hybrid and environmental security threats in North America. Panelists agreed that the Canadian Ranger program offers an excellent example that could potentially be replicated in Greenland and the US.

The Canadian Ranger program provides skilled security practitioners who are best placed to provide services for their communities in tackling threats. Canadian Rangers have trained with US Special Forces and International Arctic nations. They also have a junior ranger program which teaches responsibility and provides discipline and helps build personal resilience and set people up for success. Canadian Rangers take care of North Warning System sites and have noted the degradation of access roads. They have also noticed an increase in Chinese presence. Canadian Rangers can provide eyes and ears on the ground and in the maritime realm by identifying ships arriving in their communities. The Beaufort Sea area has been active. Alaska would be a good fit for a program like the Canadian Rangers. This can provide eyes and ears and skilled security practitioners throughout Alaska and simultaneously benefit the communities as people are able to stay and live there while serving. The local knowledge of the land can be particularly helpful for SAR. If Alaska would institute a program like the Canadian Rangers, the state could have 20,000 scouts spread through 200 communities in Alaska. This would provide people on the ground already when there is a crisis.

North American security must leverage local expertise and skills. In Greenland, the Canadian Ranger model could also be beneficial, and Greenland has already instituted integration of local Greenlanders as a critical component in maintaining security. Denmark is providing some basic training in Greenland, so Greenlanders don't have to travel all the way to Denmark. The Danish military has found inclusion of Greenlanders in patrols on and around Greenland a big force multiplier. This helps with both navigation and identifying local names and places along Greenland's long coastline. In Canada, the Coast Guard Auxiliary has been transformative as it assists with SAR, environmental response and maritime safety.

Closer partnership is another antidote to security challenges. Alaska, Canada and Greenland are all connected by the Inuit people, culture and language. In addition, the North American countries share the values of democracy, human rights, self-determination and are committed to international norms and laws. To ensure these values and norms are upheld, it is important to limit negative influence from adversarial countries

and develop, maintain and expand partnerships with like-minded nations. This is essential for a stable and peaceful Arctic. NATO is a critical alliance, and it is important to raise all NATO allies' awareness and understanding of the Arctic. Increased Arctic representation such as having a Greenland representative at NATO along with the addition of Sweden and Finland will help firmly anchor Arctic knowledge at NATO and ensure it is part of the decision-making process.

The National Guard State Partnership Program

Session Introduction:

Engaged continuously at home and abroad, the National Guard accounts for more than a third of the United States military personnel strength. Implementing the National Security, National Defense, and DoD Arctic Strategies necessarily relies on the effective and efficient employment of the National Guard. This panel, facilitated by leaders from the National Guard Arctic Interest Council, explored the role of the National Guard in the State Partnership Program (SPP) in the changing Arctic security environment.

Panel Discussion:

The US Department of Defense's SPP is managed by the National Guard Bureau as an instrument of security cooperation. The SPP began in 1993 with 10 former Soviet states paired with US states to foster enduring relationships, professionalize formerly conscripted forces, and train to NATO standards. For example, Ukraine was partnered with California – a relationship that has lasted more than 30 years. Today, there are 115 SPP relationships worldwide.

Deepening SPP connections, states now assign a Bi-lateral affairs officer (BAO) at the US Embassies in partner nations. BAOs help coordinate the National Guard efforts with the embassies' country team and the regional combatant commander. Bilateral and multilateral MIL-MIL training with SPP nations continues to be the principal method that SPP states contribute to theater security cooperation. Other connections include CIV-MIL engagements, personal connections, and National Guard members often deploy with their partner nations' troops during operational deployments.

The panel underscored that enthusiasm for SPP relationships has reached the Arctic. Since the mid-1990s, the SPP regularly gained 2-3 partnerships per year across US EUCOM and USCENTCOM. By 2003, SPP partnerships had expanded to aspiring nations in USAFRICOM, USPACOM, and USSOUTHCOM. For nearly 30 years, the program was viewed as an opportunity for developing nations to tap into US military experience. The addition of Austria in 2021 represented a shift in expanding SPP beyond aspiring nations. Since 2020, there have been 5-7 new partnerships each year with Norway formalizing their longstanding relationship with Minnesota in 2023, Finland pairing with Virginia in 2023, and Sweden

partnering with New York in 2025. The SPP took on new potential with high-end Arctic partners.

Responsibility for coordination of SPP and other statutory National Guard functions with the DoD Arctic Strategy rests with the National Guard Bureau. The National Guard implementation plan for the Arctic identifies partnerships as one of the primary lines of effort. To monitor progress and establish priorities, there are intermediate military objectives along each line of effort. Recognizing that Russia's invasion of Ukraine provided additional incentive for further partnerships and the capacity for SPP growth, more Arctic partnerships are anticipated.

With increased demands on the SPP, modest budget growth is expected. The SPP budget is set to expand from $42M in FY24 to $52M in FY25. A continuing budget resolution (CR) makes program execution more difficult; however, programmatic changes in FY25 will improve distribution of funds when an appropriation is approved. The modest budget of the SPP highlights the cost effectiveness of these durable international relationships.

Examining the budding relationship between New York and Sweden illustrates some longstanding facets of SPP as well as innovative approaches. In 2024, New York began to learn what Sweden was looking for in the short term and long-term goals. Sweden plans to leverage the SPP in building toward NATO standards to achieve interoperability as a new alliance member. Looking back, NATO interoperability has been a fundamental approach of the SPP since inception in 1993. Another proven concept is integration of Sweden's SPP goals with the US country plan and the USEUCOM campaign plan. On the other hand, a state National Guard partnering with a modern Western military is different which provides opportunities for innovation. New York National Guard members attending the Swedish Arctic Warfare course to learn cold weather tactics, techniques, and procedures is an example of novel engagement with mutual benefit. Similarly, Sweden's Arctic expertise provides new opportunities for US troops to learn about planning considerations for Arctic Operations.

Finland's formal relationship with Virginia, signed on May 2, 2024, is similarly tailored to the nation's needs. Looking at homeland defense, Finland has shared their proactive approach to Arctic logistics challenges that they anticipate if Russia invades. The scripted approach to Arctic logistics is a concept US Arctic planners could emulate. Meanwhile, Virgina is helping Finland create a professional NCO corps which did not previously exist.Together, Virginia and Finland recognized a common threat from cyber-attack. In exercises Cyber Shield and Cyber Fortress, the partners tested their defense of infrastructure from cyber-attack, explored information sharing, and experimented in an unclassified format.

Alaska's partnership with Mongolia has the Arctic connection through the state instead of the nation. A model program since 2003, Alaska has supported Mongolia's aims to: 1. Develop an Air Force, 2. Grow cyber defense, 3. Plan for whole of government emergency

management, and 4. Develop an NCO corps. Mongolia's position between Russia and China creates unique challenges for engagement. US military personnel and equipment require China's overflight approval to enter Mongolia which limits the scope and scale of every engagement. Mongolia's internet runs through China. Russia provides Mongolia with military equipment and energy. Alaska has assisted Mongolia in addressing these vulnerabilities not only through MIL-MIL engagement but also through CIV-MIL cooperation and the facilitation of CIV-CIV engagements with Alaska state government and University of Alaska Anchorage. Taking a whole of government approach in SPP engagement can include help with judicial reform, providing educational opportunities, medical and dental partnerships, cultural, humanitarian, businesses, etc. Finally, connecting Arctic interests through the SPP, Alaska is also working with Minnesota to share Arctic SAR experience with Norway.

Further panel discussion addressed cross-COCOM coordination and how the SPP can remain synchronized and mutually supporting across COCOM boundaries. The panel also offered thoughts on how to inform Arctic unit equipping and training requirements not only by leveraging new Arctic SPP relationships, but also through the NATO Center of Excellence for Cold Weather Operations (COE-CWO). Lastly, the panel members supported an audience suggestion that partner nations explore further institutional training opportunities to improve Arctic skills or to build new connections with Arctic partners with reciprocal exchanges at various levels of professional military education.

The National Guard breakout discussion highlighted the participation of the National Guard Arctic Interest Council in supporting the ASDC agenda. Panel members explored the significance of the SPP especially with new Nordic partners in Sweden and Finland. The panel examined the role of the SPP in developing partnerships that support the NSS, NDS, and DoD Arctic Strategy. State and national level leaders as well as audience members shared successful engagement ideas and best practices. Looking forward, this breakout session uncovered several promising opportunities to further the SPP in the Arctic through innovative engagements with existing partners as well as addition of new partners.

The National Guard State Partnership panel participants.

Climate Change and Security

Session Introduction:

Two panel members convened to discuss the security implications of environmental change and how the nation of Canada has been approaching this to include their sponsorship of the newly opened NATO Climate and Security Center of Excellence (CaSCOE) located in Montreal.

The goal of the session was to familiarize attendees with the NATO CaSCOE and more broadly to discuss the intersection of climate and security. As one of the speakers was a member of the Canadian Department of National Defense and the other a member of the cadre at CaSCOE (located in and sponsored by Canada), the discussion focused primarily on these issues as they affect Canada specifically. Nevertheless, the entire Alliance recognizes the importance of these issues and is working toward adaptation and mitigation.

Panel Discussion:

The discussion concentrated initially on the role of the Canadian Armed Forces in identifying and meeting the security challenges posed by the changing operational environment. This phenomenon disproportionately affects the Arctic, with estimates of three to four times the rate of warming being felt in these high latitudes. This results in unpredictable sea ice, coastal erosion, permafrost degradation, invasive species migrations and an increased frequency of extreme weather events. The direct and indirect

impacts increase the operational demands on Canadian Armed Forces. These demands include increases in domestic search and rescue and other humanitarian assistance resulting from the changing environment. For example, responses to natural disasters have been increasing over the previous decade: from 1990-2010 there were only six deployments, in 2011-2020 there were 30, and in 2021-22 alone there were 11. This increased domestic involvement makes it even more difficult to meet the nation's commitments overseas, especially in an environment of recruiting challenges. Finally, the Canadian presence in the Antarctic faces all the same challenges as those it faces in the Arctic.

The results of warming have specific impacts on defense and defense infrastructure. Changes to land through permafrost loss and coastal erosion means that access to and logistics within the Arctic have been irrevocably altered. Similarly, property damage and the reduced value of assets as well as the loss of equipment and increased operating costs arise from these phenomena. Geopolitically, competitor nations see opportunities in the increased accessibility afforded by the warming Arctic. Increased access to strategic mineral resources, alternate shipping routes through the arctic and interest from commercial fishing fleets in following fisheries northward all open Canada to increased conventional and hybrid threats.

In response to the growing threats to its security through its northern approaches, Canada's Department of National Defense published Our North, Strong and Free: A Renewed Vision for Canada (2024). This document states that environmental change is accelerating the pace of security challenges both domestically and internationally. It recognizes the role that the CAF plays in achieving the government's climate and security goals and reaffirms the defense of Canada and North America as a priority and places significant emphasis on the Arctic and northern approaches. It also recognizes that Canadian security and prosperity will be affected by 3 key trends:

- A more open and accessible Arctic driven by environmental change,
- Increasing global instability, and
- Rapid advances in technology.

It further states that meeting these challenges will require investing in a ready, resilient and relevant CAF through advancing science and technology to prepare them. Key areas include developing an understanding the effects of changing water chemistry on maritime infrastructure and undersea operations and of higher temperatures on Arctic mobility. The Department also published the Defense Climate Sustainability Strategy providing renewed targets for defense 'greening' and environmental footprints and a Climate Change Vulnerability Assessment, which provides a high-level review of defense infrastructure/facilities vulnerabilities to climate related threats.

Emblematic of Canada's leading role in the Alliance in the effort to recognize and deal with the security aspects of environmental change is its hosting of the NATO Climate Change and Security Center of Excellence (CaSCOE) in Montreal. In 2023 in Vilnius, twelve allies signed the CASCOE Memorandum of Understanding. In May 2024, the Center received accreditation as the 30th NATO COE.

A COE is an organization independent of the NATO command structure focused on a specific topic (mountain warfare, space, etc.). Being independent means that the Centers are flexible and autonomous and able to focus on a building expertise in a specific domain. They each follow a program of work determined by a Steering Committee with one representative from each sponsoring nation. All Centers have a broadly similar organizational structure with Divisions dedicated to Research and Analysis/Lessons Learned, Education and Training, Standardization, Concept Development and Experimentation and Support & Security. In the case of the Montreal CaSCOE, there is also an Outreach & Engagement Division. The Center's mission is to develop strategic partnerships, generate and disseminate knowledge, provide advice and support to Alliance member states and to provide capacity building. The current strength of the CaSCOE is 27 of an authorized 35 positions filled.

NATO has been addressing the environmental impact of military operations for decades; it is only recently that they have turned their attention to environmental change. It is already a crisis and a threat multiplier and is affecting how, where, with whom and with what militaries operate. Cascading impacts will worsen and when intersecting with existing conflicts will cause amplified challenges in security and governance. At the Summit in 2021, NATO leaders adopted the Climate Change and Security Action Plan. This was a major step forward in understanding and adapting to the strategic impact of climate change. One of the recommendations was to establish the CaSCOE. Also of note is the 2022 Strategic Concept document that states that climate considerations should be integrated across all of NATO's core tasks. Additionally, the Allied Command Transformation (ACT) Strategic Foresight Analysis of 2024 provides a shared understanding of NATO's evolving security environment through 2043 describing how risks and drivers of instability interact. It states that climate breakdown and the loss of biodiversity is the most consequential and most likely challenge moving forward. Furthermore. it will drive significant alterations in the behavior and attitudes of both state and non-state actors. Resource scarcity is also expected to increase and drive further instability.

3.2 billion people are at risk because of climate effects and weather events that are becoming more severe in frequency and intensity. To address this and in response to NATO's mandate that climate considerations be integrated across the enterprise, CaSCOE is pursuing several key projects in 2025:

- Lead climate security science and technology community within NATO,

- Focus on climate and energy risks to armed forces in the Arctic,
- Provide recommendations to improve resilience and operational efficiency,
- Streamline access to open-source climate data, and
- Host the annual Montreal Climate Security Summit.

Research initiatives will seek to answer some key questions such as: How do we ensure warfighting capabilities for the future? How do we develop and maintain operational effectiveness in a changing operational environment? And how do we leverage research and innovation across the Alliance? In addition to these research tasks, the Center seeks to build a community of interest surrounding climate intelligence. In 2021, a National Intelligence Estimate from the US intelligence community predicted that in addition to the geopolitical risks related to climate change, that there would be international tension over climate responses. These would likely include resistance to a quick transition to carbon-free world by economies that are dependent on fossil fuel. Competition for raw materials and the tech required for the green transition would also manifest. Disagreements over unilateral large- scale testing of Solar Radiation Management (geoengineering) were also seen as likely.

With Russia aligning ever more closely with the self-styled "Near Arctic state" of China, it falls to the remaining seven truly Arctic nations to counter the short-sighted policies of the former and the blatant resource grab of the latter; both of which are major contributors to geophysical and geopolitical instability. With the accession of Sweden and Finland into the Alliance, NATO is uniquely positioned to answer these daunting challenges. Asthis discussion pointed out, the climate issues facing the Arctic are, without exception, security issues. With the establishment of the CaSCOE and the ongoing efforts of the various member states (as exemplified by Canada), NATO is leading the effort to secure the Arctic, both environmentally and politically for generations to come.

Women, Peace and Security (WPS) Evening Event

WPS Event Summary

The 2023 Women, Peace, and Security (WPS) strategy focuses on institutionalizing and operationalizing gender perspectives, ensuring that peace and stability are grounded in the principles of equity and inclusivity. in accordance with the Women, Peace, and Security Act of 2017. In the Arctic, these principles are paramount. The challenges faced in the Arctic—from strategic competition to environmental-related instability to humanitarian concerns—require collaborative solutions that prioritize human security. Women's leadership in this context is a powerful force for building bridges, fostering resilience, and promoting mutual understanding across borders. In partnership with the Ted Stevens Foundation, the Ted Stevens Center convened an evening event during the Anchorage Security and Defense Conference focused on Women, Peace, and Security. The event, generously hosted at the

residence of former Lieutenant Governor Mead Treadwell, brought together leaders, scholars, and practitioners to explore the critical role of gender perspectives in Arctic security. Keynote remarks from Rear Admiral Scott Robertson, the Director of Strategy, Policy & Plans for United States Northern Command and North American Aerospace Defense Command, and Captain Rebecca Albert, Chief of Staff for Coast Guard Task Force-Arctic, celebrated the accomplishments of women who have broken barriers and contributed to Arctic security and resilience. Speakers also recognized the importance of Indigenous women who have preserved knowledge that guides thoughtful approaches to environmental stewardship. The event provided a valuable platform to exchange best practices, strengthen partnerships, and reaffirm commitments to the WPS agenda in an increasingly complex security environment.

Day 3 - Thursday, November 21, 2024

Welcome Remarks

The Ted Stevens Center for Arctic Security Studies (TSC) Associate Director for Strategic Engagement, Matthew Hickey, and Alaska National Guard Chair, Ryan Richard, moderated the Introduction and Welcome Remarks. Welcoming remarks were given by:

- Mayor Suzanne LaFrance, Municipality of Anchorage
- Col. Matthew Komatsu, Chief of the Joint Staff, AK National Guard

Mayor Suzanne LaFrance emphasized Anchorage's critical role as a strategic Arctic hub, underscoring its importance to US national security and Arctic operations. She detailed the city's historical partnership with the military, which began in the 1940s, and its enduring significance as a geostrategic location. Highlighting Anchorage's diverse population and infrastructure, the mayor framed the city as a key enabler for Arctic resilience and an essential link in addressing shared challenges within the region.

Central to her address was the modernization of the Don Young Port of Alaska, a critical asset serving 90% of the state's population and designated as one of only 18 Department of Defense strategic ports. Mayor LaFrance outlined the $1.9 billion effort to address aging infrastructure, seismic vulnerabilities, and environmental challenges. She stressed the port's vital role in supporting national defense operations across the Indo-Pacific and Europe while urging continued federal, state, and local collaboration to secure its future. Pro-active investment, she noted, is essential to maintaining resilience in Alaska's infrastructure and ensuring readiness for emerging threats.

Mayor LaFrance also addressed the broader implications of a changing Arctic, from the increased use of shipping lanes and tourism to geopolitical pressures involving Russian and Chinese activity. She framed Anchorage as a model for managing these challenges, emphasizing the importance of Arctic-wide collaboration and early intervention to ensure security and stability. Her remarks underscored the need for senior leaders to prioritize investments in critical Arctic infrastructure and to engage in partnerships that safeguard US interests while fostering resilience in the circumpolar region.

Mayor Suzanne LaFrance addresses the audience on day 3.

Colonel Komatsu began with a discussion, for the benefit of the foreign and non-military attendees, of what exactly the US National Guard is. It dates to the founding of the US and the Constitution as a balance between local control and centralized governance. The National Guard is the modern heir to this "well-ordered militia." One way to envision this is to say that the Alaska National Guard's Commander in Chief is not the President of the US, but rather the Governor of Alaska (under Title 32). This is broadly true throughout the US with minor variations from state to state. When activated (under Title 10), the Commander-in-Chief is the President of the US, as with the Regular Army and Air Force.

The AKNG is inherently Arctic and traces its lineage back to organizations such as the Territorial Guard and the Arctic Scouts. Their role was Arctic domain awareness, particularly coastal awareness, and they proved their worth during WWII when the Japanese invaded the Aleutian Islands. With the transition to statehood, the Territorial Guard became the AKNG and currently, there are approximately 4,000 members. This includes roughly 60% Air Guard and 30% Army Guard and 10% Alaska State Defense Force. The Guard performs many homeland defense missions such as air defense, missile defense, search and rescue, and aerial refueling in support of the active-duty military.

The speaker then went on to illustrate the Guard's capabilities as exemplified by ICEEX16. During this exercise, the speaker's unit was tasked with parachuting onto the ice in the Beaufort Sea and setting up an Arctic Sustainment Package to determine if they could respond to a mass casualty event in that environment. He stressed how difficult the

conditions were during this exercise and the level of expertise required to simply survive in an Arctic environment. He stated that one of the major strengths of the National Guard is that the "never leave", meaning that not only do they retain a great deal of the institutional knowledge of Arctic operations but that they are also part of the community.

He then turned his attention to the current mission of the AKNG. The lines of effort in the Guard's Arctic Strategy include, homeland defense, building and maintaining the relationships and partnerships such as that with the TSC. Maintain the Arctic capabilities and the inherent expertise present in the Guard and to share that with the rest of the DOD, as well as state, local, tribal, and international partners.

He also expressed concerns about the future to include what happens when these important efforts are interrupted by events requiring a response from the Guard outside of the Arctic? Who will replace them if they are activated and sent to EUCOM or INDOPACOM? Forces from CONUS are not equipped for such a mission when, as he noted "we break people and things." There is also fragility within our critical infrastructure as highlighted by previous speakers. He noted that "Alaska is an island" and if something happens nobody is coming to save us, indeed, nobody can save us. Given this fact, we must remain acutely aware of our key centers of gravity and vulnerability within our infrastructure, because any potential adversaries certainly are also aware.

Col. Matthew Komatsu offers welcome remarks on day 3.

Panel 6: Resilience and Total Defense: Whole-of-Society Perspectives

Moderator: Dr. Jeffrey Libby, Principal Investigator, Arctic Domain Awareness Center, University of Alaska-Anchorage.

Speakers:

- Brigadier General Timothy Brower, Vice Director for Strategy, Plans, and International Affairs, US National Guard Bureau
- Sgt. Jackie Jacobson, Canadian Rangers
- Ms. Julie Kitka, Federal Co-Chair, Denali Commission
- Ms. Maria Jonten, Swedish Defense University
- Chief Patrol Agent Ross Wilkin, US Border Patrol

Panel 6 Introduction

The "Resilience and Total Defense: Whole-of-Society Perspectives" panel convened speakers from multiple levels and divisions of government, with the aim to examine how different elements and echelons of government and society across the North have taken steps during this decade to bolster resilience. With the understanding that resilience encompasses a complex web of relationships between civil society, government agencies, and local communities, the panel explores how different organizations, communities, and governance structures work together to build and maintain security and stability in the challenging Arctic environment. The panelists acknowledge that effective resilience requires both deep local knowledge and broader institutional support structures and emphasize the resilience strategies that must evolve to address emerging threats while maintaining the core strength that comes from community engagement and cross-border cooperation.

Panel 6 Summary

This panel was assembled by ADAC Arctic and the TSC to examine various takes on a whole-of-society approach to security. Security and stability depend on resilient networks. These include everything from non-governmental entities, first responders, security professionals and above all, a cohesive civil society. The panel examines how these networks provide resilience and respond to geopolitical, geophysical and technological challenges.

The panel included representatives from the Canadian Rangers, the US Border Patrol, the Swedish Defense University's Strategic Implementations and Innovations Center, the US National Guard, the Denali Commission and AFN and the US Coast Guard. Throughout the wide-ranging discussion, the panelists' comments on resilience focused on three areas: policies, structures, and people. They highlighted different policies, to include the US National Security Strategy and National Strategy for the Arctic Region, that emphasize

resilience, especially in the harsh Arctic environment. One panelist highlighted how Russia's invasion of Ukraine spurred a revision to national policies that reinvigorated their concept of total defense to include incorporating municipalities, regions, and all levels of civil society into a more resilient network.

While policy statements carry a strategic messaging piece, funding is essential for execution of those policies. As one panelist stated, "Strategies without investments are simply hallucinations." Alaska's infrastructure is sparse and generally outdated, including fuel storage and essential ports, which pose significant risks. For example, the Port of Alaska is undergoing a $1.9 billion modernization project to address vulnerabilities to environmental and operational threats. Programs like the Denali Commission are emphasizing dual-use projects that serve both civilian and defense needs. This includes rural fuel storage and broadband upgrades.

Panelists also discussed national and organizational structures designed to promote resilience through flexibility and adaptation. For example, the US National Guard is inherently flexible due to its multiple authorities, clear structures, and procedures to deploy the Guard making full use of those flexibilities. Another panelist explained Sweden's civil compact that makes defense and security promises to the population but also requires all citizens and businesses to play an active role in their own defense to boost resilience. In this structure, the people are the built-in resiliency. Indigenous-led programs and partnerships, such as the Canadian Rangers and calls to revive the Alaska Scout Program, highlight the potential of and need for local expertise in Arctic resilience efforts. These Nordic and North American programs stress community preparedness, with emphasis placed on equipping local communities with tools for disaster response and continuity, as they are often the first responders in crises. Another panelist highlighted organizational competencies that can be leveraged to complement other agencies' efforts in responding to emergency situations or crises in the Arctic, especially considering limited resources. The complementarity helps to build resilience in all responding agencies and in the communities. The success of resilience-building lies in partnerships across federal, tribal, state, local, and international entities. Examples include coordinated exercises with the Coast Guard and NATO allies. Moreover, cross-border efforts like the Nordic "MOU High North" initiative, which promotes civil-military cooperation in Northern Europe, were highlighted as examples of successful partnerships.

Finally, all panelists highlighted people as the primary source of resilience in the Arctic. One panelist stated, and others agreed, that "the most resilient people are those in the community, from the community, who know their areas." Another panelist emphasized the people-to-people relationships that allow for reciprocal support and resilient communities. One panelist built on this concept and discussed not only people-to-people relationships within a country but also cross border people-to-people and community-to-community relationships that help people and communities respond to issues.

Within this framework, panelists moved to a discussion of how to build greater resilience in communities in the face of new and emerging threats. These threats fall into three main categories:

- Geopolitical Challenges: Russia and China's activities in the Arctic, including dual-flagged vessels and military exercises near key US and Canadian zones, were cited as growing concerns.
- Environmental Threats: Long-term weather-related shifts, such as fish stock migrations and ice loss, are increasing competition over Arctic resources.
- Technological Vulnerabilities: Cybersecurity threats and the integration of artificial intelligence into infrastructure management were flagged as priorities for future investment.

Panelists agreed that working across organizations, building coalitions, and adequate funding are all essential steps. One panelist emphasized a quick response to threats and the ability to adapt to changing circumstances, both tactically and strategically. Another panelist agreed and emphasized the need to change from a culture of managing risk to an action-oriented culture, that is, changing from doing nothing wrong to doing the right thing. Finally, panelists also emphasized working with and empowering native populations across the Arctic to enhance and deepen resilience.

There followed a lively question and answer session, which included: How the Coast Guard is addressing Arctic challenges through strategic presence and collaboration. Examples included conducting joint exercises with Canadian partners, monitoring Russian and Chinese activities, and adapting operational models to the Arctic's vastness. Innovations in maritime and shore-based operations were cited as key to enhancing resilience. The discussion then turned to how military and native community cooperation saved lives during the COVID-19 pandemic by providing PPE and testing equipment. These partnerships also underscored the need for reciprocal relationships, with native communities supplying critical resources to military operations when needed. In a similar vein, the Canadian Rangers program integrates community resilience by embedding local expertise in operations. Rangers train in cold-weather survival and disaster response, acting as guides and first responders. The program emphasizes the value of community-based solutions for Arctic security challenges. Finally, the Denali Commission advocates scaling up infrastructure funding, targeting projects like fuel storage and transportation networks to address infrastructure gaps in Alaska. Federal support is critical to addressing the backlog of needs.

In sum, the panelists stressed four themes. Community Integration: Indigenous and local expertise is indispensable for Arctic resilience. Programs such as the Alaska Scout revival and Canadian Rangers should be expanded. Strengthen Infrastructure: Dual-use projects must address gaps in fuel storage, broadband, and transportation to support resilience and

national security. Invest in Partnerships: Federal and international collaborations, including exercises and cross-border agreements, are critical to managing Arctic challenges. Prepare for Emerging Threats: Investments in cybersecurity, environmental adaptation, and fisheries management are essential to mitigate risks. Their recommendations were to expand local capacity by reviving the Alaska Scout Program to integrate Indigenous knowledge into national defense and to increase funding for local disaster preparedness initiatives. They also recommended enhancements in international cooperation by fostering cross-border collaborations, such as Nordic-style agreements, to address shared challenges and to conduct joint Arctic military-civilian exercises to strengthen operational capabilities. They also stressed the importance of modernizing infrastructure by accelerating projects such as the Port of Alaska modernization and Denali Commission initiatives and by securing sustained funding for dual-use infrastructure development. Finally, they recommended addressing technological and geopolitical risks by investing in cyber defense and AI for critical infrastructure and by strengthening Arctic governance to counter adversarial activities.

Left to right: Sgt. Jackie Jacobson, Chief Patrol Agent Ross Wilkin, Ms. Maria Jonten, Brigadier General Timothy Brower (speaking), Ms. Julie Kitka, and Mr. Shannon Jenkins.

Panel 7: Critical Infrastructure Security

Moderator: Dr. John Garver, Director, Homeland Defense Institute, US Air Force Academy.

Speakers:

- Mr. Ronald Bearse, President, Ronald Bearse Associates
- Mr. Chris Anderson, Principal Advisor for National Security and Emergency Preparedness, Lumen Technologies
- Mr. Geoffrey French, Senior Subject Matter Expert, MELE Associates
- Ms. Anu Fredrikson, Executive Director, Arctic Frontiers
- Mr. Ryan Schwartz, Director of Critical Infrastructure Policy and Analysis in the National and Cyber Security Branch, Public Safety Canada

Panel 7 Introduction

The "Critical Infrastructure Security" panel, inspired by the Army War College NATO Critical Infrastructure handbook, assembled experts across sectors to examine how nations can develop and maintain resilient critical infrastructure systems in an era of complex, interconnected challenges. As nations grapple with increasingly sophisticated threats across both physical and digital domains, this panel set out to explore the crucial shift from traditional critical infrastructure protection to a more comprehensive approach of security and resilience, reflecting the need for adaptive and robust defensive postures in today's contested environment. Panelists examined the application of risk management frameworks, the fundamental principles of critical infrastructure protection, and the role of information sharing between stakeholders, with particular attention to the Arctic region, where rapid environmental changes and increasing strategic competition are creating new vulnerabilities in critical infrastructure systems.

Panel 7 Summary

The 21st century has brought unprecedented challenges to critical infrastructure security. Concepts of protection have evolved, increasingly focusing on risk analysis-based security and resilience. While critical infrastructure protection remains primarily a national responsibility, the interconnected nature of global infrastructure makes it an international concern. Particularly in the Arctic, where environmental and geopolitical dynamics exacerbate vulnerabilities, making the region a critical focal point for infrastructure security efforts.

Critical infrastructure encompasses the physical and cyber systems vital to a nation's economic security, public health, and safety. Disruptions or destruction of these systems can lead to cascading effects on national stability. Key sectors of critical infrastructure can be broadly categorized into lifeline sectors—such as energy, water, transportation, and

communications—and specialized sectors, including chemicals, defense industrial bases, emergency services, food supply, healthcare, financial systems, government facilities, information technology, and nuclear infrastructure. As most critical infrastructure is owned and operated by the private sector, fostering robust public-private partnerships is essential. Critical infrastructure forms the backbone of modern society, enabling economic productivity, resource distribution, innovation, and human interaction. Ensuring its security and resilience is vital to economic growth, trade, and employment opportunities.

Emerging threats to critical infrastructure highlight its vulnerabilities. Adversaries increasingly target these systems with minimal repercussions, making them attractive targets. Arctic nations face unique risks due to their geographical and environmental contexts. The changing operational environment, for example, accelerates the degradation of infrastructure originally designed for long-term service, as permafrost thaw, erosion, and drastic temperature fluctuations alter the environment. Geopolitical threats add another dimension, with nations such as Russia and China engaging in sabotage, espionage, and strategic property acquisitions near critical Arctic infrastructure. Cyber threats also play a significant role, as adversaries exploit vulnerabilities with rapid and widespread attacks that much of the region's infrastructure is ill-equipped to counter. Additionally, physical threats such as sabotage, terrorism, and the increased frequency of natural disasters further imperil these systems.

Over the past 15 years, critical infrastructure protection has increasingly focused on mitigating threats and enhancing resilience. Security measures aim to reduce the likelihood of disruptions, while resilience ensures the ability to resist, absorb, recover from, or adapt to changing conditions. Achieving a robust Critical Infrastructure Security and Resilience (CISR) posture requires:

- Risk Assessment and Analysis: Identifying and prioritizing infrastructure criticality.
- Public-Private Partnerships: Collaboration between CI owners, operators, and government entities.
- Continuity Planning: Developing disaster recovery plans and ensuring supply chain integrity.

The integration of a framework emphasizing collaboration, coordination, communication, and concentration across local, regional, national, and international levels is critical to achieving these objectives.

The Arctic region presents unique challenges due to its extreme environment, sparse population, and geopolitical significance. To address these challenges, experts recommend strategies such as establishing an Arctic Critical Infrastructure Security and Resilience (CISR) Forum to implement workstreams and develop success metrics. Creating an Arctic Technical Support Working Group could streamline research and

development efforts, addressing unmet needs within short timeframes. Enhancing NATO-EU task forces to focus on infrastructure resilience and fostering private-sector innovation are also vital steps. Furthermore, robust frameworks for sharing classified and operational data across sectors are essential to building a secure and resilient critical infrastructure landscape in the Arctic.

However, several barriers hinder effective information sharing, a cornerstone of critical infrastructure security. The private sector faces challenges, such as concerns over regulation, liability, privacy laws, and competitiveness. Government barriers include classification restrictions, legal frameworks, and political considerations. Overcoming these obstacles requires building relationships with the right partners, establishing norms and incentives for information sharing, and leveraging advanced mechanisms such as machine-to-machine communication for cyber threats.

Managing risk in the Arctic's complex environment is particularly challenging due to high uncertainty and variability. Risk, defined as the combination of threat, vulnerability, and consequence, requires precise assessments to inform decisions. Security risks in the Arctic span domestic and international events, from food security and natural hazards to critical mineral shortages and resource competition. Effective management necessitates collaboration across all levels of government and society. Local efforts must align with regional, national, and international strategies to close jurisdictional gaps that adversaries may exploit. Investing in communities, enhancing municipal and military budgets, and building partnerships to identify vulnerabilities and practice response strategies are crucial steps in this effort.

Canada's approach to critical infrastructure protection highlights the need for updated policies. The 2009 National Strategy for Critical Infrastructure provided a broad framework but requires modernization to address emerging threats. Historical policies, such as the War Measures Act, emphasized vital point protection, but their repeal has reduced the ability to effectively designate and protect critical assets. Canada's reliance on provincial and municipal efforts underscores the need for stronger federal coordination.

Nordic countries offer valuable perspectives on critical infrastructure security due to their proximity to Russia and reliance on total defense founded upon a culture of societal trust. Hybrid threats, including sabotage and espionage, target municipalities with limited resources. To strengthen security, these nations must break down silos between armed forces and local governments, invest in communities to uphold societal trust, and enhance situational awareness for joint responses to hybrid threats.

Critical infrastructure security is a cornerstone of modern society, particularly in vulnerable regions like the Arctic. Addressing these challenges requires a holistic approach that integrates security and resilience, fosters public- private partnerships, and promotes

international collaboration. By implementing these strategies, nations can safeguard their critical infrastructure against emerging threats and ensure a secure and prosperous future.

Panel 7 participants from left to right: Mr. Ronald Bearse, Mr. Chris Anderson, Mr. Geoffrey French, Mr. Ryan Schwartz, and Ms. Anu Fredrikson (speaking).

Panel 8: Strategic Horizons

Moderator: Mr. Evan Bloom, Polar Governance Chair Consultant to the Ted Stevens Center, ACT1 Federal.

Speakers:

- Ambassador Petteri Vuorimaki, Ambassador for Arctic Affairs, Finland
- RADM Scott Robertson, Director of Strategy, Policy, and Plans (J5), North American Aerospace Command and US Northern Command
- Mr. David Kang, Director of Joint Training, Exercises, and Wargaming (J7), North American Aerospace Command and US Northern Command
- Dr. Dalee Sambo, Professor, University of Alaska Anchorage Discussant: Mr. Craig Fleener, Deputy Director, Ted Stevens Center

Panel 8 Introduction

The “Strategic Horizons” panel brought together high-level Arctic stakeholders to discuss primary concerns, challenges, and considerations for the future of the Arctic. Following involved and proactive discussions across panels and breakout rooms, this panel intended to chart a course for future dialogue about Arctic priorities as well as discern key

takeaways based off the productive conversations held during the ASDC. These final speakers offered statements of how the topics and themes of the conference impact the future of governance, security, and prosperity in the High North, specifically noting the salient themes of a changing environment, global geopolitical conflicts, and indigenous populations. The discussions emanating from this panel can serve as a concise takeaway for the audience as to what Arctic priorities should be reinforced to progress defense and security in the Arctic landscape.

Panel 8 Summary

Panelists highlighted several primary concerns including environmental security, integrated deterrence capabilities, Arctic governance, Arctic competition, and domain awareness and defense. To address these challenges, they noted the need for continued scientific advancement and for a holistic approach to Arctic strategy incorporating economic, military, environmental and Indigenous perspectives. Panelists supported continued use of the Arctic Council as a forum for Arctic cooperation and to raise Arctic concerns. Striking the right balance in maintaining essential communications with Russia while countering the implications of expanded military capabilities and increased combined operations was also discussed. Panelists pointed out that vulnerabilities in domain awareness must be addressed and expressed concern for the inadequacy of current domain awareness. Possible ways ahead included integrating innovative low-cost solutions and leveraging Indigenous knowledge, increased use of autonomous systems and meeting infrastructure challenges by bolstering supply and energy networks.

The panel discussion painted the Arctic as having a dual identity as a region both vulnerable and abundant. On both fronts, environmental security, geopolitical pressures/competition, and Indigenous People's rights were central themes to the discussion, consistently driving urgency and optimism. Environmental security however, while recognized as a unifying challenge across the pan-Arctic, had varying implications across domains. For Indigenous communities, the primary threat is related to cultural continuity and environmental stability. For security experts, the primary threat is increasing operational complexities, which reduces partner resilience while potentially granting adversarial access. Domain priorities intersect in a recognized need for holistic strategies which blend military, environmental, and socio-economic perspectives.

Environmental security was universally acknowledged as the Arctic's most pressing challenge, yet it was approached from different angles, across a variety of complex motivations. One perspective underscored the existential nature of "environmental tipping points," catalysis of irreversible changes, and the urgency of scientific research and policy action. Others framed environmental security as it intersects with human security, infrastructure resilience, and geopolitics. In sum, despite a consensus on the significance of the topic, there were subtleties in approaches and prioritization, some immediate

adaptation, some long-term mitigation. However, alignment and continuity can still be maintained if reflecting on the total conversation as a broader debate which balances immediate needs with future-oriented policies.

In this panel, the Arctic's geopolitical landscape was presented as a delicate balance between cooperation and competition. The Arctic Council was consistently addressed as a unifying force for Arctic states and Indigenous representatives, but still panelists expressed concerns about non-Arctic states exerting influence, citing China's growing presence as prime example. The exclusion of Russia from certain forums was also debated, with some of the opinion that it is a necessary evil and others taking the position that such acts risk eroding future cooperation and create greater complications in geopolitics of the region. Overall, the realities of strategic rivalry underscored the complexity of managing the region's security and sovereignty.

Indigenous communities were an ever-present highlight and addressed as indispensable to Arctic resilience. They were represented as capable of offering unique insights grounded in centuries of environmental stewardship, and as exemplars of Arctic resilience. Key focus was put on their rights to self-determination and the critical role they play and should play in decision-making processes related to Arctic policies and environmental stability. It is noteworthy that in addition to consistent recognition of indigenous peoples' roles and value, there was a steady undertone of critique regarding inconsistent inclusion in high-level decisions and discussions involving their traditional homelands, potentially highlighting a hidden conflict between environmental advocacy and Indigenous economic interests.

Overall, there was a noted convergence regarding core challenges in/across the Arctic but recognition of the complexities of pan-Arctic security as it intersects challenges in exiting policy and geopolitical dynamics. Environmental urgency can conflict with resource driven political agendas. Sovereignty focused governance cane sometimes alienate non-Arctic stakeholders, risking collaboration opportunities. Indigenous People's participation is celebrated but requires more equitable frameworks to align with self-determination principles. There was agreement on the need for enhanced domain awareness, the strategic importance of Indigenous partnerships, and significance of Arctic sovereignty. However, there was also disagreement on just as many subjects, to include resource allocation and geopolitical threats. Some proposed autonomous technologies, while others emphasized human preparedness and expeditionary capabilities. Regarding Russia-China cooperation specifically, many saw it as a long-term concern, but some did take the time to highlight near-term implications, further demonstrating the inherent complexity of broader Arctic strategies, assumed to be capable of addressing a multifaceted and rapidly evolving landscape.

Several actionable priorities for Arctic strategy were engaged with over the course of the panel. Enhanced domain awareness, greater reliance on Indigenous partnerships,

safeguards for sovereignty, engaging in practices which foster inclusive and collaborative decision-making, integration of disaster preparedness with defense planning, and finally, meaningful engagement with Indigenous communities as more than a strategic advantage; each of these emerged as a critical need, which were actionable now and capable of influencing Arctic Security.

As global interest in the Arctic accelerates, the region faces a pivotal moment. Environmental urgency, geopolitical shifts, and Indigenous resilience form a complex triad requiring thoughtful, coordinated responses. The panelists highlighted that the Arctic is no longer a distant frontier but an integral component of global security and governance. Moving forward, policies must reflect this interconnectedness, balancing immediate challenges with long-term opportunities for enhanced operations and collaborations.

Panel 8 speakers from left to right: Mr. Craig Fleener, Ambassador Petteri Vuorimaki, Dr. Dalee Sambo (speaking), RADM Scott Robertson, and Mr. David Kang.

Fireside Chat: What Now?

Moderator: Mr. Matthew Hickey, Associate Director for Strategic Engagement, Ted Stevens Center.

Panelists:

- Ambassador Mike Sfraga, US Ambassador At Large for Arctic Affairs
- Ms. Julie Kitka, Federal Co-Chair, Denali Commission
- Major General USAF (Ret) Randy "Church" Kee, Director, Ted Stevens Center

Introduction

The Fireside Chat focused on the question, "what now?" encapsulating key conference themes and exploring how best to address Arctic Security going forward.

Fireside Chat Summary

New US Arctic Affairs Ambassadorship

Fireside Chat panelists highlighted that having a new US Arctic Ambassador has demonstrated US commitment to the Arctic and that the Ambassadorship is already proving a very busy position. The priority is for the Ambassador to be out and about, not cloistered inside the State Department (which is the "embassy" for the new Ambassador). His focus has been on sharing missions with allies and partners, which is a vastly different scenario than the transactional relationships with countries like China and Russia. The advent of a new US Arctic Ambassador has been very well received, not just by foreign ministries, but also by ministries of defense, Arctic Council members and technical teams. The panel agreed that it is vital to be present in international spaces, to effectively reflect and project US Arctic policy. The panel called attention to the Secretary of State tasking the US Arctic Ambassador to move Arctic policy into US foreign policy, ensuring that domestic and foreign policy overlap, and spreading awareness that Alaska sits at the nexus of domestic and foreign policy.

The panel emphasized that the new US Arctic Ambassador is the Ambassador at Large for Arctic Affairs, not merely the US Arctic region itself. This necessitates focus across the global Arctic. Allies have an arc of common defense from the Bering to the Barents to the Baltics. There is connection that links into NATO and reinforces the transatlantic alliance as well as the trans-arctic alliance. This affects everything from energy to fisheries to critical minerals. Panelists emphasized that it is important to broaden the scope; not just on the definition of security but how to view the map.

Panelists discussed that there is an external and internal component to the US Arctic Ambassador's role. Internally, the Ambassador must bring together the many State Department experts whose excellent work complements the efforts discussed at this

conference. The work they do does not get much recognition, but it remains essential to effective work on Arctic security. The Arctic Ambassador position has the gravitas to coalesce and lead this group by constructing a highway to point all the different pathways towards the Arctic. The panel agreed that this leadership should thus become institutionalized along with access to the Secretary and Deputy Secretaries of State. Externally, the Arctic Ambassador position has a foreign policy component and already is involved in extensive coordination and communication with other nations.

Additionally, there is a third component to the Arctic Ambassador position and that is the domestic component to work with the state of Alaska. This means working with Indigenous leaders and organizations and understanding what is happening in the state. This knowledge can then be integrated into foreign policy efforts. The panelists reiterated the important role of Alaska at the nexus of domestic and international policy. The future construction of a Port in Nome is one example of how Alaska's geography can be utilized for domestic and international purposes. Geographically Alaska is important due to the strategic implications of the Bering Strait, but equally valuable to the state of Alaska for economic development and homeland defense. Thus, the port highlights important implications for Alaskan, national and international policy.

Sino-Russian Relations

The panelists called out the Arctic-Indo Pacific connection, the frequency and complexity of the Sino-Russia combined exercises, and China's new approach of showcasing strength rather than hiding it. Panelists acknowledged that while still a transactional relationship, China has a stronghold on Russia and there is plenty of room for that relationship to expand both geographically and functionally. This Russia-China interaction requires the West to recognize that the Arctic is globalized and interconnected. It can't be decoupled and must be dealt with in the global framework.

Furthermore, the panel indicated that China views the Arctic as one piece of a broader area of interest in which China wants to exert its capabilities and insure its access to the resources available. Another consideration for both Russia and China pointed out by the panel is that the age of their leaders means they cannot afford to wait to reach their goals and impose their vision on their respective nations. Both countries see great value in the Arctic.

The panel discussed how access and availability of fish is an important issue impacting the Arctic. The massive population in China and the economic disparity throughout the country drives an increased need for fish as a cheap source of protein. China is expanding its mining of fish proteins to include in our Arctic boundaries. Fish don't know boundaries, and this directly impacts residents of the Arctic. Defense is just one part of equation. Questions like those around fisheries propriety is another.

Ukraine

The panel also discussed the impact of the war in Ukraine, which has escalating costs and could spill beyond borders. The urgency is there; the dangers are only accelerating, and the security equation is growing more acute. The panel wondered: are we learning fast enough?

Soft Power

Panelists discussed that in addressing how to better educate and increase awareness about global-Arctic connections, it is important to remember that soft power, when done right, reduces the need for hard power. Soft power includes everything from geopolitical to geophysical to geostrategic, and the inclusion of the voices of those who have lived in the Arctic for millennia.

Two major questions emerged in the conference and were highlighted by panelists. First, how can allies generate soft power that complements hard power and leads to integrated defense and deterrence? Second, how can practitioners better identify missing components of Arctic strategy and operations to determine funding priorities within available resource limits, and how can soft power help?

Indigenous Voices

Panelists highlighted the Alaska Federation of Natives as a well-equipped forum that can address the above- mentioned complex soft- and hard-security issues. AFN's work has highlighted the importance of breaking down barriers and silos that stand in the way of the comprehensive approach that is needed to effectively address Arctic security. AFN brings in those with different equities to share their interests and viewpoints, enabling more effective movement toward common goals.

Fireside Chat Conclusions

First, panelists emphasized that there should be a very small distance between say and do. This is the most effective form of deterrence. Next, panelists agreed on the importance of bringing together groups, such as the ASDC attendees, with expertise in many different disciplines. Cross-discipline thinking is a critical piece to be able to deter and defend. Third, Alaska is the northwest corner of the NATO flank. Is it important to be cognizant of the governing articles of the NATO alliance which was established in 1949 and now includes 32 nations. Importantly, panelists agreed that there is room for optimism. One panelist stated: politics can be messy, but policy is what matters.

Lastly, panelists acknowledged that all Indigenous peoples want self-determination and want to live their own lives and are invaluable partners in the Arctic. This want of self-determination is not hostility, but the desire to continue culture and a cherished way of life. Indigenous people should not be treated as dots on a map. In Alaska, Indigenous people are the largest private landowners and are intensely organized. Most Alaska Native leaders

have multiple hats and have myriad skills, as well as relational ties in other nations. Learning from and engaging with Indigenous people is the pathway to success.

Fireside chat panelists from left to right: MG (ret) Randy "Church" Kee, Ms. Julie Kitka, Ambassador Mike Sfraga (speaking), and Mr. Matthew Hickey.

Concluding Remarks

Major General USAF (Ret) Randy "Church" Kee, Director, Ted Stevens Center

The wide variety in attendees at this conference is a testament to the power of engagement. The contributions over the past few days represent transformational work in shaping the understanding of the Arctic and defense. We have tackled some of most pressing and complex challenges during this decisive decade. This includes large scale war in Europe, the emergence of China as a multi-dimensional global power, the transformative impact of a changing operational environment, technological advances and the lasting echoes of the global pandemic. All this has had a profound impact on the Arctic. There are several key takeaways from this conference:

- We must seek whole of society approaches. We're better and stronger when we are united and bringing everyone to the table.

- The Arctic belongs to all our nations. We must remain committed to inclusivity, embracing Indigenous knowledge, fostering positive international relations, and learning from each other.
- The challenge moving forward is how to advance innovative solutions to build and maintain security and prosperity across the Arctic Region. Now is the time to act and to invest in education and work force development.
- We must prepare our future Arctic leaders.
- We must innovate for security and prosperity through a framework of collaborative inclusivity. Going forward we must expand our collaboration, turn dialogue into action, apply lessons learned, bridge generational gaps and maintain momentum through networking.
- The Arctic is a place where the threat and risk is real.
- The Arctic is part of a series of flanks for NATO.
- The real ability to defend requires real action. How do we campaign to deter and dissuade?

The Arctic is not just a region but a testament to our shared resilience, ingenuity and interdependence. The true measure of the conference is what happens next. The conference should ignite efforts to build resilience, collaboration and a stronger future. First and foremost, we must defend our most important assets, the people of the Arctic and across NATO. We look forward to future conferences and we will innovate and change as we go forward. Thanks to the Ted Stevens Foundation, ADAC-Arctic and UAA and appreciation to Department of State, the Department of Defense, and the Department of Homeland Security for their support of this conference.

Analysis

Key Themes

The Anchorage Security and Defense Conference (ASDC) 2024 examined the intersection of geopolitical competition, deterrence strategies, technological innovation, and Arctic security. The discussions emphasized the Arctic's evolving role as a theater for strategic competition, requiring enhanced defense postures, resilient infrastructure, and stronger multinational cooperation. The following key themes summarize the major insights from the conference.

Geopolitical Competition and Arctic Security

As Sino-Russian collaboration expands, Arctic security dynamics are shifting, requiring greater intelligence- sharing, joint exercises, and integrated defense postures among NATO and Arctic allies. The growing military presence of China and Russia in Arctic waters and airspace reinforces the urgency of deterrence-focused responses. The addition of Finland and Sweden to NATO was framed as a strategic opportunity to bolster Arctic security, though command integration and operational readiness require further development. The Indo-Pacific's emerging role in Arctic security, particularly through Japanese and Australian partnerships, was also emphasized.

Infrastructure Resilience and Defense Capabilities

The Arctic's vast and unforgiving operational environment presents severe challenges to infrastructure resilience, particularly for military installations, logistical hubs, and critical infrastructure. Vulnerabilities in remote airfields, energy grids, and transportation networks could be exploited by adversaries, underscoring the need for robust, redundant, and multi-use infrastructure. Public-private partnerships were identified as essential to expanding Arctic infrastructure, with Greenland's microgrid energy initiatives cited as a model for energy resilience and security.

Maritime Security and Domain Awareness

The increasing viability of Arctic sea lanes has raised concerns about dual-use vessels, unauthorized naval presence, and gaps in domain awareness. The need to counter maritime incursions, monitor military and civilian shipping routes, and enhance detection of unconventional threats was a central focus. The expansion of U.S. and allied icebreaker fleets was widely supported, along with greater collaboration in joint military exercises such as Arctic Edge to enhance deterrence and interoperability.

Emerging Technologies and Arctic Innovation

Technological advances are reshaping Arctic security. AI-enabled domain awareness, predictive analytics for Arctic energy grids, and advanced ISR (Intelligence, Surveillance, and Reconnaissance) platforms were highlighted as critical force multipliers. The integration of modular nuclear reactors (SMRs) for military bases and Arctic outposts was presented as an emerging solution to sustain long-term operations. Advancements in autonomous systems and unmanned platforms for Arctic surveillance and reconnaissance were also discussed.

Indigenous Security Leadership and Operational Integration

The inclusion of Indigenous knowledge in Arctic security planning was recognized as a force-enhancing capability. Programs such as Canada's Rangers and Greenland's Arctic Basic Education were cited as models for leveraging Arctic expertise in military planning. However, gaps in communication networks in Indigenous regions were noted as a strategic vulnerability, potentially affecting military coordination, emergency response, and situational awareness.

Shifting Environmental Landscape and the Security Implications

The Arctic's rapidly shifting operational environment—characterized by coastal erosion, permafrost degradation, and altered sea ice conditions—is reshaping military logistics and defense postures. Infrastructure must be adaptable to new environmental conditions, particularly in forward operating bases and strategic Arctic outposts. Dual-use operations, combining military patrols with environmental reconnaissance, were discussed as a means to strengthen situational awareness while maintaining Arctic presence.

Arctic Force Readiness and Workforce Resilience

Sustaining a combat-ready and operationally effective force in the Arctic is increasingly challenged by recruitment, retention, and specialized training gaps. The harsh operational environment, logistical complexities, and limited local workforce make maintaining a persistent military presence and infrastructure support network more difficult. Without a skilled, Arctic-trained workforce, both defense operations and critical infrastructure maintenance will face long-term sustainability risks.

To address these challenges, innovative training solutions—such as virtual reality-based Arctic warfare training, cold-weather combat simulations, and expanded cybersecurity education programs—were highlighted as critical for enhancing force preparedness and increasing retention rates. Additionally, greater collaboration between military, industry, and academic institutions is needed to develop a specialized workforce capable of sustaining Arctic security operations, intelligence analysis, and infrastructure maintenance. Ensuring that Arctic military installations, logistics hubs, and forward

operating bases have the necessary personnel, and expertise is vital for maintaining deterrence, rapid response capabilities, and long-term operational resilience.

The Arctic's Role in Global Defense Prioritization

A recurring concern was the risk of Arctic defense being sidelined in favor of other strategic theaters. The conference reinforced the need to frame the Arctic as a critical domain for national defense, deterrence, and force projection. The Arctic was positioned not as a peripheral region but as a central theater where military power, economic stability, and national security converge. A NATO-centric approach was strongly advocated to ensure continued military focus and readiness in the Arctic.

Emerging Trends

Beyond reinforcing established Arctic security concerns, ASDC 2024 highlighted several emerging trends that reflect evolving defense strategies, technological advancements, and geopolitical realities. These trends underscore the need for adaptive deterrence measures, forward-leaning infrastructure investments, and integrated allied defense postures.

AI-Driven Arctic Defense and Energy Optimization

Artificial intelligence (AI) is becoming a force multiplier for Arctic security, with applications in ISR, energy grid optimization, and real-time Arctic situational awareness. AI-enabled sea ice mapping, automated threat detection, and multidomain force coordination were presented as potential enhancements for faster military decision-making. AI's ability to integrate Western defense analytics with Indigenous environmental knowledge offers a new dimension to Arctic resilience planning.

Modular Nuclear Reactors for Arctic Energy Security

The integration of small modular nuclear reactors (SMRs) to sustain Arctic military bases and installations was identified as a transformative solution to ensure long-term operational independence. The discussion highlighted the dual-use benefits of SMRs, allowing both military and civilian installations to operate without reliance on vulnerable supply chains. This reflects a major shift in Arctic energy strategy, supporting remote defense infrastructure and forward-operating capabilities.

Finland's F-35 Public Highway Operations: A New Model for Arctic Airpower

Finland's demonstration of F-35 operations on public highways introduced a novel concept for Arctic air defense resilience. This distributed airpower strategy enhances combat survivability by allowing rapid redeployment from non-traditional airfields. The concept could serve as a model for NATO and U.S. Arctic force posturing, ensuring greater flexibility in extreme environments.

Dual-Use Military-Scientific Operations for Arctic Security

The integration of scientific research with military patrols was proposed to strengthen Arctic presence while gathering environmental intelligence. This dual-use approach could enhance domain awareness, infrastructure adaptation, and security presence in the region while expanding operational justification for sustained Arctic deployments.

Sino-Russian Military Coordination and Strategic Escalation

The rapid expansion of joint Chinese-Russian Arctic military exercises, including increased naval deployments near Alaska, signals a growing strategic challenge. The conference highlighted concerns that Russia may be granting China deeper access to Arctic resources and technology, potentially reshaping Arctic security dynamics. Expanded joint operations and military cooperation between the two states could necessitate greater deterrence measures and response capabilities from the U.S. and NATO.

Cyber and Hybrid Warfare Risks in the Arctic

Emerging threats in Arctic cybersecurity, electronic warfare, and infrastructure attacks were emphasized as key vulnerabilities. AIS spoofing, electromagnetic interference, and cyber intrusions targeting Arctic military and civilian infrastructure present growing security risks that require immediate countermeasures. The expansion of multi-domain defense strategies to address these threats was strongly advocated.

The Debate Over NATO's Arctic Command

A significant discussion emerged on whether NATO should establish a dedicated Arctic Command. While some argued for a specialized command structure, others cautioned against over-fragmentation of NATO's force posture. The growing role of Alaska as NATO's western flank was highlighted as a key factor in determining Arctic command structures.

Conclusion

The Anchorage Security and Defense Conference (ASDC) 2024 reinforced the Arctic's growing significance as a strategic theater for geopolitical competition, defense innovation, and allied cooperation. Against the backdrop of expanding Chinese and Russian military activities, increasing pressure on Arctic infrastructure, and rapid changes in the operational environment, discussions underscored the urgency of enhanced deterrence strategies, resilient infrastructure investment, and forward-leaning defense postures.

The Arctic is no longer a peripheral security concern—it is a primary theater for strategic competition, force projection, and military adaptation. The integration of new technologies such as AI-driven surveillance, modular nuclear reactors for energy independence, and unmanned ISR platforms reflects the next stage in Arctic defense innovation. Meanwhile, the emergence of hybrid threats, cyber vulnerabilities, and expanded joint military operations between adversarial states highlights the need for enhanced NATO coordination, multi-domain defense strategies, and greater intelligence-sharing among Arctic allies.

A key takeaway from the conference is that deterrence in the Arctic is not just about presence—it is about preparedness. The ability to rapidly deploy forces, sustain operations in extreme environments, and coordinate across military and civilian sectors will determine strategic success in the region. The Arctic's logistical and infrastructure challenges require adaptive solutions, such as Finland's innovative approach to dispersed airpower and the dual-use potential of emerging energy technologies.

Moving forward, a whole-of-alliance approach—incorporating military, scientific, technological, and Indigenous expertise—will be critical for securing Arctic sovereignty, maintaining operational superiority, and reinforcing allied defense cooperation. The Arctic's future will be shaped by those who prepare, adapt, and invest. Ensuring that defense and deterrence remain top strategic priorities will be fundamental to sustaining security, stability, and resilience in the High North.

Appendix A: Women, Peace and Security Event Flyer

EVENING RECEPTION

On behalf of Maj Gen (ret.) Randy "Church" Kee
Director of the Ted Stevens Center, and
Honorable Mead Treadwell
Former Lieutenant Governor of Alaska

With remarks from RADM Scott Robertson,
NORAD and USNORTHCOM, and
CAPT Rebecca Albert, CGTF-Arctic

You are cordially invited to the Anchorage Security and Defense Conference Women, Peace, and Security Evening Reception.

A special thank you to the Ted Stevens Foundation for generously funding this event.

Light food and beverage served
Attire: Business Casual

DAY	TIME	
NOV, 20	6PM	Anchorage, Alaska

Appendix B: Background Reading

Panel 1: Allied Perspectives on Defense in the North

Author: Nikidrea Rey, Research Consultant, ACT1 Federal, LLC

Key Points:

- NATO has so far refrained from overstating its approach to Arctic affairs without a holistic understanding of regional complexity and dynamics.
- Messages of peace, stability, and cooperation permeate Artic discussions throughout the alliance, but variance exists in the way that individual states perceive Arctic challenges.
- At the sovereign level, Allied countries independently employ mixed strategic postures in response to Russian and Chinese interest in the region and, consequently, to the militarization of the Arctic.

The Arctic is well known for its harsh physical landscape, including remoteness, severely limited infrastructure, and unpredictable natural environment (Kruke & Auestad, 2021). Both the structural features and the geostrategic implications of this region are being altered. The salience of the Arctic's melting permafrost is rising as a national priority for adjacent states, and particularly so for North Atlantic Treaty Organization (NATO) allies with Arctic equities. In 2021, NATO Allied Command Transformation (ACT) released a Regional Perspectives Report on the Arctic to addresses the Arctic's "potential to become a key space for great power competition and social disruption in the coming decades" as thawing ice creates "the possibility for new strategic and commercial sites and corridors" (p. 5). The report assesses that the "geostrategic significance of the Arctic will continue to increase out to 2040" and signals a need for both cooperation and deterrence as Russia enhances its footprint in the region and China endeavors to validate itself as a self-proclaimed "near-Arctic" state (Allied Command Transformation, 2021, 27). Most notably, ACT reveals that allies are divided on "the level of geostrategic significance to assign to the Arctic" (p. 28). Despite NATO's hesitance to clearly lay out Arctic priorities, regional exercises such as Nordic Response1 showcase Allied efforts to bridge the gaps between the European and North American polar territories.

In the United States, Arctic affairs made an initial appearance in the 2010 National Security Strategy (NSS) under former President Barack Obama. Since then, America's elaboration of Arctic concerns grew. What was a fleeting reference between 2010 and 2017 is now a dedicated section on maintaining peace in the Arctic region in the 2022 NSS. The latest iteration (2022) stipulates that the US will deepen "cooperation with our Arctic allies and partners" and collaborate "to sustain the Arctic Council and other Arctic institutions" (p.

45). This shift in US thinking was reflected by the Department of Defense's (DoD) production of its first ever Artic Strategy in 2019.

More recently in the aftermath of Russia's war against Ukraine, DoD released the 2024 Arctic Strategy to account for Russian aggression and increased Chinese involvement in Arctic affairs. While the US approach shows a clear escalation of messaging over time, a qualitative study of related policies and strategies by the International Institute for Applied Systems Analysis found that Arctic security is defined and prioritized differently by each Arctic nation (Heininen et al., 2020). In the study, the Security Indicator, which accounts for "how security is defined and what the security priorities are" among Arctic coastal states, "is relatively fragmented" (Heininen et al., 2020, pp. 28-114). Although the study coded policy texts released between 1996 and 2019, the findings still largely reflect the array of stakeholder perspectives today.

The Circumpolar North was generally hailed as a space of "cooperative consensus" where "respect for different economic and political traditions [were] held in high regard" through the late 2000s, (Busch, 2023, p. 667). All eight Arctic states – Canada, Denmark (Greenland), Finland, Iceland, Norway, Russia, Sweden, and the US – converged to establish the Arctic Council (AC), "an intergovernmental forum" that acts as a custodian for "Arctic cooperation and policymaking" (Loukacheva, 2020, pp. 110-111). Since Russia's 2022 invasion of Ukraine, the AC is unable to continue normal operations and is unlikely to change in the near term (Lysenko, Vylegzhanin, & Young, 2022). The consensus-based group fostered an "atmosphere of trust and transparency," yet anxiety about "the potential for disagreements" remained in some states (Busch, 2023, p. 680). The two main sources of friction stem from a potential resource grab and possible spillover "from broader state politics and interactions between states at a global level" (Everett & Halašková, 2022, p. 10). Until the Arctic produces conditions more suitable for navigation and resource extraction, the latter concern presents a more immediate case for resolution. The Arctic as "a growing arena for Russia-[China] collaboration" creates mixed emotions within the Alliance (Conley et al., 2024, p. 1).

Research examining the reasons for incongruent levels of willingness "to project power to compete over the control of resources and territory" concluded that national interests in the Arctic are directly linked to domestic political and economic conditions (Markowitz, 2020, p. 224). Simply stated, each allied circumpolar nation responds in a fashion commensurate with its relative need to secure Arctic resources. For some, China is an enabler. For others, non-Arctic state involvement brings additional uncertainty. Allies unanimously agree on the need to protect indigenous populations, conduct safe search and rescue operations, and limit negative externalities affecting climate and environment. All parties also concur that Russian aggression complicates Artic relations, hence its exclusion from the AC beyond 2022. The path back to cooperative relations remains unclear. As a result, a mosaic of allied Arctic positions is emerging.

Canada

Canada has the greatest share of allied territory in the Arctic. The Canadian Arctic lacks industry, urban areas, and easy entry points compared to other circumpolar nations, making it the "least accessible, least developed, and least populated part of the Arctic Ocean region" (Exner-Pirot & Huebert, 2020, p. 140). Notwithstanding the complications of this remote land, the Arctic territory is tied into the country's national identity. Therefore, threats to the region fuel Canada's push to defend its Arctic sovereignty and form a fundamental pillar of its national security concept (p. 141). Internal interpretations of the Arctic threat, however, take two compositions – those who view Russia as a threat and those who reject the notion that the Arctic, especially Canada's north, is at risk of armed conflict (pp. 143-145). Official statements regarding the Arctic echo the narrative that the "region is a stable and rules-based region of the globe that has avoided the tensions and conflicts associated with so many other parts" (p. 147). Canada's strategy toward the Arctic is solely a defensive one, owing to Russia's buildup of military assets (p. 147-148). The Canadian response is ever more proactive, to include a greater military presence and investment in land and maritime vehicles suited for Arctic physical conditions (Ritchie, 2024). The nation's latest Arctic strategy, Our North, Strong and Free: A renewed vision for Canada's defence. balances its desire for friendly relations with a strong stance against deviation from rules-based order by Russia and China.

Denmark

Greenland's proximity to North America ties Denmark's security issues to North American defense and elevates Greenland as "a geostrategically important steppingstone between the Western Hemisphere, Europe, and northern Asia" (Rahbek-Clemmensen, 2020, p. 177). After the conclusion of the Cold War, Greenland's government gained authority over local affairs and ultimately warmed up to Chinese investors (p. 181-183). China's economic interest in Denmark's autonomous territory stirs fear that the PRC may manipulate its role to "weaken the American position on the island" (p. 183). In addition to Chinese involvement, Denmark is also wary of Russia. Having released its Foreign and Security Strategy Policy in January 2022, Denmark quickly revised and reissued the document a year later with references to the threat of aggression in Europe (Christensen, 2023). The new document lists what Danish officials deem three "turning points in world history" – dismantling of the Berlin Wall, the 9/11 attack, and Russia's invasion of Ukraine (Ministry of Foreign Affairs of Denmark, 2023, p. 7). The policy paper reaffirms Denmark's commitment to peace and stability in the region, but it also establishes intention to rely on Danish Force presence for "improved surveillance and enforcement of sovereignty" (p. 12). Denmark's rapid response is noteworthy, but efforts to bolster Arctic capabilities predate the war in Ukraine. In 2021, the Danish Ministry of Defence announced a 1.5 billion DKK ($215.4 million USD) agreement specifically for that purpose. In early 2024, Denmark also made progress in finalizing an agreement that will fund "long-range [dual use] drones for

surveillance, intelligence, and asserting sovereignty in the Arctic and the North Atlantic" (Edvardsen, 2024, para 3). Considering Arctic changes, Denmark's Minister of Defence asserts that the country needs "more muscle in the Arctic and North Atlantic" (para 6).

Finland

Finland developed a policy of neutrality as an outcome from a tense history with the Soviet Union. On two separate occasions, Soviet forces invaded its neighbor and forced Finland to cede territory to end each conflict. Until the 2000s, Finland never emphasized its place as an Arctic nation, but the country became recognized as "a frontier between the West and the East" (Ferdoush & Väätänen, 2022, pp. 619-621). In this position, Finland formed an identity as "as political bridge-builder" which continues to resonate in the modern setting (p. 624). Finland opts to respond only as necessary, even in the face of Russia's militarization, since it enjoys a rare luxury of dispute-free relations with other circumpolar states and no contested claims to Arctic territory, (Heininen, 2020, pp. 199-204). Finland's Strategy for Arctic Policy (2021) touches on Russia's posturing in the North as well as China's interests, but Finland's security concerns predominantly express environmental concerns. The latest version takes modest steps away from the previous in that Finland has a "more reserved stance with respect to cooperation with Russia" and "military security aspects are more pronounced" (Middleton, 2023, para 10-11). Finland, together with Sweden, decided to join NATO shortly after Russian troops illegally entered Ukraine, but the residual response trails that of some other Arctic allies. Finland exhibited its arctic expertise while leading a joint NATO exercise north of the Arctic Circle in 2023, but material upgrades so far are quite limited (Hughes, 2024, p. 2). For now, Finland appears to exercise a wait and see strategy before making haste to define its new position toward the Arctic. In this approach, Finland leaves an open opportunity to either rapidly respond to a security challenge or to rekindle friendlier relations with Russia (Koivurova, T., et al, 2022, p. 80).

Iceland

Iceland presents a strategic conundrum of two identities – that of a "small state" and that of a that of state capable of influencing larger powers (Wilson & Ingólfsdóttir, 2020). Since 2008, the island nation regularly hosts NATO Air policing missions and provides a key staging area for the trans-Atlantic alliance (Wilson & Ingólfsdóttir, 2020, p. 189). Iceland's role does not preclude remarks by Prime Minister Katrín Jakobsdóttir's that stakeholders must refrain from militarization of the Arctic in her 2018 address to the Artic Council Assembly. The country's main concerns are rooted in the changing climate and "possible economic gains associated with the opening of Arctic shipping lanes" (Hansen & Hauksdóttir, 2021, p. 163). Size and resource constraints negate Iceland's ability to maintain a military, but the small island nation still "emphasizes a comprehensive and multilateral approach in security affairs" (p. 164). Iceland is considered a "latecomer" to Arctic discussions and national security conversations writ large, having developed its National Security Council and first National Security Policy in 2016 (p. 165). Recent

guidance, Iceland's Policy on Matters Concerning the Arctic (2021), lists 19 "points of emphasis" that reiterate peace, cooperation, and safe operations (pp. 3-6). The stance it communicates vis-à-vis Russia and China is rather benign. Iceland acknowledges Russia's interest in safeguarding its Arctic assets as "legitimate" and welcomes non-Arctic states that "respect international law and the status of the eight Arctic States and conduct themselves in a peaceful and sustainable manner" (pp. 20- 21). Going forward, Iceland will need to balance economic relations with China against its security dependence on the US (p. 168).

Norway

The High North for Norway consists of its northernmost county of Finnmark on the mainland and the island of Svalbard in the Barents Sea. Formerly the only NATO member on the Scandinavian Peninsula, Norway came to be "NATO's 'eyes and ears' in the European Arctic" (Åtland, 2020, p. 166). The country also became "a 'standard bearer' of multilateral cooperation for sustainable development in the region" as NATO's Northern borderland to non-allied Europe (Humrich, Weber, & Weber, 2020, p. 72). A four-decade-long contest over maritime rights near Svalbard between Russia and Norway ended with an agreement 2010, and the Arctic neighbors pursued more positive relations until 2014 (Åtland, 2020, p. 167). When Russia took a series of steps defecting from cooperative norms, Norway followed suit. Through the 2000s and 2010s, Russia increased "strategic bomber patrols in the international airspace over the Barents, Norwegian, and Greenland Sea," made upgrades to its Northern Fleet, and took directed political actions that produced a general decline in the collaborative atmosphere (p. 168). After 2014, Norway releases an Artic Policy followed by an Arctic Strategy, but there was limited material support to back meaningful actions toward securing the state's Arctic assets (Gricius & Fakhoury, 2024, p. 827). Norway's security is defined in two ways. On one hand, Norway prioritizes energy security and a balance of deterrence and pragmatic cooperation with Russia (p. 826). On the other hand, Norwegian security is shaped by the country's location "on the periphery of Europe" and its relatively small armed forces (Åtland, 2020, p. 168). Norway's latest Artic Policy (2021) welcomes China and other non-Arctic nations to participate in regional affairs and underscores the importance of responding to the Russia challenge in ways that limit the potential for conflict. The recent roll out of a long-term defense plan committing NOK 600 billion ($54.5 billion USD) to boost Norwegian force capacity in every branch shows a strong willingness to defend against encroachment if needed (Edvardsen, A., & Bye, 2024).

Sweden

Sweden's political and strategic landscape underwent a major transformation in the past few years. Russia's invasion of Ukraine prompted Sweden to abandon 200 years of nonalignment by joining NATO along with Finland. Although Swedish forces "actively participated in NATO- led military activities… under the Partnership for Peace umbrella"

before the decisive transition, Sweden's longstanding "military doctrine rests [ed] on a self-determined version of neutrality," (Eklund, 2020, p. 209). Most of Sweden's political and security connects in Europe are connected to its Nordic neighbors and "countries of the Baltic Sea Region (BSR)" – two areas of alarming Russian military activity (p. 209). In the High North, Russia's Northern Fleet operates a number of nuclear-powered submarines while the BSR is known more for Russian provocation of NATO elements (Eklund, 2020, p. 210).

The most recent Strategy for the Arctic Region (2020) draws attention to Russia's build up and China's push for increased influence, but it does not deviate from a focus on neutrality and cooperation (p. 23). More recently, Sweden ramped up its position as a regional power. In 2023, Sweden announced plans "to establish a new military unit in the Arctic city of Kiruna" and increase its presence in the High North (Khorrami, 2023, para 1). Sweden's Supreme Commander attributed this move to the region's "emerging importance as a key supplier of three resources: critical minerals, a space hub, and an ever-increasing number of data centers" (para 4). In early 2023, two groundbreaking developments took place in Northern Sweden with the "discovery of Europe's largest deposit of rare earth" and the inauguration of "Europe's first, and only, orbital satellite launch complex" (para 6-7). These changes create de facto competitions with China and Russia, given China's role as the main supplier of Europe's minerals and China and Russia's space contest against the West (Khorrami, 2023). Sweden's actions signify a strong stance on securing its Arctic territory, including the construction of a "new naval base in the northern city of Luleå" (Khlopina & Gnatiuk, 2023, p. 39). To further strengthen its position, Sweden's next Arctic policy should "adequately address the security concerns of the region" (Khlopina & Gnatiuk, 2023, p. 46).

United States

The United States became an Arctic nation in 1867 with the purchase of Alaska from Russia. Despite this long history, the US failed to capitalize on "opportunities to engage in Arctic policy and cooperation at nearly every turn" (Herrmann & Hussong, 2020, p. 23). Among Arctic allies, the US stands alone as the only country without a ratified United Nations Convention on the Law of the Sea. The 1994 treaty, which "defines and regulates maritime activities on the world's oceans" is increasingly vital to the Arctic as maritime routes become more accessible (Herrmann & Hussong, 2020, p. 31). The US Coast Guard is currently the only defensive component operating ice breakers, which both face obsolescence (p. 33). Results of the newly formed Icebreaker Collaboration Effort with Canada and Finland are yet to be assessed. Regarding DoD, the 2019 Arctic Strategy references several service-level changes to adapt conventional warfighting to the Arctic landscape. The 2024 version offers more detail on countering the threats posed by Russia and China in the region and clarifies a desired end state of stable relations. Critics, however, note that the language fails to direct the Artic as a strategic priority. In contrast to

strong messaging about aggressor states, the 2024 Arctic position leaves space for cooperation with any state adhering to international norms.

In summary, NATO acknowledges how "the growing importance of the [Arctic], mainly due to Russian and Chinese interests" necessitates adaptation "to a new security environment" (Allied Command Transformation, 2021, p. 16). The Alliance defers "the collective defense burden for potential Arctic operations… to those Allied nations with regional interests" and emphasizes the importance of collaboration through "bilateral, trilateral, and multinational" engagement (pp. 16-28). Similarly, cooperation remains the consensus in allied Arctic states' political and strategic messaging. Stability and the maintenance of status quo relations in the Artic are particularly significant when accounting for the fact that "nuclear power involving both military and civilian applications is a prominent feature of the [region's] "political landscape" (Lysenko, Vylegzhanin, & Young, 2022, p. 192). Disappearing sea ice and increased navigability are expected to drive the desire for nuclear assets in the Arctic even higher (Lysenko, Vylegzhanin, & Young, 2022). Despite the distinctiveness of Arctic policies, maximizing opportunities to focus on overlap remains key. Cooperation and risk management must be the priority of all stakeholders. The vitality of cooperative fora, namely the AC, will determine whether we address the new Arctic in a cohesive or chaotic manner.

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Panel 2: Technology, Energy, and Security: AI in a Changing Arctic

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The Arctic region plays a pivotal role in American security infrastructure, housing critical aerospace and maritime warning and control systems (DOD, 2024). However, the changing environmental necessitates additional considerations that may potentially compromise defense capabilities. Melting sea ice opens up choke points as navigable shipping lanes to facilitate easier access to natural resources and more secure strategic routes for military transportation (DOD, 2024; Strawa et al., 2020). While there is a standing cooperation amongst Arctic nations, shifting environmental conditions have the potential to destabilize the region and lead to geopolitical tensions due to increased human activity (DOD, 2024; Hussain, 2021; Strawa et al., 2020). This situation demands enhanced security measures and military capabilities to safeguard states' interests in resources and maritime jurisdictions. Nevertheless, the warming Arctic presents significant operational challenges for military installations, as aging infrastructure deteriorates under harsh conditions and unpredictable weather patterns impede warfighter readiness (DOD, 2024; Hussain, 2021; Strawa et al., 2020). Consequently, the 2024 Department of Defense's Arctic Strategy emphasizes the need for increased research into environmental change and its impacts, as well as the development of advanced sensors for data collection in this rapidly evolving environment.

Numerous scientific studies have demonstrated a significant reduction in Arctic sea ice, with 2020 exhibiting one of the lowest records of Arctic sea ice in the past four decades (Liu et al., 2020; Perovich et al., 2020). Accelerated sea ice melt has resulted in the replacement of multiyear ice with first-year ice, which is more susceptible to atmospheric

changes and frequently melts completely during warmer seasons (Meier et al., 2014; Nghiem et al., 2007; Zhang et al., 2008). Researchers have analyzed the decline of Arctic sea ice to model when the Arctic Ocean is at risk of being ice free during summer months. Various experts contend that an ice-free Arctic is likely to occur in the 2061–2064 timeframe, though some projections estimate it could occur by 2050, or even by the 2030s (Notz, 2020; Notz & Stroeve, 2016; Wang et al., 2022). Diminishing sea ice not only contributes to rising sea levels but also intensifies warming in the Arctic through a phenomenon known as Arctic Amplification, as since the turn of the century, the region warmed at least three times the rate of the global average (Stuecker et al., 2018; Wang et al., 2022). Sea ice is crucial for preventing temperature rises in the Arctic and beyond. Ice is highly reflective and doesn't absorb as much solar energy as open water or land (Strawa et al., 2020). Consequently, the loss of ice raises temperatures, leading to further ice loss and creating a self-reinforcing feedback loop (Strawa et al., 2020). The warming induced by this feedback mechanism alone is equivalent to as much as 25 percent of the warming created by CO2 emissions in three decades (Pistone et al., 2014). Arctic Amplification not only escalates temperatures in the Arctic but also exerts substantial influence on local ecosystems and global climate patterns (Wang et al., 2022).

Observable changes to Arctic ecosystems are manifesting due to shifting climate patterns. Researchers have discovered excess salmon counts (Moore et al., 2014; Mueter et al., 2013) and notable shifts in the abundance and distribution of seabird species (Gall et al., 2017; Kuletz et al., 2014; Renner et al., 2013). The ecological equilibrium among top Arctic predators has been disrupted, with some studies citing a larger and prolonged presence of killer whales (Stafford, 2018), while others report a decline in the condition, health, and size of top species (Hamilton et al., 2015). The loss of sea ice has compelled walruses to haul out on Alaskan shores rather than on ice floes (Jay et al., 2017) and has significantly altered hunting patterns and diminished opportunities for indigenous populations (Huntington et al., 2017; Huntington et al., 2020). These environment-induced transformations reach from the top of the food chain down to primary producers (Arrigo et al., 2012; Kim et al., 2017) and are poised to fundamentally restructure the region's food web dynamics (Huntington et al., 2020).

While Arctic warming undeniably contributes to global temperature rise, its influence on atmospheric circulation and regional weather patterns remains a subject of intense scientific debate (Barnes & Screen, 2015; Blackport et al., 2019; Cohen et al., 2020; Lannuzel et al., 2020; Screen et al., 2018; Shepherd, 2016). Warming weakens the polar jet stream, increasing the likelihood of persisting weather patterns that may lead to extreme weather events (Strawa et al., 2020). Changes in surface air temperature and atmospheric circulation are in part responsible for the shrinking and thinning of Arctic sea ice (Liu et al., 2020; Wang et al., 2012). Regions of significant sea ice loss see substantial increases in heat transfer between the ocean and atmosphere (Gervais et al., 2024). The combination of rising temperatures and declining sea ice accelerate permafrost thaw, resulting in the

release of additional greenhouse gases, potentially adding an additional 40 percent to CO2 projections, and a cumulative additional net emissions over the next century potentially surpassing those of Russia, Europe, and the United States individually (Schurr et al., 2015; Schurr et al., 2022).

The current and projected consequences of a warming Arctic have intensified calls for a transition towards renewable energy. The Biden administration has established targets to create a carbon pollution-free power sector and achieve a net-zero carbon emissions economy (DOE, 2022). Recent legislation (e.g., Inflation Reduction Act, Bipartisan Infrastructure Law, CHIPs Act) opened opportunities for clean energy development in the United States (Bird & Womble, 2024). Within the Arctic, the Renewable Energy Fund (REF) and Emerging Energy Technology Fund are instrumental in supporting local and rural Alaskan communities' efforts to implement renewable energy systems, aligning with legislation that outlined a roadmap for 50 percent of the state's energy to be derived from renewable sources by 2025 (Lovecraft et al., 2023). To date, the REF has allocated more than 250 million USD to renewable energy initiatives and financed 73 operational projects (de Witt et al, 2019). Other Arctic and near- Arctic nations have expressed their priorities regarding environmental protection of the Arctic. The European Union, Norway, and China are relying on international agreements (e.g., Paris Agreement, European Green Deal) as guiding frameworks, although China's activities suggest their priority is to exploit Arctic natural resources (Uryupova, 2021). Finland and Iceland specifically state their intentions to respect the rights of Indigenous People, while Russia has outlined a strategy to progress towards carbon neutrality (Uryupova, 2021). Canada and Sweden are prioritizing support for scientific and technological research, a focus shared by the European Union, which is also championing green technology development (Uryupova, 2021).

Recent technological advancements have enhanced the viability of transitioning towards clean, renewable energy sources. The US Department of Energy's Energy Program for Innovation Clusters awarded nearly one million USD for electric transportation initiatives in the Arctic (DOE, 2021). Researchers are examining renewable energy microgrids in remote Alaskan communities as potential models for grid-connected areas throughout the Arctic region (Poelzer, 2016). These microgrids can be stabilized using innovative flywheel energy storage systems, capable of managing brief but substantial power fluctuations (Poelzer, 2016). Hydrogen power is receiving special attention at the recently established Snowflake research facility in Russia's Yamal peninsula, where hydrogen- powered transport and fuel cells technologies are under development (Vella, 2022). Due to the rough weather conditions characteristic of the Arctic, the Snowflake facility engineered special wind turbines with anti-freezing mechanisms, expanding opportunities for wind power utilization throughout the region (Vella, 2022). Oceanic wave energy has emerged as a promising electricity generation method, valued for its high availability and predictability (Farrok et al., 2020). The exploitability of solar resources is considered especially versatile by some scholars, especially during the summer period (Morgunova et al., 2020), with innovative

research demonstrating that floating solar panels not only minimize land use but also benefit from water cooling and climatic conditions that enhance their performance (Ebhota & Jen, 2020; Tina et al., 2021; Østergaard et al., 2021). Additionally, a DOE program is investigating seaweed as a potential low-carbon fuel alternative with significant applicability in the Arctic and beyond (DOE, 2021).

Other new technologies that have great applications in protecting against environmental change are artificial Intelligence (AI) and machine learning (ML). Traditional methods of environmental monitoring face issues regarding the need to advance predictive capabilities and physical modeling (Brunet et al., 2021). Numerical weather prediction models benefit from higher spatial resolution for greater realism of forecasts, but traditional computer processing approaches are at their practical limit of what is feasible (Clark et al., 2016; Zheng et al., 2016). Given how Earth system data is ever-increasingly available, conventional algorithms and models are insufficiently scalable to these large amounts of data (Guo et al., 2019; Zheng et al., 2018). Machine learning approaches utilizing artificial intelligence have demonstrated the capacity to fill these gaps. Within environmental monitoring, ML networks have effectively estimated amounts of precipitation (Moreaux et al., 2019) and accurately predicted extreme weather up to five days beforehand (Chattopadhyay et al., 2020a; Chattopadhyay et al., 2020b). These new ML methods are more efficient in terms of human effort, as they do not require an allocated human development effort, they learn from the data (Dewitte et al., 2021).

AI and ML also have applications within energy management. Smart technology is required within smart energy management to monitor and systematize the needs and resources of all suppliers, operators, and stakeholders within an energy system (Chai et al., 2011); machine learning approaches can improve efficiency within energy management. ML can improve predictive maintenance, allowing systems to ascertain opportunities to streamline productivity, reduce costs, and enhance resilience (Nguyen et al., 2018). Furthermore, AI has signaled use within energy generation and demand forecasting, optimized energy storage, demand side management, energy theft detection, and energy pricing prediction (Aguilar et al, 2021; Ahmad et al., 2021; Antonopoulos et al., 2020; Mosavi et al., 2019). AI models can be applicable to all forms of renewable energy systems (Jha et al., 2017), and have shown promising efficacy within the design, tuning, and monitoring of a modern wind generation system (Bose, 2017).

Within the Arctic, ML was used to train a new sea ice prediction system, forecasting up to six months of sea ice concentration, and providing a level of confidence with each prediction (Andersson et al., 2021). This system was shown to be more accurate in its predictions than other physics-based models, and the ability to gauge confidence is unique compared to different deterministic models (Andersson et al., 2021). AI technology is also recommended to simulate future changes amongst glaciers, as ML has an advantage in capturing nonlinear effects when compared to traditional models (Kimothi et

al, 2022). Based on physical parameters, like shadows, water, bare soil, vegetation, and debris, AI recognizes visual attributes to indicate changes in the growth of glaciers (Kimothi et al, 2022). The use of AI has been extended to monitoring reindeer migration routes in the Arctic, allowing for more informed decisions regarding reindeer conservation (Shvetsova, 2023). From a security standpoint, AI and ML can protect Arctic military installations by accurately assessing the rate of permafrost thaw, improving how infrastructure, logistics, and operations develop in a warming Arctic (Wall et al., 2022).

Given the nature of artificial intelligence, many have expressed concern over the ethical considerations that accompany AI and ML. For one, running AI and ML models require computing power, which utilize energy that often creates emissions that contribute to global warming (Coeckelbergh, 2021; Kaack et al., 2022). Additionally, the production of electronics that run these models not only require energy for their creation, but demand the extraction of raw materials, often sourced from poor working conditions and human rights violations in low- income countries (Coeckelbergh, 2021). A review of the literature on AI ethics finds several key concerns among stakeholders: transparency, justice and fairness, non-maleficence, responsibility, accountability, privacy, safety and security, human control of technology, and promotion of human values (Fjeld et al., 2020; Jobin et al., 2019). Within environmental applications, cases of discrimination are evident when AI is utilized to determine where electric vehicle (EV) charging stations should be located based on current patterns of EV use, which charted closely along economic lines (Tao et al. 2018). Additionally, concerns over privacy within AI use are relevant when AI requires data that could reveal facets of human behavior, found in efforts to limit emissions in energy storage, industrial temperature control, and agriculture (Aftab et al., 2017; Dobbe et al, 2019; Liakos et al., 2018).

In 2022, the White House's Office of Science and Technology Policy addressed some of these ethical concerns with their Blueprint for an AI Bill of Rights, which proclaimed that US citizens had the right to be protected from unsafe systems; to not face discrimination from algorithms; to be protected from abusive systems and have agency other their data; to know and understand how and when an automated system is being used; and to be able to opt out and have access to a human to help resolve their problems (White House Office of Science and Technology Policy, 2022). Additionally, some efforts to regulate AI have been attempted. US Exports have analyzed pathways to regulate the export of AI, and a 2023 Advanced Notice of Proposed Rulemaking revealed the Biden Administration's concern over the use of AI in weapons, intelligence, and surveillance capabilities from countries of concern (Plotinsky & Cinelli, 2024). Executive Order 14410 (2023) tasks all US government agencies to evaluate the development and use of AI, including producing regulations specific to each agency (Plotinsky & Cinelli, 2024).

Several frameworks for governance of AI/ML have been proposed. The European Commission (2018) created their "Framework for Trustworthy AI", which recommends

models are validated, traceable, accountable, and provide clarity regarding the justification of decisions the model makes. Gasser and Almeida (2017) suggest a governance model that comprises a hierarchy of layers: the first to ensure the models themselves are technically sound and fair; the second to design ethics for specific uses of AI; and the third to generate appropriate regulation to cover social and legal issues regarding AI. A different approach suggests that all of society contributes to the governance of AI. Rahwan (2018) propounds that government, industry, and society work together to provide standards that represent the expectations of social norms and human values. This ensures that ethical considerations are at the forefront of governing artificial intelligence and machine learning.

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Panel 3: An 'Axis of Adversaries'? China, Russia and Associated States

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Key Points:

- The China-led, anti-Western bloc among Eurasia's major power players is forcing an international paradigm shift using coercive tactics to displace democratic principles in favor of autocracy.
- China, Russia, North Korea, and Iran possess varying levels of capability as individual actors, but they pose a credible collective threat to global stability and security.
- Although the Allied response and readiness are mixed, member states unanimously agree on preserving freedom and sovereign rights from the influence of coercive tactics.

The resurgence of an anti-Western bloc among Eurasia's major power players is forcing a global paradigm shift in the 21st century. China and Russia are central to an ill-defined partnership among despots, through which North Korean and Iranian political actions are amplified. Each of the adversarial powers pose a dynamic threat to international stability. The 2022 National Security Strategy names the People's Republic of China (PRC) as the

"pacing challenge" to US military might (NSS, 2022, p. 20). China is the primary driver among non-democratic, adversarial powers "exporting an illiberal model of international order" (NSS, 2022, pp. 8-20). Russia, on the other hand, poses an acute but "immediate threat to the free and open international system" (NSS, 2022, pp. 8-12). Both China and Russia propagate revisionist rhetoric and resort to coercive diplomacy when traditional methods fail. Russia's imperialist agenda "culminated in a full-scale invasion of Ukraine," which aimed to assert the Kremlin's dominion over a sovereign state (NSS, 2022, p. 25). China's newfound economic power produced a global strategic competition with the US. The Chinese Communist Party (CCP) is expanding the People's Liberation Army's (PLA) conventional forces as "space, counterspace, cyber, electronic, and informational warfare capabilities" are integrated into their joint warfare concepts (NDS, 2022, p. 4). Similarly, Russia possesses substantial technology, weaponry, and methods to threaten the strategic interests of the US. and allies and partners (NDS, 2022). Together, China and Russia create existential risks to the US homeland. Both countries are currently "using non-kinetic means" to limit US effectiveness, and "could use a wide array of tools" in their efforts to disrupt military readiness (NDS, 2022, p. 5). North Korea and Iran play smaller, but still sizable, roles as nuclear-capable countries. They pose a persistent threat, one brandishing weapons of mass destruction to menace and the other enabling proxies to destabilize (NSS, 20022) (NDS, 2022). The strategic environment requires the US. and allies to manage a multitude of challenges across various potential inflection points. Alignment in messaging and forces among Western-facing states is increasingly vital for the survival of the status quo international order.

Every corner of the globalized world is within reach of spillover from modern conflict as tensions flare. Researchers in Princeton University's Program on Science and Global Security found far-reaching devastation in a simulated US-Russia nuclear war, including "91.5 million immediate casualties" plus an even greater number resulting from "nuclear fallout and other long-term effects" (PLAN A, 2020, p. 26). The United Kingdom's former Defence Secretary, Grant Shapps, and Poland's Prime Minister, Donald Tusk, described Europe's current strategic environment as resembling a pre-war era, in light of Russia's ongoing war against Ukraine (Edwards, Brown, & Brennan, 2024) (Hughes, 2024). Russia retains a nearly monopolistic share of escalation options, but the next stages of the conflict are predicted to depend on broader geopolitical implications (Frederick, Cozad, & Stark, 2023). The Eurasian supercontinent throughout the 20th century was marked by clashes between democratic and autocratic schools of thought (Brands, 2024). Today, the contests persist in three principal regions where anti-Western powers operate – the Indo-Pacific, Europe, and the Middle East. The Indo-Pacific region faces "shifting security dynamics… new threats and security challenge… ongoing territorial disputes… and new military commitments" that call for a range of offensive and defensive capabilities to meet new challenges (Bitzinger, 2022, p. 248). The proliferation of weapons of mass destruction remains a key issue area, but China's military modernization holds the greatest weight,

having advanced from reliance on Russian materiel imports between the 1990s-2000s to putting pressure on the US technological advantage (Bitzinger, 2022).

Next, Russian "interventions and interferences… as well as resistance to NATO's expansion" challenge unity among European countries – and across the North Atlantic Treaty Organization (NATO), by extension (Malik, 2023, p. 42). Divergent conceptions regarding Europe's role internally and the expectations of allies, namely the US., create a potential flashpoint that could strain collaborative effectiveness of the Alliance (Malik, 2023, p. 42). European leaders are astute in recognizing the risks associated with division in the backdrop of Russian aggression and are seemingly compelled to "enhanced their own collective defence capabilities" with and alongside their North American ally (Malik, 2023, p. 53). Finally, power and ideological struggles in the Middle East produce a "highly volatile landscape resulting from an unprecedented proliferation of weak or collapsing states" (Kamrava, 2018, p. 599). With diminished US involvement in the region, Iran competes with neighbors "to challenge the dominant global and regional hierarchies" which perceives as artificial constructions of the West (Kamrava, 2018, p. 605) Needless to say, Eurasia's geostrategic conditions feature multidimensional sources of friction. Each regional struggle impresses upon and is influenced by the Eurasian geopolitics as a whole.

Before relations deteriorated to such a degree, US hegemony and unchallenged Western influence over the international system since the Soviet Union collapse ushered in a period of relative stability. Conflict, wherever it persisted, was limited to civil disputes and short-lived regional exchanges (Jones & Stedman, 2017). Adversarial powers seeking to undermine this standing system present distinct levels of capability and activity. For instance, China's PLA stands as the largest armed force in the world but "lacks any significant recent combat experience" (IISS, 2024 pp. 253-254). Military effectiveness is also constrained by ineffective training and doctrine. Conversely, Iran's more modest force size, just 30% of PLA numbers, is involved in "proxies in weaker states and entities, like Lebanon, Syria, Iraq, Gaza and Yemen" (IISS, 2024 p. 352). Table 1 below summarizes known quantities of adversarial powers' major platforms and capabilities that enable land, air, and sea power.

Perceivably the most militarily advanced country of the new axis, China strives for a "fully modernized national defense and military force by 2035 and for the PLA to become a world-class military by 2049" ("Military and Security," 2023, p. 47).The 2023 Annual Report to Congress: Military and Security Developments Involving the People's Republic of China highlights significant additions to the PRC's defense inventory; 4 however, US implementation of a "technological blockade," which limit's China's "access to semiconductors and other dual- use technologies through export controls and investment restrictions," is linked to slower growth (Wuthnow, 2024, p. 8). Still, modernization trends are expected to continue considering the PRC's progress toward "technological self-sufficiency" and "its ability to innovate in dual-use areas" (pp. 8- 9). Notable upgrades

include the PLA Air Force's evolution of "operational doctrine, missions, and roles" and the Navy's transition from "a puny coastal force of outdated ships" to a more modern fleet capable of "conducting missions far from China's shore" (Martin, 2024, p. 24) (Of battleships, 2023, para 7). In parallel and competition with US prioritization of space capabilities as warfare becomes more informatized, "China is also bolstering its supportive space infrastructure," including "newer and more efficient launch vehicles" and expansion of "its global network of ground stations in Asia, Africa, South America" (Berge & Hiim, 2024, pp. 8-9). Most significantly, the 2023 report advises that the PRC's nuclear strategy aims for a nuclear force capable of "responding with sufficient strength to conduct multiple rounds of counterstrike," after sustaining an adversary's first strike (p. 105). China's current strategic missiles can be employed via land-based, silo-based, road-mobile, sea-based, and aerial systems (pp. 106-108). Hypersonic and low-yield nuclear capabilities are sought after as future means to meet China's minimum and maximum deterrence goals (pp. 110-111).

Next up, Russia presents a paradoxical conundrum that leaves scholars and policymakers alike baffled. A duality of strengths and drawbacks in the governance structure permeates many aspects of defense as Russia increases its "power projection capability against a backdrop of stagnated politics" (Silaev, 2022, p. 599). After the Soviet Union ceased, Russia's military reform efforts appear as "incomplete and with unclear goals" (Crane, Oliker, & Nichiporuk,p. 56). The disparities in modernization priorities are quite noticeable, with "air defenses and certain strike capabilities… on track to complete modernization by the end of this decade," land and air units maintain a more gradual pace, and naval assets – traditionally thought to substantially enable power projection – are the most underfunded (Crane, Oliker, & Nichiporuk,p. 70). Deemed "Putin's blunder" by Secretary of Defense Lloyd Austin, Russia's February 2022 invasion of Ukraine represents perhaps the greatest strategic misstep in its post-Soviet history. Even before the conflict, which is in part responsive to NATO eastward expansion, analysts predicted that the capabilities needed "to deter Russia… are not daunting in magnitude and would be but a fraction of what NATO fielded during the Cold War" (Dalsjö & Jonsson, 2021, p. 182). Russia's failure to quickly seize Kyiv revealed to spectators the extent of "poor training and planning" accompanied by "massive logistical and command and control challenges" (Jones, 2022, p. 1). As it stands, Russia failed to realize most of its initial military objectives in Ukraine, committed its forces to an unanticipated protracted conflict, and saw formerly neutral Finland and Sweden accede into NATO (Jones, 2022). Reports from US intelligence agencies estimate over 310,000 Russian personnel losses to injury or death since the fighting began (Bowen, 2024, para. 9). Despite those deficiencies, Russian "strategic nuclear weapons, which can be fired from land, air and sea to strike targets located practically all over the globe" still pose a meaningful threat, and their nuclear-powered submarines remain elusive to radars. (Banasik p 38).

Further, although North Korean and Iranian militaries wield less might than their partners China and Russia, they still manage to seize relative power in their regions. The size of North Korea's nuclear arsenal is not immediately clear. The country's "total secrecy and isolation" render the quantity inestimable (Park, 2023, p. 126). North Korea's nuclear program only yielded weapons in 2013 after years of deceptive messaging about intent, including signing the 1993 Nuclear Non-Proliferation Treaty that it would eventually abandon in 2003 (Park, 2023). As of 2022, North Korea "tested nuclear weapons six times and developed ballistic missiles capable of reaching the United States and its allies Japan and South Korea" (North Korea's Military Capabilities, 2022, para 3). In addition to nukes, North Korea spends billions to maintain conventional forces and possesses sufficient expertise to wage cyberwarfare, putting at risk critical infrastructure (North Korea's Military Capabilities, 2022). Unlike the other small power, Iran is only a nuclear aspiring state. It lacks the know-how for developing nuclear weapons, but Iranian uranium enrichment facilities "can produce highly enriched uranium (HEU), which is one of the two types of fissile material used in nuclear weapons (Kerr, 2024, para 2). Current analysis from US intelligence advises that Iran halted "weaponization research" but warns that Iran would more likely undertake a deceptive approach like North Korea's if it resumes (Kerr, 2024, para 19-23). Iran, struggling with "limited and antiquated" ground forces, resorts to "asymmetrical defense capability and relies on proxies" to cope with the ongoing arms embargo put into place in 1979 and "to preserve its status as a major military player in the Middle East" (Rezaei, 2019, pp. 184- 188).

Collectively, the anti-Western powers attempting to shape norms in favor of autocracy pose a substantial risk to the international system. They enable and perpetuate counter-regime activities through defense and economic cooperation. Relations within the axis are not a new phenomenon. All parties engage in some level of bilateral trade and energy transactions. Sino-Russian relations began to grow at the end of the Cold War and "accelerated rapidly after Russia annexed Crimea in 2014" (Kendall-Taylor & Fontaine, 2024, Para 6). Iran's purchases of North Korean missiles dates to the 1980s, and "North Korea is thought to have supplied weapons to Iranian proxy groups" (Kendall-Taylor & Fontaine, 2024, Para 8). In Syria, Russia and Iran collaborate to prop up President Bashar al- Assad. Additionally, Iran presumably imported Russian materiel and defense services, such as fighter jets, pilot training, attack helicopters, and air defense systems, while receiving funding to further development of Iran's space and missile capabilities (Byman & Jones, 2024, p. 34). Russia also provided North Korea "with advanced technology for satellites, nuclear-powered submarines and ballistic missiles" (Byman & Jones, 2024, p. 34). Moreover, the adversarial group tightened collaborative efforts following Russia's invasion of Ukraine, thereby "strengthening Russia's position on the battlefield" (Kendall Taylor & Fontaine, 2024, Para 3). China's "satellite- imagery analysis and aid to improve Russian satellite and other space-based capabilities," Iran's provisioning of hundreds of Shahed and Mohajer drones, and North Korea's shipment of 11,000 containers of arms

cover some examples (Byman & Jones, 2024, pp. 33-34). In action, the partnership appears robust, but the bloc has limited functions. Neither the 2022 joint declaration of a "no limits partnership" between Russia and China nor any other agreements between bloc members led to any formal alliances (Byman & Jones, 2024, p. 37). Opportunities and challenges remain. China, Russia, and Iran are on paths to continuously increase defense cooperation (Byman & Jones, 2024, p. 37). Alternatively, Russia, China, and North Korea disagree on Russian support to North Korea's nuclear and missile development (Byman & Jones, 2024, p. 37). The lack of meaningful security collaboration in the Arctic also signals trouble, given the region's strategic importance to both countries (Ernst & Kim, 2023, p. 49).

In light of the new security landscape across Eurasia, NATO states are responding with mixed measures to suppress encroachment from inside and outside of the Alliance. Countering China, Russian aggression, and funding levels represent some pertinent areas of converging and diverging opinions. Case in point, France and Germany both acknowledge the negative political and economic implications of overdependence on China; however, France is reluctant to support NATO involvement in the sovereign affairs of European countries, and Germany favors more cooperation with China (Simón,2024, p 388). Central and East European states proximal to the conflict in Ukraine focus more on the existential crisis on their doorstep, urging the Alliance to give more attention to Russian aggression (Simón,2024, p 388). Further, allies continue to disagree on the defense spending benchmark at 2% of GDP. The 2024 NATO summit concluded with allies begrudgingly recommitting to a level of spending that many failed to keep since the first promise was made in 2014 (IISS, 2024, p. 61). The aversion NATO countries have to defense investment manifests in force readiness. Germany and France have sizable militaries organized into specialized fighting units, but "antiquated and undermaintained equipment plague German forces" while French combat vehicles are overused and soldiers, undertrained (Fox, 2024, pp. 21-25). The US, considered the world's most advanced military, still suffers "limits on force size and structure" as well as a relatively weak defense industrial base leading to constrained capability growth ("Findings and Recommendations" 2024, p. 15). Other allies face logistical and integration challenges. Questions remain for "how easily Türkiye could move heavy ground forces across the Bosporus Strait" and the time needed to assemble and move Italian troops to NATO's Eastern Flank (pp. 30). Many smaller NATO member states, "have no real military expeditionary capacity to contribute regarding heavy ground forces," and Scandinavian powers are still working to tie new allies Finland and Sweden into the NATO fold (pp. 30-33). Despite these complications, NATO members continue to find ways to innovate and improve European and transatlantic security. The release of NATO's 2022 Strategic Concept is a testament to universal agreement that Europe is in a state of war and China and Russia are leading a multidomain contest to dismantle the Western-led international order (Becker, Duda, & Lute, 2022). Through that concept, NATO can take a more dynamic approach through partnerships "with sympathetic states" in strategic areas like Eastern Europe and the Indo-Pacific

(Heckmann, 2024, para 3). In April 2024, the Alliance announced a new framework called the Partners Augmentation Forces to NATO. This framework builds on the Strategic Concept and "create[s] a pool of partner nation forces that can contribute to alliance members without being restricted by the organization's requirements" (para 16).

Power balancing theory predicts that even benign hegemony is susceptible to challengers seeking relative power gains. The post-Cold War international order guided by the Western world is at stake with the rise of despotic contenders seeking to tip the balance in their favor. At a time when strategic competition produces a security environment that "features the danger of direct military conflict between great powers," it draws skepticism of the "good force" globalization was believed to bring to the international system (Rice, 2024, para 6- 29). Notwithstanding this criticism, the US alliance network remains resilient. Allies can harness "the means to counter a Eurasian axis but together must exercise more complementary actions vis-à-vis Russia and China" (Banka et al, 2024, p. 115). Allied success in future confrontation will be largely determined by allies' ability to overcome contemporary obstacles and ensure delivery of a synchronized response.

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Panel 4: NATO at 75: New Allies and New Challenges

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The North Atlantic Treaty Organization's (NATO) Strategic Concept represents the height of allied agreement on strategic direction, as endorsed by Heads of State and Government (Becker et al., 2022). Historically, this process was predominantly influenced by the United States; however, over time there has been a demonstrable shift towards a more collaborative approach that encompasses the strategic interests of all Allies (Becker, 2021). NATO's Strategic Concept has undergone significant transformations since its inception in 1950, evolving from a focus on deterrence and burden-sharing to incorporating nuclear strategies and geopolitical adaptations (Becker et al., 2022). Throughout the Cold War era, NATO refined its strategic direction to include flexible response, escalation management, and a balance between deterrence and détente (i.e., the relaxation of strained relations), as evidenced by the "Harmel Report" which guided the alliance from 1967 to 1991 (Becker et al., 2022; Colbourn, 2020; Sloan, 1990).

The post-Cold War era ushered in a new approach, with the 1991 concept being the first publicly disclosed document, emphasizing cooperation and force reduction (Becker et al., 2022). Subsequent iterations in 1999 and 2010 expanded NATO's focus to include crisis management, partnership building, and increased consultation regarding security (Becker et al., 2022). The 2001 terrorist attacks and the Global War on Terror necessitated further strategic revision, leading to an agreement for three core tasks: crisis management, collective security, and collective defense (NATO, 2010). Recent geopolitical events, particularly Russian aggression, have prompted a reevaluation of NATO's strategic priorities (Becker et al., 2022). The most recent 2022 Strategic Concept delineates the current security environment, reaffirms NATO's core values, and articulates its fundamental purpose of ensuring collective defense. It outlines three primary tasks: deterrence and defense, crisis prevention and management, and cooperative security (NATO, 2022).

NATO's current military preparedness for its primary mission of territorial defense is at its highest level since the conclusion of the Cold War (Ricketts, 2020). This enhanced readiness is evidenced by the deployment of combat- ready forces from various NATO member states, including the United States and the United Kingdom, to strategic locations such as Poland and the Baltic States (Ricketts, 2020). Furthermore, the United States Department of Defense has made an investment of $2.2 billion in military equipment across Europe, contributing to the overall improvement in the alliance's operational readiness (Ricketts, 2020).

NATO has implemented significant enhancements to its military headquarters, aimed at facilitating troop mobilization during crises and optimizing frontline operations, thereby adopting a more combat-oriented organizational structure (Vandiver, 2024). This shift in focus represents a departure from NATO's previous post Cold War focus on out-of-area operations, particularly in Afghanistan (Vandiver, 2024). The Russian military interventions in Ukraine, occurring in 2014 and 2022, have brought about a strategic refocus within the Alliance towards territorial defense (Detsch & Detrow, 2024; Vandiver, 2024). As a result of these recent upgrades, the headquarters now has the capability to exercise command over a network of supporting command centers distributed throughout the Alliance's member states (Vandiver, 2024). The new Supreme Headquarters Allied Powers Europe (SHAPE) command center is designed to facilitate communication across NATO's territory, from the headquarters to the Alliance's eastern border, where potential conflicts could arise (Detsch & Detrow, 2024). Overall, the headquarters appears to be adapting to a changing security environment, moving away from its post- Cold War configuration towards a structure more prepared for potential military contingencies (Detsch & Detrow, 2024).

The newest members of the alliance, Finland and Sweden, have opened security opportunities for NATO in the North. The longstanding military neutrality of these two Nordic states abruptly terminated their longstanding military neutrality in February 2022, following Russia's full-scale invasion of Ukraine (Chatterjee, 2023). Russian President Vladimir Putin has consistently articulated his belief that NATO's expansion poses a direct threat to Russian national security, for years citing this as the primary justification for initiating the conflict in Ukraine (Faulconbridge, 2022). Initially, Turkey, and to a lesser extent Hungary, expressed resistance to the membership of Finland and Sweden, alleging support for organizations it categorizes as terrorist entities and seeking concessions in return for their agreement (Chatterjee, 2023). All NATO Allies must agree to admit new members.

The recent incorporation of Sweden into NATO is set to transform the Baltic Sea into a so-called "NATO lake," enhancing the alliance's capacity to secure and defend the Baltic region militarily (Akbar & Fadiyah, 2024). Finland's integration into NATO represents a substantial enhancement of the Alliance's collective security and defense capabilities (Forsberg et al., 2022). Finland's geographic position and its emphasis on Arctic matters

confer significant advantages upon NATO, as the nation's proficiency in Arctic and winter warfare is particularly valuable for operations in northern Europe and the broader Baltic Sea area (Akbar & Fadiyah, 2024).

For decades, advocates for NATO enlargement have suggested that expansion can contribute to the stabilization of Eastern Europe while simultaneously promoting democratic governance and market-based economic systems (Asmus et al. 1993; Asmus et al. 1995; Flanagan 1992; Lukes 1999). In contrast, opponents believe expansion would force existing NATO members to extend their defense commitments with questionable benefits and provoke Russian aggression (Brown 1995; Kennan 1997; McGwire 1998; Reiter 2001; Waltz 2000). While the expansion of NATO inherently increases the territory requiring protection, potentially placing burdens on its defensive posture, new members are expected to contribute positively to overall security, with the added benefit of being capable of financing their own defense (Akbar & Fadiyah, 2024).

Cooperative security is a cornerstone of the 2022 Strategic Concept, but it presents potential challenges for NATO, primarily due to the risk of involving the Alliance in regional or global conflicts that it may not be prepared for (Gilli et al., 2022). The complexity of this issue is further exacerbated by the intricate collaboration involved with cooperative security, such as intelligence sharing, capacity-building initiatives, training programs, and joint military exercises (Gilli et al., 2022). In contemporary discourse, the term "cooperative security" is frequently employed as a succinct reference to NATO's collaborative relationships with non-member states, particularly in the Middle East and North Africa (MENA) region, the Asia-Pacific area, and, increasingly, on a global scale (Gilli et al., 2022).

NATO, while comprising 32 member states, extends its influence through partnerships with over 40 non-member countries and international organizations (NATO, 2024). This network of partnerships serves to enhance security beyond NATO's territorial boundaries, consequently bolstering the Alliance's own security (NATO, 2024). NATO's approach to partnerships is based on shared values, reciprocity, mutual benefit, and respect (NATO, 2024). The organization engages in dialogue and practical cooperation with partners on a range of political and security-related issues, including global challenges such as terrorism and environmental change (NATO, 2024). Furthermore, these partnerships contribute to the maintenance of the rules-based international order, thereby supporting the defense of the values upon which the Alliance is predicated (NATO, 2024). These partnerships are designed to be mutually beneficial, contributing to improved security for all parties involved and the broader international community (NATO, 2024). Additionally, NATO's programs assist partner countries in developing their domestic defense and security institutions and forces (NATO, 2024).

In addition to new members and partners, NATO has expanded its focus to encompass contemporary threats such as cyber defense, energy security, technological innovation, and modern global events (Bincof & Qasaye, 2023). However, the expansion of advanced

technologies complicates the ability of Allies to maintain their technological edge (Gilli et al., 2022). As China becomes more competitive in the global market, there is a propensity for partner countries to rely on Chinese military equipment, which can hamper the effectiveness of capacity building, joint training, and multinational exercises, as partners utilize platforms that are incompatible with NATO's capabilities (Gilli et al., 2022). The rapid pace of technological advancement may expose certain partners to vulnerabilities, as offensive capabilities—ranging from missiles, to cyber, and disinformation—become more dispersed (Gilli et al., 2022).

NATO also finds itself in the midst of a changing world order and a new Great Power Competition (Gilli et al., 2022). During the Cold War, NATO navigated an uncertain military balance whilst in strategic rivalry, largely due to the backing of the liberal international order (Sayle, 2019). However, this is becoming increasingly challenging as the liberal international order itself is in decline (Ryan, 2020).

Russia's actions comprise the primary challenge confronting NATO. The annexation of Crimea in 2014, coupled with Russia's persistent military involvement in Ukraine, has significantly heightened tensions between NATO and Russia (Bincof & Qasaye, 2023). Recent developments indicate that member states are growing apprehensive about the possibility of further Russian hostilities, as evidenced by increased military expenditures, the reinstatement of conscription, troop mobilization, and the enhancement of military resources (Hooker, Jr., 2024). Additionally, China is perceived as a potential adversary to NATO, with its expanding military capabilities and assertive maneuvers in the South China Sea raising alarms among member nations (Bincof & Qasaye, 2023).

Since the terrorist attacks of September 11, 2001, NATO has been actively engaged in counterterrorism efforts and continues to collaborate with partners to mitigate this threat (Bincof & Qasaye, 2023). Furthermore, NATO is enhancing its cybersecurity measures to safeguard its members against cyber threats (Bincof & Qasaye, 2023). The alliance is also addressing the underlying factors contributing to migration and managing migrant flows in collaboration with its partners (Bincof & Qasaye, 2023). However, efforts to confront these various challenges could be hampered by friction within the Alliance. Tensions exist between the United States and European allies within NATO, partially stemming from the US withdrawal from Afghanistan, President Trump's criticisms of NATO, and differing perspectives on Russia (Bincof & Qasaye, 2023).

The national security framework of the United States is expected to prioritize competition with China moving forward (Becker et al., 2022). In light of this shift, NATO's European partners are required to adjust accordingly. The ongoing Russo-Ukrainian conflict indicates that Europe must enhance its capacity to defend against regional adversaries while also taking charge of its own security landscape, particularly as the United States reallocates a greater portion of its resources to other foci (Becker et al., 2022).

Leaders of the Allied nations reached a consensus to expand political consultations within NATO, and reiterated their dedication to sustaining a balanced array of nuclear, conventional, and missile defense capabilities (NATO, 2021). Furthermore, they pledged to expedite the execution of military strategies aimed at bolstering the Alliance's deterrence and defense posture, while also improving the readiness of forces to address both current and future defense requirements (NATO, 2021). Resilience is crucial for countering a range of potential adversaries, thus the leaders agreed to establish resilience objectives that would inform resilience goals for individual nations, grounded in clearer and quantified resilience targets (NATO, 2021).

The Allies also consented to initiate a new civil-military Defense Innovation Accelerator for the North Atlantic, which aims to better transatlantic collaboration on critical technologies, foster interoperability, and utilize civilian innovation by engaging with academic institutions and the private sector (NATO, 2021). Allied leaders reaffirmed the significance of the Open Door policy, and agreed to fortify NATO's partnerships with like-minded nations and international organizations, while also establishing new collaborations in regions such as Africa, Asia, and Latin America (NATO, 2021). The Allies also resolved to advance NATO's efforts to enhance the capabilities of partner nations in areas such as counterterrorism, stabilization, countering hybrid threats, crisis management, peacekeeping, and defense reform (NATO, 2021). Lastly, NATO Leaders endorsed an ambitious new Action Plan on Climate Change and Security, aiming to position NATO as the leading international organization in understanding and adapting to the implications of climate change on security (NATO, 2021).

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Panel 5: Indo-Pacific Alliances and Partnerships

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Key Points:

- US national guidance identifies China as a strategic competitor with both the means and capability to challenge internationally recognized norms.
- China's ascent to global power status was an outcome of rapid economic growth and military modernization under an increasingly undemocratic government.

- The “Pivot to Asia” in the 2010s signaled a shift in US strategic priorities toward the Indo-Pacific and set the stage for further measures to counter China’s growing influence in the region and on the world stage.
- The rise of minilateralism allows regional and global stakeholders the flexibility to collaborate on a range of security issues, many of which transcend USINDOPACOM’s area of responsibility into the Arctic.

At the start of the decade, US-China relations featured indisputable signs of deterioration. The aftermath of a trade war, talks of decoupling, incongruent approaches to human rights, maritime disputes in the Indo-Pacific region, and the emergence of the global COVID-19 pandemic created a highly contested environment between the two powers. Since then, the People’s Republic of China (PRC) continues to aggressively pursue its malign foreign policy objectives. The 2022 National Security Strategy (NSS) and the 2022 National Defense Strategy (NDS) emphasize China as the United States’ most substantiated strategic competitor. The PRC employs a myriad of diplomatic, economic, and defense resources to challenge the internationally recognized norms that serve as a pillar for global security. China seeks to undermine democracy by organizing disinformation campaigns, gaining access to foreign critical technologies, increasing military capability and capacity, and projecting power globally. The Office of the Secretary of Defense is keenly aware of China’s intent to pose a credible threat to U.S interests. Efforts to “meet growing threats to vital US national security interests and to a stable and open international system… through integrated deterrence, campaigning, and actions that build enduring advantages” are currently underway (NDS, 2022, p. 1). Similarly, NORAD-USNORTHCOM is also alert to new challenges facing the homeland, given China’s interest in geostrategic changes in the High North. In response, leaders are implementing a culture shift to ensure “operational plans and strategies, decisions, and budgeting” account for the new security landscape (USNORTHCOM, 2021, p. 5). Leveraging a whole-of-society approach, the PRC presents a multifaceted and multifront arena unlike any other emerging power. Out-competing China requires innovation to develop and expand alliances and partnerships throughout Asia, the Pacific, and beyond.

China’s growing prominence on the global stage remained undervalued during the years leading up to the 2022 NSS and NDS. After US-China diplomatic relations were established in 1979, US policy focused largely on supporting China’s “emergence as a constructive and responsible global stakeholder” and “a trustworthy partner” (A Free and Open, 2020, pp. 1-7). Instead, the Chinese Communist Party (CCP) undertook a series off deliberate actions to counterbalance the international order built on Western, rules-based principles. One major change arose in 2007 when China announced a nearly 18 percent1 increase in military spending. PRC officials cited weak defenses as the reason, but international observers began to grow wary of China’s intentions in the long run (Yardley & Lague, 2007). Another significant shift became evident as a consequence of the global financial crisis in

2008. The combination of a "ballooning budget deficit and persistent trade deficit" in the US gave way for China to surpass "Japan as the largest foreign holder of US debt" (Drezner, 2009, p. 8). Critics flagged the risk of China "convert[ing] its financial power into an instrument of statecraft" (Drezner, 2009, p. 8). Between 2008 and 2009, the PRC experienced limitations in financial leverage and will continue to do so unless growing US budget deficits more drastically skew the relationship in the PRC's favor (Drezner, 2009). The final notable milestone was the rate of China's economic growth. A 2013 World Bank report forecasted that China will "replace the United States as the world's largest economy by 2030," a prediction widely held through the 2010's (pp. 6). With this great nation status, China's economic model based on public industries is expected to conflict with global market mechanisms and produce negative welfare outcomes beyond its borders (Meltzer & Shenai, 2019).

Concerns of China's ambitions amid a growing regional power imbalance led policymakers in D.C. to engage in Indo-Pacific affairs more meaningfully. US foreign policy toward China took a significant shift with the publication of former Secretary of State Hillary Clinton's article, "America's Pacific Century" (2011). Her message still carried with an air of hopeful collaboration between the US and China but called for a realignment of strategic interest from the Middle East to the Indo-Pacific2 as the next "key driver of global politics" (2011). In 2016, under former President Barack Obama's administration, the US entered into the short lived Trans-Pacific Partnership (TPP) agreement. The trade agreement created an economic zone equal to "one -tenth of the world's population… and represent[ed] 40 [percent] of global [gross domestic product]," but it ended for the US a year later after former President Donald Trump withdrew (Amari, 2016, p. 12). During the Trump presidency, US-China relations reached an unprecedented level of contention and references to great power competition became commonplace.

The 2017 National Security Strategy called out China, along with Russia, as a "challenger… attempting to erode American security and prosperity" (p. 2). Likewise, the 2018 National Defense Strategy diverged from the earlier, modest narrative and raised attention to the PRC's efforts "to reorder the Indo-Pacific region to their advantage" (p. 2). Releases of both the United States Strategic Framework for the Indo-Pacific (2018) and A Free and Open Indo-Pacific (2020) from the White House underscored a new era for US responsiveness to China's regional ascendance via controversial means, such as its unfounded claim to the South China3 Sea and the subsequent militarization of the Spratly Islands from 2014 onward. According to a Congressional Research Service report, the Trump Administration dedicated over $410 million in 2018 alone "to improve security relations across the Indo-Pacific" and "to support foundational areas of the future" (2018, p. 14). Of realignment activities, revival and rebranding of the Quadrilateral Security Dialogue (the "Quad") were regarded among the most credible, but underutilized. The international coalition initially began as Australian, Indian, Japanese, and US maritime forces responded to Indonesia's humanitarian crisis onset by violent earthquakes in 2004. It was resurrected in 2017 "to

promote peace and stability" in the Indo-Pacific as a counterweight to Chinese assertiveness (Rai, 2018, p. 139). As each Quad member sought balance between countering and cooperating with China, the group's role remained ambiguous around the time it resurfaced (Rai, 2018).

Despite international skepticism, the Chinese Communist Party (CCP), led by General Secretary Xi Jinping, pursued various avenues to alter domestic and international politics. Internally, China underwent institutional changes that veered away from Western hopes of democratic reform. President Xi altered the PRC's national narrative soon after his assumption of power subsequent the CCP's 18th National People's Congress in 2012. His message from the beginning focused on eliminating corruption within the Party and the rejuvenation of China to its former glory as the Middle Kingdom (Economy, 2018). Xi Jinping's anti-corruption campaign produced a network of bodies under the Party's National Supervisory Commission to oversee compliance at all levels of the CCP (Liao & Tsai, 2020). The campaigns aimed to dually "enhance the public image of the CCP" while also "centralizing [President Xi's] power" as the sole leader capable of delivering China's revival (Liao & Tsai, 2020, pp. 12-21). The cementing of his vision for China, Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era, in the CCP's constitution during the 19th Congress in 2017 was evidence to the General Secretary's success and his role in shaping "the Party's guiding ideology at a critical historical juncture in China's transition to a global superpower" (Peters, 2017, p. 1299).

President Xi further solidified his position by eliminating constitutionally mandated, two-term limits for the Party's top leader (Rennie, 2022). Externally, President Xi pushed forward major investment initiatives to expand China's influence in the region and around the globe. The One Belt One Road (OBOR)4 initiative, more commonly known as the Belt and Road Initiative (BRI), was developed to increase Chinese cooperation, connection, and trade relations around the world (Rahman, 2020). By creating Sino-centric economic corridors through major investments in infrastructure and social projects, the CCP is positioning itself to "augment its global influence and presence in the world governance" (Rahman, 2020, p. 1). At the core of the PRC's international dealings sits an unlikely conglomerate of anti-Western, authoritarian powers. Each power views the US and the pervasive Western-led international order as a barrier to its prosperity, legitimacy, and stability (Byman & Jones, 2024). Collaboration "has been most consequential in the military and dual-use areas" but remains limited in establishing a unified direction without any all-encompassing, official agreements (Byman & Jones, 2024). This limitation from transactional relations creates a gap that the US expressly intends to overcome through treaty alliances and formal partnerships.

Some analysts of the current East-West ideological divide liken the state of affairs to the global polarization witnessed during the Cold War. Contemporary China, in a similar fashion to the former Soviet Union, is conducting anti-access/area denial activities to

reduce US presence and power projection (Michishita, Swartz, & Winkler, 2016). Rather than the resurgence of an arms race, the PRC's aforementioned military modernization aims to bridge the gap between China's capabilities with respect to the US and "improve its proficiencies across all warfare domains," according to the US Department of Defense's (DoD) most recent Military and Security Developments Involving the People's Republic of China report to Congress (2023, p. v). To counter Chinese expansionism, US policy toward China guided by incumbent President Joe Biden is markedly more definitive than ever before. The White House published its first ever Indo-Pacific Strategy, bringing forward the concept of integrated deterrence or full spectrum cooperation with allies and partners across the span of the competition continuum (2022). The Biden administration is pursuing its security objectives in the Indo-Pacific by stepping away from large, multinational fora and placing greater emphasis on minilaterals capable of "focusing on specific issues and shared interests" (Mohan, 2023, p. 47).

In the region, "vast distances" and perceptions of "the sea as a natural defensive barrier against attack" preclude the need for a any multilateral defense pact like the North Atlantic Treaty Organization (NATO) (Grieco & Kavanagh, 2024, p. 104). In its stead, the Quad became a primary vehicle to carry out cooperation efforts, and two additional minilateral groups involving the US emerged – the Australia-United Kingdom-United States ("AUKUS") pact and the India, Israel, United Arab Emirates, and United States (I2U2) partnership. In addition to provisioning Australia with nuclear submarines, AUKUS also "increased cooperation on cyber security, artificial intelligence, and quantum technology" (Roehrig, 2022, p.10). The Quad held its first summit in 2021, which resulted in a joint statement reiterating calls to respect international norms (Roehrig, 2022). The security pact, along with I2C2, "allow[s] India to be connected to the networks of US alliances and partnerships in East Asia… and the Middle East" (Mohan, 2023, p. 48). A budding "trilateral partnership among Japan, South Korea, and the United States" is also on the rise (Mohan, 2023, p. 48). The style of maneuvering through the new threat environment with greater flexibility led Secretary of Defense Lloyd Austin to declare 2023 a "decisive year" (FACTSHEET, 2023). With the backing of allies and partners, the US achieved a "more mobile, distributed, resilient, and lethal" force posture, is able to deploy and develop "the capabilities needed to maintain deterrence," and "strengthen peace and security across the region" through military exercises (FACTSHEET). Middle powers5 are also creating agile coalitions of growing significance to bolster the security apparatus. Among Indo-Pacific countries and with like-minded European middle powers, "bilateral and trilateral ties … are also evolving independently of Washington" (Brattenburg, 2021, p. 224). Cooperation between Australia, India, and Japan continues to increase, for instance, and the UK and France "have stepped up their respective security roles in the Indo-Pacific" (p. 224).

Additional opportunities for minilateral collaboration stem from the growing nexus between Indo-Pacific and Arctic security issues. China's 2018 Arctic Policy introduced a furtherance of BRI into the High North – the "Polar Silk Road." This Arctic endeavor is "designed to carve

a fresh maritime route across the Arctic Ocean, thereby facilitating a direct connectivity between East Asia and Europe" (Türker, 2024, p. 99). With theories for the rationale abound, China is objectively "investing in Arctic infrastructure," "participating in international institutions like the Arctic Council," and inserting itself in Arctic affairs as a self-proclaimed "near Arctic state" (p. 99-100). Since Finland and Sweden joined NATO, bringing all Arctic states besides Russia into the Alliance, the Kremlin "is courting the goodwill of its southern neighbor" (Snell, 2024, p. 92). Backlash from Russia's unprovoked aggression in Ukraine is particularly salient in driving closer Moscow-Beijing ties (p. 92). Even before Russia's invasion, the two Eurasian superpowers carried out a "series of joint naval exercises" in the Baltic Sea, the Sea of Okhotsk, and the Mediterranean Sea (The Melting Arctic, 2020, p. 30). In recent years, the occurrence of Chinese and Russian maritime vessels off the coast of Alaska has increase. In 2023, eleven warships "operating near the Aleutian Islands… were met by four US Navy destroyers" (Dinah & Alia, 2023, p. 02a). The incident marked the third such consecutive year wherein Chinese vessels "sailed in or near waters… in the Bering Sea and North Pacific Ocean" (p. 02a).

DoD's 2019 Arctic Strategy originally addressed Russia's militarization of the Arctic, which was previously uncontested. The latest iteration, published in 2024, accounts for the PRC's undertakings to influence activities in the High North and to gain access to the region's abundance of resources. As permafrost melts, the ripple of change has "implications for the global climate system" (West, 2009, p. 1083). The Arctic and Indo-Pacific are intricately connected. "Security challenges [that] originate in the Arctic" have a noticeable effect on the Indo-Pacific, and "shifts in the Indo-Pacific feedback to shape the Arctic" ((Buchanan, 2022, para. 6). The first overlapping issue is derived from the outcomes of environmental change. A 2024 study of dust loading found that air quality in South and West Asia improves as polar temperatures increase (Fan et al., 2024). Cooperation is essential to preserve Arctic sea ice while also protecting "public health and food security" in the Indo-Pacific (p. 1). Another study found that retreating Arctic glaciers are causing warming in the Indian Ocean and changes to the Asian westerly jet stream, which influences the intensity of monsoons in the area (Yadav et al., 2024, p. 12).

A second connection between the Indo-Pacific and the Arctic is the presence of marginalized players affected by environmental challenges and strategic competition. In the Indo-Pacific, Pacific Island nations express skepticism of whether "their interests are being included in the new framing of the region" (Canyon, 2024, p. 105). Islanders are facing a reduction in "food security and coastal protecting" due to "melting polar ice caps" along with increases in "cyclonic wind speeds and precipitation" (p. 128). Similarly in the Artic, indigenous populations have "a desire to make their own decisions about how to… organize their societies," yet their interests historically conflict "with the ambitions of newcomers" (Huntington et al., 2022, p. 299). Rather than a loss of food sources from Arctic ice melting, indigenous people face new hazards associated with hunting and fishing, thereby "interfering with cultural continuity" (p. 299). Finally, Arctic and Indo-Pacific

sea routes are threatened by revisionist powers Russia and China. Russia is expected to benefit from roughly 125 days of significantly diminished sea-ice coverage along its North Sea Route by 2050 (West, 2009, p. 1097). In response, Russia began the "reopening of old Soviet and construction of new military bases" to protect its Arctic sea lanes (Sergunin & Gjørv, 2020, p. 251). Its southern neighbor, China, has "asserted sovereign control over… international waters" in the South China Sea, and may leverage CCP reunification rhetoric to eventually do the same for the Taiwan Strait (Hinshaw & Michaels, 2024, para. 4).

The complexity of global affairs demands a proportional response. Proponents of the TPP agreement suggest that the time has come to return (Bearce & Park, 2023). TPP is regarded as "the most obvious tool for the United States to execute its Indo-Pacific pivot," but Congress's tepid response to the prospect indicates a need for alternate avenues (p. 7). Traditionally, the Association of Southeast Asian Nations (ASEAN) lays claim to the "central role in the regional architecture," but the dysfunction plaguing other multinationals also impedes meaningful progress here (Ha, 2022, p. 2-4). Chinese investment in ASEAN underpins the PRC's efforts to "exercise its neighborhood diplomacy" and to advocate for its "narrative and vision of the regional order" (p. 21). As such, ASEAN's role is far from obsolete, but the US, allies, and partners must continue to engage while also employing more agile solutions (p. 21).

Regarding minilaterals, more partnerships via new and existing groups are on the horizon. South Korea and Japan, two major non-NATO US allies, are in deliberations on how to interact with the Quad and AUKUS. Japan, already a standing Quad member, "is being considered for Pillar 2" of AUKUS (United States, 2024, para. 3). Pillar 2 "focuses on advanced technologies" and "holds the potential to transform the capacity of states to jointly develop and employ the most cutting-edge advanced capabilities" (Fraser & Soliman, 2023, p. 416). Japan brings to the table quantum computing, a key for AUKUS plans "to jointly develop quantum and artificial intelligence technologies with potential military implications" (Auslin, 2023, p. 13). For South Korea, participation in multilaterals is less remarkable. Seoul is yet to commit to any of the latest minilateral groups, but the Quad presents the best chance to cooperate. The unofficial Quad Plus group includes "original Quad members and South Korea, Vietnam and New Zealand" (Chung, 2022). Seoul is hesitant to fully engage because of the geopolitical constraints and potential inadvertent signaling "that South Korea is choosing sides in the great power rivalry" (Chung, 2022, p. 147). The Quad Plus, in its current form, resembles "an instrument… for great power competition," leaving South Korea a limited ability to "cooperate on a working level with participants in the Quad Plus… in economic and security domains" (p. 147). Another point for minilateralism is the unprecedented strides Indo-Pacific nations are taking to fortify the region. A noteworthy example is Japan's conclusion of Reciprocal Access Agreements (RAAs) with Australia, the Philippines, and the UK. RAAs allow signatory countries to deploy "their forces on each other's soil" (Strangio, 2024, para. 1). France and Japan are also

negotiating the terms of a potential RAA amid the "deteriorating security situation in the South China Sea" (para. 6).

Often dubbed a modern "Thucydides Trap," the challenge China poses to the existing international order safeguarded by the US and allies and partners shows a perpetual risk of escalation. The global security environment developed under Western ideology serves as more than a framework. It acts as a pillar for individual rights and a shield against nefarious actors seeking to infringe upon the sovereignty of independent states as well as the neutrality of global commons. China's rise and interconnectedness with nuclear-capable Russia, Iran, and North Korea is indicative of the need for a defense architecture that is both durable and flexible enough to rapidly respond with allies and partners to evolving threats in the modern world. Issue-oriented minilateral organizations have proven to be the most viable means for unifying likeminded stakeholders. Through minilateral groups, middle powers can strengthen their positions on relevant security matters. The transition from Western- dominated thought to a multi-polar strategic landscape is being met with adaptive policies to usher in a new era of peaceful relations among friendly states and to build a robust network capable of defending shared interests. Notwithstanding the persistent challenges of minilateral cooperation, there are many more opportunities for collaboration to explore.

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Panel 6: Resilience and Total Defense: Whole-of-Society Perspectives

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In May of 2024, the DOD released the new "Strategy for Resilient and Healthy Defense Communities," which emphasizes resilience within defense communities, amongst people and installations (Clark, 2024). This builds on previous work within NATO and the UN. During the 2016 Warsaw Summit, NATO determined that civil preparation was a core pillar of the Allies' resilience and a crucial enabler for Alliance collective defense (NATO, 2016). The plan of action put forth by the secretary-general of the United Nations (UN) in 2015 to prevent violent extremism recognizes the role of civil society in countering terrorism and preventing violent extremism, as do multiple pertinent resolutions of the General Assembly and Security Council (Bonnefont & Praxl-Tabuchi, 2023; United Nations General Assembly, 2015). These documents from the UN emphasize the significance of civil society involvement as both a normative and practical duty of nations (Bonnefont & Praxl -Tabuchi, 2023).

Total Defense is a holistic approach to national security that seeks to deter potential adversaries by increasing the costs associated with aggression and reducing the likelihood of successful attacks (Wither, 2019). A central tenet within total defense is ensuring that all aspects of society participate in ensuring national security, including local and state government organizations, civil society, and private industry. Frequently, state and local organizations are equipped with the essential community ties and insights required to identify threats like homegrown terrorism, and also typically serve as initial responders to incidents of terrorism, natural disasters, and various other potential crises (Nelson, 2012). A secure and protected homeland necessitates that both state and local partners are equipped with the ability and resources to access, gather, analyze, and share threat information with operators and decision-makers at every tier of government (DHS, 2023). These partners bring distinct capabilities, data, and specialized knowledge that can aid the Department of Homeland Security (DHS) and the Intelligence Community (IC) in addressing significant information and intelligence deficiencies, as well as contributing valuable local context that enhances the overall understanding of national threats and supports investigations carried out by federal agencies (DHS, 2023). Furthermore, state and local governments present appealing targets for foreign state and non-state actors, as these entities often possess limited awareness of national security threats, despite their potential to influence US strategic interests significantly (Tromblay, 2018). This deficiency in understanding renders sub-federal governments particularly attractive to US rivals and adversaries seeking to exploit vulnerabilities in the national security landscape and highlights the importance of total defense strategies (Tromblay, 2018).

Finland is frequently cited as a prime example of a modern total defense framework (Deutsche Welle, 2017). According to official statistics, Finland maintains a stockpile of

food, gasoline, and equipment for civil defense and offers 50,500 civil defense shelters to house 4.8 million of its citizens (Finnish Rescue Services, n.d., YLE News, 2022). Because of its robust public education system and lengthy history of dealing with Russia, its counterpropaganda, and its disinformation tactics, Finland asserts that it is particularly impervious to Russian information warfare (Standish, 2017; Weinger, 2018). Sweden has also made recent efforts towards bolstering its total defense, with key areas for Swedish total defense development encompassing organizational management, psychological and cyber security, personnel training, economic preparedness, civilian protection, critical infrastructure, law enforcement, voluntary organizations, healthcare, research, and international cooperation (Gotkowska, 2021; Secretariat of the Swedish Defense Commission, 2024; von Sydow, 2018).

A defense strategy capable of countering both conventional and non-traditional security threats was developed in Singapore, but for it to be implemented, this multifaceted security approach needed to be accepted culturally. As a result, public campaigns were a consistent component of the communications plan used to implant

Total Defense in the minds of the public (Matthews & Bintang Timur, 2023). Although the plan was aimed at adults, it also attempted to affect children's formation of responsible societal ideals (Matthews & Bintang Timur, 2023). Additionally, in order to inspire confidence and resilience in the civilian population during times of national disaster, Singapore's Civil Defense offers training in rescue operations, evacuation protocols, shelter management, first aid, damage control, and the management of essential resources (Singapore Ministry of Defence, 2004).

In recent years, there have been concerted efforts to advance state and local governments'—and even civilian entities'—capacity to engage in defense. There is ongoing discussion regarding the extent to which the American policing system has undergone a significant transformation in its priorities following the events of September 11, 2001, particularly in terms of integrating homeland security as a central function (Giblin et al., 2009; Lee, 2010; Marion & Cronin, 2009). However, it is well established that numerous police departments have implemented both structural and policy modifications in reaction to the demand for the incorporation of homeland security duties (Pelfrey, 2007; Stewart, 2011; Stewart & Morris, 2009). In his work at the Community Security Service (CSS), a nationwide nonprofit that teaches volunteer members of Jewish congregations to spot and stop indications of violent crimes and suspicious activities, a former Counter-Terrorism Advisor for the United Nations Security Council used his insights about security culture and community involvement in safety and security (Lauver, 2022). The nonprofit organization provides in-person and virtual training to community members on identifying and reducing potential security hazards. The CSS can offer security training that enables community members to react swiftly to indicators of violence and create a strong security plan for

events held in the community thanks to the volunteers' in-depth knowledge of the areas they serve (Lauver, 2022).

Several federal programs within the US exist to promote the ideals of total defense. The Office of Local Defense Community Cooperation (OLDCC) collaborates with various Federal agencies to provide a comprehensive program of technical and financial support aimed at empowering states, territories, and communities (OLDCC, 2023). This initiative facilitates the planning and execution of civilian responses to workforce, business, and community challenges that emerge from actions taken by the Department of Defense (OLDCC, 2023). The program also aims to achieve cost savings in facilities and infrastructure while reducing operational expenses, thereby enhancing the readiness and resilience of military, civilian, and industrial sectors, as well as offering support to military families (OLDCC, 2023). The purpose of the DHS I&A State and Local Fellows Program is to include state and local partners in the intelligence and information-sharing procedures used by the Intelligence Community (IC) and the federal government (DHS, 2023). Through the Joint Counterterrorism Assessment Team (JCAT), this program offers state and local partners a special chance to work with DHS and the IC to ensure that threat intelligence is most efficiently shared across all levels of government (DHS, 2023). Within the DHS/Federal Emergency Management Agency (FEMA) grant program, the FY 2024 Tribal Homeland Security Grant Program (THSGP) aims to improve state, local, tribal, and territorial governments' and nonprofit organizations' capacity to prevent, prepare for, defend against, and respond to terrorist attacks (FEMA, 2024).

Five million dollars were given to facilitate a project headed by the New Jersey Manufacturing Extension Partnership to enhance the US Army Combat Capabilities Development Command (DEVCOM) Armaments Center's supply chain capabilities (OLDCC, 2022). This center is responsible for providing technology for 90% of the Army's lethality, including advanced weapons and all conventional ammunition used by joint warfighters (OLDCC, 2022). In addition to recruiting and retaining women and underrepresented minorities, the New Jersey

Consortium will concentrate on workforce training, retraining, and engagement of veterans and military personnel as well as their families (OLDCC, 2022). There will be five new registered apprenticeships created, and more than 1,200 people will finish training that is respected by the industry (OLDCC, 2022) The initiative will find ways for nontraditional military manufacturing companies to meet critical needs for sophisticated manufacturing technology (OLDCC, 2022).

Outside the United States, civilians have found ways to aid in defensive tactics. Due to increased digitization, civilians both inside and outside of Ukraine have also made use of open-source intelligence methodologies (Kepe & Demus, 2023). These include tracking the movements of Russian troops, verifying images of attacks and massacres of civilians, and

analyzing data from commercial satellites, air traffic transponders, and geolocation published on social media profiles (Kepe & Demus, 2023).

As technology and warfare have advanced, a specific focus has been on increasing cybersecurity capabilities. Livingston, Monroe, Oakland, Washtenaw, and Wayne counties in Michigan are supporting one kind of local-state collaboration: CySAFE, a free IT security assessment tool designed to assist small and mid-sized governments in assessing, understanding, and prioritizing their basic IT security needs (Michigan Department of Technology, Management, and Budget, 2015). Indiana University (IU) has led the way among colleges that assist in managing cyber risk for the past 20 years and has recently opened an IU Cybersecurity Clinic to fulfill the needs of the Midwest region for cyber training (Wilkins & Cook, 2019). Students from business, law, informatics, computing, and engineering schools will collaborate in the clinic to assist state and local government organizations in better managing cyberattacks, safeguarding intellectual property, and enhancing privacy (Wilkins & Cook, 2019).

Public-private partnerships combine a range of resources and expertise to create more potent strategies for dismantling national crime networks and terrorist organizations. When they collaborate, they become more adept at identifying intricate organizational structures and the funding sources of organizations that compromise national security (Moody's, 2024). A critical facet within total defense, the private sector is essential because it owns a large portion of many countries' vital infrastructure, including energy, transit, information networks, and numerous capabilities that are essential in times of crisis, such as communications and maritime transport (Saxi et al., 2020). Within the United States, nearly 4 million dollars have been awarded to projects providing technical assistance, cybersecurity support, and Industry 4.0 implementation services (e.g., cloud computing and analytics, AI and machine learning) to small defense suppliers and companies in New York, California, and Maryland, aiming to enhance their capabilities and stimulate cooperation between statewide and local adjustment and diversification efforts (OLDCC, 2022).

The ease and speed at which private entities can disseminate information is their most significant advantage, demonstrated during the war in Ukraine (Lizzo, 2024). In the early stages of the Ukrainian conflict, following the vice prime minister of Ukraine's request over social media for satellite imagery from several companies, private enterprises provided battlefield intelligence, leading to the war's informal designation as the "first commercial imagery conflict" (Siegel, 2022). Private entities offer increased shareability, allowing businesses to submit imagery to the Ukrainian army moments after it is first collected, compared to ICs, which must go through a lengthy declassification procedure (Lizzo, 2024). Improved tactical and operational intelligence insights are made possible by the "democratization" of intelligence, however, concerns have mounted over the release of intelligence at hitherto unheard-of amounts and speeds (Lizzo, 2024).

The United States, along with various external allies, has historically justified its lack of engagement with local civil society by asserting that such matters pertain to the sovereign interests of the nations involved (Mahanty & Crespo, 2021). Additionally, they contend that involvement could present numerous challenges and risks, including the potential for civil society organizations to face retaliation from governmental authorities (Mahanty & Crespo, 2021). The influence of the UN counterterrorism framework on civil society has been significant; however, some scholars contend that the avenues for diverse civil society participants to actively engage with and affect UN counterterrorism initiatives and policy development are, at best, quite restricted (Bonnefont & Praxl-Tabuchi, 2023). A pertinent illustration of this is found within the United Nations Economic and Social Council (ECOSOC)

Committee on non-governmental organizations (NGOs), where member states have increasingly resorted to allegations of terrorist sympathies or connections to undermine both accredited and prospective NGOs

(Bonnefont & Praxl-Tabuchi, 2023). Last year's assessment of the Global Counter-Terrorism Strategy reiterated familiar terminology from earlier evaluations, recognizing the "significant contributions of civil society" to the execution of the GCTS; however, it neglected to consider how the counterterrorism framework has contributed to state repression, and the gradual constriction of civic space observed over the last twenty years (Bonnefont & Praxl-Tabuchi, 2023).

A prominent contemporary challenge to a comprehensive societal approach to total defense revolves around "flow security" (Saxi et al., 2020). As nations are increasingly interconnected, any total defense strategy focused on societal resilience must consider networks and infrastructures that transcend national boundaries (Saxi et al., 2020). These undesirable flows encompass various threats, including the trafficking of narcotics, arms, individuals, and cyber intrusions (Saxi et al., 2020). Security measures must address critical infrastructures such as electric grids, cyber systems including cable networks and data centers, as well as the intricacies of global supply chains and financial markets, all of which require collaboration with partners and allies to ensure their protection (Saxi et al., 2020).

A final challenge within the US is considering cultural norms. Richard Priem, an expert on community integration in security from the UN Security Council recounts tales from Baltic states, frequently encountering residents who expressed their concerns regarding individuals or events they deemed suspicious (Priem, 2022, as cited in Lauver, 2022). In contrast, his observations in the United States revealed a lower frequency of community members alerting security professionals about potentially suspicious activities (Priem, 2022, as cited in Lauver, 2022).

Along with ensuring all of society has the capacity to engage in national security, it is important for societies to develop and retain resilience. The ability of a community to endure shocks and stressors, recover from them, adapt, and become stronger as a result is known as community resilience (Administration for Strategic Preparedness & Response, n.d.). Building community resilience involves fostering citizen activism, regulating social media platforms, enhancing public-private continuity management in critical infrastructures, and establishing clear procedures for addressing hybrid threats (i.e., harmful activities that combine military and non- military means) (Juntunen & Wigell, 2021; National Academies of Sciences, Engineering, and Medicine, 2019). Key strategies include developing deterrence tools, promoting societal adaptive resilience and media literacy, integrating diasporas and minorities, improving electoral transparency, and prioritizing supply chain resilience in strategic autonomy policies (Juntunen & Wigell, 2021; National Academies of Sciences, Engineering, and Medicine et al., 2019). Effective implementation requires actively engaging community members from the outset, adopting multidimensional approaches to resilience design and measurement, collecting relevant and actionable data for decision-making, and creating incentives for resilience measurement (Juntunen & Wigell, 2021; National Academies of Sciences, Engineering, and Medicine et al., 2019). Additional national security strategies focus on enhancing interagency cooperation through open communication channels, clear role definition, resource sharing, joint exercises, regular progress monitoring, and private-sector partnerships (Virginia Commonwealth University, 2023). These measures aim to improve coordination, maximize capabilities, and ensure a unified response in areas such as infrastructure development, cybersecurity, and disaster management (Virginia Commonwealth University, 2023).

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Panel 7: Critical Infrastructure Security

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Modern societies rely on the smooth operation of various technological systems, like power grids, transportation networks, and communication systems, which are collectively known as critical infrastructures due to their vital importance (De Felice et al., 2022). Critical infrastructures (CI) encompass the physical resources, services, Information Technology (IT) systems, networks, and infrastructure components that, if compromised or destroyed, would severely disrupt essential societal functions, including supply chains, healthcare, security, and the nation's economic or social stability (De Felice et al., 2022). A Critical Infrastructure System (CIS) is thus defined as a component, system, or part thereof that is essential for maintaining a society's core functions, including health, safety, security, and economic or social well-being, and whose disruption— whether due to poor maintenance, misuse, or design flaws—would have a significant societal impact (Mottahedi et al., 2021). The scope of industries and sectors classified as critical infrastructure continues to expand as technology advances and time progresses. While the general definition of CIS remains largely consistent across different countries, the prioritization within these systems can vary significantly from one nation to another (Newbill, 2019).

The USA Patriot Act of 2001 defines critical infrastructure as those "systems and goods, both physical and virtual, so vital to the nation that their malfunctioning or destruction would produce a debilitating impact on the security of citizens, on the economic security of the nation, on national public health and on any combination of the above." These systems, considered to form the foundation of American society and serve as the cornerstone of the nation's economy, security, and health, are categorized into sixteen sectors: chemical, commercial facilities, communications, critical manufacturing, dams, defense industrial base, emergency services, energy, financial services, food and agriculture, government facilities, healthcare and public health, information technology, nuclear reactors, materials, and waste, transportation systems, and water and wastewater systems (CISA, n.d.).

The significance of critical infrastructures becomes most evident during major disruptions. In the aftermath

of a devastating storm, extensive damage to critical infrastructures becomes apparent, with power outages, debris-blocked roads, and structures collapsing due to strong winds. Tacloban city was one of the most severely impacted areas in the Philippines following Typhoon Haiyan (Duerr, 2014). Due to the typhoon's severe damage to water and food infrastructure, many affected residents had to obtain daily supplies from distribution centers throughout the city (Duerr, 2014). In another case, a widespread power outage struck the northeastern United States in August 2003, and the power grid failure cascaded to numerous other critical infrastructures reliant on electricity (North American Electric Reliability Council, 2004). Water infrastructure was compromised due to non-functional pumping and control systems, transportation was disrupted as train services halted and traffic control systems failed, and supply chains broke down (North American Electric Reliability Council, 2004). The health sector was affected as hospitals switched to emergency operations, while the food sector struggled with inoperable payment systems and failing refrigeration units (North American Electric Reliability Council, 2004).

The COVID-19 pandemic serves as a recent example, highlighting the interconnectedness of our critical and non- critical infrastructure systems and modern society's dependence on their functioning (Scholz et al., 2022). If a substantial number of critical infrastructure workers fall ill, it jeopardizes the operation of those infrastructures and consequently all others connected to them, such as hospitals (Scholz et al., 2022). For instance, Austria's food sector was impacted by border closures as Eastern European harvest workers were unable to enter the country, threatening the season's harvest and food production (Möchel & Seiser, 2020). Additionally, with a large portion of the population working remotely, the demand on information and communication services increased dramatically (National Disaster Resilience Council, 2020).

Critical Infrastructures have evolved to become increasingly intricate and interconnected, to the extent that a negative incident affecting one infrastructure in a specific location can spread to others, magnifying the adverse effects and potentially harming entities in distant areas unrelated to the initial event's origin (De Felice et al., 2022; Rinaldi et al., 2001). The continuous expansion and growing complexity of connections

between infrastructures lead to an increase in system-wide interdependencies, making the overall system more vulnerable to disruptions (De Felice et al., 2022; Rinaldi et al., 2001). This challenge is further complicated by

a wide range of interrelated factors and system conditions, encompassing the technical, economic, business, social/ political, legal/regulatory, health and safety, and security concerns that impact infrastructure operations (Rinaldi et al., 2001). The growing use of technology to link sectors within a nation's critical infrastructure has the additional concern of expanding the potential attack surface, as malicious actors can now aim to target national infrastructure using both conventional methods and more sophisticated approaches such as cyberattacks (Newbill, 2019).

The Council Directive on European Programme for Critical Infrastructure Protection defines protection as "all activities aimed at ensuring the functionality, continuity and integrity of critical infrastructures in order to deter, mitigate and neutralize a threat, risk or vulnerability" (EU Council, 2008). Critical Infrastructure Protection (CIP) acknowledges that it's impossible to safeguard all infrastructures against every threat, so its approach involves prioritizing protective measures relative to each other and then concentrating on selected protected assets (Lindström & Olsson, 2009). The prevailing view in both theory and practice is that the approach to critical infrastructure protection should primarily be founded on risk analysis, clearly identifying which risks threaten critical infrastructure operations and how to address them (Mitrevska et al., 2019).

Regarding the description of the situation and necessary actions, there's a fundamental stance that the overall protection of the state and society, from the perspective of maintaining critical infrastructure functionality, must be based on a "protection package" encompassing all infrastructures as well as each individual component (Mitrevska et al., 2019). Key focus areas for critical infrastructure protection within the US include governance and security management, secure network architectures, self-healing systems, modeling and simulation, wide-area situational awareness, forensics and learning capabilities, and trust management and privacy measures (Alcaraz & Zeadally, 2015).

Given the complex interdependencies within critical infrastructure networks, many governments have recently recognized the urgent need to develop resilient CIS to ensure the continuous functioning of their national economies (Osei-Kyei et al., 2021; Pursiainen, 2018). Additionally, various natural and human-induced hazards in the early 21st century

have heightened concerns about public safety, emphasizing the necessity for building CI resilience (Liu & Song, 2020). Resilient infrastructure is characterized by its robustness, agility, adaptability, and ability to withstand and quickly recover from disruptions, accidents, deliberate attacks, or natural threats or incidents (Clark et al., 2018; Evans et al., 2022; UNISDR, 2009). While crisis management for future events

improves by learning from past incidents, the unique aspects of each crisis cannot be fully anticipated (Labaka et al., 2016). Resilience extends beyond traditional risk management approaches by not only establishing policies for expected events but also considering unexpected occurrences (Suter, 2011). On the other hand, CI security involves reducing the likelihood of successful attacks against critical infrastructure or mitigating the effects of natural or human-caused disasters through physical means or defensive cybersecurity measures (Evans et al., 2022).

The certainty of breakdowns within complex, interdependent CIS necessitates acknowledging that not all CIS functioning and elements can be protected consistently and perpetually (Clark et al. 2018; Kim et al. 2017). The Department of Homeland Security (DHS) uses a risk-based approach to rank priority of resources within each sector, considering the likelihood of threats, infrastructure vulnerabilities, and potential national consequences of failure (Clark et al., 2018). However, some argue that this approach to CI risk management has too broad a scope, as it's not feasible to protect all 16 sectors at any cost (Clark et al., 2018). According to a recent study, the most commonly reported threats and hazards are natural disasters, aging and decay, cyber threats, terrorist activities, contamination (e.g., radioactive elements), and cascading effects (Osei-Kyei et al., 2021).

The US critical infrastructure risk management framework, presented in the National Infrastructure Protection Plan, emphasizes coordinated risk identification and management through partnerships across the critical infrastructure community (DHS, 2013). It stresses the importance of understanding cross-sector dependencies and sharing information at all levels to enhance security (DHS, 2013). The framework advocates for collaboration at regional, state, local, and international levels, recognizing the diverse perspectives within the community (DHS, 2013). Additionally, it emphasizes incorporating security and resilience measures during the design

phase of critical infrastructure facilities and systems (DHS, 2013). Recent Government Accountability Office (GAO) recommendations have expanded the responsibilities of sector risk management agencies to include risk assessment and emergency preparedness, which were not previously part of the key directive (GAO, 2023).

At the international level, NATO has established a 5-step risk assessment framework that involves identifying hazards and threats, assessing them, developing controls, implementing those controls, and supervising and evaluating (Evans et al., 2022). NATO guidance also recognizes that risk portfolios contain directly comparable risks due to

similar risk factor considerations. For instance, natural hazards can be sufficiently characterized through expected frequency of occurrence, community resilience, structural vulnerability, and a common

set of consequences (Evans et al., 2022). In contrast, terrorism risks typically consider relative threat, which involves understanding how terrorist groups differ in their intent, opportunity, and capability, significantly influencing the assessment of vulnerability and ramifications (Evans et al., 2022). The International Organization for Standardization has established ISO 27001, which assists organizations in developing and implementing information security management systems (ISMS) and security controls to protect CIS from cyber warfare

(ISO, 2022). ISO 22301 is an international standard for Business Continuity Management Systems, providing a framework for organizations to develop, implement, and evaluate a system to protect against and recuperate from disruptions (ISO, 2019). The founding principle of ISO 22301 is based on assessing consequences and managing risks; identifying the most important activities and the risks that can affect them, and then systematically addressing those risks (ISO, 2019).

Challenges around risk assessment and management include structural complexity, which derives from the heterogeneity of components across different technological domains, dependencies, and interdependencies (Zio, 2016). Dynamic complexity emerges as systems respond behaviorally to localized environmental and operational changes affecting their components (Zio, 2016). Another challenge presents itself as today's CIS are typically operated by non-computer experts, such as nurses in healthcare, soldiers in military settings, or firefighters

in emergency services. In such conditions, protecting against insider cyber attacks is often neither viable nor financially reasonable, but these threats can be practically prevented using suitable risk management strategies (Ghafir et al., 2018).

Often, attack detection tasks are performed within individual organizations, with limited information sharing across organizations (Skopik et al., 2016). Furthermore, some contend that many existing mechanisms are developed with the needs of the information technology (IT) community at the forefront, which operates under different priorities than other CIS (Kapellmann & Washburn, 2019). Givens and Busch (2013) examined the challenges in using public-private partnerships as a mechanism for building critical infrastructure protection. Their study identified (i) public-private coordination, (ii) gaps in information sharing, (iii) inadequate private sector engagement in CI protection and cybersecurity as three key challenges in cybersecurity protection (Givens & Busch, 2013). Van Eeten et al. (2011) argue that sharing information about critical infrastructure vulnerabilities is crucial for defending CIS against disasters and emphasize the necessity of

collaboration among public and private infrastructure owners and operators, where they share vital information for the security and resilience of their interconnected CIS.

Best practices for information and intelligence sharing within critical infrastructure and security recommend that appropriate tools and authorities should be used to collect, consolidate, analyze, and disseminate information from intelligence reports and evaluations to determine threats to critical infrastructure (The White House, 2024). The Cybersecurity and Infrastructure Security Agency is tasked with facilitating and sharing information and intelligence to support federal, state, local, tribal, territorial, and private sector entities' activities to safeguard against any risks to critical infrastructure (The White House, 2024). This includes acting as the Federal civilian interface for bilateral and multi sectoral distribution of information, particularly intelligence related to "cyber threat indicators, defensive measures, and cybersecurity risks" (The White House, 2024).

Regular communication between the government and private CIS owners and operators ensures multidirectional information exchange. Sharing relevant information about interdependencies between government and infrastructure operators can lead to improved performance for both parties (Gimenez, 2017). Information shared about CI vulnerabilities must be both timely and pertinent. Relying on voluntary information sharing hinders the process of developing resilient critical infrastructure; therefore, private CI operators may need to be required to share timely vulnerability information to enable the implementation of strategies that reduce the impact of these liabilities on CI (van Erp, 2017).

A crucial aspect of the collaboration between government and private infrastructure owners is fostering their relationship prior to any disruptive events (Jia et al., 2020). Mechanisms for cooperation, collaboration, and information sharing are vital for encouraging and implementing resilient strategies and policies to address interdependency-related risks (Rydén Sonesson et al., 2021). According to a survey of CIS owners and operators, information is most often shared with individuals who have established personal or professional relationships and who can be trusted to maintain the confidentiality of sensitive information (Rydén Sonesson et al., 2021).

Additional factors that enable information sharing include clear benefits from sharing (i.e., mutual information needs) or ongoing collaborative activities (Rydén Sonesson et al., 2021). Borchert (2015) builds upon existing research suggesting that the concept of information sharing unintentionally complicates cooperation by suggesting information "dominance" instead of shared information ownership. The article suggests a collaborative public-private information management agenda addressing both immediate threats through actionable information and long-term, crosscutting issues to understand the broader context of critical infrastructure development (Borchert, 2015).

Several challenges regarding information sharing have been identified, including difficulties in maintaining current information, determining necessary information and its sources,

assessing when aggregated non -sensitive information becomes sensitive, a shortage of technical tools for securely sharing confidential information, the resource-intensive nature of managing sensitive data, consolidating CIS vulnerability information from diverse sources with different data structures, and presenting information in easily accessible and digestible formats (Kapellmann & Washburn, 2019; Rydén Sonesson et al., 2021). Research indicates a need for a CIS vulnerability repository that enables analysis of multiple vulnerabilities simultaneously in a user-friendly format, with preferred access methods including newsfeeds and alerts, online dashboards, application program interfaces, XML or other markup languages, or text reports (Kapellmann & Washburn, 2019).

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Appendix C: Agenda

Anchorage Security and Defense Conference: The 'Decisive 2020s' in Allied North Perspective

Tuesday 19 November

08:00 - 09:00 Arrivals and Registration

09:00 - 09:30 Welcome Remarks and Lamp Lighting Ceremony

- MG (ret.) Randy "Church" Kee, Director, Ted Stevens Center
- Dr. Aaron Dotson, Vice Chancellor for Research, University of Alaska-Anchorage
- Mr. Richard Porter, Executive Director, Knik Tribal Council

09:30 - 11:00 Keynotes: US Perspectives on Defense in the North

This series of keynote remarks will offer senior US military perspectives on respective command and service views and response toward the evolving security environment.

- Gen. Gregory Guillot, Commander, North American Aerospace Command and US Northern Command
- MG Peter Andrysiak, Chief of Staff, US European Command
- VADM Nathan Moore, Commander, Atlantic Area, US Coast Guard
- VADM Andrew Tiongson, Commander, Pacific Area, US Coast Guard 11:00 - 11:30 Coffee Break

11:30 - 12:30 Panel 1: Allied Perspectives on Defense in the North

This session will offer senior Canadian and northern European military perspectives on national and command views and response toward the evolving security environment.

Moderator: Dr. Kathryn Bryk Friedman, North American Arctic Policy Advisor to the Ted Stevens Center, ACT1 Federal

Speakers:

- RAdm Steve Moorhouse, Assistant Chief of Defense Staff for Operations and Commitments, Royal Navy, United Kingdom
- MG Soren Andersen, Commander, Joint Arctic Command, Kingdom of Denmark (online)
- BG Dan Riviere, Commander, Joint Task Force North, Canada
- Mr. Youssef Mani, Assistant Commissioner, Coast Guard Arctic Region, Canada

- MG Joseph Hilbert, Commanding General, 11th Airborne Division, United States

12:30 - 13:30 Lunch; Video Message: US Senator Lisa Murkowski

13:30 - 13:40 Keynote Remarks

Dr. Leigh Nolan, Senior Advisor to the US Assistant Secretary of Defense for Homeland Defense and Hemispheric Affairs

13:40 - 15:00 Panel 2: Energy and Technology in a Transforming Arctic

The 2020s may be a tipping-point decade for accumulating change in global environment, energy systems, and emerging technologies. Such interconnected mega-trends promise transformative effects for societies, defense, and security. This session explores these dynamics through the prism of the impact of artificial intelligence on the energy sector in and beyond the Arctic. It offers insights into the nexus of innovation, risks, geopolitical implications, and possible governance frameworks.

Moderator: Dr. Kelsey Frazier, Associate Director for Research and Analysis, Ted Stevens Center

Speakers:

- Amb. David Balton, Executive Director, Arctic Executive Steering Committee, White House Office of Science and Technology Policy
- Dr. Erin Whitney, Director, Arctic Energy Office, US Department of Energy
- Dr. Jeremy Kasper, Director, Alaska Center for Energy and Power, University of Alaska-Fairbanks
- Dr. Humberto Garcia, Directorate Fellow and Senior Technical Advisor, Idaho National Laboratory
- Ms. Leslie Canavera, Chief Executive Officer, PolArctic

16:30 - 19:00 Cultural Event and Reception: Heart of the North: Where Alaska Native People Thrive

Hors d'oeuvre, Cash Bar

Drummers and Dancers: Imamsuat Sugpiaq

Introduction: Ms. Lily Becker, Ted Stevens Foundation

Remarks: Ambassador Mike Sfraga, Ambassador-at-Large for Arctic Affairs, United States

Arctic Indigenous People and Arctic Security Presentation: Dr. Haliehana Stepetin, Professor, Ted Stevens Center for Arctic Security Studies

Oral Traditions: Ms. Polly Andrews

Concluding Remarks: Mr. Craig Fleener, Deputy Director, Ted Stevens Center for Arctic Security Studies

Marc Brown Band

Wednesday 20 November

09:00 - 09:20 Day 2 Welcome Remarks

- Ms. Lily Stevens Becker, President, Ted Stevens Foundation
- BGen David Moar, Deputy Commander, Alaskan NORAD Region Command

09:20 - 10:30 Panel 3: An 'Axis of Adversaries?' China, Russia, and Associated States

Russia's war of aggression against Ukraine and China's challenges to neighbors and international order have cemented strategic competition as the dominant paradigm of international relations. Their declared "no limits friendship" and deepened alignments with states such as North Korea and Iran suggest return to a world of opposing blocs. This session analyzes the nature and extent of these states' individual and collective challenge. It addresses issues including the solidity of Chinese-Russian alignment, trajectories in Chinese and Russian power, remaining areas of potential cooperation, and Allied response to what some now label a "pre-war" strategic environment.

Moderator: RADM (ret.) Matthew Bell, Dean of the School of Arctic Security Studies, Ted Stevens Center

Speakers:

- Dr. Graeme Herd, Professor of Research and Policy Analysis, George C. Marshall Center
- Dr. May-Britt Stumbaum, Professor of Strategic Security Studies, George C. Marshall Center
- CDR Rachael Gosnell, Military Professor of Strategic Security Studies, George C. Marshall Center

10:30 - 11:00 Coffee Break

11:00 - 12:30 Panel 4: NATO at 75: New Members, New Challenges

NATO's recent Washington summit celebrated the 75th birthday of the world's preeminent alliance. During the current decade, the Alliance adopted a new

Strategic Concept, (re-)introduced regional defense plans, welcomed Finland and Sweden as members, and strengthened external partnerships. This session reviews impacts of such steps and potential for further measures for deterrence and defense as well as other Alliance core tasks.

Moderator: Dr. Matthew Rhodes, Professor of International Security, Ted Stevens Center

Speakers:

- Dr. Sten Rynning, Director, Danish Institute for Advance Study, University of Southern Denmark
- CDR Dr. Stefan Lundqvist, Pro-Dean, Swedish Defense University
- Ms. Minna Alander, Research Fellow, Finnish Institute of International Affairs
- MG Matthew van Wagenen, Deputy Chief of Staff (Operations), Supreme Headquarters Allied Powers Europe
- Mr. Michael Ryan, former US Deputy Assistant Secretary of Defense

12:30 - 13:30 Lunch

13:30 - 15:00 Panel 5: Indo-Pacific Allies and Partnerships

The broad Indo-Pacific region is increasingly central to global affairs. Several states across the region have declared Arctic interests. While there is no direct counterpart to NATO, some of these and others are US treaty allies. Strategic competition has meanwhile triggered a mix of revised national security concepts, "mini-lateral" security arrangements such as the Quad and AUKUS, and updated efforts toward nonalignment. This session compares different states' perspectives and approaches as well as opportunities for further collective action.

Moderator: Prof. Michael Burgoyne, Professor, Daniel K. Inouye Center

Speakers:

- Dr. Narushige Michishita, Executive Vice President, National Graduate Institute for Policy Studies (online)
- Dr. Nick Bisley, Dean of Humanities and Social Sciences, La Trobe University
- Prof. Shyam Tekwani, Professor, Daniel K. Inouye Center
- Ms. Susannah Patton, Director, Southeast Asia Program, Lowy Institute (online)

15:30 - 17:00 Break-Out Sessions

These sessions offer a range of specialized, smaller group opportunities to extend discussion and analysis beyond the main-stage panels.

Investing to Shape the Future of the Arctic - The Evolving Role of Education in Meeting Emerging Challenges ("Adventure" room):

This session explores how education is shaping the future of the Arctic, with a special focus on the critical intersections of higher education and Arctic security. The panel brings together experts deeply engaged in Arctic affairs to address the region's unique challenges and opportunities. As the Arctic becomes increasingly strategic, our discussion will highlight how educational programs are evolving and partnering to equip the next generation of Arctic scientists, researchers, and leaders with the skills needed to ensure security, sustainability, and resilience. From interdisciplinary collaborations to hands-on training initiatives, this session will offer invaluable insights

into how education is meeting the pressing needs of security challenges and building the next generation of professionals to meet the future needs of the US Arctic. It is organized by the University of Alaska-Anchorage's ADAC-ARCTIC.

Moderator: CDR (ret.) Jeremy Altendorf, Associate Director for Arctic Programs and Strategy Implementation, University of Alaska-Anchorage

Speakers:

- Dr. Chelsea Thompson, Program Manager for Arctic and Resilience, Office of University Programs,
- Department of Homeland Security
- Dr. Kaja Brix, Arctic Program Director, National Oceanic and Atmospheric Administration
- Dr. Larry Hinzman, Coordinator, Arctic Leadership Initiative, University of Alaska
- Dr. Merrit Turetsky, Director of Arctic Security, University of Colorado-Boulder
- Ms. Jocelyn Fenton, Director of Programs, Denali Commission

Nordic Security Now ("Whitby" room):

This session analyzes impacts and implications of Finland and Sweden's NATO accession while placing NATO enlargement in the context of respective national interests, regional cooperation, the parallel role of the European Union, strategic competition, and other broader security developments. It is jointly organized by the Norwegian Institute of International Affairs, Fridtjof Nansen Institute, Swedish Defense University, and Finnish Institute of International Affairs.

Moderator: Ms. Maria Jonten, Project Coordinator, Swedish Defense University

Speakers:

- CDR Dr. Stefan Lundqvist, Pro-Dean, Swedish Defense University
- Ms. Minna Alander, Research Fellow, Finnish Institute of International Affairs
- Dr. Andreas Raspotnik, Senior Researcher, Fridtjof Nansen Institute

Below Zero Medicine ("Voyager" room):

This session examines emerging developments in Below Zero Medicine (BZM) as a critical component of military operations in Arctic and Arctic-like conditions for Homeland Security. It reviews background to BZM's creation and presents future oriented perspective of challenges and solutions in areas including tactical combat casualty care, force health protection, and veterinary services. It is organized by the Below Zero Medicine team of the Alaskan NORAD Region and Alaskan Command.

Moderator/Speaker: Lt. Col. Kaitlin Salle, Deputy Surgeon, Alaskan Command

Speakers:

- Col. Laura Baugh, Surgeon, Alaskan Command
- Mr. James Pilkington, Professional Engineer, US Naval Facilities Engineering and Expeditionary Warfare Center
- Mr. Andres Martinez Murillo, Biomedical Engineer, US Naval Medical Research Unit
- Dr. Darrin Frye, Chief Science Director, US Naval Medical Research Unit
- Dr. John Castellani, Deputy Chief, Thermal and Mountain Medicine Division, US Army Research Institute of Environmental Medicine
- COL Dr. Jared Madden, Office of the Command Surgeon Veterinarian, US Army North

Threats through, to, and in the North American Arctic ("Resolution" room):

This session features Canadian, American, Greenland, and Danish experts who will critically analyze defense and security threats through, to, and in the North American Arctic. They will carefully parse current and emerging risks and threats, with attentiveness to acuity in particular sub-regions or areas and identify opportunities for enhanced cooperation amongst the North American Arctic allies and Indigenous Peoples. It is organized by the North American and Arctic Defence and Security Network (NAADSN).

Moderator: Capt. Samantha Van Cleave, Instructor and Executive Officer, Behavioral Sciences and Leadership Department, US Air Force Academy

Speakers:

- Sgt. Jackie Jacobson, Canadian Ranger patrol commander, Tuktoyaktuk, Northwest Territories
- Dr. P. Whitney Lackenbauer, Professor and Canada Research Chair in the Study of the Canadian North, Trent University
- Mr. Kenneth Høegh, Head of the Greenland Representation to the United States and Canada
- RAdm Jakob Rousøe, Defense Attaché, Royal Danish Embassy to the Unites States

The National Guard State Partnership Program ("Quadrant" room):

This session explores ways the US National Guard State Partnership Program is adapting to changes in the global security environment. It compares partnership experiences of individual states including Alaska (Mongolia), New York (Sweden, South Africa, and Brazil), and Virginia (Finland and Tajikistan). It is organized by the Alaska National Guard Arctic Interest Chair to the Ted Stevens Center.

Moderators: Mr. Ryan Richard, Alaska National Guard Arctic Interest Chair to the Ted Stevens Center and Mr. Matthew Schell, Deputy Associate Director for Research and Analysis, Ted Stevens Center

Speakers:

- BG Timothy Brower, Vice Director for Strategy, Policy, Plans, and International Affairs, US National
- Guard Bureau
- MG Michel Natali, Assistant Adjutant General, New York National Guard
- COL(P) Russell McGuire, Chief of the Joint Staff, Virginia National Guard
- BG Brian Kile, Assistant Adjutant General, Alaska National Guard

Climate Change and Security ("Easter Island" room):

This session offers an overview of the background and work of the new Climate Change and Security NATO Center of Excellence in Montreal. It discusses ways the Center promotes greater understanding of climate's growing role in security as well as innovation and alignment in response by NATO Allies and Partners. It is organized by the Climate Change and Security Center of Excellence (CCASCOE).

Moderator/Speaker: Mr. Martin Aarnaes, Branch Head for Outreach and Engagement, Climate Change and Security Center of Excellence

Speaker:

- Ms. Lauren Dyson, Section Head for Arctic Policy, Department of National Defense, Canada

1800-1930 Women, Peace, and Security Evening Reception (off-site)

The Women, Peace and Security (WPS) Evening Reception will bring together senior leaders, security practitioners, and leading experts to foster discussion, facilitate knowledge sharing, and provide education on the goals of WPS with a specific focus on the Arctic region.

Thursday 21 November

09:00 - 09:20 Day 3 Welcome Remarks

- Mayor Suzanne LaFrance, Municipality of Anchorage
- Col. Matthew Komatsu, Chief of the Joint Staff, Alaska National Guard

09:20 - 10:30 Panel 6: Resilience and Total Defense: Whole-of-Society Perspectives

Security and stability begin with resilient networks, communities, and people. people. Defensible, durable communities include security professionals, emergency responders, volunteer organizations, and cohesive civil society. This session examines ways different elements and echelons of government and society across the North have taken steps during this decade to bolster resilience against the geopolitical, geophysical, and technological challenges discussed earlier in the conference. It considers ways shared lessons from these examples can add to further headway in the remainder of the decade.

Moderator: Mr. Jeffrey Libby, PI, ADAC-ARCTIC, University of Alaska-Anchorage

Speakers:

- BG Timothy Brower, Vice Director for Strategy, Policy, Plans, and International Affairs, US National Guard Bureau
- Patrol Agent in Charge Ross Wilkin, US Border Patrol
- Ms. Julie Kitka, Federal Co-Chair, Denali Commission
- Mr. Shannon Jenkins, Senior Arctic Policy Advisor, US Coast Guard
- Ms. Maria Jonten, Project Director, Strategic Implications and Innovations Center, Swedish Defense University

10:30 - 11:00 Coffee Break

11:00 - 12:30 Panel 7: Critical Infrastructure Security

The emerging challenges of the twenty-first century are also influencing the field of critical infrastructure. Concepts of critical infrastructure protection are shifting toward risk analysis-based security and resilience. Although these are primarily

national responsibilities, global critical infrastructure is a strategic international concern. This session shares insights on threats to critical infrastructure, ways allies and partners are developing and implementing respective approaches, and areas of need for further multi-level cooperation.

Moderator: Dr. John Garver, Director, Homeland Defense Institute

Speakers:

- Mr. Ronald Bearse, President, Ronald Bearse Associates
- Mr. Chris Anderson, Principal Advisor for National Security and Emergency Preparedness, Lumen Technologies
- Mr. Geoffrey French, Senior Subject Matter Expert, MELE Associates
- Ms. Anu Fredrikson, Executive Director, Arctic Frontiers
- Mr. Ryan Schwartz, Director of Critical Infrastructure Policy and Analysis in the National and Cyber Security Branch, Public Safety Canada

12:30 - 13:30 Lunch; Video Message: US Senator Dan Sullivan

13:30 - 14:45 Panel 8: Strategic Horizons

This future-oriented session offers interactive discussion among senior officials and experts of impacts and implications of conference themes for select issues.

Moderator: Mr. Evan Bloom, Polar Governance Chair Consultant to the Ted Stevens Center, ACT1 Federal

Speakers:

- Amb. Petteri Vuorimaki, Ambassador for Arctic Affairs, Finland
- RADM Scott Robertson, Director of Strategy, Policy, and Plans (J5), North American Aerospace Command and US Northern Command
- Mr. David Kang, Director of Joint Training, Exercises, and Wargaming (J7), North American Aerospace Command and US Northern Command
- Dr. Dalee Sambo, Professor, University of Alaska Anchorage

Discussant: Mr. Craig Fleener, Deputy Director, Ted Stevens Center

15:00 - 15:30 Fireside Chat: What Now?

Moderator: Mr. Matthew Hickey, Associate Director for Strategic Engagement, Ted Stevens Center

Speakers:

- Ambassador Mike Sfraga, US Ambassador At Large for Arctic Affairs

- Major General USAF (Ret) Randy “Church” Kee, Director, Ted Stevens Center

15:30 - 16:00 Concluding Remarks:

Major General USAF (Ret) Randy “Church” Kee, Director, Ted Stevens Center

Dr. Jeffrey Libby, Principal Investigator, Arctic Domain Awareness Center, University of Alaska-Anchorage