NAVAL POSTGRADUATE SCHOOL

MONTEREY, CALIFORNIA

SUPPLEMENTAL TO DEFENSE ANALYSIS CAPSTONE REPORT

(6 OF 12: APPENDIX F)

USSF CAPABILITY GAP IN THE ARCTIC

by

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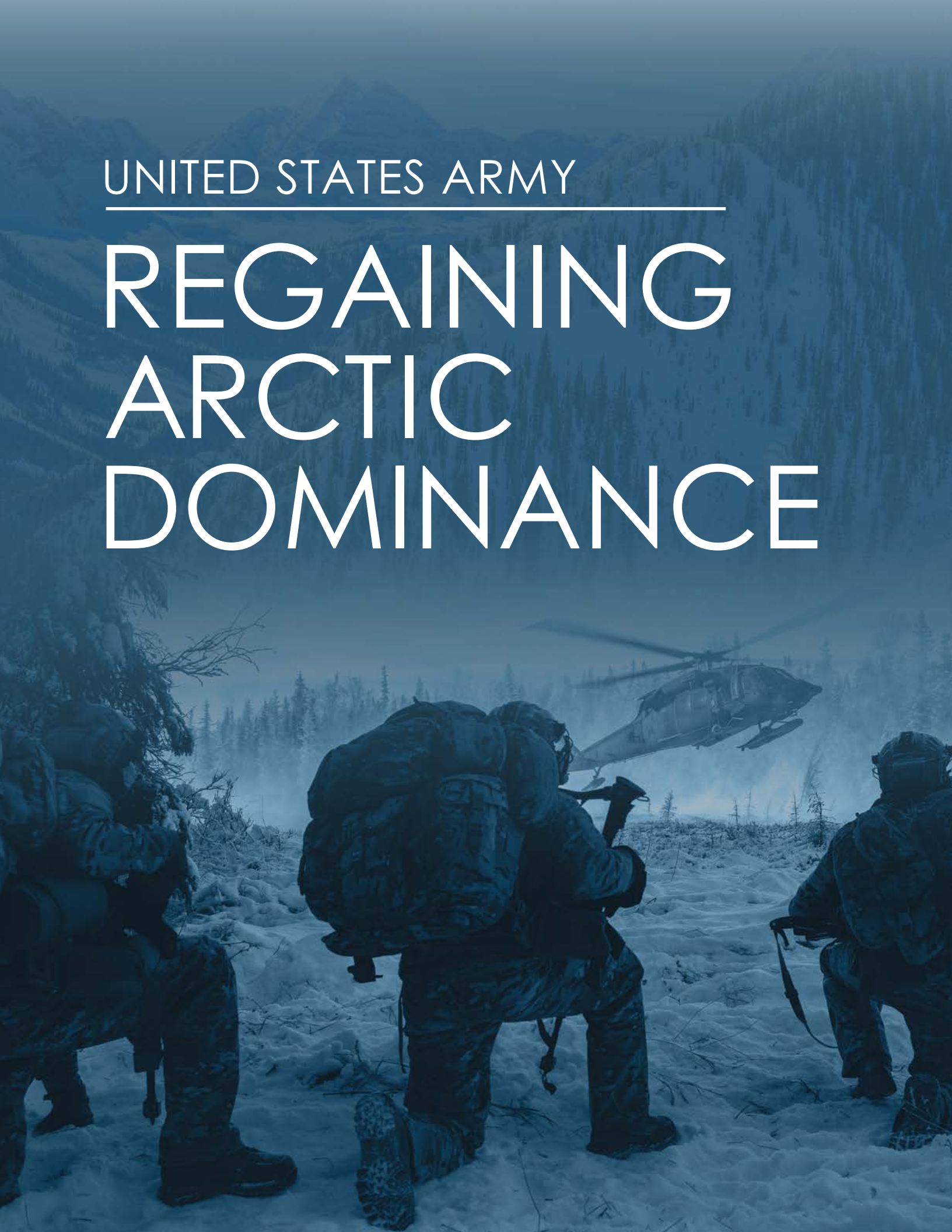
UNITED STATES ARMY

REGAINING ARCTIC DOMINANCE



REGAINING ARCTIC DOMINANCE

THE U.S. ARMY IN THE ARCTIC

Headquarters, Department of the Army
19 January 2021

Chief of Staff Paper #3

FOREWORD

Our Army exists to protect our nation and to preserve the peace. To meet that core requirement, the Army must man, train, equip, and organize to win in the Arctic. The Arctic is simultaneously an arena of competition, a line of attack in conflict, a vital area holding many of our nation's natural resources, and a platform for global power projection.

The Army is committed to defending our Arctic interests. Accordingly, the Army will field a Multi-Domain Task Force-enabled division and adjust our Alaskan-based brigade combat teams to regain the U.S. Army's Arctic dominance.

This rejuvenated Arctic capability will increase the Army's ability to operate in extreme cold-weather, mountainous, and high-altitude environments. This strategy poises the Army to adapt how it generates, postures, trains, and equips our forces to execute extended, multi-domain operations in extreme conditions in support of the Joint warfighter. Restoring Arctic dominance also requires an inherently Total Army approach incorporating the Army Reserve and National Guard.

This strategy adopts a different perspective of the world as a globe rather than a map, a view that allows us to see the opportunities of "northern routes" that will speed force generation and deployment from Alaska to points around the globe.

Regaining dominance in the Arctic provides new opportunities to engage and train with the many allies and partners around the world who also operate in extreme cold weather, mountainous, and high altitude environments. For example, in meeting India's autumn of 2020 request to provide cold-weather equipment, we gained understanding of the requirements to operate in places like the Himalayas. In regaining our Arctic focus, the Army, with our allies and partners, will develop doctrine, training, and equipment to meet the unique requirements of cold weather, mountainous, and high altitude environments.

This strategy communicates our objectives and plan to build an Army capable of Multi-Domain Operations and regaining Arctic dominance.

James C. McConville
General, United States Army
Chief of Staff

Ryan D. McCarthy
Secretary of the Army

THE ARCTIC NOW AND IN THE FUTURE

Introduction

The United States is an Arctic nation. As such, the Arctic security environment contributes directly to homeland defense and is of vital importance to our national interests. In 2019, the Department of Defense (DoD) published its most recent Arctic Strategy with the objective of an Arctic that "is a secure and stable region in which U.S. national interests are safeguarded, the U.S. homeland is defended, and nations work cooperatively to address shared challenges." The DOD directs the Department to defend the homeland, compete to maintain favorable regional balances of power, and ensure common domains remain free and open. This Army strategy builds on those objectives to identify the ways the Army will ensure land dominance and continue to complete its missions as part of the Joint Force. In order to do this, the Army must understand the Arctic's role in defending the homeland, the complicated geopolitical landscape within the context of great power competition, and how accelerated environmental change impacts future operations. With this understanding, the Army will be able to generate, project, and employ forces able to operate and compete in the Arctic as part of the joint force in support of Combatant Commands and in concert with allies and partners.

The Geopolitical Landscape

Title 15 U.S.C. § 4111 defines the Arctic as "all U.S. and foreign territory north of the Arctic Circle and all U.S. territory north and west of the boundary formed by the Porcupine, Yukon, and Kuskokwim Rivers; all contiguous seas, including the Arctic Ocean and the Beaufort, Bering, and Chukchi Seas; and the Aleutian islands chain." By using this definition, the Arctic encompasses part of the areas of responsibility of three different geographic combatant commands (USNORTHCOM, USINDOPACOM, USEUCOM), eight countries, and all time zones. (It should be noted that the Arctic is also of critical interest to all of the functional combatant commands as well.) There are two primary transit routes through the Arctic: the North-West Passage (NWP) and the Northern Sea Route (NSR).

The Arctic is also a shared region and a potential corridor for strategic competition[1]. Within the region there exists a multi-layered international partnerships and alliances, including the European Union (EU) member states, NATO members, the Arctic Council, the Arctic Five (an ad hoc, non-binding group of the five Arctic littoral states: Canada, Denmark, Norway, Russia, U.S.A.), the Arctic Coast Guard Forum (all 8 Arctic nations participate and the Arctic Security Forces Roundtable (all but Russia participate). These overlapping relationships and organizations complicate the geopolitics of the region. Current international disputes focus on maritime boundary claims and economic rights. Russia exerts claims to regulate the Arctic beyond established international laws by requiring foreign vessels to obtain permission and be escorted during transit of the NSR. Fortunately, at this time, Arctic nations continue to work through these disputes through legal and diplomatic channels. However, the decreasing amount of sea ice will lead to new routes opening in the future and may become an area of contention as Arctic nations attempt to exert control over key sea lanes (as discussed later in this strategy). This increases the likelihood of overlapping claims by states with declared interests in the region.

Figure 1 – Geographic Combatant Command Areas of Responsibility in the Arctic

[1] Office of the Under Secretary of Defense for Policy. (2019). Report to Congress, Department of Defense Arctic Strategy. Washington, DC: Department of Defense.

A polar bear on the pack ice in the Arctic Ocean north of Spitsbergen, Svalbard archipelago in northern Norway.

Environmental Impacts to Current and Future Operations

The region north of the Arctic Circle is warming twice as fast as the rest of the world, opening up new opportunities for natural resource extraction, shipping routes, and commercial fishing. According to the U.S. National Aeronautics and Space Administration, the amount of year round ice cover in the Arctic Ocean fell by 11.5% each decade between 1979 and 2012. The rate of decline reached 13.3% by 2017, suggesting the rate of decline in the ice pack is gaining pace rather than holding constant. The warming of the Arctic has led to longer windows of reduced ice conditions over a larger range of area. While

long-term trends point to a more consistently navigable Arctic, other environmental factors make it difficult to predict what the near-term conditions will be. Though the Arctic continues to lose increasing amounts of multiyear sea ice, the remaining ice is becoming less predictable. For example, heavy pack ice conditions rendered the Northwest Passage impassible for some ships in 2018, despite it being one of the warmest years on record.

Thawing permafrost affects infrastructure across the region. Reductions in single and multi-year polar ice are accelerating the rate of coastal erosion, putting already sparse infrastructure at risk. Lacking the climate-moderating effect of the warm Gulf Stream, the North American Arctic hosts a much harsher environment than the European Arctic and significantly less road and maritime infrastructure. Base infrastructure materials across the region need to have high thermal efficiency; long-term durability; tolerance to repeated freeze and thaw cycles; and resistance to permafrost degradation. Infrastructure in many austere locations has already deteriorated due to extreme environmental factors. It can also complicate force sustainment operations as roadways, sea ports, and airfields are potentially rendered inoperable. The loss of sea ice index opens up new waterways that can allow increased access to and transit through the region. This could require additional forces, equipment capability, and infrastructure investments to secure the U.S. homeland and the northern avenues of approach. Furthermore, decreased sea ice and glacial mass will open access to currently unclaimed natural resources. This presents a source of future potential conflict that necessitates a cohesive strategic approach and appropriate investments to demonstrate a credible deterrent.

The Arctic, however, is not challenging solely due to extreme cold temperatures. In many instances, mobility is actually at its highest state in the winter. Summer poses significant challenges for many wheeled vehicles, while the most challenging period is the spring thaw when ground movement becomes impossible across considerable swaths of territory. Regardless of season, mobility by air is critical to Army operations. Today and for the foreseeable future, the Arctic presents a harsh and demanding environment for Army operations and activities.

The environment is often cited as the greatest adversary to Arctic operations. Extreme temperatures, long periods of darkness and extended daylight, high-latitudes, seasonal challenging and changing terrain, and rapidly changing weather patterns define Arctic conditions. The impacts of increasingly frequent and intense winter storms increase risk, and near-term variability in the physical environment exposes military forces and capabilities to unpredictable levels of risk.

THE U.S. ARMY IN ALASKA

The U.S. Army has had a nearly continuous presence in Alaska since the United States purchased the territory from Russia in 1867. In the absence of a civilian government, the Army assumed responsibility for administering the territory and quickly established several military posts.

However, investment in Alaska remained modest until just before World War II, when the combination of increased international tensions and advances in long-range aviation made Alaska important for both defense and power projection. For nearly a year, the Aleutian Islands of Kiska and Attu were occupied by Japan until liberation by a predominantly Army force.

The importance of the Army's activities in Alaska reached a high point during the Cold War when Alaska's proximity to the Soviet Union and its challenging climate and terrain made it both the front line of defense for the United States and a vital training ground for arctic operations. In January 1947, the U.S. Chiefs of Staff stood up a unified command, the Alaskan Command, to provide for Alaska's defense and protect the U.S. from attack through Alaska. That November, its subordinate Army headquarters, the Alaskan Department, was redesigned as U.S. Army, Alaska. In 1949, Alaska's reorganized National Guard stood up new units built on the legacy of the territory's unique wartime organizations. Its two infantry battalions were to become proficient in winter and mountain warfare and assist USARAL in the ground defense of Alaska. Two scout battalions, made up

primarily of native Alaskans, were to train for scouting and emergency rescue operations, assist in developing survival tactics, and in gathering intelligence. U.S. Army Alaska's missions included the development of cold weather and mountain warfare doctrine and operation of a cold weather and mountain school. The Army Arctic School, established in 1948, provided military personnel with instruction in summer and winter operations in arctic and sub-arctic conditions.

The fall of the Berlin Wall in 1989 and the subsequent dissolution of the Soviet Union signified an end to the Cold War and portended a shift in Alaska's military significance. During the 1990s, the Army inactivated the 6th Infantry Division and resurrected U.S. Army Alaska (USARAK) as a component of a newly reestablished U.S. Alaskan Command.

Figure 2 – U.S. Army in Alaska Historical Perspective

Army Capabilities in and for the Arctic

Beyond traditional functions in ballistic missile defense, the Arctic, especially Alaska, as an operational space presents unique opportunities for power projection to enhance U.S. Army competition activities and our ability to respond in crisis and/or conflict. With increasing levels of adversary activities in the Arctic region, it is essential for the U.S. Army to employ a calibrated force posture with units that are manned, trained, and equipped to maintain a credible deterrence and the first line of defense of the homeland. If called for a contingency response in the Arctic, Army forces must have the proper training to endure the harsh Arctic environment during extended operations, equipment that can function in challenging terrain and extreme temperatures, and the infrastructure to sustain the force over vast distances.

Virtually all permanent Army forces in the Arctic and sub-Arctic are stationed in Alaska, which has three major installations: Fort Wainwright, Joint Base Elmendorf-Richardson (JBER), and Fort Greely. Approximately 11,600 Soldiers serve at Fort Wainwright and JBER under the command of U.S. Army Alaska (USARAK).

Major USARAK units include two brigade combat teams (BCTs), a combat sustainment support battalion, and two aviation battalions. Adding to organizational complexity, these forces are assigned to USINDOPACOM while stationed in the USNORTHCOM area of responsibility.

The Alaska Army National Guard (AKANG) has slightly less than 2,000 Soldiers organized into a regional support group with engineering and construction capabilities, aviation battalion, an infantry regiment, a missile defense brigade, and WMD civil support team, and augmented with two aviation companies. Additionally, members of the AKARNG serve as part of the multi-component 100th Missile Defense Brigade. The AKANG is distributed throughout the state but is largely concentrated at Fort Wainwright, with additional operating facilities at JBER, Bryant Army Airfield in Anchorage, Fairbanks, Nome, Bethel, and Juneau. AKANG aviation assets regularly support exercises and personnel recovery operations into the Beaufort Sea.

The U.S. Army Reserve (USAR) has approximately 2,000 Soldiers in five units, who provide support to the 9th MSC in Alaska. These units include a USAR Theater Support Group, ECC Mortuary Affairs, and Mobilization support elements.

Army forces in Alaska perform several major mission sets under various legal authorities:

- Readiness for operations in competition, crisis, and conflict
- Homeland defense of Alaska and the continent
- Defense Support to Civil Authorities (DSCA)
- Support to search and rescue operations
- Strengthening relationships with allies and partners through security cooperation, training, bilateral and multilateral exercises, and the State Partnership Program
- Army garrisons/Senior Commanders perform BOS-I functions in support of forces operating in Alaska/the Arctic region

Most of the operational missions are conducted under the authority of USARAK, assigned to USINDOPACOM and under the administrative control of US Army Pacific. USARAK provides Senior Commander, Title 10, Administrative Control Army support to other Services. USARAK also provides Army executive agent responsibilities, to include the authority for training, readiness, and validation for

deployment of attached Alaska-based units to execute operations in support of Combatant Command requirements across the globe. USARAK could also be called upon to provide mission command node for Homeland Defense or for Defense Support of Civil Authorities (DSCA) within the Alaskan Command (ALCOM) Joint Operations Area (JOA) in support of US Northern Command (USNORTHCOM).

Additionally, forces in Alaska conduct several missions that fall under the command of organizations other than USARAK in the Alaskan JOA:

- Army Space and Missile Defense Command (SMDC) provides space and ballistic missile defense (BMD) capabilities.
- USARNORTH performs its daily Theater Army and Army Service Component Command responsibilities to Set the Theater; Coordinate Joint Receptions, Staging, Onward Movement, and Integration; communications, and sustainment support; and provide Army Service Support as necessary for USNORTHCOM requirements. O/O USARNORTH will conduct ARFOR support to ALCOM. USARAK is not assigned ARFOR for the Sub-Unified Command, ALCOM.
- The US Army Corps of Engineers (USACE) monitors climate changes and environmental impacts upon sensors and infrastructure, and advances technology to research and simulate the Arctic environment.
- The US Army Cold Regions Test Center tests system performance in Arctic and sub-Arctic conditions.
- The Army National Guard provides forces to support Army missions including overseas deployments, homeland defense, DSCA, BMD, and air mobility.

Paratroopers with 3rd Battalion, 509th parachute infantry regiment, 4th Infantry Brigade Combat Team (Airborne), 25th Infantry Division, board A Royal Canadian Air Force CH-147 during an assault exercise at Donnelley Training Area, Alaska, Feb., 10, 2021. (U.S. Army photograph by Staff Sgt. Alex Skripnichuk

IN SUPPORT OF NORTHCOM

- Deputy to ALCOM CDR
- HD & DCSA missions as directed
- Support CDRALCOM role as NORTHCOM lead for Arctic Affairs
- Support SAR Operations
- Participate in interagency / interorganizational coordination with DoD partners

USARAK

- Provides trained and ready forces in support of worldwide unified land operations
- Supports USINDOPACOM Theater Security Cooperation Program in order to contribute to a stable and secure operational envoironment
- O/O executes joint force land component command function ISO of homeland defense and defense support of civil authorities in Alaska

IN SUPPORT OF INDOPACOM

- Senior Army Commander in Alaska
- Mission Commander
- Senior Commander at Ft. Wainwright
- Senior Army Element Commander at JBER
- Army Proponent for Cold Region Training

Figure 3 – U.S. Army Alaska Force Structure

Basic Military Mountaineering Course student 1st Lt. Christopher Peer crosses a one-rope bridge over a mountain gorge at the Northern Warfare Training Center's Black Rapids Site during training. NWTC cadre followed Coronavirus restrictions while guiding students through both the basic and advanced mountaineering courses in August. With the advent of Alaska's long, cold winter, NWTC's focus is now shifting to cold weather training for the 2020-21 season. (Army photo/John Pennell)

Training Arctic-Capable Forces

The Arctic environment calls for the generation of Arctic-capable units. In this strategy, Arctic-capable units are defined as those: enabled by doctrine, trained at echelon, with the right equipment, and manned by Soldiers with the appropriate knowledge, skills, and abilities to successfully operate in the Arctic. These formations could be employed in other sub-arctic, extreme cold weather (ECW) and mountainous environments anywhere in the world. The Army currently has some resources to train Arctic-capable Soldiers and small units.

The ability to conduct effective and extended operations in the Arctic requires far more than just a set of specialized equipment. Units cannot simply be re-purposed or provide add-on capability to be proficient and survive arctic conditions.

The Northern Warfare Training Center (NWTC) at Ft. Wainwright, Alaska is the Army's proponent for cold region training. It provides premier cold weather (CW) and mountain warfare training to U.S. and partner nation forces to enhance warfighting

An Advanced Military Mountaineering Course student searches for a route up a rock face at the Northern Warfare Training Center's Black Rapids Site during training. NWTC cadre followed Coronavirus restrictions while guiding students through both the basic and advanced mountaineering courses in August. With the advent of Alaska's long, cold winter, NWTC's focus is now shifting to cold weather training for the 2020-21 season. (Army photo/John Pennell)

capabilities to create combat credible Soldiers and leaders. It offers courses to train unit leaders and individual Soldiers to conduct small unit operations in cold, snow-covered environments and mountainous terrain. NWTC graduates provide their units with vital expertise and are a means of sustaining institutional knowledge.

The Army Mountain Warfare School (AMWS) in Jericho, Vermont, provides tactical and technical training for mountain warfare and cold weather operations, to allow graduates to use adverse terrain as a combat multiplier. With 38% of the world's landmass classified as mountains, the AMWS enables the Army to provide forces to deter conflicts, resist coercion, and defeat aggression in mountainous as in other areas.

The Joint Pacific Alaska Range Complex (JPARC), with over 2,490 square miles of land space, provides a realistic opportunity for unit training in an environment that can replicate deployment distances. With land, air, and marine maneuver range space equal to Delaware, Virginia, and Florida combined, JPARC hosts home-station training for Alaskan-based units and smaller unit training events and up to four large-scale exercises annually. JPARC offers immense training capability that will require better joint coordination, orchestration, and investment to fully exploit.

Special Operations Advance Mountaineering School (SOAMS), in Fort Carson, Colorado trains special operations Soldiers to survive and fight in mountainous environments. SOAMS establishes certification standards, submits updates to regulations, advises the command on mountain training and operations, trains and certifies select SOF service members, interagency personnel, and foreign SOF Soldiers in advanced cold weather, high altitude, and high angle Military Mountaineering skills in preparation for training and operations throughout the world in support of US objectives.

Paratroopers from C Troop, 1st Squadron (Airborne), 40th Cavalry Regiment jump into Donnelly Drop Zone Feb. 29, 2020, from a Royal Canadian Air Force C-130 as part of Arctic Edge 2020. As a Homeland Defense exercise, AE20 is designed to provide high quality and effective training in the extreme cold-weather conditions found in Arctic environments. The exercise is conducted under the authority of North American Aerospace Defense Command and U.S. Northern Command. AE20 is the largest joint exercise scheduled in Alaska this year. (Army photo/John Pennell)

ARMY ARCTIC TRAINING

The U.S. Army has fought in cold weather and mountains since its earliest days but did not systematically prepare Soldiers for these taxing environments until World War II. During World War II, the Army trained select units for cold weather and mountain warfare and briefly operated a mountain training center in Colorado. But it discontinued these efforts even before the war ended. Given the Soviet Union's climate and terrain, the Cold War that began in the late 1940s again made readiness for such operations a concern. A seasoned former Finnish army officer hinted at the challenge this situation posed for the United States when, after assisting with a small exercise in Alaska in 1948, he observed, "American infantry winter warfare ability is such that unless a miracle happens, the Russian Ski Divisions will cut these infantry divisions to pieces without mercy." Accordingly, the Army launched a broad program of research and development, testing, and training designed to improve its capabilities to conduct operations in arctic and subarctic regions. Two key elements of the program were individual schooling and field exercises, and these continued to be central components of the Army's cold weather and arctic training efforts in the decades that followed.

After World War II, Camp Carson, Colorado, was home to a group of trainers experienced in mountain warfare. In 1951, following the Army's early struggles in Korea, they formed the nucleus of a new Mountain Warfare and Cold Weather Training Command. Along with tasks such as training infantry replacements and instructors for overseas commands, it assisted in preparing troops for winter maneuvers. In 1948, the Army also stood up an arctic school at what would later be named Fort Greely, Alaska. The school was renamed

the Army Cold Weather and Mountain School in 1957 when training ceased in Colorado and it assumed sole responsibility for these instructional activities. At the time, the goal of individual training was to graduate instructors in cold weather and mountain operations. In 1963, however, the Army decided it would benefit more from the training of units for northern and mountain warfare. The service therefore redesignated the school the Northern Warfare Training Center and gave it the mission of training units in the conduct of warfare in norther latitudes, to include operations in the cold, mud, and swampy regions.

The Army also held significant exercises in multiple locations during the first decade of the Cold War. Later, the primary location of substantive cold weather training was Alaska. One of the largest exercises was Exercise POLAR STRIKE in 1965, which involved more than 14,000 Army and Air Force personnel from Alaska, multiple other states, and Canada. The field exercise portion took place in an area larger than the state of Massachusetts that encompassed nearly all variations of terrain found in the north, but few roads or people and no installed communications. A central focus was training individuals and small units in cold weather and airmobile operations.

Figure 4 – History of Arctic Training

THE ARCTIC AS A REGION OF STRATEGIC COMPETITION

The Arctic as a Contested Space - Great Power Competition

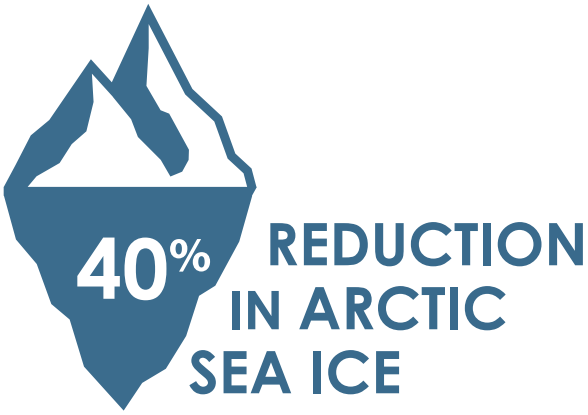
The Arctic has the potential to become a contested space where United States' great power rivals, Russia and China, seek to use military and economic power to gain and maintain access to the region at the expense of US interests. U.S. National Security Strategy highlights the Arctic as a corridor for expanded strategic great power competition between two regions – the Indo-Pacific and Europe. The NDS identifies the erosion of the Joint Force's competitive edge against China and Russia as a central problem the Department must prioritize while maintaining a favorable balance of power between the two theaters. The Army needs to generate forces able to compete effectively by, with, and through allies and partners, to pose dilemmas to adversaries as they seek to gain access to and compete in the region.

Arctic Region

The eight nations of the Arctic Council (Canada, Denmark, Finland, Iceland, Norway, Russia, Sweden, and the U.S.) have sovereign territorial claims in the region. While China does not possess land above the Arctic Circle, it considers itself a "Near-Arctic Nation" and, since 2014, holds observer status at the Arctic Council. While most Arctic nations are U.S. allies, America's great power competitors – Russia and China – have developed Arctic

strategies with geopolitical goals contrary to U.S. interests. Russia seeks to consolidate sovereign claims and control access to the region. China aims to gain access to Arctic resources and sea routes to secure and bolster its military, economic, and scientific rise. There are four drivers of great power competition in the Arctic: (1) military developments, (2) energy resources and minerals, (3) transportation, and (4) food security.

- **Military.** The Arctic is essential to Russia's military power. Russian military developments in the region are by far the most advanced driver of great power competition. China has described the Arctic as a new strategic frontier (alongside space and the seabed) where there is "undetermined sovereignty," suggesting a justification for access and presence in the high North. Sovereign ambiguity allows China to justify access to the region and potentially utilize military means to do so.
- **Energy and Minerals.** According to most estimates, the Arctic is home to 13% of the world's oil, or 90 billion barrels, as well as 30% of the world's natural gas, an estimated 47 trillion cubic meters. Additionally, the Arctic has vast deposits of base metals (aluminum, copper, iron, nickel and tin), precious metals (gold, platinum, and silver), precious stones (diamonds), other minerals (apatite, graphite, and gypsum) as well as uranium. Perhaps most importantly to digital societies around the world, the Arctic is also a source of rare earth metals (dysprosium, neodymium, and praseodymium). These metals allow the miniaturization of components for aircraft engines and advanced weapons as well as televisions, smart phones, laptops, cars, and cancer treatment drugs.



- **Transportation**. As noted, there has been a ~40% reduction in Arctic sea ice index over the last four decades during the warmer months (June-July) and ~10% in the colder months. As sea ice extent recedes to record levels, there is interest in exploring the potential for new trans-Arctic shipping. The NSR, NWP, and the potentially new Trans-polar Sea Route (TSR) across the North Pole

are possible future highways of maritime commerce. All routes cut the travel time between Europe and Asia while avoiding maritime chokepoints including the Strait of Malacca, the Bab al Mandeb, and the Suez Canal.

- **Food Security.** New fishing opportunities are an economic resource to both Arctic and non-Arctic states. Thick, multi-year ice, fishing moratoriums, and regional fisheries organizations have kept commercial fishing in sub-Arctic and Arctic waters to a minimum.

Over the next 30 years, the Arctic will be critical for Russian economic survival, while for China the Arctic will be a necessary source for energy and manufacturing, transportation, and food security diversification.

Russia – Taking Actions to Assert Dominance

As the country with the largest amount of land above the Arctic Circle, Russia's first priority is defending its historic right to rule over the Far North, securing its territorial interests against those of NATO-aligned states.

- Moscow submitted a claim in 2001, revised in 2015, to extend its continental shelf northward from the boundaries delineated in the United Nations Convention Law of the Sea (UNCLOS). Russia's claim now covers 463,000 square miles of sea shelf in the Arctic.
- Beginning in 2010, Russia invested over $1 billion to refurbish 13 airfields, enhance search and rescue capabilities, and upgrade radar stations to improve awareness in the air and maritime domains, including Sopka-2 radar systems on Wrangel Island (300 miles from Alaska) and Cape Schmidt. These systems create a "protective dome" across Russia's vast Arctic coastline and improve its overall operational ability to detect and track vessels and aircraft. These systems give Russia almost complete coverage of its northern coastline and adjacent waters.
- Moscow announced it will increase the number of S-400 air and missile defense units deployed across its Arctic territory, which tracks with its deployment of more sophisticated equipment to defend its air and maritime domains. Kotelny Island and Novaya Zemlya, for example, are equipped with Bastion-P coastal defense and Pantsir-S1 air defense missile systems, which create a complex, layered coastal defense arrangement securing territory deeper into the central Arctic.
- Russia's increased power projection

capabilities in the Barents Sea highlight its ability to deny aerial, maritime, or land access to NATO or U.S. forces.

Russia's efforts to reconstitute its military posture in the Arctic are primarily for territorial defense purposes and protection of Russia's second-strike capabilities. However, growing offensive capabilities – consisting of hypersonic cruise missiles and precision-strike munitions – designed to be un-detectable to the U.S., constitute an effective offensive threat. Russia's modernized subsurface and surface naval presence, supported by unmanned underwater vehicles (UUV) and combined with its electronic warfare capabilities, will have a strategic effect on U.S. homeland defense.

Russia's continued development of energy resources in the Arctic is crucial to its future economic survival and its status as a greater power. The Arctic is an enormous source of energy resources and revenue for Russia, accounting for two-thirds of Russian oil and gas.

The Arctic accounts for nearly 20% of Russia's GDP, 22% of its exports, and more than 10% of all investment in Russia. Approximately

TRILLION CUBIC METERS OF GAS

75% of Russia's oil and 95% of its natural gas reserves are located in the North. Russia has developed 10 major oil fields, with 2.3-billion metric tons of proven reserves, and 22 gas fields with 35.7-trillion cubic meters of gas.

These projects, however, are heavily reliant on outside capital, particularly from China. This is another element giving Beijing a stake in the region.

China – Attempting to Normalize Presence

Beijing's interest in the Far North, accelerated over the last decade, is widely viewed as a preemptive bid for control of economic resources in the region. China began to normalize its presence in the Arctic almost two decades ago under the auspices of scientific exploration. As a signatory to the 1920 Spitsbergen Treaty (Svalbard Treaty), China opened its first scientific research station in

2004, the Arctic Yellow River Station on the island of Svalbard, Norway. Since then, China has sent several scientific expeditions, some with enduring presence, to the region.

China, through their Arctic policy, desires for the Arctic states to acknowledge China's rights under international law and, therefore, its equality to the Arctic states regarding its continued access to the high seas of the central Arctic. In order to lend credence to Beijing's questionable claim to near-Arctic status, China launched the Polar Silk Road Initiative in 2018. The initiative builds on the soft-power tactics of the Belt and Road Initiative by investing in infrastructure development in Far North communities.

China's efforts in the Arctic will likely seek to preserve China's unfettered access to the Northern Sea Route and the international waters of the central Arctic Ocean. China is making a case to preserve its sovereign rights to the region by means of discovery, continual presence, and influence. China has also expressed interest in building transcontinental and cross-border data cables to facilitate high-speed data transfer between Europe and Asia.

Russian and Chinese Confluence

U.S. and European sanctions on Russia for the 2014 annexation of Crimea caused a reorientation of Russia's energy markets toward Asia; Moscow has turned to Beijing as a source of long-term financing and technology to aid the energy and infrastructure development in the High North. This has emboldened China's pursuit of its Arctic economic ambitions under the auspices of its Polar Silk Road Fund at the exact moment

Polar Silk Road

Existing route via Strait of Malacca

The Malacca/Suez and the Polar Silk Road shipping routes

when Beijing's global economic ambitions under the banner of its Belt Road Initiative are gaining momentum. A confluence of economic and political interests led to accelerated Russian and Chinese cooperation in the Arctic, as highlighted by the Yamal Liquid Natural Gas Project, a $27 billion joint venture between the Chinese National Petroleum Corporation and the Russian energy firm Novatek.

Russian Arctic energy is also only one of many energy sources necessary to satiate China's long-term energy needs and desire for supply-side diversification. Increased production by Russia, increased requirements from China, and a dearth of other suppliers could position Moscow to provide for ~20% of China's total energy consumption by 2050, emanating from both Arctic liquid natural gas (LNG) and energy piped across Russia.

China's increased physical presence in the Arctic, combined with Russia's growing economic and military ambitions in the region, highlight how both nations have long-term strategic designs for the Arctic. It is unclear, however, whether they can reconcile their Arctic ambitions to reshape the region to suit their individual strategic interests.

THE ARMY IN THE ARCTIC

A Strategic and Operational Framework

For the Army, the Arctic poses two challenges – as a place and an environment. It serves as a place where the Army, as part of the joint force, confronts our adversaries around the globe in competition. This requires us to adapt our posture to employ calibrated forces able to conduct multi-domain operations. As an environment, it poses additional challenge from extreme temperature and terrain.

The Army will regain cold-weather and high-altitude dominance by adapting how the Army generates, postures, trains, and equips our forces to execute extended, multi-domain operations in extreme conditions. Restoring dominance also mandates an inherently multi-component approach with significant contributions for the Army Reserve and National Guard. The Army will implement integrated solutions that emphasis readiness for operations in extreme cold and mountainous environments and bolsters the resiliency of our people and our installations. The Army is committed to a Total

Army approach to meeting Joint warfighter requirements in Arctic conditions around the globe. This restored dominance provides options to the Joint Force Commander to employ decisive land capabilities in support of operations.

This strategy lays out a strategic and operational approach for Army forces operating in the Arctic as part of the joint force and in conjunction with allies and partners. This is due to the efforts of great power competitors to build their capabilities in a region that is increasingly open for exploitation. However, reacting to challenges is not the only reason for reexamining how Army forces operate in the Arctic. The adoption of multi-domain operations provides an opportunity the Army needs to exploit.[2]

The tenets of multi-domain operations are the start point for examining how Army forces might operate in the Arctic in the future. Multi-domain formations, particularly those with extended ranges such as the Multi-Domain Task Force (MDTF), have clear potential in the Arctic – an area of operations characterized by vast distances and where air and naval avenues of approach are critical. MDTFs have significant potential to create anti-access/area denial challenges for competitors. For that potential to be realized, however, multi-domain formations must be able to converge their effects with the rest of the joint force and allies and partners. This is particularly difficult in the Arctic for both organizational and technical reasons. The Arctic and sub-arctic incorporates portions of three combatant command areas of responsibility and network integration is difficult in extreme cold environments, high latitudes, and areas with little commercial infrastructure. Similarly, the exceptional logistical challenges posed by a remote, poorly developed, and extreme environment make calibrated force posture essential. The Army's decision to place an MDTF in Alaska is the first step in setting the conditions for success. In Alaska, it will have the ability to take advantage of world-class training facilities and the presence of significant U.S. Air Force and U.S. Navy forces to experiment and train multi-domain operations.

[2] (U) U.S. Army Training and Doctrine Command (TRADOC) Pamphlet 525-3-1, The U.S. Army in Multi-Domain Operations 2028 (Fort Eustis, VA: TRADOC, 6 December 2018.

The Army uses that analysis combined with an understanding of the operational environment, policy guidance including the Department of Defense Arctic Strategy, and demands from global and regional campaign and contingency plans, to articulate the strategic and operational approach for Army forces operating in the region:

- The Army will be able to project power from, within, and into the Arctic to conduct and sustain extended operations in competition, crisis, and conflict from a position of advantage.
- The Army will employ calibrated force posture and multi-domain formations to defend the homeland and pose dilemmas for great power competitors.
- The Army will engage with and strengthen allies and partners to maintain regional stability.

There is also an additional institutional requirement:

- The Army will generate Arctic-capable forces ready to compete and win in extended operations in extreme cold weather and high-altitude environments.

The Army will be able to project power from, within, and into the Arctic to conduct and sustain extended operations in competition, crisis, and conflict from a position of advantage.

In most regions, there is a natural strategic flow: the region is either a power projection platform or one that receives forces from elsewhere. The Arctic is potentially both. It falls within the areas of responsibility of three different geographic combatant commands and includes the territory of the United States, allies, partners, and Russia. Depending on the specific threat, the Arctic can be either a front

Soldiers participate in a skijoring exercise at Joint Base Elmendorf-Richardson, Alaska, Jan. 27, 2021. (U.S. Air Force photo by Alejandro Pena)

Soldiers with the 5th Battalion, 3rd Field Artillery Regiment, 17th Field Artillery Brigade showcase their combat readiness with an Expeditionary Strike Package at Eareckson Air Station, Shemya Island, Alaska on September 13th, in support of Defender Pacific 2020. (U.S. Army Photo by Spc. Luke Steward)

line of defense, power projection platform, or a rear area. The nature of the region as a geographic pivot point puts a premium on flexibility. Army forces in the Arctic region must be able to array in a number of different ways depending on the contingency. Additionally, operations must be sustainable in the harsh Arctic climate.

In terms of Arctic strategic power projection, there are three cases to be considered: deployment from Alaska, deployment to Alaska, and deployment within Alaska. The first case is the deployment of forces from Alaska for general operations and activities. This has happened numerous times in support of operations in Iraq and Afghanistan and also occurs for other operations and activities, e.g.

Pacific Pathways etc. The second case is the potential for tactical movement of forces within Alaska. MDTF experimentation in Alaska, that unit might have to deploy to one of several different locations in the state to achieve its given mission. The third instance is the deployment of units from Alaska to another area within the Arctic or another location that specifically requires an Arctic-capable unit. Uniquely, Alaska's geographic proximity to strategic locations in the Indo-Pacific and Europe drastically reduces transit times from the Homeland, in and through the Arctic, in crisis, competition, and conflict. However, no recent precedent for the last two cases of power projection exist and will require effort and investment to develop.

The Army may need to project forces into the Arctic region from elsewhere. Army planning efforts will incorporate Arctic-capable formations located outside of the Arctic to identify appropriate mitigation measures in training and rapid specialized equipping. Mitigation measures might also be necessary for Arctic-capable units deploying to locations they have not previously trained. As noted earlier, there is significant variation among areas within the Arctic. A unit accustomed and optimized for Alaska operations might have some difficulties if suddenly deployed to the European Arctic.

Finally, regardless of where units deploy from, to achieve operational and strategic objectives, they must have the capability for extended operations. This includes sustained and robust logistics and lines of communication. This is as true for competition as in armed conflict. Rival powers would be certain to exploit any lack of endurance in Army forces.

The Army will employ calibrated force posture and multi-domain formations to defend the homeland and pose dilemmas for great power competitors

A multi-domain capable Army creates new options for joint force commanders to achieve their missions. The Arctic, however, poses some particular challenges. The significant distances, lack of commercial and military infrastructure, and harsh climate have historically made Arctic campaigns contests of relatively small and dispersed forces operating at the limits of operational feasibility. This small margin of error has generally had two implications. First, the quality of individuals

and units has often been decisive. The side best able to overcome challenges has tended to prevail. For this reason, the **mindset or ethos** of Arctic units has been an even more important element than any specialized equipment. Second, the environment favors the defense more heavily than in other climates. It has been difficult for attacking forces to achieve numerical superiority without pushing sustainment to its limits. The loss of one key logistics node, the failure of one convoy, the destruction of one critical bridge, or the stubborn resistance of one strongpoint along a line of communications has brought many Arctic operations to an unsuccessful close.

Paratroopers, assigned to the 4th Infantry Brigade Combat Team, 25th Infantry Division, approach a C-130J Super Hercules, assigned to the 36th Airlift Squadron, Yokota Air Base, Japan, during exercise Arctic Warrior 21 at Donnelly Training Area, AK, Feb. 8, 2021. AW21 helped Soldiers and Airmen develop and refine the tactics, techniques, and procedures necessary to successfully operate in remote and extreme Arctic winter conditions and overcome both environmental and military challenges. (U.S. Air Force photo by Staff Sgt. Gabrielle Spalding)

Due to these unique factors, multi-domain capable units are ideal for Arctic operations. The extended range of new formations is well-suited to a region featuring dispersed operations. The ability to converge effects with joint and multinational partners makes the most of what capacity is available. Finally, though there are a number of peculiarities and challenges to the Arctic region in terms of both electromagnetic and space-based capabilities, the environment still poses fewer difficulties for these virtual capabilities than those occurring within the

traditional physical domains. Arctic-capable multi-domain formations can pose significant dilemmas for rival powers.

The Army will engage with and strengthen allies and partners to maintain regional stability

Historically, the shared challenges of operating in the Arctic has fostered a norm of collaboration and cooperation.[3] However, the previous status quo in the region, frozen for many years, is thawing. The geopolitical dynamic in the Arctic is particularly susceptible to rapid change due to several key factors such as the absence of large settled populations, robust governmental presence, and significant economic and military infrastructure, all of which make it easier there to create "facts on the ground" than elsewhere. This makes the region particularly attractive for great power competition because it has the potential for more significant gains at less cost than elsewhere. This condition of a region in flux makes it critical for the United States to work with allies and partners to maintain regional stability. The Army contributes to this competition through military-to-military engagement, training and exercises, interoperability, investments in capability and capacity to assure, and any other measure that adds value and builds relationships. The Army will expand engagement with Arctic states to ensure the achievement of mutually supporting objectives to maintain stability in

U.S. Army Alaska Soldiers from Bravo Company, 3-21 Infantry Regiment, 1st Stryker Brigade scanning the Arctic tundra outside Deadhorse, Alaska, during Operation Arctic Pegasus, Nov. 4, 2015. Arctic Pegasus is USARAK's annual joint exercise designed to test rapid-deployment and readiness in the Arctic. The exercise marks the first time Strykers have deployed above the Arctic Circle. 1st Stryker Brigade Combat Team is the Army's northernmost unit and has the unique capability to deploy and operate in extreme cold regions. (Photo by Capt. Richard Packer, U.S. Army Alaska Public Affairs)

[3] Department of State, Report to Congress on Diplomatic Strategy for Continued U.S. Leadership in the Arctic, 2019, p4

the region. In addition to nation-state partners, the indigenous population of Alaska provides the Army with unique perspectives, and engagement with these local communities is critical in promoting regional stability.

Col. Christopher Ruga, U.S. Army Garrison Alaska, Fort Wainwright commander, and Command Sgt. Maj. Robert Preusser, USAG Alaska command sergeant major, met with representatives of neighboring Alaska Native tribal governments Friday, Jan. 10, 2020. These biannual meetings support the government-to-government relationships between the tribes and the Army, and ensure the trust responsibility is being met by the federal government to Alaska's indigenous people. Garrison subject matter experts and guests from Alaskan command presented information on numerous topics. Open discussion among tribes and the command group provided time to voice concerns and discuss issues of concern to both parties. Staff and leadership representatives from the consulting tribal governments included Bertha Rickman (Healy Lake Village), Donald Charlie (Nenana Native Association), Darrell Kaase (Northway Village), and Chris Denny (Native Village of Tanacross). (Photo by Daniel Nelson, U.S. Army Garrison Alaska, Fort Wainwright Public Affairs)

The Army will generate Arctic-capable forces ready to win in extended operations in extreme cold weather, snow, and mountainous environments

Wherever they are stationed, the Army requires Arctic-capable units able to effectively conduct sustained operations in extreme cold weather and mountainous environments. These units require proper equipment, individual and unit proficiency, and appropriate doctrine. Additionally, the Army must have the capability to deploy and sustain these forces in operations.

The most challenging aspect of making units Arctic-capable will be ensuring sufficient individual and collective training to achieve proficiency. Soldiers must possess special skills, physical and mental endurance, and undergo extensive training to build expertise operating in extreme conditions. Units must have undergone rigorous training under realistic conditions with equipment that functions in the extreme cold. Honing these skills requires training areas with sufficient capacity and size and the substantial training support capabilities to ensure units reach the desired training level.

These resources are vital in developing Arctic-capable Soldiers and formations. Depending on the type and quantity of training required to make a unit Arctic-capable and how many units are placed in that category, existing infrastructure might be sufficient. But if it is not, it might be necessary to upgrade or create new training areas or use multi-national exercises and facilities.

Campaign Design for the Army in the Arctic

The DOD Arctic Strategy calls for the Arctic to remain a secure and stable region where our national security interests are safeguarded in the articulation of three objectives of defending the homeland, compete when necessary to maintain a favorable balance of power, and ensure common domains remain free and open. The Army's strategic approach drives a campaign design that supports the DOD in building Arctic awareness, enhancing Arctic operations, and strengthening the rules based order in the region. This campaign design articulates how the Army will adapt to meet the needs of the Joint Force to regain dominance in the Arctic and mountainous environments.

Army End State: The US Army is able to rapidly generate and project Multi-Domain forces globally that are specifically trained, equipped, and sustained to fight, win and survive in extreme cold weather and rugged mountainous conditions over extended periods.

The first step towards this end state will be investing in a Multi-Domain Task Force enabled Division with specially trained and equipped combat brigades to recapture our cold-weather dominance. To achieve these ends, the Army will utilize five lines of effort:

- **Improve Arctic Capability**
  - Build basic Arctic capability across the force.
  - Address persistent problems from Arctic-stationed organizations.
  - Anticipate and mitigate impact of changing environment on infrastructure and operations.
- **Compete in the Arctic and Globally**
  - Achieve a strengthened network of allies and partners to compete in the Arctic.
  - Identify and partner with local and foreign indigenous forces.

- **Defend the Far North in Crisis and Conflict**
  - Deter or defeat land threats to the far north.
- **Build Arctic Multi-domain Operations**
  - Experiment and advance Combined Joint All-Domain Command and Control in support of multi-domain operations.
  - Project multi-domain effects across the region.
- **Project Power Across the Arctic**
  - Project power to dynamically employ Army forces in crisis and conflict.

These lines of effort lay out a plan for improving the Army's Arctic and environmental capabilities, through communication of first-tier objectives supported by areas for future analysis. These tasks and their supporting analyses, developed over time, will allow leaders to balance risk between current and future readiness to operate and compete in the Arctic.

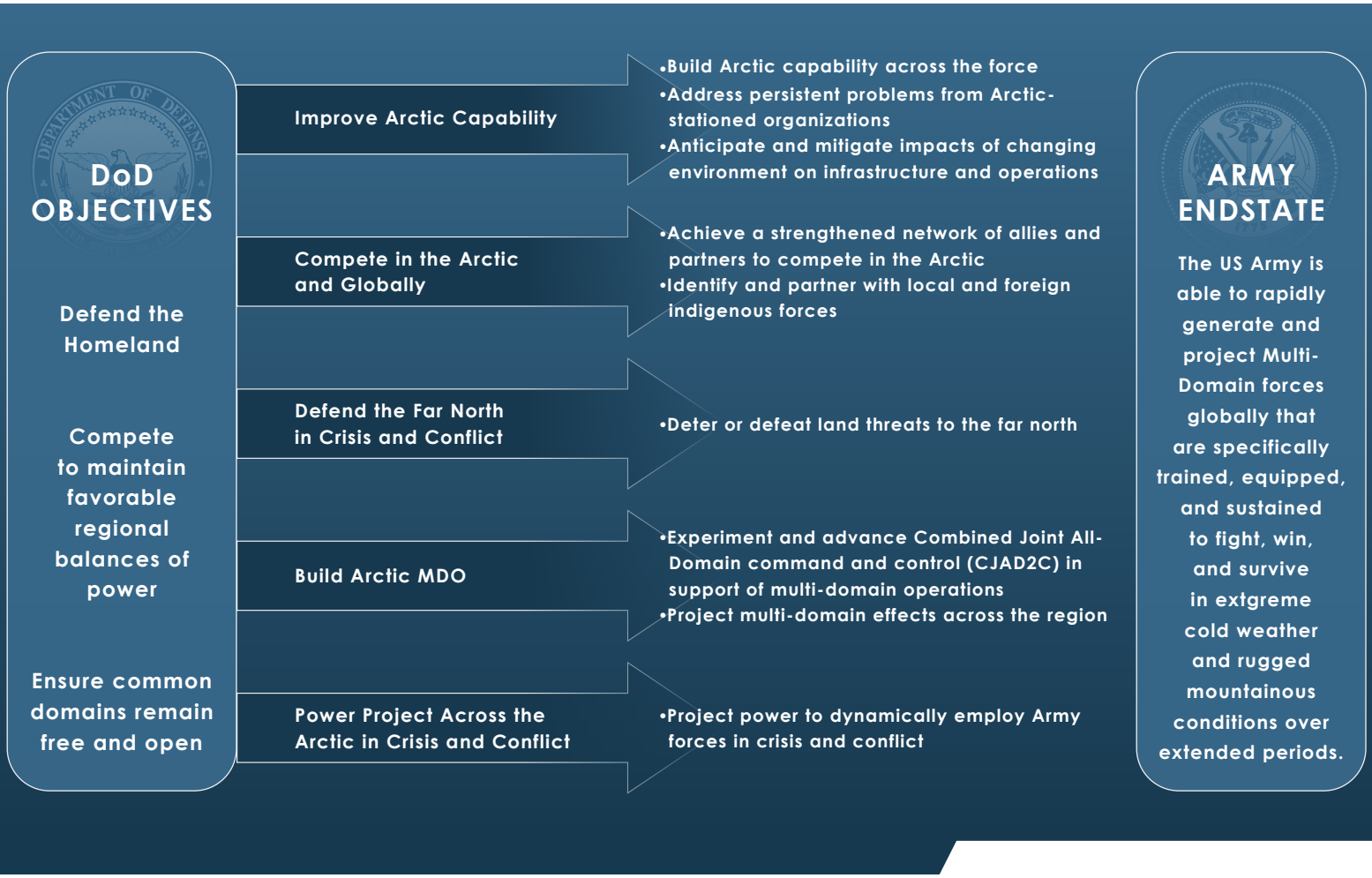


Figure 5 – Lines of Effort

THE ARCTIC PATH FOR THE ARMY

Improve Arctic Capability

The Army needs to be able to operate and compete in the Arctic and other extreme cold weather and mountainous environments. Improving this capability requires focusing on building a balanced Arctic capability across the force while addressing the persistent challenges in our Arctic-stationed organizations as we anticipate the changing environment's impact to sustain the ability in the future. This is the most varied and extensive portion of this strategy. Collectively, these elements support the generation of Arctic-capable units.

The Army will improve the materiel readiness of Arctic-capable units to conduct extended operations in the region

Ensure procured equipment for Arctic-capable formations performs properly at temperatures down to -65° F. The Army must provide equipment for Arctic-capable formations able to operate at extreme temperatures, down to -65° F for multiple days at a time. Through leveraging testing facilities we will assess protection requirements in the snow, extreme cold, and sub-arctic environments to inform our development and procurement of future generations of cold weather clothing systems and essential medical capabilities.

Ensure Arctic-capable units have full sets of equipment necessary to be operationally effective. For Arctic operations in all seasons, units must have a full set of equipment for all operations. The Army will identify equipping requirements of Arctic-capable formations and ensure the installation central issuance facility has adequate inventory available to support formations to the appropriate echelon.

Sgt. William Nagy with the 725th Brigade Support Battalion (Airborne), 4th Infantry Brigade Combat Team (Airborne), 25th Infantry Division demonstrates driving techniques in a small unit support vehicle (SUSV) during a driver's training course on Joint Base Elmendorf-Richardson, Alaska, Feb. 4, 2015. (U.S. Army photo by Sgt. Brian Ragin/Released)

Explore opportunities and capabilities which improve mobility in an Arctic environment, to include the possibility of improving current capabilities like Cold-weather All-Terrain Vehicle. The Army will continue its plan to replace the existing fleet of Small Unit Support Vehicles to mitigate maneuver challenges of the current wheeled fleet. Additionally, the Army will investigate what further changes to motorized transportation to provide four-season mobility.

The Army will adopt solutions across the Total Force to improve readiness to operate in the Arctic

Develop concepts, requirements, and doctrine for the employment of Army forces in geographically dispersed and extended duration Joint All-Domain Operations in extreme cold weather and mountainous environments. The Army will develop concepts of employment for Arctic-capable units, to include sustainment, from individual to the highest echelon of employment and codify those across into the institution. Comprehensively, this will provide the Army with an accurate doctrinal standard of what it means to be Arctic-capable.

Implement talent management efforts to make best use of Soldiers at all echelons trained in Arctic operations. Operations in the Arctic are atypical from those experienced in more temperate climates our Soldiers are accustomed to. Currently, graduates of the AMWS receive the Special Qualification Identifier for Military Mountaineering, which identifies them for future assignments for mountain units and duty locations. A similar identifier for Arctic training, denoting the skills of graduates of Arctic and ECW training programs, would allow for unit commanders and human resource managers to select Soldiers best suited for the unique requirements of Arctic-capable organizations in the Army Talent Management Process. This begins with the preferential recruitment and assignment of Soldiers with cold weather skills, knowledge, and experience. The Army will exploit the capabilities of Soldiers and leaders with Arctic experience through knowledge, skills, and attributes in the Integrated Personnel and Pay System – Army. It is important to note that procedures developed to track Arctic expertise could also be applied to Soldiers with expertise in other environments (e.g. jungle) as well. Marking this information would allow the Army

1st Sgt. Jonathan M. Emmett leads U.S. Army Alaska Aviation Task Force Soldiers assigned to Headquarters Company, 1-52 Aviation Regiment, at Fort Wainwright, Alaska, as they conduct Cold Weather Indoctrination Course II (CWIC) training November 19, 2015. CWIC training is required of all Soldiers assigned to U.S. Army Alaska annually to ensure America's Arctic Warriors have the knowledge and experience to survive, train, operate, fight and win in extreme cold weather and high altitude environments. (Photo by Spc. Liliana S. Magers, U.S. Army Alaska Public Affairs.)

to rapidly build environmental expertise in a unit designed for deployment, providing the Army the ability to respond to crisis without maintaining an array of environmental-specialized units. Furthermore, the Army will consider selecting persons with these Arctic identified skills for command positions or significant responsibilities for Arctic-capable formations to maximize their knowledge in the protection of forces undertaking operations in the region.

The Army will improve collective and individual training of Arctic-capable formations

Alter training management mechanisms and methods to align Arctic-capable unit readiness with new force generation model. Units with requirements to operate in the Arctic need to be able to focus on their Arctic training tasks to be proficient. To develop a true all-weather/environment force capable of rapid deployment may require a modification in the

Military Mountaineering Course students move from one training area to another at the Northern Warfare Training Center's Black Rapids Site during training. NWTC cadre guided students through both the basic and advanced courses. (Army photo/John Pennell)

role of the Combined Training Centers and Special Operations Forces Training Center in serving as culminating training events for Arctic based formations. An annual training rhythm that allows units to complete a winter training cycle would allow for building combat credible formations that train as they would fight in harsh terrain. The Army will examine feasibility of adding higher level command and control and combined arms maneuver to enhance the training of maneuver units in the region, with potential to expand to echelons above brigade. At the unit level, Arctic training will be embedded in schedules to allow for live-virtual-constructive-distributed training at the appropriate level for Arctic-capable formations.

Maintain training infrastructure with sufficient capacity to support the training and certification of personnel in Arctic-capable units. Soldiers in Arctic-capable units must understand the effects of cold and snow on personnel, equipment, operations, and risk management. Such training is currently provided through USARAK's Cold Weather Indoctrination Course, which may be expanded to meet demand. Additionally, the Army will work with partner nations experienced in ECW

and mountainous terrain to gain additional training. The Army will also consider the requirements necessary to improve facility support to training above the brigade level. The Army will work with the other services to improve the synchronization of training infrastructure support to facilitate live, virtual, and constructive training. The Army will also improve training of Arctic-capable formations through the incorporation of doctrinal tactics, techniques, procedures for cold weather and mountain operations in assessing readiness of mission essential tasks of Arctic based or employed formations to drive the collective and individual tasks toward those necessary to survive and operate in the uniquely harsh climate and terrain.

Maintain training infrastructure with sufficient capacity to support collective training of Arctic-capable units up through the echelon of employment. The Army will examine programmed training to determine suitability in developing a true Arctic capability, and consider adapting current programs or development of new training program events, in light of resource challenges, that aim to develop Arctic-capable formations. The Army will analyze how to enhance Alaska training areas and ranges to support execution of

Range safety patrols the drop zone at Donnelley Training Area, AK, on his snowmobile as paratroopers with 3rd Battalion, 509th Parachute Infantry regiment, 4th Infantry Brigade Combat Team (Airborne), 25th Infantry Division, parachute in at the beginning of exercise Arctic Warrior 21, Feb., 08, 2021. Paratroopers will spend approximately ten days in the Alaskan cold conducting a near-peer combat scenarios. (photo by Staff Sgt. Alex Skripnichuk)

Military Mountaineering Course students move from one training area to another at the Northern Warfare Training Center's Black Rapids Site during training. NWTC cadre guided students through both the basic and advanced courses. (Army photo/John Pennell)

extended extreme cold weather training exercises at the company through brigade level. The Army will also seek ways to expand extreme cold weather training capability to include engineering to improve mobility/counter-mobility and survivability in Arctic conditions.

Plan and conduct exercises at echelon to ensure readiness of Arctic-capable formations. Arctic-capable units need to regularly conduct extended training at appropriate echelon during the times of the year characterized by extreme cold weather in order to gain and retain proficiency. The Army will leverage the ARCTIC WARRIOR series, along with other events, so forces can experience and build resilience during the harsh Arctic temperatures. This will be an opportunity to assess and improve operational functionality of equipment, develop tactics, techniques, and procedures to improve future doctrine and inform the Army's modernization efforts.

Soldiers and units conduct individual and collective training with equipment that is able to function in the Arctic. Arctic competency is built from the Soldier to the unit level from

experience executing in the terrain using unique operational techniques. To do this, Soldiers and units require equipment that is able to operate and dominate in the extreme temperatures of the environment. The Army will ensure all equipment on hand in Arctic-capable units is winterized and suitable to operate as required to facilitate realistic training.

Consider the knowledge of indigenous populations' to improve Arctic expertise. Indigenous populations, the myriad autonomous societies, have thrived in Alaska and Arctic territory for millenia. They know the environment, wildlife, and terrain better than anyone. Learning this information from them will be valuable in understanding how to not only survive, but to train and thrive in the Arctic and in other extreme cold weather, and mountainous environments. The Army will consider this knowledge and expertise to improve individual and unit training for Arctic-capable formations.

The Army will improve its posture and capabilities in the Arctic.

Examine maneuver, sustainment, fires, intelligence, protection, and command and control force structure for globally integrated operations. As the Army moves toward multi-domain capable formations, we need to understand the nature of maneuver and sustainment in harsh conditions with limited accessibility posed by the Arctic, as well as other mountainous regions. Terrain and environmental conditions in the Arctic and sub-Arctic impacts maneuver in both the cold and warmer months. Frozen tundra offers relief from mountainous terrain, which is synonymous with ECW environments unique constraints on equipment functionality both electrical and mechanical, which during the warmer months constricts maneuver with wheeled vehicles. This challenge is only amplified by extensive bog or wetland areas in the warmer months.

Determine command and unit relationships in the Arctic region. The current unit distribution and alignment for Arctic operations may require reconfiguration. The Army will evaluate, and adjust as necessary, tactical and operational headquarters and unit relationships in the Arctic to best support Joint Force operations.

The Army will account for the unique conditions of Arctic operations as part of modernization.

Develop concepts that drive requirements and capability development to increase the firepower, speed, and survivability of land forces to maneuver in the region. The concepts the Army develops and supports with the joint force could integrate Arctic environmental challenges to allow the development of capabilities that are able to operate in the region, both physically and electronically, without significant alteration or development of alternative tactics, techniques, and procedures.

Advocate for requirements to support mobility in challenging Arctic environment in modernization efforts. The Army will advocate for the inclusion of Arctic requirements as part of joint capability development to support mobility platforms' maneuverability in winter and summer months and the force's ability to sustain equipment over an extended duration in an Arctic environment. These updates must include future and enduring Army Aviation platforms as a critical part of maneuver in an Arctic environment.

Maj. Gen. David C. Hill, deputy Chief of Engineers, toured the Cold Regions Research and Engineering Laboratory's cold boxes, a temperature-controlled room used for testing and monitoring the effects of cold on different materials and devices. (U.S. Army photo by David Marquis)

The Army will work with other services and DoD to ensure necessary investments to enable joint all-domain operations in the Arctic.

Increase Arctic Awareness. The Army will continue to advocate for the inclusion of Arctic issues in its engagements with CCMDs, Joint Staff, OSD and the other Services.

Increase developmental testing for snow, extreme cold weather, and sub-arctic environment to provide information on system performance. The Army will leverage joint programs, as appropriate, that can provide capabilities to enhance the Army's ability to operate in the region. Additionally, the Army will leverage the Cold Region Test Center to test modernization priorities, aligning testing

with exercises to improve the quality and applicability of feedback. This, combined with assessment through Soldier touchpoints integrated into the winter cycle of annual training, ensures that equipment fielded to Arctic-capable formations can meet the harsh Arctic region's requirements as we modernize.

The Army will examine new power generation systems to leverage alternative technologies. Power generation in the Arctic is a significant challenge due to vast distances, extreme temperatures, and inadequate sustainment infrastructure. The Army, in working with the other Services and Department, will examine ways to make improvements through use of alternative technologies that can improve operational effectiveness while reducing sustainment demands.

The Army will improve the quality of life for our Soldiers, Civilians, and Families that live and work in installations and facilities in the Arctic region.

Modify processes for identification and assignment of Soldiers in Alaska-based units. The nature of the Arctic environment is far different than other Army installations. Preparation for movement of Soldiers and families to Alaska requires additional lead planning time to ensure they can settle into, acclimatize, and understand the demands and differences of living and working in Alaska. The additional time would allow for building awareness and preparation for families to ease transition while improving the reception and sponsorship for Alaska-based units. Additionally, the Army will improve policies to increase the retention of Arctic expertise in critical roles, such as leaders and instructors at the Northern Warfare Training Center.

IMPROVE MEDICAL & UNIT SUPPORT FOR SOLDIERS, CIVILIANS & FAMILIES

Improve medical and unit support to mitigate health (physical and mental) challenges of Arctic duty for Soldiers, Civilians, and Families. Military and civilian health care providers, allied medical, and unit commanders and leaders need to develop an evidence-based prevention program to protect military and civilian personnel from adverse health effects of cold stress. Leaders must understand the physiologic responses and adaptations to cold.

Plans must be prepared to be implemented in the management of cold stressors. The proper application of personal protective equipment and principles will require all personnel to have knowledge for survivability purposes. Understanding the diagnosis and treatment of nonfreezing and freezing cold injuries and other medical conditions associated with extreme cold will ensure that they can develop a knowledge base amongst each other in order to recognize signs, symptoms and possible treatment at all Roles of care. Lastly, provide background information for reporting injuries and data collection of epidemiological information to note trends and to identify individual, work, and environmental factors that are not adequately controlled by preventive measures and policies.

The Army will monitor the impacts of climate change on posture and infrastructure, and operational requirements.

Assess impact of climate change on physical infrastructure. Thawing permafrost can impact the integrity of infrastructure, to include Soldier and Civilian housing and utilization of training areas. Examination and monitoring of the Arctic operational environment supports domain awareness while also supporting performance enhancements to sensors. Through detection of permafrost conditions, the Army can better understand its impact on infrastructure.

Assess ability to defend against pathogens as they reanimate due to melting of permafrost. Thawing permafrost has the potential to release previously frozen bacteria and viruses to which Soldiers have not been previously exposed. The thawing terrain can also impact the wildlife population which may introduce new disease vectors[4]. The ability to protect against pathogens in the Arctic and other environments is key to protecting our people.

[4] National Academies of Sciences, Engineering, and Medicine. 2020. Understanding and Responding to Global Health and Security Risks from Microbial Threats in the Arctic: Proceedings of a Workshop. Washington, DC: The National Academies Press. https://doi.org/10.17226/25887.

Compete in the Arctic and Globally

The NDS and the DOD Arctic Strategy both highlight the importance of alliances and partnerships. The Arctic is a shared region comprised of both allies and partners to

the United States at various levels. The shared nature requires the Army to achieve a strengthened network to compete in the region to ensure it remains open for legitimate access, allowing for the free flow of forces through the Bering Strait and other Arctic waterways while maintaining a favorable balance of power. Strengthening these networks allows the Army to "set the theater and set the globe to compete with, deter, and if necessary, defeat U.S. adversaries."[5] This line of effort focuses on continued engagement, enhanced training, and lessons sharing with these forces to reinforce our competitive advantage in the Arctic.

[5] Department of the Army, Army Strategy for Allies and Partners, 2020, p2

The Army will strengthen relationships with allies and partners to improve our ability to compete.

Collaborate with key allies and partners in the Arctic, and through bilateral and multilateral forums, to increase interoperability and extreme cold weather, mountain, and high-altitude operations expertise. Our engagements with Arctic nations or nations with ECW and mountainous terrain capability will improve our ability to operate successfully in the Arctic environment. The Army will expand security cooperation activities with partners through engagement and training by encouraging their participation in courses at the Northern Warfare Training Center (USNWTC), the Army Mountain Warfare School (AMWS), and other training facilities. In so doing, the USNWTC will become a CW training destination of choice where allies and partners will gain and share expertise in ECW and mountainous terrain. Additionally, we should advocate for greater access and participation of U.S. forces in the Arctic-focused schools of our allies and partners to build knowledge, skills, and abilities of our conventional and special operations forces in CW operations and survival.

Army Chief of Staff Gen. James C. McConville, top left, engages with other military leaders during an Indo-Pacific Landpower Conference, May 20, 2020. The virtual conference, held by U.S. Army Pacific, allowed U.S. and foreign military officials to discuss the way forward in a post-COVID-19 environment. (Photo by Screenshot image)

Identify opportunities for key leader engagements with other Arctic partners to synchronize messaging and demonstrate support to maintaining the Arctic as a region free from conflict. Each year, Army senior leaders engage with their counterparts to build relationships and share information. Additionally, the Army conducts engagements and forums to build army-to-army relationships and familiarize one another with tactics and doctrine. The Army will further explore the unique aspects of Arctic and extreme cold weather environments with partner armies in their execution of training and education of their forces to operate in extreme cold and mountainous environments and share lessons learned using these opportunities. The Army will also continue to recognize the importance of working with indigenous tribes and native communities of Alaska to recognize their equities as part of the Army's approach to competition in the region.

Incorporate future Arctic forces demand requirements in the Regionally Aligned Readiness and Modernization Model (ReARMM). The development of Arctic-capable forces presses the Army to determine the appropriate modernization levels in unit equipment fielding and training for Arctic-capable units in order to meet future demand. The Army will incorporate these unique aspects throughout implementation of this new unit lifecycle management process.

Plan and conduct extreme cold weather exercises with joint and multinational partners to test and improve interoperability and cold weather expertise. The Army will engage with our partners on shaping and leveraging exercises with our joint and multinational partners to ensure appropriate focus that can build credible formations.

Leverage the State Partnership Program to collaborate and share lessons with Arctic

Col. Scott Mitchell, commander, 196th Infantry Brigade briefs Maj. Gen. J. C. G. Juneau, deputy commanding general royal Canadian Army on the Joint Pacific Multinational Readiness Capability operations during Rotation 16-02 Arctic Anvil. (Photo by Rodney Jackson)

partner nations. The National Guard Arctic Interest Council and the State Partnership program offer opportunity the Army will continue to leverage to collaborate and share lessons with Arctic partner nations. Additionally, enhanced focus on National Guard exercises will allow Army National Guard units and Arctic Nations to train and share best practices.

Defend the Far North in Crisis and Conflict
The NDS highlights defense of the homeland as our number one priority. As the Arctic environment continues to change, the Army will adapt to improve our ability to defend critical infrastructure in the Far North.

The Army will improve ability to defend the homeland.
Examine the required force posture in the Arctic to support Joint Force operations. As the Army moves toward multi-domain capable formations, we need to understand the demands on movement and maneuver, sustainment, fires, intelligence, and command and control for the defense of the homeland and the context of global operations. Units in Alaska must be capable of conducting effective homeland defense operations in all seasons in support of global joint campaigns and operations against all threats to the homeland.

Validate ability to winterize, deploy, and employ key assets to defend the homeland in the Arctic. Defense of the homeland in the far north calls for specific Army assets to deploy to and function in the region. Therefore, sufficient winterization and testing of this capability is essential to establishing and maintaining defense of the homeland in the Arctic. Furthermore, the Army must invest in the infrastructure necessary to deploy and employ these assets in the region.

Expand arctic domain awareness through potential creation of "Alaska Scouts." In 2015 Alaska governor, Mr. Bill Walker, proposed the creation of a force of "Alaska Scouts." The Army will consider the situational awareness advantage provided by the indigenous populations in the region. The creation of an auxiliary force comprised of volunteers from the indigenous population in Alaska could serve as a source of environmental expertise and situational awareness in support of the joint force.

Improve operational capabilities in Arctic environment

Improve the ability to establish and maintain mobile command posts in the region. In coordination with the other Services, the Army will examine ways to maintain or improve its defense capabilities in the Arctic through improved communications capabilities for operations above 65 degrees north to support command and control of operations in the region. Airborne forces stationed in Alaska require en route mission command/early entry mission command capabilities to effectively support world-wide airborne forcible entry operations. Improvements in equipment would enhance ability to execute mission command functions, maintain situational awareness, and optimally conduct operations.

Identify opportunities for unmanned technologies to enhance Arctic-capable units. The harsh environment and extended distances and other mountainous environments in the Arctic limit manned-aviation operations. As unmanned aerial systems become more functional and durable in Arctic environments, they will serve as a combat multiplier in our ability to project capabilities within the region.

Pearl Harbor (July 2, 2018) Joint and combined leaders of Rim of the Pacific exercise discuss the concept of the U.S. Army Multi Domain Task Force pilot program during a fires symposium on Fort Shafter, Hawaii. (U.S. Army photo by Capt. Rachael Jeffcoat)

Assess materiel and personnel survivability within an operational nuclear environment. Army survivability assessments must assume that great power competitors not only possess but are willing to employ nuclear weapons to achieve tactical and strategic goals. Our forces must be trained and equipped to enhance their ability to operate in such an environment.

Build Arctic Multi-domain Operations

Adoption of multi-domain operations and advancement of Combined Joint All-Domain command and Control (CJADC2) provides an exploitation opportunity to operate as part of the joint force in the Arctic. The Army must employ a calibrated force posture

with multi-domain formations in order to achieve convergence and establish capability overmatch and positional advantage in the Arctic. MDTF experimentation in the Arctic to advance CJADC2 is key to continued development. This line of effort focuses on the ability to build CJADC2 capability and assure joint access to emerging sea lanes.

The Army will improve force posture to conduct multi-domain operations

Test and assess new formations in the Arctic. The Army will station a Multi-Domain Task Force in Alaska to experiment in delivery of tactical to strategic effects in the region. This experimentation in Alaska will pose an anti-access/aerial denial challenge for rival powers, constraining their operational choices and provides the U.S. with strategic advantage in crisis and conflict. An experimental MDTF in Alaska will also provide opportunities to test Army modernization priorities' ability to function in extreme environments and explore region-specific operational concepts.

Review the ability of space assets and capabilities to support a wide range of operations in the Arctic region. The Arctic region, given the high-latitude, poses operational challenges given the unique

electromagnetic spectrum. These challenges present a unique electromagnetic operational environment that requires increased U.S. access and coverage from space and high-altitude-based systems.

Advocate for enhanced space-based communications and data coverage, and build terrestrial-based retransmission sites in the Arctic. Satellite communications can assist in dispersed operations in areas with limited improved infrastructure. The Army will work with Combatant Commands and with allies and partners to identify and advocate for ways to improve satellite communications in the Arctic to mitigate the impact of solar weather patterns on UHF communications in the Polar Regions. In the interim and as a reinforcing effort, the Army will consider building widely dispersed hard shelter communications and retransmission sites or multi-spectral communication relay towers.

Enhance cyber capabilities to ensure forces have freedom of action in and through cyberspace. The ability to maneuver through the information environment to protect freedom of decision making, while denying this to adversaries, is of critical importance in the Arctic. Successful execution is challenged by the electromagnetic spectrum unique to the region. Improving commanders' information capabilities may require adaptation to current fielding of Cyberspace Electromagnetic Activities cells and potential posture adaptations to ensure the Army has adequate Arctic-capable cyber and information operations forces.

U.S. Army Lt. Gen. Christopher Cavoli, commanding general of U.S. Army Europe, observes a joint river crossing with Polish and U.S. Allies at Drawsko Pomorskie Training Area, Poland, June 16, 2020. Exercise Allied Spirit, a Defender-Europe 20 linked exercise takes place at Drawsko Pomorskie Training Area, Poland. Approximately 6,000 U.S. and Polish soldiers took part in the exercise. The exercise will test a division-sized unit's ability to conduct a deliberate water-crossing, integrate with alliance capabilities and establish a common intelligence operational picture. (U.S. Army photo by Spc. Denice Lopez)

Project Power Across the Arctic in Crisis and Conflict

As the northeastern edge and northernmost line of the INDOPACOM and NORTHCOM areas of operation, respectively, Alaska provides an opportunity for the Army to leverage its strategic geography and power projection platforms to execute strategic movement around the globe.

The Army will improve our ability to project power from, within and into the Arctic to operate and fight

Use DEFENDER, PACIFIC PATHWAYS, ARCTIC WARRIOR, ARCTIC EDGE and other such exercises to build the ability to project power from, within, and into the region. Exercises which stress our ability to conduct reception, staging, onward movement, and

integration activities in the region can inform investments to expand our operational reach. Such exercises will inform our understanding of our ability to sustain operations in a dispersed environment through determination of equipping requirements and distribution strategies to integrate sustainment.

Improve posture to support the ability of non-Arctic-capable forces to deploy to operate in the Arctic. The Army will examine the benefit of establishing an Arctic Army Prepositioned Stocks set that enables pre-positioning and training of responding non-Arctic units (e.g., Ground-Based Air Defense, sustainment enablers, security formations, etc).

The Army will improve our ability to command and oversee operations to improve force projection in the Arctic. *Examine the organization, structure, authorities, responsibilities and command relationships of US Army Alaska to provide a more operationally capable headquarters.* The Army will analyze the appropriate construct of the Headquarters in the Arctic and determine its fit as an operational, service component, or primarily garrison headquarters. To meet the requirements of an operational headquarters, there would be significant resource allocation requirements, in both manning, equipping, and authorities. The support to the organization in providing C2 to Alaskan forces would need to be improved, while sustainment of the headquarters and supporting formations would require additional sustainment assets, given mission and distributed operation requirements.

CONCLUSION

The United States is an Arctic nation. As such, the Army is responsible for providing Arctic-capable forces to support joint all-domain operations in defense from the region's threats. The Army must also be able to provide and sustain Arctic-capable forces for employment outside of the region as necessary. The Army is an essential key to ensuring land dominance in support of the joint force in the all-domain environment. The Army's ability to compete in the region delivers dilemmas to adversaries seeking an advantage in the Arctic. Working together with allies and partners, the Army supports the region's stability to achieve the nation's objectives.

The changes in the geopolitical environment and actions of great power competitors, combined with the evolving physical environment, require the Army to refocus

and analyze options to rebuild our Arctic capabilities. This strategy, through identifying the strategic and operational framework, focuses our efforts along lines of effort that will allow the Army to regain our ability to generate Arctic-capable forces ready to win in the Arctic, extreme cold weather, high-altitude, and mountainous environments.

This strategy communicates the need to support competition in the region while also rapidly organizing and responding to conduct operational maneuver in support of strategic movement. To do this, the Army will examine the posture, composition, and readiness of the force and seek improvements. The first step is to develop a full DOTMILPF definition of what is required for a unit to be Arctic-capable.

Additionally, the Army will adapt in order to win in Arctic and other challenging conditions. The actions and areas of analysis identified in this strategy lay out a plan to begin that effort. The examination and implementation of this plan will allow leaders to balance risk and make informed decisions to improve the Army's ability to operate and compete in the region.

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