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U.S. Maritime Strategy in the Arctic—Past, Present, and Future

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U.S. MARITIME STRATEGY IN THE ARCTIC

Past, Present, and Future

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> *May I be allowed to wish the rising generation of American naval officers all success in the noble profession they are entering, and to express a hope that America, and especially the American Navy, will maintain the place she has won in the front rank of Arctic explorers.*
>
> LIEUTENANT JOHN W. DANENHOWER, "THE POLAR QUESTION," 1885

The U.S. Navy has an enduring legacy in the Arctic. From the earliest days of the United States as an Arctic nation following the purchase of Alaska in 1867, our Navy has patrolled the region to protect national interests. As the area becomes increasingly accessible to maritime traffic, the Arctic will form a crossroads where geopolitical, economic, climate, technological, and security trends meet. As noted in a document published in January 2021 laying out an Arctic strategy for the Navy, warming waters and the resultant melting sea ice will create new challenges off our northern shores, and the Navy and Marine Corps must be prepared.[1] Aggressive Russian militarization and expanding Chinese interest in the region are giving rise to greater strategic competition in the Arctic. An American naval presence in the Arctic will ensure peace and prosperity.

Lessons from America's Arctic past can illuminate what needs to be done to help meet the demands of the Arctic of the future, ensuring integrated deterrence while also enabling adherence to the international rules and norms that are the backbone of our global economy. The Navy has a robust history in the region, dating back to the earliest American Arctic explorers. From USS *Nautilus* (SSN 571) onward, the Arctic has played an important role in U.S. Navy operations. During the Cold War, Navy Secretary John F. Lehman Jr.'s *Maritime Strategy* provided a forward-thinking approach that served to stretch the Soviet navy.

The competitors of the future will present threats far more complex than those the Navy faced previously, given the emergence and prevalence of advanced technologies, the cyber and space domains, hybrid warfare, and

increasingly bold state and nonstate actors. Our Navy must continue to look northward to ensure regional stability and prevent competitors from dominating an increasingly blue (as opposed to white) Arctic. The international norms that enable global economic prosperity—particularly freedom of the seas—increasingly are being challenged in the Arctic, setting a disquieting precedent for other global hot spots.

But Arctic operations are challenging in themselves. Although the region is warming and the ice cover is diminishing, operating in the polar environment will continue to be arduous. Conditions of extreme cold, icing, frequent storms, and near-complete darkness during parts of the year all serve to challenge mariners. Adding to these complexities, there are few deepwater ports and there is limited infrastructure to support and sustain operations. Communications challenges, lack of adequate hydrographic surveys, and a paucity of airfield options for search-and-rescue (SAR) and other emergency diversions increase risk to those operating in the region.

Confronting these hostile operating conditions, the Navy is materially and operationally underprepared now compared with during the Cold War. To help the service regain lost proficiency—and send a clear message to any nation seeking to challenge international norms in the region—this article will reflect on the Navy's history to gain innovative insights into ensuring maritime superiority in this challenging region. The article first will examine the service's history in the Arctic; next it will consider current geopolitics and naval operations; then it will provide specific recommendations for ensuring the establishment and continuation of American naval superiority in the evolving Arctic region.

LESSONS FROM THE PAST

The U.S. Navy is no stranger to the Arctic. The Navy Department administered the newly acquired Department of Alaska from 1879 until the territory's reorganization under civil administration in 1884. The Navy stationed the sloop of war USS *Jamestown* in Sitka, Alaska, to "preserve order among the Indians and to prevent threatened conflicts."[2] In an era of increasing exploration in the Far North, naval officers were eager to improve their Arctic expertise. The first article written in the U.S. Naval Institute *Proceedings* about the Arctic, a discussion on ice navigation by Lieutenant Frederick G. Schwatka, USA, appeared in October 1880. Schwatka provided exceptional detail on the dangers posed by "ice-packs, ice-floes, icebergs, tides, storms, currents, and other obstacles," as well as instructions for ships' "care and preservation when securely anchored by the cold clutches of the ice, for the long dreary winter night of the Arctic, [and] their liberation when the summer's sun has broken up the great ice fields."[3] Five years later, Lieutenant John W. Danenhower, USN, provided a comprehensive account

of Arctic exploration in *Proceedings*.[4] This insightful piece discussed the difficult conditions mariners faced in the High North and which maritime routes were to be preferred in the region.

The Navy pioneered America's earliest forays as an Arctic nation. The service's archives and histories document both the perils of operating in the Arctic and how those challenges could be overcome. These were important topics for naval officers seeking to defend and promote U.S. national interests in the northern latitudes. Then-Commander Robert E. Peary Sr., USN, a Civil Engineer Corps officer, became the first explorer to reach the North Pole, on 6 April 1909. His motto—"I will find a way or make one!"—reflects his impressive resilience.[5] He dedicated years to understanding the Arctic's weather patterns and ice conditions, often relying on the indigenous Inuits' extensive knowledge and experience. Less than two decades later, on 9 May 1926, Lieutenant Commander Richard E. Byrd Jr. navigated the first (although some dispute this) flight over the North Pole, beating Norwegian explorer Roald Amundsen's attempt by airship by a few days. Byrd and the pilot, Floyd Bennett—who had served in the Navy previously—received the Congressional Medal of Honor for their intrepid expedition.

The flight would not have been possible had it not departed from Svalbard, in Norway's northernmost archipelago. This highlights the enduring importance of international cooperation and the value of regional partnerships. The Arctic long has fostered international interest and unique levels of cooperation. U.S. Secretary of State Robert Lansing discussed the "perplexing situation" encompassing the Spitsbergen (later called Svalbard) Archipelago—from which Byrd, Amundsen, and many other Arctic explorers launched their expeditions—in a 1917 article in the *American Journal of International Law,* "A Unique International Problem." He noted that Spitsbergen's sovereignty question arose "as a result of American enterprise and energy, which, overcoming Arctic ice and barrenness, proved to the world the wealth of the islands."[6] Lansing was referring to the successful Svalbard operations of the Arctic Coal Company, a U.S. mining company that later was purchased by a Norwegian concern. The secretary's efforts to forge a resolution to Spitsbergen's status while a member of the American Commission to Negotiate Peace and his participation at the 1919–20 peace conference at Versailles reflected American economic and political interests in the archipelago and the Arctic access it provided. In 1920, global leaders gathered in Paris to sign the Spitsbergen (Svalbard) Treaty, which recognized Norway's sovereignty over the archipelago but stipulated that all signatories—fourteen originally, now forty-six—had equal rights to engage in commercial and research activities there. The archipelago was declared a visa-free zone and naval bases were prohibited, as was any use of Svalbard for warlike purposes. President Woodrow Wilson endorsed the treaty and the Senate ratified it in 1924.[7]

Although many at first had called America's 1867 purchase of Alaska "Seward's Folly" (it was spearheaded by U.S. Secretary of State William H. Seward), the Arctic territory's economic potential became clear during the 1896–99 gold rush, and its strategic importance became clear during the lead-up to World War II. In 1935, General William L. "Billy" Mitchell, USAAC, declared to Congress that "he who holds Alaska will hold the world"; he famously proclaimed that Alaska was the "most strategic place in the world." With his views colored by his assignment to Alaska as a junior officer, Mitchell urged the construction of military bases to enable a northern air defense. This argument later became more urgent during the Cold War, since the shortest and most likely route that Soviet bombers or intercontinental ballistic missiles (ICBMs) would take to attack the United States lay across the Arctic.

U.S. strategic interests in the Arctic—including economic, military, and geopolitical—will increase as regional activity rises. The U.S. Navy must be prepared.

The Soviet government, meanwhile, was developing Arctic navigation and aviation capabilities. The Soviets opened the Northern Sea Route in the early 1930s as a means to resupply isolated coastal communities. British journalist H. P. Smolka noted in 1938 that "[o]nly in the last few months has the world begun to be conscious of Russia's energetic efforts to push open her frozen window in the North and develop a Polar Empire."[8] Russian president Vladimir V. Putin's modern polar-great-power ambitions reflect Russia's historical interest in the region, but they are facilitated by a thawing Arctic.

At the time, Smolka also highlighted a perceived northern strength—one that today's Arctic thawing is diminishing. Relying on his extensive travels in the region studying its geography and inhabitants, he assessed that in a potential conflict Russia could be "bottled up" on three sides, but that the north was an "independent, continuous and all-Russian coastline, unassailable by anyone."[9] Indeed, while World War II was devastating to the Soviet Union, the frozen north did provide an unassailable border. Smolka had identified an important component relevant to Russia's present-day strategy in the High North. Russia's Arctic border—the world's longest national coastline—traditionally was considered impenetrable to invasion, but now the opening of the Arctic heightens the sense of paranoia that characterizes Russia's views about potential invasions and has led to increased militarization in the region.[10]

The 1920 Spitsbergen Treaty exemplified the spirit of international cooperation that has been a feature of the modern Arctic. Yet, not so long after it first was signed, growing wariness of Germany and the Soviet Union motivated the next round of Arctic diplomacy and military cooperation. The United States

and Canada signed the Ogdensburg Agreement in August 1940 to provide for closer defense cooperation against airborne threats emanating from the polar region. Although devised even as another world war was engulfing the globe, it established a Permanent Joint Board on Defense that was intended to outlive the conflagration, which became important later as wariness of Soviet Communism grew and the Cold War emerged.

In June 1942, the Japanese bombed U.S. bases at Dutch Harbor and Fort Mears in Alaska and seized the Aleutian islands of Attu and Kiska, making the Aleutians the only World War II battleground where U.S. soil suffered foreign occupation. The Alaska Territory played an important role as a transfer site for executing Lend-Lease Act programs designed to bring desperately needed food, oil, and matériel to American allies during the war.[11] The Allies used Arctic routes to resupply the Soviet Union, shipping nearly four million tons of cargo through the Barents Sea and nearly five hundred thousand tons through the Bering Strait during the war.[12] German forces, also recognizing the strategic value of the High North, established naval and air bases in Norway after their successful invasion in April 1940.

Alaska's strategic value prompted the construction of the Alaska-Canadian Highway and other significant infrastructure projects during World War II. The war made an enormous impact on Alaska's population; thousands of people moved north to support the war effort, and many remained afterward. By 1945, the military population had skyrocketed to nearly sixty thousand, from around five hundred in 1940.[13] Alaska's total population in 1950 was nearly double its 1940 population of 129,000.[14] The military expansion in Alaska during World War II, which was extended by the onset of the Cold War, fueled the state's economic growth; by 1955, uniformed military personnel made up nearly a quarter of the population, and as much as 80 percent of Alaskan employment was related to the defense industry.[15]

During the Cold War, Alaska was key to implementing a so-called damage-limitation strategy to deter a potential Soviet nuclear attack against the United States. In theory, under such strategies nuclear attacks are deterred by providing the capability to limit the damage they could wreak sufficiently to render them strategically pointless. This would be achieved by providing an air defense robust enough to destroy a substantial portion of Soviet nuclear bombers and missiles before they reached the continental United States (CONUS). Alaska was (and remains) ideally situated to provide early warning of attacks against the United States from the Soviet Union (and Russia today) because the shortest air routes between the two countries cut across the Arctic Ocean. (It is instructive to reinforce this fact using a globe or by looking at a polar projection instead of the standard Mercator one.) Once the Arctic was deemed vulnerable to Soviet nuclear

bombers, the Distant Early Warning (i.e., DEW) Line—consisting of more than fifty radar and communication stations stretched across three thousand miles—was established to allow the Strategic Air Command (SAC) to respond appropriately to any threat.[16]

In 1957, the North American Air Defense Command (NORAD)—a combined U.S.-Canadian defense organization—assumed responsibility for continental air defense, focusing on Soviet threats from the polar region. Technological developments shifted the focus of defense efforts from bomber attacks toward ICBM threats. Alaska hosted one of NORAD's first ballistic-missile early-warning stations, designed to provide approximately fifteen minutes' warning of a missile attack against CONUS. The U.S. Arctic region became strategically critical for identifying inbound Soviet bombers and missiles and providing an opportunity for defense in depth against nuclear attack.

U.S. naval leadership in exploring the Arctic again became global news when *Nautilus* completed its record-breaking voyage, becoming the first submarine to circumnavigate the globe under the polar ice cap. On 3 August 1958, the boat's captain, Commander William R. Anderson, USN, addressed his crewmembers at the historic moment they reached the North Pole: "For the world, our country, and the Navy—the North Pole." Once *Nautilus* was clear of the ice pack, the message "Nautilus 90 North" was relayed in Morse code to President Dwight D. Eisenhower via a Navy radio station in Hawaii. This demonstration by the nuclear-powered submarine made it clear that extensive under-ice operations were possible. Indeed, as Commander Robert D. McWethy, USN, one of the Navy's early advocates for the value of submarine operations in the Arctic to monitor the Soviet Union, noted in 1958, "The ice pack in the Arctic Ocean region lends itself to exploitation by submarine."[17] Commander Anderson later would envision the maritime shipping potential of the region, considering the shorter maritime route connecting the Atlantic and Pacific Oceans. However, he did not anticipate a thawing Arctic, instead predicting a future in which cargo-laden submarines shipped goods along the Arctic route.[18] Like many Arctic endeavors, his vision of submarine cargo vessels never was realized in a region that continually proves to be important strategically but challenging operationally.

Nautilus's notable achievement of sailing successfully under the ice cap elicited great pride from Americans at the height of the Cold War—especially since the Soviets were pulling ahead in the space race. Its accomplishment highlighted American naval ingenuity and demonstrated to the Soviets that American submarines could operate in their icy back yard. In 1959, USS *Skate* (SSN 578) sailed north with the mission of breaking through the thick polar ice. *Skate*'s captain, Commander James F. Calvert, reflecting on the perilous task, claimed that his

crewmembers were "immune to fear and desperation" as a result of their training and their trust in one another.[19] *Nautilus*'s and *Skate*'s polar successes built on American inventor Simon Lake's early efforts to develop submarines capable of "navigating in water covered by surface ice." Indeed, the Lake-designed submarine *Protector* became the first submarine to cruise under, and to surface through, sea ice, in 1903, off the coast of Newport, Rhode Island.[20] The submarine's success attracted attention, and five years later, in 1908, the Lake-designed submarine *Kefal,* built for tsarist Russia, became the first Russian submarine to surface through ice, near Vladivostok.[21]

The Arctic saw a dramatic increase in military operations during the Cold War, primarily conducted by submarines. Soviet and U.S. submarine activity during the Cold War was robust, although details largely remain classified. U.S. submarines were tasked with tracking Soviet missile submarines from their northern bases on the Kola Peninsula east of Finland into Arctic waters, whose ice cover provided exceptional shelter from detection. The Arctic remained a critical strategic region throughout the Cold War, including playing a part in President Richard M. Nixon's "madman theory" of deterrence. This theory originated with the nuclear brinkmanship practiced by President Eisenhower and was designed to sow doubt regarding the degree of irrationality and volatility that should be attributed to the United States. The intent was to diminish a potential Soviet provocation by raising the possibility of a stronger U.S. retaliation than Soviet leaders expected. To demonstrate both capability and unpredictability, SAC flew nuclear-armed airborne-alert flights over the Arctic Circle.[22]

In December 1971, Henry A. Kissinger, then assistant to the president for national security affairs (i.e., national security advisor) under Nixon, promulgated a national security decision memorandum on U.S. Arctic policy. The memorandum stated that "the President has decided that the United States will support the sound and rational development of the Arctic, guided by the principle of minimizing any adverse effects to the environment; will promote mutually beneficial international cooperation in the Arctic; and will at the same time provide for the protection of essential security interests in the Arctic."[23] It further stated that these security interests included preservation of the principle of freedom of the seas and of airspace. The strategic importance of the Arctic region—primarily owing to the potential flight paths of strategic bombers and ICBMs—finally had warranted issuance of a defined U.S. Arctic policy. Yet the policy also reflected the growing understanding that the region was important for more than just strategic defense. Concern for environmental issues in the Arctic prompted the 1973 Agreement on the Conservation of Polar Bears among the United States, the Soviet Union, Norway, Denmark, and Canada. Thus, scientific cooperation in the region continued despite ongoing strategic tensions.

The Arctic, in fact, long has seen the juxtaposition of cooperation and competition. Following Nixon's efforts in the region, national attention largely turned elsewhere, although the Arctic remained strategically vital for early warning of ICBM threats. Then, in the 1980s, the Reagan administration redoubled American efforts to attain a strategic advantage over the Soviet Union, particularly in the maritime domain. The *Maritime Strategy* charted a bold new course for the Navy. Secretary of the Navy Lehman and Chief of Naval Operations (CNO) Admiral James D. Watkins, USN, proposed an innovative forward global strategy, in which the Arctic played a small but important role. With contributions from brilliant strategists such as Captain Peter M. Swartz, USN (now retired), the strategy was designed and implemented to demonstrate to the Soviet Union that the U.S. Navy and allied forces had the ability to defeat the Soviet navy in a potential conflict and strike hard into the Soviet homeland—namely, the Soviets' strategic bastions in the High North. Improving the Navy's ability to operate in the difficult region was critical to pressing the Soviets and deterring aggression through a cost-imposing strategy. This approach helped lead to the ultimate downfall of the Soviet Union.

Russia's Arctic border . . . traditionally was considered impenetrable to invasion, but now the opening of the Arctic heightens the sense of paranoia that characterizes Russia's views about potential invasions and has led to increased militarization in the region.

This concept led to Exercise Ocean Venture in August–October 1981, which brought together from fifteen nations about 120,000 personnel, 250 ships, and a thousand aircraft. The Navy exercised offensive and sea-control operations north of the Greenland–Iceland–United Kingdom gap—through which Arctic-based Soviet fleets and ballistic-missile submarines would have to pass to break out into the North Atlantic to threaten NATO forces. Sustained operations in these frigid waters posed significant challenges to the naval forces, with sailors confronting reduced visibility, subzero temperatures, dangerous icing conditions, and freezing of equipment. These challenges complicated war fighting and made it more difficult for participating ships and aircraft to fulfill their missions. Using innovative tactics to overcome both the Arctic conditions and the challenges embedded in the exercise scenario, the fleet succeeded in sailing to within striking distance of Murmansk—the heart of the Soviet strategic-submarine fleet. Although the U.S. fleet had operated in the Arctic before, the principles of the developing strategy called for allied surface ships to operate in northern latitudes more frequently to balance the routine presence there of Soviet naval forces.[24] Doing so would force Soviet planners to reconsider their own force deployments to ensure they had enough

assets available to protect their strategic bastions, which was vital to the cost-imposition strategy.

As the new strategy expanded the priority of Arctic naval operations, the Assistant Deputy CNO for Surface Warfare observed in 1985 that the Navy's "limited operations in the Arctic have revealed a number of problems that must be overcome if we are to successfully send our ships into these waters on a routine basis."[25] Therefore the Navy established an Arctic / Cold Weather Program for Surface Ships to provide the fleet with instructions and hardware to operate effectively in the northernmost latitudes. The 1988 *U.S. Navy Cold Weather Handbook for Surface Ships* was published to establish procedures for Arctic operations; it provided guidance on everything from Arctic meteorological conditions to maneuvering in sea ice. It even noted the importance of ensuring excellent dental health prior to cold-weather operations, lest the thermal stresses on teeth from drinking hot coffee after being outside cause cracking![26]

While the Navy's surface community was improving its ability to operate in the challenging Arctic region, underneath the seas its submarines remained dominant. During the Cold War, the Arctic quickly became a submarine playground, with the Russians deploying their ballistic-missile submarines into protected launch bastions in the High North.[27] To operate in or close to Russia's Arctic submarine bastions, the United States needed attack submarines that could operate effectively under the ice pack while eluding detection themselves. This required a significant investment in both infrastructure and training. The *Sturgeon*-class submarines were designed for the Arctic environment, with systems capable of prolonged operation in extreme cold, top and bottom sounders to enable navigation under the ice, and a hardened sail that worked as an "ice pick" to allow the boat to break through ice.

Crews that deployed in the Arctic Ocean and High North underwent months of predeployment training, and the submarines were assigned civilian ice pilots with significant experience navigating those waters. The training included theoretical, scientific, and practical exercises that introduced crews who were accustomed to much warmer waters to the idiosyncrasies of the general Arctic environment, such as differences in temperature and salinity—and the near-constant presence of bearded seals, whose moans could be heard through the hull and in the sonar.

For example, changes in salinity were not to be taken lightly on platforms that approached eight thousand tons submerged. A submarine's neutral buoyancy is obtained by trimming the ship and loading or pumping off seawater ballast from trim tanks to maintain the diving officer's ever-elusive "zero bubble," or optimal trim. However, as a submarine approaches areas of melting

ice (which produces fresh water), the density of the ocean water changes, so buoyancy does as well. In such waters, watch teams had to be (and still must be) alert at all times and take quick action to avoid a sudden "depth excursion." Keeping track of such environmental factors is essential to safe operation in the Arctic environment.

Likewise, sailors became proficient in wearing cold-weather gear and avoiding the perils of frostbite and hypothermia when exposed to Arctic conditions, whether on the bridge or out exploring on the ice. Commercial hunting ammunition was provided to personnel to defend themselves against any rogue polar bears or arctic foxes; the latter often suffered from rabies, which made their behavior erratic and unpredictable.

Operating a submarine in the open ocean is challenging enough for a well-trained crew, but in the Arctic crews did so in an environment in which the hazards above them when submerged were not limited to adversary aircraft and surface ships. Floating icebergs pose a danger owing to the considerable depth to which they extend beneath the surface. Additionally, surface ice can come in the form of either multiyear or first-year ice; the latter tends to be less difficult to break through. As part of the seasonal ice zone, the marginal ice zone, extending from the ice edge into the ice pack, varies in width from sixty to 120 miles.[28] Simply put, ice is variable, and the uncertainties involved pose significant operational challenges to vessels operating both above and below the ice, requiring frequent updating of procedures. For instance, in temperate climates a submarine can refresh its air by raising its snorkel mast and ventilating, but this is problematic when there is pack ice overhead. In sum, standard operating procedures were no longer "standard" under the ice, so submariners had to find new ways to do normal things.

Navigation in the Arctic proved challenging as well. Magnetic compasses are useless at the polar ice cap, as crews discovered during the Cold War. Before GPS, existing radio-navigation systems used to obtain a ship's position, such as LORAN-C and Omega, were unavailable in the Arctic. Even the service's pioneering Navy Navigation Satellite System (known as NAVSAT) was unreliable in high latitudes, despite relying on satellites. These limitations resulted in the navigator's best friend becoming the Mk 19 gyrocompass; a warship's navigator and quartermasters would monitor the Mk 19 carefully as the boat approached the pole, hoping that the gyro did not tumble and lose its ability to provide a direction for the ship's track.

Sailors faced many challenges to operating in the Arctic back then, more so than they do when operating up north today. But our Navy was innovative and determined, and the Soviet Union could not help but take note. Therefore, to protect their Arctic submarine bastions, the Soviets sought to build stealthier and

Members of the wardroom of USS *Sea Devil* (SSN 664) surfaced through the Arctic sea ice in 1985.

more-capable submarines to counter the threat of American fast-attack submarines in their back yard.

Although the Navy became proficient at operating in the High North even on the surface, the end of the Cold War left the Arctic largely to those operating in the undersea domain. The figure shows the members of the wardroom of USS *Sea Devil* (SSN 664) when the boat was surfaced in a *polynya*—an opening in the sea ice—on the first visit of one of the authors to the polar region. Fifteen years after the author's first voyage to the High North, his second deployment, for LANTSUBICEX 2001, was less stressful. Training was about the same and an ice pilot was assigned to ensure safe Arctic operations. However, it was remarkable how much less ice there was in both the marginal ice zone and within the traditional demarcation of the pack-ice zone. Similarly, much to the author's chagrin, man-made pollution, particularly in the form of plastics, was much more noticeable—a disconcerting shock amid the serene, azure-blue waters of the Arctic.

THE ARCTIC TODAY

The Arctic now resides at the intersection of rapidly evolving geopolitical, economic, climate, and security trends. Although the world's polar sailors long characterized the region with the adage "High North, low tension," today's era of competition is casting doubt on the continued applicability of this catchphrase; instead, the Arctic is being catapulted into key security discussions. With just about four million inhabitants, the Arctic region accounts for only a small fraction of the global population, but its strategic location and economic potential and the stakeholders involved mean it has a disproportionate impact on global security. Despite including the world's smallest ocean, the Arctic region has the potential to connect nearly 90 percent of the world's economy.[29] What happens in the Arctic will not stay there. Melting Arctic ice is causing significant worldwide changes, particularly in sea level / depth and salinity. The fragile Arctic ecosystem is changing as temperatures rise, bringing new fishing stocks north even as some regional flora and fauna face endangerment. Climate and technological trends are enabling greater access to abundant natural resources while also having a profound impact on human and military security. Geopolitical trends are shaping the region further, in such a way that the Arctic no longer will remain an isolated region of cooperation; some states will engage in competitive strategies to maximize their national interests.

Russia

Russia has pursued an aggressive strategy in the Arctic. About half the Arctic coastline and Arctic population lie within Russia's borders, and the country is increasingly reliant on the Arctic for economic benefits, from which it derives about 10 percent of its gross domestic product and 20 percent of its exports.[30] Russia established a joint strategic command (somewhat similar to the U.S. geographic combatant commands, but with boundaries aligned to Russian territory) for the Arctic in 2014, has refurbished old Soviet-era military bases, and has built fourteen new airfields and sixteen deepwater ports in the region.[31] Russia has modernized both the Northern Fleet and its Arctic naval bases and has shifted additional military assets to the region, bringing the share of the country's modern weapons, military, and special equipment in the Arctic zone from 41 percent in 2014 to 59 percent in 2019.[32] The Northern Fleet remains Russia's principal entity responsible for strategic deterrence, and it is committed to protecting the Arctic bastions to ensure it retains a credible retaliatory capability. Alongside Russia's established defensive capabilities, which include the advanced S-400 missile system, the country also is pursuing more-disconcerting offensive capabilities, as demonstrated by its stated intent to station the first squadron of nuclear-capable Kinzhal-missile-equipped MiG-31K fighters on the Kola Peninsula.[33]

Russia also has invested heavily in infrastructure, including building more than forty icebreakers to service its Arctic ports and towns, nearly a dozen of which are nuclear powered. The naval icebreaker *Ivan Papanin*—equipped to carry the highly capable Kalibr antiship cruise missile—was launched in October 2019 to much fanfare, which noted the ship's multiple roles as a tug, icebreaker, and patrol vessel.[34] These icebreakers will be employed heavily along the Northern Sea Route, which connects Asia and Europe across Russia's northern border. Russia claims that the extent of its exclusive economic zone includes all the waters of the Northern Sea Route; even further, it considers the entire route to fall within its historic internal waters. Relying on article 234 of the 1984 United Nations Convention on the Law of the Sea (known as UNCLOS), it justifies setting rules and regulations for the route—an exercise of authority that the United States and other nations do not recognize.[35] Russia promotes the route as a shorter alternative to the traditional commercial sea route that goes through the Suez Canal and Strait of Malacca, although treacherous weather and sea conditions and water-depth limitations diminish the northern route's attractiveness. Work along the route has provided Russia's commercial and naval fleets extensive Arctic operational experience.

Russia's aggressive actions elsewhere—particularly in Ukraine—and its clear prioritization of dominating the Arctic compel the United States to ensure its capability to counter Russia in any domain.

As of 1 January 2021, Russia elevated the Northern Fleet to constitute its own military district, the first time a fleet has held status equal to that of the existing four predominantly land-focused military districts (designated West, South, East, and Central).[36] Military districts provide administrative and operational headquarters for Russian armed forces. The new district is tasked with ensuring Russian interests and territorial integrity in the Arctic, including Russia's Arctic coast and the Northern Sea Route. Admiral Aleksandr A. Moiseyev, Russia's Northern Fleet commander, noted that the joint strategic exercise ZAPAD, held annually in a different military district, most recently in September 2021, will continue to serve as the fleet's main training effort.[37] Russia's prioritization of the Northern Fleet indicates that in the High North the Russian navy will have the primary responsibility for upholding Russian interests, in contrast to the prioritization that ground forces receive in the rest of the nation.

China

Russia is striving to hold on to its commanding position in the Arctic domain, but China is increasingly active in the region. The latter country long has maintained a research station on Svalbard, and increasingly it has invested in Arctic maritime capabilities, including building two icebreakers and making plans for additional

icebreaking capability. China's interest in the Arctic has been rising for years; its January 2018 Arctic policy white paper introduces China as a *near Arctic state*—an undefined term—and makes it clear that China intends to pursue interests in the region, including adding to its Belt and Road Initiative a "Polar Silk Road" component, as a northern route to European markets.[38]

Western sanctions against Russia for its annexation of Crimea in 2014 have motivated increased cooperation between China and Russia in the Arctic, including significant Chinese investment in Russia's Yamal Liquefied Natural Gas joint venture. The Chinese drilling rig *Nan Hai VIII* (also known as *Nan Hai Ba Hao*), in partnership with Gazprom (Russia's state-owned energy corporation), has explored fields in the Kara Sea, discovering some of the region's largest gas fields. To bring liquefied natural gas (LNG) from the Yamal terminal, the *Christophe de Margerie*–class icebreaking LNG carriers were constructed at South Korea's Daewoo Shipbuilding and Marine Engineering in a joint venture among Sovcomflot (Russia's largest shipping company), Teekay Tankers of Bermuda (in partnership with China LNG Shipping), the Greek concern Dynagas, and Mitsui OSK Lines of Japan (in partnership with China Shipping Group).[39]

China has invested in infrastructure throughout the Arctic, with particular attention to natural resources and Arctic infrastructure. China has demonstrated special interest in the shipping potential of the region, sending a small number of commercial vessels through the Northern Sea Route each year, including fourteen in 2021, according to Russia's Northern Sea Route Administration. A three-month expedition in the summer of 2021 by the indigenously built Chinese icebreaker *Xue Long 2* marked China's twelfth Arctic deployment for scientific research, and provided China ample additional opportunity to study the region's characteristics to guide future civilian and military pursuits in the Arctic.[40]

Skepticism from Others

Although Russia and China are pursuing ambitious plans in the Arctic, the difficulties of operating in the region have tempered global commercial interest. While President Putin set a goal of 80 million tons of shipping through the Northern Sea Route by 2024, 2021 saw just 35 million tons. So far, shipments predominantly consist of natural resources heading to Asian and European markets rather than transit shipping of cargo, which totaled just 1.5 million tons in 2021 (compared with more than a billion tons through the Suez Canal).[41]

Yet there is no doubt that the thawing ice will continue to have effects. As new shipping corridors become more viable, maritime traffic increasingly will be drawn to the region. Fishing stocks will continue to move northward, and other natural resources will be explored.

THE OPENING ARCTIC IS A MARITIME DOMAIN

U.S. strategic interests in the Arctic—including economic, military, and geopolitical—will increase as regional activity rises. The U.S. Navy must be prepared to uphold national interests, demonstrate credible presence, and ensure freedom of navigation through the region. As the Arctic Ocean opens, strategic competition for regional sea control will increase. The Navy must be ready.

The Department of the Navy will continue to fulfill a critical role in the Arctic efforts of the Department of Defense. With their newly released *Arctic Blueprint,* the Navy and Marine Corps have taken a forward-leaning approach to improving regional presence, partnerships, and capabilities.[42] The U.S. Navy needs to build on the lessons of the past to provide insights on how to compete more effectively in the High North, uphold international norms, and prepare to counter the increasingly aggressive polar ambitions of Russia and China. And it must prepare to defend American economic and strategic interests even more directly, if necessary.

Although not yet "full speed ahead" in the Arctic, the Navy clearly is learning. Inspired by the 1981 Exercise Ocean Venture, Exercise Trident Juncture 2018 provided significant learning opportunities, as more than fifty thousand sailors, soldiers, airmen, and Marines on nearly seventy warships, 250 aircraft, and ten thousand tracked or rolling vehicles, including assets from every NATO ally and two partner nations, conducted an article 5 collective-defense scenario in Norway and nearby Arctic waters.[43]

The exercise, which was enabled by Secretary of Defense James N. Mattis's "dynamic force employment" concept that sent the *Truman* carrier strike group north, was highly successful, but it also demonstrated the need to sharpen skill sets for those contending with harsh northern environments. No U.S. aircraft carrier had operated in the Arctic in nearly three decades. The weather was challenging, so aircraft were launching at the margins of permissible conditions: twelve-to-eighteen-foot seas and high winds. Yet sailors on board were innovative and found creative solutions to problems. When CNO Admiral John M. Richardson embarked in USS *Harry S. Truman* (CVN 75), he noticed Louisville Slugger baseball bats lined up in a passageway; curious, he inquired what they were for. One of the enterprising sailors explained that the bats were critically necessary—for breaking ice off the deck.[44] But while Trident Juncture demonstrated the ingenuity of USN forces, it also revealed the complexity of Arctic operations. As USS *Gunston Hall* (LSD 44) transited through heavy seas from Iceland to Norway, the ship sustained damage to its well deck and several sailors were injured; instead of completing the exercise, *Gunston Hall* returned to Reykjavík and subsequently to the United States, escorted by USS *New York* (LPD 21) as a precautionary measure.[45] Aboard *Truman,* Rear Admiral Eugene H. Black III, the strike group commander,

noted the key lesson learned: "You've got to be agile."[46] The experience reinforced that extremely cold temperatures, frequent icing conditions, high sea states, unpredictable weather patterns, limited daylight, and greater distances to ports and emergency divert fields make even basic operations more dangerous in the Arctic than elsewhere.

The U.S. Navy must do more to remain competitive in the Arctic, given that Russia has maintained a clear focus on achieving dominance in a region that is strategically located but incredibly difficult to operate in—for both sides. Hostile environmental conditions demand updated operational procedures, cold-weather-tested gear, and special training to ensure not only war-fighting proficiency but survival.

Russia has been improving its military capabilities and adding bases in the region. In late April 2020, Russian paratroopers demonstrated operational proficiency in the challenging environment as they jumped out of an Il-76 transport plane at a height of ten thousand meters above the Eastern Hemisphere's northernmost archipelago, Russia's Franz Josef Land, then conducted three days of combat-training missions on Aleksandra Land, one of the archipelago's largest islands. There, at 80 degrees north latitude, Russia's Arctic forces have expanded Soviet-era Arctic infrastructure and built the world's northernmost military complex. The expansion of the Nagurskoye air base was designed to better secure approaches to the Russian coastline, protect natural resources, and improve monitoring of Northern Sea Route traffic. The base includes a new 2,500-meter runway.[47] It also is home to an S-300 antiaircraft missile system, as well as to troops equipped for Arctic warfare with snowmobiles, helicopters, radar systems, and unmanned aerial vehicles designed for the harsh environment.[48] General Valery V. Gerasimov, Russia's chief of general staff, has noted that the airport also can host the new hypersonic Kinzhal air-launched ballistic missile.[49] The operating range of the missile is reported to be more than a thousand miles, which means it can hold many European capitals at risk with either a conventional or a nuclear-armed warhead.[50] Indeed, Russia carefully is constructing a series of bases in the region to ensure its coverage of the country's northern flank as well as the international waters of the Northern Sea Route.

While there is no issue with an independent state enacting defensive measures to protect its sovereignty, Russia's buildup includes offensive capabilities that could hold not only the United States but also its regional allies and partners at risk. Russia's aggressive actions elsewhere—particularly in Ukraine—and its clear prioritization of dominating the Arctic compel the United States to ensure its capability to counter Russia in any domain.

In May 2020, a couple of weeks after Russia's April 2020 exercise, a surface action group (SAG) of four USN warships and a British Royal Navy frigate patrolled

the Barents Sea, the first such combined patrol since the Cold War. This was meant to signal to the Russians that—as one of the authors explained, in his capacity as commander of U.S. naval forces in Europe—the Arctic was "nobody's lake."[51] He went on to warn Russia and China that access to the Arctic should be free and fair. The Barents Sea SAG displayed the strengthening U.S. commitment to operating in the Arctic, and USN warships operated in the Arctic consistently from May to November 2020.

The learning curve for Arctic operations is steep; mistakes can be costly. . . . [T]he U.S. Navy [must] prepare now to be able to operate in a region that is increasingly important; to do so, the service must draw on the lessons of the past.

NATO's Exercise TRIDENT JUNCTURE and other USN and U.S. Marine Corps exercises in the region have improved the services' capabilities to operate in arduous conditions while demonstrating the need to build further on those foundations. The complexity involved in conducting military exercises in the region is increasing as other Arctic states prepare to protect their interests against potential security challenges.

During UMKA-21 in March 2021, Russia coordinated a first-ever surfacing of three ballistic-missile submarines within three hundred meters of one another off Aleksandra Land in the Franz Josef Land archipelago. The submarines carried a combined forty-eight ballistic missiles. Given the complexity and dangers of operating in such an environment, the simultaneous surfacing demonstrated a high level of crew training.[52] The exercise—Russia's most advanced military drill in the Arctic yet—included forty-three events that took place at Franz Josef Land and in nearby waters. Admiral Nikolay A. Yevmenov, commander of the Russian navy, announced that "[u]nder the leadership of the Headquarters of the Navy, the integrated Arctic expedition UMKA-2021 is being conducted. For the first time, in accordance with a single concept and plan, complex combat training, research, and practical measures of various directions is carried out in the circumpolar region."[53]

Since the region is attracting increasing global interest from states and corporations alike, the Navy must prepare to uphold U.S. strategic interests in the region, particularly protecting the homeland and ensuring freedom of navigation. While Russia long has been the most formidable Arctic state with which the United States and like-minded allies have contended, there is increasing alarm over China's keen desire to be present in the Arctic. China's issuance of its 2018 Arctic white paper, participation in Arctic forums, conduct of scientific research, and investment in the High North have demonstrated a firm commitment to exploring the region's economic potential. Scientific research conducted from its Svalbard research

station and during icebreaker deployments yields data that will benefit both its commercial and military ambitions in the region.[54] The Arctic deployment of China's indigenously built (though Finnish-designed) icebreaker *Xue Long 2* in July 2020 marked China's eleventh Arctic research expedition. It covered more than twelve thousand nautical miles and conducted hydrographic surveys and mapping of the ocean bottom—dual-use research that could signify preparation either to conduct natural-resource exploration or send Chinese submarines north.[55]

LOOKING TO THE FUTURE

Mariners throughout history have attested to the immense difficulty of operating in far-northern latitudes. The learning curve for Arctic operations is steep; mistakes can be costly. It is imperative that the U.S. Navy prepare now to be able to operate in a region that is increasingly important; to do so, the service must draw on the lessons of the past.

The Navy Department's January 2021 *Arctic Blueprint* offers a thoughtful strategic approach to the region, and if the Navy and Marine Corps achieve the goals it lays out they will be positioned well for a thawing Arctic. The publication establishes three primary objectives: maintain enhanced presence, strengthen cooperative partnerships, and build a more capable naval force.[56] The strategy provides a broad overview of each objective, and the relevant recommendations are both sound and necessary; the authors will not repeat them here.

However, there are key areas on which naval forces should focus in the Arctic, and as the strategy is implemented we must continue to do so if we are to achieve the stated objectives fully. Our survey of the Navy's history in the Arctic suggests six areas of focus for naval forces today as they prepare to meet growing operational demands in the region.

Prepare for the Cold. The history of the Arctic is replete with stories of the devastating effects of the region's notoriously harsh environment. Although the ice is diminishing, the Arctic remains hostile. Sailors must prepare for intense cold—dropping to minus forty degrees Celsius in winter—that hinders the functionality of machinery and poses dangers to personnel.

The increasingly open waters of the Arctic have amplified the unpredictability of ice floes; the rapid melting of one-year ice can cause large blocks of thicker multiyear ice to flow into sea-lanes, with conditions varying seasonally. Furthermore, weather conditions compound the challenges posed by ice, as severe storms often further hinder transits. In the summer, heavy fog is common, obscuring visibility and requiring vessels to slow down to avoid colliding with unexpected ice and one another.[57]

The nearly four decades that have elapsed since the Navy published its *Cold Weather Handbook for Surface Ships* have seen extraordinary and rapid changes

to the Arctic environment and dramatic advances in maritime and cold-weather technology, and there has been a significant evolution in naval operations and procedures since the Cold War. These developments demand a comprehensive update to the handbook so that naval forces can invest in the right gear and focus their training to enable successful cold-weather operations.

Innovate. Early Arctic explorers were known for their resilience and innovation. When something went wrong—which it often did—the most successful explorers relied on their training and knowledge to apply or invent effective solutions. As Commander Calvert of USS *Skate* noted, to succeed in the harsh Arctic environment it is essential for crewmembers to have both the appropriate training and trust in one another.

The Navy should enhance support of similar innovation by sailors operating in the High North via enhanced training and professional military education opportunities. It also should reward innovators—including by forgiving mistakes made in the course of innovations attempted in good faith.

Everyone Is a Scientist. Intrepid naval officers who first explored the Arctic quickly realized the importance of understanding better the environment in which they were operating; early journal articles on the region are filled with scientific findings developed from naval voyages. Yet the Arctic remains one of the least understood regions of the world.

To improve understanding of the Arctic's meteorological and hydrographic conditions, all Navy assets operating in the region should collect data, just as *Nautilus* and *Skate* did on their early voyages to the North Pole. Embarking Naval Meteorology and Oceanography Command (referred to as METOC) detachments on Arctic-bound vessels would help to ensure rigorous observation of the Arctic environment. Data collected should be compiled into carefully managed databases, both to preserve historical records and to enable trend analyses to inform units operating in the region in the future.

Enhance Presence. As strategic competition among great powers intensifies, the Navy must protect national interests, reassure allies and partners, and provide a credible deterrence. Operations in the High North should be coordinated with allies and partners to achieve these goals. In particular, the U.S. Navy can learn from countries such as Norway and Denmark, which have the expertise that comes from centuries of Arctic maritime experience. Allies such as the United Kingdom will continue to sail alongside the United States into the frigid Arctic waters, and enhancing our exercises in the region will continue to improve our collective ability to operate there.

Key Arctic enabling capabilities such as icebreakers are "high-demand, low-density" assets, so the Navy must seek creative solutions, including by training

crews of surface ships and providing the technology necessary for them to operate their vessels safely while sailing in icy Arctic waters. The Danes and Norwegians have proved that non-ice-strengthened ships can operate safely in the region. Leasing civilian icebreaking assets could be considered to fill gaps until the U.S. Coast Guard's new polar security cutters are operational; delivery of the first new U.S. heavy icebreaker has slipped to 2025.[58] Creative options, such as a combination of manned and unmanned platforms, can enhance the American presence in the Arctic further.

Allies and Partners Matter. Early Arctic expeditions were known for their reliance on indigenous partners, owing to the latter's knowledge and understanding of the region's challenging environment. Just as Rear Admiral Peary relied on Inuit expertise during his successful mission to the North Pole, today's Navy should increase exercises, operations, and personnel exchanges with Arctic allies and partners to enhance understanding of regional operations while building interoperability.

Cooperation Is Essential. The arduous environmental conditions of the Arctic long have made operations in the region conducive to cooperation. Whether sharing data from scientific missions or conducting SAR operations, mariners in the High North long have worked together to survive. Even among states engaged in great-power competition, it is necessary to build on cooperative mechanisms that can enhance transparency and reduce the potential for misunderstanding or misperception.

The U.S. Navy has an impressive history of operating in the Arctic. Admiral Peary, Admiral Byrd, and Captain Anderson achieved significant Arctic milestones, but their successes were enabled by the contributions of sailors such as Commander Henry Glass and Lieutenant Danenhower, who meticulously documented Arctic conditions during earlier Arctic expeditions. Given the complexities of today's dynamic strategic environment, it is imperative that the Navy be prepared to operate in any domain—even the harshest region in the world.

The opening of the Arctic Ocean and the increasing interest in the High North by Arctic and non-Arctic states alike demand the application of past lessons to enhance operations in the future. To secure America's long-term strategic interests while supporting the broader goal of collective defense among allies and partners, it is critical for the Navy to examine the lessons from its Arctic history and apply them to ensure maritime superiority.

NOTES

Authors' note: Any factual descriptions or assertions regarding Arctic submarine operations that are not otherwise documented reflect the career knowledge and personal experiences of Admiral Foggo.

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