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Global interest in the Arctic region: Naval operations impacting scientific-commercial activities

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Research Article

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Abstract

The Arctic region is rapidly changing as a result of climate alteration, political tensions and ambitions of the Arctic and non-Arctic states. Is the existing governance considered to be adequate for effective international security cooperation in the region? On the one hand, we look optimistic at the evolution of international relations in the areas of science and technology, conservation, search and rescue coordination, tourism, etc. On the other hand, there is a significantly increased militarisation of the Arctic region. The recent rise in military activities in the North has resulted in numerous regional deployments, patrols and other incidents in the maritime Arctic. In general, militarisation together with climate change are impacting scientific-commercial activities. Also, the absence of an adequate legal regime that may respond to climate change and interruption of civil activities by military exercises in a fast and effective way hampers international cooperation. This paper problematises various aspects of interaction between scientific-commercial activities and naval operations in the Arctic region.

Introduction

The Arctic region is characterised by vast distances, a harsh climate, limited infrastructure, communication challenges and sparse population, with economic activities traditionally focused on harvesting living marine resources. Due to climate change and development of the Arctic region as a result of the depletion of deposits of mineral resources in other parts of the world, new natural resources have become available for utilisation, and new Arctic areas are opening for commercial activities, including large-scale plans for oil and gas development, shipping, cruise tourism, and fisheries.

The Arctic is seen as an area of unique international cooperation. Despite many issues, cooperation continues as demonstrated, inter alia, by adoption of the Oslo Declaration Concerning the Prevention of Unregulated High Seas Fishing in the Central Arctic Ocean, the Polar Code, development of improved oil spill response coordination, search and rescue (SAR) interoperability, as well as by continued work of the Arctic Council. Many attribute the Arctic Council's successes in areas of soft security cooperation, sustainable development, conservation and others to the fact that military affairs are excluded from its official area of competence. As a matter of fact, Arctic nations have expressed and practiced a commitment to international law in the region, and consolidated efforts seem to be very important as it has given purpose and substance to the idea of the Arctic as a zone of peace and cooperation. The most relevant legal regime is the UN Convention on the Law of the Sea (UNCLOS), which governs all uses of the oceans and their reserves by those nations who have the sovereign right to explore and exploit marine resources.

There is a perception that the Arctic landscape is characterised by a high level of legal certainty and low potential for interstate conflicts. Among other things, there are areas of common interest which are many forms of cooperation: regional forums (like the Barents Euro-Arctic Council, the Nordic Council), research collaboration, international organisations and meetings (the Arctic Economic Council, the North Pacific Fisheries Commission (NPFC) and Arctic Frontiers), the system of SAR coordination in the Arctic, as well as transport development and investments in the region, agreements on the environmental protection, and cooperation in the fisheries sector, etc.

However, the Arctic constitutes the region which is transformed by environmental and geopolitical change. It has become the terrain for difficult international negotiations. The search for peaceful and sustainable governance of the Arctic is, in itself, a difficult objective to establish. Current negotiations at the UN, and among the nations within the polar circle, are still subject to intense debates at the Arctic Council. Energy security (for USA), financing a primary economy (for Russia), interest in fisheries (for Norway) and independence (for Greenland) are some of the issues on the table.

Nevertheless, with an increasing number of military exercises in the Arctic region we could witness absolutely a different relationship between the military and scientific-commercial activities than we would expect to see in "a peaceful region." Tensions are mounting despite the joint efforts to keep the north free of military activity. Both national and multinational military operations have extended to the sea in the Arctic region as well. They frequently involve, or have some impact, on merchant shipping, fishing and research vessels, and cruise ships. Naval operations take place worldwide, and it was documented 1276 accidents of the major navies of the world between 1945 and 1988, among them there were 184 collisions between naval vessels and civilian ships (Arkin & Handler, 1989). It is not easy to count submarine incidents that occur as soon as the information about them is usually hidden from the public. In order to reduce conflict of interest between the military and all kinds of shipping there is a system of warnings, and there are even some attempts to establish national organisations responsible for risk mitigation. However, this does not work effectively and leads to regular interruption of scientific-commercial activity. Surely, nations and the business community have a vested interest in ensuring that maritime operations are upheld to support the economy and development in a safe way. Today's absence of effective determination of the issue will probably remain the case for the next decade or two, unless there is a big effort to make a change, especially in the legal sphere.

Increasing military activity in the Arctic region

The changing climate and advancing technology have created a new environment and resultant impetus for increased activity in the northern waters. Due to these changes, the Arctic is rapidly becoming a new frontier of strategic importance. Nowadays, we can see the increased military presence and posturing in the High North. The Arctic is a region in which competition is reflected and exacerbated, and by visibly demonstrating military activities the intent to remain engaged and not cede military, economic, or political advantage is demonstrated.

According to Depledge, a number of Western-led military exercises have significantly grown in the European Arctic with participation of non-Arctic states since 2006 (Depledge, 2020). Interestingly, more than 20 European countries from beyond the Arctic region have been involved in at least one of these joint exercises on land and at sea during this period. Thus, in times of growing distrust between the East and the West, Nordic countries also seek to build their security in partnership with North Atlantic Treaty Organization (NATO) allies. As reported by TASS news agency, between 2013 and 2017 NATO and Russia had 56 and 26 military near-border exercises, respectively (TASS, 2017). The largest military exercise inside the Arctic Circle (since the 1980s) was planned to take place in Norway in 2022 – the Cold Response 2022 was expected to host about 40000 soldiers in the Ofoten Area, where USA, British and Dutch soldiers frequently drill Arctic warfare (Nilsen, 2021). The exercises train the North Atlantic Alliance forces to integrate, operate and communicate in the unique conditions of the High North, while organising complex and multi-domain operations.

Over the past decades, the Arctic nations have multiplied their military capabilities, as well as they have organised a number of special exercises for personnel in order to expose troops to different kinds of environments and gain cold-weather combat skills (Depledge, 2020). This fact is becoming harder to ignore, as the NATO uses the Arctic as a "battle practice ground" in increasing frequency. The US Air Force has stationed more fifth-generation fighter planes in Alaska than exist in any other location on the planet (Auersvald, 2020), and the US Navy reactivated the 2nd Fleet with responsibilities for the Arctic region (The Maritime Executive, 2019). In 2020, US Navy submarines ventured into the Arctic again for Ice Exercise to maintain readiness for sustained operations in the region's unique and challenging conditions (Business Insider, 2020). Also, the importance of the Arctic's geostrategic potential for the USA can be seen through the lens of what level of the US organisations have published the Arctic-focused documents: both the American Ministry of Defense and the American Coast Guard launched their Arctic strategies in 2019, followed by their own document released by the American Air Force and the American Navy in 2020. Moreover, the National Defense Authorization Act of 2021 provided the US Secretary of Defense the authority to assess, plan and establish a new Department of Defense (DOD) Regional Center, specifically oriented to the Arctic area. This Regional Center intends to build strong, sustainable, domestic and international networks of security leaders and promote and conduct focused research on Arctic security to advance DOD security priorities in the Arctic region and to "secure the Northern Flank" (The U.S. Department of Defense, 2021). Canada's defence policy is contained in the 2008 Canada First Defence Strategy, which includes plans for investments in the north until 2028 (The Canadian Department of National Defense, 2008). The NATO members constitute four states which border the Arctic Ocean (Canada, USA, Norway and Denmark), and they are further represented in key regional governance institutions such as the Arctic Council. Beyond these direct linkages, NATO has a long history of engagement in the region. As the Alliance's Northern Flank, the Arctic was a vital supply replenishment route during wartime and remains a direct sea line of communication and home to security infrastructure, including NATO's High North military presence (NATO, 2020).

The security landscape in the Arctic is deteriorating. Russia has also militarised the Arctic at a dizzying rate (Melino & Conley, 2020). Moscow sees the development of the Arctic Zone as a state priority, which is reflected in the document titled the "The strategy of development of the Arctic Zone of the Russian Federation and a national security plan through 2035" (The Kremlin, 2020). For example, the Kola Peninsula in the western part of the Russian Arctic seems to be one of the most concentrated military areas on Earth. Russia is expanding the visibility of its maritime presence both in the Pacific and the Atlantic sectors in the North. Moreover, parts of the armed forces have become Arctic-capable and Russia's Northern Fleet has been repurposed to operate a hardened, Arctic-capable, multi-layered air defence and sea denial system. The country seeks to achieve three objectives: enhance economic development, enhance homeland defence and create a staging ground to project power. What is on Russia's agenda in the North: refurbished airfields, investments in SAR along the Northern Sea Route, and construction of radar stations to improve awareness in the air and maritime domains. Here is not just a posturing but also ensuring national security and protecting the northern border of the country. However, the 2013 Arctic Strategy contained no references to the military activities of other states; quite the opposite, the 2035 Arctic Strategy mentioned "existing and projected" military threats to Russia's national security interests in the Arctic (The Kremlin, 2020).

A fuller picture emerges when China and Russia cooperate in the northern frontiers, where the two countries' economic interests have been converging. The development of the China–Russia

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comprehensive strategic partnership is shown through a series of binational naval manoeuvres. In 2017, Sino-Russian naval exercises took place in the Baltic Sea – a very much controversial near-Arctic location (Higgins, 2017). In the Bering Sea, China demonstrates capabilities in power projection and expresses its interest in engagement in the Arctic issues. In 2015, the People's Liberation Army Navy (PLAN) fleet of five ships crossed into US territorial waters within 12 nautical miles of the Aleutian Islands in the North Pacific (LaGrone, 2015). In 2021, the Chinese vessels conducted military and surveillance operations during their deployment to the Bering Sea and North Pacific region (Greenwood, 2021).

It is necessary to notice that often exercises take place in or around the same locations in the Arctic seas, which may lead to potential incidents to escalate. For instance, during Trident Juncture 2018, a NATO-led exercise in southern Norway, the Russian Northern Fleet suddenly designed a Notice to Airmen (NOTAM), a closure area with the purpose to conduct an exercise, just outside the Norwegian territorial waters. Since then, the Russian navy has made similar NOTAM areas for missile firings in the Norwegian Sea (Nilsen, 2021).

How do civilian vessels receive warnings about the upcoming military exercises in the area? SafetyNet is an international automatic satellite-based service for the dissemination of Maritime Safety Information (MSI), navigational and meteorological warnings, meteorological forecasts, SAR information and other urgent safety-critical messages such as defects, dredging, fishing zones, and military exercises to bridge crews on ships. By messages on NAVTEX, the international maritime navigational telex system, countries or/and alliances say they would carry out shooting exercises at sea in specified periods. Vessels are reminded to pay special attention to the above areas and avoid entry into and keep clear of these areas during passage planning. It is mandatory under SOLAS (International Convention for the Safety of Life at Sea, the SOLAS Convention) requirements for ships to carry NAVTEX and either Inmarsat C or mini-C SafetyNet receivers, depending on through which area a ship is navigating, in order to receive safety information. In 2011, the International Maritime Organization, the International Meteorological Organization, and the International Hydrological Organization introduced the World-Wide Navigational Warning System (WWNWS) into Arctic waters (Wingrove, 2011). Navigational warnings are categorised by their location, and Arctic navigational warnings are produced as a HYDROARC product. Norway is responsible for broadcasting to Navareas XIX, the Russian Federation looks after areas XX and XXI, while Canada manages areas XVII and XVIII. Even coverage is limited over the Arctic region by satellites, navigable waters on the Northeast and Northwest Passages are quite good provided by MSI. The warnings about the upcoming military drills may be for different periods of time, usually within a week or a month. Unfortunately, often they are given late, or even not received by civilian ships for operational reasons.

The legal question

The Arctic Ocean (and the region itself) is subject to a number of governance systems. Military drills may pose a challenge to various activities in the Arctic region, including fisheries, cruise tourism and others. All nations have an absolute right under international law to conduct military activities beyond the territorial sea of another nation, that is why the Arctic might be considered as a "future military playground" for anyone. Also, there is a stipulation in maritime law that allows a warship to cross into another country's maritime territory legally. When it comes to the Arctic region, all countries – allies and neighbours – must be informed about military exercises in accordance with international standards and agreements. Additionally, under the Vienna Document, member states in the Organization for Security and Cooperation in Europe (OSCE) invite each other to observe military exercises taking place in the European Arctic (OSCE, 2021).

The UNCLOS is a comprehensive treaty that creates a legal regime governing the peaceful use of the ocean and its resources (UNCLOS, 1982). The Convention provides recommendations on different maritime matters such as environmental protection, pollution and resources rights. However, it does not clearly cover issues concerning military operations and the use of force in the oceans, while the UNCLOS Article 88 requires that "the high seas shall be reserved for peaceful purposes." It is also important to recognise that UNCLOS does place some restraints on military activities at sea. However, none of these limitations apply in the exclusive economic zones (EEZs); thus, it means that during military operations within EEZs other types of vessels seem to be restricted. The question of military activities in another state's EEZ remains controversial. Bilateral or regional arrangements seem to be helpful to clarify at least some military presence in the EEZ: the 1989 Agreement and Joint Statement bring the USA and USSR into accord on the matter, explicitly affirming the existence of a right of innocent passage for warships without prior authorisation or notification (The Union of Soviet Socialist Republics-United States, 1989).

According to the Convention, civilian ships are allowed to navigate inside EEZ only with prior agreement or approval. Also, the UNCLOS Articles 40 and 54 prohibit exploration activities for marine scientific research and hydrographic survey ships engaged in transit passage, including archipelagic sea lanes passage (UNCLOS, 1982). It all makes operation of research vessels challenging in the Arctic waters in the context of ongoing military exercises. However, there are broad principles of freedom of the high seas and navigation rights within specific situations that permit coastal States to impose some limitations on freedom of navigation! Most nations agreed with the position advocated by the major maritime powers, that "military operations, exercises and activities have always been regarded as internationally lawful uses of the sea. The right to conduct such activities will continue to be enjoyed by all States in the exclusive economic zone" (The 3rd UN Conference on the Law of the Sea, 1982). The UNCLOS Articles 55, 56, 58 and 86 – all of them accommodate the various competing interests of coastal States and user States in the EEZ without diminishing freedom of navigation and other internationally lawful uses of the sea.

The UNCLOS provides general principles for the conduct of marine scientific research, in particular Article 240, and a regime to obtain the consent of the coastal State. Among the principles that should be applied, the following is mentioned: "marine scientific research shall not unjustifiably interfere with other legitimate uses of the sea compatible with this Convention and shall be duly respected in the course of such uses," including the obligation to retrieve research equipment (Woker et al., 2020). Marine scientific research, naval surveillance, and oil and gas commercial surveys – each of these activities is governed differently under international law. The UNCLOS requires governments to seek permission at least six months in advance for marine scientific research in another state's EEZ or continental shelf.

Naval research and surveillance is not clearly regulated by the Convention though: some countries agree that there are no

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restrictions on the right to conduct military surveys within the EEZs of other states, some claim the right to prohibit foreign military activities within their EEZs. Intentionally, oil and gas commercial marine surveys within the EEZ or on the continental shelf must have the coastal state's permission.

Regarding other types of vessels, the UNCLOS Article 17 states that ships of all States, whether coastal or land-locked, enjoy the right of innocent passage through the territorial sea, but nothing is mentioned about their rights when military exercises take place. Additionally, Article 24 of the Convention says that the coastal State shall not "hamper the innocent passage of foreign ships through the territorial sea except in accordance with this Convention" and "discriminate in form or in fact against the ships of any State or against ships carrying cargoes to, from or on behalf of any State."

Interruption of science-commercial activities by military operations in the Arctic

History of relations between the military and scientific-commercial activities in the Arctic

Since the early twentieth century, nations have conducted polar military operations and military-supported scientific expeditions. Civilian institutions with military affiliations emerged to carry out reconnaissance surveys in the natural and social sciences, whereas military agencies established advanced research centres, constructed complex defence networks and organised numerous military exercises in the region. During the Cold War, a significant part of research in the Arctic had "military" involvement due to the strategic importance of the region as an important area of forward deployment. Geopolitical environment dictated new terms, where "the secrecy accompanying military scientific research resulted in closing vast areas and refusal of access to scientists, and a large proportion of the research remained classified for reasons of national security" (Takei, 2013). For the Soviet Union, the Arctic was seen as a region with economic resources and the Northern Sea Route was considered as a transportation way with huge perspectives; thus, the country invested a lot in the development of the region covering it with a network of research stations and organising scientific work there. The USA did not pay significant attention to the Arctic until the outbreak of World War II, when military commanders quickly grasped the strategic importance of this region. As East–West tensions rose after the World War II, the US recognised the Arctic as an arena of strategic competition. The USA and Canada launched a multi-year project to build a series of radar stations across their territories in the High Arctic. Finished in 1957, the Distant Early Warning Line, consisted of dozens of installations – during its construction a lot of attention was paid to permafrost research done by the Arctic Research Laboratory L (later the Naval Arctic Research Laboratory) (Treadwell & Holshouser, 2019). However, it does not matter the Western or the Eastern powers, the topic of civilian–military relations remains of critical importance in the contemporary polar security regime. Scientific and technological advances have driven the effective operations on land, at sea and in the air in the Arctic region.

Developments in military technology during World War II, combined with the location of the Arctic Ocean between the superpowers, made the region a suitable deployment area for strategic, high-tech weapon systems. During the course of the World War II, however, a revolution took place: there was a turning point in the relationship of the military to science, one that was initiated and sustained not so much by the military as by science. The civilian National Defense Research Committee (NDRC) in the USA saw to it that by the end of the war pre-war disinterest was largely reversed. Military stimulation of science and technology became institutionalised, supported by government funding directed not only to service labs but also to industrial laboratories and academic institutions (Williams, 2010). In the 1950s and 1960s, Arctic airspace served as a deployment area and as an attack route for strategic bombers. This deployment pattern was further accelerated in the 1970s with the deployment of new generations of intercontinental ballistic missiles (Østreng, 2010).

Indisputably, successful military operations depend on extended knowledge about weather conditions at high latitudes. When analysing the history of wars, it is easy to notice the importance of accurate forecasts made by meteorologists in the High North. For example, weather forecasting for the German army improved, when in October 1941 a group of Luftwaffe observers under the direction of Erich Etenne were accommodated on Spitsbergen. Throughout World War II, Soviet meteorological stations operated on Cape Zhelaniya on Novaya Zemlya, Blagopoluchiya Bay and Tikhaya Bay on Franz Josef Land. Interestingly, most countries stopped sharing meteorological data in 1939, when the World War II began. Before this, Britain, Germany and the Soviet Union exchanged weather reports with Canada and other countries. American scientists and naval officers gathered meteorological and oceanographic data gained from the free flow of information from the foreign sources (Hamblin, 2011). Data concerning approaching cyclones, low-pressure and high-pressure systems, and wind became a closely guarded state secret, since weather conditions could facilitate or hamper warfare involving aircraft, warships and ground forces (Menshikova, 2021).

Additionally, research vessels purportedly involved in scientific exploration can also use their instruments for naval reconnaissance, gathering intelligence on foreign military facilities and vessels in the high latitudes as well. It is believed that civilian ships could be used to bring in supplies during combat operations.

In support of military activity, scientific research became important to Canada's national and international security posture in the Cold War Arctic in 1947–1954. Joint military and scientific reconnaissance was needed to define the problems which faced man in the Arctic environment – from everyday activities to basics of tactical deployment, navigation, re-supply and other related issues (Pennie, 1966). Prior to the mid-1950s missile threat, the Canadian Defense Research Board facilitated Arctic research in areas primarily concerned with defence of land and sea. In aiding the military, the Board conducted Arctic warfare research concerned with human living and fighting in northern environments (Wiseman, 2015).

During the Cold War, the geopolitical situation in the Arctic region was absorbed by the overall bipolar tension between the Soviet Union and the USA. Thus, US Coast Guard icebreakers conducted several scientific missions to demonstrate freedom of navigation through straits claimed by the Soviet Union – before the days of the UNCLOS. In the late 1970s, the Arctic region was given a great deal of attention as a result of the exploitation of oil and gas resources supported by the technological boom in the North. Also, that was an important time in the history of atomic-era human subject research. For example, one of the crucial sites for experiments on acclimatisation and survival, as well as training was the Arctic Aeromedical Laboratory, based at Ladd Air Force Base in Fairbanks, the US State of Alaska. These studies together with experimental detonation of nuclear weapons, including at

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various test sites, including Alaska, affected the lands of Indigenous peoples (Farish, 2013). The Polar-class icebreakers, however, as military vessels, serve a variety of purposes in the US Arctic, and the support of scientific research is not the sole mission of US Coast Guard vessels. Using submarines for collecting underway profile data on a variety of parameters, such as bathymetry and under-ice morphology, has several significant limitations. For that reason, submarines are rarely used for scientific purposes in the Arctic region.

In Russia, the opening of the NSR resulted in a complex civil–military build-up along the Arctic Zone of the country. The Northern Sea Route became one of the main transportation routes for the Lend-Lease programme during World War II. Use of existing Soviet infrastructure and building of new military bases from scratch along the transport route have provided Russia with SAR capabilities, as well as scientific and meteorological research bases. Radio-electronic communications, satellites and surveillance drones serve the Northern Fleet and the energy companies in high latitudes.

Another example of successful cooperation on the civil–military relations is the Declaration on Arctic Military Environmental Cooperation (AMEC) signed by Russia, Norway and the USA in 1996. This forum was designed with the purpose to establish effective communication on military–environmental interactions and sustainable utilisation of nuclear fuel used by Russia's Northern Fleet as the Cold War legacy (Sawhill, 2000).

Military activities supported by scientific exploration in the north have increased in quantity, scope and priority since the end of the Cold War's superpower rivalry. Nowadays, the Arctic states seek to optimise civilian–military cooperation in science and technology. For example, the highly efficient partnership between the US National Science Foundation (NSF) and the US Air National Guard (ANG) in Greenland provides transports for scientists and their equipment from the continental USA to research bases in Greenland, and sometimes even on to the ice sheet. Using navy submarines for collecting underway profile data on a variety of parameters, such as bathymetry and under-ice morphology, has several significant limitations. For that reason, submarines are rarely used for scientific purposes in the Arctic region. Earth-orbiting spacecraft, manned or unmanned, provide a powerful and unique tool for large-area sensing and real-time-series measurements, especially in high latitudes. Satellites can provide a synoptic view of several oceanographic properties and accurately forecast weather, which are vital to air and naval operations in the Arctic ocean.

Partly, the idea of reducing conflict between military and shipping is covered by the Naval Cooperation and Guidance for Shipping (NCAGS), which enhances safety and security on sea specifically for merchant vessels. This naval doctrine is used worldwide, during times of peace, tension, crisis and war. The NCAGS is often a joint effort between countries, especially the member states of NATO (The NATO Shipping Centre, 2021). Deconfliction, or reduced interference between commercial shipping and military operations, is supposed to provide support to military commanders and civilian shipping in peacetime, tension, crisis and conflict.

Military exercises vs. science activities

Under global warming due to anthropogenic increases in atmospheric carbon dioxide concentration, the reduction of sea ice extent in the Arctic Ocean is continuing. Owing to this change, the potential for research activities and regular ship navigation through the Arctic Ocean has increased. The Northern Sea Route and the Arctic Ocean, among other locations, represent the most unexplored on Earth. Apart from ice conditions, unknown oceanographic features such as underwater mounds and currents are posing additional threats to shipping. Thus, surveys are expected to be carried out in waters along the Northern Sea Route to fill gaps in current hydrographic coverage in the passage, as long as modern bathymetric data is still sparse or non-existent in certain locations. In 2020, research work on the transportation route was carried out with a rising rate: 27 vessels and 13 companies were involved in research work covering all the seas of the Northern Sea Route and the Arctic region in general (Analysis of Shipping Traffic in the NSR Waters in 2020, 2021).

There is no mutual mistrust of scientists and the military; quite the reverse, the obvious military's role is seen in stimulating research and technology. However, when it comes to pursuing different aims, then the drifting forces behind the activities are at variance. It is not very frequently discussed such issues as growing military activity in the region that stimulates (and might do in the future) conflicts of interest that can contribute to science-military discord. Of note, the Arctic field season for scientists is quite short; thus, postponed expeditions may result in significant changes in premeditated working schedule. Often offshore scientific expeditions are dependent on phytoplankton blooms, breeding seasons of marine mammals or other natural events. Given all the circumstances, research teams have to change their plans and adapt to new conditions, which result in missing unique data, losing time and contributing to shrinking budgets for the current projects. Also, many researchers work in a very narrow time frame to test new methods, measure parameters and collect samples in the Arctic.

Honestly, it is almost impossible to apply for research vessel permits to sail in waters closed off for missile shootings or trials at a certain time. For instance, large areas in the Barents and Kara Seas were closed off for missiles shooting in 2017 (Nilsen, 2017). And in 2019, infamous accident in the White Sea outside the Nenoksa test site which happened on a launch pad during the salvage work of a crashed Burevestnik missile – as a result of this event, five experts were killed after the explosion, which also caused a spike in radiation over the site and another larger area marked forbidden for navigation (Lewis, 2019). Such exercises or trials significantly shorten field research opportunities at sea.

Military exercises vs. recreational activities

Cruise tourism is another commercial venture gaining traction in the Arctic region. Mounting tensions, and subsequently militarisation of the Arctic, circle around recreational activities as well. In recent years as the region has become more accessible, more tourists have turned their attention to the North. Cruise vessels operating in the polar waters are usually small with few passengers on board; however, a surge in Arctic tourism is bringing ever bigger cruise ships to the formerly isolated, ice-bound region. Until the year 2020, when, by June, more than 50% of Arctic cruise ships had been cancelled or postponed until 2021 due to the COVID-19 pandemic (Halpern, 2020); the cruise ship industry was rapidly expanding to meet demand in the Arctic. In 2016, the passenger liner Crystal Serenity sailed along the Northwest Passage (NWP) from Vancouver to New York City. According to Nilsen (2018), by 2022 it is anticipated that about 30 new, specially designed ships will be operational in addition to the 80 (in

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2018) already sailing in the Arctic waters. The development of the cruise industry is regarded as controversial as military manoeuvres are increasing in the Arctic as well.

There have been mounting tensions between the military and tour operators observers in the northern waters. Thus, a Norwegian tour operator Hurtigruten applied for permission to enter Russian waters to sail near the Franz Josef Land Archipelago in 2019. All documents were prepared in advance, and the cruises had been announced. Murmansk was supposed to be the entry and exit port to Russia for Hurtigruten's explorer ship «*Spitsbergen*» on two voyages between Tromsø and Franz Josef Land in August and September 2019. Later, the company was informed that the long-time planned – and highly profiled – tours to the Russian Arctic did not get permission from Russian authorities. The official version was a low ice-class reason to ban Hurtigruten from Franz Josef Land, because Hurtigruten's «*MS Spitsbergen*" holds ice-class 1C (Nilsen, 2019a). The «*MS Spitsbergen*» voyages to Franz Josef Land were cancelled at short notice due to Russia refusing sailing permits, and by coincidence the Russian missile tests took place in the Barents area at the same time as the planned voyages (Nilsen, 2019b).

As another pressing issue, military bases/activities in the Arctic greatly restrict access to natural landmarks. Thus, Wrangel Island is located in the Arctic Ocean between the Chukchi Sea and East Siberian Sea, in far northern east Russia. This is a UNESCO World Heritage Site, and most of the island is a nature reserve. Here is Russia's Ushakovskiy military base in the southern part of the island, allowing no access for civil ships to the area. What does it mean for tour operators (national and foreign vessels)? It means that visits to Wrangel Island are subject to special authorisation. Moreover, cruise ships are not allowed to pass by the Ushakovskiy military base and have to cover longer distances during a circumnavigation of Wrangel Island. Thus, military presence makes these unique locations less attractive for tour operators.

Military exercises vs. fisheries

Military naval operations are known to contribute to deterring and repressing acts of piracy and armed robbery at sea, thus helping fishing boats avoid being victims (Atuna, 2009). Additionally, effective civil–military cooperation to combat Illegal, Unreported and Unregulated Fishing is distinguished in different parts of the world (Yozell, 2018).

In the Arctic, however, the interplay of the military and fisheries emerges in a completely different form – in the current absence of maritime piracy, military operations are most likely a disturbance for fishing boats rather than an actual help. It is a general practice, no matter where exercises take place, but in the northern waters with rich commercial fish stocks it may have a direct negative effect on those dependent on biological resources. Also, climate change is resulting in shifts in natural communities and leading to the migration of boreal fish species towards the northern seas. In the future, this environmental crisis will not diminish the role of intensified competition between fisheries companies that may cause stress for the environment. However, a lack of interference between fisheries and military is not guaranteed in the region. Fishing stocks have already declined in areas that are commercially fished, and many nations are scrambling for new locations. As the Arctic warms and ice declines, it exposes new fishing areas to exploit. Fish migration periods, weather, tides and other conditions affect species behaviour – planning the best times to fish is essential for Indigenous peoples and fisheries companies. Danger zones covering extensive areas at sea are established during the military exercises, thus fishing vessels risk losing several days at sea and face subsequent additional costs.

Fishing vessels contribute significantly to ship traffic in the northern waters. According to data on vessel operations in the Arctic in 2015–2017, fishing vessels, primarily in the Barents, Bering, and Norwegian Seas, surpassed operations of all other vessel types (excluding military ships) and comprised about one-half of all voyages recorded each year. Fishing vessels also accounted for more trips than any other vessel type in the Greenland Sea, Davis Strait and Baffin Bay (Silber & Adams, 2019).

Additionally, military naval operations are the potential impacts on the essential fish habitats in the North. According to the studies carried out in the North Pacific, such activities as missile, gunnery, bombing, and electronic combat exercises, anti-submarine warfare tracking operations; mine countermeasures training, naval special warfare training, and intelligence, surveillance, and reconnaissance activities may adversely affect water column, substrate and biogenic habitats, as well as bring contaminants in the environment (explosives and explosives byproducts) (The U.S. Department of the Navy, 2015).

Naval operations interrupt fishing with increasing frequency. According to Fiskebåt, Russian military exercises impact Norwegian fishing vessels in the Norwegian Sea and the Barents Sea increasingly often (Bye, 2021). Experts say that the extent as well as intensity of Russian military exercises has increased over the past few years. The affected areas in which fishing activities take place are the Norwegian economic zone as well as the fisheries protection zone around Svalbard. In August 2021, Russian firing exercises were conducted in the so-called Loophole area, claiming a big area affecting several Norwegian as well as foreign shrimp trawlers. In September 2021, drills were conducted with danger areas defined both in the Russian economic zone and the Norwegian economic zone, as well as the fisheries protection zone, that affected many vessels. When crossing the national economic zones, Norwegian vessels have to cover significant distances and follow extensive procedures for entering and leaving the zone. Additionally, warnings are provided on short notice and with no clear instructions on distances required from the exercise areas. Under the circumstances, the room for manoeuvring is very limited, which leads to many additional challenges for fishing companies in the Arctic waters.

Military exercises vs. commercial shipping

As melting sea ice opens the Arctic to navigation, more commercial ships are sailing in the northern waters. Not only large vessels (cargo, container ships and tankers) travel between major ports, but also ferry service for passengers and vehicles between coastal communities work in the area. The NSR, which runs along the north coast of Russia and within its EEZ, is rapidly becoming ice-free for longer times during the year. The NWP in Canada is an alternative route that runs along the northern coast of North America from the Bering Strait to Europe. Like the NSR, the NWP is becoming economically viable as its sea ice melts. The first commercial ship to transit the NWP was the SS "Manhattan," an oil tanker testing to see if the route would work for carrying Alaskan crude out of Point Barrow, in 1969. In 2013, the first commercial bulk carrier MS Nordic Orion transited the NWP with a cargo of coking coal from Vancouver to the Finnish port of Pori (Garamone, 2020).

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Ship traffic is increasing in the Arctic, and countries are becoming quite interested in the exploration of opening maritime routes. Over the last years, the NSR has been considered mainly as a domestic transport system, which is used to deliver vital goods to the remote regions in the Russian Arctic and Far East, also to contribute to the development of the resource potential of the northern areas. Accelerating the growth of shipping along the Northern Sea Route remains a key priority for Russia as the country declares a target of 80 million tons of cargo travelling along the route by the end of 2024 (PortNews, 2021). With the growth in number of liquified natural gas (LNG) carriers and tankers, the NSR has rapid exponential increase in annual cargoes, from 10.7 million tons in 2017 to 19.7 million tons in 2018, and 31.5 million tons in 2019 (Brigham, 2021). Some experts express doubts about the future of the NSR and argue that it is unlikely that it can be a regular and reliable trans-Arctic trade route between the Atlantic and Pacific oceans for container shipping. By contrast, Russian shipping pundits note that the NSR could become an effective "seasonal supplement" to the marine traffic through the Suez and Panama Canals (Moscow Times, 2013). Scenario calculations show that the speed and cost of goods delivery between Asia and Europe using the NSR can be reduced by 30%, depending on parameters (Eliseev & Naumova, 2021). One of the options for the development of international transit along the NSR would be a construction of a domestic Arctic container fleet, which could be used for the transportation of goods independent of international transport companies (Eliseev & Naumova, 2019). Notably, interest in development of the economic relations and utilisation of the transit capacity of the NSR is shown by Asian countries. A seasonal NSR/SCR (Suez Canal Route)-combined shipping service linking Asia and Europe, while using the Northern Sea Route during the economical navigable window and the traditional Suez Canal Route at other times, is considered as economically feasible for the transit freight traffic (Xu et.al., 2018). Initiating the Polar Silk Road (PSR), China aims at improvement of navigational safety and passability of the NSR and other major lanes in the Arctic seas (Gao & Erokhin, 2020). South Korean investors are interested in building ships and participating in the creation and operation of an Arctic container line (PortNews, 2021). Other non-Arctic players, such as the UAE-based DP World, one of the global leaders in logistics, are also interested in the development and operation of cargo services along the NSR (Khorrami & Devyatkin, 2021).

Interestingly, the opening of the NWP has nearly the same implications as the NSR. However, Canada's Arctic and Northern Policy Framework does not focus specifically on the development of the NWP. At the same time, international legal questions still remain unclear about who has control over the transport route along the northern coast of North America. Nowadays, shipping along the NWP is still risky. In 2014, the cargo ship "Nunavik " made first ever unescorted trip from Canada to China (Oskin, 2014). With retreating sea ice, the NWP could become an economically viable shipping route, with some possible implications for other activities in the region. In 2019, US Navy secretary Richard Spencer said that the Navy planned to send vessels through the Arctic, and specifically through the NWP (Pincus, 2019). Also, possible interest in developing a strategic port in the Bering Sea region was mentioned there. Taking into account Canada's claims regarding the NWP, all these activities organised by the US Navy may challenge the relations between Canada and the USA in the future. Creation of the Article 234 of the UNCLOS, with Section 8 on «ice-covered areas», was a solid attempt to get nations to the negotiation table among Canada, the USA and the USSR. With absence of clear descriptions of legal status of some Arctic waters, the jurisdictional claims of Canada and of the USSR became possible, and they created the environment for intense discussions. Using terms of the EEZs and the territorial sea, Canada and Russia (with fast growing interest) may use international rules for the marine Arctic according to their national interests.

Massive military exercises at sea result in many delays and other challenges for civilian vessels. As a recorded case, the flagship NATO exercise Trident Juncture 2018 took place in Norway and the surrounding areas of the North Atlantic and the Baltic Sea – quite a big defined water area used for shipping and fishing (FAO, 2021). A live field exercise, including sea activity, lasted from 25 October to 7 November 2018 in the area. Media attention was caught by several incident reports of environmental damage and complaints, as well as traffic collisions between military and civilian vehicles. Thus, the collision involving the Norwegian frigate "Helge Ingstad" and the crude oil tanker "Sola TS" outside the Sture terminal in Norway (NavalToday, 2018). The investigation showed that the crew on the frigate "Helge Ingstad" did not realise that they were on collision course until it was too late, so the Navy was the main culprit (Schuler, 2019). Numerous collisions of navy ships with civilian vessels during naval operations are well known across the globe.

Implications for cooperation in the Arctic

In the Arctic, different countries organise military training with varying frequency which affect local economies and activities. Most of the challenges in the Arctic region are cross-sectoral, and they require close cooperation between the military and the civilian sectors. As we know from history, the Military–Industrial–Scientific Partnership serves well during wars and conflict periods. Military operations at sea will frequently involve, or have some impact, on commercial activities in the Arctic region. Also, an increase in military activity carries the risk of incidents and complicates dialogue and confidence building between industries. International cooperation can minimise delays and enhance the safety and security of shipping and activities when transiting through maritime areas of operation. The trend for militarisation affects the security situation in the Arctic as Russia and the US-led West sees the need to increase their military presence in the region and to invest in new defence capabilities. It is clear that for the great powers the Arctic region is part of wider strategic interests, and it thus constitutes an integral part of their military planning. However, it may further impact scientific-commercial activities with implications for effective cooperation in the North.

A lack of Arctic security dialogue at the Arctic Council makes the relations challenging as well. Today's Arctic cooperation can be strongly attributed to the effectiveness of the Arctic Council, a very important governance forum; however, its charter mandates no discussion of military-strategic affairs. The essential point to remember is that the limits of Arctic stability without collective security management may be reaching an end. The Arctic Council would be a great platform for dialogue between military representatives of the member states to mitigate risks of military escalation in the region and further interruption of civil activities in the region. Annual meetings of the chiefs of the general staffs of the Arctic Council's member states took place in maintaining regional security before, but since 2014 these meetings have been suspended. The Arctic Security Forces Roundtable (ASFR) is currently the only military forum focused on the Arctic region's security issues, as well as the full range of military capabilities and

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cooperation. It is highly important to mention that Russia has not participated in the annual meetings since 2014 as Western sanctions preclude its participation. Without a dialogue between the major powers, it would be extremely challenging to end up with a balance between the military and civil activities in a rapidly changing North.

It is also important to address why security cooperation is highly needed in the Arctic region. Among the answers are the following: the surge in navigable waters, the race for mineral and biological resources, a bid for supremacy, competition for trading routes, and others. Also, it is required to establish alliances and partnerships to start the dialogue between the opposing states and to deescalate the situation with a military buildup in the Arctic region.

What are the potential drivers for change in the security landscape in the Arctic region? First, finding the right balance of military powers would be vital for the region – through dialogue and cooperation. As an option it would be to expand the Arctic Council's mandate to include an ability to address military security issues. Second, establishment of national organisations which are responsible for reducing conflict between military and science-commercial activities in the northern waters. Third, working on effective policies that would take into consideration interests of fisheries, science, shipping and tourism in the relevant areas. Additionally, limiting the extent of danger areas during military exercises as well as providing warnings very much in advance should be considered as a mandatory action.

Conclusion

The future of the Arctic as a peaceful region open to shipping, responsible resource extraction, and security for its nations is not assured. However, the Arctic can and must be the site of a new dynamic of collective agreement for the establishment of peaceful and sustainable governance of its resources, based on the principle of general interest, and justified by the importance of the region for everyone. In order to achieve this goal, policymakers and nations interested in the Arctic region should minimise interruption of scientific-commercial activities by military operations. Such a new Arctic security policy covering aspects of use of military ships in the Arctic Ocean could become more important to all the interested nations. No doubt, ineffective policies lay the groundwork for competition rather than unite the parties in the Arctic region. It is essential to create clear and effective policies in place and transit to a new governance complex to manage the future risks of impacting businesses, research and other civil activities by naval operations with implications for international cooperation. Supporting a military–defence balance and cooperating with the science and commercial sector effectively is the key to success for all nations in the Arctic region.

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