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Bolstering the Bastion: The Changing Pattern of Russia's Military Exercises in the High North

RESEARCH ARTICLE

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ABSTRACT

Between 2015 and 2022, Russia conducted a number of naval and air exercises, including live-fire drills, in the international waters and airspace on NATO's northern flank. Some of this activity took place in the Norwegian Sea, well south of the Arctic Circle, and often coincided in time and space with NATO exercises or U.S. deployments to the region. This indicated that the activity was largely meant to serve the purpose of political signaling. Drawing on recent empirical data, including Russian Notice to Airmen (NOTAM) messages issued after February 24, 2022, this study finds that the pattern of Russia's military exercise activity in the High North has changed significantly since the start of Russia's full-scale invasion of Ukraine. Almost all Russian NOTAM events in the High North now take place in the Barents Sea, rather than in the Norwegian Sea. The primary purpose of the activity now seems to be to bolster the Northern Fleet's bastion defense, rather than to send political signals. Exploring the Russian exercise activity in greater detail, we discuss four hypotheses that may explain the "post-invasion" pattern change: (1) Russia may have realized that its previous signaling events in the Norwegian Sea had proven futile; (2) pushback from civilian actors and foreign governments; (3) lack of conventional capacity due to military losses suffered in Ukraine; and (4) an increased Russian emphasis on the need to boost nuclear deterrence.

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INTRODUCTION

In the years prior to the start of Russia's full-scale invasion of Ukraine, Russia's military exercises in the High North were commonly understood as acts of politically motivated and coercive signaling. Naval deployments and live-fire exercises announced by the Russian military in the European Arctic were often perceived as acts aimed at "compelling a change in patterns of specific U.S. and allied behavior" (Charap et al., 2022, p. viii) or "communicating Russia's displeasure with the occasional presence of United States and other NATO forces on or outside Norway's territory" (Åtland, Nilsen & Pedersen, 2022, p. 63).

The dramatic escalation of Russia's war in Ukraine in February 2022 calls for new and updated analyses of Russia's military behavior in the international waters and airspace on NATO's northern flank. The purpose of this article is to compare the post-invasion pattern of Russian activity in the High North to that of the preceding years, and to discuss how and why the activity has changed in the aftermath of Putin's full-scale attack on Ukraine. Of particular interest in this regard is the question of whether Russia's exercises in the High North are still to be understood (mainly) as acts of external signaling and geopolitical messaging, or whether they now (mainly) serve the purpose of bolstering Russia's bastion defense in the Barents Sea.

Russia's war of aggression against Ukraine, which started with the Russian occupation and annexation of Crimea in February–March 2014 and continued with the seizure of eastern Donbas in April 2014, entered a new and significantly more dramatic phase in February 2022. Launching a full-scale invasion of Europe's second largest state, Russia initiated what soon came to be known as "the largest and deadliest military conflict in Europe since the end of World War II" (Plokhy, 2023, p. 294). The Russian invasion of Ukraine led to far-reaching, and presumably long-lasting, changes in the European and global security environment.

In the northern part of Europe, the East-West balance of forces has changed in a way that looks increasingly disadvantageous for Russia (Friis & Tamnes, 2024, p. 813). Finland and Sweden have become members of NATO. This is likely to turn the Nordic-Baltic area into a more integrated defense and deterrence space, strengthening NATO's collective security. Russia's ground forces – including those based on the Kola Peninsula – have been decimated on the battlefield in Ukraine (Strauss & Wegge, 2024, p. 3). Most likely, it will take time for these units to regain their former strength.

Given the importance that both NATO and Russia attach to the maritime spaces of the High North, including the Norwegian and Barents Seas, it is necessary to regularly evaluate the nature of Russia's military exercise activity in the region. Any observed changes in the scope, nature, or geographic location of the activity, beyond what may be described as "natural variation", could be indicative of noteworthy changes in Russia's strategic priorities.

The geographical focus area of this study, which will be elaborated on below, can be defined by latitude and longitude lines: We will be looking at a maritime area in the European High North, between 60° and 85° north and between 0° and 38° east (see Figure 1). This area may be slightly larger than the area typically referred to as "NATO's Northern Flank" (see for instance Wegge, 2022, p. 97), but it includes maritime spaces that have traditionally played – and continue to play – an important role in Norwegian and allied security policy and defense planning.

The Barents and Norwegian Seas also play an important role in Russia's bastion defense strategy. In order to ensure the safe operation of the Northern Fleet's ballistic missile submarines in the inner part of the bastion, that is, in the Barents Sea (see Figure 1), Russia must be able to control the maritime space (and airspace) east of the gap between North Cape and Bear Island (Halsne, 2022, p. 34). In the event of a conflict with NATO, Russia may also want to conduct sea denial and maritime interdiction operations west and south of this line, all the way to the Greenland–Iceland–UK (GIUK) gap (Boulègue, 2019, p. 7; Pincus, 2020, p. 53). As an operational environment for naval forces, the Norwegian Sea is more difficult to control than the Barents, particularly when it comes to the subsurface domain. The Barents Sea is a relatively shallow marginal sea of the Arctic Ocean, with an average depth of 230 meters. The Norwegian Sea, by comparison, has an average depth of around 1800 meters.

Drawing on insights from our previous study of Russia's exercise activity and signaling behavior in the High North in the period between 2015 and 2022 (Åtland, Nilsen & Pedersen, 2022), this study seeks to shed light on the post-invasion pattern of Russia's exercise activity in the

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Norwegian Sea, the Barents Sea, and the European part of the Arctic Ocean. It will also discuss factors that may explain any observed changes. As with the previous study, this study will draw on Russian "Notice to Airmen" (NOTAM) data from the period of research.

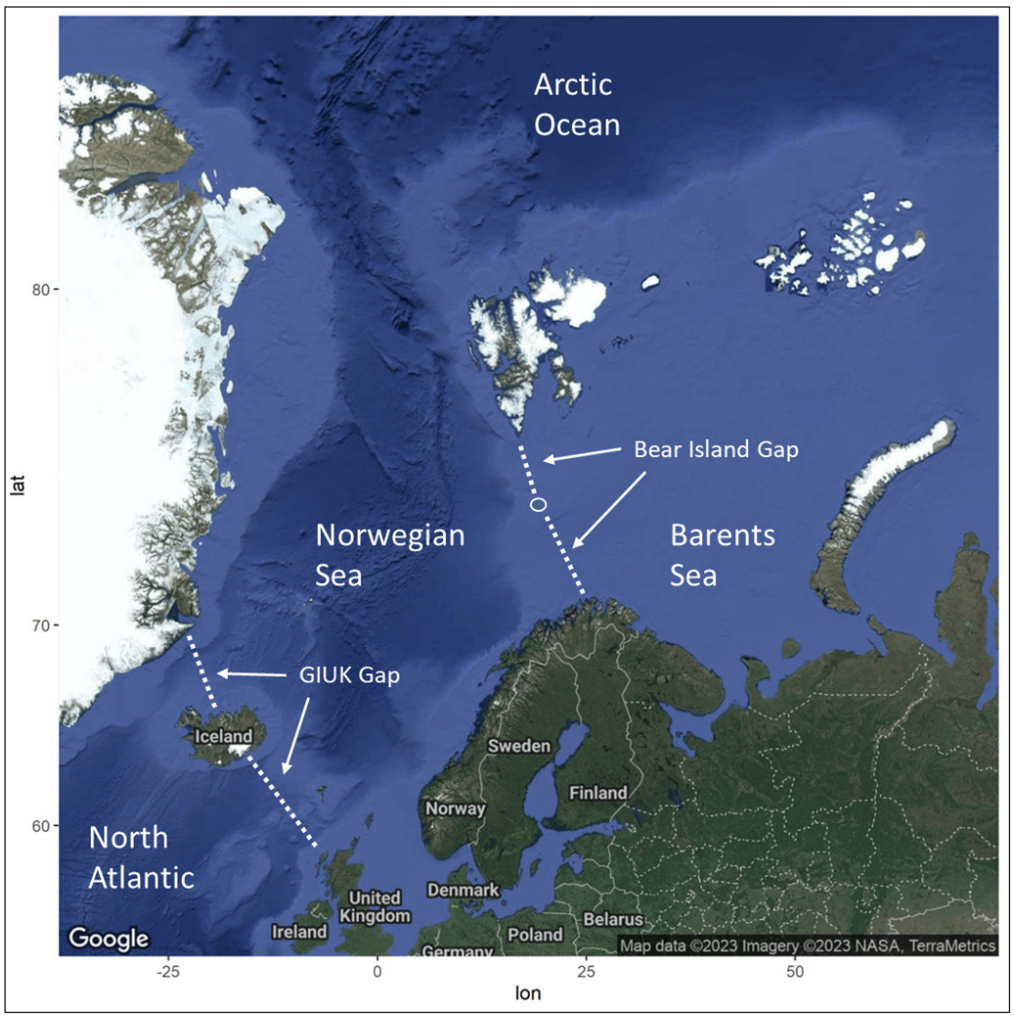

Figure 1 The European High North (map prepared by the authors).

The article will proceed as follows: It starts by elaborating on the concepts of *signaling*, which is about the (external) communication between states; and *bolstering*, or capacity-building, which is primarily meant to serve the (internal) purpose of increasing a state's combat readiness. After this, the article presents an overview of its methodology and sources. The article continues by delving into the empirical data and analyzes past and current patterns of Russian NOTAM events in the High North before discussing various interpretations of observed changes in Russian behavior. Finally, it summarizes the findings and offers some concluding remarks.

THEORETICAL CONCEPTS

Military exercises and weapons tests are integral and essential parts of what a nation's armed forces do. Such activities serve a variety of purposes, ranging from the "tactical-technical" to the "political-strategic" (Heuser, 2018, p. 9). The first set of purposes is more or less synonymous with "capability development". Military forces train to become better at fighting wars. Beyond serving the purpose of developing practical skills and building cohesion at the level of military units, military exercises may also serve the (political-strategic) purpose of "geopolitical messaging" (Clem, 2018, p. 132), sometimes even "coercive signaling" (Charap et al., 2022).

It should be emphasized that the latter category of exercise objectives does not necessarily exclude the former, or vice versa. The practical and the political objectives of a military activity or training event may well be combined. As observed by Bowen (2021), Russia uses its military exercises "to test military readiness, refine operational concepts, assess new equipment and technologies, and improve command and control". At the same time, it may use military exercises "as a form of coercive signaling towards neighboring states and foreign audiences" (Bowen, 2021).

In some cases, the political-strategic effect is the primary (or sole) objective of an exercise. In other cases, the tactical-technical effect is its primary (or sole) purpose. Military muscle-flexing in far-away regions may qualify as a "political signaling" activity, whereas table-top or command post exercises (TTX or CPX in the military terminology), which typically take place behind the closed doors at military headquarters, would qualify as a more practically oriented training activity. Ultimately, the purpose of a foreign state's military activity may be evaluated on the basis of criteria such as its nature, location, timing, and political context.

In this article, we will explore two (intertwined) aspects of military training and exercises. The first aspect is that of *signaling*, which here refers to the peacetime display of armed force to change an opponent's behavior. The second aspect is what we have chosen to call *bolstering*, or capability development, which in this context is linked to the peacetime preparations that armed forces conduct in order to increase their skills and combat readiness. The two concepts are discussed in greater detail below.

SIGNALING

Signaling has been defined as "the purposive and strategic revealing of information about intent, resolve, and/or capabilities by an actor A to alter the decisions of another actor B to improve the chances that an outcome desired by A is reached when the desired outcomes of A and B are dissimilar" (Gartzke et al., 2017, p. 19, cited in Åtland, Nilsen & Pedersen, 2022, p. 66).

The peacetime display of armed force is one way of communicating such intent, resolve, or capability. The political use of armed forces occurs when "physical actions are taken by one or more components of the uniformed military services as part of a deliberate attempt by the national authorities to influence, or to prepare to influence" the behavior of an opponent. Physical actions include exercises and the use of firepower (Blechman & Kaplan, 1978, p. 12). Hence, signaling is a means of interstate communication, which involves a sender, a message, and one or more receivers (Gartzke et al., 2017, p. 19).

The phenomenon of signaling has received considerable attention from the International Relations research community and become a key concept in various sub-fields of security studies, ranging from gunboat diplomacy (e.g., Mandel, 1986; Widen, 2011) to cyber deterrence (e.g., Klimburg, 2020; Pedersen, 2023). Particularly relevant to our case are recent works on naval signaling (as summarized by, among others, Chao & Cho, 2023) and a recent RAND report on Russia's coercive signaling (Charap et al., 2022).

The display of naval power to signal resolve or intent can easily lead to misunderstandings, disputes, or military escalation – perhaps more easily than the display of power in other domains (Gartzke & Lindsay, 2020, p. 612). Even so, Russia has in recent years regularly used this instrument to express its discontent with Western adversaries. Russian forces are frequently "acting in a manner that is aimed at compelling a change in patterns of specific U.S. and allied behavior" (Charap et al., 2022, p. viii). Russia's coercive signaling activities in the maritime areas outside Norway may, however, have the opposite effect. It may lead to more of the behavior that Russia seeks to dissuade (Åtland, Nilsen & Pedersen, 2022, p. 76).

BOLSTERING

While signaling relates to *external* communication, bolstering (or "capability development") refers to the *internal* process of developing "the power and ability to do something" (Yue & Henshaw, 2009, p. 54). Military capability is, according to NATO, "a critical attribute needed to achieve success in the execution of a military activity" (NATO, 2018, p. F-2) and is developed across lines such as doctrine, organization, training, material, leadership and education, personnel, and facilities (DOTMLPF).

Military capabilities have a *temporal* dimension, as the desired effect must be achieved within a specific time over a certain period. Thus, military force structures must be sustained so that they may be ready to succeed in their missions (Correia, 2019, p. 28).

Capabilities also have an *environmental* aspect, as they must achieve the desired effect inside a given environment (Correia, 2019, p. 24). While Russia and others define the future battlefield as multi-domain and unrestricted, the Kola Peninsula and adjacent operational areas persist as vital to Russia's strategic forces (Expert Commission, 2015, pp. 20–21; Halsne, 2022, p.

34; Strauss & Wegge, 2024, pp. 2–3; Pedersen, 2019, pp. 106–107). Geography dictates the importance of the peninsula, which provides Russia's strategic nuclear submarines with ice-free ports and access to the Atlantic as well as the Arctic Ocean, an operational area wedged between Russia and North America.

Vital to Russia's second-strike capability, and hence strategic deterrence, is the ability to defend these strategic assets. The defense system, widely conceptualized as Russia's "bastion defense" (Expert Commission, 2015, pp. 20–21), includes an inner zone (the Barents Sea), in which Russia has a *sea control* ambition, and outer zone (the Norwegian Sea), in which Russia may conduct *sea denial* operations (see Figure 1). Thus, Russia's security is inescapably linked to these maritime spaces, where "the perception of the elements of the environment ..., the comprehension of their meaning, and the projection of their status in the near future" defines situation awareness (Endsley, 1995, p. 36). One's knowledge of this environment can translate into a tactical advantage (Pedersen, 2019, p. 104). As one scholar (Winters, 1998, p. 1) notes, "in combat, an environmental advantage for one side always means some degree of misfortune for the other".

While *signaling* refers to a state's external aim – to influence the behavior of another state – military capability development, or *bolstering*, has the internal objective of increasing the combat readiness of a state's armed forces inside a nominated environment.

METHOD AND SOURCES

Our study relies on a combination of quantitative and qualitative research methods. In order to get an overview of Russia's military exercise activity in Norway's maritime zones before and after the start of Russia's full-scale invasion of Ukraine, we have collected quantitative data from unclassified sources. Of special interest in this regard are Russian NOTAM messages issued for areas located within Norway's 200-nautical-mile Exclusive Economic Zone (EEZ), the Fisheries Protection Zone (FPZ) around archipelago of Svalbard, and the Fisheries Zone around to island of Jan Mayen.

A NOTAM, or "Notice to Airmen",[1] is a standardized type of notification issued by a state's civil aviation authorities. Its primary purpose is to alert aircraft pilots and others about potential hazards that may affect the safety of flight operations. A typical example of such a hazard would be a military exercise, particularly one that involves the launch of missiles or other weapon systems. Under international law, states may legally conduct such activities in and over international waters, including in and over the EEZs of other states (for details, see Van Dyke, 2004; Geng, 2012). Military exercises and weapon tests may, however, not be conducted within another state's airspace or territorial sea, which may extend up to 12 nautical miles from its baselines.

As per Article 1 of the Norwegian-Russian Delimitation Treaty (Government of Norway, 2010), the easternmost section of the maritime delimitation line in the Barents Sea follows the 38th meridian. In our data collection, we have chosen to use this line as the eastern cut-off point. NOTAM warnings issued for areas located within Russia's own EEZ in the Barents Sea have been examined only to the extent that they cross into Norway's EEZ or the FPZ. Our analysis does, however, include Russian NOTAM events in high seas areas located outside Norway's EEZ in the High North (i.e., the "Loophole" in the Barents Sea and the "Banana Hole" in the Norwegian Sea), where parts of the continental shelf are under Norwegian jurisdiction.

In cooperation with Avinor Air Navigation Services, which is the primary Norwegian recipient of Russian NOTAM messages, we have compiled a dataset containing detailed information about 67 Russian NOTAM events in the High North in the period between January 2015 and December 2023. In this dataset, 37 of the events predate the start of Russia's full-scale invasion of Ukraine in February 2022, whereas the remaining 30 are from the subsequent two-year period.

In the analysis of our dataset, which contains information about the timing, location, duration, and nature of Russian NOTAM events in the High North, we have made extensive use of the programming language "R" (version 4.0.5, which was released in 2021).[2] Working in the

1 On December 2, 2021, the U.S. Federal Aviation Administration (FAA) slightly redefined the meaning of acronym, which now stands for "Notice to Air Missions", at least in the U.S. The purpose of this adjustment was mainly to make the acronym gender-neutral and more in line with evolving societal norms.

2 For details, see https://www.r-project.org/.

"RStudio" console, we have been able to access our dataset and simultaneously download and access relevant software packages.[3] This has enabled us to generate maps, plots, and visual representations of the dataset. Most of the illustrations used in this article, including maps showing the location of the Russian NOTAM areas, were generated in R.

By comparing the pre-February 2022 pattern of Russian NOTAM events in our area of interest with that of the succeeding period, we should be able to examine how Russia's military behavior in the High North has changed. This would in turn allow for a discussion of factors that may explain the identified changes. Central in this regard is the previously mentioned question of whether Russia's military exercise activity in the region has primarily been intended to serve the (external) purpose of political signaling, or rather the (internal) purpose of military capacity-building.

This is where qualitative/interpretive research methods have been used. In our interpretation and "sense-making" of patterns identified in the statistical analysis, we have drawn on additional information gathered from sources such as the websites of the Russian Ministry of Defense[4] and the Murmansk-based Sea Port Administration for the Western Arctic,[5] as well as articles from wide range of journals and newspapers. We have consulted a variety of official and unofficial Russian and Western sources that may shed light on the study's topic and help us to contextualize and explain the observed changes in Russia's northern military behavior. We have also drawn on insights from the works of fellow scholars, including the previously mentioned RAND report (Charap et al., 2022) and other studies exploring the phenomenon of interstate signaling (Gartzke et al., 2017; Clem, 2018; Chao & Cho, 2023).

RUSSIAN NOTAM EVENTS IN THE HIGH NORTH, 2015–2023

Looking at the pattern of Russian NOTAM events in the High North before and after the start of Russia's full-scale invasion of Ukraine, the first variable to consider is that of *frequency*. As shown in Figure 2, there was an incremental increase in the annual number of Russian NOTAM warnings in the High North in the period between 2015 and 2019, from one in 2015 to nine in 2019. The number fell to three in 2020, after which it started to increase again, to a level of nine in 2021 and seventeen in 2022. Thus, here was a significant increase – almost a doubling – from 2021 to 2022. Of the 17 events registered in 2022, 3 took place before February 24, whereas 14 took place after this date. In 2023, there was a slight decrease in the number of Russian NOTAM events in the High North, to a level of 16.

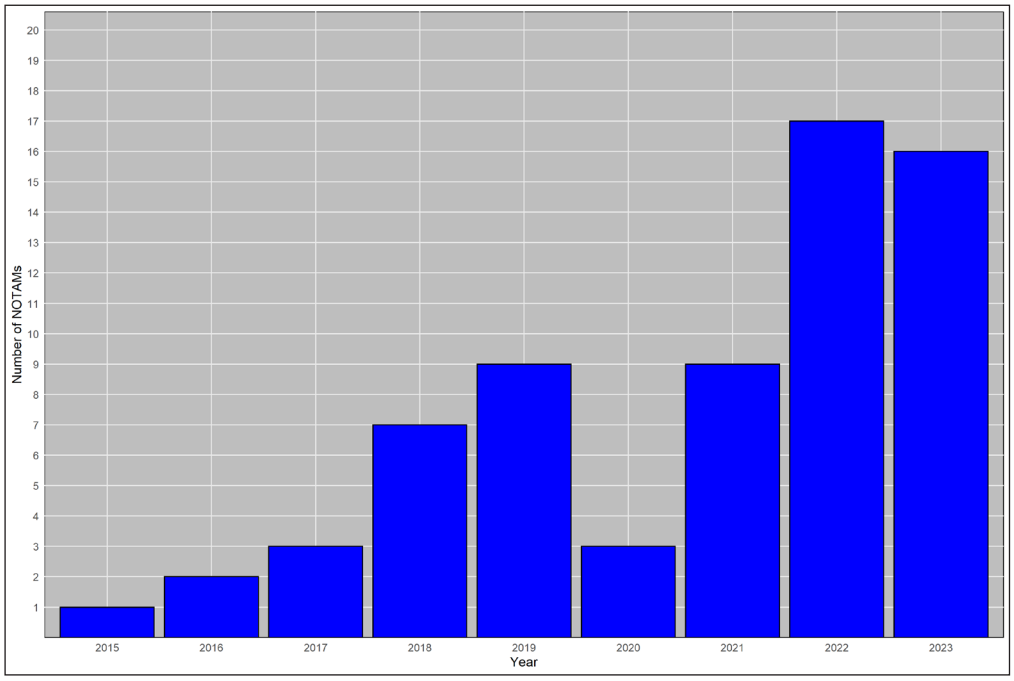

Figure 2 Annual number of Russian NOTAM events in the High North, 2015–2023.

Source: Authors' NOTAM dataset.

3 For this study, we have used the following software packages: "tidyverse", "ggmap", and "ggplot2".

4 Russian Ministry of Defense: https://mil.ru/.

5 Sea Port Administration for the Western Arctic: https://www.mapm.ru/Prip.

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The next variable to consider is that of *location* (see Figure 3). Where were the Russian NOTAM areas located in the period between January 2015 and December 2023? And to what extent did the pattern of locations change over time, particularly before and after February 24, 2022?

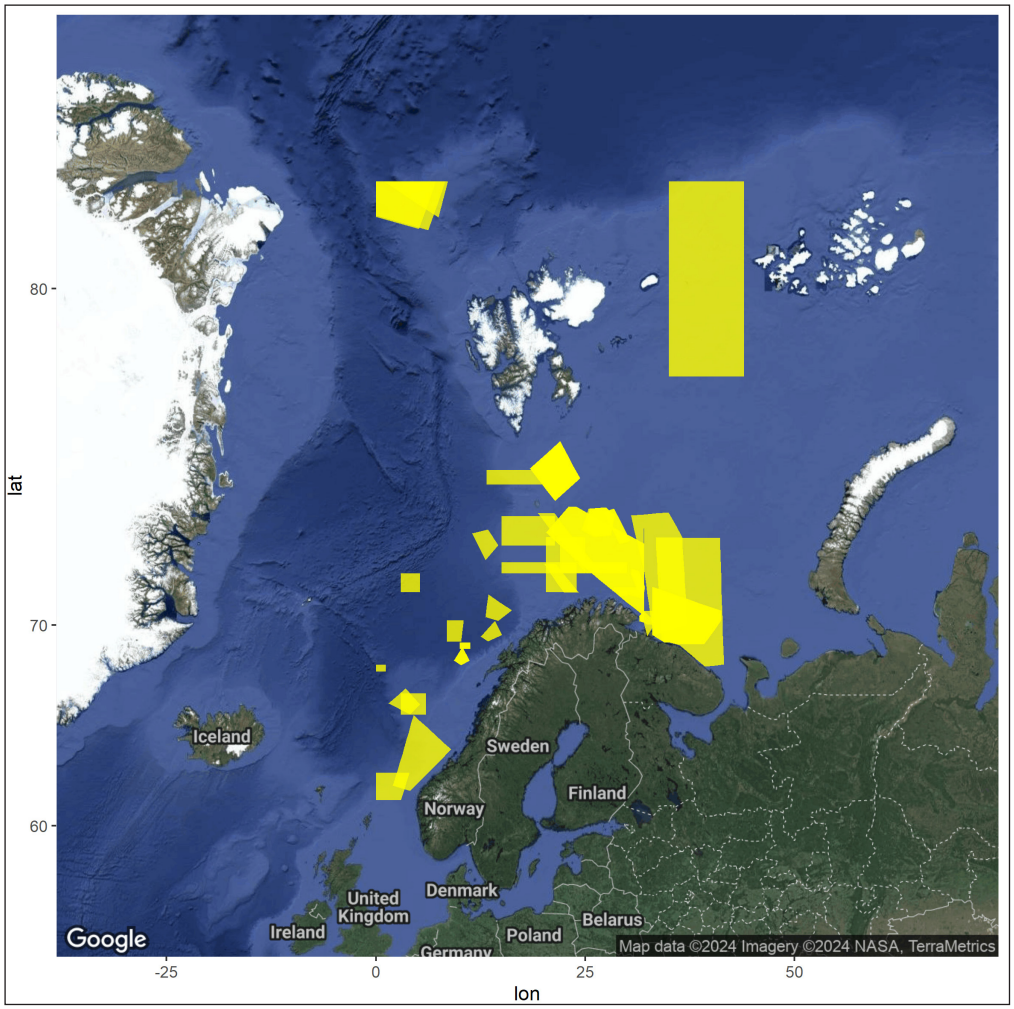

Figure 3 Location of Russian NOTAM areas in the High North, 2015–2023.

Source: Authors' NOTAM dataset.

To answer the first question, we plotted all the Russian NOTAM areas on a map of the High North. As shown in Figure 3, the 67 Russian NOTAM areas in our dataset are spread out over large parts of Norway's maritime jurisdiction areas, from the southern Norwegian Sea (the Møre coast) in the south to the southern part of the Arctic Ocean (the Nansen Basin) in the north. There are numerous Russian NOTAM areas in the northern part of the Norwegian Sea (northwest of the Lofoten islands) and in the western Barents Sea (between North Cape and Svalbard).[6] There are also a handful of areas further east in the Barents Sea. Many of these are large in size and located partly in Russia's EEZ, and partly in Norway's. We also found a few areas northwest of Svalbard, and one between Svalbard and the Russian archipelago of Franz Josef Land. Like those found south of Svalbard (around Bear Island), these were located in, or crossed into, the Svalbard Fisheries Protection Zone.

To answer the second question, relating to the issue of a possible "pattern change" in or around February 2022, we divided our dataset in two. We plotted the pre-invasion NOTAM areas on one map, and the post-invasion areas on another. In Figure 4, the 37 NOTAM areas announced before February 24, 2022, are marked in red, whereas the 30 NOTAM areas announced after this date are marked in pink. Interestingly, all but one of the NOTAM areas in the latter period are located in or near the Barents Sea. This indicates that the "center of gravity" of Russia's NOTAM activities in the High North must have moved north (and east) after the start of Russia's "special military operation" in Ukraine.

6 Unlike the southernmost NOTAM areas, which were largely unique, those in the western Barents Sea were in many cases recurring and recognizable. The latter were also more numerous than the former.

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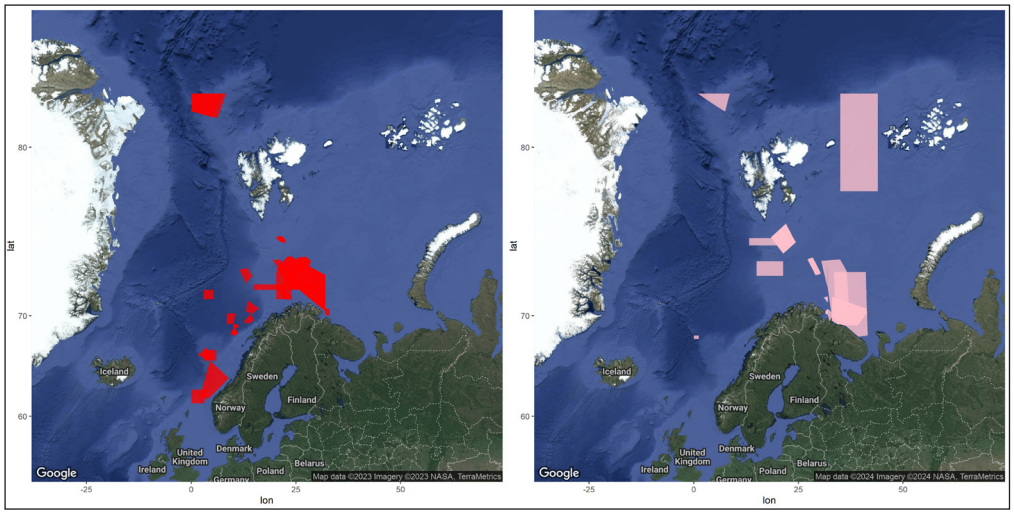

Figure 4 Russian NOTAM areas in the High North before (red) and after (pink) the start of Russia's full-scale invasion of Ukraine.

Source: Authors' NOTAM dataset.

Seeking to explore this issue more thoroughly, we calculated the average latitude of each of the 67 NOTAMs in our dataset. We then looked at how the average latitude had evolved over time. Since February 24, 2022, there has not been a single Russian NOTAM event south of the Arctic Circle. The southernmost Russian NOTAM in the post-invasion period (event number 38 in our dataset), was located in the central part of the Norwegian Sea, slightly north of the Arctic Circle. It was announced during the exercise *Cold Response* in mid-March 2022. The area in question was small, relatively short in duration (3 days), and it was located far from the shore, almost halfway between Northern Norway and Iceland, as shown in Figure 4.

By comparison, there were several Russian NOTAM events well south of this location, and much closer to the shore, in 2016, 2018, 2019, and 2020 (events number 3, 10, 17, and 23 in our dataset; see Figure 5). The largest of them (event number 10) took place in the southern Norwegian Sea during the exercise *Trident Juncture* in early November 2018. In the period as a whole (2015–2023), the average latitude of the Russia's NOTAM areas in the High North increased from approximately 71° to approximately 74° north (see Figure 5).

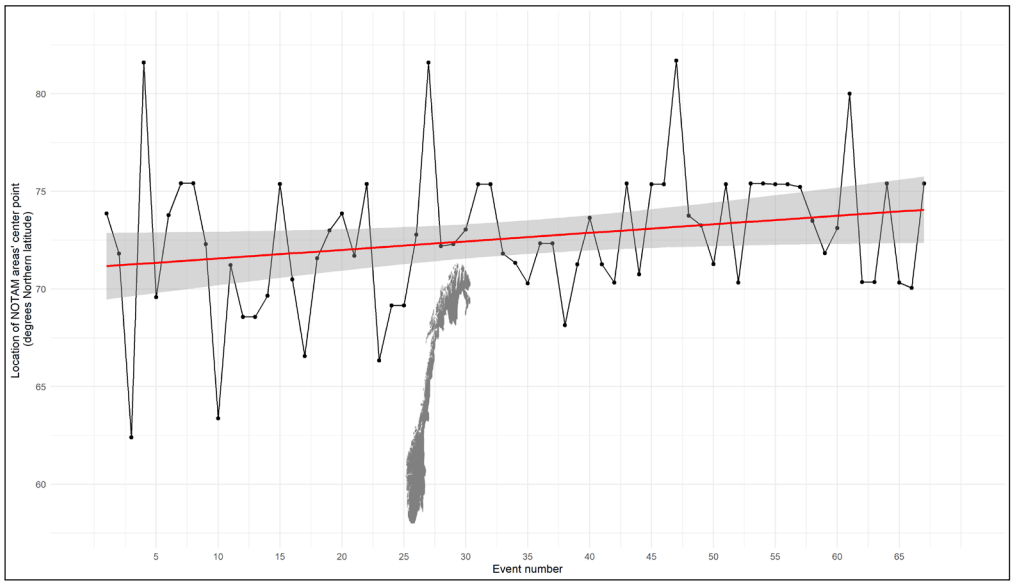

Figure 5 Average latitude of Russian NOTAM areas in the High North, 2015–2023 (events number 1–37 are those that took place before February 24, 2022; events number 38–67 are those that took place after this date). The red line shows the NOTAM areas' average latitude.

Source: Authors' NOTAM dataset.

When it comes to the *size* of the Russian NOTAM areas, there is a high degree of variation. This is illustrated in Figure 6. The smallest NOTAM area (event number is 49, a little triangle located outside the Varanger peninsula, dated October 14–17, 2022) covered only 177 km^2. By contrast, the largest one (event number 44, located in the southern Barents Sea, dated May 30–31, 2022) covered an area of as much as 138,419 km^2. This is 3.2 times the size of Denmark.[7] Average size in the entire period from 2015 to 2023 was 15,454 km^2.

7 It should be pointed out that most of the NOTAM area in question was located in Russia's EEZ, and only a small portion of it in Norway's.

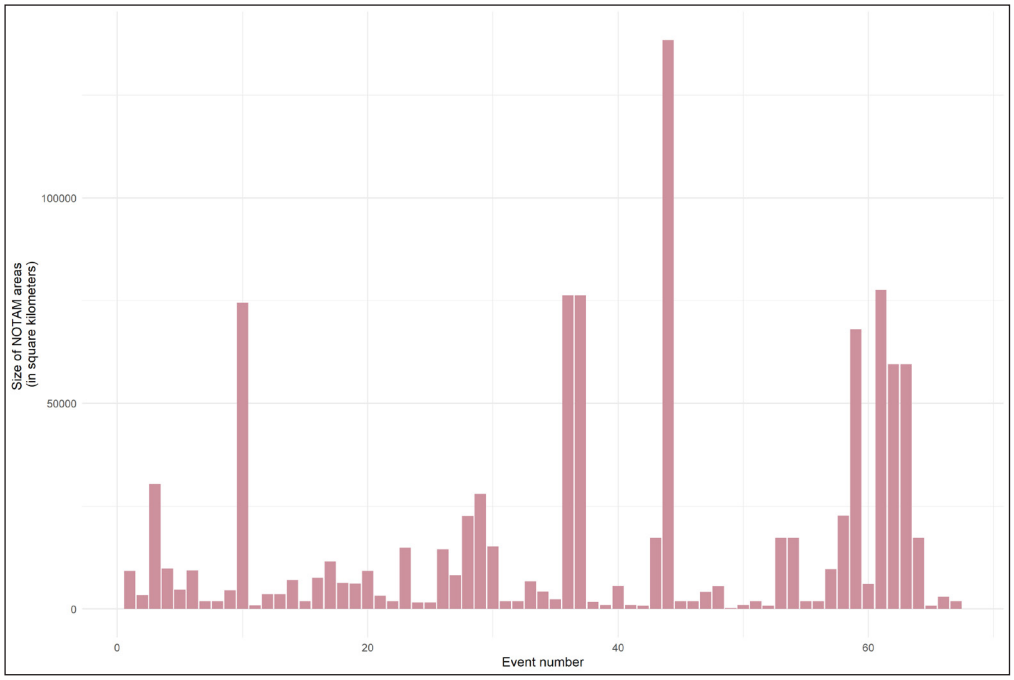

Figure 6 Size of Russian NOTAM areas in the High North, 2015–2023.

Source: Authors' NOTAM dataset.

In the period from 2015 to the start of Russia's full-scale invasion of Ukraine in February 2022 (events number 1–37), Russia's NOTAM areas in the High North had an average size of 13,196 km^2. In the period from February 2022 to December 2023 (events number 38–67), they had an average size of 18,238 km^2. They were, in order words, 38% larger in the post-invasion period than they had been in the pre-invasion period.

This trend was particularly evident in the high latitudes. Figure 7 shows NOTAM size as a function of latitude. The largest Russian NOTAMs in the period between January 2015 and February 2022 were found well south of the Arctic Circle (66°34' north). In the rest of 2022 and throughout 2023, the largest ones were found north of 70° north. One was even located north of 80° north (the large area between Svalbard and Franz Josef Land, which was active between October 1 and 6, 2023). The latter was a very unusual location for a Russian NOTAM.

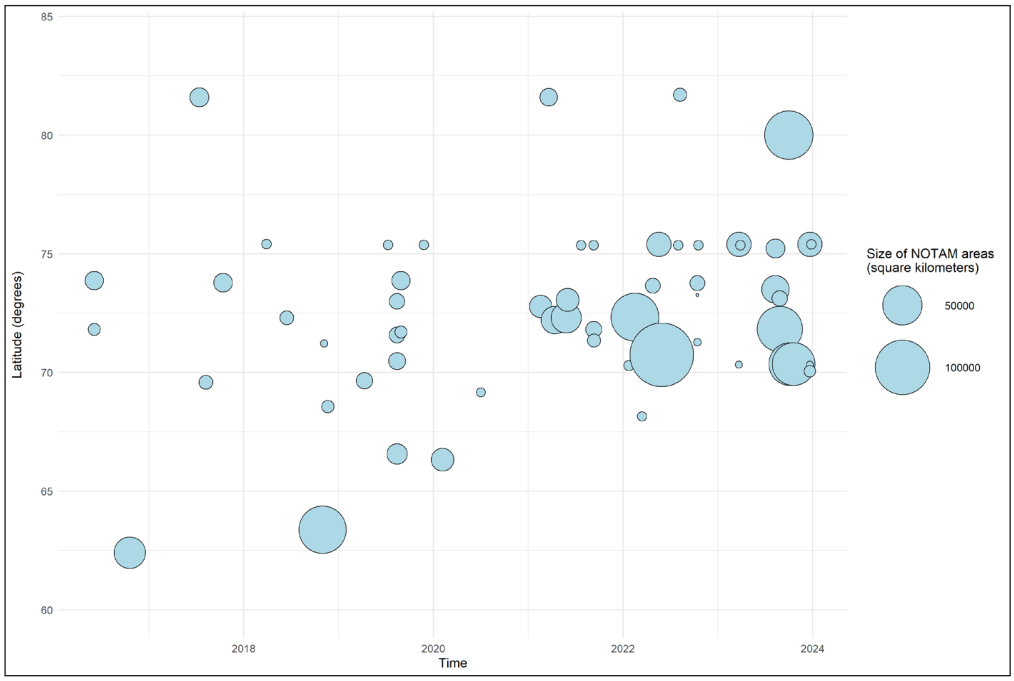

Figure 7 Chronological order (x-axis), latitude (y-axis), and size of Russian NOTAM areas in the High North, 2015–2023. The size of the circles indicates the size of the NOTAM areas.

Source: Authors' NOTAM dataset.

Finally, we looked at the variable of *duration*. As shown in Figure 8, the average duration of the Russian NOTAM events in the High North increased significantly in the period from 2015 to 2023, from slightly more than two days in 2015 to almost six days in 2023. Average duration in the pre-invasion period (events number 1–37) was 2.5 days. Average duration in the post-

invasion period (events number 38–67) was 5.5 days. This amounts to a 120% increase in the average duration between period one and period two. The longest-lasting NOTAM event in our dataset (event number 41, a small area located northwest of Bear Island, which was active between April 28 and May 7, 2022) lasted 11 days.

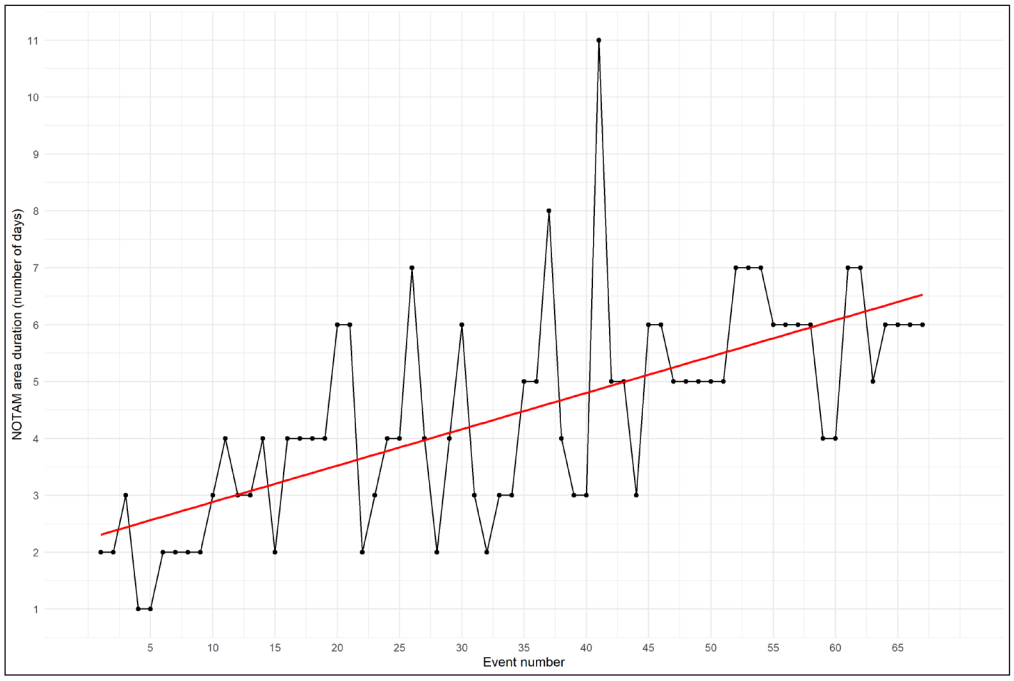

Figure 8 Duration of Russian NOTAM events in the High North, 2015–2023 (measured in days). The red line shows the change in average duration.

Source: Authors' NOTAM dataset.

POSSIBLE INTERPRETATIONS OF THE CHANGE IN RUSSIA'S BEHAVIOR

In the previous section, we documented significant changes in the pattern of Russian NOTAM events in the High North since the start of Russia's full-scale invasion of Ukraine. The most striking and noteworthy of the changes is the shift in the NOTAM events' geographical location, from lower to higher latitudes, and from the Norwegian Sea to the Barents Sea. Since February 24, 2022, we have not registered any Russian NOTAMs south of the Arctic Circle. Almost all Russian NOTAM events now take place in or near the Barents Sea.

This shift in Russia's exercise pattern again raises the question first asked in the introductory part of this article: To what extent are Russia's naval and air exercises in the High North still to be understood principally as acts of geopolitical messaging? In the following, we argue that post-invasion pattern of Russia's military exercises and weapon tests in the High North may be indicative of a significant shift in Moscow's motives, intentions, and strategic priorities.

In the years preceding the start of Russia's full-scale invasion of Ukraine, Russia's military exercises on NATO's northern flank, particularly in the Norwegian Sea, were seen by many as intended to serve the purpose of coercive signaling. Particularly illustrative in this regard was Russia's announcement of an unusually large NOTAM area off the coast of Western Norway during the *Trident Juncture* exercise in November 2018 (Åtland, Nilsen & Pedersen, 2022, p. 74).

The post-invasion pattern of Russian behavior, described above, indicates an increased emphasis on the need for (internal) bolstering – that is, a strengthening of Russia's bastion defense capabilities in the Barents Sea. There may be several reasons for the observed change in the dominant pattern of Russian military activity in the region. In the remainder of this section, we will briefly discuss four different, but not necessarily mutually exclusive, hypotheses that may explain the identified shift. It should be emphasized that our hypotheses are based on inference rather than on inside knowledge about the intentions of Russian decision-makers, and that the list is not intended to be exhaustive.

HYPOTHESIS 1: RUSSIA LEARNED THAT ITS PREVIOUS SIGNALING EVENTS WERE FUTILE

As noted in Åtland, Nilsen & Pedersen (2022, p. 63), several of the high-profile NOTAM events that Russia staged in the Norwegian Sea in the period between 2015 and 2022 appeared to

have been "tailored for the purpose of intimidating Norway and its allies and communicating Russia's displeasure with the occasional presence of United States and other NATO forces on or outside Norway's territory".

The activities may, in other words, have been designed to induce – perhaps even compel – a change in the pattern of Norway and NATO's military activity in High North. The intended and preferred outcome for Russia would presumably have been a reduction in the number and size of NATO exercises in, and foreign military deployments to, Norway. Alternatively, Russia may have wanted to push such activities further south, so that it could achieve a position of military dominance in the northern part of the Norwegian Sea and the Barents Sea.

What happened was, simply put, the opposite of what Russia would have wished for: NATO's presence and activity in the northern waters and airspace *increased*. On some occasions, it even moved further north.[8] This happened in tandem with the general deterioration of Russia's relations with the West, and it was exacerbated by the dramatic expansion of Russia's war in Ukraine in February 2022.

Thus, rather than dissuading NATO allies from operating closer to Russia's northwestern bastion, Russia's military behavior in (and outside) the region turned the Norwegian Sea into a frequently used deployment and training area for western naval forces, including aircraft carriers such as HMS *Prince of Wales* (April 2022), USS *Gerald R. Ford* (June 2023), and HMS *Queen Elizabeth* (September 2023). Western nuclear-powered submarines have also increased their presence in the north, as noted in connection with the visit by an Ohio-class cruise missile submarine, the USS *Florida*, to the Arctic port of Tromsø in September 2023. On some occasions, NATO warships have also sailed into Russia's EEZ north of the Kola Peninsula.

Thus, it is plausible that Russia came to the conclusion that it would make little sense to continue with the previous signaling moves on NATO's northern flank, since they had largely failed to achieve their intended objective(s), perhaps even been counterproductive. This interpretation does, of course, rely on the assumption that Russia in fact believed that its activities would have some kind of impact on the military behavior of Norway and NATO. In principle, we cannot exclude the possibility that Russia held no such illusions, and that the purpose of the Russian NOTAM events was just to serve as an anti-NATO protest and produce some kind of "rally-around-the-flag" effect at home (Charap et al., 2022, p. 78).

Given the increased level of tension in NATO-Russia relations after the start of Russia's full-scale invasion of Ukraine, and the heightened risk of inadvertent escalation of incidents and episodes, it may well be that the playing field for provocative behavior and symbolic demonstrations of force in the High North narrowed – for Russia as much as for NATO. Despite its increasingly harsh anti-NATO rhetoric in the post-invasion period, Russia may have taken a more careful approach in its dealings with NATO in the High North.

HYPOTHESIS 2: PUSHBACK FROM CIVILIAN ACTORS AND FOREIGN GOVERNMENTS

Russia's issuance of NOTAM warnings and conducting of live-fire drills in areas far from the Northern Fleet's home bases has also been an increasingly contentious issue in the country's relationship with neighboring states and civilian users of the northern waters and airspace. The circumnavigation of temporarily restricted areas may be a time-consuming undertaking and lead to extra fuel costs and economic losses for airlines and shipping companies, particularly when the Russian NOTAM areas are large in size and have a long duration.

Short-notice area closures in regions of heavy traffic or extensive civilian activity can be a substantial challenge for aviators, ship captains, and fishermen, including Russia's own. The Norwegian Fishermen's Organization has, on a number of occasions, called for a reduction in the number and size of Russia's military exercises in the High North, at least during the peak season for fisheries. The fishermen have also expressed dissatisfaction with the short warning times, which lead to extra costs or loss of income when they are forced to leave productive fishing grounds at short notice due to Russian live-fire exercises. The issue has also been a topic in Norwegian-Russian interactions at the political level.

8 The Norwegian-led *Cold Response* exercise in 2022 may be a good case in point. Involving some 30,000 troops and significant amounts of military hardware, it took place significantly further north than *Trident Juncture* in 2018. It was "the largest NATO exercise inside the Arctic Circle since the 1980s" (Nilsen, 2022b).

In 2015, 2016, and 2017, when the annual number of Russian NOTAMs in the High North was relatively low, Norwegian politicians were generally reluctant to criticize Russia for its occasional conduct of military exercises in the Norwegian and Barents Seas. Reference was often made to Russia's right under international law to train and launch weapons in international waters. This gradually changed in the following years, when the number of NOTAMs increased (as shown in Figure 2), and when it became clear that many of the Russian NOTAMs were never used for the designated purposes (Åtland, Nilsen & Pedersen, 2022, p. 76). In April 2019, when Russia announced a live-fire missile drill in the Norwegian Sea, near the fishing grounds west of the Lofoten islands, the Norwegian Minister of Defense did not hesitate to describe the activity as "unnecessary" (Johnsen & Rognstrand, 2019).

Even stronger words have been used by representatives of the fishing industry, particularly in recent years. In August 2023, when Russia announced the closure of two large, rectangular-shaped NOTAM areas north and south of Bear Island, reportedly to conduct missile launches, Norwegian fishing industry representatives indicated that they had no intention of leaving the area (Johansen 2023). The Bear Island incident was in many ways similar to the situation that arose in January 2022, when Irish fishermen refused to make room for a Russian missile firing event in the Irish Sea, east of the busy port of Cork. Ireland's Minster for Foreign Affairs and Defense, Simon Coveney, even contacted Defense Minister Sergei Shoigu with a request to reconsider the location of the event. On the latter occasion, Russia decided to relocate its planned activity to a different area, situated southwest of the Irish EEZ (Nilsen, 2022a).

Whether and to what extent this kind of pushback from civilian actors and foreign governments has been a factor in Russia's decision to move most of the exercise activity in the High North to "home waters" after February 2022, is difficult to know for sure. In the current geopolitical environment, one should not overestimate Russia's receptiveness to the concerns of neighboring states. But it may well have been a contributing factor.

HYPOTHESIS 3: DIMINISHED CONVENTIONAL MILITARY CAPACITY AFTER THE UKRAINE INVASION

Russia's unprecedented military losses in Ukraine may also have been a factor affecting the scope and nature of Russia's exercise activity in the High North. Enormous amounts of equipment and personnel have been lost on the battlefield in Ukraine, particularly within the land forces, and Russia's weapon and munition stockpiles have been dramatically reduced. Since February 2023, military units from all over Russia, including the Kola Peninsula, have been deployed to Ukraine. Almost all of them have sustained heavy casualties.

In February 2023, Vice Admiral Nils Andreas Stensønes, chief of the Norwegian Intelligence Service, stated that the Russian land forces on the Kola Peninsula were at approximately 20% of their pre-war capacity (Nilsen, 2023). Whether and when the forces will be able to recover from this diminishment and regain their former strength remains to be seen. Moreover, Russia's sense of vulnerability in the region has likely increased in the aftermath of Finland and Sweden's decision to seek membership in the Atlantic alliance (Rumer & Sokolsky 2022). This turn of events, and the deteriorating relationship between NATO and Russia, may already have led to changes in Russia's force posture and military behavior in the High North.

Considering whether Russia's "withdrawal" to the Barents Sea after February 2022 can be interpreted as an indication that its conventional forces in the northern theater are stretched thin, we need to acknowledge the fact that Russia's naval and air forces have not been degraded to the same extent as the country's land forces. Thus, if Russia really wanted to continue with its "signaling" deployments to the Norwegian Sea, it would probably have been able to find the vessels or aircraft needed for the purpose.

On the other hand, it is no secret that vessels from the Northern Fleet have spent much time in the East Mediterranean/Black Sea region since February 2022.[9] As long as these weapon

9 In February 2022, shortly before Russia's full-scale invasion of Ukraine, the Russian Black Sea Fleet was reinforced by two Ropucha-class landing ships from the Northern Fleet (*Georgy Pobedonosets* and *Olenegorsky Gornyak*). The Northern Fleet's newest and most modern landing ship of the Ivan Gren class (*Pyotr Morgunov*) was also deployed to the Black Sea. In August the same year, the Northern Fleet deployed one of its nuclear-powered attack submarines of the Yasen class (*Severodvinsk*) to the Mediterranean. Northern Fleet cruisers (*Marshal Ustinov*), destroyers (*Vice Admiral Kulakov*), frigates (*Admiral Grigorovich* and *Admiral Kasatonov*), and auxiliary ships (*Vyazma*) have also been on various Mediterranean deployments in 2022 and 2023. For further details, see Sutton (2022); Monitoring Group (2023).

platforms are on patrol in Southern Europe, capacity will be somewhat diminished in the High North. On top of this, there may have been an implicit understanding within the Russian military establishment that its dwindling stockpiles of missiles and ammo should be spent on the battlefield in Ukraine rather than on symbolic demonstrations of force in the High North.

HYPOTHESIS 4: INCREASED RUSSIAN FOCUS ON THE NEED TO STRENGTHEN NUCLEAR DETERRENCE

Finally, it should be noted that nuclear deterrence has been brought to the top of Russia's agenda after the 2022 invasion. Moscow has suspended its participation in the New START agreement on strategic nuclear disarmament and revoked its ratification of the 1996 Comprehensive Nuclear Test Ban Treaty (CTBT). Russia has also repeatedly rattled its nuclear saber amid the war in Ukraine. Seen from a Russian perspective, the increasing risk of nuclear escalation calls for the bolstering of Russia's bastion defense, the core of which is located in the Barents Sea.

Indicative of Russia's willingness to prioritize nuclear-related training events at the expense of other activities is the fact that the long-anticipated *Zapad* exercise, originally scheduled for September 2023, was canceled just a few weeks prior to its start, apparently due to the lack of available troops and equipment. By comparison, the annual nuclear forces drill, traditionally referred to as *Grom* (Thunder), went ahead as planned in October the same year.

As in previous years, the 2023 *Grom* exercise included the launch of a ballistic missile from a Delta IV submarine in the Barents Sea, the launch of a Yars intercontinental ballistic missile (ICBM) from the Plesetsk cosmodrome, and the launch of cruise missiles from a Tu-95MS ("Bear-H") bomber (Russian Ministry of Defense, 2023). The purpose of the exercise, as reported by Defense Minister Shoigu, was to rehearse the delivery of "a massive nuclear strike by strategic offensive forces in response to an enemy nuclear strike" (Wright, 2023).

CONCLUDING REMARKS

Russia's full-scale invasion of Ukraine has led to significant changes in the European and global security environment. The changes that have taken place in the European High North are, for obvious reasons, of special significance to the security situation of the Nordic countries, all of which are now members of NATO. The maritime space between the GUIK gap in the south and the Bear Island gap in the north, and the airspace above it, has traditionally been an important arena for interaction between Russian and NATO forces. This is likely to remain the case in the years ahead.

That said, the security dynamics on NATO's northern – and Russia's northwestern – flank are more fluid than they have been in a long time. New patterns of military activity are emerging, threat perceptions and strategic priorities are changing, and states are doing their best to adapt to the new realities. As this study has shown, the dominant pattern of Russia's sea and air exercises on NATO's northern flank has changed significantly in the time that has passed since February 2022. Particularly noteworthy is the shift in *location* – from lower to higher latitudes, and from the Norwegian Sea to the Barents Sea.

The shift in Russia's focus and priority may have multiple explanations. We have put forward four hypotheses, none of which can be excluded on the basis of present information. First, Russia may have realized that its previous signaling attempts have proven futile; second, it is possible that pushback from civilian actors and foreign governments may have contributed to the change of behavior; third, it may indicate a lack of capacity, given the post-2022 degradation of Russia's conventional military forces; and, fourth, Russia may have found it necessary to prioritize the Barents Sea bastion defense in a time of heightened geostrategic tensions and increased nuclear risks.

Obviously, there are strengths and weaknesses to each of our four hypotheses. With the regard to the first, it can be noted that it is difficult to assess the degree to which the identified change in Russian activity can be attributed to some kind of acknowledgment of the result – or lack thereof – of past Russian activities. What is clear, however, is that Russian NOTAM events off the coast of Norway in 2015–2022 did not achieve the objective of effecting a change in Norway and NATO's military posture in the region.

When it comes to the second hypothesis – that the change in Russia's military activity was related to pushback from civilian actors and foreign governments – it seems to have been a contributing but not necessarily decisive factor. The third ("lack of capacity") hypothesis is, in our view, more plausible. The same goes for the fourth hypothesis regarding the increased Russian focus on nuclear deterrence and the need to protect the Barents Sea bastion in a situation of heightened East-West tension. Withdrawing to the Barents Sea, Russia may also have wanted to reduce the risk of unwanted incidents, episodes, and inadvertent escalation.

The newly emerging pattern of Russian NOTAM events in the High North is consistent with Moscow's increased emphasis on the need for (internal) bolstering of the Barents Sea bastion defense. The rebalancing seems to be coming at the expense of (external) offshore signaling and coercive diplomacy, which was a hallmark of the country's military activities in the High North in the years prior to February 2022. The post-invasion change in the scope and geographical location of Russia's military exercises in the northern waters and airspace, and the increased Russian focus on nuclear deterrence, does not necessarily imply that the Russian signaling events in the region have ceased, altogether or permanently. But there is little doubt that Russia's military behavior in the High North has changed, at least temporarily.

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The authors have no competing interests to declare.

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