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Military Muscle-Flexing as Interstate Communication: Russian NOTAM Warnings off the Coast of Norway, 2015–2021

RESEARCH ARTICLE

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ABSTRACT

When, where, and why does Russia issue warnings about missile launches and other potentially dangerous military activities in international waters and airspace west and north of Norway? Drawing on information derived from a series of Russian "Notices to Airmen" (NOTAMs), this article examines the pattern of Russia's live-fire air and naval exercises in and over the Norwegian and Barents Seas between January 2015 and December 2021. It discusses factors that may explain the extent and nature of Russia's military muscle-flexing in the region. The study suggests that a number of the Russian exercises and missile launches, particularly in areas adjacent to Norway's west coast, were primarily meant to obstruct Norwegian/NATO exercises such as the Trident Juncture exercise of 2018. On a number of occasions, Russia's NOTAM warnings appear 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.

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INTRODUCTION

The maritime spaces on NATO's northern flank, off the coast of western and northern Norway and south of the archipelago of Svalbard, play an important role in NATO's security policy and defense planning. NATO's ability to transfer reinforcements to its northernmost ally in the event of a crisis or conflict with Russia depends to a significant degree on the ability of the alliance to maintain control of the maritime and aerial approaches to potential ports of debarkation on Norwegian soil.

Russia, for its part, sees the Barents and Norwegian Seas as integral to its "bastion defense" strategy (see for instance Strømmen, 2019; Lacey, 2020; Halsne, 2022). In order to ensure the safe operation of the Northern Fleet's ballistic missile submarines in the inner part of the bastion (the Barents and Kara Seas), Russia must be able control the North Cape – Bear Island gap (see Figure 1). Controlling this gap, the Northern Fleet's attack submarines, surface forces, fighter jets, and maritime patrol aircraft can also conduct sea denial operations in the maritime areas further south (the Norwegian Sea, the Greenland–Iceland–United Kingdom gap, and the North Atlantic), and potentially threaten NATO's transatlantic sea lines of communication.

Figure 1 Naval chokepoints in the North Atlantic and European Arctic. Source: Expert Commission on Norwegian Security and Defense Policy (2015).

In recent years, there have been numerous media reports about Russian military activity, including live-fire events, in the international waters and airspace off the coast of northern and western Norway. In order to alert mariners and aircraft pilots of potential dangers related to this activity, Russia has intermittently issued so-called "Notices to Airmen" (NOTAMs) covering various parts of Norway's Exclusive Economic Zone (EEZ) and other areas of Norwegian maritime jurisdiction. Under international law, such activity is fully legal, as long as it is properly announced and takes place outside the territorial waters of the coastal state. Nonetheless, the temporary restriction of access to maritime areas and international airspace may in various ways affect other actors, civilian as well as military. The degree to which other actors are affected by a foreign state's NOTAM warnings in a coastal state's EEZ depends heavily on factors such as the timing, location, size, and duration of the danger area. Such information is usually included in the NOTAM messages.

The purpose of this article is to conduct a systematic analysis of NOTAM warnings issued by Russia in international waters and airspace off the coast of Norway, including the archipelago of Svalbard, in the period between 2015 and 2021. The study examines *when* and *where* the Russian NOTAMs have been issued and discusses *why* Russia may have chosen to place them in these areas rather than in areas closer the Kola Peninsula.

To address the "when" and "where" questions, we examine the timing and frequency of Russia's NOTAM notifications and the geographical scope of the maritime areas in question. Variables to consider are, for example, latitude and longitude, and the size and duration of the NOTAM areas. Based on a comprehensive dataset, we present trends and patterns in Russian activity.

To address the "why" question, the study draws on the NOTAM dataset, among other available sources. In addition, we lean on insights from the theoretical literature on foreign policy signaling, naval diplomacy, and political uses of the military. We identify and discuss underlying factors that may explain Russia's issuance of NOTAM warnings and the country's conduct (or non-conduct) of live-fire exercises in the areas under analysis.

A key consideration is the extent to which Russia's military activities off the coast of Norway in the past six years can be interpreted as political statements or reactions to Norwegian and NATO policies and activities – that is, a form of non-verbal interstate communication. The dynamics of political signaling and uses of armed forces are central themes in parts of the international relations (IR) literature (see for instance Snyder & Diesing, 1977; Blechman & Kaplan, 1978; Allen, 1980; Mandel, 1986; Fearon, 1997; Gartzke et al., 2017; Montgomery, 2019).

In the first section below we provide a brief overview of the theoretical literature. We then go on to present the methodology and sources of the study in the second section, before analyzing the dataset in the third section, where we discuss the "when," "where" and "why" questions mentioned above. In the fourth section, we discuss the interplay between Russian and Norwegian/NATO military activities in the High North.[1] Our findings are summarized in the fifth and final section.

THEORETICAL PERSPECTIVES

Armed forces serve as political instruments, a notion embedded in Karl von Clausewitz's (1989) dictum that war is "a continuation of political intercourse, carried on with other means" (p. 88). Even in times of peace, they serve as political instruments. As pointed out by Barry Blechman and Stephen Kaplan, armed forces may be used in an effort to change other states' behavior:

> A 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, specific behavior of individuals in another nation without engaging in a continuing contest of violence. (Blechman & Kaplan, 1978, p. 12)

According to this conceptualization, cases of political use would have to include (a) a physical change in the disposition of the armed forces, (b) a political consciousness of purpose behind the disposition, (c) decision-makers seeking to "attain their objectives by gaining influence in the target state," and (d) an intent to "avoid a significant contest of violence" (Blechman & Kaplan, 1978, p. 13). Blechman and Kaplan (1978) further point to a range of physical military dispositions that decision-makers could devise to influence target states, including exercises and the use of firepower:

> The use of firepower; the establishment or disestablishment of a permanent or temporary presence abroad; a blockade; an interposition; an exercise or demonstration; the escort or transport of another actor's armed forces or materiel; a visit by a military unit to a foreign location; an evacuation; the operation of reconnaissance, patrol, or surveillance units in a non-exercise context; or a change in readiness status. (Blechman & Kaplan, 1978, pp. 12–13)

In order for such activities to qualify as the *political* use of armed force, there would have to be a certain "consciousness of purpose" on the part of the national command authority of the initiating state. It would, in other words, have to be an intentional act, aimed at influencing the perceptions and behavior of the target actor or actors (Blechman & Kaplan, 1978, p. 13). As other authors have pointed out, shows of force in peacetime range from subtle foreign policy signaling, itself the subject of a growing body of literature, to acts conveying "the clearest and most threatening signal possible short of open conflict" (Allen, 1980, pp. 24–25), including brute "gunboat diplomacy" (see, for example, Mandel, 1986).

1 As noted by Skagestad (2010), "the High North" is an "elastic" concept, the political use of which is not always accompanied by a precise geographic definition. The concept is often taken as a reference to the Arctic part of Europe, including Svalbard, and the adjacent maritime areas, including the Barents Sea and the northern part of the Norwegian Sea. However, for the purposes of this study, it makes sense to include all of the Norwegian Sea, including the parts located south of the Arctic Circle, all the way down to the 60th parallel.

For Snyder and Diesing (1977), who theorize on crisis bargaining between sovereign states in the intermediate zone between peace and war, the usefulness of limited "symbolic displays of force" lies in "the sense of menace they convey, combined with the ambiguity about what is being threatened in what contingency, which preserves flexibility" (p. 231). Shows of force may be designed to show an intent, a capability, or a readiness to fight. Moves designed to show *intent* are, for all practical purposes, the equivalent of verbal threats, they argue. A show of *capability*, which "imply intent only indirectly," are designed "to increase the adversary's perception of the harm that one is physically able to inflict," while a display of *readiness* suggests "a real intent to use the forces if necessary." Of the three, a display of capability is the more subtle (Snyder & Diesing, 1977, pp. 231–232).

Snyder and Diesing (1977) suggest that shows of force can be given additional potency if symbolism is attached to the instruments; by deploying a highly reputed vessel with a combat history, for instance, showing force on a certain date or an anniversary, or putting high-ranking officials onboard a vessel, one can make the signaling even more powerful.

The meaning of "foreign policy signaling" resembles the concepts explored, respectively, by Blechman and Kaplan (1978) (on the political use of armed forces) and by Snyder and Diesing (1977) (on the symbolic displays of force). Gartzke and his colleagues (2017) define foreign policy signaling 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" (p. 5). Adopting the terminology of classic communication models, they distinguish between "sender," "receiver," "message," and "reaction" (Gartzke et al., 2017, p. 19).

The "message" may be addressed to more than one "receiver," and the intended receiver is not necessarily the only actor affected by the signal that is sent (Gartzke et al., 2017, p. 19). A distinction is often made between "dyadic" and "multi-actor" signaling, based on whether the exchange of signals takes place between two or more actors. The alliance dimension is naturally relevant in this regard, in both conventional and nuclear signaling. With regard to the case of our study, the *interplay* – or two-way signaling – between Russia and NATO in the High North is of special interest, specifically in relation to the "reaction" concept used in Gartzke et al. (2017, p. 19).

Arguably, naval power has proven to be particularly suitable for subtle political signaling. As noted by a prominent scholar of naval diplomacy, sea power provides visibility and can effectively "convey threats, provide reassurance, and earn prestige" (Bull, 1976, p. 6). Navies are both flexible and universal in the sense that they are highly autonomous and can be deployed quite rapidly to "almost all places" (Widen, 2011, p. 718). In his seminal *The Sea in Modern Strategy*, L.W. Martin (1967) concluded that navies effectively exert peace-time influence on international affairs, if only vaguely: "This effectiveness short of war is difficult to characterize but is nevertheless pervasive and may well comprise the most significant benefit a nation derives from its naval instruments" (p. 33).

J.J. Widen (2011) stresses that naval diplomacy, a concept more delicate than overt "gunboat diplomacy" and more complex than an operational state of a "naval presence," must be understood in its political context (pp. 717–718). Building on Edward Luttwak's (1975) "theory of suasion," Widen (2011) puts emphasis on the receiver's reactions and perceptions as much as the sender's "actions, or intent, of the deploying party" (p. 725). The political effects of a sender's routine maneuvers ("latent" diplomacy) may be indistinguishable from the effects of deliberate attempts to bring about a reaction from a receiving state ("active" diplomacy). While endorsing naval diplomacy as a useful analytical concept, Widen (2011) acknowledges the challenges of tracing causes and effects. He concludes that it is "difficult to establish to what extent a naval diplomatic action has resulted in intended effects, since many latent and active causes for changed behavior is possible" (Widen, 2011, pp. 730–731).

METHOD AND SOURCES

In order to get an overview of the scope and scale of Russia's NOTAM warnings off the coast of Norway between 2015 and 2021, and trying to identify factors that may explain Russia's choice of time, place, and type of activity, we rely on a combination of qualitative and quantitative

research methods. The first step is to create a dataset containing detailed information about the Russian NOTAM areas, based on Russian NOTAM messages and information from other unclassified sources. The second is to analyze the dataset and visualize the findings using statistical software suited for the purpose. The third and final step is to interpret and contextualize the findings, based on qualitative knowledge of the region of our study, the political and military context at the time of the NOTAM events, and insights from international relations (IR) theory. Each of the three steps is elaborated on below.

COLLECTING THE NOTAM DATA

Russian NOTAM messages containing warnings about potentially dangerous military activity in the area of our study – that is, north of 60° north latitude and west of 33° east longitude – constitute the main source of knowledge about Russian NOTAM events in the High North. This area includes significant parts of Norway's 200-nautical-mile Exclusive Economic Zone (EEZ) in the Norwegian Sea and the Barents Sea. It also includes the Fisheries Protection Zone around Svalbard (including the Nansen Basin north of the archipelago, which is part of the Arctic Ocean), the Fisheries Zone around Jan Mayen, and the two maritime areas located outside Norway's EEZ (the "Loophole" in the Barents Sea and the "Banana Hole" in the Norwegian Sea), where parts of the continental shelf are under Norwegian jurisdiction.

From Avinor Air Navigation Services,[2] the primary Norwegian recipient of Russian NOTAM messages during the period of our study, we obtained a copy of all relevant Russian NOTAMs received since January 2015. The data and information provided by Avinor proved to be of invaluable help in our efforts to build a detailed dataset for the study. Avinor's NOTAM data was supplemented with, and checked against, data from other sources, such as the website of the International Civil Aviation Organization (ICAO) and the NOTAM Info website.[3] Our dataset was continually updated throughout the period of research. Using this methodology, we were able to gather detailed information about 27 Russian NOTAM warnings in our area of interest.

For each of the 27 NOTAMs, the available information was divided into eight categories, or columns: (a) serial number of the NOTAM (e.g., "A3554/21," where the latter two numerals denote the year); (b) start date of the danger area; (c) end date of the danger area; (d) schedule of the announced activity (times of day, Greenwich Mean Time, e.g., "daily 0500–1900'); (e) textual information about the planned activity and nature of the anticipated danger (e.g., "IMPACT AREA FOR RUSSIAN MISSILES'; (f) location of the danger area (typically five to nine geographical coordinates, where the first and the last are the same); (g) lower limit of the danger area (typically "GD," meaning "ground," or "SF," meaning "surface"); and (h) upper limit of the danger area (e.g., "FL560," meaning "flight level 560," which is 56,000 feet, or "UNL," meaning "unlimited').

Such information can tell us a lot about Russia's live-fire exercises and other activities affecting the safety of mariners and aviators in and above the Norwegian and Barents Seas. We can draw conclusions about the frequency, timing, and location of the activity, as well as the size and duration of the Russian NOTAM warning areas, and how the pattern of activity has varied over time. This may give us a better insight into the presumed purpose(s) of the Russian activity and the interplay between Norwegian/NATO and Russian activity.

DATA ANALYSIS AND VISUALIZATION

Analyzing the NOTAM dataset and trying to visualize the findings, we have relied heavily on a software program and programming language called "R" (version 4.0.5).[4] R is a free software environment for statistical computing and graphics generation, widely used by statisticians, and increasingly, also, by scholars within the natural and social sciences.

2 Avinor is the state-owned company that owns and operates most of the civilian airports in Norway. It was created in January 2003, after the privatization of the Norwegian Civil Aviation Administration ("Luftfartsverket"). Avinor Air Navigation Services, a subsidiary of the Avinor Group, provides air navigation services in Norwegian airspace and keeps track of NOTAM warnings in its area of responsibility.

3 The Norwegian map of NOTAM Info is available at https://notaminfo.com/norwaymap. ICAO's global repository of NOTAM data is searchable at https://www.icao.int/safety/iStars/Pages/notams.aspx. Both of these websites primarily contain current, rather than historical, data.

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

The strength and versatility of R lie in the combination of the integrated development environment ("RStudio"), which was launched in 2016, and the comprehensive and freely available library of software packages (for details, see Wickham & Bryan, 2015). The packages can perform various functions, such as the creation of maps, plotting of data on maps, creation of graphs, diagrams, timelines, etc. For the purposes of this study, we used several of the available packages, including "tidyverse," "ggmap," "ggplot2," "timelineS," and others.

Working in RStudio, we were able to access our dataset and simultaneously download and access relevant software packages, and track the history of our code writing. This allows for the generation of high-quality 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.

DATA INTERPRETATION

This brings us to the third step of the process – the data interpretation. In order to make sense of the empirical data, and visual representations thereof, we have to analyze it in view of the political and military context at the time of the Russian NOTAM warnings. This is where qualitative research methods are needed. Drawing on a variety of other sources such as Russian and Western news reports and research articles, recently published interviews with centrally placed decision-makers, and theoretically oriented works within the discipline of international relations, we seek to shed light on the "why" question mentioned in the introduction. While this is undoubtedly more difficult to answer than the "when" and "where" questions, the "when" and "where" can inform the "why" discussion, as we will show below.

Studying the phenomenon of interstate signaling is not an exact science. We cannot know for sure what, if any, political purpose any Russian NOTAM event was meant to serve. The best that we can to is to reason, based on the information that we have about the size, time, and place of the NOTAM areas and the context within which they were announced. Doing so, we can hopefully reach a higher level of understanding of what Ola Tunander (1989, p. 7) once called "the body language of states."

At the same time, it is important to acknowledge the limitations and caveats of our study. We have only considered events in the past six years, mostly because it is nearly impossible to obtain detailed NOTAM data that goes back further. Due to the lack of detailed information about Russia's exercise activity and weapon tests off the coast of the Kola Peninsula and in other parts of Russia's EEZ (which is not notified in the same manner), we will not be in a position to make meaningful comparisons between Russia's activity "at home" and Russia's activity outside Norway. We will, however, discuss it the context of "the NATO–Russia military exercise dynamic" (Clem, 2018, p. 33).

Finally, we should point out that we have only studied events that can be said to have represented some degree of "danger" (hence the issuance of NOTAMs and the temporary sea and airspace closures). Thus, "non-dangerous" Russian military activity in and over the Norwegian and Barents Seas, such as bomber patrols, naval transits, and other training events, fall outside the scope of our study.

RUSSIAN NOTAMS: WHEN, WHERE, AND WHY?

Let us now take a closer look at the characteristics of the Russian NOTAM areas off the coast of Norway. As noted above, we have identified 27 NOTAM areas in the region and period of our study. These are spread out over a large geographical area. Some are unique in terms of location, whereas others have been used several times. They also vary in size, shape, and duration.

Below, we present our findings with regard to (a) the timing, frequency, and duration of the Russian NOTAM warnings; (b) the location of the NOTAM areas; (c) the size and shape of the NOTAM areas; and (d) the type of activity conducted in them. On the last point, the available information is relatively scarce, at least in open sources. Information is more detailed on the first three points, where relevant data may be derived from the NOTAMs.

TIMING, FREQUENCY, AND DURATION OF THE RUSSIAN NOTAM WARNINGS

The first finding, illustrated in Figure 2, is that the 27 Russian NOTAM warnings are quite unevenly spaced in time. There was a marked increase in the annual number of NOTAMs between 2015 and 2019, from one in 2015 to nine in 2019. Since 2019, the annual number of NOTAMs has declined to a level of three in 2020 and two in 2021.

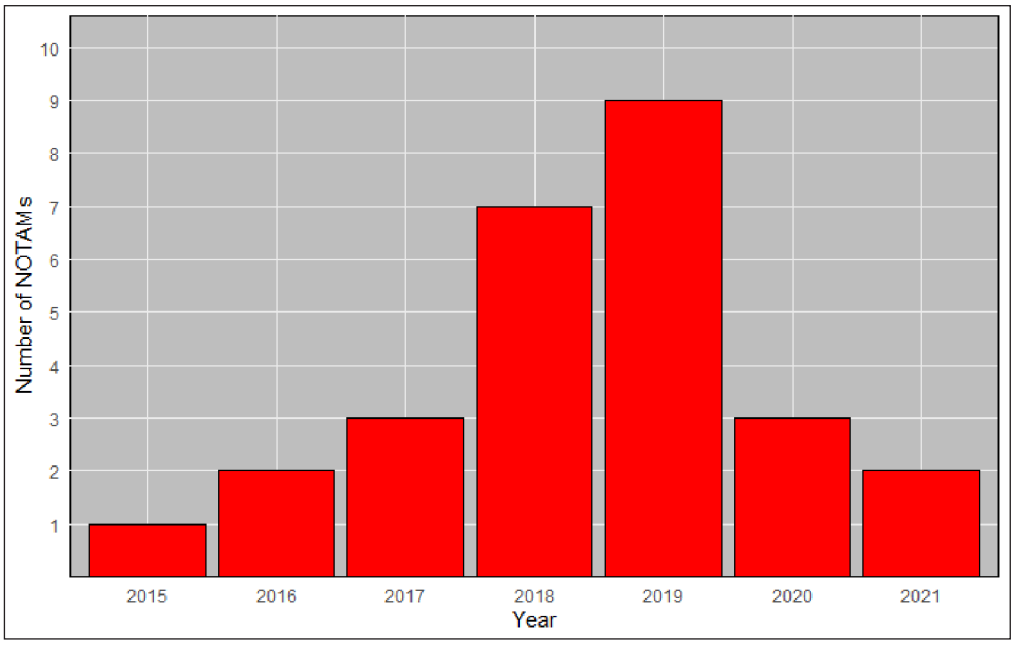

Figure 2 Annual number of Russian NOTAM messages in the High North, 2015–2021. Source: authors' NOTAM dataset.

As illustrated in Figure 3, the average duration of the Russian NOTAM areas in our region of study increased from approximately 1.7 days in 2015 to approximately 4.7 days in 2021. Average duration in the period as a whole was three days. The most typical duration was two and four days, with eight occurrences of each in the 2015–2021 period. The number of accumulated "NOTAM days" was significantly higher in the second half of the period than in the first half of the period (68 versus 10). The shortest-lasting NOTAM area, announced in July 2017, lasted only one and a half hours.[5] The longest-lasting NOTAM area, announced in February 2021, lasted seven days.

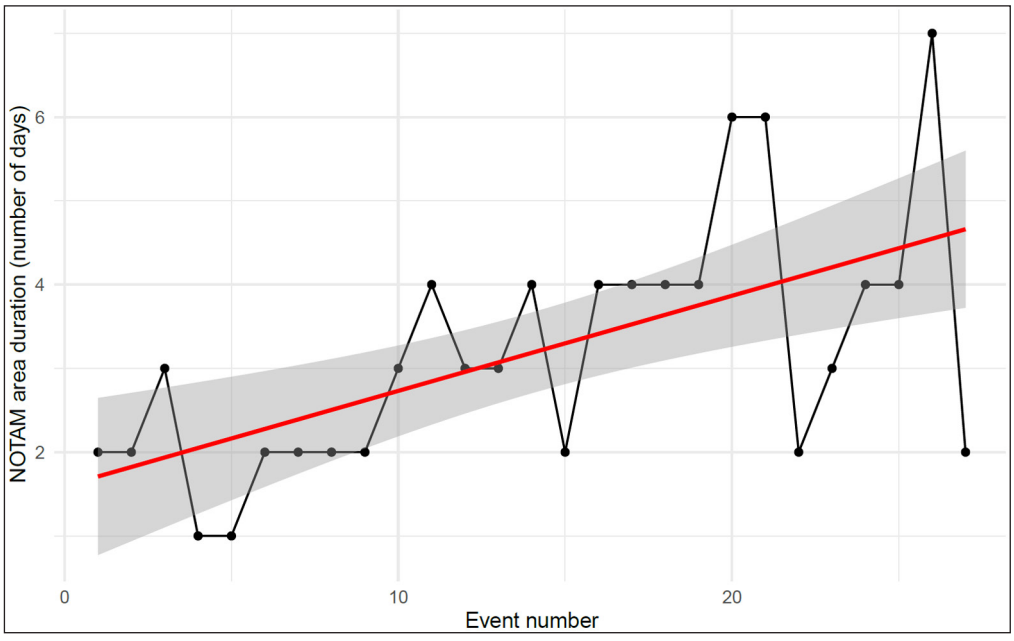

Figure 3 Duration of Russian NOTAM areas in the High North, 2015–2021. The red line marks the average duration, and the grey area marks the confidence interval (95%). Source: authors' NOTAM dataset.

5 Russian NOTAMs with a duration shorter than 24 hours have for practical purposes been counted as "one day or less" in our illustrations (Figure 3).

LOCATION OF THE RUSSIAN NOTAM AREAS

Figure 4 shows the location of the Russian NOTAM areas. As mentioned above, they cover significant parts of the region of study, from the southern part of the Norwegian Sea in the south to the Nansen Basin in the far north. The southernmost point affected by a Russian NOTAM is located at 61°50' northern latitude, that is, slightly north of the town of Florø (61°36'). The northernmost point affected by a Russian NOTAM is located at 82°, that is, well north of Svalbard. All of the Russian NOTAM areas in our dataset are located outside Norway's territorial waters and airspace (more than 12 nautical miles from the baseline).

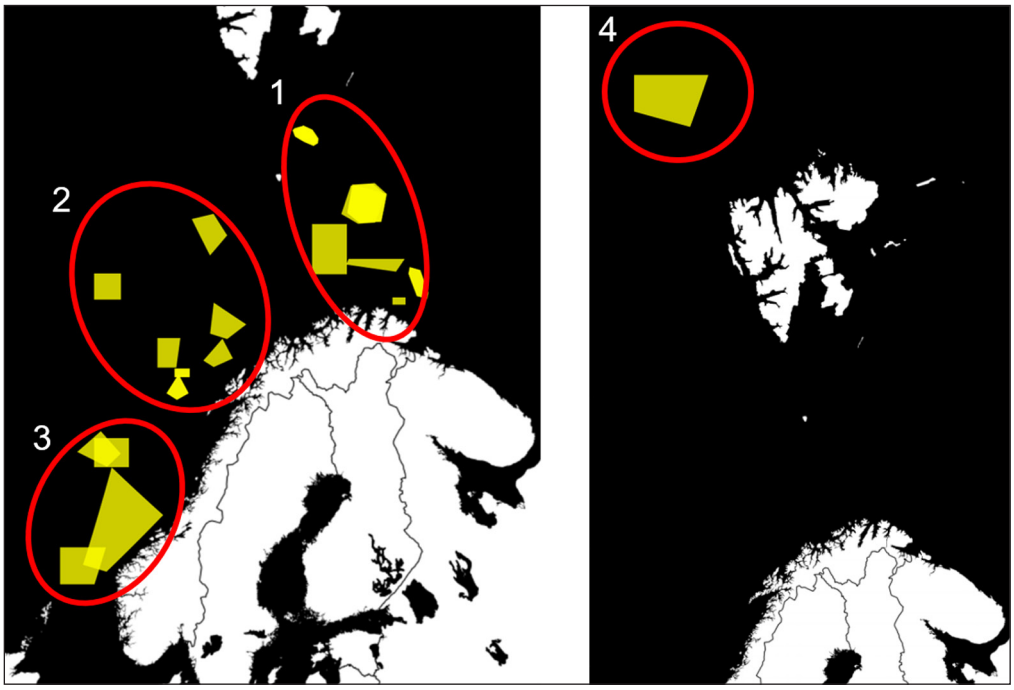

Figure 4 Location of Russian NOTAM areas in the High North, 2015–2021. Source: authors' NOTAM dataset.

For practical reasons, we have defined four main NOTAM areas, which we have called Areas 1, 2, 3, and 4. Area 1 is located in the western Barents Sea, between the North Cape and Svalbard. This is where we found the highest number of NOTAMs (13). Many of these are recurring NOTAM areas, meaning that the polygons are reused with varying intervals, and sometimes reused with slight amendments. Area 2 is located in the Norwegian Sea, northwest of the Lofoten islands. Here we found nine NOTAMs. Area 3 is the southernmost area, located off the coast at Møre. Here we found four NOTAMs. Unlike the NOTAMs in Area 1, all of the NOTAMs in Area 3 are unique, rather than recurring. This is also where we find the largest of the 27 NOTAM areas (see below). Area 4 (one NOTAM), which is the most northern, may be seen an "outlier" case.

Related to the issue of location is the question of whether there has been any movement along the north-south axis. The answer to this question seems to be a contingent "yes." In the period of our study, there has been a slight southward movement in the average center point of the NOTAM areas, from approximately 72° to approximately 70° north (to give a reference point on land, the town of Hammerfest is located at 70° 39'). This development may, however, hardly be described as dramatic. It is also worth noting that the two southernmost NOTAMs in our dataset came quite early in the series, in October 2016 and November 2018 respectively (see Figure 6). We have not seen Russian NOTAMs this far south in the past three years.

SIZE AND SHAPE OF THE RUSSIAN NOTAM AREAS

The most striking feature of the NOTAM area sizes, is the tremendous variation (see Figure 5). The smallest covers an area of only 897 km^2, or twice the size of the Municipality of Oslo. The largest NOTAM area, located off the Møre coast, is enormous – 74,521 km^2, roughly comparable to the size of the county of Troms and Finnmark. Average size is 9,412 km^2, and median size is 5,414 km^2.

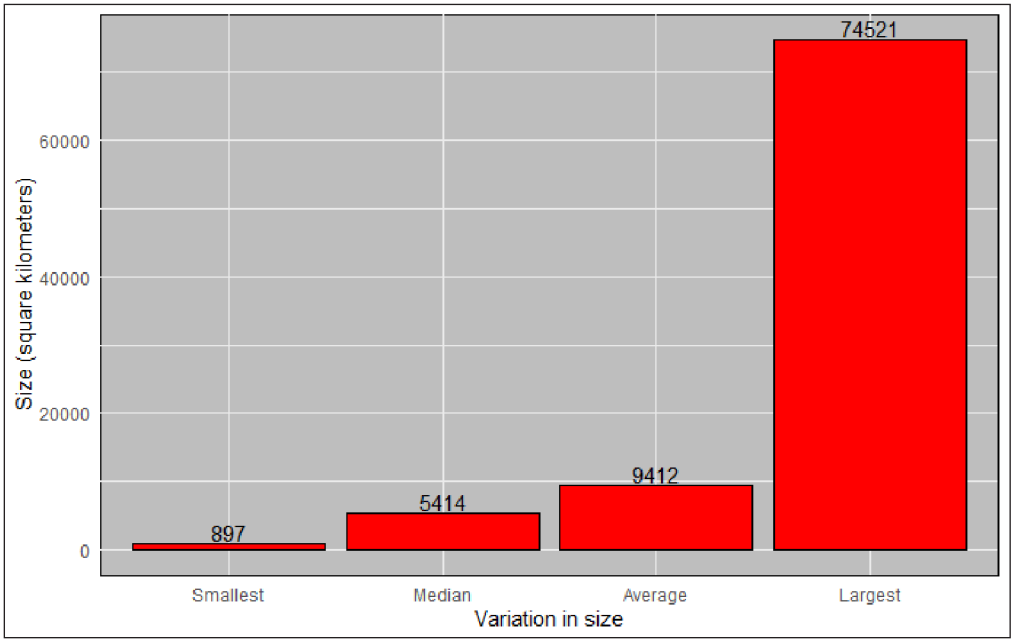

Figure 5 Size of Russian NOTAM areas in the High North, 2015–2021. Source: authors' NOTAM dataset.

While on the topic of size, we should point out that NOTAM areas cover a three-dimensional space, and not only a surface area. The lowest upper limit of a NOTAM area in our dataset is "Flight Level 180," that is, 18,000 feet (one occurrence). In theory, this would allow commercial airliners to fly over the area at cruising altitude, at least on long-haul flights. Other designations used in the Russian NOTAM messages are "Flight Level 330," "Flight Level 560," "Flight Level 660," and "unlimited," meaning that there is no upper limit for the danger area. The most commonly used designations are "Flight Level 560" (nine occurrences) and "unlimited" (ten occurrences), which would imply that all air traffic would have to circumnavigate the announced danger area.

The order of small and large NOTAM areas looks relatively random, and the largest and the smallest in the series came immediately after each other, both in November 2018. There does not appear to be a trend indicating growing size. There does, however, appear to be a correlation between size and the degree of "southernness." As illustrated in Figure 6, the most southern NOTAM areas in the series are also the largest.

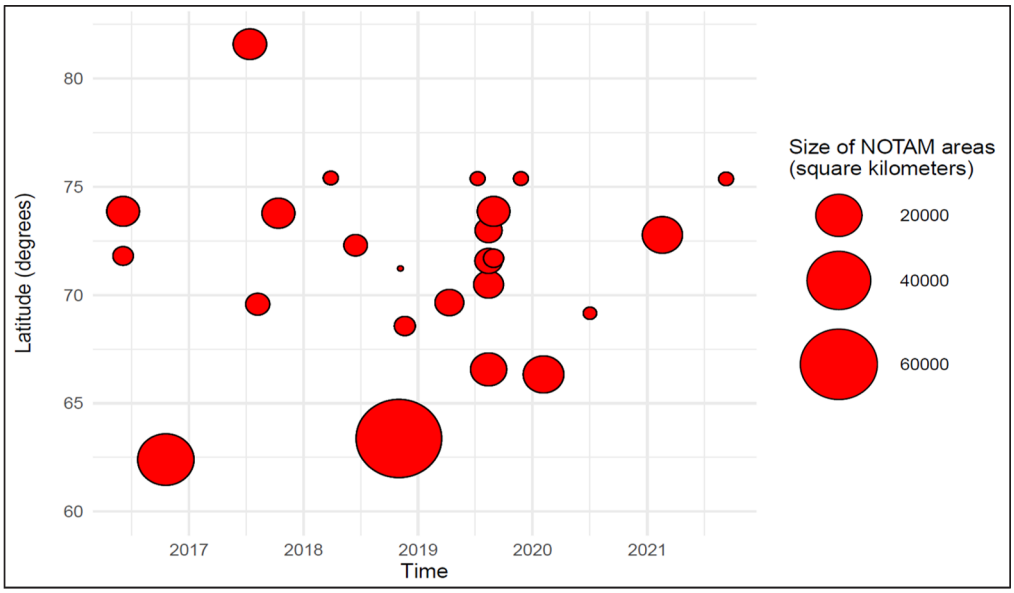

Figure 6 Chronological order, latitude, and size of Russian NOTAM areas in the High North. Source: authors' NOTAM dataset.

When it comes to the shape of the NOTAM areas, some of them are square or rectangular, whereas others are more unevenly shaped polygons, as indicated in Figure 4. Sometimes the sides of the polygons run parallel with latitude and longitude lines, but many of the polygons are tilted to the left or right in order to fit operational or other needs. The most commonly used NOTAM areas in

the western Barents Sea between North Cape and Svalbard are hexagonal or octagonal in shape (straight lines between six or eight corners). This may indicate that the activity in the area is space-related (see below). None of the NOTAM areas in our dataset is circular in shape.

TYPE OF ACTIVITY IN THE RUSSIAN NOTAM AREAS

The text of the Russian NOTAM messages also provides some clues about the type of activity that is to be carried out in the announced danger areas, at least on a general level. Among the formulations frequently used are "TEMPO[RARY] DANGER AREA ACTIVATED AT PSN [...]," "ROCKET TEST FIRINGS IN [...]," "ROCKET TEST FIRING FOR RUSSIAN NAVY," "RUSSIAN NAVY PLANS MILITARY EXERCISE IN [...]," "RUSSIAN NAVY PLANS TRNG FLTS [TRAINING FLIGHTS] IN [...]," or just "IMPACT AREA FOR RUSSIAN MISSILES.". These formulations, as well as information from other sources, such as press releases from the Russian Ministry of Defense and the Northern Fleet, indicate that various weapon systems are being used or tested during the NOTAM events, including surface-to-air, air-to-surface, and surface-to-surface missiles. Sometimes, Russian defense authorities – or the Norwegian Joint Headquarters, located at Reitan outside Bodø in Northern Norway – provide additional information about the weapons launched during the given exercise or the Russian vessels involved in it. The ageing Udaloy-class destroyers of the Northern Fleet are, for instance often involved in this activity (see, for instance, Nilsen, 2020), along with the new classes of frigates (see, for instance, Nilsen, 2018b). Submarines and air forces are also often involved in the exercises.

In addition, it appears that many of the Russian NOTAMs, particularly in Area 1 (the western part of the Barents Sea between North Cape and Svalbard, see Figure 4), are space-related. At the Plesetsk Cosmodrome, located some 180 km south of Arkhangelsk, missile launches are conducted several times a year. Some of the launches are ICBM tests, where the ballistic missiles follow an eastbound trajectory toward the Kura test range at Kamchatka. At other times, multi-stage rockets (typically of the "Soyuz" family) are launched in a north-westerly direction, for instance to put military or civilian satellites into orbit. During these launches, stage one of the booster rocket typically falls off the coast of the Kola Peninsula, and the payload fairing (the two-part cone that protects the payload) typically falls in the western Barents Sea southeast of Svalbard. Sometimes, debris from these launches falls as far away as Baffin Bay, causing safety, environmental, and health concerns for the indigenous population there (Byers & Byers, 2017).

Going through the list Russian NOTAM warnings in the Norwegian and Barents Seas, and cross-checking it against open-source information about what may have taken place in each of the areas, we have come across a phenomenon that deserves special attention: "unused" NOTAM areas. By this, we mean areas that are announced in accordance with established procedures, due to potential hazards associated with planned missile launches or other military activity, but where no such activity takes place within the announced time window. This appears to be a fairly common practice, particularly for Russian NOTAMs in the Norwegian Sea (see for instance Nilsen 2018a).

INTERPLAY BETWEEN RUSSIAN AND NORWEGIAN/NATO EXERCISE ACTIVITY

To arrive at a deeper understanding of the rationale behind Russia's military muscle-flexing in the Norwegian and Barents Seas between 2015 and 2021, and the political and military purposes that it may have been intended to serve, we need to analyze it in a wider context. Many of the Russian NOTAM events seem to coincide with, or succeed, major NATO exercises, such as Trident Juncture in the fall of 2018 and Dynamic Mongoose in the summer of 2019. On some occasions, even the location of the Norwegian/NATO and Russian exercise areas overlap. This may indicate the presence of a "tit-for-tat" dynamic.

At the same time, we need to distinguish between *correlation* (in time and space) and *causation*. The former does not necessarily imply the latter. But in some of the cases of correlation, which we will discuss in greater detail below, the connections are simply too striking to be classified as random coincidences. Before getting to these cases, we will first provide some background on the changing pattern of Russian and NATO deployments and exercise activity in the High North.

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CHANGES IN THE PATTERN OF MILITARY ACTIVITY

With Russia reviving the Soviet-era practice of sending strategic bomber aircraft on regular patrols along the coast of Norway to the North Sea region in 2007, it still took years for NATO to take measures to deter these activities in the High North (Faulconbridge, 2007). In 2015, American B-52 and B-2 bombers participated in several NATO-led training missions across Europe, and in 2016 the United States deployed three B-52 bombers to Europe (Gibbons-Neff, 2016). The aircraft also participated in a series of training missions in the skies above Norway during exercise Cold Response (Nilsen, 2016). Such joint exercises with fighter jets from Norway and the other Nordic countries in the north have since become more frequent and increased in size.

While Norway had advocated for more NATO presence in the High North for years, the alliance's first substantial changes came with the Wales Summit Declaration in 2014, calling for a response to the changes in the security environment and the strategic challenges posed by Russia (NATO, 2014). From the same year on, a second NATO Baltic Air Policing presence was established in Estonia; further, NATO aircraft deployments to Iceland have since been placed on Quick Reaction Alert (QRA) status and flown armed patrols. Both moves came in response to the deterioration in NATO-Russia relations following the annexation of Crimea and the start of the Donbas war in 2014.

In parallel with the increased NATO presence, security cooperation with the two non-aligned Nordic countries, Finland and Sweden, was also strengthened. In addition to the steadily developing Nordic Defense Cooperation (NORDEFCO), both Finland and Sweden were designated as NATO Enhanced Opportunity Partners (EOP), the Alliance's highest-tiered partnership status, at the 2014 Wales Summit. In the following years, multiple multilateral exercises with the participation of the United States took place in the northernmost regions of the two countries (see Depledge, 2020, pp. 297–298), including some of Western Europe's largest fighter jet drills, involving activities at the air bases of Kallax (Luleå), Rovaniemi, Bodø, and Ørland. Such cross-border exercises near the strategically important Kola Peninsula are considered by Moscow as efforts to bring NATO closer to Russia's doorstep.

In Norway, the period from 2015 to 2021 has been characterized by an increase in the scope and scale of allied training and deployments. Units from the U.S. Marine Corps regularly conduct training in Norway, particularly during the winter months (for details, see Strauss, Gordinier & Byrne, 2020). An agreement signed in 2021 will also let the United States establish and use facilities at the Ramsund Naval Station and three Norwegian airfields, including Evenes Air Station in Northern Norway, where the it can deploy P-8 Poseidon maritime patrol aircraft capable of tracking Russian submarines in the northern waters (U.S. Department of State, 2021).

The security landscape in the High North has deteriorated, the allied presence in the region has grown, and Norway is no longer alone as "NATO in the north." Seen with Russian eyes, this means that the main adversary, the United States, is coming closer to the strategically important coastal regions and maritime spaces of the Russian Arctic. Norway's traditional role as a buffer and bridge-builder has come under pressure, and the level of East-West tension has increased. This trend is likely to continue in the aftermath of Russia's large-scale invasion of Ukraine in February 2022.

CASES OF CORRELATION AND NON-CORRELATION

Many of the Russian NOTAM warnings in areas outside the coast of Norway can be interpreted as a response to the above-mentioned enhancement of NATO presence in the Euro-Arctic, Nordic, and Baltic regions after 2014. Some Russian NOTAM events, at least, may have been intended to signal Moscow's dissatisfaction with the increased American military presence on land, sea, and air in areas closer to Russia's nuclear submarine bases and patrol areas in the region.

This is not to say that *all* Russian NOTAM messages in the Norwegian and Barents Seas can be related to parallel Norwegian and NATO activities. A good example is event number 3 in our dataset (see Figure 6), which is the southernmost of the Russian NOTAM areas, located outside the coast of Florø in the northern part of Vestland County. This NOTAM area was active

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between 19 and 21 October 2016. The activity announced was "Russian Navy training flights." The announced danger area was quite large (30,410 km^2), but extended only up to 18,000 feet (the lowest in our dataset). Upon further examination, we found out that this event was related to the southbound transit of the Russian Navy's only remaining operational aircraft carrier, the Admiral Kuznetsov. During its transit to the east Mediterranean (this was during the active phase of Russia's air operations in Syria), it took the opportunity to train its air wing. To our knowledge, no major allied activities took place in or near Norway at the time, or in the preceding weeks.

At the other end of the spectrum, in terms of the degree of correlation with NATO activities, is event number 10 in our dataset. This is the largest Russian NOTAM area in the series (74,521 km^2), and the second most southern, located off the coast of Møre (see Figures 4 and 6). It was active between 1 and 3 November, 2018. Thus, it coincided in time and space with the exercise Trident Juncture, the largest NATO exercise hosted by Norway since the end of the Cold War. The purpose of the Russian NOTAM was clearly to obstruct the NATO exercise and create confusion among Norwegian and Allied commanders. U.S. Navy Admiral James Foggo, who commanded the NATO exercise, later talked about this in an interview:

> This all came to a head during Trident Juncture, when the Russians … designed what we call a notice to mariners or a closure area just outside territorial waters from Norway. A closure area is an intent to conduct an exercise, so they overlaid an exercise on top of our big exercise. Very ungentlemanly thing to do. And so, the Norwegians were a little upset about this. They hadn't ever seen this before, that close to their waters, with Admiral Bruun Hansen and his joint staff, they said, Admiral Foggo, what do you want to do? And I said, well, those are international waters. We do the same thing. And quite frankly, unless somebody is launching a missile or doing some kind of an event that might cause an accident or collision, I'm gonna drive right through it. We're going to continue to do this exercise and we are going to project power and presence and keep those lines of communication open. So that's exactly what we did. (Foggo & Braithwaite, 2021)

Interestingly, no Russian missiles were launched in the NOTAM area off Møre. In the final days of Trident Juncture, Russia issued another NOTAM warning (November 6–9) for rocket test firings, this time just north of Finnmark in the Norwegian sector of the Barents Sea (Nilsen, 2018b). Among the participating vessels were the nuclear-powered battle cruiser Pyotr Velikiy, the Northern Fleet's largest warship. A third NOTAM warning (November 20–22) came shortly after the NATO exercise had ended; one was located west of Andøya in Nordland region. Andøya Air Station is home to Norway's maritime patrol aircraft, and in recent years also frequently used by U.S. maritime surveillance aircraft in search for Russian multi-purpose submarines in the GIUK gap (Nilsen, 2018c). Only weeks before, the USS Harry S. Truman had sailed into Vestfjorden. This was the first U.S. aircraft carrier to be north of the Arctic Circle since the 1980s (NATO, 2018).

In July 2019, Norway hosted an anti-submarine warfare (ASW) exercise in the High North, given the name Dynamic Mongoose. This is an annual event, hosted consecutively by Norway and Iceland. The 2019 edition of the exercise involved six surface ships, nine maritime patrol aircraft, eight helicopters, four submarines, as well as personnel from Canada, France, Germany, the United Kingdom, Norway, Portugal, the United States, Turkey, and Denmark (NATO, 2019). Ahead of the exercise, Russian Navy surface vessels, and at least one Kilo-class submarine, entered the exercise area. And a few weeks later, Russia issued a comprehensive series of NOTAM warnings in the Norwegian Sea (Nilsen, 2019). Four areas were announced off the coast of Helgeland and Lofoten, in the period between 14 and 17 August. The Norwegian Chief of Defense at the time, Haakon Bruun-Hansen, said that the move was a signal sent by Russia to the United States and NATO. The NOTAM warnings, however, ended without smoke. Not a single missile was launched in any of the four areas.

One of the last Russian NOTAMs included in this study (event number 26) was dated 18–24 February 2021 and came in the so-called Bear Island Gap, between mainland Norway and Bear Island. This is where the shallow Barents Sea meets the deeper Norwegian Sea. Four U.S. Air Force B-1B strategic bombers landed at Ørland Air Base between February 22-23 for

a deployment that lasted until mid-April. The deployment provoked strong Russian reactions (see Ministry of Foreign Affairs of Russia, 2021).

In Figure 7, we summarize our findings regarding the issue of interplay between Norwegian/NATO and Russian military activities. Some of the Russian NOTAM warnings seem to have been triggered by, and even intended to obstruct, allied training activity on or near Norwegian soil. The clearest example is the Russian NOTAMs during and after Trident Juncture in 2018. In other cases, such as the Russian NOTAMs in the Norwegian Sea after Dynamic Mongoose in 2019, a connection is likely, but more difficult to prove. And then we have the many cases where Russian NOTAM events do not coincide with allied activities. The latter category includes the southernmost of the NOTAMs, issued in October 2016, and the space-related NOTAMs southeast of Svalbard. These do not appear to have been prompted by, or related to, any Norwegian or NATO activity.

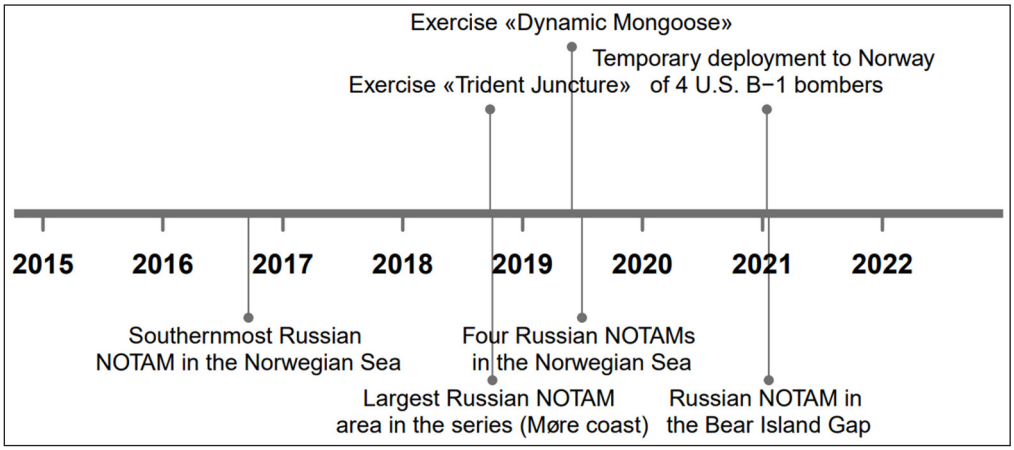

Figure 7 Timeline of major Norwegian/NATO and Russian exercises, 2015–2021. Figure prepared by the authors.

CONCLUDING REMARKS

Devoting special attention to the *when*, *where* and *why* questions, this study set out to conduct a systematic analysis of Russia's NOTAM warnings in the international maritime and aerial spaces off the coast of Norway in the period between 2015 and 2021. Relying on Russian NOTAM data and other available unclassified sources, we have presented a comprehensive overview of Russia's NOTAM events in the international waters and airspace outside Norway. Our dataset shows an increase in the annual number of such events between 2015 and 2019, from one in 2015 to seven in 2018 and nine in 2019. Since then, the number has declined to a level of three in 2020 and two in 2021.

The greatest number of Russian NOTAMs were issued in the western Barents Sea, between the North Cape and Svalbard, and in the Norwegian Sea, northwest of the Lofoten Islands. The largest Russian NOTAM areas, however, were found further south, off the coast of Møre and the northern part of Vestland County. The average duration of the Russian NOTAM areas was longer in the latter than in the early part of the period, regardless of location. The longest NOTAM area, announced in the Bear Island Gap in February 2021, lasted seven days.

Explaining *why* Russia issues NOTAM warnings in these areas, some of them near the territorial waters of Norway or close to important sea lines of communication and fishing areas, is a more complicated matter. To understand why these notices were issued, we have consulted the growing body of theoretical research on the political uses of armed forces, naval diplomacy, and foreign policy signaling. Moreover, we have explored the political context of the Russian activities and events that may shed light on Russia's choice of time and place for the NOTAM areas off the coast of Norway.

Four of the seven NOTAMs in 2018 were issued in November, which was the time of the Trident Juncture exercise. There was also an unusually high number of NOTAMs (six) in August 2019, shortly after NATO's ASW exercise Dynamic Mongoose. This exercise, and four of the Russian NOTAM areas, were placed in the Norwegian Sea. One of the more recent NOTAM warnings, issued in February 2021, coincided in time with the deployment of American B-1 bombers to

Ørland Air Base. This may suggest that at least some Russian NOTAMs were related to NATO activities in the High North.

Interestingly, a significant number of Russian NOTAM areas were never used for the designated purpose. Such "non-events" may have several explanations. One possible explanation could be unforeseen technical issues, such as a weapon malfunction ("failure to launch"). Another possible explanation could be weather conditions. Heavy swells, gusty winds, thick fog, thunderstorms or snowfall may have forced commanders to delay or cancel planned live-fire events. In instances where Russian naval or aerial vessels are present in or near the NOTAM area at the announced time, explanations such as these are certainly plausible. But there is a third possible explanation that we would like to call attention to, and this one is mostly political: it may be that Russia never really intended to launch weapons in these "non-event" areas, and that the primary purpose of the NOTAM was, rather, to obstruct Norwegian and allied military activities taking place in the region.

As noted in the theory section, non-verbal communication with armed forces usually conveys some level of ambiguity. Signaling and other symbolic uses of military force are often deliberately vague. This attribute provides a level of plausible deniability and serves as a safety valve. Ambiguity allows the "sender," in our case, Russia, to communicate a political message to the "receiver(s)," in our case, one or more NATO capitals, without causing an unintended military escalation. The inherent ambiguity found in foreign policy signaling poses an analytical challenge to this study: proving any underlying political intentions of Russia is rendered virtually impossible by design.

However, the political context and events leading up to the Russian NOTAM warnings may still provide some indications and answers. In the section above, the chronology of seemingly interrelated events and exercises was explored. In at least some of the cases, our data suggests that the Russian NOTAMs – and subsequent missile firings – were indeed acts of political signaling.

As a final note, it should be pointed out that our study does not aim to assess the political or military *effect* of any Russian non-verbal messaging aimed at Oslo, Washington, Brussels, or other Western capitals. However, if Russia's intentions were to bring about changes in NATO's force posture or military activity in the High North, there are many indications that the Russian signaling may have been ineffective, perhaps even counterproductive. Despite the many Russian NOTAMs off the coast of Norway in 2015–2021, NATO's presence in the region has only increased.

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COMPETING INTERESTS

The authors have no competing interests to declare.

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