Hybrid CoE Paper 28

# Bracing for a cold front: Assessing Russian and Chinese strategic objectives and hybrid threat capabilities in the Arctic

Hybrid CoE

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January 2026

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ISBN 978–952–7591–32–1 (web)
ISBN 978–952–7591–33–8 (print)
ISSN 2670–2053 (web)
ISSN 2814–7227 (print)

January 2026

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**The European Centre of Excellence for Countering Hybrid Threats (Hybrid CoE)** is an autonomous, network-based international expert organization dedicated to addressing hybrid threats. Hybrid CoE's mission is to enhance the security of its 36 Participating States, the European Union, and NATO by providing expertise, training, and networks to counter hybrid threats. Its core values are excellence, integrity, and respect. The Centre is located in Helsinki, Finland.

# Contents

# Summary

Authoritarian states increasingly rely on hybrid threats to target and undermine the functioning of democratic societies. The Arctic is no exception. Hybrid threats observed in the region include influencing of local communities, instrumentalized migration, sabotage of communication and sensor cables, GPS-jamming, weaponization of fishing vessels, and intelligence gathering and surveillance. Risks of hybrid threats in this theatre may grow in future as receding sea ice and technological progress create new avenues of access and vulnerabilities, and as Russia and China develop and field additional capabilities to support their Arctic operations and presence and advance their hybrid threat tools.

This paper presents Russia's and China's long-term objectives in the Arctic, assessing how their capability, technology and infrastructure development, as well as broader civil-military cooperation, create the potential for future hybrid threats. The focus is primarily on civilian and multipurpose capabilities (including space-based, surface and subsurface assets) that support situational awareness, navigation and other activity in maritime and coastal environments. A key thesis of this paper is that, beyond their potential for physical operations or military use, Russia's and China's evolving capabilities can be leveraged to establish an advantage or dominance in information, logistics, communications and data flows in the Arctic, and to create socioeconomic dependencies. This calls for cooperation and coordination between affected democratic countries and cooperation with Indigenous and other local stakeholders. Collaborative whole-of-society approaches to resilience following Nordic models can serve as inspiration.

# 1 Introduction

The Arctic region[1] is of growing global significance. While it connects the continents and oceans of the Northern Hemisphere, it has particular strategic importance for the maritime, air, space and digital domains. Historically dominated by a harsh climate and sparse infrastructure, the Arctic environment is transforming, and receding sea ice and technological progress are opening new avenues of access. These developments have enabled a greater research presence and opened new economic opportunities for resource exploitation, shipping and tourism. This reinforces the need for fixed, mobile and digital new infrastructure while heightening vulnerabilities. Although around 4 million local inhabitants, among them more than 40 Indigenous peoples, are potential beneficiaries, new infrastructure may also incur environmental harm to their Arctic habitats or trigger socioeconomic conflicts of interest.

The opening of the maritime Arctic is increasingly raising interest in the region beyond the eight Arctic Council states, most importantly from the People's Republic of China ("PRC"), which is eager to advance its influence in Arctic affairs and explore the region's economic and strategic potential. Within the last decade, China has increased its economic, scientific and civil-military cooperation with Russia to achieve this, as both the PRC's and Russia's relationship with other Arctic states has deteriorated.

Primarily due to Russian efforts, which include an evolving cooperation with the PRC, seasonal shipping is increasing through the Northeast Passage ("NEP"), the first operable trans-Arctic shipping lane, which minimizes the distance and travel time between the North Atlantic and Pacific (Figure 2, in red). To be viable, polar shipping lanes will require more coastal and offshore infrastructure, greater coverage of services for communication, positioning, weather and ice forecasting, and enhanced search and rescue capacity. Strategic competition in the Arctic further increases demand for assets that support military operations, situational awareness and communication. Given Russia's and China's growing prioritization of the region and their reliance on hybrid threat tools to pursue their objectives, concerns about the threat potential of their evolving capabilities and cooperation are mounting.

## 1.1. Hybrid threats and the Arctic

Authoritarian states are increasingly relying on hybrid threats to target and undermine the functioning of democratic societies. Current hybrid threat activities in the Arctic stretch across all three spaces (governance, services and civic) and many of the thirteen domains of Hybrid CoE's Conceptual Model.[2]

1 The polar cap, as circumscribed by the Arctic Circle at 66° 33′ 47.2″ north, is one definition of the Arctic region. Other definitions, which use biophysical criteria, commonly further encompass the Norwegian Sea, the northernmost Atlantic islands and the littoral regions around the Bering Sea, while excluding continental areas of the Nordic Arctic states (Figure 1). All these areas are considered in this report, conforming to the geographical scope of the Arctic Human Development Report: Niels Einarsson, Joan Nymand Larsen, Annika Nilsson et al., *Arctic Human Development Report* (AHDR), 17–18, http://hdl.handle.net/11374/51.

2 Georgios Giannopoulos, Hanna Smith, & Marianthi Theocharidou, *The Landscape of Hybrid Threats: A Conceptual Model*, European Commission, Ispra, 2020, PUBSY No. 123305, https://www.hybridcoe.fi/publications/the-landscape-of-hybrid-threats-a-conceptual-model/.


FIGURE 1. Definitions of the Arctic region. Source: Arto Vitikka, Arctic Centre, University of Lapland.

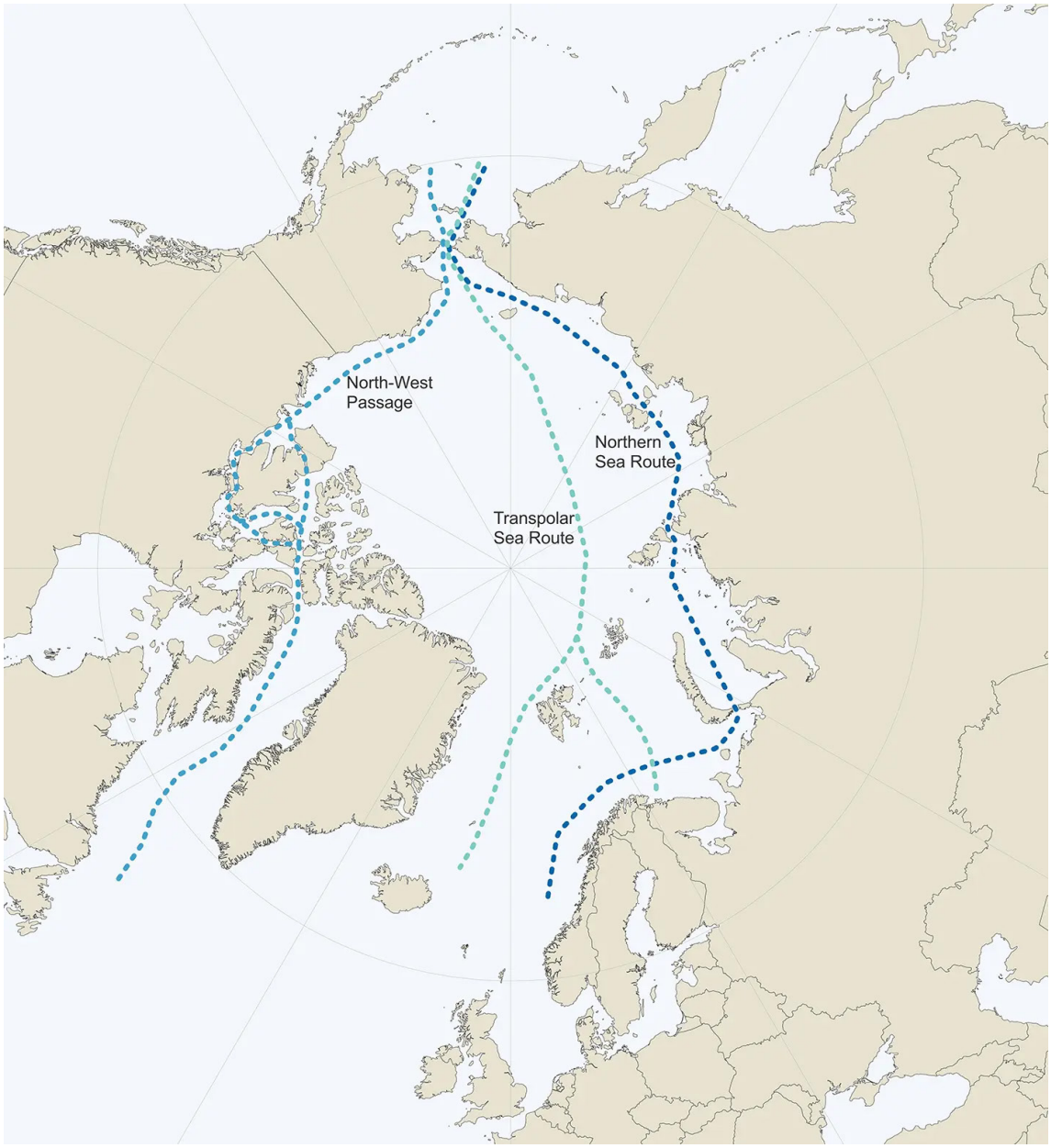


**FIGURE 2. Arctic seaways: Northern Sea Route, Northwest Passage and Transpolar Sea Route. Source: Arto Vitikka, Arctic Centre, University of Lapland,** https://arcticcentre.org/en/arctic-region/maps/arctic-seaways/.

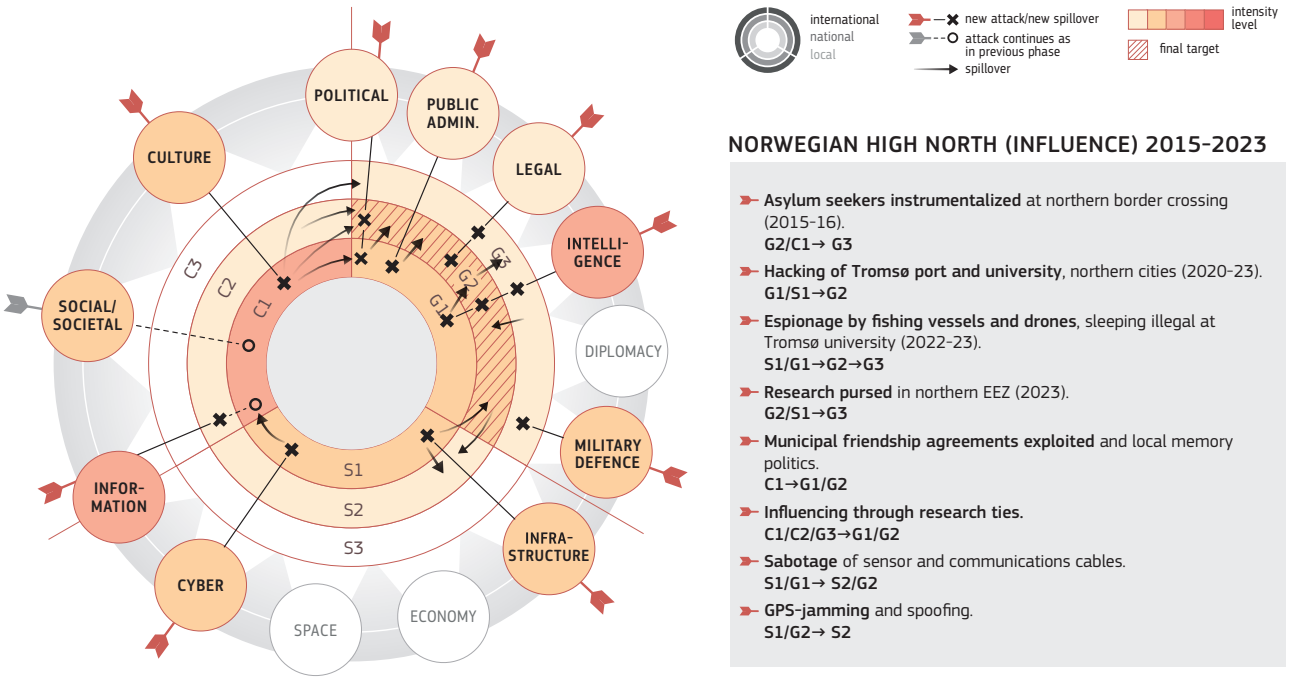


**FIGURE 3. Hybrid threat activities in the Norwegian High North, illustrated by a dartboard image of the CORE model.[3]**

Hybrid threats – as observed in the Norwegian High North (according to a case study published by Hybrid CoE[4]) and illustrated in Figure 3 – have until now included targeted influencing of local Arctic communities and war memorial policies, instrumentalized migration, sabotage of communication and sensor cables, GPS-jamming, weaponization of fishing vessels, and detectable and covert intelligence and information gathering, including within the framework of academia. In the Canadian Arctic (according to another case study published by Hybrid CoE[5]) covert cyber influence campaigns related to mining projects have been attributed to the PRC, and local communities have been subject to marketing by Chinese Huawei, which has sought to exploit fraught relations between Arctic peoples and the federal government concerning the sparse availability of telecom infrastructure.

3 Rainer Jungwirth, Hanna Smith, Etienne Willkomm et al., *Hybrid threats: A comprehensive resilience ecosystem* (EUR 31104 EN, JRC129019). Publications Office of the European Union, 2023, https://doi.org/10.2760/37899.

4 Gunhild Hoogensen Gjørv, *Security and geopolitics in the Arctic: The increase of hybrid threat activities in the Norwegian High North*, Hybrid CoE Working Paper 30, 27 March 2024, European Centre of Excellence for Countering Hybrid Threats, Helsinki, Finland, https://www.hybridcoe.fi/publications/hybrid-coe-working-paper-30-security-and-geopolitics-in-the-arctic-the-increase-of-hybrid-threat-activities-in-the-norwegian-high-north/.

5 Gaëlle Rivard Piché & Bradley Sylvestre, *Vulnerabilities and hybrid threats in the Canadian Arctic: Resilience as defence*, Hybrid CoE Working Paper 24, 29 May 2023, European Centre of Excellence for Countering Hybrid Threats, Helsinki, Finland, https://www.hybridcoe.fi/publications/hybrid-coe-working-paper-24-vulnerabilities-and-hybrid-threats-in-the-canadian-arctic-resilience-as-defence/.

The growing number of incidents targeting infrastructure nodes in the Baltic and North Seas, as well as in the Taiwan Straits and the South China Sea, suggests that EU member states and NATO allies should be prepared for similar incidents in the strategically important Arctic in the future. Single points of technology failure increase the stakes for communities who depend on them. The development of additional infrastructure could enhance redundancy and resilience while increasing the attack surface. Additional vulnerabilities to hybrid threats that adversaries can exploit will emerge as democratic countries develop new infrastructure in the Arctic, whether onshore, offshore, on the seafloor or in space. Moreover, research cooperation and reliance on strategic competitors' research platforms create exploitable dependencies. Adversary states' dual-use or weaponizable multipurpose[6] infrastructure and technologies may also enable intelligence gathering and surveillance and support civil-military operations to pursue and defend interests across the Arctic's maritime, air and undersea environments. This provides future tools for hybrid threat activities in the cyber, diplomacy, information, intelligence, legal, military/defence and space domains, for example. The proliferation of Russian and Chinese infrastructure, which includes polar satellites, may also increase their influence on digital platforms and services in the Arctic, which can be exploited to target communities in all the other domains of the services and civic spaces, including cultural, economic and societal ones.[7] Last but not least, in the event of a military escalation better situational awareness (along with superior logistics and posture) could provide an information and decision advantage that benefits both kinetic and subthreshold military operations.

### 1.2. The aim and structure of the paper

The aim of this Hybrid CoE paper[8] is to present the PRC's and Russia's articulated long-term objectives in the Arctic and assess how their capability, technology and infrastructure development, as well as broader civil-military cooperation, create the potential for future hybrid threats against affected EU and NATO countries and other democratic states and societies.[9] In this context the paper evaluates exploitable civil, research and commercial activity, including Arctic shipping. The focus

6 "Dual-use" here is understood as military and civilian use. This meaning is difficult to apply to hybrid threats because non-military tools are typically used in them, albeit also weaponized.

7 Conlan Ellis, Theodora Ogden, & James Black, *China and space: How space technologies boost China's intelligence capabilities as part of hybrid threats*, Hybrid CoE Paper 21, October 2024, European Centre of Excellence for Countering Hybrid Threats, Helsinki, Finland, 15–16, https://www.hybridcoe.fi/publications/hybrid-coe-paper-21-china-and-space-how-space-technologies-boost-chinas-intelligence-capabilities-as-part-of-hybrid-threats/.

8 This paper is generally updated for the situation in the late spring of 2025 and was selectively updated during the review process.

9 The frequent and formulaic use of "EU and NATO countries" in this text reflects that the 36 Participating States of the Hybrid CoE comprise all EU member states and all NATO allies. It is used without prejudice to or implications for the respective roles and positions in Arctic matters of NATO or its allies, the EU or its member states, the Arctic nations (Arctic 5, Arctic 7, Arctic 8), or partner nations in the Pacific Region with observer status on the Arctic Council.

is primarily on civilian and multipurpose capabilities (including space-based, surface and subsurface assets) that support situational awareness, navigation and other activity in the maritime domain. The paper also addresses the potential for physical/kinetic hybrid threat operations against infrastructure (sabotage), which could serve strategic and military ends. A key thesis of this paper is that, beyond their potential for physical operations or military use, Russia's and China's evolving capabilities can be leveraged to establish an advantage or dominance in information, logistics, communications and data flows in the Arctic, and to create socioeconomic dependencies, all of which bolster the potential for the exercise of a wide range of hybrid threats against EU and NATO countries' societies and Arctic communities locally, nationally and regionally.

To this end the paper first focuses on adversarial *intent*: it outlines Russia's and China's interests, policies and strategic objectives in the Arctic, as well as their doctrinal thinking relevant to the weaponization of civil capabilities for hybrid threats in section 2. Section 3 discusses adversarial potential: it addresses Russian and Chinese present and future *capabilities* developed in the context of Arctic maritime transport, science and the space domain, and the implications of ongoing Russia–PRC cooperation. Section 4 builds on this knowledge to outline possible hybrid threat vectors and implications for affected democratic states and societies, now and in the future.

The paper concludes that although special attention should be paid to Russia's and China's focus on disabling critical infrastructure, a wide range of tools may be used to undermine trust and resilience in Arctic societies more broadly. Whole-of-government and whole-of-society approaches to security are required to prepare for this. Stronger coordination between different governmental agencies and departments and between the civil-military and public-private sectors is required at the national, bilateral and multilateral levels. To reduce vulnerabilities to hybrid threats, policies and actions in the Arctic need to be formulated in partnership with stakeholders and rightsholders such as Indigenous peoples and local Arctic communities. Moreover, cooperation and coordination between affected democratic countries – pooling resources to develop and field capabilities across all domains, optimizing information sharing, sharing approaches to enhance resilience, coordinating responses, and integrating forces – is critical and could help offset some risks.

# 2 The PRC and Russia in the Arctic security landscape

The Arctic, long seen as an "exceptional" region defined by "low tensions",[10] has increasingly become an arena for strategic competition. Growing Russian investment in security-relevant infrastructure, especially since 2014, and Russian territorial aggressions in Eastern Europe have severely impacted governance structures and undermined the trust of the other seven Arctic states. Russia's full-scale war against Ukraine, launched in February 2022, has made cooperation with Russia in most areas untenable. As a result, meetings of the Arctic Council came to a halt in March 2022, though working groups subsequently resumed some of their work under the Norwegian Chairship of May 2023 – May 2025. Another result of Russia's territorial aggression was that Finland and Sweden joined NATO in 2023 and 2024, leaving Russia the only Arctic state not part of the Alliance. In light of these developments, Russia is stepping up its hybrid threat activities in the Arctic, while NATO has intensified its focus on the European Arctic and Atlantic, reflected in its updated regional plans approved at the Vilnius Summit in 2023.[11]

Rather than prioritizing governance via the Arctic Council, Russian policies increasingly favour partnerships with non-Arctic states, which in turn gives these states greater access to the large portion of the Arctic Russia controls. Quantitative and qualitative technological and infrastructure advances that support connectivity in the region at the same time reinforce its geostrategic interdependencies with other theatres and domains.

International law guides governance and resource management in the Arctic region. Territorial disputes in the Arctic have, with few exceptions, been resolved.[12] Yet the potential remains for unintended conflict or conflict as a result of hybrid threats, especially as strategic rivalry is growing, and increasing activity and interest in the region risk escalation.[13]

Some conflicts of interest or differing interpretations of international law could create potential for future conflict. An obvious future escalation scenario could evolve from differing interpretations of the scope of freedom of navigation along the NEP's chokepoints.[14]

10 Camilla T. N. Sørensen, Elizabeth Buchanan, Emma Lappalainen et al., *Security and hybrid threats in the Arctic: Challenges and vulnerabilities of securing the Transatlantic Arctic*, Hybrid CoE Research Report 4, 17 December 2021, European Centre of Excellence for Countering Hybrid Threats, Helsinki, Finland, 10–11, https://www.hybridcoe.fi/publications/hybrid-coe-research-report-4-security-and-hybrid-threats-in-the-arctic-challenges-and-vulnerabilities-of-securing-the-transatlantic-arctic/.

11 Vilnius Summit Communiqué, NATO Press Release, 11 July 2023, https://www.nato.int/cps/en/natohq/official_texts_217320.htm.

12 Andreas Østhagen, Five Misconceptions in Arctic Security and Geopolitics, The Arctic Institute, Commentary, 1 June 2023, https://www.thearcticinstitute.org/five-misconceptions-arctic-security-geopolitics/.

13 Andreas Østhagen, *The Arctic After Russia's Invasion of Ukraine: The increased risk of conflict and hybrid threats*, Hybrid CoE Paper 18, 10 May 2023, European Centre of Excellence for Countering Hybrid Threats, Helsinki, Finland, https://www.hybridcoe.fi/publications/hybrid-coe-paper-18-the-arctic-after-russias-invasion-of-ukraine-the-increased-risk-of-conflict-and-hybrid-threats/.

14 Malte Humbert, 'US Government Investigates Strategic Importance of Northern Sea Route as Part of Study on Maritime Chokepoints', High North News, 9 April 2025, https://www.highnorthnews.com/en/us-government-investigates-strategic-importance-northern-sea-route-part-study-maritime-chokepoints.

Moreover, overlapping claims concerning the extended outer continental shelves of the Arctic Coastal States, which remain under review by the UN Commission on the Limits of the Continental Shelf (CLCS), could exacerbate existing tension. While the Ilulissat Declaration commits the Arctic Coastal States to an "orderly settlement" of potential overlapping claims, it provides no enforcement mechanism in the event of unsuccessful bilateral negotiations. Russia and the PRC have also challenged US claims to its extended continental shelf on the grounds that the United States has not ratified the UN Convention on the Law of the Sea ("UNCLOS").[15] In another contested matter Russia, the EU and some European countries have questioned whether Norway's sovereign rights to an Exclusive Economic Zone (EEZ) (currently claimed as a Fisheries Protection Zone) and a continental shelf around Svalbard under UNCLOS should be subject to exploitation rights by other State Parties to the 1920 Svalbard Treaty in accordance with its stipulations applicable to the Svalbard territory.[16]

Adversaries could exploit these differing interpretations to create rifts between individual states and increase vulnerabilities to "lawfare". They could also increase the risk of other hybrid threats or unilateral actions that undermine existing agreements.

The remainder of section 2 discusses Russia's and China's Arctic interests, policies and strategic objectives, as well as their doctrinal thinking on activities that could function as hybrid threats. Overall, this section establishes these actors' *intent* to intensify their use of hybrid threats in the Arctic, before presenting their evolving *capabilities* of doing so in section 3.

### 2.1. Russian Arctic policy and strategic objectives

Russia makes up 53 per cent of the Arctic Ocean coastline, stretching across much of the warmer arc of the Arctic. With an economy based on resource extraction and raw material exports, it views the Arctic as vital to its present and future economic and security interests. Russia is eager to embrace the economic opportunities presented by rising temperatures to exploit the potential of the resource-rich region, including the Yamal peninsula, which reportedly holds the world's largest natural gas deposits, for resource extraction, shipping and infrastructure development. However, a more accessible Arctic also leaves Russian strategic assets more exposed, heightening the Kremlin's sense of vulnerability to potential foreign threats. Changing geostrategic realities in the region,

15 Kenza Bryan, Josh Gabert-Doyon & Demetri Sevastopulo, 'China and Russia challenge US claim to mineral-rich stretches of seabed', Financial Times, 25 March 2024, https://www.ft.com/content/0e550c72-c6b1–42ac-876b-22aa49c2057b.

16 Cecilie Juul Stensrud & Andreas Østhagen, 'Hybrid Warfare at Sea? Russia, Svalbard and the Arctic'. *Scandinavian Journal of Military Studies*, Volume 7, Issue 1 (2024): 111–130, https://sjms.nu/articles/10.31374/sjms.233. A recent verdict by the Norwegian Supreme Court endorsed the view of the Norwegian government that the Svalbard treaty was inapplicable to the seabed in this zone. See Gwladys Fouche, 'In case affecting oil, Norway Supreme Court says EU ships cannot fish Arctic snow crab', Reuters, 20 March 2023, https://www.reuters.com/world/europe/case-affecting-oil-norway-supreme-court-says-eu-ships-cannot-fish-arctic-snow-2023–03–20/.

including Finland's and Sweden's accession to NATO, have exacerbated the Kremlin's perception of "encirclement" and reinforced its view of the Arctic and Baltic Sea region as interconnected.[17]

Russia's focus on exercising control of the perimeters of its maritime Arctic areas and modernizing its dual-use border control infrastructure is motivated by security and economic interests. Most of Russia's nuclear deterrent is centred around the Kola peninsula, with the Northern Fleet headquartered at the naval base at Severomorsk, less than 200 km from the Norwegian and Finnish borders. With this in mind, Russia has historically been interested in keeping the Arctic stable to avoid inadvertent escalation, while at the same time aiming to ensure perimeter defence around these strategic assets by seeking to project multilayered interdiction capabilities at sea and in the air under the concept of "Bastion Defence"; with receding sea ice, Russia may seek to control larger areas in future.[18] A vital part of Russia's resource strategy is its bid to expand sovereign extraction rights over the Arctic Ocean seabed and its rich mineral resources.[19] While most of its Extended Outer Continental Shelf ("OCS") claims have been deemed scientifically and technically valid by the UN Commission on the Limits of the Continental Shelf (UNCLCS), a large part of its claims overlaps with significant claims by Canada and Denmark that remain under review.[20]

Russia claims – and de facto exercises – control of the middle section of the NEP, the Northern Sea Route ("NSR"). Moscow manages merchant vessels' passage through the NSR by permits issued under its 2020 NSR Rules of Navigation. The regime cites Article 234 of UNCLOS, which grants coastal states the right to regulate non-military shipping for environmental protection in marine areas within their Exclusive Economic Zones, which are ice-covered for most of the year. In a contested move to restrict the passage of state vessels through the key straits of the NSR, Russia has unilaterally enacted domestic legislation, effective since December 2022.[21] Melting sea

17 Heather A. Conley, Sophie Arts, Bonnie S. Glaser et al., *Defending America's Northern Border and Its Arctic Approaches Through Cooperation With Allies and Partners*, GMF Research Report, August 2023, German Marshall Fund of the United States, Washington, DC, 9–10. https://www.gmfus.org/news/defending-americas-northern-border-and-its-arctic-approaches-through-cooperation-allies-and.

18 Mathieu Boulègue, *Russia's Military Posture in the Arctic: Managing Hard Power in a 'Low Tension' Environment*, Research Paper, Chatham House, June 2019, 6–12, https://www.chathamhouse.org/2019/06/russias-military-posture-arctic.

19 Alexander Dalziel, *Frozen Assets: Russia's ambitions to exploit the Arctic Ocean seabed*, Paper, 26 June 2025, Macdonald-Laurier Institute (MLI), https://macdonaldlaurier.ca/frozen-assets-russias-ambitions-to-exploit-the-arctic-ocean-seabed/.

20 Recommendations by UNCLOS are not legally binding, and the Ilulissat Declaration outlines processes to settle overlapping claims between states cooperatively. For more on the Russian case see Elizabeth Buchanan, 'Russia's Gains in the Great Arctic Race', War on the Rocks, 4 May 2023, https://warontherocks.com/2023/05/russias-gains-in-the-great-arctic-race/.

21 Andrey Todorov, *New Russian Law on Northern Sea Route Navigation: Gathering Arctic Storm or Tempest in a Teapot?*, Article, 9 March 2025, Belfer Center for Science and International Affairs, https://www.belfercenter.org/publication/new-russian-law-northern-sea-route-navigation-gathering-arctic-storm-or-tempest-teapot.

ice further complicates Russia's (debated) interpretation of Article 234.[22]

### 2.1.1. Hybrid threat activities and Russian deterrence strategy

Russia has stepped up hybrid threat activities in the Arctic in an effort to advance its geopolitical and economic objectives as part of a broader destabilization campaign. Beyond the case of the Norwegian High North, exemplified in 1.1 above, Moscow has generally intensified its use of disinformation strategies to underpin its narrative that NATO is militarizing the Arctic, with allegedly harmful effects on the region and its inhabitants.[23]

Russia has the tools to conduct hybrid activities across different domains and theatres, including in the Arctic. The latest 2014 military doctrine highlights the "comprehensive use of military force, political, economic, informational, and other non-military measures, alongside the extensive use of the protest potential of the population and special operations forces".[24] Russia has grown bolder in its hybrid threat operations since 2022, arguably in line with its "integrated approach to deterrence", which combines nuclear escalation and sabotage operations.[25] While not exclusive to the Arctic, Russian military doctrine and practice blend the boundaries between military and non-military tools for integrated deterrence and strategic effect with a view to increasing plausible deniability and exploiting more rigid boundaries within NATO countries between peace and war, and between nuclear, conventional and non-military domains.[26] As the Arctic becomes more accessible and infrastructure is further developed, the attack surface for hybrid threat operations against NATO allies' assets will grow. With this in mind, Russian hybrid activities in other theatres provide important insights into possible risks.[27]

In the priming stage before Russia's full-scale invasion of Ukraine, damage to fibre optic cables was inflicted in the Norwegian Arctic.[28] Recently, several commercial vessels with potential connections to Russia, albeit flagged and operated by other countries, have damaged undersea infrastructure (pipelines and fibre optic cables) in the Baltic Sea. A much-

22 Jan Jakub Solski, 'The 'Due Regard' of Article 234 of UNCLOS: Lessons From Regulating Innocent Passage in the Territorial Sea', *Ocean Development & International Law*, Volume 52, Issue 4 (2021): 398–418 https://doi.org/10.1080/00908320.2021.1991866.

23 Alexander Dalziel & Daniel Nikoula, *Polarized: Climate Change, Geopolitics and Disinformation in the Arctic*, InfoLab at the University of Ottawa, July 2025, https://infolab.uottawa.ca/common/Uploaded%20files/PDI%20files/Polorized-EN-FINAL.pdf.

24 The Military Doctrine of the Russian Federation, translation from Russian approved by the President of the Russian Federation on 25 December 2014, https://rusmilsec.blog/wp-content/uploads/2021/08/mildoc_rf_2014_eng.pdf.

25 Katarzyna Zysk, *Russia's Nuclear Doctrine Amendments: Scare Tactics or Real Shift?*, USIP Analysis, 29 January 2025, https://www.usip.org/publications/2025/01/russias-nuclear-doctrine-amendments-scare-tactics-or-real-shift.

26 Ibid.

27 Heather A. Conley, Sophie Arts, Kristine Berzina et al., *Protecting Undersea Infrastructure in the North American Arctic*, GMF Insight, 3 October 2024, German Marshall Fund of the United States, Washington, DC, https://www.gmfus.org/news/protecting-undersea-infrastructure-north-american-arctic.

28 Hoogensen Gjørv, 'Security and geopolitics', 20.

discussed case involved the Chinese-owned Hong Kong-flagged Newnew Polar Bear (which was operated by Torgmoll, a company with connections to Russia and accompanied by a Russian nuclear-powered cargo ship). Under a Chinese captain, who has since been criminally charged in Hong Kong,[29] the ship damaged the Balticconnector pipeline and two undersea cables after its maiden journey through the NEP/NSR. Given Russia's growing focus on non-military means, such incidents have been viewed with suspicion. Although attribution has proved difficult, Russian involvement is suspected in several cases. Furthermore, Russia has assets and units that focus on "maritime special operations".[30] According to a RUSI report, they are "directed by the Ministry of Defence (MoD) and the GRU – Russia's foreign military intelligence agency" which "appear to control activity in organisational terms, both through the [Russian Navy and the Main Directorate for Deep Sea Research] GUGI and the Russian Naval Staff's Intelligence Directorate".[31]

Targeting of critical infrastructure nodes is an important concept of Russian "strategic operations" and is discussed in the context of pre-emptive use of force for escalation management – both in the priming stage of conflict and within war – to inflict limited damage on an adversary to deter further military action.[32] Targets may be both military and civilian.[33] Russia's operations in Ukraine have further emphasized the critical function of space-based assets in supporting military operations and led to public statements declaring that civilian assets may be targeted.[34]

Contrary to Moscow's actions, Russian policy documents and public statements hold international law in high regard while casting doubt on its efficacy. Against this backdrop it is likely that Russia sees its own activities as unaligned with international law in the context of "a strategy of displaying the costs of what it claims as disregard for its 'legitimate' interest. That opens space for hybrid activities."[35]

29 Brian Wong, 'Ship captain remanded in custody in Hong Kong over damaging Baltic Sea pipeline', South China Morning Post, 9 July 2023, https://www.scmp.com/news/hong-kong/law-and-crime/article/3309618/ship-captain-remanded-custody-hong-kong-over-damaging-baltic-sea-pipeline.

30 Sidharth Kaushal, *Stalking the Seabed: How Russia Targets Critical Undersea Infrastructure*, Commentary, 25 May 2023, RUSI, https://www.rusi.org/explore-our-research/publications/commentary/stalking-seabed-how-russia-targets-critical-undersea-infrastructure.

31 Ibid.

32 Michael Kofman, Anya Fink, Dmitry Gorenburg et al., *Russian Military Strategy: Core Tenets and Operational Concepts,* CNA Research Memorandum, October 2021, 70, https://www.cna.org/reports/2021/10/russian-military-strategy-core-tenets-and-concepts.

33 Ibid.

34 Marc J. Berkowitz, *Strategic Lessons from the Russia-Ukraine Conflict*, Information Series, Issue No. 549, 6 March 2023, National Institute for Public Policy, 4, https://www.realcleardefense.com/articles/2023/03/07/strategic_ lessons_from_the_russia-ukraine_conflict_885661.htm.

35 Alexander Dalziel, 'Hybrid Threats to Telecommunications and Data in the Arctic – The Russian Dimension', 2, an unpublished draft background paper commissioned for the purpose of this paper (Hybrid CoE, August 2024).

### 2.1.2. The Arctic region in Russia's international relations

Economic interests appear increasingly to compete with Russia's focus on controlling all access to its "Arctic Zone" (AZRF) as Russia seeks to develop the NSR as a viable shipping lane. Russia was long opposed to granting the PRC greater access to the Arctic and permanent observer status in the Arctic Council, which it ultimately attained in 2013. Russia's growing political, economic and technological isolation in the aftermath of its aggression against Ukraine and subsequent dependence on the PRC seem to have eclipsed much of Moscow's historic mistrust for China for now, at least at the highest political level.[36] Conversely, leaked Russian intelligence documents from late 2023 and early 2024 suggest that the intelligence community continues to be suspicious of China.[37]

In 2023 Russia amended its 2020 Arctic strategy with a view to emphasizing bilateral cooperation in the Arctic instead of its traditional focus on regional and other multilateral cooperation, including through the Arctic Council.[38] All regional and multilateral forums relevant to the Arctic require cooperation under terms set by democratic states Russia has classified as unfriendly.

As Russia seeks to develop the NSR and extractive industries and infrastructure along its path, it has increasingly looked to the PRC and other BRICS+ countries to provide much-needed investment, with some limited success. Chinese investment in the Russian Arctic as measured cumulatively by Foreign Direct Investment (FDI) amounts to a few tens of billions of dollars, which is a significant but arguably stagnant amount (and not quite as spectacular as often suggested).[39] Chinese actors hold significant minority shares, strategically important for the PRC's interests, in Novatek's Yamal LNG and

36 Heather A. Conley, Sophie Arts, Bonnie S. Glaser et al., *A New Era of Arctic Geopolitics: Russia-PRC Strategic Alignment Is Driving Unprecedented Regional Collaboration*, GMF Report, 18 July 2024, German Marshall Fund of the United States, Washington, DC, https://www.gmfus.org/news/new-era-arctic-geopolitics.

37 Jacob Judah, Paul Sonne, & Anton Troianovski, 'Secret Russian Intelligence Document Shows Deep Suspicion of China', New York Times, 7 June 2025, https://www.nytimes.com/2025/06/07/world/europe/china-russia-spies-documents-putin-war.html.

38 Jørgen Staun & Camilla T. N. Sørensen, 'Incompatible Strategic Cultures Limit Russian-Chinese Strategic Cooperation in the Arctic'. *Scandinavian Journal of Military Studies,* Volume 6, Issue 1 (2023): 24–39, 32. https://doi.org/10.31374/sjms.178.

39 Joshua Tallis, Mark Rosen, & Cornell Overfield, 'Arctic Economic Security: Recommendations for Safeguarding Arctic Nations against China's Economic Statecraft', Report to the US Department of Defense (CNA, January 2022), 3–4, https://www.cna.org/reports/2022/01/arctic-economic-security. An oft-cited number, distorted by its wider geographical scope and obsolete data, is that of "$90bn in Arctic energy and mineral projects, primarily in Russia", which is traceable to Mark E. Rosen & Cara B. Thuringer, 'Unconstrained Foreign Direct Investment: An Emerging Challenge to Arctic Security', Occasional Paper, CNA, December 2017, 54, https://www.cna.org/reports/2017/unconstrained-fdi-arctic-security. For an up-to-date assessment see Anders Christoffer Edstrøm, Guðbjörg Ríkey Th. Hauksdóttir, & P. Whitney Lackenbauer, *Cutting Through Narratives on Chinese Arctic Investments*, Policy Brief, June 2025, Belfer Center for Science and International Affairs, https://www.belfercenter.org/research-analysis/china-arctic-investments.

Arctic LNG 2 projects.[40] Further examples are the Eastern Siberia–Pacific Ocean oil pipeline and the Power of Siberia natural gas pipeline.[41]

## 2.2. Chinese Arctic policy and strategic objectives[42]

With its long history of interest in Arctic affairs, which includes the Chinese Republic's accession to the Svalbard Treaty in 1925,[43] China looks to the Arctic today for economic, strategic and political reasons. Fossil fuels, fisheries and in the long term critical minerals are of particular interest to satisfying its growing resource needs. The PRC is eager to increase its influence and presence in spaces it considers "global commons" and/or "strategic new frontiers",[44] that is, domains it considers critical to determining strategic global dominance: outer space; cyberspace; the deep sea; and both polar regions.[45] As a state without any territory in the Arctic, the PRC is determined to increase its say in Arctic governance and to advance arguments for greater involvement of non-Arctic states, whether within regional arrangements, bilaterally or through multilateral organizations with a wider scope.[46]

### 2.2.1. Military-civil fusion (MCF) and Irregular Warfare Conceptions

In the context of an emerging technological and strategic competition with the United States, "military-civil fusion" (MCF) is part of a strategic effort by the PRC to turn the country into a technological superpower by fusing its defence and commercial economies.[47] MCF was elevated to a national strategy in 2015, and the Central Military-Civil Fusion Development Committee, chaired by Xi Jinping, was established two years later.[48] MCF aspires in particular to bring about

40 Edstrøm et al., 'Cutting Through Narratives', 7–8.
41 Edstrøm et al., 'Cutting Through Narratives', 8.
42 This subsection draws on Trym Eiterjord, 'China's Scientific Presence in the Arctic and Dual-use Research', 2–3, 9–20, an unpublished background paper commissioned for the purpose of this paper (Hybrid CoE, November 2024).
43 Ties Dams, Louise van Schaik & Adâja Stoetman, 'Presence before power: why China became a near-Arctic state', Chapter 2 in *Presence before power: China's Arctic strategy in Iceland and Greenland*, Clingendael Report, June 2020, https://www.clingendael.org/pub/2020/presence-before-power/2-presence-before-power-why-china-became-a-near-arctic-state/.
44 'China's Arctic Policy', State Council Information Office of the People's Republic of China, January 2018, https://english.www.gov.cn/archive/white_paper/2018/01/26/content_281476026660336.htm.
45 Patrik Andersson, 'The Arctic as a "Strategic" and "Important" Chinese Foreign Policy Interest: Exploring the Role of Labels and Hierarchies of China's Arctic Discourses', *Journal of Current Chinese Affairs*, 2021, Volume 0: 13. https://journals.sagepub.com/doi/epdf/10.1177/18681026211018699.
46 For a discussion building on other authors' findings, including Anne-Marie Brady, Matti Puranen, Sanna Kopra, Trym Eiterjord, & Mark Lanteigne, see Heather A. Conley, Sophie Arts, Bonnie S. Glaser et al., *From Reluctance to Greater Alignment: Russia-PRC Scientific Cooperation in the Arctic Supports Strategic Goals*, GMF Report, 29 May 2024, German Marshall Fund of the United States, https://www.gmfus.org/news/reluctance-greater-alignment.
47 Richard A. Bitzinger, 'China's shift from civil-military integration to military-civil fusion', *Asia Policy*, Volume 16, Issue 1 (2021): 5–24. https://doi.org/10.1353/asp.2021.0001.
48 Amitra Jash, 'China's military-civil fusion strategy: building a strong nation with a strong military', *Claws Journal*, Volume 13, Issue 2 (2020): 42–62, 48, 54.

a shift to "intelligentized warfare" by military applications, defined as the "operationalization" of artificial intelligence (AI) and its enabling technologies such as cloud computing, big data analytics, quantum computing and autonomous systems.[49] The PRC views these technologies as essential to winning future wars by destroying an opponent's critical systems and protecting its own.[50]

The space, cyberspace and maritime domains (the last of which in Chinese strategic thinking includes the Arctic) have been the three "major security domains" of the MCF strategy since 2016.[51] Military officials have discussed how to set up a "maritime information infrastructure", which would include an "all-weather, all-day, multi-method, three-dimensional, high-precision maritime battlefield situational awareness network" and a "national joint marine environment investigation and monitoring system".[52] Others have highlighted the importance of developing "underwater detection, information transmission and security, and improving comprehensive ocean perception capabilities", along with other polar surface vessels, including icebreakers, and supporting equipment.[53]

### 2.2.2. Chinese civil-military presence in the Arctic

Hybrid threat tools can be used in the Arctic to spread insecurity and confusion while normalizing the Chinese military-civil presence. Despite some key differences in the geopolitical contexts, it could be useful for preparedness to take stock of the tools deployed by the PRC in Antarctica, and even of some evidenced in the South China Sea. Future hybrid threats in the Arctic could range from coercive to subtler tools and can include the spread of anti-Western messaging, amplifying societal wedges, leveraging economic influence, coopting key elites, kinetic and cyber sabotage of infrastructure, and exploiting loopholes in international law and norms.

Scientific research has long been China's primary vehicle to advance its polar, including Arctic, presence. The PRC joined the International Arctic Science Council in 1996. It has relied on research stations, icebreaker science missions and collaborative projects with other countries to advance its Arctic science research and physical presence. China's reliance on its MCF strategy underscores the dual-use potential of scientific missions. As part of its broader Belt and Road Initiative, the PRC has sought to develop a "Polar Silk

49 Bitzinger, 'China's shift from civil-military', 7.

50 'Military and Security Developments Involving the People's Republic of China', Annual Report to Congress (U.S. Department of Defense, 2024), 35, https://media.defense.gov/2024/Dec/18/2003615520/-1/-1/0/MILITARY-AND-SECURITY-DEVELOPMENTS-INVOLVING-THE-PEOPLES-REPUBLIC-OF-CHINA-2024.PDF.

51 Alex Stone & Peter Wood, *China's Military-Civil Fusion Strategy*, Report, 15 June 2020, China Aerospace Studies Institute, Air University, 93, https://www.airuniversity.af.edu/CASI/Display/Article/2217101/chinas-military-civil-fusion-strategy/.

52 Stone et al., 'China's Military-Civil', 94.

53 'State Council: Civil-military integration gives priority to the development of remote-sensing satellites, cyberspace, and marine equipment' (Highlight from sohu.com, 5 December 2017), https://www.sohu.com/a/208628378_466840.

Road" and a "Digital Silk Road" – both of which require investment in shipping and information infrastructure in the Arctic. As Western countries have grown warier of China's strategic aims and coercive tactics, its efforts to develop multipurpose infrastructure in the seven NATO countries with territory in the Arctic region have increasingly been thwarted. Instead, the PRC has increased its cooperation with Russia (a topic explored in more depth in section 3).

Chinese strategic thinking characterizes the Arctic region as an "important maritime interest", falling under the PRC's strategic objective of becoming a "maritime great power".[54] More specifically, China has cast itself as a "polar power", with the aim of becoming a "polar great power" by 2030 with a polar infrastructure on a par with the United States and Russia.[55] A list of the new strategic frontiers was written into the PRC's new National Security Law in 2015 (Article 32).[56] The chapter in the most recent edition of the Science of Military Strategy from 2020[57] on "New domains of military conflict" has an entire section entitled "Military conflict in the polar regions", describing the Arctic as the "strategic commanding heights" overlooking the Northern Hemisphere.[58] This section emphasizes the expansion of China's national interests and the new challenges and tasks this poses for the use of the PRC's military power. It highlights new shipping routes, climate change research, energy, and mineral and other natural resources.[59]

However, large parts of the chapter warn against the deployment of military forces in the polar regions, cautioning that "some Arctic countries regard the Arctic actions of extraterritorial powers as an infringement on their 'backyard'" which could trigger "international conflicts". The section therefore stresses obeying and serving the PRC's overall foreign policy and its long-term strategy for operating in the polar regions, following the military-civil fusion (MCF) approach for the utilization of military forces, relying on non-military capacity-building activities such as search and rescue operations, and actively exploring international cooperation with other countries.[60]

These caveats and the emphasis on non-military capacity-building activities not only reflect caution about the use of military forces and its optics but could also be read as a stepwise buildup of capabilities for communication and monitoring, air, sea and land manoeuvrability in polar climates, and situational awareness, using the MCF policy to

54 Michael A. McDevitt, *China as a Twenty-First Century Naval Power: Theory, Practice, and Implications* (Annapolis: Naval Institute Press), 2020.

55 Andersson, 'The Arctic as', 6.

56 'People's Republic of China National Security Law', Presidential Decree No. 29, 1 July 2015, https://www.gov.cn/zhengce/2015–07/01/content_2893902.htm.

57 This strategy was published by the National Defence University and is indicative of the military thinking of policy planners and strategists in China.

58 *Science of Military Strategy 2020* [paginated translation of the '2020 Science of Military Strategy'], In Their Own Words, 28 January 2022, China Aerospace Studies Institute, Air University, 163, https://www.airuniversity.af.edu/CASI/Display/Article/2913216/in-their-own-words-2020-science-of-military-strategy/.

59 'Science of Military Strategy 2020', 162–164.

60 'Science of Military Strategy 2020', 166–167.

achieve these objectives.[61] This interpretation is in line with views of Chinese strategists, who highlight scientific research and civilian activities, including search and rescue, as "capacity-building" measures for a greater polar military asset presence and gathering intelligence. To this effect a lecturer at the National Defense University of the People's Liberation Army ("PLA") has stated that the military can engage in Arctic affairs by providing support and protection for the PRC's scientific and commercial activities in the region, conducting search and rescue operations, entering into security cooperation with Arctic countries, and undertaking reconnaissance and intelligence-gathering missions.[62] Further, another authoritative security expert has argued that at the initial stage of capacity building "it is appropriate to carry out relevant preparatory work in the form of 'civilian' [activities] such as scientific expeditions and other forms of research to collect comprehensive information on the geology and geomorphology of the high seas area of the Arctic Ocean, marine hydroacoustic and hydrological data, and gravitational and magnetic parameters of the [Arctic] seabed", and that the People's Liberation Army Navy (PLAN) should develop its icebreaking capability and "look for opportunities to enter the Arctic Ocean" through search and rescue exercises or operations, for example.[63]

It is unclear, however, whether the PRC's articulated interest in "Far Seas Protection" (as outlined in its current naval strategy), which seeks to defend its territory from foreign attack and protect "overseas interests" beyond the second island chain, will eventually extend to projecting military force to the Arctic theatre.[64] Strategists emphasize the control of important global Sea Lines of Communications (SLOCs) for military and strategic purposes.[65] While the Arctic is not explicitly mentioned in this context, its strategic importance suggests that the PRC could eventually seek to use military force – including against assets of EU and NATO countries – to defend its Arctic and global interests. However, as Ryan Martinson suggests, this prospect "remains very remote".[66] Nonetheless, the PRC's policy, whether as officially adopted or formulated by prominent Chinese experts, sees the country's emergent scientific and economic involvement in the maritime Arctic as an important interface for its military's future presence and capabilities, which by extension will create the capacity to exert hybrid threats.[67]

61 Eiterjord, 'China's Scientific Presence', 14.
62 Zuo Pengfei, '极地战略问题研究 [A Study on Polar Strategy]' (Shishi Press, 2018), 96, as paraphrased in Eiterjord, 'China's Scientific Presence', 18.
63 Deng Beixi, '北极安全研究 [Arctic security research]', (海洋出版社 [Ocean Press], 2020), 236, as translated by Eiterjord ('China's Scientific Presence', 19), who reports that Deng Beixi leads the PRIC Polar Security and Policy Center.
64 Ryan Martinson, 'China's Oceanic Aspirations: New Insights from the Experts', *Orbis*, Volume 66, Issue 2 (2022): 249–269, 249–257, https://doi.org/10.1016/j.orbis.2022.02.012.
65 Ibid., 263.
66 Ibid., 266–267.
67 Eiterjord, 'China's Scientific Presence', 19–20.

# 3 Arctic capabilities of the PRC and Russia enabling future use of hybrid threats

As the previous sections have outlined, infrastructure and civil assets (fixed or mobile) in the Arctic region can be weaponized and often serve multiple purposes. One capability may simultaneously serve or support commercial, scientific and military ends, and may as such variably be instrumentalized for military purposes or hybrid threats. A closer examination of Russian and Chinese weaponizable capabilities is warranted to assess how commercial, scientific and multipurpose surface, subsurface and space capabilities (as well as terrestrial infrastructure) may be used for surveillance purposes to impede or deny access to international waters as defined by international law/UNCLOS, to exert influence on information flows/knowledge production, for military operations, or to target the critical infrastructure and vital societal functions of EU and NATO countries.

This section outlines some of the key capabilities of the PRC and Russia, which are increasingly cooperating commercially, scientifically and in some contexts militarily in the Arctic region. Their cooperation is in many respects facilitated by Russia's interest in developing the Northern Sea Route (NSR) into a viable sea lane and developing infrastructure and extractive industries along it to bring resources to market, and to some extent a desire to compete with Western interests in the region.[68]

### 3.1. Trans-Arctic shipping and adversarial capabilities for communication and maritime awareness

Arctic shipping remains modest in volume but is strategically significant, including for the Arctic NATO countries. Undisrupted shipping within, between and to their Arctic territories is vital for the viability of regional economic activities and security of supply of insular and coastal local communities, and even entire nations.[69] Maritime connectivity is also critical for maintaining situational awareness and supporting stations for research and meteorological monitoring, as well as military installations. Dependence on transport that supports onshore and offshore extractive industries in NATO countries may grow in future. Moreover, with less ice cover more cruise ships are entering the Arctic. This creates a growing need for positioning and communication infrastructure, as well as search and rescue. As Western maritime activity increases, so will the potential for accidents and hybrid threats such as deliberate disruptions to traffic and connectivity (e.g. satellite services), including at navigation chokepoints.[70]

Shipping through the NSR is currently the most important vehicle for the introduction of multipurpose capabilities in the Arctic region. As this subsection and subsection 3.3 on "The space domain and polar satellites" indicate, maritime traffic in the Arctic requires positioning and communication systems with coverage adapted for high latitudes. Furthermore, safe

68 Alexander Dalziel, *Polar Power: The Northern Sea Route in Russia's strategic calculus*, paper, 26 June 2025, The Macdonald-Laurier Institute (MLI), https://macdonaldlaurier.ca/polar-power-the-northern-sea-route-in-russias-strategic-calculus/.

69 Self-governing nations and (according to the definition in subsection 1.1) Iceland.

70 Robert C. Rasmussen, *An Emerging Strategic Geometry – Thawing Chokepoints and Littorals in the Arctic*, Center for International Maritime Security, 3 June 2020, https://cimsec.org/an-emerging-strategic-geometry-thawing-chokepoints-and-littorals-in-the-arctic/.

navigation requires capabilities for search and rescue, as well as remote-sensing to monitor the environment and ice conditions. Both in turn provide superior situational awareness to help support, monitor and deny any type of presence or activity. Russia–PRC cooperation in developing the NSR (alongside scientific missions in international waters) also provides an opportunity to introduce Chinese assets into the Arctic to support these different missions.

**3.1.1. Russian commercial shipping interests and supporting multipurpose capabilities**[71]

Russia hopes to multiply transport volumes on the NSR in just a few years. The total volume of cargo transported via the NSR reportedly reached a record 38 million tonnes by the end of 2024[72] – almost double the 2018 total.[73] Yet it falls well short of the goals set in the *Plan of the development of the NSR until 2035*: 90 million tonnes for 2024; 216 million tonnes for 2030. Much of the growth will depend on the progress of a few large Arctic projects for hydrocarbon extraction, mainly destined for export to Asia.[74]

Remarkably, and mainly because of Russia–PRC cooperation, the growth of Pacific-Atlantic transit voyages passing through the entire NSR water area and beyond to the Barents Sea or North Atlantic, or the NEP, has recently grown much faster, albeit starting from a very low level. During 2024 some 97 transit voyages reportedly carried more than three million tonnes of cargo.[75] This new annual record significantly surpasses the previous peaks in 2013 and 2021.[76] Growing trade between Russia and the PRC continues to be the main driver (95 per cent of all transit traffic in 2024). Crude oil shipped from Russia to China constituted 62 per cent of the cargo transported via the NSR in 2024.[77] To realize its fast growth ambitions, Russia is seeking to develop local markets along the route. Most importantly, for viable logistics and affordable insurance it will have to increase

71 This subsection benefits from Tero Vauraste, 'Balancing the Arctic with Hybrid Activities', 10–16, an unpublished background paper commissioned for the purpose of this paper (Hybrid CoE, November 2024).

72 'New record set for volume of cargo shipped along the Northern Sea Route', ROSATOM news item, 10 January 2025, https://www.rosatom.ru/en/press-centre/news/new-record-set-for-volume-of-cargo-shipped-along-the-northern-sea-route/. The numbers for 2025 were still unknown when this text was being finalized, but as of November the number stood at 33,5 million tonnes: 'Profitable without restrictions: foreign investors are growing interest in the Northern Sea Route, Izvestija news item, 11 December 2025, https://iz.ru/en/node/2005979.

73 Diana Mikhailova & Shinichiro Tabata, 'Prospects for the development of the Northern Sea Route after February 2022: An analysis of Russia's policy in the new conditions', *Polar Science*, Volume 41 (2024): 3–4. https://doi.org/10.1016/j.polar.2024.101054.

74 Mikhailova et al., 'Prospects for the development', 6–7.

75 'Main Results of NSR Transit Navigation in 2024', Centre for High North Logistics (CHNL) news item, 28 November 2024, https://chnl.no/news/main-results-of-nsr-transit-navigation-in-2024/. The numbers for 2025 were still tentative when this text was being finalized, but there were indications of a decelerated growth under unfavourable ice conditions: 'Main Results of NSR Transit Navigation in 2025', Centre for High North Logistics (CHNL) news item, 9 December 2025, https://chnl.no/news/main-results-of-nsr-transit-navigation-in-2025/.

76 Mikhailova et al., 'Prospects for the development', 4. 'Main results [..] 2024', Graph 1.

77 'Main results [..] 2024'.

and modernize its ports, terminals, railways and icebreaker fleet, and invest in a rescue fleet and other emergency rescue infrastructure. Russia's plans also require investment in telecommunications and the improvement of navigational safety and management systems. The 2022 NSR development plan (which has been deemed unrealistic because it would require a level of modernization and investment yet to occur)[78] includes budgeted figures for most of this.[79] The Russian Arctic Strategy was amended in February 2023,[80] reaffirming a significant expansion of the icebreaker fleet, more emergency response and rescue vessels, and hydrographic survey vessels. It also confirmed plans for an automated system for identifying vessels and monitoring them at long distance, and the provision of remote-sensing data to interested customers in accordance with Russian legislation.

While shipping via the Arctic has been discussed as a promising alternative with potential to shorten transit from Asia to Europe by up to 40 per cent compared with routes via the Suez or Panama Canals, some experts have questioned the future viability of different Arctic passages as major transit routes due to persistent logistical and operational challenges.[81] Russia has focused on developing the NSR's economic potential by charging fees for traffic along its path. It may hope that disturbances in other sea lanes could make more countries dependent on the NSR in future.

One of the main bottlenecks in efforts to develop the NSR, openly admitted by Russian policymakers, is that the shipbuilding complex of the Russian Far East lacks the capacity to build more than a fraction of the ice-classified LNG carriers, container ships and bulk carriers required to achieve the goals.[82] It is therefore unsurprising that Russia has sought cooperation with the PRC and other actors such as Dubai's DP World[83] and India,[84] and that it is looking to Turkish shipyards for the construction of

78 Mikhailova et al., 'Prospects for the development', 8.

79 Mikhailova et al., 'Prospects for the development', 2, 5, 8.

80 'Amendments made to Strategy for Developing Arctic Zone of Russia and Ensuring National Security until 2035', Kremlin Press release 27 February 2023, http://en.kremlin.ru/acts/news/70593.

81 Jack Detsch & Robbie Gramer, 'The Geopolitics of New Arctic Shipping Lanes', Foreign Policy, 30 May, 2024, https://foreignpolicy.com/2024/05/30/arctic-geopolitics-russia-china-maritime-trade-northern-sea-route/; Alina Kovalenko, Terje Andreas Mathisen, & Jeroen Pruyn, 'Generalized transport costs in intermodal shipping: the context of the Northeast Passage', *Journal of Shipping and Trade,* Volume 9, Issue 25 (2024): https://doi.org/10.1186/s41072–024–00183-y; Adan Wu, Tao Che, Qingchao Xu et al., 'Assessing the economic viability of the Arctic Northeast Passage from 2021 to 2065', *International Journal of Digital Earth*, Volume 17, Issue 1, 2323182 (2024): https://doi.org/10.1080/17538947.2024.2323182; Stephen M. Carmel 'The Cold, Hard Realities of Arctic Shipping', U.S. Naval Institute, Proceedings 139/7, July 2013, https://www.usni.org/magazines/proceedings/2013/july/cold-hard-realities-arctic-shipping.

82 Denis Zagore, 'Deputy PM admits Russia can't build enough ice-class ships', Barents Observer, 23 October 2024, https://www.thebarentsobserver.com/news/deputy-pm-admits-russia-cant-build-enough-iceclass-ships/419242.

83 Mark Trevelyan & Gleb Stolyarov, 'Russia strikes deal with Dubai's DP World to develop Arctic sea route', Reuters, 24 October 2023, https://www.reuters.com/markets/commodities/russia-sets-up-joint-venture-with-dp-world-develop-arctic-sea-route-2023–10–24/.

84 Rezaul H. Laskar & Rajeev Jayaswal, 'India, Russia discuss new initiatives for Northern Sea Route',

icebreakers and other vessels adapted for the Arctic.[85]

### 3.1.2. Chinese commercial interests and Russia–PRC cooperation on the Northern Sea Route

The PRC and Russia have overlapping interests in developing infrastructure that supports Arctic shipping. China is highly dependent on imports to meet its energy needs, which continue to grow. As the world's largest energy consumer and importer of crude oil, a major importer of natural gas, and the fourth largest commercial shipping power, China has a vested interest in diversifying its trade routes. This includes avoiding routes and chokepoints susceptible to congestion and potential naval blockages. For the PRC the appeal of the NSR for destinational shipping has grown due to lower Russian oil and gas prices, affected by Western sanctions and price caps.

As stated in section 3.1 (cf. footnote 72), transit shipping over the NEP reached new records in 2024. The post-2022 growth in transit through the NEP remains modest in volume, and containers make up only six per cent of transit shipping.[86] The Hainan Yangpu NewNew Shipping Co. Ltd. shipping line, owned by the Torgmoll group, is a new actor. In June 2024 it signed an MoU with the Russian state-owned Rosatom (which owns the nuclear-powered icebreaker fleet and controls the management of the NSR) with a view to developing container traffic through the NEP into a year-round undertaking.[87] This MoU was concluded while Russia was reportedly helping disrupt the main alternative sea lane by providing targeting data for Yemen's Houthi rebels as they were attacking Western ships in the Red Sea.[88]

In March 2023 Russia and the PRC pledged to establish a joint body to promote traffic along the NSR. According to a report of the first meeting of a new "Sub-Committee" in late 2024, areas of cooperation include capabilities that are relevant as enablers of future hybrid threats through an advantage or dominance in information, logistics, communications and data flows: "safety of navigation, planning and ensuring the growth of cargo traffic along the NSR, promoting the development of logistics routes, exchanging data about the NSR ice situation, meteorological and other conditions".[89]

Hindustan Times, 14 October 2024, https://www.hindustantimes.com/india-news/india-russia-discuss-new-initiatives-for-northern-sea-route-101728912533475.html.

85 The Jamestown Foundation, 'Two Nations Are Challenging Russia's Arctic Shipping Dominance', 9 April 2023, https://oilprice.com/Energy/Energy-General/Two-Nations-Are-Challenging-Russias-Arctic-Shipping-Dominance.html.

86 'Main results [..] 2024'.

87 'Russia's Rosatom and Chinese Firm to Establish Year-Round Arctic Shipping Route', gCaptain, citing Reuters, 6 June 2024, https://gcaptain.com/russias-rosatom-and-chinese-firm-to-establish-year-round-arctic-shipping-route.

88 Benoit Faucon & Thomas Grove, 'Russia Provided Targeting Data for Houthi Assault on Global Shipping', Wall Street Journal, 24 October 2024, https://www.wsj.com/world/russia-provided-targeting-data-for-houthi-assault-on-global-shipping-eabc2c2b.

89 'Russia, China Agree Important Safety, Security Issues Along The Northern Sea Route', Russia's Pivot to Asia news portal, 1 December 2024, https://russiaspivottoasia.com/russia-china-agree-important-safety-security-issues-along-the-northern-sea-route/.

In October 2024 the NewNew Shipping Line and Russia's Atomflot announced the construction of five Arc7 ice-class container ships.[90] Once constructed and in use, these ships will allow the shipping company to "further expand into the shoulder season or eventually the winter months".[91] The prolongation of the operating season and the expansion of the ice-capable fleet of a Chinese shipping company are yet another step in normalizing and cementing the Arctic presence of Chinese actors and Chinese multipurpose infrastructure to support navigation. In August 2025 a Chinese shipping company announced the launch of the first liner-type container shipping route via the Arctic, while the PRC's meteorological authorities under the Ministry of Transport began releasing a live Arctic sea ice monitoring product, which "greatly improves the spatial resolution of Arctic sea ice monitoring, identifies waters passable by ships, and provides more accurate data support for the safety of Arctic shipping routes".[92]

The PRC's goal of developing the Polar Silk Road also requires fixed infrastructure that supports shipping. In 2023 Russian Titanium Resources (Rustitan) and China Communications and Construction Company (CCCC) signed a cooperative agreement to develop large titanium and quartz deposits in the Komi Republic, set to begin in 2026. The project is tied to the potential development of a much-delayed deepwater port at Indiga and the construction of a connecting railway, which Russian sources project to become "one of the main stations of the Northeast Passage". Both projects have been delayed, partly due to the high cost.[93]

As Chinese investments in the NSR expand, Chinese interests to protect them may increase. While commercial cooperation between Russia and the PRC has grown, so have additional civil-military cooperative efforts. In April 2023 the FSB and China Coast Guard (CCG) signed a memorandum of understanding in Murmansk to enhance their cooperation in joint maritime law enforcement.[94] Both countries' coast guards have since conducted their first joint patrol in the Bering Sea near Alaska.[95] The MoU and its signing in Murmansk have prompted speculation

90 Malte Humpert, 'China-Russia Announce Plans for Five Ice-Capable Containerships for Year Round Arctic Service', High North News, 15 October 2024. https://www.highnorthnews.com/en/china-russia-announce-plans-five-ice-capable-containerships-year-round-arctic-service.

91 Ibid.

92 Malte Humpert, 'China Launches 18-Day Arctic Express Containership Route To Europe With Stops in UK, Germany, Poland', High North News, 18 August 2025, https://www.highnorthnews.com/en/china-launches-18-day-arctic-express-containership-route-europe-stops-uk-germany-poland.

93 Edstrøm et al., 'Cutting Through Narratives', 9; 'China to assist Russia with titanium mining in the Arctic', Janes, 1 February 2023, https://www.janes.com/osint-insights/defence-and-national-security-analysis/china-to-assist-russia-with-titanium-mining-in-the-arctic; 'Indiga Seaport: what it is and what it means for the Northeast Passage', Arctic Russia web page, https://arctic-russia.ru/en/project/indiga-new-gate-into-the-arctic/.

94 Thomas Nilsen, 'FSB signs maritime security cooperation with China in Murmansk', *The Barents Observer*, 25 April 2023, https://www.thebarentsobserver.com/security/fsb-signs-maritime-security-cooperation-with-china-in-murmansk/162966.

95 Simone McCarthy, 'China's Coast Guard claims to have entered the Arctic Ocean for the first time as it ramps up security ties with Russia', CNN, 3 October 2024. https://www.cnn.com/2024/10/03/china/china-russia-coast-guard-arctic-ocean-intl-hnk/index.html.

about a potential future CCG presence deeper in the Arctic. It remains unlikely that Russia will allow CCG vessels access to more sensitive areas within Russia's "Arctic Zone" (AZRF). The current focus of joint activities in the Bering Sea suggests that the PRC's primary focus is on signalling to the United States, including demonstrating its displeasure with US messaging regarding Taiwan and the South China Sea.

Recent developments demonstrate that commercial shipping serves as a driver of closer Russia–PRC cooperation and mutual dependence in the development of navigational support capabilities. While shipping also serves as a platform to normalize PRC's presence in the Arctic, where it has no territories of its own, it further serves as a vehicle to roll out multipurpose technologies that could become future enablers of hybrid threats through an advantage or dominance in information, logistics, communications, and data flows.

### 3.2. Science capabilities

Russia and China both have an interest in scientific research in the Arctic and a history of cooperating broadly with international partners. In recent years they have increasingly looked to each other to cooperate in this field.

#### 3.2.1. Russian Arctic science interests and capabilities

As the country with the largest Arctic territories and coastline, Russia can build on a long history of research to support scientific, civil and military aims. Although climate change and permafrost thaw affect Russia especially severely, resulting in damage to urban, energy and military infrastructure, commercial and military interests have overshadowed climate science.[96] Russia has conducted decades of research focusing on the Arctic seabed to support its extended Outer Continental Shelf ("OCS") claims. It was the first country to reach the seabed of the North Pole, where it infamously planted a Russian flag in 2007.[97]

In the spring of 2023 Russia announced that it would develop an international Arctic science centre on Norwegian Svalbard in addition to the science village in Ny-Ålesund, operated by Norway with the participation of international partners. Russia further announced that this additional centre would function in collaboration with some BRICS and other "friendly countries" in the former Soviet mining town of Pyramiden, claiming that China, Brazil, India, Türkiye and Thailand had expressed interest. The Svalbard Treaty of 1920, which recognizes Norway's sovereignty over Svalbard, grants signatory countries' citizens equal rights to engage in commercial activities, while the extent and modalities of their rights to conduct scientific research remain disputed.[98] Although a Russian spokesperson indicated in 2024 that development of the new science centre would begin that year, and both Chinese officials and Turkish scientists discussed the project during visits in 2024, no tangible developments in

96 Heather A. Conley & Cyrus Newlin, *Climate Change Will Reshape Russia*, CSIS Commentary, 13 January 2021. https://www.csis.org/analysis/climate-change-will-reshape-russia.

97 Tom Parfitt, 'Russia plants flag on North Pole seabed', The Guardian, 2 August 2007. https://www.theguardian.com/world/2007/aug/02/russia.arctic.

98 Geir Ulfstein, 'The Svalbard Treaty and Research: Comment to Pedersen and Molenaar', *The Polar Journal*, Volume 11, Issue 2 (2021): 433–437. https://doi.org/10.1080/2154896X.2021.2014107.

project actualization have been publicized. The Pyramiden science station is one of several Russian efforts to invite the BRICS+ into the Arctic – developments that could be interpreted, at least in part, as attempts to challenge the sovereignty or interests of other Arctic states, and in this case Norway.[99]

**3.2.2. Chinese science interests and capabilities, and cooperation with Russia**[100]

The PRC dispatched its first Arctic research expedition on its first icebreaking research vessel *Xue Long* in 1999. In 2004 China inaugurated its first permanent Arctic research station, the Yellow River Station, at the international science village operated by Norway in Ny-Ålesund, Svalbard, while the China-Iceland Arctic Observatory, opened in 2018 in Kárhóll, Iceland, became the second. The PRC has attempted to establish research, space observation and satellite ground stations in Sweden, Finland and Greenland, but cooperation projects have been thwarted or halted given growing concern about their multipurpose potential, including for surveillance and intelligence gathering.[101]

The PRC's 2018 Arctic policy white paper stresses the importance of science, and the country's Arctic research grows rapidly: measured by publications, its national output has become the fourth largest globally.[102] Scientific research has been an important pathway for China to expand its presence and data collection in both the Arctic and Antarctic. The PRC also uses its science diplomacy as a soft power tool for building trust and influencing decision making.[103]

Given the PRC's MCF strategy, all scientific efforts must be viewed as inherently dual-use. Arctic research conducted by Chinese universities, including the "Seven Sons of National Defence",[104] a network of seven universities overseen by the Ministry of Industry and Information Technology, is closely aligned and supports Chinese defence industrial development.

The PRC has increasingly looked to Russia as a research partner in the Arctic. Since 2013 both have discussed joint research missions. The first such mission took place in 2016, with more following in 2018 and 2020. In 2023 the PRC overtook Germany and the United States as

99 Kari Aga Myklebost, Stian Bones & Thomas Nilsen, Hybrid Threats in High Latitudes: Facing Russia on Svalbard, Hybrid CoE Paper 26, December 2025, European Centre of Excellence for Countering Hybrid Threats, Helsinki, Finland, https://www.hybridcoe.fi/publications/hybrid-threats-in-high-latitudes-facing-russia-on-svalbard/.

100 This subsection benefits from Eiterjord, 'China's Scientific Presence', 3–5/6.

101 Nadya Yeh, 'China's Arctic ambitions and Russian ties stoke NATO fears', The China Project, 25 April 2023, https://thechinaproject.com/2023/04/25/chinas-arctic-ambitions-and-russian-ties-stoke-nato-fears/.

102 Dag W. Aksnes, Christopher Blöcker, Cristian Colliander et al., *Arctic Research Trends: Bibliometrics 2016–2022*, Arctic Centre at Umeå University, January 2023, 15–17, 40, https://doi.org/10.5281/zenodo.7961982.

103 Matti Puranen & Sanna Kopra, 'China's Arctic Strategy: a Comprehensive Approach in Times of Great Power Rivalry', *Scandinavian Journal of Military Studies*, Volume 6, Issue 1 (2023): 244–246, https://doi.org/10.31374/sjms.196.

104 Alex Joske. 'The China Defence Universities Tracker: Exploring the military and security links of China's universities', policy brief (Report No. 23/2019) , 25 November 2019, Australian Strategic Policy Institute, https://www.aspi.org.au/report/china-defence-universities-tracker.

Russia's primary partner measured by scientific research outputs.[105] Russia and China continue to highlight joint Arctic research in statements, including one signed in October 2024.[106] Cooperative Arctic research efforts between the two countries have resulted in a growing number of projects since 2016, facilitated by Chinese universities linked to the defence industry, providing the potential for exploitation of scientific experiments and data for military applications, including submarine and anti-submarine operations.[107]

The PRC operates five icebreaking research vessels for Arctic science missions and its civil-military objectives. In 2018 a *Xue Long* expedition first made use of an uncrewed underwater glider in the Barents Sea.[108] The same expedition reportedly installed a remotely operated "Arctic sea-ice-air unmanned ice station observation system" based on ice-tethered online devices in the Arctic Ocean.[109] In 2021 a *Xue Long 2* expedition first navigated a submerged uncrewed sonar-equipped vehicle and gathered topographic data in the Central Arctic Ocean.[110] In 2023 Chinese expeditions established a system of acoustic underwater buoys in the high seas of the Arctic,[111] and deployed another uncrewed underwater vehicle which observed the Arctic sea ice bottom and measured the sea current of the ice–water interface. It reportedly verified key technologies for high-latitude underwater navigation and underwater acoustic communication in the polar region.[112] The mission included Russian and Thai scientists, covering areas along the Gakkel Ridge, over which Canada, Denmark and Russia have overlapping claims for OCS extensions.[113] The latest of China's fifteen Arctic expeditions

105 David Matthews, 'China becomes Russia's biggest collaborator after war decimates science ties with the west', Science Business, 22 February, 2024. https://sciencebusiness.net/news/international-news/china-becomes-russias-biggest-collaborator-after-war-decimates-science-ties.

106 Atle Staalesen, 'Following landmark Chinese visit to Moscow, foreign ministries step up bilateral talks on Arctic', The Barents Observer, 2 October 2024, https://www.thebarentsobserver.com/news/following-landmark-chinese-visit-to-moscow-foreign-ministries-step-up-bilateral-talks-on-arctic/231871.

107 Conley et al., 'From Reluctance to Greater'; Frank Jüris, 'Sino-Russian Scientific Cooperation in the Arctic: From Deep Sea to Deep Space', in *Russia-China Relations: Global Power Shift*, ed. Sarah Kirchberger, Svenja Sinjen & Nils Wörmer (Cham: Springer, 2022), 185–202, https://doi.org/10.1007/978–3–030–97012–3_10.

108 Jiang Jiao, 'Home-made underwater glider adopted for first time in China's Arctic expedition', CGTN news, 29 July 2018, https://news.cgtn.com/news/3d3d414e314d544d79457a6333566d54/index.html.

109 Shen Cheng, 'China's Arctic ice station observations enter the "unmanned era"', Xinhua News, 22 August 2018, http://www.xinhuanet.com/politics/2018–08/22/c_129938144.htm.

110 Wu Yue Hui, 'China's self-developed AUV shows impressive capabilities in latest Arctic scientific expedition', People's Daily Online, 30 October 2021, http://en.people.cn/n3/2021/1030/c90000–9913574.html.

111 Stephen Chen, 'China plans massive listening programme at the North Pole after declaring success in Arctic test of underwater device', South China Morning Post, 9 July 2023, https://www.scmp.com/news/china/science/article/3226755/china-plans-massive-listening-programme-north-pole-after-declaring-success-arctic-test-underwater.

112 'HEU "Xinghai 1000" Polar AUV Explores the Arctic Ocean', Harbin Engineering University, News 9 October 2023, https://english.hrbeu.edu.cn/info/1101/3637.htm.

113 Bipandeep Sharma, 'China's 13th Arctic Expedition', IDSA Comments, 10 November 2023, https://www.idsa.in/publisher/comments/chinas-13th-arctic-expedition.

took place in 2025, when an expedition conducted "extensive marine surveys across the Chukchi Plateau, Canada Basin, and the central Arctic Ocean north of Russia, including multidisciplinary studies along the sea ice edge and three-dimensional coordinated observations of atmosphere-ice-ocean systems".[114] In early August 2025, during this expedition, the PRC conducted its first-ever manned deep-sea dive under Arctic ice in the Chukchi Sea, northwest of Alaska.[115] The expedition, which in addition to the recently commissioned newest icebreaking vessel *Tan Suo San Hao* included three more vessels and was temporarily joined by one further vessel, made headlines as it closed in on Alaskan waters and was monitored by the U.S. Coast Guard.[116] Such scientific capabilities can be used to gather intelligence about Arctic countries' infrastructure and posture, generate data that supports military and hybrid threat operations, and potentially challenge assets of EU and NATO countries.

## 3.3. The space domain and polar satellites

Satellites in polar orbits and Highly Eccentric/Elliptical Orbits (HEO) have important functions to enable high-latitude communication, earth observation and navigation. Satellites in polar orbits are also important for global coverage, as they can rotate over all zones of the earth twice in a single day and have fewer blind spots than satellites in other orbits.[117] For all these reasons, both Russia and the PRC continue to invest in Arctic-relevant space assets and ground infrastructure. These capabilities support ISR, communications, position and navigation, all of which can aid potential strategic objectives and military operations in the Arctic. They can also contribute to establishing an advantage or dominance in information, logistics, communications and data flows to support influence operations and other hybrid threats that may exploit dependencies in services.[118]

### 3.3.1. Russian polar satellite interests and capabilities, and cooperation with the PRC

Despite financial and technological strain, Russia has sought to expand its (1) navigation, (2) communications and (3) earth observation satellites to support its Arctic ambitions. Russia's GNSS GLONASS, which provides *positioning, navigation, and timing* ("PNT"), is outdated and cannot compete with US GPS and China's BeiDou, but its strength in the Northern Hemisphere has been relatively robust. Although Russia continues to invest in GLONASS, it looks to BeiDou to supplement coverage and has

114 'China Completes Largest Arctic Expedition With Historic First Manned Dive Beneath Ice', Marine Insight News Network, 29 September 2025, https://www.marineinsight.com/shipping-news/china-completes-largest-arctic-expedition-with-historic-first-manned-dive-beneath-ice/.

115 Ibid.

116 Malte Humpert, 'China Deploys Five Icebreakers Near Alaska in Unprecedented Arctic Move', gCaptain, 7 August 2025 https://gcaptain.com/china-deploys-five-icebreakers-near-alaska-in-unprecedented-arctic-move/.

117 Douglas Gorman, 'The Increasing Allure of Polar Orbits: An Explainer', Payload newsletter, 7 October 2024. https://payloadspace.com/the-increasing-allure-of-polar-orbits-an-explainer/.

118 Conlan Ellis et al., 'China and space'.

worked with the PRC to enhance both systems' complementarity and performance.[119]

Russia's military *communication* satellites are ageing, a problem Russia is attempting to address. The dual-use Meridian-M satellite constellation in HEO, launched in 2022, is part of the Integrated Satellite Communication System (ISCS) used by the Russian military. It is designed to improve performance and reliability.[120] It also supports civilian "communications between vessels and ice reconnaissance aircraft in the area of the NSR with coastal and ground stations" and helps "expand the capabilities of Russian satellite communication stations in Siberia and the Russian Far East".[121]

Yet operations on the NSR also require *earth observation* satellites to support ice reconnaissance and forecasts. According to Russian reports, operations on the route have been hampered by "restrictions on obtaining data from foreign satellites, as well as the lack of a domestic satellite constellation of radar surrounding the Earth".[122] Russia has responded by reportedly looking to the PRC to provide the satellite-based data required as part of a broader effort by Rosatom to create "a new unified platform to collect data on the meteorological, ice, and navigational conditions in the waters of the NSR" that relies on: "satellite images and radar data, photographs taken by ice reconnaissance aircraft flying over the NSR, and automatic observations made by vessels regularly traveling along the route".[123]

Russia has few remote-sensing *earth observation* satellites in the Arctic, but it has been looking to develop what it has labelled "the world's first Arctic observation satellite system".[124] This claim is made despite other nations operating earth observation satellites in polar orbits and in Highly Elliptical Orbits (HEO) which provide more continuous coverage of the polar regions. As part of its planned multipurpose constellation in HEO, which is designed ultimately to include ten satellites,

119 John Hardie, 'China, Russia Deepen Partnership on Satellite Navigation', Foundation for Defense of Democracies (FDD) policy brief, 20 October 2022, https://www.fdd.org/analysis/2022/10/20/china-russia-satellite-navigation/.

120 Ilya Tsukanov, 'Russian Military Takes Command of Meridian-M Comms Satellite After Successful Launch Into Orbit', 22 March 2022, available through https://www.globalsecurity.org/space/library/news/2022/space-220322-sputnik01.htm; Russian Military Takes Command of Meridian-M Comms Satellite; (originally published at https://sputnikglobe.com/20220322/russian-military-takes-command-of-meridian-m-comms-satellite-after-successful-launch-into-orbit-1094095642.html).

121 Ibid.

122 Malte Humpert, 'Lacking Own Satellite Coverage Russia Is Looking to China For Northern Sea Route Data', High North News, 30 March 2023, https://www.highnorthnews.com/en/lacking-own-satellite-coverage-russia-looking-china-northern-sea-route-data.

123 Ibid.

124 'Russia Turns On World's First Satellite System for Arctic Monitoring', The Maritime Executive news item, 28 April 2024, https://maritime-executive.com/article/russia-turns-on-world-s-first-satellite-system-for-arctic-monitoring.

Roscosmos launched and activated the first two Arktika-M satellites in 2021 and 2023.[125] The mission aims to monitor the Earth's atmosphere and surface in the Arctic, gather and relay information from Arctic facilities, monitor cosmic rays, and assist in the international search and rescue service.[126] According to Russian reports, these satellites allow Russia "to monitor the area around the North Pole and the length of its NSR without interruption in 15 minute intervals".[127] The first launch was originally scheduled for 2014 and the project has continued to suffer from significant delays,[128] probably exacerbated by sanctions and export controls against Russia.[129]

### 3.3.2. Chinese polar satellite interests and capabilities, and cooperation with Russia

The PRC views the polar regions and space as interconnected, especially for the purpose of Intelligence, Surveillance and Reconnaissance (ISR).[130] The Arctic has been an important domain for the country's earth observation satellites, as well as for its BeiDou satellite navigation system.

The PRC is focusing on expanding its satellite infrastructure in the polar regions for several reasons. Bennett and Eiterjord outline that these include (1) gaining greater access to and situational awareness of the region via the global commons of space in what the authors label "reverse access", (2) developing independent satellite capabilities (duplicating US and European capabilities) that support commercial, scientific and potentially military operations in the region, (3) strengthening its BeiDou Navigation Satellite System's global operations, and (4) supporting a "data nationalism" policy that discourages data sharing and contrasts with the "international Arctic scientific and policy-making communities' embrace of an open data culture" and may allow the PRC "to alter the terms of

125 Ibid.; plans for the constellation include ten satellites – eight in HEO: the two Arktika-M satellites for meteorology and emergency communications, three additional satellites for communication and GPS, and three for air traffic and navigation. It also envisages two radar remote-sensing satellites in Sun-Synchronous Orbit. Source: 'Russia builds Arctic satellite network', Russian Space Web, https://www.russianspaceweb.com/arktika.html.

126 'Arktika-M', eoPortal Satellite Missions Catalogue, https://www.eoportal.org/satellite-missions/arktika-m#overview.

127 Malte Humpert, 'Russia Plans to Launch Nine Polar-orbiting Satellites to Monitor the Arctic by 2026', 4 November 2022, https://www.highnorthnews.com/en/russia-plans-launch-nine-polar-orbiting-satellites-monitor-arctic-2026.

128 'Mission Status' eoPortal on Arktika-M, https://www.eoportal.org/satellite-missions/arktika-m#missionstatus; Staff Writers, 'Russia Proposes Launch Of Arktika Space Monitoring Project In 2014', RIA Novosti, 17 August 2010, available through https://www.spacedaily.com/reports/Russia_Proposes_Launch_Of_Arktika_Space_Monitoring_Project_In_2014_999.html.

129 Eric Berger, 'Roscosmos seeks to obscure bidding process to evade US sanctions', Ars Technica, 20 February 2024, https://arstechnica.com/space/2024/02/roscosmos-seeks-to-obscure-bidding-process-to-evade-us-sanctions/.

130 Elsa B. Kania & John Costello, 'Seizing the commanding heights: the PLA Strategic Support Force in Chinese military power', *Journal of Strategic Studies*, Volume 44, Issue 2 (2021): 240.

knowledge production and intervene in regional governance".[131]

The PRC relies on three different types of satellites to support its Arctic scientific and commercial operations: (1) optical imagery satellites; (2) Synthetic Aperture Radar (SAR); (3) positioning, navigation, and timing (PNT) satellites.[132] As satellites have dual-use functions and multipurpose potential, they could be used to support situational awareness and data transfers (from space and interconnected with surface and subsurface systems), communication, and PNT that benefits strategic ends.[133]

The PRC launched Ice Pathfinder, its first optical satellite to monitor climate, environment and navigation in the polar regions, in 2019 as the first of a constellation of 24 satellites projected for completion in 2030.[134] The satellite "has a wide field of view (744 km) glimpsing much of the Arctic at once", much wider than NASA's Landsat 9 (185 km) and the European Space Agency's Sentinel-2 (290 km).[135] It also has a unique Automatic Identification System (AIS) function that allows it to track ships that have enabled their AIS transponder, affording the PRC insights into "emerging shipping lanes".[136] In 2020 China announced the development of a SAR satellite for the Arctic that would "complement the country's existing SAR fleet, which contributes to Arctic monitoring".[137]

Finally, the PRC has been focusing on expanding its BeiDou satellite navigation system into the polar regions, which will help it bolster its regional and global services. BeiDou was launched in 2000 and today features three generations of satellite systems. It was originally developed to enhance the PLA's strategic autonomy and reduce dependence on US GPS. It has been "integrated into the PRC's military systems" since "at least 2014".[138] Some experts have pointed out that the latest generation of BeiDou satellites may pose "specific security risks via technical manipulation or surveillance – including through [its] two-way messaging capability", which enables communication outside the range of cellular coverage and facilitates location tracking.[139] Russia and the PRC are seeking to increase the interoperability of GLONASS and BeiDou, but

131 Mia M. Bennett & Trym Eiterjord, 'Remote control? Chinese satellite infrastructure in and above the Arctic global commons', *The Geographical Journals*, Volume 189, Issue 3 (2023). https://rgs-ibg.onlinelibrary.wiley.com/doi/abs/10.1111/geoj.12503.

132 Ibid., 402.

133 Conlan Ellis et al., 'China and space', 15–16.

134 Bennett et al., 'Remote control?', 402.

135 Ibid., 403–404.

136 Ibid., 403.

137 This includes the Goafen-3, which was launched in 2016, and which has been used to "model wave height in the Arctic Ocean and classify sea ice into new ice, thin first-year ice, thick first-year ice and old ice". Ibid., 404–405.

138 Jemima Baar, 'BeiDou And Strategic Advancements in PRC Space Navigation', *China Brief* (The Jamestown Foundation), Volume 24, Issue 5, 1 March 2024, https://jamestown.org/program/beidou-and-strategic-advancements-in-prc-space-navigation/.

139 Sarah Sewall, Tyler Vandenberg, & Kaj Malden, *China's BeiDou: New Dimensions of Great Power Competition*, paper, February 2023, Harvard Kennedy School Belfer Center for Science and International Affairs, 1, https://www.belfercenter.org/sites/default/files/files/publication/Chinas-BeiDou_V10.pdf.

the systems remain complementary and are not fully integrated.

Efficient utilization of data flows from satellites in polar orbits requires ground stations in either of the polar regions. As the Arctic NATO countries have grown warier of the dual-use potential of Chinese research and space observation stations, and several projects have been halted, the PRC has sought alternatives. Bennett and Eiterjord write: "Recognizing the vulnerability of ground stations on foreign soil, Chinese scientists have called for accelerating the construction of satellite ground stations in Antarctica, over which polar orbiting satellites pass as they wend their way around a new line of longitude with each progressive encirclement of the Earth".[140] They argue that "China is likely to continue pursuing this 'reverse access' to the Arctic from space, especially as Beijing encounters growing geopolitical obstacles to participating in the space sector in the Arctic itself".

Russia provides another vector of access, as both countries have deepened their space cooperation. A joint Committee on Major Strategic Cooperation Projects in Satellite Navigation was established in 2015 to enhance interoperability and augmentation.[141] In 2022 both countries signed contracts to host ground stations that would support their respective global navigation satellite systems and support both military and civilian purposes.[142] In 2023 Russia announced that China would open a ground station in Petropavlovsk-Kamchatsky on Avacha Bay, an access point to the NSR and the location of a Russian submarine base.[143] There is no (publicly available) evidence that the project has been completed, however.

### 3.4. Prospects of and limits to Russia–PRC cooperation in the Arctic

As Russia's and China's relations with the United States and its allies have deteriorated over the last decade, Moscow and Beijing have increasingly looked to each other as partners, including in the Arctic. While the PRC has long focused on diversifying its relationships and minimizing its dependencies in the Arctic, in the current environment the country depends to a great extent on Russia to support its Arctic access. Meanwhile, Russia depends on the PRC's economic investment, as well as its supply of goods and technological and machine components.

Russia–PRC cooperation increasingly covers sensitive and strategic civil technologies, and other domains where cooperation has thus far been non-existent. Yet historic mistrust between the two countries will be difficult to overcome: Russian intelligence remains wary of their country becoming a vassal state of a more powerful China. Moreover, the PRC seems reluctant to commit to unreserved cooperation, which until recently was evident in the slow

140 Bennett et al., 'Remote control?', 402.

141 Kevin Pollpeter, Elizabeth Barrett, Jeffrey Edmonds et al., *China-Russia Space Cooperation: The Strategic, Military, Diplomatic, and Economic Implications of a Growing Relationship*, CNA & China Aerospace Studies Institute, Air University, April/May 2023, 27, https://www.cna.org/reports/2023/06/china-russia-space-cooperation-may-2023.

142 Hardie, 'China, Russia Deepen Partnership'.

143 'Russia, China ink space cooperation deal to 2027', TASS, 29 December 2022. https://tass.com/science/1557333.

progress in negotiations on the Power of Siberia 2 pipeline. Although a memorandum of intent was signed, China continues to drive a hard bargain, further underlining Russia's role of *demandeur* in the partnership.[144] While the PRC has great need for energy imports, it continues to focus on diversification, low prices and long-term flexibility.

Nevertheless, other assessments aligned with this paper's analysis suggest that Vladimir Putin and Xi Jinping have more to gain economically, strategically and politically from their cooperation than they stand to lose.[145] Russia's and China's cooperation in the Arctic, which is driven by the top levels of government (along with a broader strategic partnership), has significantly evolved since 2014, and especially since 2023.[146] It also increasingly touches on sensitive and strategic civil technologies and military cooperation. Beyond declared efforts to conduct joint maritime law enforcement, both countries have also conducted joint military manoeuvres (air and naval/coast guard patrols) near Alaska. With this in mind, diplomatic efforts seeking opportunities to drive a wedge between the two, including through renewed cooperation between the United States and Russia, are unlikely to seriously disrupt their partnership.

144 Antti Rauhala, 'China's Bargain, Russia's Lifeline: The Geopolitics of Power of Siberia 2', The Diplomat, 3 September 2025, https://thediplomat.com/2025/09/chinas-bargain-russias-lifeline-the-geopolitics-of-power-of-siberia-2/.

145 Conley et al., 'A New Era of Arctic Geopolitics'.

146 Ibid.

# 4 Outlook over a landscape of evolving hybrid threat potential

Mistrust resulting from Russia's aggression against Ukraine has affected Russia's relations with the other Arctic states. Adversaries may in future use their commercial, scientific, civil and military capabilities in different ways to exert control over Arctic routes, use dependencies coercively or interfere with affected democratic countries' infrastructure. Despite its overly high level of abstraction, the Chinese concept of the polar regions as "commanding heights" has some clout. The polar regions are vital to space-based situational awareness/communications, and the Arctic approaches are a key vector for potential missile threats from adversaries against North America. Moreover, the Arctic Ocean offers an avenue to bridge the Pacific and Euro-Atlantic regions in transport and telecommunication. Whoever maintains an edge in telecommunications and remote sensing in the Arctic also has an advantage in ISR capabilities and in influencing local populations in the information space.

Despite uncertainties concerning the PRC's true intentions, capabilities and planning horizons, its leadership's policies and actions, and their outlined focus on disabling opponents' critical infrastructure and technological enablers in future confrontations, indicate that it has significant ambitions in this field, uniquely conflated in this region with Russia's assets, ambitions and capabilities. This may pose growing challenges in future to EU and NATO states in many of the Conceptual Model's thirteen hybrid threat domains (see Figure 3).[147] In the following a few categories of tools that may pose emerging risks are indicated and broadly outlined: physical operations; cyber and electronic operations; and cultural and socioeconomic influencing. The first two groups are directly relevant given the evolving capabilities; the third brings together the hybrid threat tools these capabilities will enable that are particularly relevant in the Arctic for the targeting of local communities.

### 4.1. Physical operations

The growth in commercial, civil and military traffic increases the potential for accidents, environmental disasters and potential sabotage, including against undersea cables in the Arctic and beyond. Commercial vessels, icebreakers used for commercial and scientific purposes, submarines, and uncrewed underwater vehicles used for scientific experiments and military ends may deliberately or accidentally damage undersea infrastructure. As previous cases in various theatres, including the Baltic Sea, Taiwan Straits and South China Sea, have shown, commercial vessels (tankers or fishing vessels) can easily damage undersea infrastructure. Even in cases where culpability can be established it is very difficult to determine intent.[148] Moreover, the involvement of commercial actors and different flag states makes attribution at a state level extremely difficult and often leaves criminal prosecution as the only option.

As EU and NATO countries look to expand undersea cable projects, they will need to assess risks and address potential vulnerabilities by increasing situational awareness, enhancing the resilience of cable projects (including through cable reinforcements and armour, and inbuilt

147 Georgios Giannopoulos et al., 'The Landscape of Hybrid Threats'.

148 The case of the NewNew Polar Bear operated by China's NewNew Shipping Line, tied to incidents against the Balticconnector pipeline and fibre optic cables in the Baltic Sea in October 2023 after the vessel completed its maiden voyage across the NSR, demonstrates this.

monitoring capabilities), and ensuring adequate repair capabilities. Data transfers further depend on satellite ground stations and the landing stations of undersea cables, all of which can be targeted by physical operations.

Beyond commercial vessels, military and dual-use subsea capabilities, including uncrewed systems, potentially equipped with the deep-sea cable cutting technology, which the PRC is reportedly developing, could be used to damage subsea infrastructure.[149] In areas with limited situational awareness such an attack may be deemed a low risk. Greater reinforcement and surveillance of undersea infrastructure could serve as a deterrent but are challenging and costly to implement over the Arctic's vast sea areas.

Among critical targets are the undersea communication infrastructure of affected democratic countries, either already in place or to be built in future,[150] as well as Norwegian offshore oil and gas pipelines,[151] of which a few extend into "the Arctic region" (as defined in footnote 1),[152] with one reaching above the Arctic Circle.[153] Damage to fibre optic cables would present severe challenges and could interfere with civilian and military communications for a prolonged period given the dearth of repair vessels and difficulty in accessing undersea infrastructure in the remote and navigationally challenging Arctic.

The frequent use of ships without a proper ice class on the NSR further calls into question Russia's focus on environmental protection in its EEZ. This has raised concerns about possible accidents and oil spills which could also be instrumentalized for hybrid threats and have catastrophic environmental effects.

The potential for hybrid threats in the context of shipping must further be evaluated against Russian primacy in physical Arctic infrastructure such as ports, search and rescue assets, and dual-use icebreakers, and its much greater military presence than that of EU and NATO countries. All these assets, along with technology contributing to situational awareness, could be leveraged to exert control of traffic across the NSR and by extension the NEP.

Any disturbance of other main sea lanes in the medium and long term may increase the appeal of using the NEP,[154] at the latest when improved icebreaking and rescue services enable year-round traffic, facilitated by a warmer Arctic climate. This will increase vulnerability to economic coercion by Russia and dependence on states in possession of an ice-classified merchant fleet. Russia or its enablers could

149 Stephen Chen, 'China unveils a powerful deep-sea cable cutter that could reset the world order', South China Morning Post, 22 March 2025, https://www.scmp.com/news/china/science/article/3303246/china-unveils-powerful-deep-sea-cable-cutter-could-reset-world-order.

150 'Trans-Arctic', Submarine Cable Networks, web page, https://www.submarinenetworks.com/en/systems/trans-arctic.

151 'The oil and gas pipeline system', Norwegian petroleum, web page, https://www.norskpetroleum.no/en/production-and-exports/the-oil-and-gas-pipeline-system/.

152 'Activity in the Norwegian Sea and Barents Sea', Norwegian petroleum, web page, https://www.norskpetroleum.no/en/developments-and-operations/activity-per-sea-area/#norwegian-sea.

153 'Polarled', Gassco, Pipelines web page, https://map.gassco.eu/rorledninger/polarled.

154 Malte Humpert, 'Crude Oil Tankers Divert Via Arctic Bypassing Red Sea Chaos', gCaptain web news, 27 August 2024, https://gcaptain.com/crude-oil-tankers-divert-via-arctic-bypassing-red-sea-chaos/.

use its hybrid threat capabilities to interfere in international shipping veins such as the Suez and Panama canals. This could be done either physically, as in the Red Sea, or through cyber activities hampering traffic management systems or disturbing communication networks.[155]

Both Russia and the PRC possess civil and military capabilities that could pose kinetic hybrid threats to the infrastructure of EU and NATO countries. Space assets could be targeted by Anti-Satellite (ASAT) capabilities (e.g. Direct-Assent ASATs, Co-orbital ASATs and Kinetic Kill Vehicles). Moreover, ballistic missiles and projectiles could physically damage a satellite. The cascading and indiscriminate impact of space debris on other spacefaring nations' assets (including their own) renders the use of such systems extremely risky and destructive. Despite these risks, Russia and China have focused on developing a range of ASAT weapons, including a much-discussed nuclear-armed ASAT system that Russia is reportedly developing.[156] Both have also conducted ASAT tests. While these are military capabilities, it is conceivable that in certain circumstances kinetic force against space assets could be portrayed as accidental, with the aim of achieving plausible deniability.

### 4.2. Cyber and electronic operations

This paper has emphasized the dual-use potential of infrastructure for surveillance purposes. Remote-sensing satellites, sensors, underwater hydrophones, and ground and science stations may all be used to gather various information that could be weaponized or used to support military operations. As noted in subsection 2.2, the PRC's military doctrine not only recognizes outer space, cyberspace and the deep sea as strategic frontiers for global dominance but also includes both polar regions in this concept. In 2024 the PLA's Information Support Force was established and placed with the Cyberspace Force and Aerospace Force directly under the Central Military Commission (CMC), the Chinese Communist Party's highest military body.[157] It has been suggested that this signals a high-level emphasis on information dominance and intelligence.[158]

As in other regions, cyber capabilities will be and are already being used for the collection of large amounts of personal and situational awareness data. Such data may be exploited in future for hybrid influencing among Arctic communities and interference in decision making in which the local, national and regional levels are contentiously intertwined.[159] In a crisis or priming stage of a conflict cyber operations

155 Vauraste, 'Balancing the Arctic', 16.

156 Marc Berkowitz & Chris Williams, *Russia's Space-Based, Nuclear-Armed Anti-Satellite Weapon: Implications and Response Options*, National Security Space Association, 16 May 2024, https://nssaspace.org/wp-content/uploads/2024/05/Russian-Nuclear-ASAT.pdf.

157 This sudden reform replaced an earlier initiative from 2015 to upgrade and reorganize these vital functions. It had established the People's Liberation Army (PLA) Strategic Support Force (PLASSF), which until 2024 oversaw space, cyberspace, electronic warfare and joint operations, as well as reconnaissance and geospatial intelligence gathering. Elsa B. Kania & John Costello, 'The strategic support force and the future of Chinese information operations', *The Cyber Defense Review*, Volume 3, Issue 1 (2018): 105–122.

158 Meia Nouwens, 'China's new Information Support Force', IISS Online Analysis, 3 May 2024, https://www.iiss.org/online-analysis/online-analysis/2024/05/chinas-new-information-support-force/.

159 Rivard Piché et al., 'Vulnerabilities and hybrid threats', 9–10.

could be used to intercept or disrupt data flows in the Arctic and interfere with civil and military operations by EU and NATO countries. They could also be used to collect currently encrypted data for future decryption with quantum computers.

GPS jamming and spoofing, which rely on radio signals to interfere with GPS signals from satellites to receivers, affecting positioning and timing, are another tool that Russia already frequently uses, though some have argued they could be an inadvertent side effect of Russian defence against Ukrainian drones. GPS jamming in Norway's Northern Finnmark region has become so frequent that the authorities have stopped registering instances,[160] despite the significant challenge to air traffic in Northern Norway and Finland and shipping in the busy Baltic Sea. As traffic on Arctic routes increases, this challenge could also increase the risk of accidents in the region.

Russian hybrid threat activities in space could include influencing commercial satellite capacities used for security purposes: "[i]nhibiting or stopping data flow to/from space and between the suppliers and customer, harming ground station antenna systems and connections, injecting software bugs, executing encryption attacks and disturbing by other cyber means could prove useful".[161]

### 4.3. Cultural and socioeconomic influencing

Given the landscape of hybrid threats identified in the case studies in the Norwegian High North (footnote 4) and Canadian Arctic (footnote 5), and the observed behaviour of Russia and the PRC in other theatres of strategic interest (e.g. the South China Sea and Southeast Asia, Taiwan, Eastern Europe and the Caucasus), there are reasons to expect increasing non-kinetic hybrid threat activities targeting local communities in the Arctic. This could include fuelling distrust by amplifying historical grievances, exploiting conflicts of interest, pushing divisive narratives, and driving wedges between local constituencies and national decision making. It could further involve the establishment of dependencies on malign actors in the provision of services, whether in the field of logistics and transport or, as already observed in Canada, in digital communication.[162] Information operations may also be manifested through selective evocation of treaties to raise questions about US legal claims that refer to UNCLOS and Norwegian rights around Svalbard, for example.

It is beyond the scope of this report to speculate on the precise tactical character of such future hybrid threat operations, but it is clear that establishing primacy in the digital domain in the Arctic, as well as in physical infrastructure supporting situational awareness, navigation and other activity in the maritime domain, provides capabilities that could allow the domination of the information space, creating dependencies in services and exerting influence that targets local communities and their decision making and governance.

160 Trine Jonassen & Birgitte Anie Hansen, 'Stops Registering GPS Disruptions in Finnmark, Northern Norway', High North News 27 September 2024, https://www.highnorthnews.com/en/stops-registering-gps-disruptions-finnmark-northern-norway.

161 Vauraste, 'Balancing the Arctic', 9.

162 Rivard Piché et al., 'Vulnerabilities and hybrid threats', 16–17.

# 5 Conclusions

This paper sought to assess how Russian and Chinese capability, technology and infrastructure development, and broader civil-military cooperation create potential for future hybrid threats against affected EU and NATO countries and other democratic states and societies. It emphasized that, beyond their potential for physical operations or military use, Russia's and China's evolving capabilities can be leveraged to establish an advantage or dominance in information, logistics, communications and data flows in the Arctic and to create socioeconomic dependencies, all of which bolster the potential for hybrid threats. Given the wide conceptual scope, it only covered a subset of activities encompassed by the Hybrid CoE conceptual model. It did not attempt to anticipate all possible cascading effects or implications for affected democratic states and societies.

The paper outlined that both Russia and the PRC strategically integrate and blend civil and military tools and targets. To adequately respond to these strategies and tactics, whole-of-government and whole-of-society approaches to security are critical. Nordic countries' comprehensive security approaches can serve as models to be emulated and adapted in other countries and different contexts.[163] Deeper coordination across the board between different governmental agencies and departments and between the civil-military and public-private sectors is required at the national, bilateral and multilateral levels.

The Arctic is home to Indigenous peoples and other Arctic communities, and the formulation of policies and actions in partnership with local stakeholders and rightsholders is key for resilient Arctic societies. As climate change advances, and the exploitation of Arctic resources and securitization of Arctic issues potentially strain these partnerships, this will become more important for reducing vulnerabilities to hybrid threats. Moreover, based on equal and trusted partnerships, these communities can be important for detecting hybrid threats.

Analysts' opinions about the future of Russia–PRC cooperation in the Arctic differ, with some highlighting limits to the partnership, and others emphasizing the potential for deeper cooperation. Even without a continuous deepening of cooperation and interoperability, Russia and the PRC could pose significant hybrid threats to affected democratic countries today, unilaterally, jointly, or via parallel or coordinated operations.

In this context cooperation between affected democratic countries –pooling resources to develop and field capabilities across all domains, optimizing information sharing, coordinating responses, and integrating forces – is critical and can help offset some risks. Given the great emphasis both Russia and the PRC place on information operations, proactive information sharing and strategic communication between NATO allies and EU members can help provide affected democratic countries a strategic advantage.

163 Christian Fjäder & Johan Schalin, *Building resilience to hybrid threats: Best practices in the Nordics*, Hybrid CoE Working Paper 31, May 2024, European Centre of Excellence for Countering Hybrid Threats, Helsinki, Finland, https://www.hybridcoe.fi/publications/hybrid-coe-research-report-4-security-and-hybrid-threats-in-the-arctic-challenges-and-vulnerabilities-of-securing-the-transatlantic-arctic/.

There are many hybrid threat tools Russia and the PRC may use and are already using to advance their own strategic objectives and interfere with the interests of EU and NATO countries in the Arctic region. This paper has shown how evolving adversary capabilities and growing Arctic presence foreshadow a more comprehensive future toolkit, with implications for EU and NATO countries' threat assessments. In considering potential future conflict scenarios, attention should be paid to Russia's and China's focus on disabling critical infrastructure, which poses particularly acute risks to the infrastructure of EU and NATO countries in the priming stage of conflict. Yet hybrid threats may also be used for escalation management and to deter opponents. Moreover, a wide range of tools may be used during peacetime influencing and societal priming to undermine trust and resilience in Arctic societies, sow doubts about the aims and policies of EU and NATO countries, and disrupt political decision making more broadly.

In this context it is important that EU and NATO countries monitor and assess Russian and Chinese strategic objectives, political messaging, multipurpose capabilities and both countries' evolving cooperation across the civil-military spectrum. This will benefit political decision making and investment in EU and NATO countries and across their cooperative formats.

# Acknowledgements

The authors gratefully acknowledge the contributions through commissioned background research by Trym Eiterjord, Tero Vauraste and Alexander Dalziel. References to them are made at a general level for the relevant subchapters and subsections, and at a sentence level where warranted. We are also deeply grateful to Professor Abbie Tingstad, who reviewed the paper, Associate Professor Mia Bennett, who reviewed the subsection on space capabilities, and to colleagues at Hybrid CoE and the German Marshall Fund of the United States (GMF), who contributed valuable advice and comments. Responsibility for the text remains with the authors.

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