



## China, Rare Earth Elements, and the Arctic: Assessing Security Implications for Canada

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### *Introduction*

Climate change has caused the polar ice caps to melt, increasing international interest in the Arctic. In 2018, China claimed to be a “near-Arctic state,” showing continued interest in the mineral reserves and shipping routes that climate change has opened up. With a near-monopoly on rare-earth elements (REEs), and a history of using natural resources as political leverage, China’s interest in the Arctic has implications for Canadian Arctic sovereignty. This policy brief argues that China’s interest in the Arctic poses a real threat to Canada due to both China’s behaviour and Canada’s vulnerability. Specifically, this brief focuses on the implications of China’s REE dominance and its increased interest in the Arctic for Canadian Arctic security. After providing a brief overview of China’s interest in the Arctic, I will detail the nature of this threat, focusing on China’s recent Arctic advancements and Canada’s green energy goals. Next, I will discuss Canada’s unique vulnerability to an Arctic threat from China. Finally, I will conclude with policy recommendations for the Department of National Defence.

### *Why is China Interested in the Arctic?*

There are three main reasons why China might want to secure greater access to the Arctic. The first is natural resources. The Arctic is home to many untapped natural resources, including oil, hydrocarbons and critical minerals. The U.S Energy Information Administration estimates that about 22% of the world’s undiscovered oil resources, as well as immense reserves of gold, diamond, iron ore, base metals and rare earth elements, are found in the Arctic (Oddleifson, Alton & Romaniuk 2021). While the majority of the Arctic’s natural resources are located in Russia’s Arctic territory, Canada has significant reserves of oil, gas, and most notably rare earth elements. Rare earth elements are necessary for the transition to green energy sources, with important usage in electric vehicle batteries, permanent magnets and wind turbines (Government of Canada 2024). These green minerals also have important military uses, not limited to radar systems, jet engines and nuclear submarines. China currently has a near monopoly over producing



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and refining rare earth elements, which remains important for Canada's Greening Government goals.

The second motivation for China's interest in the Arctic is improved shipping routes. As polar ice melts, the Northern Sea Route (NSR) and the Northwest Passage (NWP) garner attention as more productive alternatives to traditional shipping routes. For instance, it is estimated that a ship travelling from Western Canada to continental Europe through the NWP would reduce travel by around 1000 nautical miles and save an estimated \$80,000 USD in fuel costs when compared with the Panama Canal route (Oddleifson, Alton & Romaniuk 2021). Canada deems the NWP "internal waters," which prohibits such free passage. However, Chinese officials have repeatedly emphasized the Arctic as the "common heritage of mankind," indicating an interest in the internationalization of Arctic shipping routes and a disregard for Canadian sovereignty (Fadeev et al. 2024, 25).

Finally, the Arctic provides China with a useful vantage point to the West. The current geopolitical environment has seen greater East-West polarization, especially following Russia's 2022 ongoing invasion of Ukraine, wherein China has de facto sided with Russia. With NATO gaining new members Finland (2023) and Sweden (2024) and continuing to move eastward, a greater foothold in the Arctic could reassure some of China's security worries and provide a better opportunity for gathering intelligence on the U.S and Canada.

### ***Why is the Threat of China Imminent?***

For more than 20 years, China has increased activity in the Arctic. Between 1999 and 2017, China made nine arctic expeditions (Biedermann 2020, 586). In 2013, China became an observer of the Arctic Council. Indeed, China has made numerous investments in the Arctic nations, totaling approximately \$1.4 trillion USD between 2005 and 2017 (Oddleifson, Alton & Romaniuk 2021). In 2017, China launched its "Polar Silk Road" program as a part of its Belt and Road Initiative, aimed at improving shipping routes and opening up access to natural resources. Since then, Chinese officials have been cooperating closely with Russia on mining projects in the Arctic (Biedermann 2020). The bottom line is that China wants to become a major player in the Arctic.

What does increased Chinese investment in the Arctic mean for Canada? Chinese officials have maintained that they are committed to adhering to international law in the region and seek Arctic access for peaceful "scientific exploration". However, the link between scientific and military innovation should not be understated. Indeed, China has previously used "scientific cooperation" as a cover for projects that serve a dual-use (Puranen & Kopra 2023, 246). Further, China has successfully developed and tested underwater gliders and listening devices in the Arctic, with stated peaceful purposes to chart the sea floor and monitor water salinity and ice levels. However, these devices can also track allied submarines, which positions them as a good surveillance tool, especially given that Canada lacks such technology to surveil its own regions. Additionally, China is continually developing deep-diving submersibles, which could be used for espionage via underwater cables, which Canada would have a tough time detecting due to its lack of deep-diving capabilities (Huebert 2023).

As China ramps up its activity in the Arctic, it is also gaining leverage over countries that aim to transition to green energy sources. China controls most of the world's rare earth elements, that are essential to the "green transition" away from carbon. In 2022, China

accounted for 70% of global mining production and 87% of global refining (Government of Canada 2024). They have long held a competitive advantage in amassing REEs due to their financial prowess, which allows them to mine and refine the costly elements, as well as their poor corporate social responsibility (CSR), resulting in their continued extraction of the elements despite the environmental costs. They have even set up mining contracts with Russia in the Arctic, increasing their near-monopoly. The bottom line is that countries trying to transition to a green economy will likely have to answer to China. Canada is one of these countries, with Canada's Greening Government Strategy hinged on the achievement of "net-carbon zero by 2050" (Treasury Board of Canada Secretariat 2017). Given that the average electric vehicle requires six times the mineral inputs of a conventional car, Canada will need REEs to complete a green transition (IEA 2021). While Canada has domestic REE reserves, they are commercially off limits due to proximity to Indigenous land, environmental degradation and the difficulty of extraction. Thus, if Canada cannot diversify its supply chains fast, it might be left to rely on China for REEs.

If Canada must turn to China for REEs, it could create trouble in the Arctic. China could weaponize the trade of REEs to pursue their Arctic interests. Global REE demand is projected to double over the next fifteen years, and there are currently limited viable alternatives (IEA 2024). China could demand greater access to the Canadian Arctic in return for REEs. With Canada's current Arctic capabilities, granting greater access to China would create more security risks and further soften Canadian sovereignty over the NWP. Currently, Canadian Arctic resources are protected as a part of Canada's exclusive economic zone (EEZ). However, if the NWP was accepted as international waters, increased transit could enhance Canada's vulnerability to having its EEZ violated. This is especially relevant given the contestation of the NWP as Canadian "internal waters." Many nations, including the United States, have previously opined that it should be considered an international strait. A revival of such contestation is certainly not off limits, amid declining Canada-US relations and Donald Trump's recent undercuts to Canadian sovereignty. Since Canada's sovereignty is already contested, it could be easily challenged by China soon, worsening the risk of China's REE monopoly and relative power increasing.

### **Canada's Vulnerabilities**

What makes Canada vulnerable in the Arctic? The first vulnerability lies in declining Sino-Canadian relations. Despite a previously strong relationship, Sino-Canadian relations have declined since the Huawei dispute. In 2018, Meng Wanzhou, the CFO of Huawei, was detained and arrested in Vancouver on fraud charges (Chen 2023, 37). Beijing retaliated by arresting two Canadian nationals, who were only released upon Wanzhou's release. The entire dispute resulted in Canada banning Huawei and other Chinese companies from Canada's 5G networks. In 2021, Canada placed sanctions on various Chinese businesses and individuals for the human rights violations perpetuated against the Uyghur minority in Xinjiang (Global Affairs Canada 2021). Since 2022, Canada and China have found themselves on opposite ends of the Russia-Ukraine conflict, with China being one of the few countries refusing to impose sanctions on Russia. Further, in 2023, China flew a high-altitude balloon across North America, which was shot down by the US Air Force and rumoured to be an act of espionage (Huebert 2023). Deteriorating relations between the

two states exacerbate worries that China could weaponize trade or pursue its interests more aggressively in the Arctic.

With declining Sino-Canadian relations, there is an increased risk of Chinese revisionism in the Arctic due to their aggressive precedent. Despite Beijing's official claims that they adhere to international law when conducting their Arctic activities, they have frequently flouted international law in the South China Sea, largely in pursuit of natural resources. For instance, in 2016, China ignored the Hague Permanent Court of Arbitration ruling in favour of the Philippines and continued to pursue its aggressive territorial claims (Center for Preventive Action 2024). China has also built islands and maintained the ambiguity of their 'nine-dash line' to assert control over most of the South China Sea. If China is willing to aggressively pursue its economic interests in the South China Sea, there is a possibility that it will do the same in the Arctic.

Further, China has a history of natural resource weaponization, especially during disputes with other nations. In 2010, following a fishing dispute between a Chinese trawler and the Japanese coast guard, China suspended all shipments of rare earth elements to Japan for two months (Kullik 2019, 4). The incident completely disrupted the Japanese automotive markets, increasing prices globally and sparking a frenzy to diversify supply chains, which proved unsuccessful. Japan is a reminder that China could leverage its REE dominance again to achieve its political goals. If China attempts to use REEs to gain access to the Canadian Arctic in the near future, Canada lacks diversified enough supply chains to confidently reject China as an REE supplier, and the Canadian Greening Government goals echo this fact. This threat might seem far away for many Canadians; however, it is not one to discount, especially with the recent developments in the U.S. Most recently, in retaliation to the U.S export restrictions on artificial intelligence technology, China announced that it will ban several critical minerals exports to the U.S, including those important to military and electric vehicle technology. Evidently, Beijing is willing to withhold important goods to achieve its national goals. Canada should be actively working to prevent Canadian dependence on China, especially as the Arctic opens up.

### **Conclusion and Policy Recommendations**

This policy brief has discussed the rising geopolitical importance of the Arctic, the threat posed by China's increased presence in the region, and Canada's vulnerabilities to a Chinese threat.

To mitigate Canada's vulnerabilities in the Arctic, Canada should:

#### **1. Improve Supply Chain Resilience**

As Canada moves toward a green economy, REE supply chain resilience will be imperative to national security. Canada must avoid depending on China for REEs and safeguard against economic coercion. The first step in achieving REE supply chain resilience is diversifying Canada's supply chain. China controls the majority of global REE mining and refinement, and Canada cannot bear the costs of taking on China alone. Accordingly, Canada should work with its allies in the United States, Europe and Oceania to collaborate on REE mining and refinement projects. Close collaboration with allies like Australia, who have a history in the REE industry, will help fill technological knowledge gaps and dilute the costs for all partners.

Canada has also been strengthening its relationship with its partners in Africa. Many African countries are well endowed with REEs and have had a large presence of Chinese mining companies, whose popularity has diminished due to poor corporate social responsibility. Canada can present an alternative to Chinese mining firms, working closely with African partners to develop mutually beneficial mining ventures that better local development instead of hurting it. The Department of National Defence and Global Affairs Canada should engage with key African stakeholders, including the African Union, to discuss the possibility of shared economic partnerships in the natural resource sector.

Canada should also take domestic action to avoid resource dependence on China. The Canadian government should prioritize stockpiling its supply of REEs, among other critical minerals, to protect against supply chain disruptions. Since stockpiling REEs will be difficult, given Canada's ambitious Greening Government goals, the Canadian government should also invest in research and development of alternatives for REEs and new recycling technologies. The Government of Canada could offer subsidies to companies researching REE alternatives and innovative recycling technologies to expedite the research process. Investing in recycling and alternatives could be a favourable option instead of attempting to mine and refine Canada's REEs, as the latter would be costly and could interfere with Indigenous reconciliation. Instead, to complement investment in REE alternatives and recycling, Canada could incentivize innovation in sustainable mining by creating grants for Canadian companies mining abroad. By investing in the green energy transition, the Government of Canada is investing in its national security.

### 1. **Modernize NORAD**

Canada's Arctic security infrastructure is too outdated to address the emerging threats from China. Championing Canadian sovereignty in the Arctic begins with NORAD modernization. While Canada is currently in the NORAD modernization process, many implementation timelines will take over ten years. The Department of National Defence should prioritize bottom-up NORAD modernization to ensure that Arctic security infrastructure improves consistently, as we approach some of the longer timelines. Some of the areas that should be prioritized include improving underwater surveillance to aid in detecting Chinese submersibles, operating polar icebreakers to help monitor and chart the Canadian Archipelago, and updating the North Warning System (NWS) to better detect aerial threats. To ease the process of NORAD modernization, Canada should also work closely with its Arctic allies (Greenland, Norway, Finland, Sweden, Iceland, United States). Collaborating with Arctic allies could increase information sharing, which will not only bolster security in the Arctic but potentially aid in developing new technology for Canadian Arctic security.

### 2. **Re-assert Canadian Arctic Sovereignty**

Establishing consensus on Canadian Arctic sovereignty is more important than ever. Until now, many states, include the United States, have contested Canadian sovereignty over the Northwest Passage, claiming it to be an international strait.



While Canada and the U.S seem to have tabled their disagreement over Canada's sovereign claim to the NWP (the U.S has not violated Canadian sovereignty), the fact remains that few states have been champions for Canada's sovereignty over the passage. With China's increased interest in the Arctic, ally support for Canadian sovereignty is invaluable. Canada must work with its allies in the Arctic Council to assert its sovereignty over the NWP on an international stage. Namely, as Canada closely collaborates with the U.S on NORAD modernization, Canada must convince its southern ally that re-affirming Canadian sovereignty over the NWP is in everyone's security interests, especially in the Arctic. Canada could also appeal to its greater allies in NATO and the UN to strengthen the case against a Chinese incursion.

### 3. Comprehensive Arctic Strategy

There remains little public knowledge of the connection between green minerals (REEs) and Canadian Arctic security. While Canada's 2024 Arctic Foreign Policy is a good start, it along with the 2017 Canadian defence policy document "Strong Secure Engaged," fails to engage with rare earth elements. Similarly, the 2022 Canadian Critical Minerals Strategy fails to critically engage with the Arctic. Canada should adopt a whole-of-government Arctic Security Strategy that aligns environmental, economic and security domains to bridge these important topics in public consciousness. The Department of Defence could take the lead on this document, integrating valuable knowledge from Natural Resources Canada and Global Affairs Canada. By synthesizing the insights of different government agencies, this Arctic Security Strategy would better address the nexus between the green transition and Arctic security, bringing attention to a timely issue.

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