

Why Arctic States Must Protect The Deep

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*Aerial photograph by Polarstern at Gakkel Ridge, Arctic.
Photo by Alfred-Wegener-Institut/Stefanie Arndt, CC-BY 4.0.*

Introduction

A new contest is emerging over the mineral resources of the Arctic's deep seabed. Arctic seabeds hold known and suspected mineral deposits, but their **economic viability is unproven**, the **technology to mine them at scale is not ready**, and the **ecological consequences are vast and poorly understood**. Scientific data and input from Indigenous knowledge systems are still missing, leaving decision-makers effectively blind to the risks. If deep-sea mining (DSM) proceeds in this region, it could mark the **beginning of a race to the bottom**—one that risks undermining biodiversity, climate resilience, and trust in international ocean governance.

In the face of these challenges, Arctic countries have an **opportunity to set a global example** by prioritising precaution, cooperation, and the preservation of fragile ecosystems for long-term resilience.

Policy recommendations


1. Endorse a **moratorium on deep-sea mining** in national and international waters. The precautionary principle is essential to allow for the completion of independent scientific research that can properly assess the impacts DSM would have on the marine environment.
2. **Support independent, public research** and **engage with Indigenous peoples** to increase the knowledge of Arctic deep-sea ecosystems.
3. Prioritise **demand-side solutions to critical raw materials** by advancing circular economy strategies, including recycling, material substitution, and reducing consumption.

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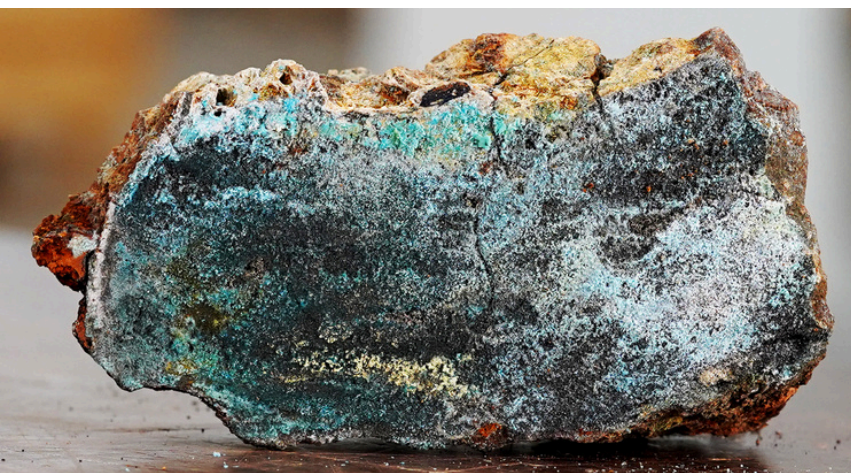
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Arctic mineral resources

Arctic seabeds contain deposits of polymetallic sulfides, cobalt-rich ferromanganese crusts, and ferromanganese nodules.¹ The Norwegian continental shelf in the Greenland and Norwegian Seas is thought to hold several of these deposits, concentrated around **seamounts** and **hydrothermal vent** systems. A government-commissioned survey estimated significant resource potential but acknowledged the high levels of uncertainty in both size and recoverability.² Its high potential has been highly contested by the Norwegian Geological Survey and independent experts.³



A sulphide sample. Photo from the Norwegian Offshore Directorate.



Extractor vehicles developed for the Bismarck sea by the bankrupted DSM company Nautilus Minerals. Photo by engineering company SMD.

Emerging threats

Norway is one of the few states preparing for DSM in its national waters. In January 2024, the Norwegian Parliament approved opening a vast area of its continental shelf—**281,200 square kilometres**—to DSM activities.⁴ This will allow the government to issue exploitation licenses to companies, with an exploration phase. In September 2025, regulations for data collection and documentation were adopted.⁵

The process has, however, been strongly criticised: the Norwegian Environment Agency found the government's **Environmental Impact Assessment inadequate**, and WWF Norway has initiated **legal action** challenging the decision.⁶

The United States has also expressed interest in DSM. Along with seeking seabed mineral development in domestic waters, the U.S. is currently exploring the possibility of awarding licenses to mine in international waters—an approach that **conflicts with international law**.⁷ Under the UN Convention on the Law of the Sea (UNCLOS), the International Seabed Authority (ISA) has the mandate to regulate mineral-related activities in the international seabed.⁸

Financial risks

Extraction at kilometre depths remains **untested at industrial scale**, and the total costs of infrastructure, vessel operation, environmental management, and restoration are likely to exceed potential revenues, especially in volatile commodity markets.⁹ Even industry proponents admit commercial extraction is at least **several years away**.

Early pilot projects in the Pacific have faced repeated **delays**, cost **overruns**, and **investor withdrawals**.¹⁰ In the Arctic, the technological challenges are compounded by ice cover, seasonal extremes, and fragile ecosystems already overwhelmed by climate change.

Environmental and climate risks

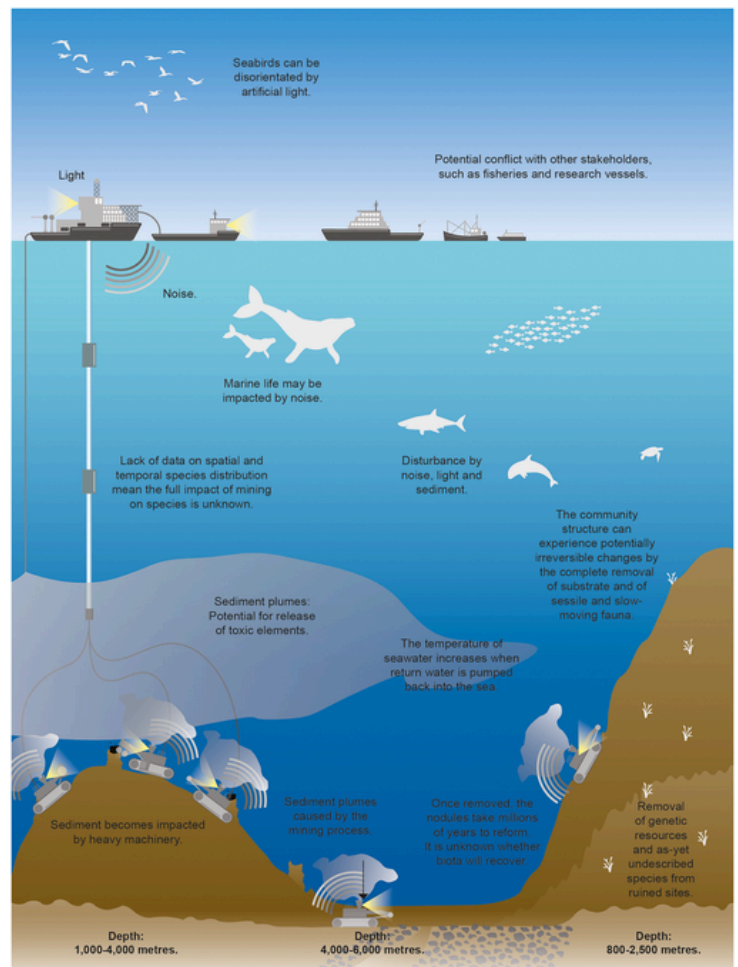
Although there are many **knowledge gaps** in relation to deep-sea ecosystems, especially in the Arctic, the identified risks of DSM are profound.¹¹ The direct physical **destruction of the seabed** by mining machinery would obliterate slow-growing, ancient habitats such as sponge and coral gardens, which are vital biodiversity hotspots. Furthermore, the process creates potentially **toxic sediment plumes** that can smother seafloor life and, when discharged from surface vessels, spread over vast distances, which can disrupt the phytoplankton that form the base of the marine food web.¹² These operations also introduce intense **noise and light pollution** into the otherwise dark and quiet deep-sea environment, disrupting species such as whales that rely on sound.¹³

Beyond biodiversity, DSM could have implications for the ocean's capacity to store carbon. Disturbance could **release carbon-rich sediments** into the water column, undermining natural carbon sequestration and potentially accelerating climate change.¹⁴

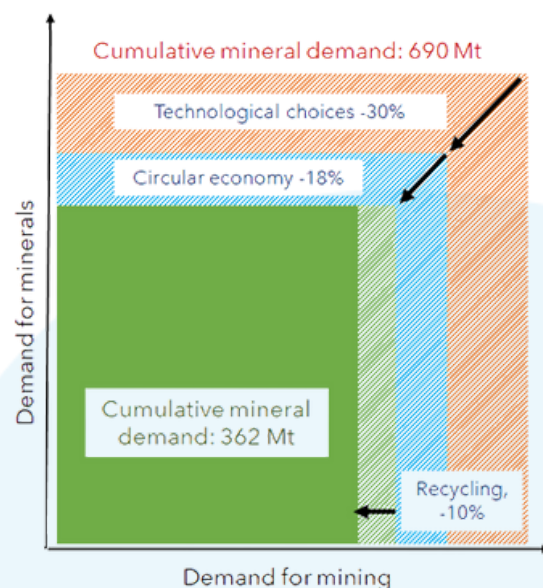
Finally, DSM would act as a major new stressor on an ecosystem already struggling to adapt to the climate crisis, with the **cumulative impacts** likely to be far greater than the sum of their parts.¹⁵

Critical minerals?

The argument that DSM is necessary to provide minerals for the green energy transition is being directly challenged by rapid and fundamental technological advancements.¹⁶ The industry's **demand projections are becoming obsolete** with the commercial ascent of alternative battery chemistries including lithium iron phosphate (LFP) batteries, which are cobalt- and nickel-free. There is also rising political interest in demand reduction measures such as increasing repairability and recyclability, eliminating electronic waste and enhancing circular business models.



Overview of possible impacts provided by Miller et al. (2018). See footnote 11.



A SINTEF study found cumulative mineral demand can be halved compared to the mainstream demand scenario. Photo from footnote 16.



Protests outside the Norwegian Parliament Stortinget. Photo by Greenpeace.



There are currently 38 countries worldwide that oppose deep-sea mining to start. Photo by Deep Sea Conservation Coalition.

Global opposition

Arctic DSM faces mounting pressures on its legitimacy and social licence from a variety of sectors:

- The **European Parliament** noted concerns about Norwegian DSM plans and reiterated their call for a moratorium on DSM until environmental impacts are fully understood.¹⁷ The **Council of the EU** noted similar concerns, and the **European Commission** stated in its European Ocean Pact it supports a precautionary pause.¹⁸
- Parliamentarians in the **Nordic Council** passed a resolution urging their governments to support a moratorium, with broad political backing.¹⁹
- **Canada, Finland, the Kingdom of Denmark** (including **Greenland** and the **Faroe Islands**) and **Sweden** support a moratorium or precautionary pause on DSM. Globally, there are 38 countries and counting calling for a ban, moratorium, or precautionary pause on the industry.²⁰
- The Ministerial Meeting of **OSPAR**, the regional sea convention for the North-East Atlantic, committed to applying the precautionary principle to DSM.²¹
- **Major civil society organisations**, both globally and in the Arctic region, have called for a halt to DSM in the Arctic.²²
- **Many Indigenous groups**, including the Saami Council, have called for a moratorium.²³
- Reacting to Norwegian DSM plans, both **Norwegian and European fisheries organisations** have called for a moratorium.²⁴
- Over **940 marine scientists worldwide** have signed a statement on the need for a moratorium on DSM.²⁵
- **Major companies** such as Google, BMW, and Samsung have pledged not to source minerals from the deep seabed, while banks and insurers are warning of reputational and financial risks.²⁶

The beautiful sea anemone can be found in deep Arctic waters. Photo by Greenpeace.

Conclusion

The combination of incomplete science, environmental and climate risks, regulatory gaps, legal challenges, and the global momentum for precaution make a **rush toward DSM irresponsible**. Arctic states face a clear choice: proceed now at substantial ecological, legal and financial risk, or choose a science-led, precautionary path that preserves the ocean while investing in alternatives.



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Arctic sponge grounds on the Langseth Ridge. Photo by Max Planck Institute.