ORRAA Policy Brief: Deep Seabed Mining

We know more about the surface of the Moon than we do about the deep seabed.

Knowledge about the quantity of carbon sequestered in the seabed and the marine life that inhabits it is scant. The deep seabed also contains mineral deposits and metals in the form of polymetallic nodules, polymetallic crusts and sulphides. Proponents of deep-seabed mining (DSM) aim to remove these deposits from the seafloor through large-scale industrial mining activity operating at depths ranging from 200 to 6,500 metres. Interest in DSM has grown in recent decades due to a growing understanding of the distribution of seafloor mineral deposits, technological advancements which have made mining the seafloor more feasible, as well as increasing demand for metals.

The risks from the impacts of such large-scale industrial extraction on these fragile habitats and on the biodiversity in the water column above them, are currently unknown.

Why is this important?

The vast majority of deep-sea marine scientists, and a growing list of 21 countries, from Palau to France, are calling for a moratorium on DSM, arguing for a precautionary approach given the scientific unknowns and potential collateral damage from opening the deep seabed to massive industrial extraction.

The scale needed for seabed mining to break-even or potentially deliver a profit, together with potential sequestered carbon release, and the risks compounding the already-existing threats to marine biodiversity from ocean heating, pollution and acidification, are not currently environmentally or economically defensible.

Growing Opposition

A 2022 report by the UN Environment Programme Finance Initiative states that "**in their current form, there is no foreseeable way in which the financing of deep-sea mining activities can be viewed as consistent with the Sustainable Blue Economy Finance Principles"**.[1] The report provides a detailed overview of the possibly reputational, regulatory and operational risks associated with DSM and outlines how financial institutions should focus on alternative strategies such as reducing the environmental footprint of terrestrial mining and supporting a transition to a circular economy.

The International Capital Market Association and the International Finance Corporation echoed this in their Blue Bond Guidance[2], stating that investments in "non-renewable extractive industries (e.g. offshore oil and gas, dredging, and deep-sea mining)… are therefore excluded" from the definition of the sustainable blue economy in supporting the issuance of credible blue bonds.

Recommendations

ORRAA and its members include private finance and insurance partners representing trillions of dollars of assets under management, together with governments, multilateral institutions, and civil society. ORRAA echoes the calls from a growing number of financial institutions, businesses, governments, scientists, and civil society to prevent the start of DSM in 'the Area' (the seabed beyond national jurisdictions) and for countries to not allow DSM activity within their own jurisdictional waters.

[1] https://www.unepfi.org/publications/harmful-marine-extractives-deep-sea-mining/
[2] https://www.icmagroup.org/News/news-in-brief/new-guidance-on-blue-themed-bonds-to-help-unlock-finance-for-a-sustainable-ocean-economy

ORRAA recommends that commercial DSM is paused unless and until its environmental, social and economic risks are fully understood, strong regulatory frameworks are in place to reduce and manage its impacts, and the International Seabed Authority is reformed to be more transparent, accountable, inclusive, and environmentally responsible.

A Deeper Dive

The International Seabed Authority

The legal framework for the regulation of deep-sea mining is dependent on whether deposits are located within national or international jurisdiction, as established under the UN Convention on the Law of the Sea (UNCLOS).[3] The 60%+ of the ocean floor in areas beyond national jurisdictions ('the Area') is deemed the common heritage of [hu]mankind and regulated by the International Seabed Authority (ISA). Part of the ISA's mandate is to "ensure the effective protection of the marine environment from harmful effects that may arise from deep-seabed related activities". This includes issuing contracts for both scientific exploration and future potential exploitation of mineral resources. Although commercial DSM has not yet begun, ISA has entered into 15-year contracts for the exploration of mineral resources in the deep seabed with 22 contractors, including countries and private companies. By its very nature, such contracts are for large-scale activities to take place.

In 2021, the Pacific Island state of Nauru was the first country to seek permission from the ISA to begin commercial DSM. The request triggered a provision for the ISA to, within 2 years, establish the rules, regulations, and procedures that would allow for seabed mining. In July 2023, the 28th Annual Session of the ISA was marked by contentious debate on the topic. After failing to reach an agreement, the ISA pushed the decision to 2025, on whether DSM will be allowed and how countries could pursue it. Throughout 2024, ISA member States will continue to debate and discuss the environmental risks and impacts of DSM to inform the 2025 decision.

The Fallacy of Clean Energy Demand

Arguments in support of DSM include the economic potential of these seabed resources for clean energy infrastructure and the potential environmental and social gains of scaling down land-based mining.[4] The reality, however, is that the deep sea contains many of the most pristine, biodiverse, and poorly studied ecosystems on Earth. DSM risks degrading ocean ecosystems from the seabed to the water column, impacting food webs, risking the fisheries that are key to food security and livelihoods, and affecting the carbon storage potential of ocean sediments.

Building a new global energy system is dependent not only on scaling-up renewable energy, but also finding a way to source and use the minerals required for it in a sustainable way that does not degrade nature or up-end existing carbon sinks.[5] Alternative technologies and economic incentives include improved recycling of minerals already in circulation and developing a less mineral-intensive renewable energy system.

[3] https://portals.iucn.org/library/sites/library/files/documents/2018-029-En.pdf
[4] https://www.irena.org/Publications/2023/Jul/Geopolitics-of-the-Energy-Transition-Critical-Materials
[5] https://oceanpanel.org/publication/what-role-for-ocean-based-renewable-energy-and-deep-seabed-minerals-in-a-sustainable-future/

Understanding the Risks of DSM

DSM risks degrading ocean ecosystems, harming fisheries that we depend on, as well as disrupting food webs and the ability of the ocean to store carbon. As our scientific understanding of deep-sea ecosystems grows it becomes ever clearer that we need to leave the ocean floor undisturbed.

1. Impacts to marine ecosystems

The deep sea contains many of the most pristine, biodiverse, and poorly studied ecosystems on our planet. Deep sea mining would result in physical damage to these systems – wherein mining vehicles on the sea floor impact habitat, seafloor structure, and non-mobile organisms such as sponges. Despite studies, it is unclear how long it takes a mined seabed to recover from the physical impacts alone.[6] DSM also runs risks of broader ecosystem damage from the disturbance of sediments, which will impact water quality and turbidity. Discharged wastewater and sediments as part of the mining process result in plumes throughout the water column that can spread for miles[7], possibly affecting or displacing biodiversity and fisheries. Finally, the noise pollution from DSM equipment and processes can negatively impact both fish and megafauna such as whales.

2. Long-term species and fisheries disruptions

Recent studies have demonstrated the possible long-term ramifications of DSM on fisheries. In 2020, a Japanese research operation excavated a 120-meter stretch of cobalt on a seamount in the Pacific Ocean; a year later, they found that the density of fish and shrimps dropped by 43% in the area directly affected, and 56% in adjacent areas.[8]

One of the most sought after and economically viable locations for DSM in the Pacific Ocean is also home to globally and locally important tuna fisheries, valued at over USD$5.5 billion. New scientific evidence shows that as Pacific bigeye, skipjack and yellowfin tuna populations shift locations in a changing climate, this fishery and proposed DSM would significantly overlap,[9] with any unforeseen impacts putting the food security of Pacific islands and global commercial fisheries at risk.

3. Potential impacts on Ocean carbon sequestration

The ocean is the world's largest carbon sink, playing a critical role in the regulation of the global climate. One component of the global carbon cycle is the sequestering of organic carbon in deep ocean sediments, facilitated by microscopic organisms. Disturbance of these sediments releases this stored carbon. We know that just bottom trawling in the fishing industry releases as much carbon dioxide every year as the entire aviation industry.[10] Further disturbance by DSM could accelerate this. In addition, the collective impacts of DSM on microbial ecosystem functions are not yet well understood, but it could impact carbon sequestration in deep-sea sediments.[11]

[6] https://www.mdpi.com/2071-1050/13/9/5261
[7] https://www.greenpeace.org/usa/news/revealed-undercover-video-shows-deep-sea-mining-tests-tainted-by-pollution-and-flawed-monitoring/
[8] https://www.sciencedirect.com/science/article/pii/S0960982223008151
[9] https://www.nature.com/articles/s44183-023-00016-8
[10] https://www.nature.com/articles/s41586-021-03371-z
[11] https://aslopubs.onlinelibrary.wiley.com/doi/full/10.1002/lno.11403

Key Resources

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