ORRAA Policy Brief: Deep Seabed Mining
15 July 2024

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 limited. The deep seabed contains mineral deposits and metals in the form of polymetallic nodules, polymetallic crusts and sulphides. Interest in deep-seabed mining (DSM) has grown in recent decades driven by 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.

Proponents of DSM aim to remove these deposits from the seafloor through large-scale industrial mining activity operating at depths ranging from 200 to 6,500 meters.

Yet the scope of 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 27 countries (as of July 2024), from Palau to France, are advocating for a DSM moratorium, precautionary pause, or an outright ban. Given the scientific unknowns and potential collateral damage from opening the deep seabed to massive industrial extraction, as well as emerging climate and ocean risks, these countries argue for the application of a highly precautionary way forward.

The operational scale needed for seabed mining to break-even or potentially deliver a profit, together with the potential release of sequestered carbon, and compounding 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 (UNEP-FI) 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 potential 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 concerns of a growing number of financial institutions, businesses, governments, scientists, and civil society with regards to the lack of a full understanding of the environmental, social and economic risks of DSM. ORRAA is also concerned that there are not strong regulatory frameworks in place to manage this activity, including the need for a more transparent, accountable, inclusive and environmentally responsible International Seabed Authority. As such, ORRAA recommends a precautionary pause on DSM until at least 2030 in 'the Area' (the seabed in areas beyond national jurisdictions); and for countries to not allow DSM activity within their own jurisdictional waters.

ORRAA member WWF, is leading efforts for businesses to sign up to a Statement Supporting a Moratorium on Deep Sea Mining.

[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

A Deeper Dive

The International Seabed Authority

The legal framework for the regulation of DSM 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 "Area" encompasses over 60% of the ocean floor, is deemed the common heritage of humankind and is 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 (RRPs) that would allow for seabed mining. After the third part of the 28th ISA's Annual Session in November 2023, and failing to meet the 2-year deadline, the ISA committed to continuing to work on creating the RRPs, with a "view to adopt" them in 2025. However, a company could still seek ad hoc approval to mine the deep seabed despite the absence of regulations. At least one mining company has stated it would reserve its right to do so.

In addition to the rules to address environmental impacts, ISA country members have divergent visions on other fundamental aspects of DSM, including the type and amount of royalties companies will pay the ISA for mining rights, how to effectively monitor compliance by companies operating in the deep sea, and whether the ISA itself needs internal changes to become a more robust regulatory body.

[3] https://portals.iucn.org/library/sites/library/files/documents/2018-029-En.pdf

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. Under international law, the ISA does not have regulatory authority over the water column above the deep seabed.

Building a new global energy system is dependent not only on scaling-up renewable energy, but also on 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] Potential alternative technologies that do not use rare Earth minerals, as well as economic and policy incentives that include improving recycling of minerals already in circulation, regulations for alternative technologies, grid connection and supply diversification and developing a less mineral-intensive renewable energy system, raise significant questions about arguments being made for extracting deep seabed minerals.

[4] https://www.irena.org/Publications/2023/Jul/Geopolitics-of-the-Energy-Transition-Critical-Materials

[5] https://www.oceanpanel.org/publication/what-role-for-ocean-based-renewable-energy-and-deep-seabed-minerals-in-a-sustainable-future/

Understanding the Risks of DSM

From a purely financial perspective, DSM risks billions of corporate value. DSM risks degrading ocean ecosystems, harming fisheries that we depend on, disrupting food webs, and reducing the ocean's ability 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. Financial risk and corporate value destruction

Multiple perspectives lead to the conclusion that mining the deep sea is not a financially sound decision. Research by Planet Tracker[6] reinforces this view, finding that from a natural capital perspective, preserving the planet's abyssal plains is worth at the very least ten times more than exploiting them. If companies were to mine polymetallic nodules in international waters, it could destroy USD$30-132 billion of corporate value. That is 3 to 13 times the combined GDP of all Pacific Island Small Island Developing States. While subsea mining equipment providers may see some gain, the mining sector itself would face significant value destruction. This is due to high operational costs, leading to negative returns on investment, and increased capital costs for existing land-based nickel, cobalt, and copper mines facing competition from DSM.

The DSM industry's negative impact on the deep sea's ecosystem services is estimated to contribute to at least another USD$465 billion of value destruction, primarily as a result of habitat destruction.

2. Impacts on marine ecosystems

The deep sea contains many of the most pristine, biodiverse, and poorly studied ecosystems on our planet. DSM 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.[7] 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,[8] possibly affecting biodiversity and fisheries. Finally, the noise pollution from DSM equipment and processes can negatively impact both fish and megafauna such as whales.

[6] https://planet-tracker.org/wp-content/uploads/2024/02/How-to-Lose-Half-a-Trillion.pdf

[7] https://www.mdpi.com/2071-1050/13/9/5261

[8] https://www.greenpeace.org/usa/news/revealed-undercover-video-shows-deep-sea-mining-tests-tainted-by-pollution-and-flawed-monitoring/

3. 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.[9]

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,[10] with any unforeseen impacts putting the food security of Pacific islands and global commercial fisheries at risk.

Quantifying the exact impact of DSM on fisheries remains challenging. However, research by Planet Tracker estimates a significant negative impact, potentially reaching USD$344 million.[11]

4. 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.[12] 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.[13]

[9] https://www.sciencedirect.com/science/article/abs/pii/S0960982223008151

[10] https://www.nature.com/articles/s44183-023-00016-8

[11] https://planet-tracker.org/wp-content/uploads/2024/02/How-to-Lose-Half-a-Trillion.pdf

[12] https://www.nature.com/articles/s41586-021-03371-z

[13] https://aslopubs.onlinelibrary.wiley.com/doi/full/10.1002/lno.11403

Key Resources

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Learn More About ORRAA here.

The Ocean Risk and Resilience Action Alliance (ORRAA) is the only multi-sector collaboration connecting the international finance and insurance sectors, governments, non-profits, and stakeholders from the Global South to pioneer finance products that incentivise investment into coastal and ocean Nature-based Solutions (NbS). Our mission, by 2030, is to activate at least USD$500million of investment into this space, and in so doing, help build the resilience of at least 250 million climate vulnerable coastal people.

The heart of ORRAA's mission is focused on building the resilience and adaptive capacity of marine and coastal ecosystems and the coastal communities around the world that rely on them. We do this by driving investment into ocean and coastal Nature-based Solutions, as well as through the mitigation of risk multipliers like overfishing and pollution. These solutions will enable the Ocean and the communities which depend on it to thrive, creating greater economic security as well as social and cultural resilience for climate vulnerable coastal communities.