deepsea conservationcoalition

Deep-sea mining: an introduction

The deep sea is the largest biome on Earth. This mysterious and varied place makes up 90% of the marine environment and plays a vital role in regulating our planetary systems, not least by absorbing and storing vast quantities of the carbon dioxide emitted into the air by human activity.

Broadly speaking, the deep sea is the water column below 200 meters and the seabed beyond continental shelves. It is one of the most inaccessible areas on Earth. Most of the diverse species and ecosystems it supports have adapted to the unique conditions of the deep ocean and are extremely vulnerable to human disturbance.

In addition to flora and fauna, the deep seabed is also home to vast quantities of metal-rich mineral deposits. Some of these metals, such as copper, cobalt, nickel and manganese, are commonly used in industrial and electronic applications. The existence of these deposits, and the potential value of the metals they contain, make the highly speculative new industry of deep-sea mining attractive.

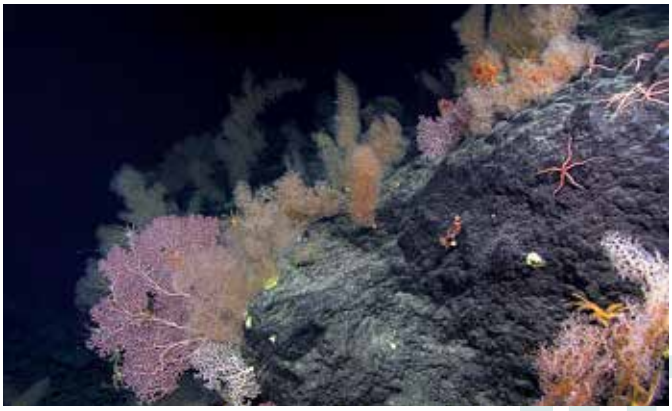
State of play

Deep-sea mining is the process of retrieving mineral deposits from the deep seafloor. While experimental and exploratory work is already underway in various locations, deep-sea mining has not yet begun at a commercial scale. However, there is strong commercial interest in mining the deep sea in the international areas of the ocean.

At the same time there is growing concern about the impact that mining would have if permitted to occur and whether and how the industry could be managed to prevent damage to deep-sea ecosystems as required under international law. Many scientific experts consider that biodiversity loss would be inevitable and likely irreversible if deep-sea mining is permitted.[1] They urge extreme caution, due to the significant damage expected to occur to fragile and vulnerable deep-sea ecosystems that are rich in biodiversity and which are already under stress from climate change impacts, pollution and plastics in the ocean.[2] Their concerns are supported by an increasing number of political leaders and institutions, as well as leading conservationists and environmental and other organizations, who are calling for a moratorium on deep-sea mining.[3]

In spite of the high risks, lack of scientific knowledge, and widespread concern, the industry is lobbying hard for commercial mining licenses to be issued in the international seabed area, and there is a real possibility that the deep ocean would be opened to mining in the near future.

Below: garden of coral, Sibelius Seamount, at a depth of 2,465 meters.



Threats

There are three broad types of deep-sea habitats where metal-rich mineral deposits are formed: abyssal plains; seamounts; and hydrothermal vents. Mining activities would have different impacts from site to site depending on the unique species and ecosystems in each of these habitats. The main threats are:

Destruction of deep-sea species, ecosystems and habitats: While the technology to extract metal-rich mineral deposits is still under development, all methods currently being explored to extract crusts from seamounts are expected to destroy the bottom habitat and ecosystems around seamounts, including corals and sponges that may have taken thousands of years to grow. In deep abyssal plains, each mining operation for so-called polymetallic nodules is expected to effectively strip mine 8,000 to 9,000 square kilometers of seabed[4] over the course of a 30-year license – equivalent to an area a third the size of Belgium. This would destroy most of the creatures that live on, or just below, the seabed.

Sediment disruption: In the deep abyssal plains, mining would stir up sediment that has lain on the seabed for many thousands of years. The sediment plumes could drift far from the actual mining sites themselves, potentially smothering or killing filter feeders and other deep-sea denizens.[5] It is thought that the animals dependent on the nodules may take millions of years to recover and that even partial recovery of the animals living in the disrupted sediment "may take hundreds to thousands of years".[6]

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Above: cusk eel above the seafloor at about 1,840 meters of depth.

Wastewater: Modeling by scientists indicates that the plumes of wastewater, sediment and residual metals discharged from ships during mining could flow hundreds of kilometers away from the mining sites. These plumes could impact ocean ecosystems at various depths. The metals they contain could prove toxic to some forms of marine life and could, potentially, get into the marine food chain.[7]

Noise and light pollution: This would affect thousands of meters of the water column from the seabed to the surface. It could impact whales and other deep-diving or deep-dwelling animals that use noise and echolocation to communicate and find prey in the ocean's depths.

Regulation

Deep-seabed mining in the international areas of the world's ocean is controlled by the International Seabed Authority (ISA). The ISA was established in 1994 by the United Nations Convention on the Law of the Sea (UNCLOS) to control deep-sea mining in the international areas of the world's ocean. Comprised of 167 Member States plus the European Union, it is explicitly charged with ensuring the "effective protection" of the marine environment from seabed mining activities and with preventing damage to the flora and fauna of the seabed.[8] If deep-sea mining is permitted by the ISA, according to the law, it must be done for the "benefit of mankind as a whole",[9] as opposed to individual companies or countries only.

However, the decision-making procedures, structure and governance[10] of the ISA are set up to facilitate mining and there is pressure within the ISA to adopt commercial mining regulations as fast as possible, without a clear understanding of what the environmental consequences would be. Moreover, questions remain around who would benefit from deep-sea mining. While it may prove profitable to individual companies, current calculations of the economics of mining in deep abyssal plains, for example, suggest that the financial benefit from payments to each ISA Member State may amount to only a few hundred thousand dollars per license each year.[11] The expenses of the ISA itself would likely be deducted from these royalty payments. Concerns over the ISA's role, as both a beneficiary and regulator of deep-sea mining, led the UK's House of Commons Environmental Audit Committee to conclude in January 2019 that it has a "clear conflict of interest".[12]

Recommendation

Mining in the biologically rich areas of the deep sea would knowingly put valuable ecosystems at risk, thereby contravening international obligations to ensure the protection of the marine environment.

Widespread concern about the vulnerability of deep-sea habitats and ecosystems, the scale and nature of proposed mining practices, the lack of information to conduct a thorough environmental impact assessment and deficiencies in the ISA as a regulatory body all make a clear case that a moratorium on deep-sea mining is essential.

Endnotes

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8 Article 145 UNCLOS.
9 Article 140 UNCLOS.
10 Refer to DSCC briefing on the International Seabed Authority.
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12 House of Commons, Environmental Audit Committee: Sustainable Seas, 17 January 2019. https://publications.parliament.uk/pa/cm201719/cmselect/cmenvaud/980/980.pdf. Paragraphs 70 and 71.

About the DSCC

The Deep Sea Conservation Coalition (DSCC) was founded in 2004 to address the need to prevent damage to deep-sea ecosystems and the depletion of deep-sea species on the high seas from bottom trawling and other forms of deep-sea fishing. The DSCC is made up of over 80 non-governmental organizations (NGOs), fishers organizations and law and policy institutes, all committed to protecting the deep sea.

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