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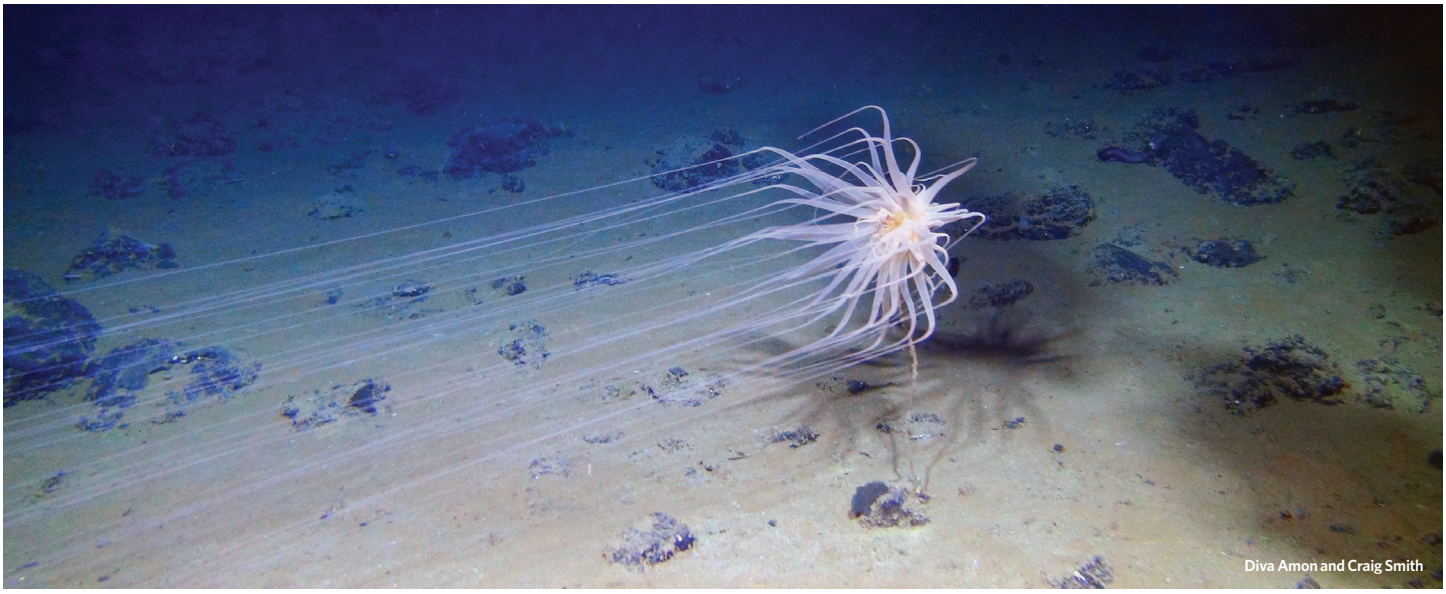

How to Protect the Deep Sea

Why regional environmental management plans are important

Overview

The International Seabed Authority (ISA) was established to manage mining on the international seabed and to protect the marine environment from its harmful effects. Striking a balance is a formidable challenge.

All mining operations, land or sea, cause environmental damage. Research strongly suggests that deep-sea mining will result in the loss of biodiversity—losses that may be permanent.[1] How can that loss be minimized? The United Nations Convention on the Law of the Sea (UNCLOS) requires the ISA to manage activities in the international seabed "for the benefit of mankind as a whole" and to "ensure the effective protection of the marine environment" from mining's harmful effects. In order for the ISA to fulfill its protection obligations, it will need to manage ecological impacts at a regional scale as well as take steps to prevent and mitigate effects within individual mining sites.

The ISA's regulatory tool for environmental protections custom designed for a particular area is called a regional environmental management plan (REMP). At recent sessions of the ISA Council and Assembly, Member States have called for the development of REMPs as a precondition of mining in any given area. REMPs would include both area-based and rules-based management tools, including—but not limited to—a network of large no-mining areas that can serve as refuges for marine species and preserve ecosystem functions.

Because REMPs are vital to protecting the marine environment, they must be part of the ISA's regulatory Mining Code. The ISA should adopt a formal, binding regulation that no mineral exploitation can occur in any region not covered by a REMP.

What is a regional environmental management plan?

A REMP lays out the goals, rules, and management tools particular to a specific region where mining could occur. Different regions and habitats require different rules and thresholds to ensure effective protection. So REMPs must be tailored to the ecosystem structure and functions for the specific area in question, as well as the different habitats, community structure, biodiversity, connectivity, and resilience of the area. In general, there are two main classes of management tools for REMPs:

Area-based management tools. All REMPs should conserve areas of the seabed through a network of large no-mining zones. These zones are called "areas of particular environmental interest" (APEIs). APEIs should cover the full range of habitats, biodiversity, and ecosystem functions within the overall management area. Development of the APEI network should be based on scientific principles. Placement of such networks is typically based on spatial analyses of physical, geochemical, ecological, and social datasets.

Rules-based management tools. REMPs are more than maps of where contractors cannot mine. They should also include rules for managing the areas where mining is permitted. These could be general rules such as requiring updates to baseline data, taking account of cumulative impacts, and ensuring the application of best environmental practices. Rules could also be region- or species-specific. Certain habitats could be given special protections. Mining could be suspended during key breeding or migratory seasons. Underwater sites of historical or cultural significance could also be set aside.

What makes a good REMP?

A successful REMP will ensure effective protection of the marine environment, maintain biodiversity, and safeguard ecosystem functions during any mining operations within a particular area of the international seabed. It will also include networks of APEIs; region-specific rules, guidelines, standards, and thresholds; and consequences for failure to comply.

A well-formed plan would be based on generally accepted and widely used principles for the design of marine protected area networks and would:

- Include networks of APEIs that are **representative** of the range of habitats, species, and ecosystem functions in the area.
- Include in the network **ecologically important areas** that harbor unique biodiversity and provide important ecosystem services or functions.
- Offer **connectivity** for populations. In other words, APEIs should be close enough so that larvae and other dispersing life stages can travel between APEIs to maintain and/or restore population sizes.
- **Replicate** protections so that species, habitats, and ecological processes are covered in more than one protected area.
- Assure **viable sites** of the size, populations, and protections sufficient to sustain their ecological functions and maintain self-sustaining populations.
- Draw APEI networks that protect **30** to **50 percent** of the total management area.[2] The ISA has committed to protecting 30 to 50 percent of the Clarion-Clipperton Zone (CCZ) in the Eastern Pacific Ocean, the only area with a management plan to date.[3] Scientists have called for similar safeguards in other regions.

Once in place, an APEI network and the REMP in which it is contained should be evaluated against an objective set of performance metrics. The placement of APEIs should be open to review and revision only if the ISA and the contractors can ensure that there will be no net loss of biodiversity, or if their performance metrics are not met.

APEI networks and other protections specified in a REMP should remain in place until there are no more active contracts in the region and areas affected by any mining activities have fully recovered from such impacts.

Current and future REMPs

As of 2018, the CCZ was the only area with an ISA-approved REMP. However, the ISA has plans to create REMPs for each of the regions with exploration contracts, and the CCZ could provide a template.

The ISA Council approved the CCZ REMP in 2012 as "one of the measures appropriate and necessary to ensure effective protection of the marine environment."[4] Scientists developed the plan's APEI network over a series of workshops and submitted several design scenarios to the ISA.[5] The scientists produced a plan for a network of nine large APEIs and a wide range of additional conservation-minded management objectives. The final REMP, as approved by the ISA Council and Assembly, shifted the proposed APEIs outward from the center of the CCZ so that no protected areas would overlap current exploration areas.

The CCZ REMP was approved for an initial period of three years. The plan included the revised network of nine protected areas and a range of additional management objectives. The ISA Legal and Technical Commission (LTC) reviewed the CCZ REMP in 2016[6], noting that a majority of these management objectives had not been implemented. The LTC review recommended adding two additional protected areas, developing guidelines for impact reference zones and preservation reference zones, and establishing an expert working group. The ISA now plans to review the CCZ REMP in late 2019 to incorporate significant new data acquired in recent years.

In July 2018, the ISA also approved a two-year plan to support the development of REMPs to cover the Western Pacific seamount region (home to ferromanganese crusts, a mineral resource being explored) as well as the hydrothermal vent systems in the Mid-Atlantic and Indian oceans (currently being explored for polymetallic sulphides). The ISA has scheduled a series of workshops for each area. The deep-sea community faces the considerable tasks of delineating the regions, proposing APEIs and other conservation protections, and specifying the metrics by which the REMPs' efficacy can be judged.

REMPs should be developed with active participation and input from all stakeholders because, as UNCLOS stipulates, the seabed is the "common heritage of mankind." Equally important, no exploitation can be undertaken in any region unless and until a REMP for that region has been formally approved.

Endnotes

1 Lisa A. Levin et al., "Defining 'Serious Harm' to the Marine Environment in the Context of Deep-Seabed Mining," *Marine Policy* 74 (2016): 245-259, https://doi.org/10.1016/j.marpol.2016.09.032; Holly J. Niner et al., "Deep-Sea Mining With No Net Loss of Biodiversity — An Impossible Aim," *Frontiers in Marine Science* (2018), https://doi.org/10.3389/fmars.2018.00053.

2 Michael Lodge et al., "Seabed Mining: International Seabed Authority Environmental Management Plan for the Clarion-Clipperton Zone. A Partnership Approach," *Marine Policy* 49 (2014): 66-72, https://doi.org/10.1016/j.marpol.2014.04.006; Convention on Biological Diversity, Conference of the Parties 9 Decision IX/20. https://www.cbd.int/decision/cop/?id=11663; Daniel C. Dunn et al. "A Strategy for the Conservation of Biodiversity on Mid-Ocean Ridges From Deep-Sea Mining," *Science Advances* 4, no. 7 (2018), https://doi.org/10.1126/sciadv.aar4313.

3 International Seabed Authority, "Environmental Management Plan for the Clarion-Clipperton Zone," (2011) ISBA/17/LTC/7, https://www.isa.org.jm/documents/isba17ltc7.

4 International Seabed Authority, "Decision of the Council Relating to an Environmental Management Plan for the Clarion-Clipperton Zone," (2012) ISBA/18/C/22, https://www.isa.org.jm/documents/isba18c22.

5 Lisa M. Wedding et al., "From Principles to Practice: A Spatial Approach to Systematic Conservation Planning in the Deep Sea," *Proceedings of the Royal Society B: Biological Sciences* 280, no. 1773 (2013), https://doi.org./10.1098/rspb.2013.1684.

6 International Seabed Authority, "Review of the Implementation of the Environmental Management Plan for the Clarion-Clipperton Fracture Zone," (2016) ISBA/22/LTC/12, https://www.isa.org.jm/document/isba22ltc12.

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