



A Journalist's Guide to Reporting on Deep-Sea Mining and its Impacts on Island Communities

by Rachel Ramirez

Definition/Overview

Deep-sea mining is the process of extracting rare-earth elements and critical minerals such as nickel, copper, cobalt and manganese from the seabed, typically by dredging and vacuuming the ocean floor at extreme depths using large, robotic equipment. While these minerals are essential for modern technologies, including missile systems, steelmaking, smartphones and batteries for electric vehicles, deep-sea mining poses significant dangers to marine ecosystems and island communities that rely on the ocean for their livelihood, food security and cultural preservation.

Key terms to know

The United Nations Convention on the Law of the Sea (UNCLOS) is an international treaty, often referred to as the "constitution of the oceans." Adopted in 1982, UNCLOS establishes a legal framework to promote order, stability, and peaceful relations on the world's oceans and seas.

- The treaty defines maritime zones, guarantees freedom of navigation through territorial sea and international straits for ships and aircraft, and declares the seabed and all its resources beyond national jurisdiction to be the "common heritage of mankind."

The **High Seas** are international waters. These are areas of the ocean that lie outside the jurisdiction of any single country and are essentially the world's shared oceans. Under UNCLOS, the High Seas begin where a country's Exclusive Economic Zone ends.

Exclusive Economic Zone (EEZ) is the waters and seabed that typically extends up to 200 nautical miles from a nation's coastline. The coastal country claims special rights to this area, particularly with regard to resource exploration and use. Everything else beyond the EEZ is considered the High Seas.

The International Seabed Authority (ISA) is the regulatory U.N. body, headquartered in Kingston, Jamaica, that oversees any mining-related activities in the deep-sea beyond national jurisdiction, known as "the Area" of the ocean and seabed over which no single country has the right to manage or claim sovereignty.

- **Mining code:** exploitation regulations that the ISA is actively negotiating on to govern commercial-scale deep-sea mining. These regulations are not yet finalized.
- The **"two-year rule":** In 2021, the Pacific island nation of Nauru triggered a provision that sets a deadline for the ISA to finalize the mining code and regulations by July 2023.
 - **The ISA missed this deadline**, which means any ISA contractor can submit an application for a mining license even without the full regulatory framework in place.
 - However, the ISA council has stated that no mining will occur without final regulations.

- The ISA has issued 30 contracts for exploration in the international seabed area, with large areas covered by license holders from countries such as China, the U.K., Belgium, and Japan.

High Seas Treaty, formerly known as the **Agreement on Biodiversity Beyond National Jurisdiction or the BBNJ Agreement**, is an international, legally binding treaty designed to address critical gaps in UNCLOS, including conservation and protection of marine biodiversity in the High Seas. This addresses the two-thirds of the ocean that is largely unregulated by any state. The agreement focuses on marine protected areas, environmental impact statements, benefit sharing, and capacity building within developing countries. The treaty went into effect in January 2026.

State of Play

No commercial-scale deep-sea mining is happening anywhere in the world. Nevertheless, countries like the United States and Japan, and companies like The Metals Company and Impossible Metals are currently exploring the ocean, particularly the Pacific Ocean, to track where these critical minerals are.

- **Polymetallic nodules** are potato-sized rock concentrations, roughly three to 10 centimeters in diameter, that rest on the deep-sea sediment, often at depths of 4,000 to 6,000 feet.
- **Rare-earth mud** is a specific type of deep-sea sediment containing rare-earth elements and yttrium. This is different from polymetallic nodules, which sit on top of the sand on the seafloor, while rare-earth mud is the soil or sand itself.



Caption: Rachel Ramirez holding a nodule containing manganese extracted by Japan near Minamitorii Island (Minamitorishima)

- Due to geopolitical reasons, there is a growing push for commercialization driven by demand for minerals and other rare-earth elements.
- However, there is also a massive push or movement, mostly among small island states, calling for a moratorium on deep-sea mining.

President Trump's Executive Order

In April 2025, President Donald Trump issued an [executive order](#) entitled "Unleashing America's Offshore Critical Mineral and Resources," invoking the 1980 **Deep Seabed Hard Minerals Resources Act** (DSHMRA) and reframing access to deep-sea minerals as a matter of "urgent national security and supply chain independence" for the U.S.

This mandates the acceleration of the permitting process for U.S. entities to explore and develop seabed minerals both on the U.S. Outer Continental Shelf (OCS), the seabed and subsoil that extends roughly three nautical miles from the coast into the ocean, and in areas beyond national jurisdiction.

This is **not** bound under UNCLOS and the International Seabed Authority.

- What does DSHMRA do?
 - accelerates the environmental assessment process, exploration and commercial recovery of hard mineral resources of the deep-seabed under the National Oceanic Atmospheric Administration
 - encourages the continued development of technology necessary to recover the hard mineral resources
 - establishes an interim domestic legal regime for deep-sea mining until an international regime is agreed upon
 - DSHMRA has long prevented the U.S. from ratifying UNCLOS.
- **Legal conflict:** The Trump administration's action directly challenges the ISA's authority as the sole regulator of the deep-seas
 - The U.S. is essentially trying to bypass ISA framework
 - The ISA and member states see this unilateral attempt by the U.S. as a violation of international law
- The National Oceanic and Atmospheric Administration (NOAA) has proposed streamlining the offshore licensing permit process for U.S. entities.

In October 2025, the **United States and Japan** [signed an agreement](#) to work together to secure critical minerals and rare-earth elements through ways like deep-sea mining. Both countries are now racing to explore the ocean to counter China's dominance of critical mineral reserves.

- The main goal is to reduce the world's reliance on China, which provides roughly 60 to 90 percent of the world's critical minerals exports.
- The deal between U.S. and Japan includes:
 - a strategic partnership to advance deep-sea mining and exploration
 - strong cooperation across the entire supply chain
 - joint financing for certain projects expected to deliver critical minerals to buyers in both countries
 - accelerated permitting and project execution to mine and process critical minerals and rare-earth elements

The U.S. government is currently planning to mine the seabed around two of its U.S. territories: **American Samoa** and the **Commonwealth of the Northern Mariana Islands**.

- The Bureau of Ocean Energy Management (BOEM) has identified an area for potential leasing in American Samoa, which is located no closer than 50 miles from the islands, despite the American Samoa government expressing strong opposition.

- BOEM also issued a request for offshore leasing in the CNMI, particularly the area west of the Mariana Trench National Monument, a region largely unexplored for mineral wealth.
- Political status: Residents of American Samoa and the Northern Mariana Islands are U.S. citizens who can serve in the U.S. military, but cannot vote for president.

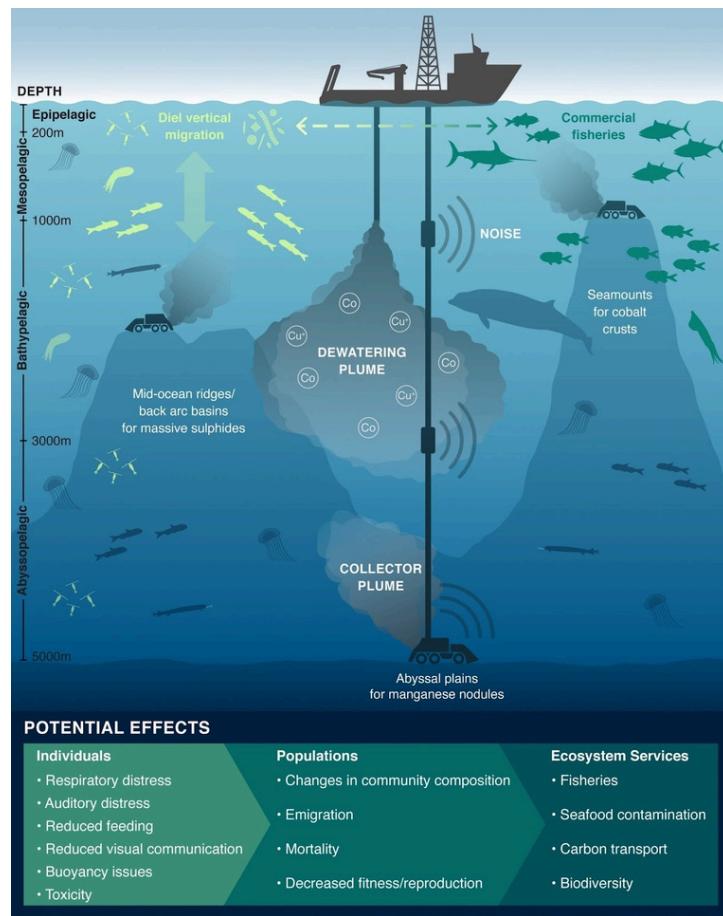
Japan is also conducting deep-sea mining research tests within its exclusive economic zone (EEZ) around Minamitorishima Island.

- The research, led by the government agency Japan Agency for Marine Earth Science and Technology, is testing mining rare-earth-rich mud from the deep-sea.

Scientific Concerns

Scientists are primarily concerned that deep-sea mining will cause irreversible harm to unique deep-sea ecosystems, including habitat loss, noise and light pollution, and sediment plumes.

Although science is not yet up to speed, researchers are working fast to capture the full impacts of deep-sea mining on marine ecosystems.



Courtesy of University of Hawai'i at Mānoa School of Ocean and Earth Science and Technology (SOEST)

Here is what scientists know so far:

- Scientists have warned about the uncertainties of deep-sea mining for years. Here is a [June 2017 study](#) by UH Manoa's School of Ocean and Earth Science and Technology.

- Researchers at the University of Hawai'i at Manoa are continuing to examine the potential harms of seabed mining on [deep-sea corals](#).
 - Dr. Fanny Girard, a researcher from the University of Hawai'i at Manoa, has been studying deep-sea organisms and how they interact with their physical environment.
 - She spent time on the deep-sea mining research vessel, the Nautilus.
- A [study](#) published in October found that the habitats of 30 species of sharks, rays and chimaeras, also called ghost sharks, overlap with areas where proposed deep-sea mining may occur.
 - Nearly two-thirds of these species are already threatened with extinction due to human activities, so discharge plumes and sediment from seabed mining will disrupt the seafloor and only further elevate their extinction risk.
- A [study published](#) in November in the journal Nature Communications found that waste plumes coming from deep-sea mining operations in the Pacific threaten critical food sources like zooplankton that could cause a ripple effect throughout the ocean's food web.
 - Particle plumes discharged from mining operations could disrupt marine life in the ocean's "twilight zone," a vital region where there's just enough light to sustain life and below which the ocean transitions into a dark abyss.
 - 53 percent of all zooplankton and 60 percent of micronekton, which feed on zooplankton, would be affected by the mining discharge.
 - This could ultimately move up the food chain, affecting predators higher up on the web, such as the shrimp and fish people eat at the dinner tables.

Another [study published](#), in December in the journal Nature Ecology and Evolution, also funded by The Metals Company, analyzed samples from the seafloor before and after a mining test and showed that the count of worms, minute crustaceans, and other small animals in the mining vehicle's track dropped by 37 percent, with the variety of these organisms also falling by 32 percent.

Push for a moratorium

In October 2025, the U.S. government-funded vessel called the Nautilus was conducting a research expedition in the oceans of the Cook Islands, following an agreement between the U.S. and the Cook Islands to "advance scientific research" of seabed mining.

But as the exploration vessel returned to Rarotonga port, a group of environmental activists held a banner that read "Don't Mine the Moana," [protesting efforts](#) to mine the Oceania region. (Moana means "ocean")

More than 40 countries have formally taken a position against deep-sea mining in international waters, including France, Canada, New Zealand, Germany, Chile, Brazil, Spain, Portugal, Switzerland, Costa Rica, Ireland, Belgium, Finland, Sweden, Dominican Republic, Trinidad and Tobago, Panama, Tuvalu, Austria, Greece, Mexico, Romania, and the United Kingdom.

A strong contingent of Pacific island nations launched the Alliance of Countries Calling for a Deep-Sea Mining Moratorium, pointing to threats to their ocean-based economies and cultural heritage, including Palau, Fiji, Samoa, Federated States of Micronesia, Vanuatu, and the Marshall Islands.

Back in the U.S., some states and territories have acted independently to ban or restrict deep-sea mining activities within their own waters, including Hawai'i, California, Oregon, Washington, Guam and American Samoa.

Indigenous voices

The voices of Indigenous Pacific Islanders have been crucial to the fight against deep-sea mining, putting a spotlight on their roles as stewards of the ocean.

Solomon Kaho'ohalahala, or Uncle Sol, has been one of the leading voices speaking out against deep-sea mining. The Native Hawaiian man from the island of Lana'i said if deep-sea mining happens at a commercial scale, companies would be mining the Pacific's graveyard.

The Kumulipo, a Hawaiian chant that tells the creation story, describes the ocean as the source of all living things, starting with sea creatures in the darkness, particularly the corals.

"I have taken the Kumulipo as my foundation, and now, in my speaking about ocean protection, it became clear that I had a story that connected me to the ocean," Kaho'ohalahala told me. "We are all the same people of Oceania, and we have our own stories that need to be elevated in this discussion in these times as we experience climate change."

[Read Uncle Sol's full statement to the ISA meeting here.](#)

In a Grist article by Senior Reporter Anita Hofsneider, Teurumereariki Hinano Murphy said "(The Pacific Ocean) is where the soul of our ancestors, when they leave this world, they go into the deep."

"Deep-sea mining, that's like you're digging up the grave of my ancestors," Cecilio Raiukiulipiy, a traditional navigator from the Federated States of Micronesia, added.

Read the full [Grist story by Anita Hofsneider here.](#)

How can countries challenge Trump's executive order?

According to Aline Jaeckel, a researcher and associate professor at the Australian National Centre for Ocean Resources and Security (ANCORS) at the University of Wollongong, there are ways for countries to legally challenge Trump's executive order under U.S. domestic law and internationally.

Countries under UNCLOS can also isolate any attempt from the U.S. to mine unilaterally. These states are bound by provisions that say they must not support any unilateral mining, Jaeckel said.

"If the U.S. does mine unilaterally, UNCLOS countries must not support it in any shape or form — meaning they can't give funding, can't give technology, can't buy minerals, can't help process the minerals," she said. "That would be a breach of international law."

Example reporting:

["Japan's unprecedented project could test the limits of deep-sea mining"](#) by Rachel Ramirez for Grist
Japan is spending five weeks mining the seafloor. It is a technological milestone — and a stress test for how nations balance geopolitics, clean energy demand, and environmental risk.

Key places to do field reporting

- Tonga
- Cook Islands
- Nauru
- Hawai'i - Clarion Clipperton Zone
- American Samoa
- Northern Mariana Islands and Guam
- Kingston, Jamaica (where the ISA is headquartered)
- Minamitoru Island in Japan

Sources

- Deep Sea Conservation Coalition (DSCC) - Travis Aten travis@communicationsinc.co.uk
- Greenpeace - Sol Gosetti sol.gosetti@greenpeace.org
- The Sierra Club Hawai'i Chapter
- University of Hawai'i at Manoa researchers including:
 - Dr. Jeff Drazen - jdrazen@hawaii.edu
 - Dr. Brian Popp - popp@hawaii.edu
 - Dr. Fanny Girard - f girard@hawaii.edu
 - Michael Dowd - mdowd3@hawaii.edu
 - Victoria Assad - vassad@hawaii.edu
 - Aaron Judah - ajudah@hawaii.edu
- Dr. Aline Jaeckel, a researcher and associate professor at the Australian National Centre for Ocean Resources and Security (ANCORS) at the University of Wollongong, on the regulatory process - aline@uow.edu.au
- Dr. Travis Washburn, a deep-sea scientist and assistant professor in the Department of Physical and Environmental Science at Texas A&M University, Corpus Christi, who has done deep-sea mining research with the Japanese government - travis.washburn@tamucc.edu
- On the High Seas Treaty
 - Ina Tessnow Von Wysocki, BBNJ Agreement and UNCLOS Consultant, i.tessnow-von-wysock@unesco.org
- On Indigenous perspectives:
 - Solomon Kaho'ohalahala, or Uncle Sol - maunalei.ahupuua@gmail.com
 - Vicente Diaz, professor of American Indian and Indigenous Studies at University of California, Los Angeles - vmdiaz@ucla.edu
 - Lindsey Ekolu - ekolusiphone@gmail.com
 - Brittany Kamai with 'A'ole Deep Sea Mining <https://www.instagram.com/freefloatingoceansoul?igsh=MXhrczAweDV6eGJmdQ==>
 - Joe-Silem Enlet, ocean governance researcher and former diplomat, from the island of Chuuk joe_enlet@uri.edu

