

Deep-sea mining looms on horizon as UN body issues contracts

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In this April 30, 2009 file photo, coral reefs grow in the waters of Tatawa Besar, Komodo islands, Indonesia. Rising demand for copper, cobalt, gold and the rare-earth elements vital in manufacturing smartphones and other high-tech products is causing a prospecting rush to the dark seafloor thousands of meters (yards) beneath the waves. The Jamaica-based International Seabed Authority has issued 27 separate 15-year contracts that allow for mineral prospecting on over 1 million square kilometers (over 390,000 sq. miles) of seabed in the Pacific, Atlantic and Indian Oceans. (AP Photo/Dita Alangkara, File)

The deep oceans span more than half the globe and their frigid depths have long been known to contain vast, untapped deposits of prized minerals. These treasures of the abyss, however, have always been out of reach to miners.

But now, the era of deep seabed mining appears to be dawning fueled by technological advances in robotics and dwindling land-based deposits. Rising demand for copper, cobalt, gold and the rare-earth elements vital in manufacturing smartphones and other high-tech products is causing a prospecting rush to the dark seafloor thousands of meters (yards) beneath the waves.

With authorities at the Jamaica-based International Seabed Authority issuing exploration contracts, alarmed conservationists are warning that the deep ocean's fragile biodiversity must be protected and not nearly enough is known about the risks of extracting minerals from seabeds.

"The pace of activity has increased dramatically over the last five years," said Michael Lodge, deputy secretary-general of the obscure U.N. body in Kingston that acts as a global steward of the deep seafloor and is tasked with regulating this new mining frontier. "We're seeing the private sector invest in a big way."

The U.N. agency, known by its initials ISA, presides over seabed outside the exclusive territorial waters of individual countries. So far, it has issued 27 exploration contracts, the large majority of them since 2011. The 15-year contracts allow for mineral prospecting on over 1 million square kilometers (over 390,000 sq. miles) of seabed in the Pacific, Atlantic and Indian Oceans.

Governments and private companies have been moving so rapidly to stake claims and assess deposits that insiders forecast that commercial deep-sea mining could start within the next five years using robotic

collectors equipped with cameras and sonar sensors along with pipe systems that can siphon crushed minerals to ships.

During a gathering this month in Jamaica of representatives from nearly 170 member states, ISA has started drafting a framework to regulate commercial exploitation of seafloor metals and minerals. The session ended Friday.

A group of international scientists, in a July 9 article in the journal *Science*, urged ISA to temporarily halt authorization of new mining contracts until networks of "[marine protected areas](#)" are established around areas targeted for mining.

"We owe it to future generations to ensure that we think before we act and gain a thorough understanding of the potential impacts of mining in the deep sea before any mining is permitted," said Matthew Gianni, co-founder of the Deep Sea Conservation Coalition, which sent observers to ISA's 21st session in Kingston.

But despite the warnings, in recent days ISA authorized its latest exploration contract, a 72,745 square kilometer (28,087 sq. mile) permit in the Pacific to China Minmetals Corp., sponsored by Beijing. China now has the most permits from the U.N. body with four.

ISA was launched in 1994 and operates under the U.N. Convention on the Law of the Sea. The only major maritime power that has not ratified the convention is the United States, where lawmakers have argued it could impinge on U.S. economic and military sovereignty. The Department of the Interior has granted exploration licenses in the Pacific to Lockheed Martin Corp., a U.S. company that has also partnered with the United Kingdom, an ISA member, by setting up a deep-sea mining subsidiary there.

So far, most of ISA's contracts have been issued for the deep abyssal plains of the Clarion-Clipperton Fracture Zone, a sprawling area of the Pacific Ocean off Mexico and the U.S. At depths of 4,000 to 6,000 meters, it is known to be rich in nodules containing copper, cobalt, manganese and significant concentrations of rare-earth elements. As part of an environmental plan, ISA has set aside nine areas in this zone, prohibiting them to contractors.

Other coveted exploration areas contain copper-rich sulphides formed around hydrothermal vents and black cobalt crusts created along the slopes of seamounts and volcanic mountain ranges. These biologically complex areas are found in the Western Pacific, Atlantic and Indian Oceans. ISA literature estimates that one site could provide up to 25 percent of the annual global market for cobalt.

"The concentrations of minerals that you find in the seabed are very much richer than what's left on land. So demand is only going to increase," Lodge said.

Douglas McCauley, an ecologist and conservation biologist at the University of California, Santa Barbara, said seabed mining and other industrial activities like ocean-based power generation and farming indicates that mankind is on the cusp of launching a "marine industrial revolution."

Current proposals for the oceans over the next several decades "look uncomfortably similar to what we did to land in the 1700s and 1800s," he said, adding that the onset of the land-based industrialization was associated with a spike in animal extinction rates.

But there are basic things humanity can do to approach seabed mining intelligently, he said. First, learn what biodiversity is down there before we mine. Second, go slowly on exploitation contracts and study the

impacts of this mining as it is happening. Third, set up systems of protected areas before, not after, mining starts.

"The terrestrial industrial revolution happened before we had the tools to manage goals for development and goals for sustaining biodiversity. You can't really blame people in the 1700s for the damage they did to the environment..." he said. "But we certainly are to blame if we don't do seabed [mining](#) properly."

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