

Study warns deepsea mining may pose serious threat to fragile marine ecosystems

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Undersea habitats supporting rare and potentially valuable organisms are at risk from seafloor mining scheduled to begin within this decade, says a new study led by a University of Toronto Mississauga geologist.

Mining of massive sulphide deposits near “black smokers”—undersea hydrothermal vent systems that spew 350 C water into the frigid deep-sea environment and support sulphur-loving bacteria and bizarre worm and clam species—could smother and contaminate these communities, which some biologists argue may represent the origins of life on Earth.

“We need to act now to establish scientific and legal methods to protect these sensitive ecosystems and minimize the potential environmental impact of this industry,” said lead author Jochen Halfar, an assistant professor of earth sciences at U of T Mississauga. “Imposing regulations after operations begin would prove very difficult and some of the governments in the jurisdictions targeted by this industry have a poor record of mining oversight. The prospects for regulation of underwater mining are not good.”

The study appears in the May 18 issue of the journal *Science* and is co-authored by Rodney Fujita, a marine ecologist with U.S.-based Environmental Defense.

A Canadian-based company is currently planning the world’s first commercial undersea exploration for high-grade gold and copper. They are targeting an area known as the Manus backarc basin off the coast of

Papua New Guinea. The active hydrothermal vents in these areas occur where new oceanic crust is formed through undersea volcanic activity.

Until the late 1970s, scientists had assumed that life required sunlight, but the discovery of these vent communities showed that life could exist on thermal and chemical energy. Since oceans have existed, more or less, since the beginning of Earth's history, these deep sea hydrothermal vents could be the most ancient sites of life on Earth. The vents have broader appeal, too, since the organisms may have pharmaceutical and biotechnological applications.

Mining companies first turned their attention to the oceans in the 1970s and interest grew in manganese nodules that exist on the surface of the ocean floor. However, high projected costs and the regulatory restrictions on deep-sea mining in international waters through the United Nations Convention on the Law of the Sea (UNCLOS) have currently put those projects on hold.

In particular, Halfar said, restrictions by the International Seabed Authority—which oversees environmental protection and demands that profits from mining in international waters be shared with developing nations—redirected prospecting and exploration of the seafloor into areas under national jurisdiction, where regulations are often weaker or non-existent.

Source: University of Toronto

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