

Call for consensus on the protection of deep-sea hot spring ecosystems

Human impact is increasing in the deep ocean, Earth's last frontier. Despite their remoteness, deep-sea hot springs, called hydrothermal vents, are beginning to feel the pressures of intense research activity, bioprospecting, ecotourism and mineral exploration.

Concern over the future of these rare and fragile ecosystems brought together scientists, ocean mining experts, lawyers and fisheries officials from Canada, France, the USA, Japan, Germany and the United Kingdom at a recent workshop at the Institute of Ocean Sciences, in Sidney, British Columbia, Canada. The workshop was sponsored in part by NSERC.

Discovered in 1977, 'hot vents' are found on volcanic ridges, at depths of 1500 to 4000 metres, or in shallower coastal water. Luxuriant oases of life, they are home to exotic species of animals and microbes that live under extreme conditions of temperature, pressure and toxic substances. The enormous potential of this genetic resource in areas such a medicine and biotechnology provides a powerful argument for hot vent protection.

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The 25 workshop participants discussed both the impact of scientific sampling as well as the potentially greater impact of mining. The mining industry is now seriously considering exploitation of deep-sea hydrothermal sites, which form copper and zinc mineral deposits similar to those being mined on land.

Issues related to bioprospecting were also discussed. Several high-temperature enzymes from hyperthermophilic microbes are already being marketed, raising issues of who owns vent microbes within and outside the Exclusive Economic Zones.

The workshop concluded with the drafting of a code of ethics for research and other activities such as ecotourism, and guidelines for evaluating environmental impact at vent sites. The participants launched an appeal to the ocean mining and tourism industries to work closely with scientists to ensure that these unique oases are conserved for future generations.

Fisheries and Oceans Canada has already taken a step in this direction, through the creation of a pilot Marine Protected Area on a volcanic ridge off the British Columbia coast, where there are spectacular examples of deep-sea hydrothermal vents.

InterRidge, an international scientific organization set up to help co-ordinate research on mid-ocean ridges also sponsored the workshop. Other sponsoring agencies were Fisheries and Oceans Canada, the U.S. National Science Foundation (through the RIDGE program) and the Marine Policy Institute of the Woods Hole Oceanographic Institution in Massachusetts.

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For more information on Canada's Endeavour Hot Vents Pilot Marine Protected Area,
see:

<http://www.er.uqam.ca/nobel/oasis/>

For more information on Canada's deep-sea vehicle that is used to conduct research at
deep-sea vents, see:

<http://www.ropos.com>

For more information on InterRidge, see:

<http://www.intridge.org>

For more information on IFREMER, see: :

<http://www.ifremer.fr>

For more information on research at deep-sea hydrothermal vents, see:

<http://newport.pmel.noaa.gov/nemo/multimedia.html>

<http://www.ocean.washington.edu/outreach/revel/>

<http://www.amnhonline.org/expeditions/blacksmokers/>