Extraordinary hydrothermal vent discovery in the mid-Atlantic ocean

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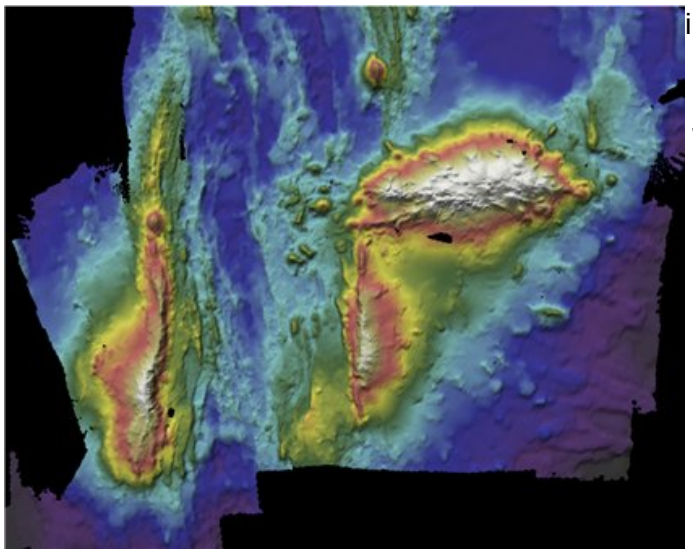
Chimney of the new vent field where hydrothermal activity is visible. Credit: ROV “LUSO”, Portuguese Task Force for the Extension of the Continental Shelf

An international team of scientists has discovered a new hydrothermal field near the Gigante Seamount in the Azores, a rare finding they are very excited about. The team, including scientists from the EU Horizon 2020-funded project ATLAS, have been surveying the largely untouched seas of the Azores, an archipelago in the mid-Atlantic which harbours some of the most important deep-sea ecosystems in the Atlantic Ocean. Researchers from the University of the Azores (IMAR–UAz) are leading Remote Operated Vehicle (ROV) operations in the "Blue Azores" expedition organised by the Oceano Azul Foundation, in cooperation with the Waitt Foundation and National Geographic PRISTINE SEAS, and in partnership with the Regional Government of the Azores.

Telmo Morato, ATLAS principal investigator at IMAR–UAz, who is leading the expedition's ROV dives says the find is fantastic. The newly discovered site, located on Gigante Seamount at 570 m depth and approximately 100 km from Faial island, is remarkable given its accessibility compared to other hydrothermal vent systems. This relative ease of access could present a unique opportunity for scientists to discover more about these areas of high biological and mineral richness, which are like an oasis hidden in the deep ocean. Hydrothermal fields are poorly understood so far, mainly due to most vent fields discovered to date being difficult to access, but they are important for their relative high biological productivity in the deep ocean, often hosting complex communities.

The discovery was made using the Portuguese ROV "Luso," which is capable of diving to a depth of 6000 meters. Luso makes it possible to map deep-sea benthic communities inhabiting hydrothermal fields, such as this one, as well as seamounts in the region. The newly discovered hydrothermal vents have built up distinctive chimneys on the seafloor through which warm waters rich in carbon dioxide are discharging. The team at sea have seen evidence that bacteria are growing in great numbers around these vents and are likely to support a specialised food chain. These chemosynthetic organisms don't need light to make their food and can support diverse ecosystems in the dark depths of the deep Atlantic.



Map of the Gigante seamount with the Mid Atlantic Ridge separating the North American and Eurasian plates. Credit: Hydrographic Institute of the Portuguese Navy

The scientists on this expedition have also deployed baited cameras around the seamounts to attract pelagic fish and dived the Luso late at night to capture migration patterns, allowing us to better understand the biodiversity of the region. The valuable information provided by these dives will aid the sustainable management of deep-sea ecosystems and maintain the wealth of services the ocean provides us.

Currently, only 3 percent of the ocean is protected, and the ATLAS team onboard are gathering vital information to understand whether these vent ecosystems meet the criteria of being Vulnerable Marine Ecosystems (VMEs) as agreed by the United Nations Food & Agriculture Organisation.

This unexpected discovery is a huge step forward for deep-sea exploration and the better understanding of these largely untouched ecosystems. Professor Murray Roberts, ATLAS Project coordinator at the University of Edinburgh, said "This just shows how little we know about the deep sea, the largest ecosystem on our planet. Hydrothermal vents not only form oases of life in the deep ocean, but research over the last 20 years has shown the minerals they release also have important consequences for life throughout the ocean. As plans to mine deep sea minerals are developed around the world it's absolutely essential we understand these relationships to protect the oceans and the support functions they provide to all life on Earth."

Provided by AquaTT