

BITS Goa, NIO and NIT Calicut join hands to explore deep-sea plumes

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Panaji: Researchers from BITS Pilani Goa Campus, CSIR-National Institute of Oceanography (NIO), and NIT Calicut are collaborating on a project to explore deep-sea plumes using autonomous underwater vehicles (AUVs).

Deep-sea plumes are areas of warm, cloudy water that can rise several hundred meters above the vent sites found at the ocean bottom.

The project aims to better understand ocean phenomena and their impact on climate change, and will delve into aspects such as underwater communication, fleet control

FINDING OCEAN'S SECRETS

➤ Deep-sea plumes are **phenomena found hundreds of metres** at the ocean bottom

➤ Study will reveal impact of plumes on climate change, and also **understand underwater communication, fleet control and navigation techniques**

Plumes could be salinity, turbidity, temperature gradient, particulate, or colour gradient



➤ Data from oceans can be **transmitted to a control station via network & Internet-of-Things (IoT) technology**

and navigation techniques. Through advanced technologies, researchers hope to establish observatories and collect real-time data for improved ocean monitoring

and prediction. The plumes could be salinity, turbidity, temperature gradient, particulate, or colour gradient.

▶ **'Time to plan', P 2**

Time to plan hunt for underwater resources, say experts

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Together the team will be preparing the acoustic algorithm using the AUV developed by CSIR-NIO to track the plumes. We will conduct a real-time test of the plumes in still waters first before venturing into deep sea," said CSIR-NIO director, Sunil Kumar Singh.

"Goa can be ambitious beyond surfing the gentle waves to dive deep down underwater explorations with a planet-conscious mantra; explore, protect and restore," scientists from BITS Goa said. "What's hidden in the mysterious blue oceans must be answered for our genera-



Continuous collection and analysis of real-time data will enhance the understanding of ocean properties, life processes, and events, aiding in predicting future climate changes and their impact on human life

tion. It's our time to plan the treasure hunt for huge underwater mineral resources. Intentionally, we can put our efforts to restore our corals, so that they could no longer be a thing of past,"

they added.

The groundbreaking project titled, "Autonomous measurement and tracking of deep-sea plumes using swarm of heterogeneous underwater vehicles" is led by

Sarang Dhongdi from BITS Pilani, along with Pramod Kumar Maurya from CSIR-NIO and Rakesh Warier from NIT Calicut. This initiative falls under the ministry of earth sciences' deep ocean mission.

The project employs cooperative underwater exploration strategies, utilising a network of connected autonomous vehicles. By deploying a fleet of AUVs, data from the ocean can be transmitted to a control station via the network and Internet-of-Things (IoT) technology.

Oceanographers and marine scientists aspire to establish observatories using modern technologies to ex-

plore the inner space of the ocean. Continuous collection and analysis of real-time data will enhance the understanding of ocean properties, life processes, and events, aiding in predicting future climate changes and their impact on human life.

From micro-level processes to global climate changes, various underwater phenomena can now be monitored and studied more effectively with advancements in mobile observation systems. This collaborative effort promises to shed light on the secrets of the deep sea and contribute to scientific knowledge and environmental conservation efforts.