

Under-ice mission for Bluefin-21 AUV turns up valuable data for climate research

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Last month, a Bluefin-21 Autonomous Underwater Vehicle (AUV) owned by the Alfred Wegener Institute for Polar and Marine Research (AWI) was sent out on an under-ice mission and retrieved valuable data that could shed light on climate change. The AUV was deployed by AWI and Bluefin crew members from the R/V *Polarstern* about 79° north. Equipped with an AWI-developed water sampler payload, the vehicle traveled under heavily packed ice collecting 22 samples in discrete time intervals for later analysis.

"We are one of the world's first working groups to have successfully carried out such an under-ice mission, a goal we have been working hard to achieve," said Dr. Thomas Soltwedel, the chief scientist of the expedition. "The samples and data obtained will shed a new light on phytoplankton production in the transition area between the permanently ice-covered Arctic Ocean and its ice-free marginal zone. Autonomous underwater vehicles are opening up new possibilities to investigate the ice-covered polar seas - areas that are of pivotal importance in climate research."

"The polar research conducted by our AWI colleagues is top-notch and cutting-edge, and we are pleased to have participated in AUV operations that uncovered such valuable data," said David Kelly, President and CEO of Bluefin Robotics. "This cruise signifies a critical step in advancing an under-ice Bluefin AUV capability for the climate research community."

The Bluefin-21 AUV is a 3000-meter-rated system capable of traveling over 70 kilometers at a speed of approximately 3.5 knots. A mission is configured on Bluefin's Mission Planner software and loaded onto the vehicle computer via an RF link. Once launched into the water, the AUV carries out the mission completely autonomously. Vehicle status is transmitted back to the operator computer via acoustic communications. Upon recovery, data is downloaded and the water samples removed for analysis.

As well as being equipped with a water sampler, the AUV also carries various measuring instruments including a conductivity-temperature-depth sensor, light sensor, and fluorometer. The AWI cruise began in Longyearbyen, Spitsbergen on the June 30th and ended in Reykjavik, Iceland on July 29th.

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