

Highlight of the Polarstern expedition

July 29 2010

The Alfred Wegener Institute for Polar and Marine Research in the Helmholtz Association for the first time sent its Autonomous Underwater Vehicle (AUV) on an under-ice mission at about 79° North. The four-metre-long, torpedo shaped underwater vehicle was deployed from the research icebreaker Polarstern under heavy pack ice. The vehicle was subsequently recovered by helicopter.

"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," says 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 underwater vehicle reaches a maximum depth of 3000 metres. It can travel a total distance of 70 kilometres at an average speed of five to six kilometres per hour. The planned course, desired depth and surfacing position are all entered into the AUV's computer before deployment. The vehicle then carries out its mission independently, with no connection to the research vessel.

The autonomous submersible of the Alfred Wegener Institute was equipped with various measuring instruments, which continuously recorded and stored temperature and salinity data during the hour-long

dive. A [light sensor](#) captured the photosynthetically active radiation in the surface layer of the ocean. A so-called fluorometer continuously recorded the distribution of micro-algae along the vehicle's track. A newly developed sampling system collected 22 water samples at discrete time intervals, for later analysis.

The research vessel Polarstern is on its 25th Arctic expedition. The current cruise leg began in Longyearbyen (Spitsbergen) on the 30th June and will end in Reykjavik (Iceland) on the 29th July. Fifty scientists carried out long-term biological studies and oceanographic measurements for numerous national and international projects in the so-called HAUSGARTEN and in the Fram Strait. The HAUSGARTEN of the Alfred Wegener Institute is a long-term deep-sea observatory, which the scientists have set up to investigate the reactions of the marine Arctic ecosystem to global climate change.

The third leg, which is planned to carry out geoscience research in the northern Baffin Bay (Canada), begins in Reykjavik on the 31st July. Polarstern is expected back in Bremerhaven on the 10th October 2010.

More information: www.awi.de/en/home/

Provided by Helmholtz Association of German Research Centres

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