

Ocean Modules V8 Sii ROV conquers both poles

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Four years after visiting the Antarctic with the Aurora Australis Sea Ice Physics and Ecosystem Experiment the Ocean Modules V8 Sii ROV has now also visited the North Pole, to measure sun light underneath the sea ice.



Most parts of the Arctic Ocean are covered by sea ice most of the year. The bright white surface is known to reflect most of the incident sun light back to the atmosphere. However, a significant amount of the light penetrates into the sea ice and further into the upper ocean, where it is used as an energy source. This energy is used to warm and melt sea ice as well as to enable photosynthesis organisms living in and under the sea ice. Since the bottom of the sea ice and water under the sea ice are difficult to access, the knowledge about the amount and distribution of light under sea ice is still rather small.

In order to study these light penetration through sea ice in more detail, Marcel Nicolaus and his colleagues from the Alfred Wegener Institute for Polar and Marine Research are currently measuring how much light reaches the ocean under the sea ice. They are participating in a multidisciplinary and international cruise of the German research ice breaker FS *Polarstern* through the high Arctic.

For their measurements, they are operating an Ocean Modules V8 Sii ROV, equipped with light sensors, spectral radiometers to measure the light directly, an altimeter to measure the distance to the ice and the ice thickness, and a video camera to document the dives and the ice conditions.



The ROV is operated directly from the sea ice while the ship anchors on an ice floe for several hours. The vehicle is launched through melt pond holes, which are present on the ice during this season, and controlled from a tent on the ice. The work directly from the sea ice reduces the effects of the vessel on the measurements and enables direct sampling of the ice along the transects.

During the last two weeks, the group performed three successful ice stations of several dives, collecting thousands of spectra and several hours of video documentation. The ROV, known to the crew as Alfred, has been doing a great job and was happy to reach the North Pole on the 22nd of August 2011. The scientists have had no issues at all in the water or on the ice. The cruise will continue until FS *Polarstern* returns to Bremerhaven, Germany, on the 7th of October.

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