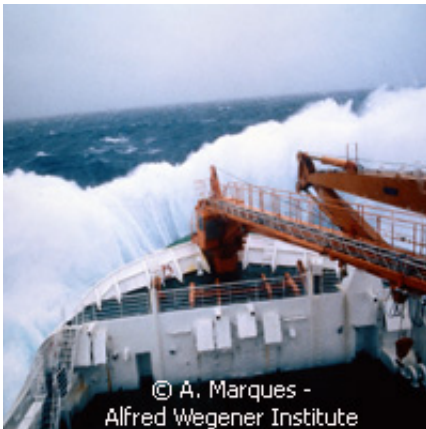


Creatures not adapting to environmental changes in Antarctic, study finds

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Organisms found in the Antarctic region are not quick to adapt to changes in the environment, new international research shows. The study, carried out by 200 scientists from 15 countries, is the culmination of a 7-month expedition on board the Polarstern vessel of the Alfred Wegener Institute (AWI) for Polar and Marine Research in the German-based Helmholtz Association.

The Polarstern research vessels returned to the Bremerhaven port in late May 2011. During their journey, the researchers measured the [temperature](#) of the [Weddell Sea](#), discovering that while the warming of the deep water continues, the organisms found undersea are not adapting quickly to these changes.

Polar researchers from Germany favor in particular the Weddell [Sea](#) as locations for their studies. Oceanographers, for example, use sophisticated sensors, along with a network of moorings and floats, to measure temperature, sea ice thickness and [salt concentration](#). They use floats and satellites to transmit their information. Extending their network of measurement was one of the objectives of this latest expedition, led by Dr. Eberhard Fahrback from AWI's Climate Sciences / Observational Oceanography Division.

"An initial evaluation of the measurement data shows that the temperature down to great depths of the Weddell Sea continues to rise," explains Dr. Fahrback, who was in Antarctica on the Polarstern from November 2010 to February 2011.

Both measurements made on the ship and information generated by the moorings were collected within the framework of international observation programs. The data help bolster our understanding of the role of the Atlantic sector of the Southern Ocean in large-scale events of importance to the climate, according to the researchers.

Concerning temperature and salt concentration distribution, the global conditions in the deep area of the Weddell Sea are influenced in such a way that cold, [saline water](#) sinks (thermohaline circulation). So changes in the properties of these cold water masses in the Antarctic will have global impacts, the researchers say.

They point out that the rise in bottom water temperature can be detected over large sections of the ocean north of the Atlantic. The temperature in the Weddell Sea, says Dr. Fahrback, has increased by six-hundreds of a degree on average across the entire water column in just a little over a quarter of a century.

"This temperature rise seems small," says Dr. Fahrback, "but because it

extends down to great depths, it entails a considerable heat volume that is stored in the ocean. This contributes to the fact that the atmosphere heats up less than expected as a result of the increase in the greenhouse effect. According to the World Climate Report (IPCC), more than 80% of the heat that Earth has additionally absorbed thus far due to the altered greenhouse effect is stored in the upper ocean layers down to a depth of 1 500 metres. Now we have been able to show that the deep ocean with its enormous volume is also involved in this process."

Also part of the expedition was the study called CAMBIO (Change in Antarctic Marine Biota), where scientists investigated which species can adjust to climate change quickly. AWI's Dr. Rainer Knust and colleagues probed sites near the coast in the western and eastern Weddell Sea. They discovered that some organisms cope better with altered conditions than others because of their physiological features. The researchers say these species adapted to their environmental conditions in the course of evolution, and species from the high Antarctic adapted 'optimally to very low.'

The researchers are scheduled to leave on the Polarstern for another expedition in mid June.

Provided by CORDIS

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