

Press Release



7/3/2014 | **Please note the embargo until 04 December 2014, 2:00 pm U.S. Eastern time**

Antarctica: Heat comes from the Deep Scientists observe rising temperatures on the West Antarctic shelf

04 December 2014/Kiel. **The water temperatures on the West Antarctic shelf are rising. The reason for this is predominantly warm water from greater depths, which as a result of global change now increasingly reaches the shallow shelf. There it has the potential to accelerate the glacier melt from below and trigger the sliding of big glaciers. These data are published today by scientists of the GEOMAR Helmholtz Centre for Ocean Research Kiel together with colleagues from the UK, the US and Japan in the international journal Science.**

The Antarctic ice sheet is a giant water reservoir. The ice cap on the southern continent is on average 2,100 meters thick and contains about 70 percent of the world's fresh water. If this ice mass were to melt completely, it could raise the global sea level by 60 meters. Therefore scientists carefully observe changes in the Antarctic. In the renowned international journal *Science*, researchers from Germany, the UK, the US and Japan are now publishing data according to which water temperatures, in particular on the shallow shelf seas of West Antarctica, are rising. "There are many large glaciers in the area. The elevated temperatures have accelerated the melting and sliding of these glaciers in recent decades and there are no indications that this trend is changing," says the lead author of the study, Dr. Sunke Schmidtke from GEOMAR Helmholtz Centre for Ocean Research Kiel.

For their study, he and his colleagues of the University of East Anglia, the California Institute of Technology and the University of Hokkaido (Japan) evaluated all oceanographic data from the waters around Antarctica from 1960 to 2014 that were available in public databases. These data show that five decades ago, the water masses in the West Antarctic shelf seas were already warmer than in other parts of Antarctica, for example, in the Weddell Sea. However, the temperature difference is not constant. Since 1960, the temperatures in the West Antarctic Amundsen Sea and the Bellingshausen Sea have been rising. "Based on the data we were able to see that this shelf process is induced from the open ocean," says Dr. Schmidtke.

Around Antarctica in greater depth along the continental slope water masses with temperatures from 0.5 to 1.5°C (33–35°F) are predominant. These temperatures are very warm for Antarctic conditions. "These waters have warmed in West Antarctica over the past 50 years. And they are significant shallower than 50 years ago," says Schmidtke. Especially in the Amundsen Sea and Bellingshausen Sea they now increasingly spill onto the shelf and warm the shelf.

"These are the regions in which accelerated glacial melting has been observed for some time. We show that oceanographic changes over the past 50 years have probably caused this melting. If the water continues to warm, the increased penetration of warmer water masses onto the shelf will likely further accelerate this process, with an impact of 0.01 to 0.02°C per year." (s)

