

Warm sea water is melting Antarctic glaciers

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The ice sheet in West Antarctica is melting faster than expected. New observations published by oceanographers from the University of Gothenburg and the US may improve our ability to predict future changes in ice sheet mass. The study was recently published in the journal *Nature Geoscience*.

A reduction of the ice sheets in Antarctica and Greenland will affect the water levels of the world's oceans.

It is therefore problematic that we currently have insufficient knowledge about the ocean circulation near large glaciers in West Antarctica. This means that researchers cannot predict how water levels will change in the future with any large degree of certainty.

"There is a clear reduction in the ice mass in West Antarctica, especially around the glaciers leading into the [Amundsen Sea](#)," says researcher Lars Arneborg from the Department of [Earth Sciences](#) at the University of Gothenburg.

Together with his research colleagues Anna Wåhlin, Göran Björk and Bengt Liljebadh, he has studied the ocean circulation in the Amundsen Sea.

One reason why West Antarctica is particularly sensitive is that the majority of the ice rests on areas that are below sea level. Warm sea water penetrates beneath the ice, causing increased melting from underneath.

"It is therefore probably a change in the [ocean circulation](#) in the Amundsen Sea that has caused this increased melting," continues Arneborg.

Until now, researchers have been referred to studies that use high-resolution computer models.

"But there have been very few oceanographic measurements from the Amundsen Sea to confirm or contradict the results from the computer models. Nor has there been any winter data. [Sea ice](#) and icebergs have made it impossible to get there in the winter, and it isn't easy to have instruments in place all year round."

However, since 2010 the researchers from Gothenburg have managed to have instruments positioned in the Amundsen Sea, enabling them to measure the inward flow of warm sea water towards the glaciers.

The observations show that the warm [sea water](#) flows towards the glaciers in a more or less constant current all year round, in contrast to the model results which suggested a strong seasonal cycle.

"This shows just how important observations are for investigating whether the models we use describe something that resembles reality. Warm ocean currents have caused much more melting than any model has predicted, both in [West Antarctica](#) and around Greenland.

The researchers want more and longer time series of oceanographic observations in order to improve the models and achieve a better understanding.

"Only then will we be able to say something about how the ice masses of the Antarctic and Greenland will change in the future."

Provided by University of Gothenburg

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