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## Major Antarctic Ice Loss Changing Earth's Gravity: Study

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Using measurements of the elevation of the Antarctic ice sheet made by a suite of satellites, the researchers found that the Southern Antarctic Peninsula showed no signs of change up to 2009.

Around 2009, multiple glaciers along a vast coastal expanse, measuring some 750 km in length, suddenly started to shed ice into the ocean at a nearly constant rate of 60 cubic km, or about 55 trillion litres of water, each year.

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This makes the region the second largest contributor to sea level rise in Antarctica and the ice loss shows no sign of waning, researchers said.

"To date, the glaciers added roughly 300 cubic km of water to the ocean. That's the equivalent of the volume of nearly 350,000 Empire State Buildings combined," said Dr Bert Wouters, a Marie Curie Fellow at the University of Bristol, who lead the study.

The changes were observed using the CryoSat-2 satellite, a mission of the European Space Agency dedicated to remote-sensing of ice.

By analysing roughly five years of the data, the researchers found that the ice surface of some of the glaciers is currently going down by as much as 4m each year.

The ice loss in the region is so large that it causes small changes in the gravity field of the Earth, which can be detected by another satellite mission, the Gravity Recovery and Climate Experiment (GRACE).

Data from an Antarctic climate model shows that the sudden change cannot be explained by changes in snowfall or air temperature. Instead, the team attributes the rapid ice loss to warming oceans.

Many of the glaciers in the region feed into ice shelves that float on the surface of the ocean. They act as a buttress to the ice resting on bedrock inland, slowing down the flow of the glaciers into the ocean.

The westerly winds that encircle Antarctica have become more vigorous in recent decades, in response to climate warming and ozone depletion, researchers said.

The stronger winds push warm waters from the Southern Ocean poleward, where they eat away at the glaciers and floating ice shelves from below.

Ice shelves in the region have lost almost one-fifth of their thickness in the last two decades, thereby reducing the resisting force on the glaciers.

A key concern is that much of the ice of the Southern Antarctic Peninsula is grounded on bedrock below sea level, which gets deeper inland, researchers said.

This means that even if the glaciers retreat, the warm water will chase them inland and melt them even more.

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