

'Stable' region of Antarctica is melting

Radar data from Cryosat-2 probe show sudden ice loss on southern Antarctic Peninsula.

Jeff Tollefson

21 May 2015



Jonathan L. Barber

The southern Antarctic Peninsula shed around 56 billion tonnes of ice a year from July 2010 to April 2014.

New data reveal that glaciers along the southern Antarctic Peninsula suddenly surged towards the sea five years ago. The findings, published in the 22 May *Science*¹, add to evidence that the ice blanketing West Antarctica is much less stable than previously thought.

A radar instrument aboard the European Space Agency's Cryosat-2 satellite, launched in 2010, captured the dramatic changes in the topography and elevation of the southern Antarctic peninsula. Researchers confirmed the loss using measurements from NASA's twin Gravity Recovery and Climate Experiment (GRACE) probes, which capture ice-mass loss, but not ice movement.

"There was nothing happening, and then, all of a sudden in the last five years, all of these glaciers started to send ice into the ocean," says Bert Wouters, a glaciologist at the University of Bristol, UK, and an author of the study.

In many areas, the edges of the vast West Antarctic Ice Sheet extend into the ocean — making the ice [susceptible to melting by warm currents](#). Studies published last year suggest that the ice sheet has begun to collapse because of melting from below^{2,3}. But until now, there has been little direct evidence that this process was under way along the southern half of the Antarctic Peninsula.

The latest findings are consistent with earlier work by researchers at Princeton University in New Jersey, who documented accelerated melting in West Antarctica using GRACE data. That paper, published in *Earth and Planetary Science Letters* in February, estimated that the rate of ice loss across West Antarctica has doubled in the past six years⁴.

"What is surprising is the timescale over which these changes are occurring," says Christopher Harig, the geophysicist who led the Princeton study. "For this to occur in just a few years is kind of alarming."

Wouters' team estimates that glaciers along the southern edge of the Antarctic Peninsula shed around 56 billion tonnes of ice a year from July 2010 to April 2014. That is a significant share of Antarctica's annual contribution to global sea-level rise.

Although scientists believe that warm currents are driving ice loss in this part of the peninsula, they lack the detailed sea-floor data that they need to model the behaviour of the region's ice sheets and glaciers.

“We need more data before we can say anything with confidence,” Wouters says. “The major implication of the study is that a large section of the ice sheet can react very rapidly to changes in the ocean and the environment.”

Eric Rignot, a glaciologist at the University of California, Irvine, says that the acceleration of ice loss is new, but not entirely surprising. Rignot was the lead author on a paper in May 2014 that [documented the destabilization of major glacier systems in the nearby Amundsen Sea](#). Warm ocean currents are probably to blame for ice loss in this area, too, he says.

“As more ocean heat is transported to the glaciers, you would expect to see some changes in that region,” Rignot says. “I’m surprised that we haven’t seen more of that sooner.”

Nature | doi:10.1038/nature.2015.17606

References

1. Wouters, B. *et al.* *Science* **348**, 899–903 (2015).
2. Joughin, I., Smith, B. E. & Medley, B. *Science* **344**, 735–738 (2014).
3. Rignot, E., Mouginot, J., Morlighem, M., Seroussi, H. & Scheuchl, B. *Geophys. Res. Lett.* **41**, 3502–3509 (2014).
4. Harig, C. & Simons, F. J. *Earth Planet. Sci. Lett.* **415**, 134–141 (2015).