

Polar regions

# Rapid ice melt in west Antarctica now inevitable, research shows

Tuesday 24 October 2023, by [CARRINGTON Damian](#) (Date first published: 23 October 2023).

## Sea level will be driven up no matter how much carbon emissions are cut, putting coastal cities in danger

Accelerated ice melt in west [Antarctica](#) is inevitable for the rest of the century no matter how much carbon emissions are cut, research indicates. The implications for sea level rise are “dire”, scientists say, and mean some coastal cities may have to be abandoned.

The ice sheet of west Antarctica would push up the oceans by 5 metres if lost completely. Previous studies have suggested it is [doomed to collapse](#) over the course of centuries, but the new study shows that even drastic emissions cuts in the coming decades will not slow the melting.

The analysis shows the rate of melting of the floating ice shelves in the Amundsen Sea will be three times faster this century compared with the previous century, even if the world meets the most ambitious Paris agreement target of keeping global heating below 1.5C above pre-industrial levels.

Losing the floating ice shelves means the glacial ice sheets on land are freed to slide more rapidly into the ocean. Many millions of people live in coastal cities that are vulnerable to sea level rise, from New York to Mumbai to Shanghai, and more than [a third of the global population lives](#) within 62 miles (100km) of the coast.

The climate crisis is driving sea level rise by the melting of ice sheets and glaciers and the thermal expansion of sea water. The biggest uncertainty in future sea level rise is what will happen in Antarctica, the scientists say, making planning to adapt to the rise very hard. Researchers said translation of the new findings on ice melting into specific estimates of sea level rise was urgently needed.

“Our study is not great news – we may have lost control of west Antarctic ice shelf melting over the 21<sup>st</sup> century,” said Dr Kaitlin Naughten, at the British Antarctic Survey, who led the work. “It is one impact of climate change that we are probably just going to have to adapt to, and very likely this means some coastal communities will either have to build [defences] or be abandoned.”

Naughten said her research showed the situation was more perilous than previously thought. “But we shouldn’t give up [on climate action] because even if this particular impact is unavoidable, it is only one impact of climate change,” she added. “Our actions likely will make a difference [to Antarctic ice melting] in the 22<sup>nd</sup> century and beyond, but that’s a timescale that probably none of us today will be around to see.”

Dr Taimoor Sohail, at the University of New South Wales, in Australia, and not part of the study, said: “The collapse of the west Antarctic ice sheet is a worrying climate tipping point. This

assessment suggests that accelerated melting of ice shelves is locked in. The implications for sea-level rise are dire.”

Dr Tiago Segabinazzi Dotto, at the UK National Oceanography Centre, said: “It is likely that we [have] passed a tipping point to avoid the instability of the west Antarctic ice sheet. However, the pace of this collapse is still uncertain – it can happen in decades for some specific ice shelves or centuries.

“The conclusions of the work are based on a single model and need to be treated carefully.” But he said some details of the findings agreed with previous studies: “[This] gives confidence that this study needs to be taken in consideration for policymakers.”

The research, [published in the journal Nature Climate Change](#), used a high-resolution computer model of the Amundsen Sea to provide the most comprehensive assessment of warming in the region to date. The results indicated that increased rates of melting in the 21<sup>st</sup> century were inevitable in all plausible scenarios for the pace of cuts in fossil fuel burning.

An important factor is that natural climate variability is significant in west Antarctica and these variations in melting swamp the small differences in ice melting between rapid, medium and slow scenarios for emissions cuts.

Naughten said: “We already have a refugee crisis in the world, and [sea level rise] will only make it worse. How are we going to deal with the displacement of millions of people, or possibly over a billion people, depending on the amount of sea level rise?”

Prof Alberto Naveira Garabato, at the University of Southampton, UK, said: “This is a sobering piece of research. However, it should also serve as a wake-up call. We can still save the [east] Antarctic ice sheet, containing about 10 times as many metres of sea level rise, if we learn from our past inaction and start reducing greenhouse gas emissions now.”

**Damian Carrington** *Environment editor*  
@dpcarrington

---

## **P.S.**

• The Guardian. Mon 23 Oct 2023 17.00 CEST:  
<https://www.theguardian.com/environment/2023/oct/23/rapid-ice-melt-in-west-antarctica-now-inevitable-research-shows>

*Damian Carrington articles in The Guardian:*  
<https://www.theguardian.com/environment/climate-crisis>

\* Unlike many others, the Guardian has no shareholders and no billionaire owner. Just the determination and passion to deliver high-impact global reporting, always free from commercial or political influence. Reporting like this is vital to establish the facts: who is lying and who is telling the truth.

And we provide all this for free, for everyone to read. We do this because we believe in information equality. Greater numbers of people can keep track of the global events shaping our world,

understand their impact on people and communities, and become inspired to take meaningful action. Millions can benefit from open access to quality, truthful news, regardless of their ability to pay for it.

If there were ever a time to join us, it is now. Every contribution, however big or small, powers our journalism and sustains our future.

Support the Guardian

Available for everyone, funded by readers

[Contribute](#)

[Subscribe](#)