

# Antarctica sea ice reaches alarming low for third year in a row

**The extent of ice floating around the continent has contracted to below 2m sq km for three years in a row, indicating an ‘abrupt critical transition’**

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A view of Antarctica icebergs on 7 February, 2024. The sea ice coverage around Antarctica has been lowest on record for the past three years. Photograph: Anadolu/Getty Images

For the third year in a row, sea ice coverage around Antarctica has dropped below 2m sq km – a threshold which before 2022 had not been breached since satellite measurements started in 1979.

The latest data from the US National Snow and Ice Data Center confirms the past three years have been the three lowest on record for the amount of sea ice floating around the continent.

Scientists said another exceptionally low year was further evidence of a “regime shift”, with new research indicating the continent’s sea ice has undergone an “abrupt critical transition”.

Antarctica’s sea ice reaches its lowest extent at the height of the continent’s summer in February each year.

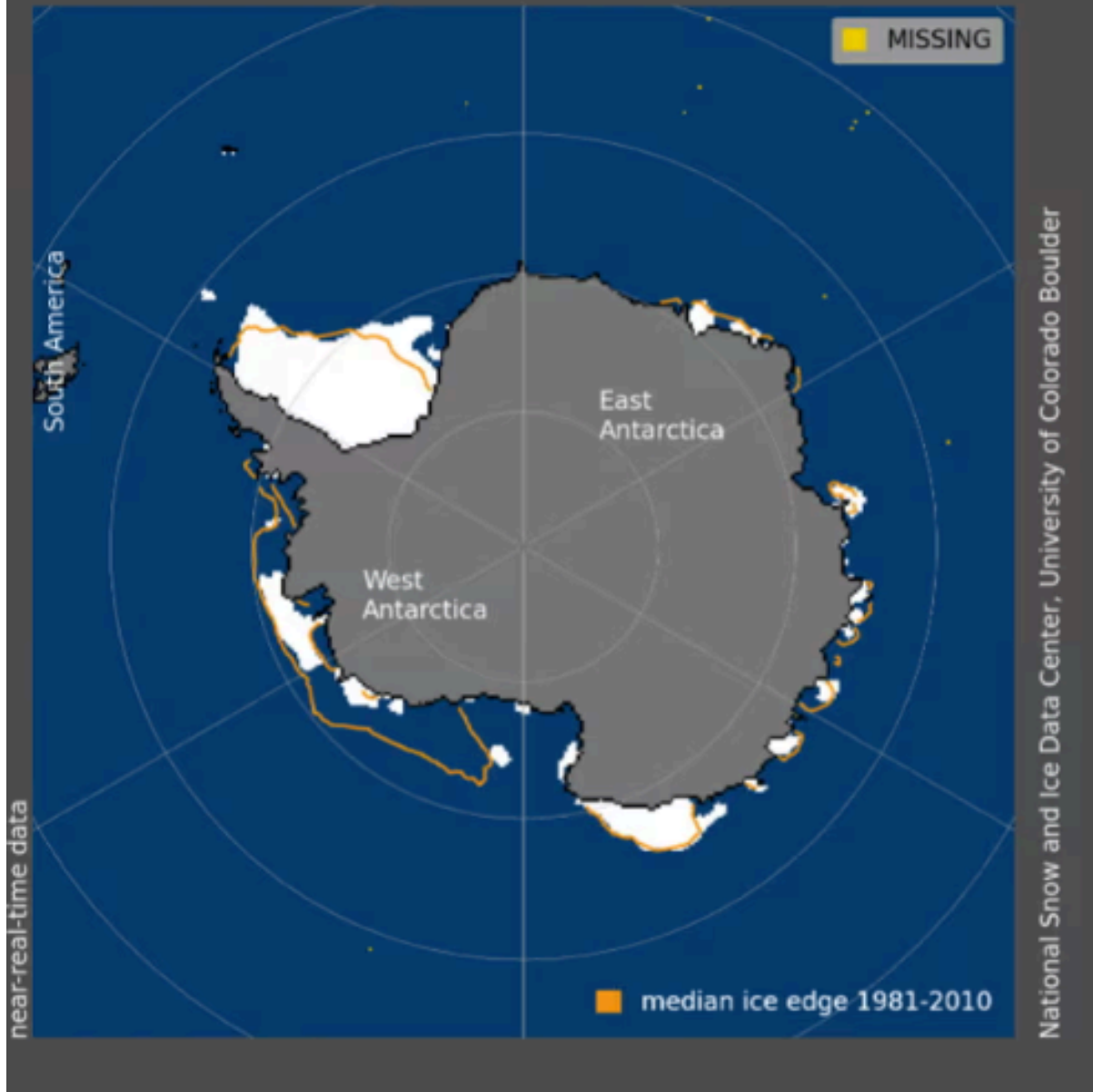


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On 18 February the five-day average of sea ice cover fell to 1.99m sq km and on 21 February was at 1.98m sq km. The record low was 1.78m sq km, set in February 2023.

## Sea Ice Extent, 21 Feb 2024



Antarctica sea ice extent on 21 February, 2024. Photograph: National Snow and Ice Data Center

Whether the current level represents this year's minimum won't be known for another week or two.

“But we’re confident the three lowest years on record will be the last three years,” said Will Hobbs, a sea ice scientist at the University of Tasmania.

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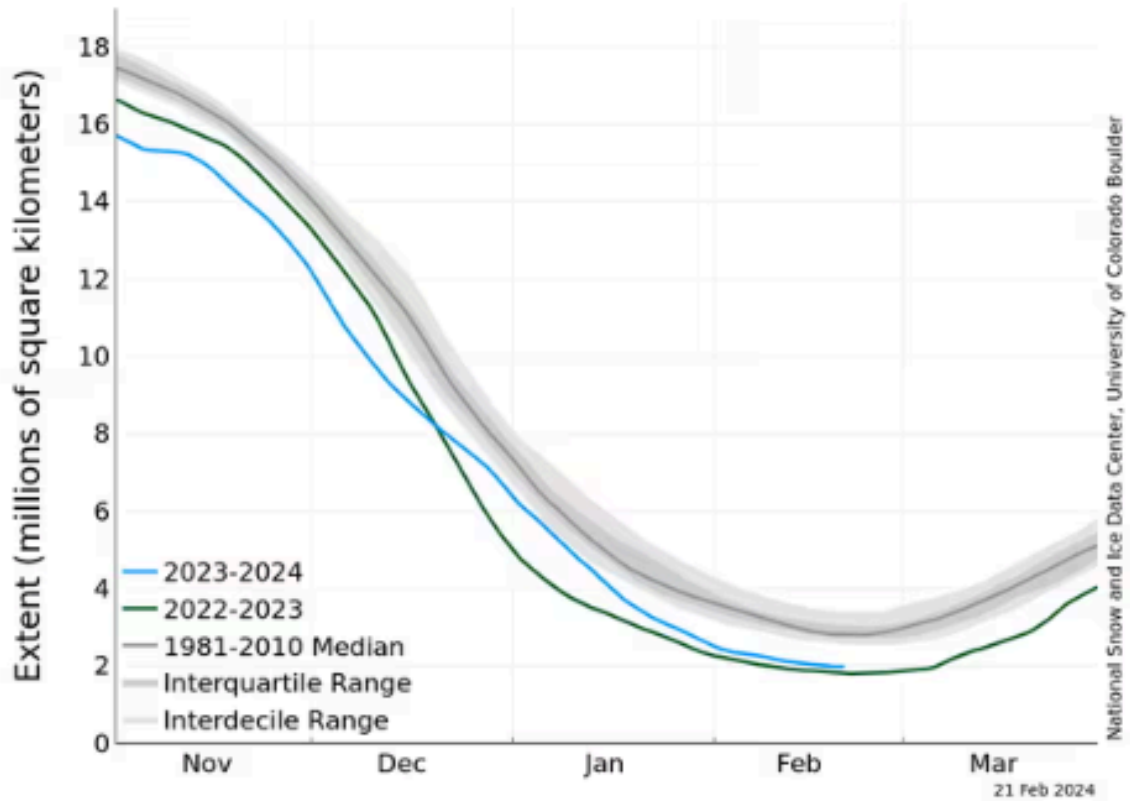
Antarctica's sea ice reaches its peak each September, but last year's maximum extent was the lowest on record, easily beating the previous record by about 1m sq km. Scientists were shocked at how much less ice regrew last year, falling well outside anything seen before.

Coverage appeared to recover slightly in December as the refreeze progressed, but then fell away again to the current levels.

There are no reliable measurements of how thick Antarctic sea ice is, but Ariaan Purich, a climate scientist specialising in Antarctica and the Southern Ocean at Monash University, said it was possible the ice that did regrow was thinner than usual.

"It seems plausible, and thinner sea ice could melt back more quickly," she said.

## Antarctic Sea Ice Extent (Area of ocean with at least 15% sea ice)



Antarctic sea ice extent (area of ocean with at least 15% sea ice). Photograph: National Snow and Ice Data Center

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Scientists are still investigating what is causing the decline in sea ice,, but they are concerned global heating could be playing a role – in particular by warming the Southern Ocean that encircles the continent.

Sea ice reflects solar radiation, meaning less ice can lead to more ocean warming.

Antarctica’s ecosystems are tied to the sea ice, from the formation of phytoplankton that can remove carbon from the atmosphere to the breeding sites of penguins.



Emperor penguins: thousands of chicks in Antarctica die due to record-low sea ice levels

Purich led research last year that said the continent's sea ice could have undergone a "regime shift" that was probably driven by warming of the subsurface ocean about 100 metres down.

Research led by Hobbs and colleagues at the Australian Antarctic Program Partnership and other institutions has added evidence to support this claim.

In a paper published this month in the Journal of Climate scientists examined changes in the extent of sea ice and where it was forming each year.

Looking at two periods – 1979 to 2006 and 2007 to 2022 – the researchers found the amount of sea ice had become much more variable, or erratic, in the later period.

This change could not be explained by changes in the atmosphere – mostly winds – which have previously dictated most of the year-to-year variability of the ice.

The study concludes an "abrupt critical transition" has occurred in Antarctica, but Hobbs said they could not say why.

"We don't know what the driver of change is. It could be ocean warming or a change in ocean salinity," he said. But it was also possible the change was a natural shift.

Scientists have warned the loss of sea ice is just one of several major changes being observed in Antarctica that is likely to have global consequences – in particular, its loss is exposing more of the continent to the ocean, accelerating the loss of ice on the land, which can push up global sea levels.

Scientists have been increasingly vocal in calling for governments to take the Antarctic changes more seriously and have lamented the comparative lack of data from on and around the continent.

Hobbs said: “What we need is sustained measurements of ocean temperature and salinity underneath the sea ice. We need improvements in our climate models. And we need time.”