

World's biggest ice sheet could cause massive sea rise without action: study

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The A-68 iceberg was one of the largest ever observed.

The world's biggest ice sheet could cause "several meters" of sea-level

rise over centuries if the global temperature rises more than 2°C, according to a British study published Wednesday.

Researchers at Durham University concluded that if global greenhouse emissions remain high, the melting East Antarctica Ice Sheet (EAIS) could cause nearly half a meter of sea-level rise by 2100. Their analysis was published in the scientific journal *Nature*.

If emissions remain high beyond that, the EAIS could contribute around one to three meters to global sea levels by 2300, and two to five meters by 2500, they said.

However, if emissions were dramatically reduced, EAIS could contribute around two centimeters of sea level rise by 2100, according to the assessment.

This would represent far less than the ice loss expected from Greenland and West Antarctica.

"A key conclusion from our analysis is that the fate of the East Antarctic Ice Sheet remains very much in our hands," said lead author Chris Stokes, from Durham University's Department of Geography.

"This ice sheet is by far the largest on the planet, containing the equivalent of 52 meters of sea level and it's really important that we do not awaken this sleeping giant.

"Restricting global temperature increases to below the 2°C limit set by the Paris Climate Agreement should mean that we avoid the worst-case scenarios, or perhaps even halt the melting of the East Antarctic Ice Sheet, and therefore limit its impact on global sea level rise," he added.

Computer simulations

The study did note that the worst scenarios projected were "very unlikely".

World leaders agreed at the 2015 UN Climate Change Conference in Paris to limit global warming to well below 2°C and pursue efforts to limit the rise to 1.5°C.

The research team, which included scientists from the UK, Australia, France and the US, analyzed how the ice sheet responded to past warm periods when making their predictions.

They ran computer simulations to model the effects of different greenhouse gas emission levels and temperatures on the ice sheet by the years 2100, 2300 and 2500.

They found evidence to suggest that three million years ago, when temperatures were around 2-4°C higher than present, part of the EAIS "collapsed and contributed several meters to sea-level rise".

"Even as recently as 400,000 years ago—not that long ago on geological timescales—there is evidence that a part of the EAIS retreated 700 km inland in response to only 1-2°C of global warming," they added.

Nerilie Abram, a co-author of the study from the Australian National University in Canberra, warned the sheet "isn't as stable and protected as we once thought."

More information: Chris Stokes, Response of the East Antarctic Ice Sheet to past and future climate change, *Nature* (2022). [DOI: 10.1038/s41586-022-04946-0](https://doi.org/10.1038/s41586-022-04946-0).
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