

# Antarctica risks 'cascades of extreme events' as Earth warms, study says

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Extreme weather in Antarctica, including ocean heat waves and ice loss, is set to become more intense unless urgent policy action reduces the burning of fossil fuels, a new study has found—the latest to sound the

alarm on the damage climate change is unleashing.

"It is virtually certain that continued [greenhouse gas emissions](#) will lead to increases in the size and frequency of events" as the world gets dangerously close to exceeding the 1.5C warming limit laid out in the 2015 Paris Agreement, according to a study published Tuesday in the journal *Frontiers in Environmental Science*. "We cannot rule out future cascades where [extreme events](#) may have wide-ranging linked impacts in multiple realms."

Scientists have become increasingly alarmed on how the Antarctic ice has struggled to grow back after hitting an all-time low in February—a deviation so extreme from the normal that it's been dubbed a " six sigma event," or once-in-a-7.5-million-year phenomenon. The Arctic, too, is expected to be ice-free in summers by 2030, underscoring the rapid pace at which global warming is damaging the planet's ecosystems.

The rising temperatures have also led to the hottest June and July on record with wildfires and heat waves ravaging Canada and several European countries this year. South America is also grappling with unprecedented winter temperatures, with readings in parts of Chile surpassing 30C.

The world's most extreme heat wave was recorded in east Antarctica. Temperatures hit 38.5C above the seasonal normal there in 2022, according to the study that has reviewed climate extremes in Antarctica and the Southern Ocean. The study's authors have also warned that low sea ice events may become more frequent, and, similar to the Arctic, become self-perpetuating as more solar heat is absorbed and less is reflected back due to the reduced ice cover.

The study concludes that Antarctica is likely to face considerable stress and damage in the coming decades. Twelve countries including the U.K.,

U.S., India and China pledged to preserve the continent's fragile environment through the Antarctic Treaty in 1959. The study says some countries risk breaching the terms of this agreement without urgent action to reduce emissions.

"Nations must understand that by continuing to explore, extract and burn fossil fuels anywhere in the world, the environment of Antarctica will become ever more affected in ways inconsistent with their pledge," lead author Martin Siegert, a professor at the University of Exeter, said in a statement Tuesday.

As the Antarctic sea ice melts, more areas of the continent may become accessible to ships and this would also require careful management, as well as biosecurity measures, to protect vulnerable sites. "Antarctic change has global implications," said Siegert. "Reducing greenhouse gas emissions to net zero is our best hope of preserving Antarctica, and this must matter to every country—and individual—on the planet."

**More information:** Martin J. Siegert et al, Antarctic extreme events, *Frontiers in Environmental Science* (2023). [DOI: 10.3389/fenvs.2023.1229283](https://doi.org/10.3389/fenvs.2023.1229283)

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