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Premium

As green patch spreads in Antarctica, here's what is worrying scientists

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Moss hummocks, Ardley Island, Antarctic Peninsula. (Image: Nature Geoscience)

Plant cover across the Antarctic Peninsula, a long, mountainous extension of Antarctica that points north towards South America, has increased more than 10 times over the past few decades due to rising temperatures, a new study says.

“It is the beginning of dramatic transformation,” Olly Bartlett, a remote-sensing specialist at the University of Hertfordshire and one of the authors of the study, ‘Sustained greening of the Antarctic Peninsula observed from satellites’, told *Nature*.

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How quickly is Antarctica warming?

A 2023 study published in the journal *Nature Climate Change* found that the continent is warming twice as fast as the global average, at a rate of between 0.22 degrees Celsius and 0.32 degrees Celsius per decade currently. The Intergovernmental Panel on Climate Change (IPCC), the United Nations body that advances scientific knowledge about climate change, has estimated that the Earth as a whole is warming at the rate of 0.14-0.18 degrees Celsius per decade.

The situation in the Antarctic Peninsula is worse than in the rest of Antarctica — it is warming five times faster than the global average. The Antarctic Peninsula is now almost 3 degrees Celsius warmer on average than in 1950.



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Antarctica has also been experiencing record-breaking heatwaves, especially during the height of its winter season (which is summer in the northern hemisphere). In July this year, ground temperatures in parts of the continent were around 10 degrees Celsius higher than normal, and up to 28 degrees higher on certain days.

In March 2022, Antarctica experienced its most intense heatwave — temperatures in East Antarctica soared to 39 degrees Celsius above normal.

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What has the study found?

Researchers used satellite imagery and data to conclude that the extent of vegetation in the Antarctic Peninsula has increased 14 times in just 35 years. Vegetation — mostly mosses and lichen — covered less than 1 sq km of the roughly 5,00,000-sq-km peninsula in 1986, but had spread to almost 12 sq km by 2021, according to the study. The rate of greening has increased by more than 30% between 2016 and 2021.

Although the actual area covered by plant life is tiny, the percentage increase in cover is astonishing, according to the researchers. Study co-author Thomas Roland, an environmental scientist at the University of Exeter, told *CNN*, “Our findings confirm that the influence of anthropogenic climate change has no limit in its reach... Even on the Antarctic Peninsula — this most extreme, remote and isolated ‘wilderness’ region — the landscape is changing, and these effects are visible from space.”

Rising temperatures in Antarctica have also resulted in a rapid decrease in the extent of sea ice — the 2024 extent was the second smallest of the satellite record, only slightly more than the record low set in 2023, the US National Oceanic and Atmospheric Administration (NOAA) said on Tuesday. Warmer open seas may be leading to wetter conditions that favour plant growth, according to the study.

Why should we worry about increased vegetation in Antarctica?

Mosses can colonise bare rock and create the foundation of soils that could in milder conditions make the continent more favourable for the growth of other invasive species that could threaten native flora and fauna.

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Study co-author Bartlett told *The Guardian*, “Soil in Antarctica is mostly poor or nonexistent, but this increase in plant life will add organic matter, and facilitate soil formation. This raises the risk of non-native and invasive species arriving, possibly carried by eco-tourists, scientists or other visitors to the continent.”

Increase in plant life could also reduce the Antarctic Peninsula’s ability to reflect sunlight (solar energy) back to Space — a darker surface absorbs more solar

radiation. This could further increase ground temperatures, with local and global repercussions.

Antarctica has already lost 280% more ice mass in the 2000s and 2010s than it lost in the 1980s and 1990s, according to a 2019 study published in the journal PNAS. Rising temperatures will exacerbate the loss of ice, and raise global sea levels.

As unprecedented levels of greenhouse gases enter the atmosphere mainly through the burning of fossil fuels, Antarctica will continue to get warmer, and the vegetation is only likely to increase, according to the researchers.

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