

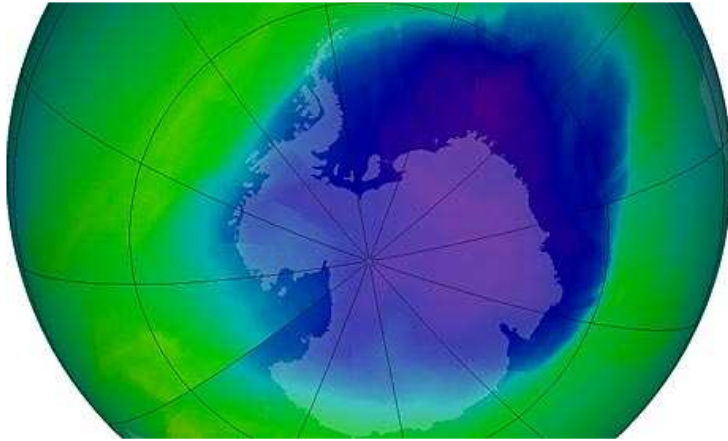
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Antarctica may heat up dramatically as ozone hole repairs, warn scientists

As blanket of ozone over southern pole seals up, temperatures on continent could soar by 3C, increasing sea level rise by 1.4m

Alok Jha, green technology correspondent
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Nasa graphic showing the extent of the ozone hole over Antarctica

The hole in the Earth's ozone layer has shielded Antarctica from the worst effects of global warming until now, according to the most comprehensive review to date of the state of the Antarctic climate. But scientists warned that as the hole closes up in the next few decades, temperatures on the continent could rise by around 3C on average, with melting ice contributing to a global sea-level increases of up to 1.4m.

The western Antarctic peninsula has seen rapid ice loss as the world has warmed, but other parts of the continent have paradoxically been cooling, with a 10% increase in ice in the seas around the region in recent decades. Many climate change sceptics have used the Antarctic cooling as evidence against global warming.

But John Turner of the British Antarctic Survey said scientists are now "very confident" that the anomaly had caused by the ozone hole above Antarctica. "We knew that, when we took away this blanket of ozone, we would have more ultra-violet radiation. But we didn't realise the extent to which it would change the atmospheric circulation of the Antarctic."

These changes in weather have increased winds in the Southern Ocean region and meant that a large part of the continent has remained relatively cool compared with the western peninsula. But because the the CFC gasses that caused the ozone hole now been banned, scientists expect the damage to repair itself within the next 50-60 years. By then the cooling effect will have faded out and Turner said the Antarctic would face the full effects of global warming. This means an increase in average air temperatures of around 3C and a reduction in sea ice by around a third.

The biggest threat to the continent comes from warming seas. Robert Binschadler, a glaciologist at Nasa who monitors Antarctic ice sheets, said: "The heat in the ocean is getting underneath the floating ice shelves, these floating fringes of the ice sheet that are

hundreds of metres thick. That warm water is melting the underside of the ice shelf, reducing the buttressing effect." Thinning of the ice shelf at the fringes leads to glaciers moving more quickly.

The retreat of ice from Antarctica has contributed around 10% to global sea-level rise in recent decades. "The danger is that this warmer water will get under these ice shelves and cause the ice streams to get faster and feed ice out into the ocean," said Turner.

Published by the [Scientific Committee on Antarctic Research](#) (SCAR), a coalition of international experts that coordinates international research in the region, the report has been published to give negotiators in Copenhagen the most up-to-date science available. "Everything is connected — Antarctica may be a long way away but it is an important part of the Earth's system," said [Colin Summerhayes](#), executive director of SCAR. "It contains 90% of the world's ice, 70% of the world's fresh water and that is enough, if it melts, to raise sea levels by 63m."

SCAR's review also corroborated recent work by [Stefan Rahmstorf](#), a climate scientist at the [Potsdam Institute for Climate Impacts Research](#) in Germany, that average sea-level rise will be closer to 1.4m by the end of the century. This is higher than the rise predicted by the [Intergovernmental Panel on Climate Change](#) (IPCC) in 2007, said Turner, because the IPCC's forecasts did not include the impact of melting ice sheets on [sea level](#) rises. Many of the climate models used by the IPCC have also not taken the ozone hole into account in their simulations.

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