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Antarctic ice growth linked to ozone hole

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ABC/Reuters

An expansion of sea ice around Antarctica is linked to a hole in the ozone layer high in the atmosphere, according to a study that helps clear up a mystery about global warming.

The finding, by scientists at the [British Antarctic Survey](#) (<http://www.antarctica.ac.uk/>) (BAS) and the US space agency [NASA](#) (<http://www.nasa.gov/>), explains an apparent contradiction between the recent record thaw of ice in the Arctic and an increase in ice around Antarctica during the past 30 years.

"This new research helps us solve some of the puzzle of why sea ice is shrinking in some areas and growing in others," says John Turner of BAS and lead author of the report, which appears in the journal *Geophysical Research Letters* (<http://www.agu.org/journals/gl/>).

The scientists say damage to the ozone layer, which shields the planet from ultraviolet rays, cooled the stratosphere and disrupted wind patterns around Antarctica.

The shift meant winds blew off the continent more often, cooling the sea and creating more ice, they say.

"While there is increasing evidence that the loss of sea ice in the Arctic has occurred due to human activity, in the Antarctic human influence through the ozone hole has had the reverse effect and resulted in more ice," says Turner.

Sea ice around Antarctica has expanded at a rate of around 100,000 square kilometres per decade since the 1970s, and now covers an area of about 19 million square kilometres at its winter maximum, doubling the size of the continent.

By contrast, summer sea ice around the North Pole shrank in 2007 to the smallest since satellite records began in the 1970s.

Delayed effect

According to the study's authors, the ozone hole may also be delaying the effect of global warming on Antarctic sea ice.

"Although the ozone hole is in many ways holding back the effects of greenhouse gas increases on the Antarctic, this will not last, as we expect ozone levels to recover by the end of the 21st century," says Turner.

Dr Tony Worby of the [Australian Antarctic Division](#) (<http://www.aad.gov.au/>), who was not involved in the study, says it's a really interesting hypothesis.

"The way sea ice is distributed around Antarctic has a lot to do with wind," he says.

"If you see long term changes in the way sea ice is distributed around Antarctica, one of the first things you would look at would be to understand whether there has been some shift in mean circulation in wind."

"We all know that different parts of the atmosphere are connected in different ways, so to see a surface signal from something happening in the stratosphere is an interesting result."

Worby says that while there has been an increase in the total area of Antarctic sea ice, the total volume of ice is relatively unknown.

"It's a bit hard to say because we don't know the thickness of the ice," he says. "We can measure the extent of the ice using satellites, but we don't have any satellite technology to tell us about thickness."



The study explains the increase in ice around Antarctica during the past 30 years, despite the recent record thaw of ice in the Arctic (Reuters)

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"The 1% increase [also] hides the fact that there is a huge decrease in sea ice around the Antarctic Peninsula," he says. "The devil is in the detail."

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