

Climate change affects Southern Ocean carbon sink

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The first evidence that recent climate change has weakened one of the Earth's natural carbon 'sinks' is published this week in the journal *Science*.

A four-year study by scientists from the University of East Anglia (UEA), British Antarctic Survey (BAS) and the Max-Planck Institute for Biogeochemistry reveals that an increase in winds over the Southern Ocean, caused by greenhouse gases and ozone depletion, has led to a release of stored CO₂ into the atmosphere and is preventing further absorption of the greenhouse gas.

Lead author Dr Corinne Le Quéré of UEA and BAS said,

"This is the first time that we've been able to say that climate change itself is responsible for the saturation of the Southern Ocean sink. This is serious. All climate models predict that this kind of 'feedback' will continue and intensify during this century. The Earth's carbon sinks – of which the Southern Ocean accounts for 15% – absorb about half of all human carbon emissions. With the Southern Ocean reaching its saturation point more CO₂ will stay in our atmosphere."

This new research suggests that stabilisation of atmospheric CO₂ is even more difficult to achieve than previously thought. Additionally, acidification in the Southern Ocean is likely to reach dangerous levels earlier than the projected date of 2050.

Professor Chris Rapley, Director of British Antarctic Survey said,

"Since the beginning of the industrial revolution the world's oceans have absorbed about a quarter of the 500 gigatons of carbon emitted into the atmosphere by humans. The possibility that in a warmer world the Southern Ocean – the strongest ocean sink - is weakening is a cause for concern."

The saturation of the Southern Ocean was revealed by scrutinising observations of atmospheric CO₂ from 40 stations around the world. Since 1981 the Southern Ocean sink ceased to increase, whereas CO₂ emissions increased by 40%.

Source: University of East Anglia

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