

New threat from ocean acidification emerges in the Southern Ocean

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The oceans act as a carbon sink and have already absorbed more than 40% of anthropogenic carbon emissions. The majority of this CO₂ has been taken up by the Southern Ocean making these waters hotspots of ocean acidification (OA).

Lead author of the paper published in *Nature Climate Change*, Dr. Katherina Petrou from the University of Technology Sydney, said that although changes in [ocean](#) pH have been shown to impact marine calcifying organisms, the consequences for non-calcifying [marine phytoplankton](#) are less clear.

"Previous studies reported a range of responses to OA [in phytoplankton] yet rarely considered how environmental pH shifts might affect silicification rates in diatoms," she says.

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Diatoms are responsible for around 40% of ocean productivity which means they play a major role in supporting marine food webs, sustaining life for millions of creatures, including humans.

The research was carried out at the Australian Antarctic base, Davis station, by a team of scientists from the University of Technology Sydney (UTS), Southern Cross University (SCU), the Australian Antarctic Division (AAD) and the University of Tasmania. Using large 650 L experimental tanks, a temperature controlled 40-foot container and natural coastal water, their research was designed to investigate the effects of predicted future changes in ocean acidity on the community

structure of the Antarctic phytoplankton.

"We were alarmed to find that diatoms were so negatively affected, with some species likely to have diminished silica production before the end of this century," says Dr. Petrou.

In the context of global climate change, these findings are important because they reveal that OA can not only alter [phytoplankton](#) community composition, but also reduce [diatom](#) ballast (sinking ability), adds SCU based Kai Schulz. Loss of silica production and thus ballast could mean that fewer diatoms end up on the [ocean floor](#), resulting in less atmospheric CO₂ being removed from our atmosphere and transported for storage in the deep ocean.

"The only genuine way to circumvent this outcome, is to cut our greenhouse gas emissions and limit the acidification of our oceans," the researchers say.

More information: Acidification diminishes diatom silica production in the Southern Ocean, *Nature Climate Change* (2019). [DOI: 10.1038/s41558-019-0557-y](#) , [nature.com/articles/s41558-019-0557-y](https://www.nature.com/articles/s41558-019-0557-y)

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