

## Study discovers why global warming will accelerate as CO2 levels rise

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Credit: University of Reading

Global warming is likely to speed up as the Earth becomes increasingly more sensitive to atmospheric  $CO_2$  concentrations, scientists from the University of Reading have warned.

In a new study, published this week in the prestigious journal *PNAS*, the scientists explain that the influence of increasing levels of atmospheric CO2 on global warming will become more severe over time because the patterns of warming of the Earth's <u>surface</u> will lead to reduced cloud cover in some sensitive regions and less heat being able to escape into space.

The findings are supported by observations, suggesting that forecasts



made by climate models evaluated by the Intergovernmental Panel on Climate Change are realistic.

Paulo Ceppi, researcher at the University of Reading and lead author of the study, said: "This resemblance of computer simulations to observations increases our confidence in projections that the climate sensitivity to the progressive rise in <u>carbon dioxide concentrations</u> will increase over time into the future."

Evidence suggests that the upper level of the Earth's atmosphere warms faster than the surface in response to CO2 levels. However, the new study shows that as CO2 levels increase further, the rate of warming in the upper levels slows in comparison with that closer to the Earth's surface.

Reduced contrast in temperature between the upper and lower levels of the atmosphere causes decreased low altitude cloud cover over some areas of the Earth's oceans, leading to more sunlight reaching the sea surface, and therefore a more rapid rise in <u>sea surface temperatures</u>.

These conditions also impede the loss of heat from the atmosphere into space, contributing to the accelerated surface warming in response to rising CO2 concentrations.

These results emphasise the importance of rapidly reducing human caused emissions of greenhouse gases to avoid the worst impacts from ongoing <u>climate change</u> as discussed at the recent COP23 meeting in Bonn that builds upon the 2017 Paris climate agreement.

**More information:** Paulo Ceppi et al. Relationship of tropospheric stability to climate sensitivity and Earth's observed radiation budget, *Proceedings of the National Academy of Sciences* (2017). DOI: 10.1073/pnas.1714308114



## Provided by University of Reading

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