

Cutting pollution won't cause global warming spike, study finds

August 2 2019



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Fears that efforts to reduce air pollution could dramatically speed up the process of global warming have been allayed with the publication of a landmark new study.

Scientists have long worried that [air pollution](#), while having a devastating impact on human health, may paradoxically have been acting as a 'brake' on the heating of the atmosphere. Pollution particles help clouds to form with more water droplets, meaning they reflect more of the sun's energy back into space.

Until now, the extent to which pollution inadvertently helps to cool the planet has not been clear. If the cooling is strong, it would mean that efforts to clean up the air could actually accelerate [global warming](#), making efforts to tackle climate change even more difficult.

However, new research carried out at the University of Reading has shown pollution affects different clouds in different ways. While some clouds get thicker, others become thinner, meaning pollution is unlikely to offset more than half of greenhouse gas warming.

The findings, published in *Nature*, offer greater hope that current plans to curb global warming by moving to cleaner sources of energy may still work without leading to an unexpected extra source of heating.

Velle Toll, lead author of the study, now at the University of Tartu in Estonia, said: "Until now, it was assumed that thicker clouds form when [water droplets](#) condense around the particles in polluted air, delaying rainfall, and allowing clouds to reflect more sunlight back into space.

"To test this, we studied satellite data from clouds near sources of pollution. In fact, there was little change in average water content across all the polluted clouds we found, showing that pollution makes little difference overall to many types of clouds. Some clouds got thicker, but other areas thinned out.

"This reduces a big area of uncertainty for future forecasts of the climate. Our study provides more evidence that cutting emissions of

greenhouse gases and air pollution is a win-win situation for the health of people's lungs and for preventing the worst impacts of climate change."

For this study, the researchers scoured the world for clouds formed over areas of pollution using near-infrared satellite images. Clouds affected by pollution appear 'brighter' in these images.

The scientists located hundreds of polluted clouds around the world, produced by tiny [pollution particles](#) from sources such as volcanoes, cities, ships, factories and wildfires. They analysed whether changes to [clouds](#) simulated by climate models are accurate, in order to better predict future [climate change](#).

Dr. Nicolas Bellouin, study co-author from the University of Reading, who is also a Working Group I lead author in the IPCC's 6th Assessment Report, said: "The fear that reducing air pollution could lead to a spike in global warming has been a lingering concern for climate scientists. What if our efforts to clean up the air actually meant we make global warming worse?"

"Our study provides assurances that polluted air has a limited ability to prevent the atmosphere from heating up, in addition to being bad for people's health. There is now one less excuse for us not to cut emissions of both air pollution and greenhouse gases, or we will continue to see [temperature rises](#) that put people and the natural world in danger.

"In any case, a small temperature rise resulting from cutting [pollution](#) is a price very much worth paying to prevent greater, long-term harm caused by greenhouse gases."

More information: Velle Toll et al. Weak average liquid-cloud-water response to anthropogenic aerosols, *Nature* (2019). [DOI: 10.1038/s41586-019-1423-9](#)

Provided by University of Reading

Citation: Cutting pollution won't cause global warming spike, study finds (2019, August 2)
retrieved 20 September 2024 from

<https://phys.org/news/2019-08-pollution-wont-global-spike.html>

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