

Role of natural aerosols in climate uncertainties underestimated

November 6 2013



Credit: NASA

Natural aerosols, such as emissions from volcanoes or plants, may contribute more uncertainty than previously thought to estimates of how the climate might respond to greenhouse gas emissions.

An international team of researchers, led by the University of Leeds, has shown that the effect of aerosols on the [climate](#) since industrialisation depends strongly on what the atmosphere was like before pollution – when aerosols were produced only from [natural emissions](#). The research will be published in the journal *Nature* on 7 November.

Professor Ken Carslaw, from the School of Earth and Environment at the University of Leeds and lead author of the study, said: "We have shown that our poor knowledge of aerosols prior to the industrial revolution dominates the uncertainty in how aerosols have affected clouds and climate.

"In order to better understand [climate change](#), we need to turn our attention towards understanding very clean regions of the atmosphere – as might have existed in the mid-1700s. Such regions are incredibly rare now, but we are looking for them."

Aerosols tend to increase the brightness of clouds, which would increase the reflection of solar radiation to space, thereby partially masking the climate-warming effects of greenhouse [gas emissions](#). Firmly establishing the effect of aerosol-induced changes on cloud brightness is an important challenge for climate scientists.

In an assessment of 28 factors that could affect the uncertainties in cloud brightness, the researchers found that 45% of the variance comes from natural aerosols, compared with 34% for human-generated [aerosols](#). (Aerosol processes, such as how quickly they are removed from the atmosphere, account for the remaining uncertainty.)

"Our results provide a clear path for scientists to reduce the uncertainty in aerosol effects on climate because we have been able to rank the causes for the uncertainty," concludes Professor Carslaw.

More information: The study, 'Large contribution of natural aerosols to uncertainty in indirect forcing', will be published in the journal *Nature* on 7 November 2013. [dx.doi.org/10.1038/nature12674](https://doi.org/10.1038/nature12674)

Provided by University of Leeds

Citation: Role of natural aerosols in climate uncertainties underestimated (2013, November 6)
retrieved 25 April 2024 from

<https://phys.org/news/2013-11-role-natural-aerosols-climate-uncertainties.html>

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