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Climate 'fix' could deplete ozone

By Helen Briggs
Science reporter, BBC News

Research has cast new doubt on the wisdom of using Sun-blocking sulphate particles to cool the planet.

Sulphate injections are one of several "geo-engineering" solutions to climate change being discussed by scientists.

But data published in Science journal suggests the strategy would lead to drastic thinning of the ozone layer.

This would delay the recovery of the Antarctic ozone hole by decades, and cause significant ozone loss over the Arctic, say US researchers.

The idea of pumping sulphur into the upper atmosphere to counteract global warming comes from nature.

Major volcanic eruptions emit vast quantities of sulphur particles that can cool the planet significantly.

This was observed following the 1991 eruption of Mount Pinatubo.



Polar stratospheric clouds provide a surface for ozone-destroying reactions

But one potential drawback is that sulphates provide a surface on which chlorine gases in polar clouds can become activated, causing chemical reactions that lead to the destruction of ozone molecules.

“ The bad side is definitely the ozone depletion, but you can cool the climate ”

Dr Simone Tilmes

Ozone loss

Dr Simone Tilmes of the National Center for Atmospheric Research (NCAR) in Boulder, Colorado, and colleagues used a combination of measurements and computer simulations to estimate future ozone loss if sulphate injections were carried out.

Quantities capable of mitigating climate change would destroy as much as three-quarters of the ozone layer over the Arctic, if carried out in the next few decades, they said.

This would also delay the expected recovery of the ozone layer over the Antarctic by about 30 to 70 years, they concluded.

Ozone depletion was enhanced in the Antarctic in the Mt Pinatubo aftermath.



Dr Tilmes said more research was needed before society attempted global geo-engineering solutions in the future.

However, she said the study should not rule out the approach altogether.

She told BBC News: "Politicians have to decide what is most important - if you have climate change you might have catastrophic conditions - they might decide to do this anyway.

"If you have to make decisions you need to know what is good about it and what is bad about it. With this scheme the bad side is definitely the ozone depletion, but you can cool the climate."

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