

AAAS.ORG | FEEDBACK | HELP | LIBRARIANS

Science Magazine

Enter Search Term

ADVANCED

[Science Home](#) [Current Issue](#) [Previous Issues](#) [Science Express](#) [Science Products](#) [My Science](#) [About the Journal](#)[Home](#) > [Science Magazine](#) > [30 May 2008](#) > [Tilmes et al.](#), 320 (5880): 1201-1204

Published Online 24 April 2008  
*Science* 30 May 2008:  
Vol. 320 no. 5880 pp. 1201-1204  
DOI: 10.1126/science.1153966

[◀Prev](#) | [Table of Contents](#) | [Next▶](#)

## • REPORT

## The Sensitivity of Polar Ozone Depletion to Proposed Geoengineering Schemes

Simone Tilmes<sup>1,\*</sup>, Rolf Müller<sup>2</sup> and Ross Salawitch<sup>3</sup>[±](#) Author Affiliations\* To whom correspondence should be addressed. E-mail: [tilmes@ucar.edu](mailto:tilmes@ucar.edu)

## ABSTRACT

The large burden of sulfate aerosols injected into the stratosphere by the eruption of Mount Pinatubo in 1991 cooled Earth and enhanced the destruction of polar ozone in the subsequent few years. The continuous injection of sulfur into the stratosphere has been suggested as a “geoengineering” scheme to counteract global warming. We use an empirical relationship between ozone depletion and chlorine activation to estimate how this approach might influence polar ozone. An injection of sulfur large enough to compensate for surface warming caused by the doubling of atmospheric CO<sub>2</sub> would strongly increase the extent of Arctic ozone depletion during the present century for cold winters and would cause a considerable delay, between 30 and 70 years, in the expected recovery of the Antarctic ozone hole.

Received for publication 10 December 2007.

Accepted for publication 9 April 2008.

[Read the Full Text](#)

The editors suggest the following Related Resources on Science sites

**In Science Magazine**

## ATMOSPHERIC SCIENCE

**Whither Geoengineering?**

Alan Robock

*Science* 30 May 2008: 1166-1167.[▶Summary](#) [▶Full Text](#) [▶Full Text \(PDF\)](#)

## THIS ARTICLE HAS BEEN CITED BY OTHER ARTICLES:

**Photophoretic levitation of engineered aerosols for geoengineering***Proc. Natl. Acad. Sci. USA* 21 September 2010: 16428-16431.[▶Abstract](#) [▶Full Text](#) [▶Full Text \(PDF\)](#)**An overview of geoengineering of climate using stratospheric sulphate aerosols***Phil Trans R Soc A* 13 November 2008: 4007-4037.[▶Abstract](#) [▶Full Text](#) [▶Full Text \(PDF\)](#)

## ATMOSPHERIC SCIENCE: Whither Geoengineering?

*Science* 30 May 2008: 1166-1167.[▶Abstract](#) [▶Full Text](#) [▶Full Text \(PDF\)](#)

