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Can We Offset Global Warming By Geoengineering The Climate With Aerosols?

ScienceDaily (Feb. 22, 2008) — Concerned that energy system transformations are proceeding too slowly to avoid risks from dangerous human-induced climate change, many scientists are wondering whether geoengineering (the deliberate change of the Earth's climate) may help counteract global warming.

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- Consensus of scientists regarding global warming
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Sulfate aerosols, commonly released by volcanoes, serve to scatter incoming solar energy in the stratosphere, preventing it from reaching the surface. To investigate the feasibility of deliberately mimicking the effect of volcanic aerosols, Rasch et al. explore scenarios in which aerosol properties are varied to assess interactions with the climate system.





Through model simulations, they discover that, because stratosphere-troposphere exchange processes change with increasing levels of aerosols, about 50 percent more aerosols would have to be injected into the atmosphere than in the scenario where such processes stayed constant.

Further, almost double the level of aerosol loading is required to counteract greenhouse warming if aerosol particles are as large as those seen during volcanic eruptions. The authors caution that geoengineering methods to mask global warming may have serious environmental consequences that must be explored before any action is taken.

Journal reference: Exploring the geoengineering of climate using stratospheric sulfate aerosols: The role of particle size. *Geophysical Research Letters* (GRL) paper 10.1029/2007GL032179, 2008; <http://dx.doi.org/10.1029/2007GL032179>

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Volcano eruption on Reunion Island. Should humans deliberately mimic the effect of volcanic aerosols to try to offset global warming? (Credit: iStockphoto/Julien Grandin)

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