Xu, Yangyang; et al. (2020): Climate engineering to mitigate the projected 21st-century terrestrial drying of the Americas: a direct comparison of carbon capture and sulfur injection


"We show that sulfur injection, in contrast to previous notions of leading to excessive terrestrial drying (in terms of precipitation reduction) while offsetting the global mean greenhouse gas (GHG) warming, will instead mitigate the projected drying tendency under RCP8.5."

Read more » Xu, Yangyang; et al. (2020): Climate engineering to mitigate the projected 21st-century terrestrial drying of the Americas: a direct comparison of carbon capture and sulfur injection
Neuber, Frederike; Ott, Konrad (2020): The Buying Time Argument within the Solar Radiation Management Discourse

"In this article, we will establish a version of the buying time argument (BTA) in favor of Sulphur Aerosol Injection (SAI) Climate Engineering (CE). The idea is not to promote the deployment of such scheme, but rather to present the strongest possible argument pro SAI in order to look at its presuppositions, implications, critical points and uncertainties."

Read more » Neuber, Frederike; Ott, Konrad (2020): The Buying Time Argument within the Solar Radiation Management Discourse
Visioni, Daniele; et al. 2020: “What Goes up Must Come down: Impacts of Deposition in a Sulfate Geoengineering Scenario.”


"We consider here an extreme sulfate geoengineering scenario necessary to maintain temperatures at 2020 levels while greenhouse gas emissions continue to grow unabated. We show that the amount of stratospheric sulfate needed could be globally balanced by the predicted decrease in tropospheric anthropogenic SO2 emissions, but the spatial distribution would move from industrialized regions to pristine areas. We show how these changes would affect ecosystems differently depending on present day observations of soil pH, which we use to infer the potential for acid-induced aluminum toxicity across the planet."

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Read more » Visioni, Daniele; et al. 2020: “What Goes up Must Come down: Impacts of Deposition in a Sulfate Geoengineering Scenario.”
Duan, Lei; et al. 2020: “A Model-Based Investigation of Terrestrial Plant Carbon Uptake Response to Four Radiation Modification Approaches.”


"Using the National Center for Atmospheric Research Community Earth System Model, we performed simulations that represent four idealized radiation modification options: solar constant reduction, sulfate aerosol increase (SAI), marine cloud brightening, and cirrus cloud thinning (CCT)."

Read more » Duan, Lei; et al. 2020: “A Model-Based Investigation of Terrestrial Plant Carbon Uptake Response to Four Radiation Modification Approaches.”

01.04.2019

# New Publications

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Zhan, P.; et al. (2019): Impacts of sulfate geoengineering on rice yield in China


"In this study, we simulated the impacts of sulfate geoengineering on rice yield in China both with sufficient irrigation (irrigated) and without irrigation (rainfed). We used Geoengineering Model Intercomparison Project (GeoMIP) G4 climates from 6 climate models to force the ORYZA version 3 crop model to simulate rice yields under sulfate geoengineering scenario."

LINK

Read more » Zhan, P.; et al. (2019): Impacts of sulfate geoengineering on rice yield in China

17.03.2019

# Media

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IQS Directory: Everything You Need To Know About Geoengineering

"Now though, a majority are starting to accept that something in our environment is happening. Supporting this sentiment is the fact that a large number of scientists the world over agree that our world is rapidly"
changing – and not for the better. As more individuals subscribe to the scientific data points of a climate in peril, the debate is now turning to what we should do about it. In certain instances, those disagreements are far more intense than those concerning if there is a problem at all. One such climate remedy that continues to gain traction is equal parts radical and fantastical, brilliant and bonkers. That remedy is geoengineering.

Nbcnews: Wallace Smith Broecker, the 'grandfather' of climate science, leaves a final warning for Earth

"It was time for humankind and the world’s scientific community to begin to seriously study more extreme solutions to the climate crisis, Broecker said. That included creating a massive solar shield in the Earth’s atmosphere, a tactic known variously as 'geoengineering,' 'the sulfur solution,' 'solar radiation management' and the 'Pinatubo Strategy.'"
MIT Technology Review: We’re about to kill a massive, accidental experiment in halting global warming

"Studies have found that ships have a net cooling effect on the planet, despite belching out nearly a billion tons of carbon dioxide each year. That's almost entirely because they also emit sulfur, which can scatter sunlight in the atmosphere and form or thicken clouds that reflect it away. In effect, the shipping industry has been carrying out an unintentional experiment in climate engineering for more than a century."

LINK

Read more » MIT Technology Review: We’re about to kill a massive, accidental experiment in halting global warming
"Climate modification by stratospheric SO$_2$ injections, to form sulfate aerosols, may alter the spectral and angular distributions of the solar ultraviolet and visible radiation that reach the Earth’s surface, with potential consequences to environmental photobiology and photochemistry. We used modeling results from the CESM1(WACCM) stratospheric aerosol geoengineering large ensemble (GLENS) project, following the RCP8.5 emission scenario, and one geoengineering experiment with SO$_2$ injections in the stratosphere, designed to keep surface temperatures at 2020 levels."

LINK