

Topics (T)
Interactive Presentations (IP)

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GEOENGINEERING FROM SPACE: INTERIM RELIEF FROM CLIMATE CHANGE?

Abstract

Geoengineering has been described in many technical journals as a deliberate large-scale intervention in the Earth's natural systems to gain a specific benefit, such as counteracting global heating. Not surprisingly geoengineering, as an intervention strategy, is attracting significant interest as the planet struggles with the impacts of climate change.

Geoengineering efforts should not detract from or replace long term sustainability efforts to reduce greenhouse gases (GHG) and reach targets established by the UN Climate Change Conference in Glasgow (COP26) in 2021. Much like a person who takes an aspirin to prevent a heart attack but understands that longer term lifestyle changes are needed, scientists should study interim solutions to improve the health of the planet until the people of Planet Earth make the necessary changes to reduce GHG emissions.

There are two basic geoengineering strategies for climate intervention: solar radiation modification and carbon sequestration. We will focus on solar radiation modification, which is a strategy involving the introduction of upper stratosphere or space-based particles, aerosols or objects to block the amount of incoming sunlight to moderate global heating. The analysis will emphasize the need to study volcanic emissions and orbital debris re-entry particles. When introduced into the upper stratosphere, these particles present an opportunity to study the impacts of geoengineering. From this we can begin to develop a baseline body of knowledge to build towards purposeful geoengineering.

Governance and Policy Issues – Key Questions. There is no precedent or institution ready to assume oversight for geoengineering. The paper will discuss the benefits, challenges, and governance complexity of geoengineering, including:

- Opportunities to study the unintentional solar radiation geoengineering as a proxy for full scale geoengineering.
- How to coordinate a governing body and receive appropriate agreement. How would the selected oversight institution govern the use of the technology?
- How can the project be monitored and stopped if there are unintended and severe consequences?
- How can the selected governing body enforce rules? Or prevent a rogue nation from moving forward with their own project, without permission or consensus?

The analysis will include interviews from key geoengineering experts. This topic is timely as the satellite industry is currently contributing to the injection of aerosols into the ozone layer. The satellite sector expects a significant surge in launch activity over the next decade. The paper will also make recommendations for future geoengineering studies that NASA, NOAA, or similar organizations might fund.