# Concerns rise over expanding geo-engineering techniques to modify weather patterns



Concerns are rising over the increasing use and expansion of geo-engineering techniques aimed at modifying weather patterns, particularly through sun-dimming and cloud-seeding initiatives. These interventions, which have quietly developed over more than a decade, have begun to attract public attention following recent media reports, highlighting the scale of government and commercial involvement worldwide and raising questions about their environmental and societal impacts.

Cloud-seeding, a practice dating back to the 1940s, involves dispersing substances such as salt or silver iodide into the atmosphere to encourage precipitation. Initially conceived to alleviate droughts or aid firefighting efforts, this technique has evolved into a more routine form of weather modification, employed by both state and private actors. Countries including Saudi Arabia, the United States, Russia, China, Australia, and more recently France and Spain, have adopted or are considering these technologies, driven by concerns over increasing climate variability and water security. Evidence suggests that cloud-seeding is widely used for various purposes, such as suppressing heatwaves, inducing rainfall, clearing fogs, minimising hail damage, or even creating snow for ski resorts.

Despite its prevalence, the environmental implications of cloud-seeding remain inadequately understood. A review published by earth.org in April 2024 expressed cautious criticism, noting the uncertainty surrounding whether increased precipitation in one area might inadvertently cause droughts elsewhere or lead to severe flooding. Moreover, the commonly used chemical silver iodide poses potential toxicity risks to terrestrial and aquatic ecosystems.

Adding to the complexities are allegations regarding covert geo-engineering practices. A question submitted by Ramon Tremosa, a Catalonian member of the European Parliament, to the European Commission referenced claims from within Spain’s Meteorological Agency suggesting that aircraft have been spraying materials such as lead dioxide, silver iodide, and diatomite nationwide, purportedly to suppress rainfall and create favourable summer tourism conditions. These allegations, dating back to at least 2015, also link such activities to health concerns due to inhalation of toxic substances. However, the European Commission denied any commercial motivations behind such actions and rejected the claims.

More broadly, concerns have been raised about the use of coal fly ash—a byproduct of coal combustion—being dispersed into the atmosphere since the late 1990s, with accusations of deliberate public deception circulating.

Sun-dimming, or solar radiation management (SRM), represents another geo-engineering approach under discussion and limited experimentation. These methods aim to reduce the amount of solar energy reaching the planet's surface by spraying reflective particles or employing other blocking techniques. While experiments have reportedly taken place, official statements maintain that many SRM approaches remain at the theoretical or modelling stage rather than active deployment. Governments in the UK, US, and other countries have investigated SRM as a potential last-resort measure to mitigate anthropogenic climate change, with the UK commissioning research under initiatives like the Geoengineering Model Intercomparison Project. Nevertheless, concerns persist regarding the unintended consequences and ecological risks associated with SRM projects, such as those devised by institutions like Stanford and Harvard.

The 2010 UK Commons Science and Technology Committee report categorised cloud seeding and similar short-duration weather modification techniques as outside the strict definition of geo-engineering, thus suggesting they fall outside stringent regulatory frameworks beyond existing international agreements against hostile use. However, a 2023 World Meteorological Organization review emphasised the need for enhanced research and monitoring to better understand and regulate weather modification programmes, indicating that comprehensive oversight remains limited.

Experts, including Laura Kuhl, Assistant Professor of Public Policy and Urban Affairs at Northeastern University in Boston, have highlighted deficiencies in policy discussions on cloud-seeding, despite the technology's widespread deployment. Critics warn that such geo-engineering efforts could exacerbate environmental problems rather than solve them, with motivations sometimes tied to economic interests such as trading questionable carbon credits rather than achieving genuine environmental protection.

The use of weather modification techniques also holds implications beyond environmental concerns, potentially affecting international relations. China’s extensive weather-modification programme serves as a case in point, as it proceeds despite the possible effects on neighbouring countries.

The Conservative Woman, which published these insights in a series titled "What are they doing to our skies," has brought these issues to the fore, advocating for greater awareness of the scope, impact, and governance of geo-engineering projects. The next instalment is expected to explore details of weather modification activities within the United Kingdom.

Source: [Noah Wire Services](https://www.noahwire.com)

## References

* <https://www.geoengineeringmonitor.org/technologies/weather-modification> - Supports claims about weather modification techniques, including cloud seeding and their environmental implications.
* <https://www.geoengineeringmonitor.org/what-is-geoengineering> - Corroborates the definition of geoengineering and its overlap with weather modification practices.
* <https://www.dri.edu/cloud-seeding-program/what-is-cloud-seeding/> - Provides technical details on cloud seeding methods and outcomes, including evidence of increased precipitation from specific projects.
* <https://www.noaa.gov/news/fact-check-debunking-weather-modification-claims> - Addresses solar geoengineering claims and clarifies the theoretical vs. applied status of such technologies.
* <https://www.ametsoc.org/ams/about-ams/ams-statements/archive-statements-of-the-ams/planned-weather-modification-through-cloud-seeding/> - Offers historical context for weather modification efforts, including seeding thunderstorms to mitigate extreme weather.
* <https://www.geoengineeringmonitor.org/technologies/weather-modification> - Reiterates concerns about environmental risks and governance gaps in weather modification programs globally.
* <https://news.google.com/rss/articles/CBMihwFBVV95cUxQcHBfM3ppREFBaHkxeERxR0lvbDVvU2dYaDJfbWtlWWtBNFRCeU9Mb1hVcUxIZWJwcWZkdEY5TklNdUZLc2VSdEF5a3J0Z1F6OF85eDg4VE9tVEVReG1GODZqS1JidFBRcGZqVHVIMDQ0NEZPQ3dfaGYwY3Y3ODVOLW5lNHp5RVE?oc=5&hl=en-US&gl=US&ceid=US:en> - Please view link - unable to able to access data