# Manchester scientists pioneer marine cloud brightening to temporarily cool planet



A team of scientists at the University of Manchester has recently embarked on an innovative project aimed at tackling the alarming rise in global temperatures through a technique known as marine cloud brightening. Funded by the UK’s Advanced Research and Invention Agency, this ambitious initiative is designed to explore the potential of spraying fine sea salt particles into low-lying marine clouds, enhancing their ability to reflect solar radiation away from Earth. Although the project is still in its early stages, initial research suggests that this technology could modestly reduce surface temperatures by between 0.5 to 1°C, particularly in selected regions.

The project's lead researcher, Professor Hugh Coe, has emphasised that marine cloud brightening should be viewed as a temporary measure rather than a comprehensive solution to climate change. This approach acknowledges the pressing need to tackle the root causes of global warming, primarily greenhouse gas emissions. Coe noted that while marine cloud brightening can provide crucial time for humanity to transition towards cleaner energy sources, it does not replace the imperative for aggressive emission reduction strategies.

The concept of enhancing cloud reflectivity is not without its controversies. Recent experiments in California to implement similar geoengineering techniques faced significant public opposition. For example, a university-led initiative involving the release of sea salt particles over San Francisco Bay was abruptly halted due to community concerns and the complexities inherent in climate dynamics. The incident underscored the risks associated with geoengineering—raising questions about potential unintended consequences and the necessity for a robust governance framework to manage these experiments effectively.

Public sentiment surrounding geoengineering remains largely sceptical. Local authorities in Alameda, California, even opted to suspend a cloud brightening project on the grounds of potential risks. This decision came after initial findings indicated that the experiment did not pose a significant threat to community health but nonetheless highlighted the widespread apprehension towards such technological interventions. Advocates for environmental caution argued that the focus should remain on sustainable practices rather than experiments that could mislead public perception regarding the urgency of reducing emissions.

Despite these reservations, proponents of marine cloud brightening advocate for careful, transparent experimentation as a means to confront the escalating climate crisis. Studies, including those undertaken by the National Oceanic and Atmospheric Administration, suggest that such interventions could complement existing strategies like stratospheric aerosol injection. Future research will be essential in determining the comprehensive impacts of marine cloud brightening, as the technology’s ability to influence the broader climate remains unclear.

As the world grapples with the urgent consequences of climate change—evident through increasing heatwaves and extreme weather events—the development of innovative solutions becomes paramount. Marine cloud brightening represents a glimmer of hope in the scientific community's quest for methods to moderate global warming. Yet, researchers and policymakers alike must tread carefully, ensuring that the pursuit of such technologies does not detract from the critical task of cutting greenhouse gas emissions and fostering a sustainable future.

Ultimately, the outcome of the Manchester project, dubbed "REFLECT," may influence future approaches in climate intervention, but it is crucial that these endeavours remain part of a broader, holistic strategy aimed at safeguarding the planet.

## Reference Map:

* Paragraph 1 – [[1]](https://www.saba.ye/en/news3487916.htm), [[4]](https://barrierreef.org/news/explainers/what-is-cloud-brightening)
* Paragraph 2 – [[1]](https://www.saba.ye/en/news3487916.htm), [[2]](https://www.ft.com/content/710259b4-6a16-4755-939a-14f05d18c821), [[6]](https://en.wikipedia.org/wiki/Marine_cloud_brightening)
* Paragraph 3 – [[2]](https://www.ft.com/content/710259b4-6a16-4755-939a-14f05d18c821), [[3]](https://www.lemonde.fr/en/environment/article/2024/06/13/in-california-the-town-of-alameda-refuses-to-host-a-climate-geoengineering-experiment_6674627_114.html)
* Paragraph 4 – [[3]](https://www.lemonde.fr/en/environment/article/2024/06/13/in-california-the-town-of-alameda-refuses-to-host-a-climate-geoengineering-experiment_6674627_114.html), [[5]](https://csl.noaa.gov/news/2025/426_0324.html)
* Paragraph 5 – [[2]](https://www.ft.com/content/710259b4-6a16-4755-939a-14f05d18c821), [[4]](https://barrierreef.org/news/explainers/what-is-cloud-brightening)
* Paragraph 6 – [[1]](https://www.saba.ye/en/news3487916.htm), [[6]](https://en.wikipedia.org/wiki/Marine_cloud_brightening)
* Paragraph 7 – [[1]](https://www.saba.ye/en/news3487916.htm), [[7]](https://bluecooling.org/the-case-for-mcb/brightening-ocean-clouds/)

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## Bibliography

1. <https://www.saba.ye/en/news3487916.htm> - Please view link - unable to able to access data
2. <https://www.ft.com/content/710259b4-6a16-4755-939a-14f05d18c821> - This article discusses the controversy surrounding geoengineering experiments aimed at addressing climate change. A California city recently halted a university-led project spraying sea salt particles over San Francisco Bay to brighten clouds and cool the local climate. This follows the cancellation of a Harvard project to release sulfur particles in Sweden. Concerns include complex climate dynamics, potential unintended consequences, distraction from emission reduction, public opinion, and lack of governance. Despite these issues, the article argues that not experimenting carries risks, as global temperatures continue to rise, exacerbating heatwaves and associated problems. It suggests that careful, small-scale, transparent, and equitable testing could be beneficial, highlighting the need for a governance framework to prevent unauthorized geoengineering actions and prepare for potential future scenarios.
3. <https://www.lemonde.fr/en/environment/article/2024/06/13/in-california-the-town-of-alameda-refuses-to-host-a-climate-geoengineering-experiment_6674627_114.html> - In April 2024, the city of Alameda, California, discovered that a University of Washington experiment aimed at cloud brightening to reflect solar radiation back into space was being conducted on the USS Hornet, a converted museum aircraft carrier. The project, funded with an annual budget of approximately $1 million by the SilverLining association, involved spraying sea salt particles into the air to brighten clouds and combat global warming. The experiment was suspended by officials after a New York Times publication and an environmental study concluded that the experiment did not pose a significant risk to community health or animals. However, the installation of air quality monitors was recommended. During a council meeting, which attracted global attention and lasted several hours, the controversial aspects of solar geoengineering were extensively debated. Ultimately, Alameda officials voted against allowing the continuation of the experiments in their city, expressing a reluctance to pioneer such contentious technologies. The organization Friends of the Earth applauded the decision, while Sarah Doherty from the University of Washington expressed her intention to seek alternative locations.
4. <https://barrierreef.org/news/explainers/what-is-cloud-brightening> - Marine cloud brightening is a proposed technique to enhance the reflectivity of clouds over oceans, potentially mitigating global warming. The process involves spraying fine sea salt particles into low-lying marine clouds, increasing their reflectivity by 5-10%. This could lead to a temporary temperature drop in specific regions, with preliminary studies suggesting a reduction of 0.5 to 1°C. The technology relies on natural sea salt, which has a short atmospheric lifespan, settling within a few days, making the intervention more controllable compared to more radical approaches like stratospheric aerosol injection. However, the broader impact on the global climate remains under investigation.
5. <https://csl.noaa.gov/news/2025/426_0324.html> - A NOAA study published in March 2025 found that injecting light-reflecting particles into the stratosphere could indirectly make marine clouds more reflective. This diffusion-brightening effect could increase cloud reflectivity by about 10%, enhancing the cooling effect of stratospheric aerosol injection. The study suggests that implementing stratospheric aerosol injection could indirectly cause an additional marine cloud brightening effect, substantially increasing the overall cooling effectiveness. The research highlights the need for a comprehensive understanding of such climate interventions and their potential impacts.
6. <https://en.wikipedia.org/wiki/Marine_cloud_brightening> - Marine cloud brightening (MCB) is a proposed geoengineering technique aimed at increasing the reflectivity of marine clouds to mitigate global warming. The process involves spraying fine sea salt particles into low-lying marine clouds, enhancing their ability to reflect sunlight back into space. This could lead to a temporary cooling effect in specific regions. MCB is considered a temporary solution that does not address the root causes of global warming, such as greenhouse gas emissions. The technology relies on natural sea salt, which has a short atmospheric lifespan, making the intervention more controllable compared to more radical approaches like stratospheric aerosol injection. However, the broader impact on the global climate remains under investigation.
7. <https://bluecooling.org/the-case-for-mcb/brightening-ocean-clouds/> - Marine cloud brightening (MCB) is a proposed geoengineering technique that aims to increase the reflectivity of ocean clouds to mitigate global warming. The process involves spraying fine sea salt particles into low-lying marine clouds, enhancing their ability to reflect sunlight back into space. This could lead to a temporary cooling effect in specific regions. MCB is considered a temporary solution that does not address the root causes of global warming, such as greenhouse gas emissions. The technology relies on natural sea salt, which has a short atmospheric lifespan, making the intervention more controllable compared to more radical approaches like stratospheric aerosol injection. However, the broader impact on the global climate remains under investigation.