

# Fed report: Time to examine purposely cooling planet idea

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It's time to study and maybe even test the idea of cooling the Earth by injecting sulfur pollution high in the air to reflect the sun's heat, a first-of-its-kind federal science report said Tuesday.

The idea was once considered fringe—to purposely re-engineer the planet's climate as a last ditch effort to battle global warming with an artificial cloud. No longer.

In a nuanced, two-volume report, the National Academy of Sciences said that the concept should not be acted upon immediately because it is too risky, but it should be studied and perhaps tested outdoors in small projects. It could be a relatively cheap, effective and quick way to cool the planet by mimicking the natural effects on climate of large volcanic eruptions, but scientists concede there could be dramatic and dangerous side effects that they don't know about.

Because warming has worsened and some countries might act unilaterally, scientists said research is needed to calculate the consequences.

Panel chairwoman Marcia McNutt, editor of the journal *Science* and former director of the U.S. Geological Survey, said in an interview that the public should read this report "and say, 'This is downright scary.' And they should say, 'If this is our Hail Mary, what a scary, scary place we are in.'"

This is the first time a government-associated science panel talked about the controlled small scale outdoor tests of the artificial cloud concept, called solar radiation management or SRM. But even then panelists downplayed the idea and said it would require some kind of government or other oversight before it is done.

"Yes, small scale outdoor tests might be allowed, but it wouldn't just be in the hands of scientists to decide what's allowable and what's not allowable," McNutt said. "Civil society needs to engage in these discussions where the line is to be drawn."

Some scientists worry that research itself it will make this type of planet hacking more likely to occur.

"This creates a bit of what we call a moral hazard," said Waleed Abdalati, a University of Colorado ice scientist and former NASA chief scientist who co-authored the report. "There will likely come a time we're going to want to know the ramifications of that kind of action. ... You're talking about potentially changing weather and climate. You don't want to do that without as good an understanding as you can possibly have."

And the committee scientists said once you start this type of tinkering, it would be difficult to stop because warming would come back with such a force. So a decision to spray particles into the air would have to continue for more than 1,000 years.

The report was requested by U.S. intelligence agencies, academy president Ralph J. Cicerone said. Because the world is not reducing the emissions of greenhouse gases that cause global warming, scientists have been forced "to at least consider what is known as geoengineering," he said.

The panel did favor technology to suck carbon dioxide from the air and bury it underground. But unlike the artificial cloud concept, it would be costly and take decades to cool the planet. The panel wrote a separate volume on this method with the idea of distancing the concept from the idea of the artificial cloud, which McNutt described as a political hot potato.

Carbon dioxide is a byproduct of the burning of coal, oil and gas. Removing it from the air treats the cause of man-made global warming, while deflecting the sun with an artificial cloud only treats the symptoms and does nothing about ocean acidification, the report said.

A leading climate engineering scientist, David Keith of Harvard, hailed the report, but said it could have gone further. With backing from billionaire Bill Gates, Keith has proposed an experiment involving putting about two pounds (1 kilogram) of a sulfur solution in the air to see what happens.

Rutgers University scientist Alan Robock said it would be interesting to spray a small sulfur dioxide into a cloud, and use a blimp or drone to measure what happens. But that should only be done with proper oversight, he said.

Other climate scientists are adamantly against injecting sulphates into the air, even as a last ditch effort.

Such an idea "could do far more harm than good" and scientists should treat the Earth like doctors do their patients, abiding by the rule "first, do no harm," said Pennsylvania State University climate scientist Michael Mann. But he favors increased study of the issue "if only for one purpose: to expose just how dangerous many of these schemes might be."

While the artificial cloud idea is a much worse option than carbon dioxide removal, it is more attractive to some people because "we could probably do it right now," said Texas A&M University atmospheric sciences professor Andrew Dessler. "There's really very little that's technologically standing in our way."

**More information:** National Academy of Science: [www.nas.edu/](http://www.nas.edu/)

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