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### 'Sunshade' for global warming could cause drought

08:13 02 August 2007 by [Catherine Brahic](#)

Pumping sulphur particles into the atmosphere to mimic the cooling effect of a large volcanic eruption has been proposed as a last-ditch solution to combating climate change - but doing so would cause problems of its own, including potentially catastrophic drought, say researchers.

Sulphur "sunshades" are just one example of a "geo-engineering" solution to climate change. Such solutions involve artificially modifying our climate to counteract the effects of human greenhouse gas emission. Other examples include [space mirrors](#) and [iron fertilisation of the ocean](#) (see also [Sunshade for the planet](#)).

Recent research has suggested that sulphur sunshades could rapidly cool the climate back down to pre-industrial temperatures (see [Solar shield could be quick fix for global warming](#)).

However, a study, led by Ken Caldeira of the Carnegie Institution of Washington in the US, warned that failing to correctly deploy or maintain such a scheme would result in sudden warming - which would be worse than the long-term warming that had been avoided because of its swiftness.

Now, Kevin Trenberth and Aiguo Dai of the National Center for Atmospheric Research in Colorado, US, have shown that - even if correctly deployed - a sulphur sunshade could have deleterious effects on the environment by reducing rainfall.

#### Cooling cloud

Sulphur sunshades are inspired by the cooling effects of large volcanic eruptions, which blast sulphate particles into the stratosphere. The particles reflect part of the Sun's radiation back into space, reducing the amount of heat that reaches the Earth. In 1991, the eruption of [Mount Pinatubo](#) in the Philippines cooled Earth by a few tenths of a degree for several years.

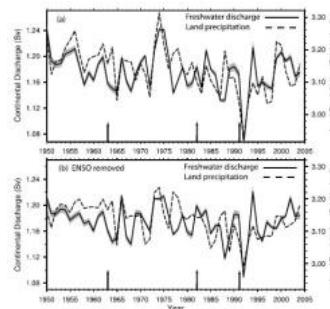
To study the effects that sulphur sunshades might have on rainfall, Trenberth and Dai looked at trends in precipitation and continental run-off from 1950 to 2004 to try to detect the impact of the eruptions of [Mount Agung](#) in Indonesia 1963, [El Chichón](#) in Mexico in 1982, and Pinatubo in 1991.

The researchers had to account for the effects of [El Niño](#), which tends to decrease rain over land, and increase it over the oceans. After this, a marked decrease in rainfall and run-off in the year after the Pinatubo eruption was clear (see graph, right).

However, the Agung and El Chichón eruptions did not produce a detectable signal in the precipitation records. Pinatubo is thought to have pumped significantly more particles into the atmosphere than Agung and El Chichón, releasing aerosols that increased the optical density of the atmosphere by about 10 times more than each of the other two. "We think those two were not strong enough to have an effect on precipitation," says Dai.

Dai and Trenberth say their results suggest that artificially putting large amounts of sulphate particles into the atmosphere in order to decrease solar radiation could have catastrophic effects on the planet's water cycle. "Creating a risk of widespread drought and reduced freshwater resources does not seem like an

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Rainfall was dramatically reduced in 1992, as a result of the 1991 Pinatubo eruption, even if the effects of El Niño were eliminated from the record (bottom graph); arrows indicate the eruptions of Mount Agung, El Chichón, and Pinatubo (Image: GRL/Trenberth/Dai)

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appropriate fix," they say.

They note that the negative effects experienced after Pinatubo erupted were harshest in the tropics.

**Climate Change** - Want to know more about global warming: the science, impacts and political debate? Visit our continually updated [special report](#).

Journal reference: [Geophysical Research Letters](#) (DOI:10.1029/2007GL030524).

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#### Scary or what ?

Thu Aug 02 11:19:47 BST 2007 by [bron](#)

As climate change is a nature process and the theory of man made global warming a religion more than a science I think any deliberate interference by man would be ludicrous in the extreme.

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#### Scary or what ?

Thu Aug 02 13:02:14 BST 2007 by [Michael Marshall](#)

At New Scientist we report on the evidence, and as a result our coverage reflects the overwhelming scientific consensus that climate change is happening because of anthropogenic emissions of greenhouse gases. We will continue to cover all important new studies relating to the issue in our Special Report on Climate Change (<http://environment.newscientist.com/channel/earth/climate-change>). We have also addressed 26 common climate myths in our feature Climate Change: A Guide for the Perplexed ([long URL - click here](#)). Michael Marshall, online editorial assistant

#### A high-albedo diet will chill the planet

18:19 15 January 2009

One way of temporarily reducing global temperatures would be to replace existing crops with variant strains that reflect more solar energy back out to space, a study suggests

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17:49 15 January 2009

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**Scary or what ?**

Fri Aug 03 04:49:35 BST 2007 by **The Respected Doofinator**

'By Michael Marshall Thu Aug 02 13:02:14 BST 2007 At New Scientist we report on the evidence, and as a result our coverage reflects the overwhelming scientific consensus that climate change is happening because of anthropogenic emissions of greenhouse gases.' Ummm. No. There is no 'overwhelming scientific consensus'. This is a crock. Show me the evidence of 'overwhelming scientific consensus'. The Respected Doofinator

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**Scary or what ?**

Sat Aug 04 00:59:07 BST 2007 by **Brock**

We need a new classification of deliberate idiot! There is no English word to describe people spending their time refuting information that is both obvious AND from a consensus.

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**Scary or what ?**

Sun Aug 05 21:58:56 BST 2007 by **MvL**

Humans are almost certainly the cause, or one of the big causes, of this global warming. Even if we weren't, we'd need to find a way to stop it and generate cooling. Massive warming trends have happened in the past without human intervention (CO2 emissions), and that means they'll happen again in the future without us too, again, even if we are causing the current warming, which I believe the evidence suggests we are. Whether caused by us or not, we need to do something about it. That said, let's seriously consider human geo-engineering strategies. The alternative is to give up - some science suggests that even if we halted all CO2 emissions now, we're still in for potentially catastrophic warming, and halting them all now is totally unrealistic and ridiculous, even if it is desirable. We've managed, since the advent of the industrial revolution, to significantly increase global CO2 levels in the atmosphere, just as an unintentional side effect of our energy production methods. Let's not, with full intention, alter the atmosphere and the global temperature. Whatever we can do as an unintentional side effect, we can certainly undo with intent and ingenuity, and good engineering. Or, it's worth trying, since we might have nothing to lose, and everything to gain.

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**Scary Or What ?**

Fri Dec 28 19:32:20 GMT 2007 by **Erik**

Wow, what an idiot!

So what you are saying is that even if we aren't causing global warming, you think we should screw with the natural cycles of the earth by taking extreme measures that could very well have negative effects?

You probably call yourself an environmentalist, I bet.

Truly mind-boggling logic!

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