

The Met Office, geoengineering and SPICE

Large-scale geoengineering schemes are far from being implementable, but a number of hypothetical schemes have been proposed, for instance, those contained in the [Royal Society's](#) report from 2009. These can be broadly split into two categories: those that seek to capture carbon dioxide from the atmosphere (known as carbon dioxide removal schemes) and those that seek to reduce warming by reflecting more sunlight away from the earth (known as solar radiation management schemes). It is worth noting that the latter would not address the direct effects of CO₂ on ocean acidification, but would retain some of the benefits of enhanced terrestrial fertilization for plants.

The potential benefits, detriments, side-effects and risks of geoengineering remain relatively poorly understood. In the case of cloud modification for example by introducing sulphur into the atmosphere, it's unclear what changes to rainfall distribution and intensity might be. There are also potential side effects on atmospheric chemistry when extra sulphur is put into the stratosphere.

While the Met Office does not advocate any particular emission reduction policy or any geoengineering scheme, it does provide objective scientific research commissioned by policy makers in government and business that can be used to inform decision making.

<http://www.metoffice.gov.uk/climate-change/guide/science/explained/geoengineering>

One such strand of research is the work in modelling the potential impacts and consequences of proposed geoengineering in the SPICE¹ project. For this project, and others of a similar nature², the Met Office is using its state-of-the-science climate models to undertake theoretical modelling studies to assess the scheme's impact relative to various business as usual (strong, medium and weak mitigation) scenarios.

Specifically for SPICE, the project is broken into three work packages:

- WP1 — Particle efficiency
- WP2 — Delivery mechanisms
- WP3 — Atmospheric modelling

The Met Office is involved only in WP3, which is essentially modelling volcanic eruptions via SO₂ injection into the stratosphere. While WP2 (delivery mechanisms) advocates the development of a stratospheric balloon suspending

¹ Stratospheric Particle Injection for Climate Engineering project led by the Universities of Bristol and Cambridge

² IAGP (Integrated Assessment of Geoengineering Proposals) and GeoMIP (Geoengineering model intercomparison project)

a pipe, the work in WP3 (atmospheric modelling) is totally independent of the mechanism of delivery.

The test, first scheduled for October 2011, has been delayed because funders believe that more talks about the social aspects are needed. It is now unlikely that the test will take place before April 2012. The UK media has recently picked up this story — see <http://www.bbc.co.uk/news/science-environment-15132989>