

CLIMATE

Geoengineering debate revives

UN group hosts high-level talks on controversial topic.

BY JEFF TOLLEFSON

The United Nations Environment Assembly is debating this week whether to launch a study of geoengineering technologies, which aim to cool the planet by reflecting sunlight away from Earth or sucking carbon dioxide out of the atmosphere.

A proposal backed by Switzerland and ten other countries would require the UN Environment Programme to prepare a comprehensive assessment of geoengineering by August 2020. The report would examine the underlying science and technology, and how to govern research and large-scale use.

“In principle, it’s a big deal,” says Ted Parson, who studies environmental law and policy at the University of California, Los Angeles. “This could be the start of the serious international deliberation on governance that has been needed for years.”

A final decision by government ministers could come at the end of the UN assembly’s meeting, which runs from 11 to 15 March in Nairobi. The resolution faces opposition from countries such as the United States and Saudi Arabia, and scepticism from non-governmental groups that oppose geoengineering.

Other UN bodies have considered geoengineering in the context of specific treaties. In 2010, the 196 member countries of the Convention on Biological Diversity called for a moratorium on geoengineering technologies; the non-binding decision includes exceptions for research. And in a series of decisions over the past decade, parties to the London Convention on ocean pollution have banned the commercial use of ocean fertilization — in which iron is released into the ocean to spur the growth of CO₂-absorbing algae — while laying out criteria for research.

But concerns about the global nature of solar geoengineering — the injection of reflective particles into the stratosphere — in particular have spurred efforts to give the governance debate more prominence within the UN. A fleet of high-flying aircraft could pump enough sulfur into the stratosphere to offset around 1.5°C of warming for between US\$1 billion and \$10 billion annually, according to the Intergovernmental Panel on Climate Change. The relatively cheap price has spurred concerns that individual countries could eventually pursue such a programme on their own, with global consequences. ■



Agung volcano on the Indonesian island of Bali erupts in November 2017.

EARTH SCIENCE

AI could help to predict eruptions

Satellite data and machine learning allow researchers to keep an eye on unmonitored volcanoes around the world.

BY ALEXANDRA WITZE

Volcanologists are combining satellite measurements of ground movements with artificial intelligence to more accurately monitor — and eventually predict — volcanic eruptions.

Although about 800 million people live within 100 kilometres of a volcano, very few of these potential natural hazards are monitored consistently. But emerging methods are now enabling researchers to keep a constant eye on volcanoes, says Juliet Biggs, a volcanologist at the University of Bristol, UK.

Her team will present its work, which uses machine learning to spot ground distortion around volcanoes, on 20 March at a conference in Santa Fe, New Mexico.

Biggs and her colleagues use radar

observations from two satellites that make up the European Sentinel-1 mission. Depending on their location as they orbit Earth, the craft collect data on the world’s volcanoes every 6, 12 or 24 days. As they repeatedly pass over the same spot, the satellites measure the distance between themselves and the ground. This can indicate whether that distance has changed over time — which can happen when the ground lifts or drops as magma shifts beneath a volcano.

But interpreting such data is not always straightforward. Water vapour in the atmosphere can mimic the signal of shifting ground, and researchers must account for this when looking at radar observations. These atmospheric distortions are particularly problematic when scientists are trying to work in near-real time.