



Wednesday 12 June 2019

Scientists and regulators to cut carbon levels have called for urgent action from scientists and regulators to enable decisions to be made within three years about which methods might work.

Marine geoengineering has been proposed as a possible way to reduce atmospheric carbon levels and avoid catastrophic climate change.

To keep global warming below the 1.5°C goal set by the [International Panel on Climate Change](#) (IPCC), 20 billion tonnes of CO₂ would need to be removed from the atmosphere each year until 2100.

In a Comment piece [published in the leading international science journal Nature](#), Institute for Marine and Antarctic Studies (IMAS) Professor Philip Boyd and UK researcher Dr Chris Vivian argue that little is known about the potential consequences of marine geoengineering and scant research has been carried out that could inform policy decisions.

Philip Boyd said:

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Professor Boyd said the geoengineering methods that have been proposed include fertilising the sea with iron to speed the growth of phytoplankton which take up CO₂, and spraying clouds with seawater to reflect sunlight and cool the planet.

They would need to be applied on a massive, ocean-wide scale to cap warming.

As the dangers mount, marine geoengineering needs a body of evidence to guide research and regulation.

Key findings include:

1. Researchers must identify and start to fill key knowledge gaps, and their results should be published and shared;
2. The potential benefits and drawbacks of each method should be assessed and ranked;
3. There must be scientific criteria for evaluating risks, and there should be a set of tests that experiments must meet to be permitted; and
4. If tests are passed, research should be scaled up.

The International Science Council should take the lead by promoting these steps, so informed decisions can be made on geoengineering, Professor Boyd said.