Less gloopy oceans will slow climate change

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Our changing climate will have an unexpected effect: it will make the oceans less thick and viscous. That is good news, as it should make the seas much better at burying atmospheric carbon out of harm's way on the seabed.

The effect is big enough to reduce the temperature rise by 8 per cent, says Jan Taucher of the Helmholtz Centre for Ocean Research at Kiel, Germany, who claims to be the first to model the change in stickiness.

Much of the carbon dioxide we pour into the atmosphere dissolves into the ocean, where it is taken up by growing organisms. When these organisms die, some of the carbon forms particles that sink to the ocean floor. To replace this buried carbon, the oceans absorb more from the air, which in turn curbs climate change.

Global warming may give this process a boost, says Taucher. Warmer water is less viscous, and a previous study suggested the particles will sink 5 per cent faster for every degree of warming, so more carbon will end up on the seabed.

Taucher added the viscosity effect to a model of ocean physics and chemistry and ran it until the year 4000, with emissions falling to zero after 2100. The world ended up 6 °C warmer, but the oceans absorbed 17 per cent more carbon dioxide than previously thought. That reduced overall warming by 8 per cent.

Sticky seas

The viscosity effect will not stop global warming, says Taucher. But it will slow it a bit.

His model predicts that the effect will be slow, because it assumes deep waters take centuries to warm. But they seem to be warming "much faster than previously estimated", says Taucher. "My guess would be that oceanic carbon uptake could be enhanced by the viscosity effect by 10-15 per cent." That should lead to 0.1 to 0.2 °C less warming within 100 years.

"I like this paper a lot. It has identified something important that is not in the models," says Tim Lenton of the University of Exeter, UK.

"But the world may turn out to be more complicated," says Lenton. Warm tropical waters produce smaller carbon particles than colder waters, and those particles are more buoyant and do not sink much. Such small particles could become more common as the oceans warm. "I would expect the greater buoyancy of smaller particles to trump the viscosity effect," says Lenton.

Some prospective geoengineers would like to boost the oceans' uptake of carbon by fertilising them with iron to encourage plankton growth. Taucher's work suggests the seas will do some of this work on their own.

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