

Chopping the Giving Tree – Climate Change in the Anthropocene

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The 2007 Fourth Assessment Reports of the Intergovernmental Panel on Climate Change (IPCC) classified evidence for human induced global warming as unequivocal. In the final report “Climate Change 2007: the Synthesis Report” the IPCC stated that some risks to the environment could be abrupt, or even irreversible. Scientific evidence for climate change is now not only an inconvenient truth but an incontrovertible one, where the global threat is real, contemporary, omnipresent and accelerating. So great is humanity’s ecological footprint on the planet that Nobel Prize winning scientist Paul Crutzen dubbed the 21st Century as the era of the Anthropocene – a geological period where humanity has become *the* dominant force of nature.

The 1994 United Nations Framework Convention on Climate Change (UNFCCC) has set the objective for humanity of achieving atmospheric stabilization of greenhouse gases in the atmosphere at level to prevent “dangerous” anthropogenic interference with the climate system. An atmospheric temperature increase of 2°C has been proposed as a reasonable upper limit, corresponding to a CO₂ level of 450ppm. Already at 380ppm, avoiding dangerous climate change requires deep cuts in anthropogenic CO₂ emissions -perhaps as high as 85% during the 21st century. Whilst some international efforts to reduce carbon emissions, improve energy efficiency and ramp up the deployment of renewable energy are laudable the fact remains that such actions may come too little too late. Carbon flux data show that the world’s oceans and sediments have experienced a net gain of carbon over the last 300 years, but there has been a net loss from the land. Simultaneous to our over exploitation of the oceans for food, raw materials and resources throughout the Anthropocene, the oceans have taken the strain in absorbing up the half of the atmospheric overburden of carbon dioxide. Now however, it is becoming apparent that the “Giving Tree” role of the oceans is in serious jeopardy. Yet, even now, we can turn to the resilience of the ocean to give us the Midas touch for atmospheric stabilization. Carbon capture and storage technologies hold great promise for slowing, and eventually reversing, the risk of dangerous climate change. However, great care is needed - some current geo-engineering proposals are tantamount to rolling the dice with global ecosystem security.

This presentation will explore the dynamic role of the ocean in atmospheric carbon regulation, and examines the potential for harnessing ocean science, technology and engineering to address the climate crisis.