Dr Tim Kruger, Oxford Geoengineering Research, UK

Venue: Marquee, National Oceanography Centre, Southampton
Date and time: Monday 6th September 2010 14:00 - 15:00h
Title: The case for geoengineering research

Tim Kruger is the founding director of Oxford Geoengineering Research
http://www.oxfordgeoengineering.org/about.php
OGR is currently a virtual organisation and it provides a means of building links between disciplines and institutions which share an interest in furthering our understanding in the field of geo-engineering. The intention is to create the Oxford Geoengineering Institute as a charity and to achieve the objectives laid out on the Home page http://www.oxfordgeoengineering.org/
Tim is currently researching a technique to remove carbon dioxide from the atmosphere (see www.cquestrate.com)

Abstract
We may not be able to reduce emissions sufficiently to avoid catastrophic climate change. This could be due to a lack of political will or technical ability or it could be that the climate may be more sensitive than we currently estimate. Last year's Royal Society report on geoengineering examined a wide range of proposed techniques which could to some extent counteract climate change. We need to examine in detail the technical and social aspects of the full range of proposed techniques to be able to assess which, if any, of them could be employed without countervailing side-effects.

Dr David Santillo, Greenpeace Research Laboratories, School of Biosciences,
University of Exeter, UK

Venue: Marquee, National Oceanography Centre, Southampton
Date and time: Monday 6th September 2010 14:00 - 15:00h
Title: Ocean Geoengineering: an intervention too far?

Dr David Santillo obtained a degree in marine and freshwater biology in 1989, and a PhD in marine microbial ecology in 1993, both from the University of London, before continuing with postdoctoral research into nutrient pollution in the Adriatic Sea. A senior scientist, David joined the Greenpeace Research Laboratories in 1994, and now has almost 15 years experience in organic analytical chemistry and development of policies for environmental protection. He has keen interest in the issues surrounding geoengineering.

Abstract
The term ocean geoengineering covers a diversity of propositions, from manipulating the carbon cycle by fertilization, enhanced upwelling or waste dumping, through attempts to manage seawater chemistry, to proposals to increase sea surface reflectivity by injection of microbubbles. What these

do have in common, however, is firstly the questionable assumption that ecosystems will respond positively, predictably and verifiably to large-scale human intervention and secondly a worrying focus on tackling the symptoms of global climate change rather than the real causes. Perhaps the most extensively researched to date, namely fertilization with iron, has shown little or no potential to mitigate climate change, with any increase in carbon flux to deep water being, at best, marginal and transient. Furthermore, the potential for negative and uncontrollable impacts has recently been highlighted by increased growth of harmful algal species in an iron-fertilized patch. Research into other ocean geoengineering techniques is in relative infancy, with some schemes merely conceptual in nature. To put faith in marine geoengineering, even as a possible 'emergency stop' measure, would therefore seem to be both unsustainable and unwise, and risks taking the pressure off the need for rapid and deep cuts in greenhouse gas emissions at source. The prevalence of commercial interests in 'proof of concept' raises additional concerns. The questions then arise as to whether field research into marine geoengineering should be permitted at all and, if so, how the distinction can be drawn between research and deployment. While it may be argued that some continued use of ocean fertilization as a research tool may be vital to improve understanding of biogeochemical cycles, its continued pursuit as a contribution to climate change mitigation would, on the basis of results to date, be wholly unjustified. At the very least, any proposals for research which entails uncontained manipulation of marine ecosystems on a significant scale, for whatever purpose, must be subject to a consistent, independent and transparent process of assessment and regulatory control. This presentation will set out some of the basic principles which should underpin such mechanisms of governance, consistent with long-standing legal obligations for the protection of the oceans.

Dr Emily Shuckburgh, University of Cambridge, British Antarctic Survey

Venue: Marquee, National Oceanography Centre, Southampton
Date and time: Tuesday 7th September 2010 09:05 - 09:50h
Title: Probing the Polar Oceans

Emily Shuckburgh is a fellow in Mathematics in Darwin College, University of Cambridge. She is also head of the Open Oceans research group at the British Antarctic Survey. Her research focuses on understanding the dynamics of the atmosphere and oceans and the distribution of chemicals such as ozone and pollutants. She is currently working on a five-year, multinational project in the Southern Ocean looking at the circulation of ocean currents due to salinity and temperature. The understanding of this is key to understanding climate change. Dr Shuckburgh was voted ''Smartest Woman in Britain'' in a 2002 BBC poll.

Abstract

Mixing plays a critical role in influencing the physics and biogeochemistry of the polar oceans. Mixing directly influences the distribution of tracers and indirectly influences the dynamics via the impact on the buoyancy structure. Indeed, climate models are highly sensitive to the representation