GESAMP Working Group 41 on Ocean Interventions for Climate Change Mitigation

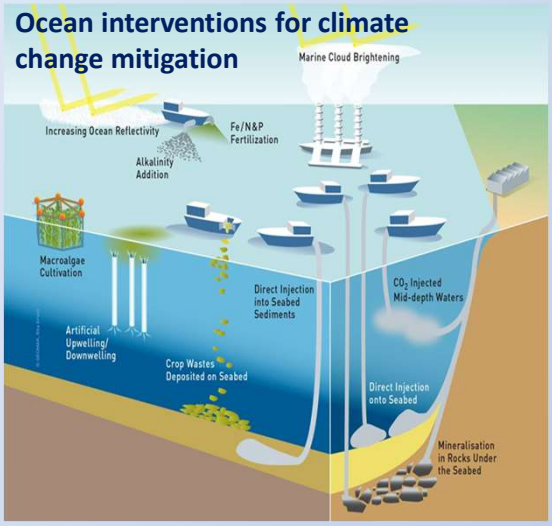
Potential contributions to enable ocean carbon dioxide removal to achieve net zero emissions and climate recovery

The Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection (GESAMP) an inter-agency body that advises the UN system on the scientific aspects of marine environmental protection

http://www.gesamp.org/

GESAMP established Working Group 41 on Ocean Interventions for Climate Change Mitigation (previously marine geoengineering) in 2015 under the lead of IMO and supported by IOC of UNESCO and WMO, co-chaired by Dr. Chris Vivian and Professor Philip Boyd

http://www.gesamp.org/work/groups/41



"deliberate intervention in the planetary environment of a nature and scale intended to counteract anthropogenic climate change and its impacts".

Why the marine environment?

- Our seas have a much larger areal extent than land
- The ocean plays a key and multi-faceted role in the natural Carbon cycle
- With its great depths (> 4 km) ocean trenches & extensive sea floor, the ocean has unique features with potential for Carbon Dioxide removal (CDR)

The Paris Agreement calls for a dual approach to limiting warming to 2C or less using both emissions reductions and the enhancement of sinks for greenhouse gases.

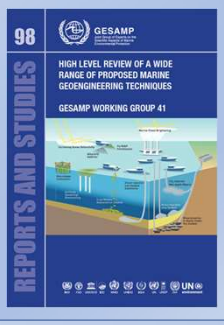
WG41 Objectives

1. Better understand the potential environmental and wider societal impacts of different marine geoengineering approaches: and
2. To provide advice to the London Protocol Parties to assist them in identifying those marine geoengineering techniques that it might be sensible to consider for listing in the new annex 4 of the Protocol

WG41 First Phase

Carried out a '***High level review of a wide range of proposed marine geoengineering techniques***' published in March 2019

http://www.gesamp.org/publications/high-level-review-of-a-wide-range-of-proposed-marine-geoengineering-techniques



WG41 Main Findings

The first dedicated assessment of the wide range of proposed marine geoengineering approaches.

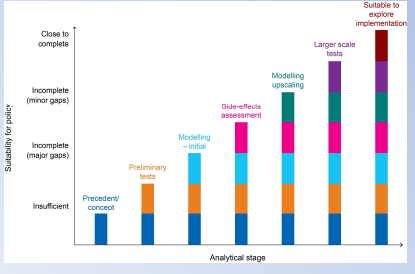
- Catalogued 27 approaches from categories spanning Carbon Dioxide Removal (CDR), Albedo Modification (AM), and hybrid technologies
- The information available on proposed techniques varied widely
- For all techniques information on approaches available in the permanent public record, and/or as peer-reviewed documents, is **inadequate to permit a robust scientific assessment, much less one that can be readily intercompared with other approaches to climate intervention**.

Main Findings cont.

Although decisions on policy formulation or governance are often based on incomplete information, for many of the approaches examined the knowledge available was viewed to be insufficient for evidence-based decision-making.

These major gaps raise issues regarding the ability to effectively communicate the aspects of geoengineering to the general public. The report provides guidelines for proponents on the series of steps needed to support an evidence-based assessment.

Steps to support a scientific assessment



The next phase of WG41

Develop a framework to integrate inputs from **natural sciences and societal disciplines** into a holistic assessment of ocean interventions for climate change mitigation

Stimulate information gathering to **fill the knowledge gaps, enabling robust scientific assessment** and improved modelling simulations, at the scale of ocean basins and multiple decades, to look at spatial and temporal extrapolation of climate intervention approaches

Encourage a stronger dialogue between modellers and scientists (conducting lab and field studies) to improve model accuracy and hence reduce uncertainties in projections.

= thorough scientific and societal assessment of potential ocean interventions for climate change mitigation so that their potential contribution to net zero and climate recovery can be reliably evaluated