



PLANNING OF GESAMP ACTIVITIES:

OCEAN INTERVENTIONS FOR CLIMATE CHANGE MITIGATION

Report of the Co-Chairs of Working Group 41

Activities of the Working Group

1 Since the last GESAMP session in September 2021 we have recruited two additional members, one from Germany and one from China. Currently, WG 41 has ten male members and seven female members with eleven members from Western/Europe/North America and seven from other parts of the world.

2 Since the last GESAMP meeting, we have had three working group meetings, in July 2021, November 2021 and March 2022 with the main focus of discussions being the proposed Integrated Assessment Framework (IAF). Good progress has been made in developing the framework with the aim to have a draft version available for external review/discussion by the end of 2022.

3 In addition, we established sub-groups on blue carbon and on drafting the questionnaire for ToR 11.1. The blue carbon sub-group had its first meeting on 18 March 2022 and agreed the following tasks:

- .1 Review the relevant literature;
- .2 Assess potential interventions to increase carbon sequestration by blue carbon ecosystems;
- .3 Consider monitoring and verification for carbon sequestration (also definitions); and
- .4 Review standards for carbon sequestration accounting

4 In late 2021, Chris Vivian drafted an updated draft submission to the London Convention/London Protocol (LC/LP) Scientific Groups meeting to assist the London Protocol Parties in identifying marine geoengineering techniques that it might be prudent to consider for listing in the new Annex 4 of the Protocol (addressing part of ToR 11.3). It was circulated to the working group members and the Chair of GESAMP for comments and after some amendment, it was submitted to LC/LP Scientific Groups meeting that was due to take place in April 2022.

5 The 45th joint session of the LC/LP Scientific Groups was held virtually from 28 March to 1 April 2022, and the GESAMP WG 41 document was considered and discussed. In addition, Chris Vivian gave a presentation to the meeting on a number of further marine geoengineering projects that had been proposed since the submission of the GESAMP WG 41 document covering seaweed farming, CO₂ extraction from seawater and ocean alkalization. A number of delegations welcomed the updated information from WG 41.

6 There was general consensus that the marine geoengineering techniques identified by the GESAMP WG as highest priorities merited urgent consideration by the Scientific Groups namely:

- .1 fertilization for fish stock enhancement;
- .2 macroalgae cultivation for sequestration including artificial upwelling;
- .3 microbubbles/reflective particles/material;
- .4 marine cloud brightening;
- .5 alkalization of the ocean by adding alkaline material directly to the ocean or by electrochemistry;
- .6 mineralization of CO₂ in rocks under the seabed; and
- .7 extraction of CO₂ from seawater.

7 In the discussion that followed a number of delegations generally agreed with the seven marine geoengineering techniques identified by GESAMP WG 41 as priorities and supported further discussion on establishing a clearing house mechanism to compile information submitted by LC/LP Parties and observer organizations concerning proposed marine geoengineering techniques.

8 Following discussions in a working group, the Scientific Groups re-established the Correspondence Group on Marine Geoengineering, under the lead of Italy, with the following terms of reference:

- .1 provide recommendations on the possible inclusion of marine geoengineering activities in the new annex 4 to the London Protocol (2013 amendment) using the following as initial sources of information:
 - the information provided by GESAMP WG 41 in documents LC/SG 45/3;
 - the Assessment framework for scientific research involving ocean fertilization (LC 32/15, annex 6);
 - the Guidance for consideration of marine geoengineering activities (Circular LC-LP.1/Circ.67); and
 - comments made in plenary and any additional sources of information.

9 At the invitation of the Carnegie Climate Governance Initiative (C2G, see <https://www.c2g2.net>), GESAMP WG 41 co-sponsored a side event at the UN Oceans Conference on 1 July 2022 on 'Marine Cloud Brightening – A Governance Dilemma'. Chris Vivian introduced GESAMP and C2G and Miranda Boettcher, a member of WG 41, was the moderator for the event. A recording of the event is available at <https://www.c2g2.net/un-ocean-conference-2022/>.

Action requested of GESAMP

10 GESAMP is invited to note the information provided and to take action as appropriate.
