



GESAMP

Joint Group of Experts on the
Scientific Aspects of Marine
Environmental Protection

49th session
Agenda item 4

GESAMP 49/4/4

21 Aug 2022

ENGLISH ONLY

PLANNING OF GESAMP ACTIVITIES:

Climate Change and Greenhouse Gas Related Impacts on Contaminants in the Ocean

Report of the Chair of Working Group 45

1 During the past year, GESAMP WG 45 held one virtual meeting and has focused its attention on three main activities: (i) production of a peer-reviewed publication; (ii) consolidation of four thematic sub-groups (i.e., metals, organic pollutants, nutrients, and radionuclides) to work in parallel; and (iii) literature review focusing on the effects of climate change on the pollution of coastal systems (e.g., bays, estuaries, blue carbon ecosystems).² The annual group meeting was to be held in June 2022 at IAEA, Monaco. Unfortunately, due to COVID-19, this i has now been postponed to 28 to 30 September 2022. Instead, a virtual meeting was held on 29 June 2022. The decisions and accomplishments of the meeting are:

- .1 To formally introduce the two new members Justin Gwynn and Pamela Noyes, who replaced Maeve Lohan and Lorraine Currivan (Annex 1). The new members are specialists on radionuclides and ecotoxicology, respectively, who have already contributed to the literature review as experts (Annex 3).
- .2 The leaders of each sub-group presented the work's advancements in gathering, compiling, and reviewing the available literature on the sensitivity of ~~excess~~ anthropogenic nutrients, trace metals, organic pollutants, and radionuclides to climate change drivers.
- .3 Plans were developed to advance the work focused on coastal ecosystems to have a mature and finalizing discussion during in-person meeting in September 2022. From there, we ~~planned~~ to start focusing our activities on open ocean.

4 The group has published a perspective manuscript (Hatje et al., 2022. "Emergent interactive effects of climate change and contaminants in coastal and ocean ecosystems". *Front. Mar. Sci.* 9:936109. doi: 10.3389/fmars.2022.936109), where it calls for a coordinated effort to assess the interaction between? and impacts of climate change on contaminants in marine environments. In this manuscript, the group discussed how the interaction between climate change and contaminants leads to poorly constrained impacts that affect the sensitivity of organisms to contamination leading to impaired ecosystem function, services, and risk assessment evaluations. The group also highlighted that the holistic consideration of the pollutants-climate change nexus has significant knowledge gaps but will be important in understanding the fate, transport, speciation, bioavailability, toxicity, and inventories of contaminants. Greater focus on these uncertainties would facilitate improved predictions of future changes in the global biogeochemical cycling of pollutants and human health and marine ecosystems.

Action requested of GESAMP

5 GESAMP is invited to consider the information provided and to take action as appropriate.

ANNEX 1

WG 45 members

Name	Country	Subject
Vanessa Hatje (Chair)	Brazil	Marine pollution, blue carbon ecosystems, biogeochemistry
Sarin Manmohan (Co-chair)	India	Biogeochemistry, radionuclides, atmospheric transport of contaminants
Elisabeth Holland	Fiji	Climate change
Sylvia Sander	Germany	Biogeochemistry, metal speciation
Purvaja Ramachandran	India	Nutrients
Pamela Noyes	United States	Ecotoxicologist, organic pollutants, climate change
Nuria Casacuberta	Switzerland	Radiotracers, ocean circulation, SPM fluxes
Ricardo Barra	Chile	Persistent organic pollutants
Dario Omanovic	Croatia	Trace elements, speciation, speciation modeling
Alessandro Tagliabue	United Kingdom	Modeller, ocean biogeochemistry, trace elements
Christoph Voelker	Germany	Physical oceanography, modeling
Justin Gwynn	Norway	Radiochemist

ANNEX 2

Terms of Reference for WG 45

Terms of reference for WG 44

1. Critically review existing research on:
 - a. The effect of changes in ocean physics and chemistry on the speciation, cycling, fate and bioavailability of diverse contaminants including trace elements, radionuclides, organic pollutants and nutrients.
 - b. The effect of such changes on important coastal and marine resources.
2. Identify knowledge gaps.
3. Make recommendations for future research directions on the effect of changes in ocean physics and chemistry on the speciation, cycling and bioavailability of diverse contaminants including trace elements, radionuclides, organic pollutants and nutrients.
4. Develop a plan for publication and dissemination of the findings of the WG.
5. Propose additional work relevant to the topic of the WG that may be useful to the sponsoring agencies and which could be carried out by the WG beyond what is listed above.

ANNEX 3

Experts contributing to systematic reviews

Sub-group Organic Pollutants	
Name	Country
Begoña Jimenez	Spain
João Torres	Brazil
Rainer Lohmann	United States
Daniele Miranda	United States
Rolland Kallenborn	Norway
Fabio Torres	Brazil
Yago Guida	Brazil
Gabriel O de Carvalho	Brazil
Sub-group Nutrients	
Name	Country
Adina Paytan	United States/Israel
Claudia Benitez-Nelson	United States
Dennis Swaney	United States
José E. Martinelli Filho	Brazil
Mike Elliot	United Kingdom
Ramesh Ramachandran	India
Cristina Richardson	United States
Sub-group Metals	
Rebecca Zitoun	Germany
Saša Marcinek	Croatia
