

2020 Annual SCOR Working Group Report

1. Name of group

SCOR WG 155 Eastern Boundary Upwelling Systems (EBUS): Diversity, Coupled Dynamics and Sensitivity to Climate Change

2. Activities since previous report to SCOR (e.g., virtual or in-person meetings, email discussions, special sessions). Limit 1000 words

Virtual Annual Meetings: A full WG meeting was held on 17 December 2020. The meeting was focused on the steps to achieve the terms of reference (TdR) 1 and 2 and associated deliverables.

Virtual Meetings for Review Article: A full WG meeting was held on 28 January 2021. Subgroups meetings were held on 20 May 2021 and June 2021. Very active discussions over e-mail have also been occurring from December 2020 to present. Documents have been shared via google drive https://drive.google.com/drive/folders/1q_qwj0jy4BhoGJrfsWopJbN01KxwT-Wi?usp=sharing

Virtual Meeting for the Open Science Conference: The Open Science Conference (OSC) programmed for 2021 was cancelled due to COVID. The OSC is now planned for September 2022 and virtual meetings have been occurring regularly starting on 30 March. Members of the WG together with other convenors are actively working on the program and associated web site. Related documents can be found in the following link <https://drive.google.com/drive/folders/1PsL48f5Yunr0Oxj5dzcPeVnbTKUSIYUk?usp=sharing>

Virtual Meetings and E-mails discussion for the web portal: Several virtual meetings were held between December 2020 and March 2021 to advance this task with Peruvian collaborators. The portal can be found on <https://ebus.science>

Further information related to WG can be found in <https://scah.igp.gob.pe/scor-working-group-155>

3. Documents published since previous report to SCOR (e.g., peer-reviewed journal articles, reports, Web pages) and should be limited to publications that resulted directly from WG activities and which acknowledge SCOR support

Contributions from WG Members that acknowledge SCOR 155 EBUS WG:

- Web platform <https://ebus.science>
- GO2NE webinar series on June 24th <http://www.ioccp.org/index.php/more/777-webinar-on-ocean-deoxygenation-24th-june-2021-14-00h-15-00h-utc>
- Participation to regional program as SCOR WG EBUS representative: CLAP (Research Program for Climate Action Planning)
- Grégoire et al. (Submitted) A global ocean oxygen database and atlas for assessing and predicting deoxygenation and ocean health in the open and coastal ocean, *Frontiers in Marine Science*
- Parouffe et al. (Submitted) South East Pacific Oxygen Minimum Zone future habitability using climate velocities, *Nature Geoscience*

4. Progress toward achieving group's terms of reference. List each term of reference separately and describe progress on each one. Limit 1000 words

Our progress toward achieving the TORs include the following:

Deliverable #1. A scientific review paper on the value of ocean observation and modeling in relation to ecosystem services and climate in EBUS and a summary for policy makers will be the key deliverables.

Members of the WG are actively working on this paper.

Deliverable #2. Develop an information system for EBUS.

Before starting the development of the information system, WG members reviewed and evaluated existing systems (e.g., POMEQ, EMODNET, CCLME ECO-GIS viewer, PaclOOS, Windy, GEOOS, COPERNICUS). It was found that these platforms covered the requirement of accessing data from EBUS regions. The WG instead invested in the development of a platform for finding published scientific information on EBUS within a graphical environment (<https://ebus.science>). The platform was developed in collaboration with the Sustainable Computing Research Center of the University of Engineering and Technology (UTEC) of Peru, with undergraduate students participating in the development. This exercise opened up a new window for the university and their students into EBUS oceanography. The WG has also identified other sources of data in EBUS (i.e. private industry, universities, government institutions) that will require further work to get the data into international repositories. This effort is ongoing.

Deliverable #3. Determine the strengths and weaknesses of existing EBUS coupled physical-biological models.

WG members are analyzing global IPCC models (RCP8.5, NEMO-PICES, CESM-LE) to evaluate biases in EBUS. This analysis will also help determine which models provide the best set of boundary conditions to be used in EBUS coupled ocean-atmosphere models. The present focus is on physics (primarily) and some biogeochemistry.

Deliverable #4. Recommend a framework for regional interdisciplinary (physics to biology) EBUS observing and modeling systems.

Members of the WG have been working with other interested parties (e.g. IMARPE, IRD, IOC) to organize an Open Science Conference on EBUS in Lima in September 2022. This conference is an activity in support of this deliverable in that it will help define the framework.

5. WG activities planned for the coming year. Limit 500 words

Planned activities include: 1) completing and submitting the review article; 2) continue the organization of the Open Science Conference; 3) complete the analysis of the IPCC models and prepare a report/publication; 4) Write up a recommendation for the framework for EBUS observing and modeling systems. We will be participating in the first forum for South America organized by WCRP Climate Research Forum.

6. Is the group having difficulties expected in achieving terms of reference or meeting original time schedule? If so, why, and what is being done to address the difficulties Limit 200 words

Unfortunately, the current situation due to the COVID-19 pandemic has influenced the time dedicated to the work and actions in this WG. Lately, we relied on virtual meetings and e-mail interactions to

maintain activities of the WG, however, sometimes the daily days are overfilled without having dedicated time for this activity. Placeholder for letter.

7. Any special comments or requests to SCOR. Limit 100 words.

Over the last 2 years, starting in early 2020, the entire world has been impacted by the COVID-19 pandemic. The impact has been particularly severe in South America, Peru and Chile in particular, basically bringing activities to a standstill. Two key activities of the working group, the 2020 Summer School along with the workshop and meeting of the WG at Dakar, Senegal, and the EBUS Open Science Conference in 2021, were cancelled. While some activities were carried on through video or phone conferences they could not replace the progress that would have been possible with several weeks of face-to-face meetings. The EBUS Open Science Conference (OSC) has now been rescheduled for September 2022 in Lima Peru with the WG being active in its organization. The EBUS OSC will be an important opportunity for the WG to meet in person and make progress. Therefore we would like the SCOR leadership to consider extending the WG through June of 2023.

Additional information can be submitted and will be included in the background book for the SCOR meeting at the discretion of the SCOR Executive Committee Reporter for the WG and the SCOR Secretariat.