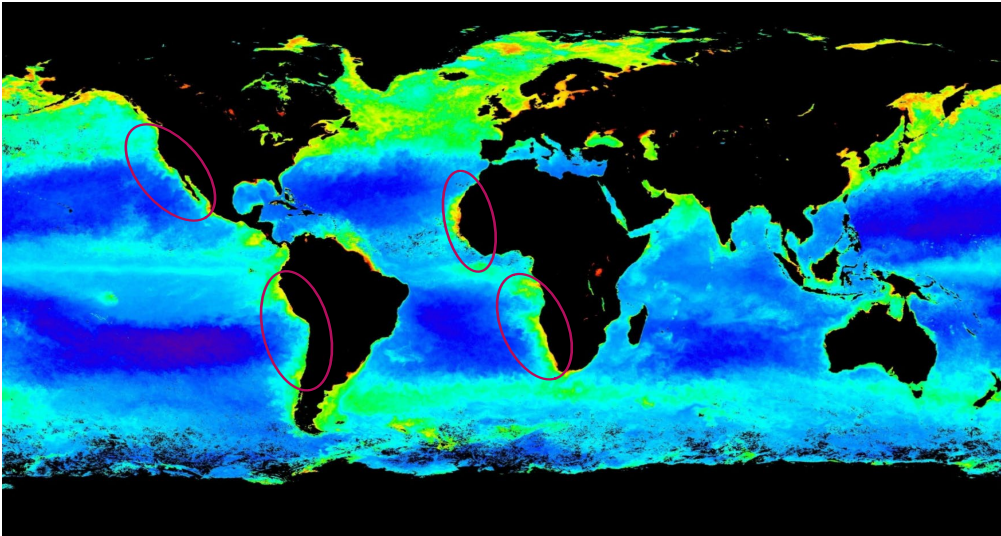




# SCOR Working Group 155 Eastern Boundary Upwelling Systems (EBUS): Diversity, Coupled Dynamics and Sensitivity to Climate Change

<https://www.igp.gob.pe/programas-de-investigacion/ciencias-de-la-atmosfera-e-hidrosfera/proyectos/SCOR>



- **EBUS are highly productive marine ecosystems**
- **Sustaining ca 40% of the world's fisheries.**
- **Wind-driven coastal upwelling is the key process promoting biological productivity**
- **EBUS play a global role in biogeochemical cycles in the ocean and climate regulation, and have important socio-economic implications for several countries**



Imagery ©2018 NASA, TerraMetrics, Map data ©2018 Google, INEGI 2000 km



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## Starting by mid 2018 **TERMS OF REFERENCE**

**ToR #1.** Synthesis of the available scientific information on EBUS

**ToR #2.** Develop a Web portal for EBUS data

**ToR # 3.** Analysis of existing EBUS coupled physical-biological models

**ToR # 4.** Recommending a framework for regional management



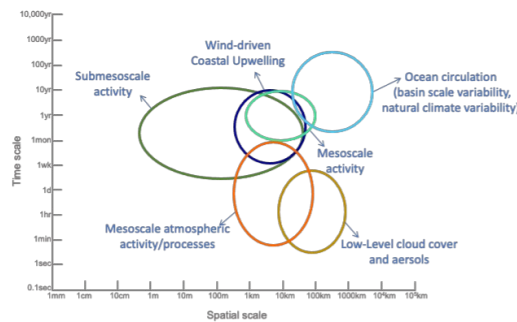
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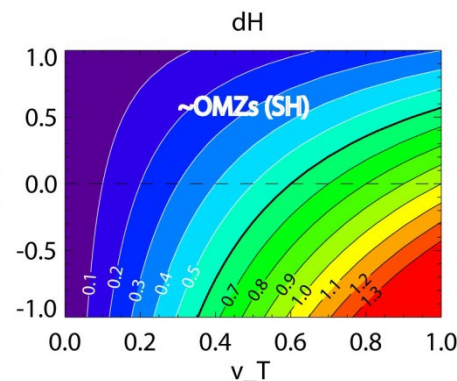
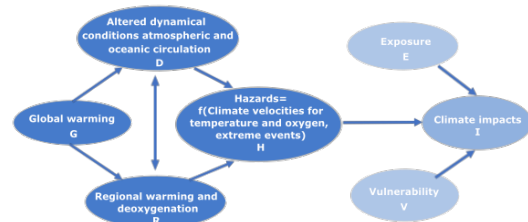


## ToR #1. Synthesis of the available information about EBUS:

*Montes et al.* Ecosystem services and climate change in EBUS: the value of ocean observing and modeling (final stage for submission).



Physical Process	Relevant Parameters (RVP)	Relevant Processes (RP)	Impacts on the physical system (IP)	Define the marine ecosystem (DEME)	Support the marine ecosystem (SEME)
Wind-driven Coastal Upwelling	• Wind stress • Surface and subsurface currents • Sea surface temperature and salinity	• Temperature • Salinity • Density • Turbulence • Mixing	• Ocean circulation • Ocean circulation • Ocean circulation	• Ocean circulation • Ocean circulation • Ocean circulation	• Ocean circulation • Ocean circulation • Ocean circulation
Mesoscale activity	• Temperature • Salinity • Density • Turbulence • Mixing	• Temperature • Salinity • Density • Turbulence • Mixing	• Ocean circulation • Ocean circulation • Ocean circulation	• Ocean circulation • Ocean circulation • Ocean circulation	• Ocean circulation • Ocean circulation • Ocean circulation
Mesoscale atmospheric activity/processes	• Wind stress • Surface and subsurface currents • Sea surface temperature and salinity	• Temperature • Salinity • Density • Turbulence • Mixing	• Ocean circulation • Ocean circulation • Ocean circulation	• Ocean circulation • Ocean circulation • Ocean circulation	• Ocean circulation • Ocean circulation • Ocean circulation
Low-Level cloud cover and aerosols	• Wind stress • Surface and subsurface currents • Sea surface temperature and salinity	• Temperature • Salinity • Density • Turbulence • Mixing	• Ocean circulation • Ocean circulation • Ocean circulation	• Ocean circulation • Ocean circulation • Ocean circulation	• Ocean circulation • Ocean circulation • Ocean circulation



Annual  
Meeting  
Sep 2022





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### ToR #2. Develop a Web portal for EBUS <https://ebus.science>

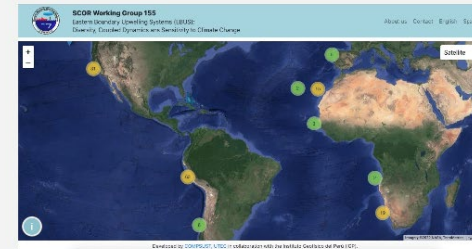
Decision-makers need access to sufficient and reliable documentation, where data can be located, the analysis of information based on clear, robust and well documented methods, as well as to new findings and challenges.

The primary sources proving first-hand information are from scientific research papers, available in different journals. This issue is well recognized within the scientific community, although it is unknown for non-scientists.

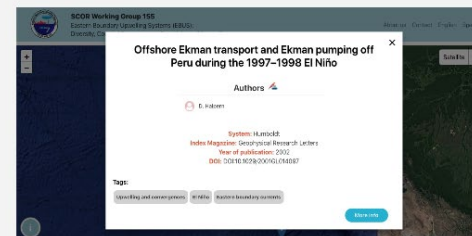
Ebus.science is therefore a platform and highly valuable tool for finding published scientific information on Eastern Boundary Upwelling Systems (EBUS) in a friendly and graphical environment.

<https://ebus.science>

(1) In the platform, blue pins on a world map are used for georeferencing scientific research papers (or also called articles) about EBUS, where the geo location is referred to the study area or the position of the data available in the article. If the pins are close, they are grouped and, as a result, a circle with the total number of grouped pins is visualized. By clicking on the circle, the individual pins will be visible.



(2) Going back to the blue pins, by clicking on it, the title of the scientific research paper will appear.



(3) by clicking on 'more info', additional details will appear such as scientists involved in the study (author and coauthors), year of publication, the DOI (digital object identifier) and the journal where the paper was published. In addition, by clicking on 'more info', you will redirect to a certain page where the article is located.

The platform was developed with the assistance of undergraduate students; this exercise has therefore opened up a new window for the university and their students into the EBUS oceanography.



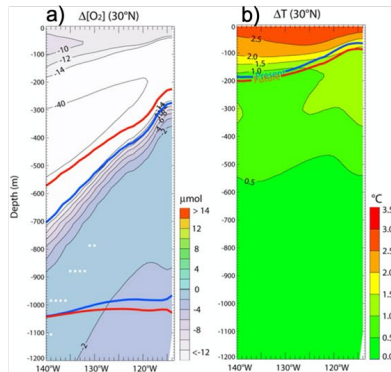
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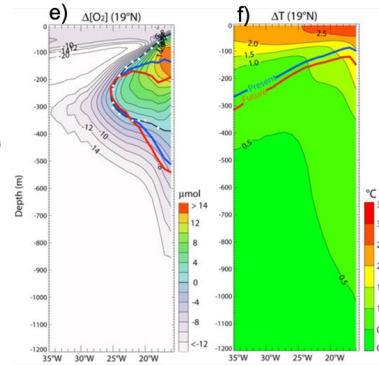


## ToR # 3. Analysis of existing EBUS coupled physical-biological models

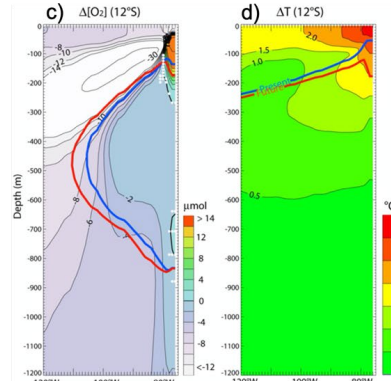
California



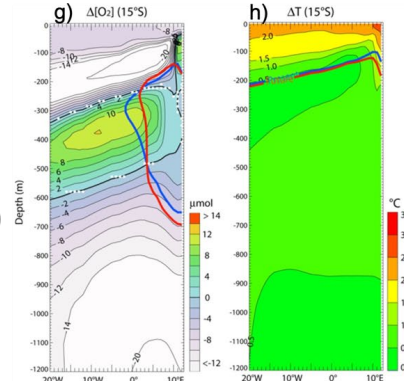
Canary



Humboldt (North)



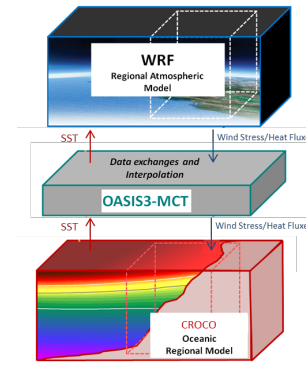
Benguela



Partial analysis with CMIP5 which is being incorporating in summary paper (ToR #1)

Projects:

- CLAP project case study
- SEPICAF Project
- Regional Earth System Model (RegESM) for Humboldt System







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ToR # 4. . <https://www.ebus-lima2022.com>



Open Science Conference on Eastern Boundary Upwelling Systems  
(EBUS): Past, Present and Future

&

Second International Conference on the Humboldt Current System

19-23 September 2022



+ 400 participants (in person and remote)  
270 talks and 175 posters



- Early career scientist event
- Open parallel events



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ToR # 4. . <https://www.ebus-lima2022.com>

Early Career Scientist event



Ocean Literacy



Executive Panel



ECS supported  
by SCOR





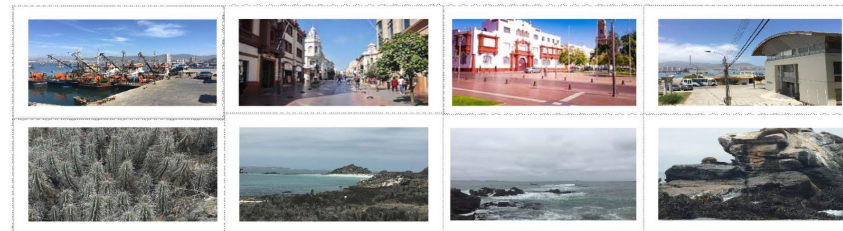
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**GOOD-OARS-CLAP-COPAS SS2023:**  
**GOOD-OARS-CLAP-COPAS Summer School**  
**6-12 November 2023, Coquimbo-La Serena, Chile**

**Summer School:  
postponed/cancelled  
Partial participation of  
WG Members at  
Coquimbo, Chile 2023**



**Directors**

Véronique Garçon, CNRS/LEGOS, France  
Boris Dewitte, CEAZA/UCN, Chile  
Camila Fernandez, CNRS/Univ. Concepcion, Chile

**Scientific Committee :** Marilaure Grégoire ,

Véronique Garçon, José Martin Hernandez-Ayon, Kirsten Isensee,  
Diego Narvaez, Oscar Pizarro, Andreas Oschlies,  
Boris Dewitte, Camila Fernandez, Laura Farias

**Organizing Committee :** Kirsten Isensee, Véronique Garçon,

Marcel Ramos, Boris Dewitte,  
José Martin Hernandez-Ayon, Camila Fernandez (UdeC), Victor  
Aguilera (CEAZA), Maria Valladares (CEAZA), Diego Narvaez (UdeC)





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## REMARKS AND PENDING ACTIONS

- **Completing and publishing the review paper**
- **Participation of WG Members at Summer School in Coquimbo, Chile**
- **Editing, reviewing and publishing process of Special Issue in Deep Sea Research II Proceedings from the EBUS Conference**
- **Completing and feeding the EBUS Web Portal**