

# IMPROVING AND INTEGRATING EUROPE'S CAPABILITY IN BIOLOGICAL OCEAN OBSERVATIONS

Concept Note, May 2021

As indicated in the EOOS Strategy 2018-2022, a guiding principle for the European Ocean Observing System (EOOS) is 'Connecting communities, coordinating efforts and engaging diverse stakeholders' and one of the main focus areas is a 'Better Coordinated and Sustained *In Situ* Ocean Observing'. Biological ocean observations are often more complex to measure than physical or biogeochemical observations. This yields a greater price-tag per bit of information and a significant amount of time to process and often interpret, hampering biological ocean observations to fully become operational (Benedetti-Cecchi *et al.*, 2018). To support a sustained and standardised biological observing system, two complementary frameworks exist at international level:

- The Biology and Ecosystem Essential Ocean Variables (EOVs), defined by the Global Ocean Observing System Biology and Ecosystem Panel (GOOS BioEco Panel), as a set of standardised procedures of ocean monitoring activities, to be conducted anywhere in the global ocean;
- The marine Essential Biodiversity Variables (EBVs), curated by the Marine Biodiversity Observation Network of the Group on Earth Observations Biodiversity Observation Network (GEO BON MBON), as a set of biological state variables needed to detect biodiversity change.

To work together and coordinate a global marine biodiversity observing system, in 2016, the GOOS BioEco Panel, the GEO BON MBON and the Ocean Biogeographic Information System (OBIS, as custodian of the data) signed an agreement. This agreement sets the plan to develop and streamline the implementation of biological EOVs and marine EBVs and increase the monitoring programmes that include these variables. Muller-Karger *et al.*, 2018 explain the many connections between EOVs and EBVs.

In addition, a foresight analysis conducted by European Marine Board on Europe's capability in biological ocean observing (Benedetti-Cecchi *et al.*, 2018, Task 2.1.1 of the EOOS implementation plan) has the following recommendation to improve and integrate biological ocean observations in Europe:

*Identify key steps for designing and implementing a strategic vision on biological ocean observations, bringing together key stakeholders, to provide the necessary long-term support to a balanced and integrated ocean observing system that is a direct contribution to the European Ocean Observing System (EOOS) and harmonized with the Global Ocean Observing System (GOOS).*

However, many current biological ocean observations follow neither of these two frameworks per se (due to historical reasons), such as national environmental monitoring, genetic observations or remote sensing. So, focusing on these two international frameworks would leave out many important observations from Europe.

EOOS is seen as a good opportunity and key to ensuring progress, maturation and promotion of an integrated observing system based on EOVs and EBVs in Europe (Benedetti-Cecchi *et al.*, 2018). The EOOS action on mapping existing infrastructures and capabilities will be key to investigate the use of EOVs and EBVs in Europe, and connections should be explored with the EOOS action on MSFD monitoring optimisation.

Working to integrate biological observations into the mix of ocean observations has been reinforced, for instance, through a dedicated session on the OceanObs'19 conference (September 2019). Additionally, opportunities have emerged to sustain efforts currently taken under GEO BON MBON, the GOOS BioEco Panel and Horizon 2020, in Europe and globally, namely:

- Two half-time positions support the GEO BON MBON: a part-time programme manager and a part-time administrator at the AIR Centre in the Azores. They coordinate activities with the GEO BON Secretariat and with MBON Co-Chairs (Isabel Sousa Pinto, Massa Nakaoka and Frank Muller-Karger) and Steering Committee;

- A full-time position at CSIRO in Australia supports the GOOS BioEco Panel, working part-time for the Horizon 2020 project EuroSea (Task 1.1.2 led by IOC/UNESCO). Work with EuroSea project includes: (i) mapping the current biological ocean observing networks and capabilities; and (ii) organising workshops to reach agreement on observation strategies, data sharing practices, and best practices and standards.

Considering these opportunities, the EOOS Steering Group currently supports regular exchange between the EuroSea officer (supporting the GOOS BioEco Panel), the EuroGOOS officer mapping European infrastructures (see related concept note), and the GEO BON MBON officers.

## Next steps:

- Keep organising joint meetings between EOOS Steering Group representatives, the GEO BON MBON AIR Centre officers and MBON Co-Chairs, GOOS BioEco panel, and key contacts from the EuroSea project to plan this activity's coordination.
- Support efforts of 'Mapping existing ocean observing infrastructures and capabilities' related to biological observing networks.
- In 2021, a planned workshop supported by the EuroSea project will count on input from this group. This workshop will aim to reach an agreement on observation strategies, data sharing practices, and best practices and standards for Europe. Proposed actors to be invited include representatives from GEO Blue Planet, ICES, ETN, MARS, Euromarine, EMBRC, JERICO, LifeWatch, ELIXIR, EMODnet, CMEMS, Regional Sea Conventions, JRC and its new Biodiversity Knowledge Centre, EU Biodiversity Partnership and structures in place within DG ENV and DG MARE.