

EOV Adoption Process as approved by GOOS Steering Committee

January 2024

Introduction

Established in 1991, The Global Ocean Observing System (GOOS) is co-sponsored by the Intergovernmental Oceanographic Commission of UNESCO, the World Meteorological Organization, the United Nations Environment Programme, and the International Science Council.

In its first decades, GOOS designed and coordinated the development of a global ocean observing system to support climate science and to serve as the observational backbone for operational forecast systems. In 2012, this success, coupled with growing concerns about the health of oceans and demand for information products to help nations manage their ocean economies, sparked development of the visionary **Framework for Ocean Observing**: a guide to meet the needs of multiple stakeholders. GOOS has since led the implementation of this framework by the ocean observing community, with the goal of serving users across climate, operational services and ocean health, increasingly with a focus on coastal areas and regional seas (taken from GOOS 2030 Strategy).

The FOO applies a systems-design approach to guide ocean observing communities in establishing requirements for an integrated, fit-for-purpose, sustained global ocean observing system, focused in measuring a limited number of variables: the GOOS **Essential Ocean Variables (EOVs)**.

The EOVs are *physical, biogeochemical, biological, and some early human impact, sustained measurements or combinations of measurements, which are needed to assess ocean state and change of a global nature, and to provide applications in support of societal benefits*. Under the hood of the EOVs lie the key phenomena that we are trying to track and characterise. **Phenomena** are processes, events, or properties in the ocean that have distinct spatial and temporal scales which, when observed, inform on ocean state and ocean change. Each EOV is constituted by one or several **sub-variables**, which are the key measurements that are used to estimate the EOV.

There are currently (as of 30/Jan/24) 35 EOVs divided by disciplines: physics (12 EOVs), biogeochemistry (8 EOVs), biology and ecosystems (12 EOVs) and three EOVs that are cross-disciplinary and also linked to human impacts.

The GOOS Expert Panels are responsible for the stewardship of existing EOVs and for identifying new EOVs. The final adoption of new EOVs lies in the GOOS Steering Committee, but the adoption process has not been formalised so far. This document describes the steps that lead to the inclusion of a EOV in the GOOS EOV list and identifies who is in charge of each part of the process.

GOOS Steering Committee in its Online Intersessional meeting on 30 January 2024 approved the "Process to adopt new GOOS Essential Ocean Variables (EOVs)". The process can be reviewed and re-submitted for approval to GOOS SC as required.

Process to adopt new GOOS Essential Ocean Variables (EOVs)

1. The proposal shall be put forward by a group of experts representing a community to the relevant GOOS Expert Panel(s)¹ under which the EOV will be managed.
2. The proposal shall justify why the EOV should be adopted, demonstrating:
 - I. that the systematic and sustained observation of the EOV at a global scale is technically, politically and economically feasible using proven, scientifically understood and ethical methods;
 - II. that the systematic and sustained observation of the EOV at a global scale will improve the understanding of ocean phenomena with relevance for at least one of the GOOS overarching societal benefits areas: climate, weather and hazard warnings, and ocean health. The EOVs need to address the needs of users, whether from science, government or the private sector, and the justification for observing the EOV must be supported by the broader community as detailed in articles, reports from expert meetings or workshops etc.;
 - III. that the EOV is essential to address a societal problem and/or understand certain phenomena (i.e. they cannot be sensibly replaced by another variable(s), and they belong to the minimum set of variables needed to address the problem and/or observe the phenomena).
3. The proposal will consist of a 2–3-pages report and a completed specification sheet to be considered by the GOOS Expert Panel(s) under which the EOV will be managed.
 - The report shall provide the background for the proposal, including the justification mentioned in point 2.
 - The report will specify what sub-variables constitute the EOV.
 - The specification sheet shall define the observational requirements for the collection of sub-variables that constitute the EOV (see template).
4. The proponents of the new EOV will be invited to give a presentation to the relevant GOOS Expert Panel(s).
5. After a public announcement, the proposal will be open for public review announced via the GOOS website for at least 2 months. The responsible GOOS Expert Panel(s) will consider the comments received during the public review.
6. The GOOS Expert Panel(s) will then have up to 6 months to evaluate the pertinence of the proposal and, if accepted, categorise the variable as concept, pilot or mature².
7. The lead Panel(s) will keep the other GOOS Panels informed about the proposal and the evaluation process, for their awareness and opinion.

¹ Some EOVs may be cross-disciplinary and need oversight from more than one panel.

² A variable of high importance but without as yet proven observing infrastructure is either considered pilot if there are efforts to improve and prove observing capability or concept if there is as yet insufficient effort on observing capability.

8. The lead Panel(s) will provide a written justification of their evaluation and categorisation to the proponents and to GOOS Steering Committee.
 - If the variable is considered to be concept or pilot, the justification will specify what aspects must be further developed to reach maturity. Concept and Pilot EOVS can still be noted in the GOOS EOVS framework and be worked on towards reaching maturity and resubmitted when this has been achieved.
 - If the variable is considered to be mature, and under the guidance of the Expert Panel/s, the proponents will be invited to present the EOVS to the GOOS Steering Committee who will ultimately take the decision on the final incorporation of the variable to the GOOS EOVS list.
9. When the GOOS Steering Committee approves the adoption of an EOVS as mature, the proponents must commit to maintaining and updating the specification sheets for that EOVS in coordination with the relevant GOOS Expert Panel(s) and GOOS Secretariat to ensure that the EOVS continues to be effective.
10. Additions of one or more new EOVS sub-variables to an existing EOVS will be the responsibility of the relevant GOOS Expert Panel(s) in charge of the EOVS, who will approve or not those additions. The relevant GOOS Expert Panel(s) will inform the other panels about those additions for their awareness and opinion.