

Paper for Consideration by Council

Proposal for inclusion of Depth as an Essential Ocean Variable

Submitted by:	IHO Secretariat
Executive Summary:	The paper introduces the Global Ocean Observing System (GOOS) and sets out the rationale, process and benefits of Depth being included as one of its Essential Ocean Variables (EOVs).
Related Documents:	C8 5.2.2A – Update on IHO Contributions to the UN Decade of Ocean Science for Sustainable Development
Related Projects:	GEBCO Programme Nippon Foundation – GEBCO Seabed 2030 Project

Introduction / Background

1. The Global Ocean Observing System (GOOS) defines the scope of the ocean parameters that it monitors through a series of Essential Ocean Variables (EOVs). Depth is not currently an EOV.
2. This paper sets out a proposal for Depth to be included as an EOV within the GOOS framework.

Analysis/Discussion

3. **The role of GOOS.** The ocean is an essential component of Earth's weather and climate system, comprises a major part of Earth's ecosystems, and 70% of the surface of the planet. Human society depends critically on the ecosystem services and economic activities offered by the ocean. Safeguarding the ongoing sustainability of these activities, whilst ensuring that the services provided by the ocean can continue to be delivered in the future requires an understanding of the functioning of the ocean and the delivery of information to those that will be taking decisions. GOOS was created under the auspices of the United Nations (UN) in 1991 to establish the coordination framework and services needed to deliver that information.
4. **EOVs.** GOOS has identified and manages 36 EOVs which describe the breadth and scope of the observing system. Together they comprise an observation infrastructure which is a global resource providing critical ocean information to decision makers. Currently, depth is not a GOOS recognized EOV, despite it being widely acknowledged as a critical baseline data type that underpins all other ocean science and modelling. The 36 EOVs are split into three categories: Physics, Biogeochemistry and Biology & Ecosystems. Each of these categories is overseen by an expert panel who are responsible for ensuring consistency across the various observing networks that underpin each EOV.
5. **Proposing a new EOV.** The process for proposing a new EOV is described in Annex A. This process has only just been adopted by GOOS and the IHO has been invited to be the first party to use it to submit a new EOV for consideration. The key components of the submission are a 2-3 page report outlining the justification and rationale against the principles set out by GOOS, together with a completed specification sheet which describes the nature of the observing network that underpins the EOV.
6. **Depth as an EOV.** If Depth was to be included as an EOV under the GOOS system, our community will benefit from various initiatives being undertaken to raise awareness of the criticality and value of ocean data at the highest international policy levels. In doing so, the seabed mapping community would be acknowledging/recognising, that the global suite of data gathering platforms (Ships, satellites, autonomous vessels etc.), together with the various infrastructure and data management elements that already exists, are collectively (regardless of their independent ownership and operation) a distributed ocean observing system. If Depth was accepted as a new EOV, there would be an enduring role for the IHO to act as a custodian of the EOV. This is a role that would fit well within the remit of the vision set

out in GEBCO's new strategy. GEBCO could be invited to take on this operational role on behalf of the IHO, and in doing reinforcing its position as the pre-eminent, freely available global bathymetric dataset.

7. **Link to Strategic plan.** The notion of proposing Depth as an EOV falls between IHO Strategic Plan Goal 2, *"Increasing the use of hydrographic data for the benefit of society"* and Goal 3, *"Participating actively in international initiatives related to the knowledge and the sustainable use of the Ocean"*. Whilst there are no SPIs that speak directly to this activity, it would certainly support the aims and objectives of GEBCO and the Nippon Foundation - GEBCO Seabed 2030 Project.

Conclusions

8. Depth as an EOV represents a paradigm shift in the way that our community generally views seabed mapping activity – discrete activities being seen as a distributed ocean observing network which underpins a critical component of maritime infrastructure. The benefits of such an approach are significant, as set out in this paper.
9. Depth as an EOV is totally aligned with IHO Strategic Goals 2 and 3. Further, it is tangible and measurable.

Recommendations

10. The following recommendations are made to Council:
 - a. Recognise the importance of the IHO aligning itself to the aims and ambitions of the broader ocean observing community;
 - b. Task the IHO Secretariat, through the GGC Secretary, to lead the submission of Depth as a new EOV, liaising with GGC as required;
 - c. Task the GGC to assume the role of custodian of Depth as an EOV on behalf of the IHO;
 - d. Consider the including participation in GOOS through Depth as an EOV, in any future IHO strategic planning.

Justification and Impacts

11. In terms of justification, depth as an EOV would improve meaningful delivery and measurement of Goal 2 and 3, reaffirm and protect the domain expertise of IHO and raise the awareness of the importance and need for investment in seabed mapping and hydrography. Further, this initiative could be considered by the Strategic Plan Review Working Group (SPRWG), with the inclusion of Depth into the wider remit of GOOS being a potential new outcome.
12. In terms of impacts, including depth as an EOV is a long-term commitment which will require the IHO (through GEBCO) to assume the role of custodian of a GOOS EOV, which by extension formally aligns the organisation with GOOS. This is deemed to be a positive outcome for the reasons articulated above.

Action Required of Council

The Council is invited to:

- a. Note and discuss this paper,
- b. Consider the recommendations made in 10.
- c. Take any action it deems necessary.

ANNEX 1

Process to adopt new GOOS Essential Ocean Variables (EOVs)

1. The proposal for a new GOOS EOV must 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 must 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 should consist of a 2–3-pages report and a completed specification sheet, and should be submitted to the GOOS Expert Panel(s) under which the EOV will be managed for consideration.
 - The report shall provide the background for the proposal, including the justification noted in point 2.
 - The report will specify what sub-variables constitute the EOV.
 - The accompanying specification sheet will define the observational requirements for the collection of sub-variables that constitute the EOV (a template is available [here](#)).
4. The proponents of the new EOV will be invited to give a presentation to the relevant GOOS Expert Panel(s).

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

5. After a public announcement, the proposal will be open for public review and announced via GOOS communication channels, and made available 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.
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 EOV 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 EOV to the GOOS Steering Committee who will ultimately take the decision on its adoption, and incorporation of the variable to the GOOS EOV list.
9. When the GOOS Steering Committee approves the adoption of an EOV as mature, the proponents must commit to maintaining and updating the specification sheets for that EOV in coordination with the relevant GOOS Expert Panel(s) and GOOS Secretariat to ensure that the EOV continues to be effective.
10. Additions of one or more new EOV sub-variables to an existing EOV will be the responsibility of the relevant GOOS Expert Panel(s) in charge of the EOV, 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.

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.