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INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION
(of UNESCO)

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Item **4.1** of the Provisional Agenda

GLOBAL OCEAN OBSERVING SYSTEM (GOOS) GOVERNANCE

Summary

Further to IOC Decision A-32/4.8.1, which requested the Executive Secretary *"to review progress with reform of GOOS governance to meet the needs of Member States, including any proposed actions or otherwise in response to the nine recommendations of the 2021 'Report of the Study on Support Provided to Global and Regional Ocean Observing Systems' by Neville Smith and to report progress to the IOC Executive Council at its 57th session in 2024,"*. This document provides information on governance progress and proposed actions for consideration by Member States. The addendum to this document (in English only) details the GOOS Progress against the nine recommendations in the Neville Smith report.

Proposed decision: The Executive Council is invited to take note of this report and proposed actions and consider the draft decision referenced as Dec. EC-57/4.1 in the Provisional Action Paper IOC/EC-57/AP Prov.

Introduction

1. The current structure and funding of the Global Ocean Observing System (GOOS) is insufficient to provide the data needed to meet the requirements of Member States which are relying on this system for operational forecasting, preserving ocean health, sustainable ocean planning, and climate change mitigation and resilience.

2. The GOOS mandate dates from 2012 by Resolution XXVI-8, which also sets out the terms of reference for its Steering Committee. GOOS currently operates under a multi-tiered structure. Its key governance components are the GOOS Steering Committee, the GOOS sponsors (the Intergovernmental Oceanographic Commission of UNESCO, the World Meteorological Organization, United Nations Environment Programme, and the International Science Council), and the GOOS Management Team which includes the central GOOS Office based in IOC, Paris, as well as distributed representatives and scientific officers supporting GOOS components.[1] GOOS regional Alliances also have their own governance structures as coalitions of nations, institutions or under IOC regional Sub-commissions.

3. The Neville Smith Report (GOOS-290) was commissioned by the IOC in 2021 to assess the efficacy of support arrangements for global and regional ocean observing systems. It gave nine recommendations as well as three options proposed for governance "reform": (i) business as usual but reinforced (act on recommendations that can be implemented without regret); (ii) stand-by option, (dependent on guidance from other governance discussions; and (iii) a major reset of the support structure, with a renovated and rejuvenated (hub and spoke) governance model with six pillars of support.

4. As requested in IOC Decision A-32/4.8.1 this document provides a review of progress with reform of GOOS governance, in response to the nine recommendations in the Smith report, to meet the needs of Member States (see Addendum) and proposed actions. Member States are invited to consider this review and consider the proposed actions below.

Proposed Actions

5. Invite the Executive Secretary to develop a proposal for a GOOS 2.0, in consultation with the GOOS Steering Committee and representatives from Member States and GOOS sponsors, to be presented to IOC Assembly in 2025 that considers:

(i) Revising and focusing the central mission of GOOS to facilitate worldwide cooperation in providing a fit-for-purpose ocean observing system that has clear scope and set of aims, and addresses needs, priorities and deliverables for UN processes and national processes;

(ii) A review across all the components of GOOS, and ToR where applicable, to identify gaps, needs, priorities, how the components work together as well as metrics of success for the GOOS revised central mission. The review should also identify where partners need to be taking the lead with GOOS steering at the global and regional levels;

(iii) Support for the work being undertaken within the Ocean Decade to create a functioning Digital Ecosystem that fully enables end-user applications, and that recognizes that such an ecosystem has three key underlying components, namely, 'observations and data collection', 'data management and sharing', and 'analytics modelling and predictions,' with the intention to weave, using co-design concepts, such a Digital Ecosystem into the fabric of GOOS 2.0 and thus enable the implementation of an ocean

[1] For information on GOOS components see https://goosocean.org/who-we-are/.

observing system that seamlessly feeds through to knowledge in the hands of end-users;

(iv) Evolve a GOOS user and uptake strategy to identify the level of investment needed for the global ocean observing system. This is an important opportunity when considering that the current support for GOOS, primarily driven from the scientific research community, is not sufficient or adequate for the critical infrastructure needed for a sustained and expanded ocean observing system;

(v) Determine a process to review and revise the *GOOS 2030 Strategy* that incorporates recommendations from the Decade Vision 2030 process to set a strategy for GOOS 2.0.

6. Invite the sponsors of GOOS to consider revising Memoranda of Understanding in line with the above focus.

7. Invite the GOOS management team to develop a communications toolkit that can be used by all members of the governance and support structure. It should reflect the role and intended direction of the Chair and Executive Secretary in engaging with IOC Member State Delegations and the National Focal Points, business and other stakeholders beyond the observation community who are in a position to be supporting GOOS.

8. Invite Member States, either through direct contributions, secondments, or through taking on modules of work, to support IOC/GOOS carry out the above activities.

Financial and administrative implications

9. The development of the proposal and the communications toolkit can be included in the activities under Function B of the mid-term Strategy Observing System / Data Management" and the 2024–2025 budget for GOOS (42 C/5).

10. Longer term implementation of the component parts of the proposal will require human and financial support by IOC Member States to finance coordination at the IOC Secretariat and implementation of the wider system itself.

ADDENDUM (in English only)

GOOS Progress against the nine recommendations in the Neville Smith report

> *Recommendation 1. "The GOOS community should reconsider its structure within the governance discussions, aligning GOOS uniquely with ocean observation activities, and recognizing a Global Ocean Information System and a Global Ocean Processing, Modelling and Forecasting System as the two other elements of a world ocean system."*

1. The Smith report (table 4) proposes a "world ocean system or ocean partnership" with a changed structure where GOOS focuses on observation and other communities focus on data management, production and application. In practice there has been no progress by GOOS on recommendation 1. The current terms of reference do not enable the recommended structure.

2. With the commencement of the Ocean Decade, Decade Challenge 7 was designed to "Expand the Global Ocean Observing System." This has led to creation of the Decade Coordination Office for Ocean Observing (DCO-OO), with a coordinator based within the GOOS Management Team. The DCO-OO is liaising closely with the DCO for Ocean Data sharing (DCO-data) working on Challenge 8 and the Decade Collaboration Centre on Ocean Prediction (DCC-OP). The Ocean Decade has provided visioning for expanding the global ocean observing system through the Vision 2030 white paper on Challenge 7 (Ocean Decade Series, 51.7).

> *Recommendation 2. "A plan for rejuvenating national engagement should be developed, including for communicating progress with all parts of the support structure."*

3. National engagement is being strengthened with the GOOS National Focal Point (NFP) community. Currently 76 out of 150 Member States have nominated focal points. Engagement includes, so far, a European NFP meeting in September 2023, the first National Focal Point (NFP) Forum in October 2023, and a NFP messaging document. National level user stories to show the value of ocean observations are also being developed.

4. Speaking to the benefits of integration and collaboration, the Expert Team on Operational Ocean Forecast Systems published the *Guide on Implementing Operational Ocean Monitoring and Forecasting Systems* in 2023. ETOOFS, through the OceanPrediction DCC, and GOOS are collaborating on an Operational Readiness Level (ORL) tool that serves system developers and users to assess the operational development status of a nation's ocean forecasting system.

> *Recommendation 3. "Regional networks should be recognized as part of the support structure when and where they offered advantage and value for implementing the six pillars of the support strategy and for regional user/societal engagement."*

5. The Smith report notes that the lack of support arrangements and coordination between GOOS and GOOS Regional Alliances (GRAs) affects engagement, development, and investment in GOOS. The GOOS Regional Alliances can provide the networks and systems to support user/societal engagement at the regional level. Currently working together with the respective IOC Regional Sub-Commissions and GRAs, two-year workplans for the GRAs in the Pacific and Caribbean SIDS, Indian Ocean and Africa are being developed, to identify priorities for the funding available through UNESCO 42 C/5 budget. Nevertheless, challenges of engagement remain including due to the different institutional set up, capacity and governance systems of the GRAs.

> *Recommendation 4. Experimental and ad hoc research contributions to observations, data and information management and modelling and forecasting should be recognized, but not necessarily coordinated through the support structure. Research use of products and system services should be captured in the user and uptake strategy.*

6. GOOS provides an observing system based on EOV requirements, observations, and data and information and recognises contributions including through its components. The Observations Coordination Group (OCG) and the Bio-Eco Panel have developed notional maturity attributes (based largely on the Framework for Ocean Observing) for identifying sustained observing networks that are the focus of OCG and GOOS attention. The OCG attributes have strongly focused efforts of observing activities that aspire to become sustained and integrated into GOOS.

> *Recommendation 5. A plan for showcasing user uptake and energising the dialogue and engagement with the user community more generally should be developed. Such an activity was presently not resourced as part of the support structure.*

7. This recommendation is becoming increasingly important to positioning GOOS to meet the needs of Member States and fully align with the UN Ocean Decade. A number of activities across GOOS champion user uptake and GOOS must work with Regional Alliances and all partners, as well as recognise this is not the sole responsibility of GOOS.

8. At the international level, engagement includes the WMO on the Rolling Review of Requirements, Global Greenhouse Gas Watch and Early Warning Systems for All, UNEP on the Global Environmental Monitoring System and the UNFCCC through Global Climate Observing System (GCOS). GOOS is collaborating with the OECD including to show how observations are used in value chains. GOOS co-led the 'Dialogues with Industry' series and developed a roadmap, along with the Marine Technology Society (MTS), the US National Oceanic and Atmospheric Administration (NOAA), and industry partners to explore how the private sector can support more users of data. At the regional level, several GRAs are demonstrating user uptake, for example the Australian Integrated Marine Observing System, which is tracking societal benefit and demonstrates an approximate 5:1 return on investment.

9. The GOOS Ocean Decade Programmes Ocean Observing Co-Design, CoastPredict and Observing Together aim to drive the transformation needed to achieve the Ocean Decade outcomes and enhance the global observing system for user uptake.

> *Recommendation 6. A small study group should be formed from the major supporters of capacity building, education, and training to provide guidance on how activities should be identified, prioritised and executed within the framework of support.*

10. The GOOS Steering Committee meeting in 2023 identified the need for an overall gap analysis capacity across GOOS within Co-Design and WMO Rolling Review of Requirements context, including carrying out OSE/OSSE design experiments and engaging further with teams producing observing system assessment. Capacity and funding are needed to support such developments. To date, there have been potentially three core elements triggering a major assessment of the system: a crisis (e.g. TPOS where parts of the observing capacity were failing); major technological advances (e.g. Argo); and demand for new societal applications (e.g. coupled NWP models). OceanOPS should be better recognised for its unique role in delivering integrated and quality marine metadata to the WMO and other parties for most of the ocean observing networks of the Observations Coordination Group (OCG). OceanOPS require extended investment in IT workforce to make progress as identified in the OceanOPS 5-year Strategic Plan 2021–2025.

11. Ongoing efforts on capacity development at the national level include through the IODE office and the *IOC Capacity Development Strategy 2023–2030*, the national operational level capacity development tool being developed by the Expert Team on Operational Ocean Forecasting Systems (ETOOFS), as well as relevant work by Regional Alliances.

> *Recommendation 7. A high-level description of the architecture of the ocean system should be developed and put out for public comment and feedback.*

12. This recommendation from the Smith report is dependent on firstly identifying clear structure and focus for GOOS as indicated in Recommendation 1 and then aligning with digital twin architectures that are being developed at global and regional levels.

> *Recommendation 8. The framework for support should be further developed, along with a 5–10-year strategy based on the guidance provided in this Report.*

13. The need for a framework for support is well understood by GOOS and, indeed, the Smith report was commissioned to provide some insight and advice into this question. The *GOOS 2030 Strategy* is at its halfway mark and there is an opportunity now to review and revise.

14. A framework for support could be developed with the imperative for sustainably expanding the global ocean observing system to be fit for purpose, recognizing the need for a critical national and global observing infrastructure and data ecosystem responsive to the needs of end-users that supports ocean risk management, sustainable ocean planning and operational forecasting as well as scientific understanding.

> *Recommendation 9. The community supporting relevant ocean activities should be engaged to renovate and rejuvenate the current hub-and-spoke arrangement, consistent with whatever changes in governance that might be agreed elsewhere and following the other Recommendations and Findings of this Report. The change should be in place by 2025 and follow the roadmap outlined in this study.*

15. Recommendation 9 addresses the actions needed to provide a major reset of the GOOS support structure, with a renovated and rejuvenated (hub and spoke) governance model with six pillars of support: (i) Planning and design; (ii) Coordination; (iii) Tracking progress and impact; (iv) Developing, setting, and maintaining standards and best practice; (v) Resources and investment; and (vi) Engagement and communication.

16. Governance is not addressed specifically in the Smith recommendations as the report leaned more towards structure and linking better at regional and national levels. However, the structure proposed implies the need for revised governance that considers internal alignment, communication and organization, strategic implementation, and limited private sector engagement.

17. The Smith recommendations must be considered alongside other coordination and implementation components of GOOS. Before taking a direction, the new GOOS 2.0 needs gap analysis and consideration of current components, their ToR, the current complex structure, as well as new directions needed of the observing system, changing landscapes, clear identification of delivery areas (mandated and/or societal) and potential success criteria. There has also been no clear signal provided by Member States as to whether GOOS should adopt the Neville Smith report or a decision to use its direction as the path for GOOS.