Restricted Distribution

IOC/A-31/3.5.2.Doc

Paris, 31 May 2021
Original: English

INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION
(of UNESCO)

Thirty-first Session of the Assembly
UNESCO, 14–25 June 2021 (Online)

Item **3.5.2** of the Provisional Agenda

EXECUTIVE SUMMARY OF THE GLOBAL OCEAN OBSERVING SYSTEM IMPLEMENTATION PLAN

Summary

IOC Resolution XXVI-8 (2011) created the GOOS Steering Committee and requested it to "produce a biennial Workplan for consideration by the IOC Governing Bodies and adoption by the Assembly."

Purpose of the document: This executive summary of the GOOS Core Team Implementation Plan describes planned one to five-year actions for the Core Team components of GOOS (Steering Committee, panels, teams, and the GOOS Office). This integrates actions across GOOS, allows analysis towards implementation of the *Global Ocean Observing System 2030 Strategy* (IOC/BRO/2019/5 rev.), an understanding of the resources needed to undertake this implementation and how GOOS can better structure itself internally to do so, and reflects a new integrated planning and tracking process for the work of GOOS.

The Assembly is invited to note the broad ambition of this implementation plan, its identified resource implications, as well as the need to reinforce partnerships and support structures. Member States are encouraged to work with GOOS to identify how they can help with implementation and what their contributions will enable us to achieve together.

Financial and administrative implications: The financial and administrative implications of the activities fall within the parameters of the regular budget of IOC, and any extrabudgetary and in-kind resources that can be identified.

The proposed decision is referenced Dec. A-31/3.5.2 in the Second revised Action Paper (document IOC/A-31/AP Rev.2).

Introduction

1. The purpose of the Global Ocean Observing System (GOOS) Core Team Implementation Plan is to reflect a process of planning that brings the *Global Ocean Observing System 2030 Strategy* to life and shapes the programme to deliver. It focuses on the actions of the GOOS Core Team which is made up of the:

- GOOS Steering Committee: providing direction to the GOOS core team in implementing its strategic objectives and building outside partnerships.
- Expert Panels: The Physics and Climate (OOPC), Biogeochemistry (BGC Panel) and Biology and Ecosystems (BioEco Panel) Panels are vital for identifying user needs and evaluating the system.
- GOOS Observations Coordination Group (OCG): strengthens GOOS implementation by coordinating the system through 12 global observing networks and OceanOPS.
- GOOS Expert Team on Operational Ocean Forecast Systems (ETOOFS): guides initiatives to improve capacity, quality and interoperability of ocean model forecast products.
- GOOS Regional Alliances (GRAs): identify, enable and develop GOOS ocean monitoring and services to meet regional and national priorities.
- GOOS Projects: advance innovation and expand the observing system, services and product delivery by expanding into new areas and capabilities.
- GOOS Office: The cross-GOOS coordination team works full time to enable the GOOS core team to function, and to enable connection across GOOS, partners, sponsors, and the observing enterprise. A core cross-GOOS coordination function is housed at IOC.

2. The full GOOS Implementation Plan was a working document for the 10th Meeting of the GOOS Steering Committee (26–29 April 2021, goosocean.org/goos-sc-10-1), and included details of 58 actions including the leads from the GOOS Core Team, proposed work, outputs and impacts, partners, resources required, and dependencies. This integrated view of actions across the GOOS Core Team provided the Steering Committee with visibility of action towards implementing the 2030 Strategy, enabling the setting of priorities, identification of gaps, the establishment and management of partnerships, and an understanding of the resource and structural implications. Work remains to fully integrate the work of GOOS Projects into the planning process.

3. Launching the Ocean Decade has made GOOS's work more important than it has ever been. GOOS has identified three key areas for action that encapsulate the transformation needed. These GOOS Programmes – Ocean Observing Co-Design, CoastPredict and Observing Together – are the first programmes of many that will actively drive the Ocean Decade and its ocean observing challenge. These programmes are integrated into the actions and represent major decadal cross-GOOS activities as well as vehicles for partnership development. As the programmes develop, their contribution to the Strategic Objectives and interaction with other GOOS actions will also develop. If funded, these programmes have the power to support major transformational initiatives for GOOS and the ocean observing community.

4. This Executive Summary provides the Member States of the IOC Assembly with a high-level analysis of priorities for implementation and resource implications. Implementation will depend on resources provided through IOC, WMO, and through extrabudgetary and in-kind support that can be identified with Member States and partner organizations.

Actions viewed through GOOS Strategic Objectives

5. The following table lists the 58 Actions in the Implementation Plan and their level (cross-GOOS major, multi-element, single element, and Ocean Decade programme), organized by the eleven Strategic Objectives (SOs) of GOOS.

Number	Action	Level
Goal: Deepening engagement and impact		
SO1. Strengthen partnerships to improve delivery of forecasts, services, and scientific assessments		
1.1	GRA assessment for forecasts and services	Single element
1.2	Partnerships for delivery	Cross-GOOS
SO2: Build advocacy and visibility with stakeholders through communicating with key users and national funders		
2.1	Value of Ocean Observations Project	Single element
2.2	GOOS Communications Plan	Cross-GOOS
2.3	GOOS National Focal Point role developed	Cross-GOOS
2.4	Evolve *Ocean Observing System Report Card*	Cross-GOOS
SO3**:** Regularly evaluate system impact to assess fit for purpose		
3.1	Network status reporting	Multi element
3.2	Observing System evaluation and metrics	Cross-GOOS
3.3	Ocean Forecast evaluation and metrics	Single Element
3.4	Global map of ocean forecasting systems	Single Element
3.5	Develop an interactive map of networks and metadata for biological monitoring	Multi element
3.6	Global Ocean Indicators Framework	Cross-GOOS
3.7	Ocean Observing Co-Design	Decade Prog.
SO4: Strengthen knowledge and exchange around services and products, to boost local uptake		
4.1	Toolkit/Guide on Operational Ocean and Monitoring and Forecasting Systems	Single element
4.2	Data Integration Products Across GRAs	Single element
4.3	Establish and promote a GOOS product and services portfolio for Ocean Forecasting centres	Multi element
Goal: Supporting integration and delivery		
SO5: Provide authoritative guidance on integrated observing system design, synthesizing across evolving requirements and identifying gaps		
5.1	Essential Ocean Variable (EOV) / Essential Climate Variable (ECV) Stewardship & GCOS	Multi element
5.2	GOOS EOV Review	Multi element
5.3	Observing System Evaluation and Reviews	
	5.3.1 Strategy for Ocean Heat and Freshwater Cycles	Single element
	5.3.2 Observing System Evaluation and Strategy for the Ocean-Atmosphere Interface and Boundary Layers	Single element
	5.3.3 Observing System Evaluation and Strategy for Boundary Systems	Multi element

Number	Action	Level
Goal: Deepening engagement and impact		
	5.3.4 Optimal carbon flux observing system blueprint	Multi element
5.4	GOOS Evaluation and Review Framework	Multi element
5.5	Regional network coordination/OceanObs'19 synthesis	Multi element
5.6	Observing System Design around EOVs	Cross-GOOS
SO6: Sustain, strengthen and expand observing system implementation through GOOS and partner communities, promoting standards and best practice, and developing metrics to measure success		
6.1	Implementation of multidisciplinary initiative VOICE	Multi element
6.2	GOOS Endorsed Best Practices available across EOVs and platforms	Multi element
6.3	Solution spaces for ocean observations in EEZs	Cross-GOOS
6.4	Emerging and existing network integration	Multi element
6.5	Develop and/or maintain an up to date referenced hardware directory	Single element
6.6	Advancing BGC/BioEco observations across global networks	Multi element
6.7	Environmental Stewardship	Single element
6.8	Inter-comparison and standards	Single element
6.9	Coordinate and expand surface ocean biogeochemistry observations	Multi element
6.10	CoastPredict	Decade Prog.
6.11	Building the BioEco community	Single element
SO7: Ensure GOOS ocean observing data and information are findable, accessible, interoperable, and reusable, with appropriate quality and latency		
7.1	Data Flow mapping OCG networks	Single element
7.2	Metadata standardisation global networks	Single element
7.3	Support a Global Data Assembly Centre for Biogeochemical (BGC) EOVs	Multi element
7.4	Observations Coordination Group Data Strategy	Single element
7.5	Establish OpenGTS Prototype	Single element
7.6	Description of production & dissemination standards for Ocean Forecasting Systems	Single element
7.7	BioEco EOV data available through OBIS	Single element
7.8	Create new and sustain existing BGC data synthesis products	Single element
Goal: Building for the future		
SO8**:** Support innovation in observing technologies and networks		
8.1	Speed integration of new technology	Single element
8.2	Clear directive on use of biomolecular approaches including eDNA to support biological EOVs	Single element
SO9: Develop capacity to ensure a broader range of beneficial stakeholder participation		
9.1	Organize global online trainings on operational ocean monitoring and forecasting system	Single element
9.2	Enhance existing and develop new technical capacity building resources (including online)	Single element
9.3	Implementing ocean monitoring and forecasting system with the engagement of GRAs	Single element

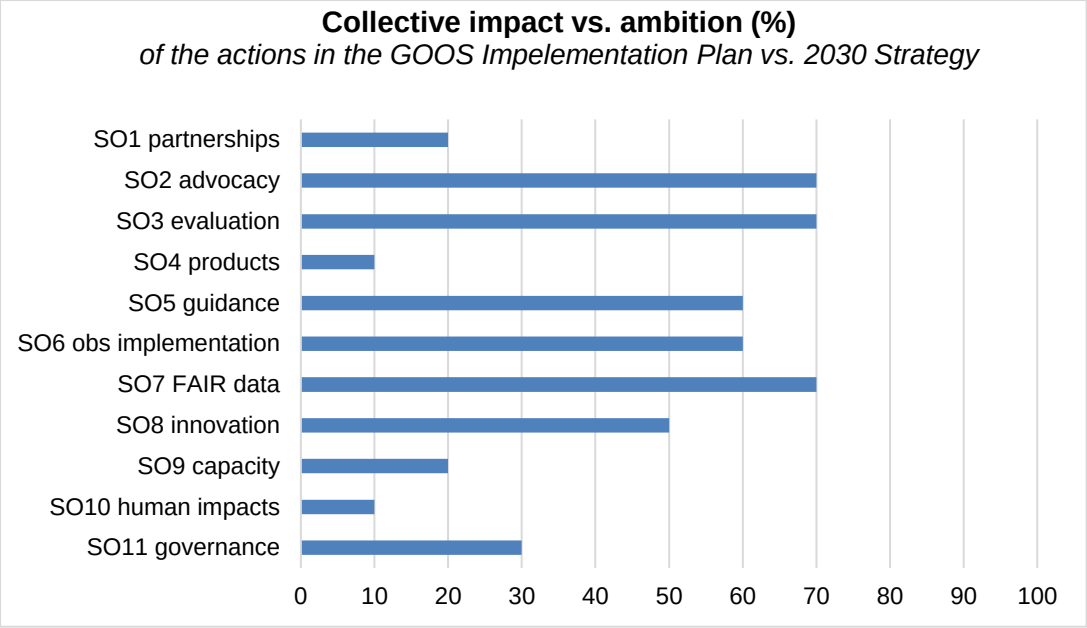
Number	Action	Level
Goal: Deepening engagement and impact		
9.4	Cross network integrated capacity development	Single element
9.5	Partner with MBON, OBIS and WCMC on capacity exchange	Single element
9.6	Ocean monitoring and forecasting system centre evaluation/assessment	Single element
9.7	Capacity Exchange Materials and Workshops for Developments or Expansion of GRAs	Single element
9.8	Market and capability building for EOV reporting in support of the global biodiversity framework indicators and assessment	Single element
9.9	Co-development of biodiversity and marine habitat indicators with the business community	Single element
9.10	Observing Together	Decade Prog.
SO10: Extend systematic observations to understand human impacts on the ocean		
10.1	Establish coordination of an Integrated Marine Debris Observing System	Single element
10.2	Incorporate/link to the human pressure indices	Multi element
SO11: Champion effective governance for global in situ and satellite observing, together with partners and stakeholders		
11.1	GOOS Structure evaluation and evolution	Cross-GOOS
11.2	GOOS Governance evolution	Cross-GOOS
11.3	Develop a GOOS Resourcing Team	Cross-GOOS

6. There are a large number of actions under SO6, which represents a core area of work of the GOOS Core Team. A large number of activities in data (SO7) and capacity development (SO9) indicate areas where further consolidation of single element actions will likely increase impact. Compared to the five identified priority Strategic Objectives (marked in bold in the table), the linked SO1 and SO2 will require more focus moving forward, with the development of long-term plans. Significant collaboration across the elements of the GOOS Core Team is envisioned in the actions identified, which is a positive outcome that also requires support.

7. A large number of partner programmes and organizations are identified in the actions. The most frequently-identified partners are IODE, the World Meteorological Organization, and OceanPredict, and these core partners of GOOS require strategic links to be carefully maintained and expanded.

Impact analysis

8. The *Roadmap for the Implementation of the Global Ocean Observing System 2030 Strategy* (GOOS Report No. 249) gives more detail on the broad issues, implementation, and desired outcomes for each of the Strategic Objectives in the 2030 Strategy. Looking at the collective impact of the planned actions in the GOOS Implementation Plan and comparing their level of ambition with the *Roadmap* (table below) reinforces the need for GOOS to boost planning internally and with partners in certain areas, while also identifying where we expect to have the greatest impact in the medium term.



9. With present plans, certain areas (SO1, SO4, SO9, SO10, and SO11) will need future reinforcement, as they lack in ambition. The core Strategic Objective 6, which is the target of substantial resources at the moment, is not hitting all the elements foreseen in the *Roadmap*. Overall, the planning process going forward will work to tighten expressions of the impacts and benefits of each action, and how they fit together into an overall expected impact for the Global Ocean Observing System.

Priorities

10. The GOOS Steering Committee decided that priorities for GOOS implementation should include increasing the focus and resources for SO1 partnerships for delivery and SO2 advocacy and communications. It will work with the Core Team to connect the many single actions in SO7 on FAIR data, working closely with IODE, and to work on larger partnerships to increase the impact and longer-term strategic view of actions in SO9 capacity development. The Ocean Decade Programmes will be integrated into the implementation plan as they develop. The Steering Committee will prioritize actions based on the resources available on an ongoing basis.

Resource requirements

11. The GOOS Core Team is supported by a distributed GOOS Office which today has 14.25 full-time equivalent staff members, distributed and funded as indicated in the table below.

GOOS Office element	Full-time equivalents	Funding source	Location
Core Coordination	2.65	IOC	Paris, France
OOPC	1	USA NOAA	Geneva (WMO), Switzerland
BGC Panel	2	USA (NSF via SCOR), EC H2020 EuroSea, IOC	Sopot, Poland
BioEco Panel	1	CSIRO, AIMS, EC H2020 EuroSea, IOC	Hobart, Australia
BioEco data (IODE/OBIS)	0.1	IOC	Oostende, Belgium

GOOS Office element	Full-time equivalents	Funding source	Location
OCG	0.65	IOC, WMO, USA NOAA	Paris, Geneva (WMO), Washington DC, USA
Networks	0.35	IOC, WMO	Paris, Geneva (WMO)
OceanOPS	6	National contributions from USA (68%), Monaco, EU, France, Australia, Canada, China, Germany, Japan, Italy, India, and South Africa. Some support from IOC and new from WMO in 2021.	Brest, France
ETOOFS	0.25	IOC	Paris, France
GRAs	0.25	IOC	Paris, France
Total	**14.25**		

12. Achieving the full ambition and impact of the actions identified in paragraph 5 above, without prioritization, will require a more than doubling of this staff support in the medium term of about three years. The experience built over time with a distributed GOOS Office, and the intense experiment in remote work over the past year, show that part of this support could work remotely from anywhere. This opens the option for support to be provided in-kind and in country to support projects. There are advantages to concentrating support in some hubs to create synergies, and the overall core coordination will need to be a strong hub in order to ensure a common purpose and coordinated delivery across other hubs and spokes of activity, drawing on the voluntary effort of the experts engaged in GOOS.

13. The ambition of GOOS Core Team activities and the development of the GOOS Ocean Decade programmes will require transformation not only in the observing system and its stakeholder engagement, but also in the support provided to coordination of this key infrastructure. In this way Member State activities will be able to leverage a functioning global system, and capacities can be developed to respond to the upcoming Decade's challenges. GOOS will need to engage in some serious fundraising, for both GOOS implementation and the Ocean Decade programmes.

14. We invite interested Member States to learn more and to engage in the GOOS planning process, by starting a conversation with the GOOS Steering Committee and GOOS Office to identify how they can help with implementation, and what their contributions will enable us to achieve together.

Proposed decision

15. The Assembly is invited to consider Dec. A-31/3.5.2 in the Second Revised Action Paper (document IOC/A-31/AP Rev.2).