



## Scoping Document: Governance, Coordination and Funding of Sustained Observations

*DRAFT Scoping Paper: June 2021*

**Summary:** Strengthening the sustained ocean observing system is central to the goals of the G7 Future of the Seas and Oceans Initiative. As the FSOI brings together Experts, Funders and Policy makers, addressing the complex issues of Governance, funding and coordination of the sustained ocean observations are issues which the G7 can show leadership in addressing in a way that is tractable with a smaller group of nations while consulting and engaging the broader ocean observing community in consultation with GOOS, drawing on international best practice through e.g. the Group of Senior Officials for Global Research Infrastructure (GSO GRI) and international ocean governance discussions.

### 1. Background Information

To realise the first goal of the Future of the Seas and Oceans Initiative (FSOI), which is to '*support the development of a global initiative for enhanced sustained observations*', the draft work plan tabled in 2017 proposed an action to '*develop a plan for funding of sustained observations*.' This goal and action aligns with the UN Decade of Ocean Science for Sustainable Development (UN Ocean Decade), where one of the ten challenges is to '*Expand the Global Ocean Observing System*'. The UN Ocean Decade therefore presents a real opportunity to transform sustained observing and by 2030, have a robust, resilient and responsive observing system to meet the needs of science for sustainable development.

The global ocean observing system is extremely fragile, reliant on a voluntary collaborative effort from a diverse range of actors. Within Europe, only 28% of the sustained ocean observing system is on core institutional funding compared to 73% for meteorological observations. At the global scale, large components of the sustained ocean observing system are funded through national research budgets, often through competitive research grants or short term (3-5 year) programmes.

Sustained observations are also funded for operational applications through meteorological services (often focused more on surface observations) and monitoring applications through environment portfolios (often focused towards coastal observations).

Consistent with the FAIR (Findable, Accessible, Interoperable and Reusable) data principles, the utility of sustained observations is rarely limited to the purpose which it was funded for. For instance, research funded observations are increasingly used to initialise operational forecasts. Observations funded for monitoring applications will inevitably have research and operational applications. It is timely therefore to consider how sustained observations are funded, coordinated and delivered within different national systems, share experience and best practice, and raise the provide with governments and policy makers of the needs for and benefits of investing in a core sustained observing system.

## 1.1. National Funding and coordination structures

Given ocean observations are funded, implemented and utilised across government ministries, institutions and stakeholders, coordination is valuable at a number of levels to ensure our combined investment collectively delivers more benefits than the sum of its parts.

For instance:

- *Cross Ministry Marine Policy Coordination* – To articulate collective Marine Science and Policy needs, and coordinate on cross portfolio funding and resourcing (e.g. the UK Marine Science Coordination Committee; in Japan, an Ocean Policy annual liaison meeting is held).
- *Cross Institutional Marine Science Coordination* – To articulate Marine Science activities, strengths and priorities, and also the implementation of national scale infrastructure (research vessels and equipment, observations, data infrastructure, etc) which can be leveraged for a broad range of science applications and experiments (e.g. in France, the Coriolis Management Committee; in Germany, the Consortium of national research institutions, KDM).
- *Observational Coordination Structures* – To articulate observation coordination requirements, engagement with users and stakeholders, observing system design, implementation and delivery (e.g. in the US, the Interagency Ocean Observing Committee as well as a national observing system US-IOOS (coastal focused), and in Canada, the Canadian Integrated Ocean Observing System (C-IOOS)).

The specifics of such coordination approaches play out differently depending on the specifics of the national governance systems. This activity will be an opportunity to explore approaches to coordination, how this relates to funding streams and structures for sustained observations, and how the case is made for investment.

There are a range of institutional stakeholders in sustained ocean observations, each of them bringing certain strengths to the table, including:

- *Research Funding and Institutions* provide the largest contributions to global scale sustained observations. They bring advances in understanding the ocean system, scientific rigour, innovation and the ability to take risks, but funding is piecemeal, short term and uncertain unless funded through research infrastructure funding streams (e.g. French Research Infrastructure, Australia's Integrated Marine Observing System,).
- *Operational, Meteorological Services* bring an operational rigour focused on process and delivery and also increasingly as a user of ocean observations. New prediction systems will increasingly exercise the upper ocean observing system for primarily physical variables and data delivery. Meteorological Services generally contribute some of the surface met-ocean observations, with a small number contributing to e.g. Argo (such as the UK Met Office).
- *Environmental Agencies* primarily focus on our coastal systems and regions with the highest interactions with society.
- *Private Sector, Civil Society and Citizen Science* have the potential to play an increasing role.

The challenge, and opportunity, is how to bring these diverse stakeholders together in a way that capitalises on their strengths to deliver a resilient and responsive sustained observing system that meets the needs of a broad range of uses and users– delivering optimum benefit for investment.

## 1.2. Strengthening regional, international governance and coordination

In addition to strengthening funding and coordination at the national level, we also need to strengthen the connection of national observing activities and funders to regional and global coordination efforts to deliver a resilient global collaborative enterprise for ocean observing.

With the expansion of the activities in global sustained ocean observing activities, their applications and the expanded community that engages, the Global Ocean Observing System (GOOS) has recognised the need to strengthen and expand the governance to enable this broad and diverse international collaboration. As an illustration of community growth, the first conference on focused on developing the global sustained observing system, OceanObs99 had 300 attendees, OceanObs09 had 680 attendees, and OceanObs'19 had 1500 attendees. Two OceanObs'19 Whitepapers<sup>1</sup> were focused on aspects of governance for global Ocean Observing. In addition, in 2020 GOOS recently commissioned a report on international support structures for sustained ocean observing.<sup>2</sup> GOOS has now established a Task Team to oversee the evolution of GOOS governance. It is proposed that the G7 FSOI work with the GOOS Governance Task Team, providing groundwork from the perspective of the G7 members and their activities engaging in and contributing to global ocean observing and GOOS coordination structures.

The GOOS Governance Task Team will be considering governance approaches and interests in particularly through the Governance structures and partnerships of it's sponsoring organisations, the Intergovernmental Oceanographic Commission, the World Meteorological Organisation, the UN Environment Programme and the International Science Council. This activity will therefore consider other approaches and networks which might not be encompassed through GOOS and its sponsoring organisations.

The Task Team will explore models and approaches to governance of global infrastructures which are not covered through GOOS and its co-sponsors.

One concept which is useful to explore is International Research Infrastructure. While Research Infrastructure is historically considered as physical/bricks and mortar entities such as Laboratories, Ships and physical structures, there is a shift increasingly to consider more distributed, data-oriented entities as research infrastructure, with the data being the infrastructure that supports the research. Hence research infrastructures could provide useful models of governance and funding of a core or backbone sustained observing system. Within Europe, European Research Infrastructure Consortia (ERICs) have been established as legal entities (however few members contribute to ERICs through national research infrastructure funding streams and are expected to scratch together funds through existing budgets which causes undue strain). Looking to other domains, research infrastructure can be both centralised (CERN, the International Space Station), or distributed (the Global Ecosystem Research Infrastructure). Working with the Group of Senior Officials on Global Research Infrastructure (see below) provides the opportunity to consider the broader range of approaches to governance, funding and coordination of research infrastructures, and learn from best practice. A sustained global ocean observing system must build on a system of sharing nationally-funded and implemented facilities that have global value.

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<sup>1</sup> Tanhua et al., What We Have Learned From the Framework for Ocean Observing: Evolution of the Global Ocean Observing System <https://www.frontiersin.org/articles/10.3389/fmars.2019.00471/full>  
Weller et al., The Challenge of Sustaining Ocean Observations  
<https://www.frontiersin.org/articles/10.3389/fmars.2019.00105/full>

<sup>2</sup> Smith. N. (2021) Report of study on Support Provided to Global and Regional Ocean Observing Systems. Internal report, unpublished. Available through the GOOS website [here](#)

Several regional and basin-scale ocean observing groups have highlighted the importance of improving research infrastructure sharing agreements as a means of increasing observations using existing structures and networks and realising the full potential of existing investments. Significant barriers to sharing exist, even amongst G7 partners working within a common framework. Reducing or eliminating these barriers requires a forum that brings together the scientific community with the government agencies and ministries responsible for funding and implementing research infrastructure.

### **The Group of Senior Officials on Global Research Infrastructure (GSO-GRI)**

The Group of Senior Officials on Global Research Infrastructure (GSO-GRI) was formed initially as a G7 Group in 2008 and now has representatives from 15 countries. The Organisation for Economic Co-operation and Development (OECD) is an observer to ensure good coordination with the Global Science Forum (GSF). The GSO-GRI developed a framework that identifies a set of 14 key principles (criteria) for global research infrastructures.

Case studies are followed on different types and models of research infrastructure, to strengthen the framework and share approaches and best practice. The group serves the shared policy goals of its member countries in ensuring that world class research infrastructures are available to promote high quality research, in particular in areas which require international cooperation on global challenges or where it makes sense to pool investments to secure the best value for money.

Working with the GSO-GRI will enable the exploration of a broad range of approaches to governance, funding and coordination across different types of research infrastructure and governance arrangements.

### **Other Groups to Engage**

Discussions about ocean governance, including ocean observing, are being conducted through a range of national, regional and global fora. Examples include the European International Ocean Governance Forum, as well as a range of global (e.g. globally coordinated networks, International Research Vessel Operators), regional (e.g. GOOS regional alliances, basin scale programmes) and national coordination structures for sustained observing (e.g. US-IOOS, CIOOS).

## **2. Description of Activity and next steps**

The goal of this activity is to document how G7 members coordinate and fund ocean observing nationally, and how they engage and coordinate regionally and globally. This activity should liaise with the Global Ocean Observing System, the Group of Senior Officials and Global Research Infrastructure<sup>3</sup>, and regional and international ocean governance groups that are also currently evaluating the ways and means of strengthening the sustained ocean observing system governance and support. The activity should aim to develop strategies to increase the percentage of the ocean observing system on core / regular funding, and strengthen coordination to maximise delivery and benefit for investment. The activity will also look at opportunities to strengthen regional and global collaboration and coordination, including exploring barriers to research infrastructure sharing.

A Task Team on Observing System Governance, Coordination and Funding structures should be formed working with relevant global and member initiatives.

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<sup>3</sup> Group of Senior Officials on Global Research Infrastructures <https://www.gsogri.org/>

Task 1: Explore national approaches to funding sustained observations, coordination structures and identify opportunities to strengthen:

- Document current national funding and coordination structures, best practice and experiences in making the case for support for sustained ocean observing.
- Explore barriers inhibiting sustained funding and scope options drawing on best practice for possible future models that might support the cost of ocean observing infrastructures and the information value chain underpinned by them.
- Develop a high-level paper on the case for support for sustained observing infrastructure, drawing on best practice.

Task 2: Consider international governance approaches and frameworks to strengthen sustained observing, including:

- Explore models and approaches and best practice for global research infrastructure governance and funding, working with the GSO-GRI and the GOOS Governance Task Team and other relevant governance frameworks and entities..
- Work with GSO-GRI to evaluate the status and arrangements for global ocean observing and how we can improve coordination, collaboration, agreements, etc. Models of cooperation and governance, financing, etc.
- Document barriers to research and data infrastructure sharing, focusing on known collaboration and communications issues, investigate financial and administrative barriers and enhance bartering agreements among G7 partners.

Task 3: Pilot approaches to strengthen coordination within and across G7 partners, and their engagement in regional and global coordination structures, drawing on and engaging with GOOS Governance and review discussions.

### **3. Resourcing**

Task 1: 20% FTE support from G7 FSOI Coordination Centre. G7 expert engagement in the development of report.

Task 2: to be determined in consultation with GSO-GRI.