Intergovernmental Oceanographic Commission
Reports of Meetings of Experts and Equivalent Bodies

Ocean Data and Information System (ODIS) Steering Group Meeting

Report

9 December 2025

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English only

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Table of Contents

1. Overview

Time: Session 1. 07:00-08:00 and Session 2. 16:00-17:00 (UTC)
Date: 9 December 2025
Participants: https://oceanexpert.org/event/4919#participants
Chair: Joanna Post, Head of Section
Format: Online
Webpage: https://oceanexpert.org/event/4919

2. Agenda

1. - Opening of the meeting / Welcome
2. - Approval of the agenda
3. - Round of introductions
4. - The history of ODIS, and the Ocean Infohub Project
5. - Status quo of ODIS systems
6. - Terms of reference for ODIS and the Steering Group
7. - Q & A
8. - Thanks, closing, next meeting

3. Opening, approval of the agenda and introductions

The meeting, chaired by Joanna Post, provided the kick off for the newly constituted ODIS Steering Group and a chance for them to meet for the first time and hear about the history and current status of ODIS and future expectations for the group as provided in the terms of reference.

4. The history of ODIS, and the Ocean Infohub Project

Ms Lucy Scott presented the history of ODIS and the Ocean InfoHub Project. At its 24th Session in March 2017, the IODE Committee adopted Decision IODE-XXIV.4, mandating the development of an interoperable global ocean data and information system, subsequently supported by the 29th Session of the IOC Assembly (A-29) in June 2017. Between 2017 and 2019, IODE undertook significant preparatory work, including the First Session of the Intersessional Working Group (March 2018) and the development of Document IOC/IODE-XXV/5.2, which articulated the ODIS Concept Paper and a Summary Implementation Plan. In February 2019, the 25th Session of IODE approved the concept paper and launched the ODIS Catalogue of Sources (ODISCat), a global inventory of ocean-related data and information resources which now includes more than 3,100 records.

In parallel, technical foundations were being laid - in mid-2019, INVEMAR (Colombia) produced a portal prototype demonstrating how federated, interoperable approaches could integrate multiple systems regardless of geographic or institutional context. This was an early precursor

to the Ocean InfoHub (OIH). During 2019, IODE prepared and submitted a proposal for the IOC Ocean InfoHub project to the UNESCO/Flanders Fund-in-Trust. The proposal was approved, and in April 2020 the Ocean InfoHub Project formally commenced with the mandate to pilot the ODIS architecture.

The Ocean InfoHub (OIH) project became the primary mechanism through which ODIS evolved from a concept to an operational, federated global system. OIH sought to resolve the fragmentation of ocean data resources by enabling interoperability across independent digital systems, improving discoverability and access, and supporting equitable participation across regions and institutions. Three pilot regions were selected to co-develop and demonstrate the ODIS architecture in practice. The approach focused on enabling regional partners to expose existing metadata through lightweight, standards-based web conventions rather than forcing the development of new databases or altering established workflows. This socio-technical model proved essential in regions where institutional trust, digital infrastructure, or data management capacity were limiting factors.

The IOC Assembly formally established ODIS through Decision A-31/3.4.2 in 2021, following IODE-XXVI's recommendation to create the system as a permanent IOC mechanism. By 2023, IODE-XXVII designated ODIS as one of its three Programme Components, formalising its status as foundational global infrastructure.

The ODIS approach is built around federation: a distributed network of independent systems linked through common, web-native metadata conventions (JSON-LD, schema.org, and linked open data paradigms). Partners retain full control and ownership of their data, choosing what to expose through their ODIS node. The system is resilient, scalable, and designed for incremental growth across diverse organisational and national contexts. The Global Search Hub portal continues to be supported as a demonstration of ODIS (https://oceaninfohub.org). The portal currently contains over 130,000 content items in seven content categories: (i) Experts (27,000); (ii) Institutions (13,000; (iii) Documents (42,000); (iv) Training (1,500); (v) Vessels (113); (vi) Projects (3,600); and (vii) Datasets (48,000). A new front-end interface is in development.

ODIS has matured into a global ecosystem that connects 57 data sources from 47 partner organisations across multiple regions. These partners include national oceanographic centres, regional organisations, NGOs, academic institutions, and thematic programmes. ODIS nodes serve as communication points where partners expose metadata for discovery while continuing to manage data internally through their existing systems.

Key benefits for data providers include:
- The ability to expose metadata once for global visibility without changing internal workflows.
- Retention of complete ownership and control over their data.
- Adjustable visibility settings for sensitive or restricted content.
- Automatic discoverability through both ODIS and external tools such as Google Dataset Search.

For data users, ODIS offers a consolidated mechanism to discover trusted resources across a fragmented ocean data landscape. Users can identify datasets, experts, institutions, and documents more easily and can access authoritative sources directly. IODE accreditation helps distinguish trusted providers, supporting confidence in data quality. Existing global and regional portals also benefit. They can incorporate the ODIS knowledge graph to enrich their content and

expose their own records through ODIS nodes. Regional Seas organisations, such as SPREP in the Pacific, use ODIS to improve access to global information while enabling member states to share their metadata for wider visibility and for national reporting (e.g., State of Environment Reports).

ODIS is now deeply integrated into multiple IOC and partner initiatives, including emerging interoperability work with WIS 2.0, WESR, and BioEco Portals. The system is supported by comprehensive open documentation (https://book.odis.org) and practical guidance for joining (https://odis.org/join).

5. Strategic considerations for steering ODIS: The Status quo of ODIS systems and perspectives for Phase II

Dr Pier Luigi Buttigieg, former chair of ODIS, presented on the foundational principles, technical status, and key strategic considerations of ODIS. He re-emphasised ODIS's primary mission to promote standardised and technically transparent and verifiable data sharing/exchange practices by reusing robust Web architectures and underscored the importance of using existing standards that have broad adoption and are managed by recognised standards organisations.

With a growing mosaic of regulatory requirements, particularly those related to data sovereignty and privacy in Europe (GDPR), China (PIPL), and internationally, particularly in contexts involving Indigenous data or nationally sensitive information, a core principle of ODIS is to respect and enable plurality and independence among its constituent digital systems (i.e. its Nodes). Each participating Node retains autonomy while deciding what to share over the global interoperability layer at ODIS' core. This mediation ensures partners can maintain internal processes and compliance, while participating in a federated data-sharing ecosystem. Dr Buttigieg underscored the importance of maintaining this element of the ODIS Federation, and understanding that it is ultimately the Nodes that decide what information to share and how to share it.

Dr Buttigieg described how ODIS is composed of several interconnected layers: i) the ODIS team at IODE coordinate the federation, providing logistical support and input from IOC Members and associated organisations/initiatives; ii) the ODIS Federation of partners, encompassing all member organisations and entities whose collective participation and contribution of time and resources to maintain their Nodes is essential to the system; iii) the actual data systems that link to the Web using the ODIS Architecture, constituting the ODIS digital ecosystem. As emphasised during the meeting, the ultimate definition and value of ODIS are determined by its partners: what they contribute, how they connect, and the direction they wish the Federation to move.

On a more technical note, the decision to use JSON-LD and schema.org was driven by the need for simplicity, universality, and alignment with technologies already used by tens of millions of devices and services worldwide. By staying close to mainstream Web architecture, ODIS enables participation from high-capacity nodes as well as institutions in regions with limited digital resources. The result is a system whose architecture is both resilient and scalable, suitable for regional, national, and global collaboration. The governance of this interoperability layer is central, as it determines the cohesion and overall success of the ODIS Federation. Simplifying recommendations and maintaining generic, widely implementable solutions are guiding strategies. By avoiding technical or organisational specificity, ODIS remains inclusive, welcoming diverse participants into its framework. In terms of steering ODIS, this translates into being very

aware of potential "capture" by more localised standards or tools that are not mainstream, are relatively new/experimental, or are only understood by a minority of systems in the Federation and its potential partners. A conservative approach is wise in such federations, similar to planning large infrastructures.

Using widely implemented and standardised data exchange approaches - linked to the original vision of the Web - has allowed IODE to build tools such as the ODIS [dashboard](#). These serve a critical function of monitoring the Federation, verifying Node availability, and validating metadata shared by the Nodes. This verification is essential in an era where claims of "FAIR data" are frequent, especially at the high-level, but often unsubstantiated once a closer examination of systems is undertaken. ODIS therefore "ground-truths" interoperability by continually checking the performance and standards compliance of each Node. The ODIS Operations Group (ODIS-Ops) can assist the SG in evaluating changes to the technical architecture that may affect this approach.

Participation in the systems (e.g. OIH) run by the IOC-coordinated ODIS Programme Component, require partners to register in ODISCat, generating a persistent catalogue entry pointing to a sitemap (an everyday Web technology) listing the datasets and digital assets they intend to share. The catalogue approach is flexible, allowing each partner to determine the scope of their shared information. This metadata is then aggregated and visualised in systems such as the ODIS front end, enabling users to explore and analyse the entire Federation's collective digital assets. The approach has been demonstrated effectively by organisations such as the UK's MEDIN, which coordinates input from over 600 organizations through a single national node, and offers an excellent model for NODCs and ADUs.

ODIS also exemplifies the concept of federation-scale mediation, not merely enabling communication among its partner systems, but actively forging connections across federations, such as the bridge being built between ODIS and the WMO WIS2.0. Through shared architectural standards and mediation tools, a prototype to bridge ODIS Nodes to WIS2.0 nodes, and vice versa, is under development. This will increase the value of participating in ODIS, as its components can build solutions that can elevate the discoverability and impact of all Nodes. This collaborative approach aligns with broad web architecture trends, which have also spurred WIS2 in a convergent direction. All technical documentation is maintained in the [ODIS Book](#).

The recently established Operations Group, comprising technical representatives from participating systems, will work alongside the Steering Group. The intention, articulated at IODE 28, is for the Steering Group to focus on high-level direction reflecting the wishes of IOC Member States, while the Operations Group ensures technical feasibility, monitors issues, and translates strategic guidance into practice.

6. Terms of reference for ODIS and the Steering Group

Dr Joanna Post presented the Terms of Reference for ODIS and the ODIS Steering Group.

The terms of reference for ODIS are provided in
Annex B to Recommendation IODE-28/3.4.1.2
Annex 2 to Dec. A-33/3.4.2
Available for easy reference [here](#)

The terms **of Reference for the ODIS Steering Group are provided in**
Annex B to Recommendation IODE-28/3.4.1.2
Annex 2 to Dec. A-33/3.4.2
Available for easy reference here

Dr Post encouraged members to consider whether they would wish to be considered for the Co-chair positions – the role would be to co-chair meetings, to hold meetings with the Secretariat to co-develop the ODIS Work plan and to engage with the operations group. Another part of the role would be stronger cooperation with the WMO through the JCB (Joint Collaboration Board, subgroup on data). There will be a short Steering Group meeting early in January 2026 to confirm the two co-chairs. On 28-29 January 2026, the IODE Management Group meeting will be held, and the ODIS co-chairs would need to attend, hopefully in person.

7. Q & A Session

Discussions covered the following topics:

Clarification of the role of the ODIS Operations Group, also constituted at A-33, and how it will work with the ODIS Steering Group. The Operations Group consists of a technical representative from each of the ODIS nodes and the TOR indicate its role is to support the ODIS SG on feasibility and local constraints of changes to / evolvement of technical aspects of ODIS. The Operations Group must support the ODIS SG in its workplan

Interoperability between WIS 2.0 and ODIS. Documentation is available on the interoperability between the two systems here: A WIS 2.0 Guide is available.

Protecting local knowledge, such as in the Pacific, and whether there is any current focus from ODIS on this. Some work has been carried on for Local Contexts and an approach is drafted to implement biocultural and traditional knowledge labels within the ODIS patterns, and that is expanding to a local working group within the indigenous community on how to assert indigenous provenance. See : https://github.com/iodepo/odis-arch/pull/507

The need to build a better focus in phase two on data sharing and consideration of pathways or technologies to do that. So far this is at theoretical phase. For every metadata record that is shared, it is possible to link to the actual data asset - that would be a direct download link, or an API or a query. The metadata offers the discovery layer and it's up to the node to pre-package data sets according to what they would like to show the global community (similar to schema.org data distribution). ODIS is also issuing release graphs, and those can be used as data objects in and of themselves.

The possibility for ODIS to offer a basic architectural design for NODCs/ ADUs to start setting up a fundamental infrastructure to gain the capability to interoperate and share their data. This was a challenging and interesting part of the first phase where nodes did not have any architecture to start sharing data. ODIS set up guidance for those nodes to start sharing metadata online (https://book.odis.org/tooling/ckan.html). For some of them, even just a Github or Zenodo repository could be linked, without the need for much IT infrastructure. Currently there is no

mapping of how each of the nodes has linked to ODIS. There is also the possibility to provide support, such as encouraging use of ERDAPP.

8. Closing and next meeting

Dr Post explained that the intention would be to meet quarterly, and also for the co-chairs to join the IODE management meeting as mentioned. We also have an in-person IODE committee meeting that would be virtual for next year. She thanked all the Steering Group members and wished them compliments of the season.

A group photograph was taken and the meeting closed after one hour. Photographs were merged from both sessions (see Annex 1).

Annex 1. List of Participants

Peter Teye BUSUMPRAH
Pier Luigi BUTTIGIEG
Sofie DE BAENST
Kristin DE LICHTERVELDE
Douglas FILS
Katarina Lotta FYRBERG
Champika GALLAGE
Jhonny GARCES ORTEGA
Duncan HUME
Tom KRALIDIS
Arno LAMBERT
Adam LEADBETTER
Yulong LIU
Shameelah MAMODE

Joanna POST
Sundar RANGANATHAN
Mark REHBEIN
Lucy SCOTT
Paula SIERRA CORREA
Emanuel SOEDING
Anne-Sophie STE-MARIE
Marte STRØMME
Toru SUZUKI
Elena TEL
Lennert TYBERGHIEN
Abigail URIBE MARTÍNEZ
Colm WALSH
Fangfang WAN