The Global Ocean Observing System

Session 3: Strengthening Data Integration and Delivery

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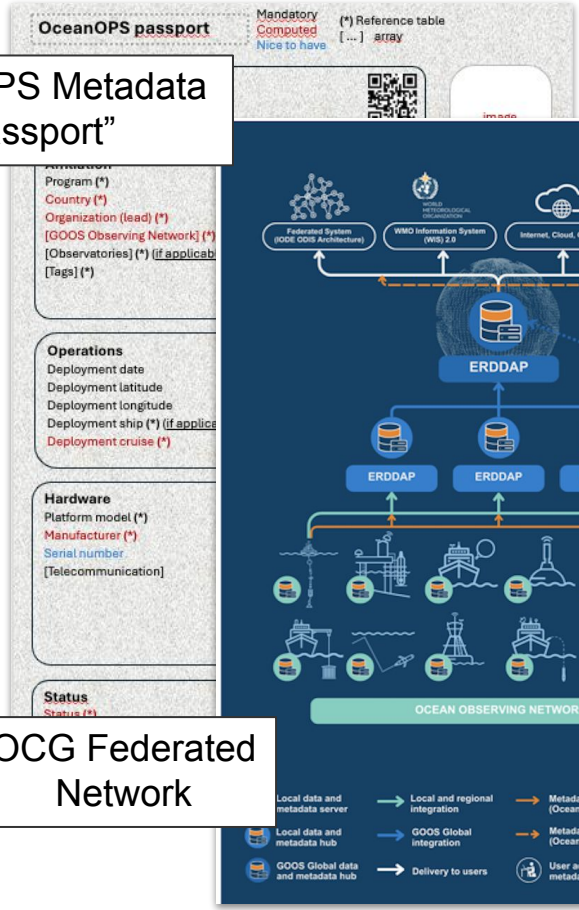
14th GOOS Steering Committee meeting (SC-14) | 19-21 February 2025 | Paris, France

3.2 OCG Implementation plan & Update from the OCG Data Task Team

OCG Data Task Team

- Improve metadata content (minimum required metadata) and flows to OceanOPS
- Ensure metadata specifications meet needed requirements (i.e., WMO/OSCAR, GOOS reporting needs, IOC Data Architecture)
- Identify global data nodes for federation, expand ERDDAP
- Define/agree minimum metadata flow between network data systems, OceanOPS, and external stakeholders (WMO, IODE, etc)

OceanOPS Metadata "Passport"



OCG Federated Network

GOOS OCG Data Hypernode – *Connection to ODIS and IOC Architecture*

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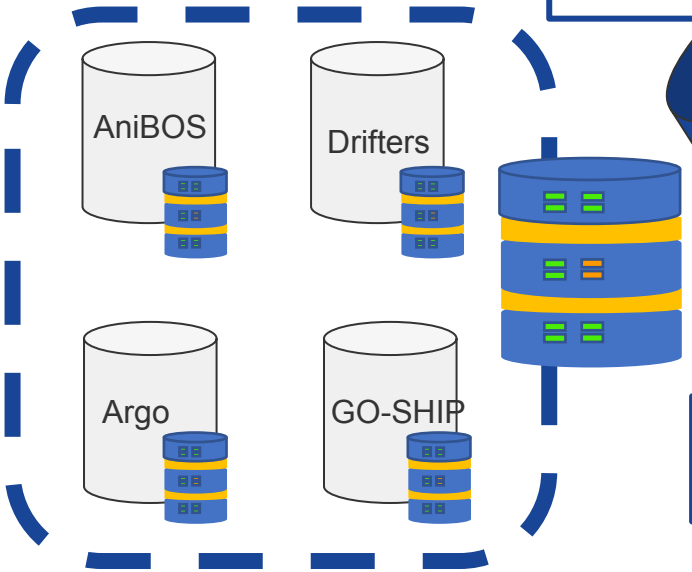
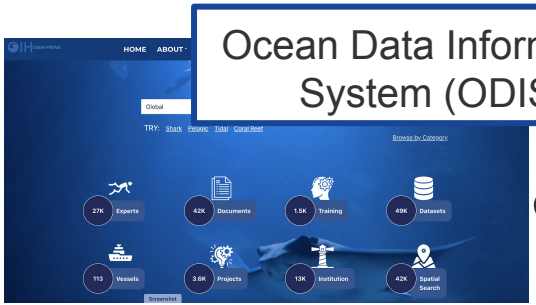


GOOS Federated Data (aka Hypernode)

ODIS Harvest



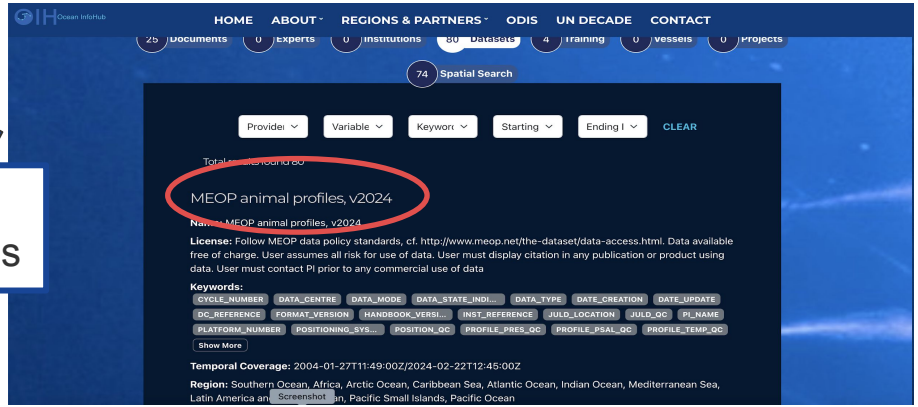
Ocean Data Information System (ODIS)

ODIS Harvest

OceanOPS

User query

Data Access



Existing issues

- Harmonizing metadata concepts across networks is tricky
  - **Some networks provide unique requirements**
- Identifying existing data and metadata endpoints
  - **Integrating these into the OCG Federation**
- Integration into WIS 2
  - **In particular, evolving from GTS → WIS 2 for NRT data exchange**

Next steps

- Survey sent to all OCG Data TT members
  - **Asking for input into or issues with metadata requirements**
  - **Identifying data/metadata endpoints (URLs)**
- Continue building out OCG Federated network
  - **Continue linking/harvesting through ODIS**
- Connect OceanOPS metadata to ODIS and OBIS
- Ensure seamless integration into IOC data architecture being developed

3.3 IOC Data Architecture

Step change… partnership towards a connected & federated digital ecosystem

Recent advances: IODE-GOOS Data Workshop

- FIRST cross IODE-GOOS (IOC) Data Workshop to support data access for the future - looking across disciplines and sections
  - Identify roles and synergies
  - Develop a joint vision
  - Technical solutions identified
  - Coordination & future planning
- GOOS & IODE: OCG, BGC Panel, BioEco Panel, OceanOPS, OBIS. Plus Ocean Decade (data. DCO/DCC), IOC Ocean Science Section and Tsunami Unit
- WMO presented WIS2 and discussed connections to ODIS

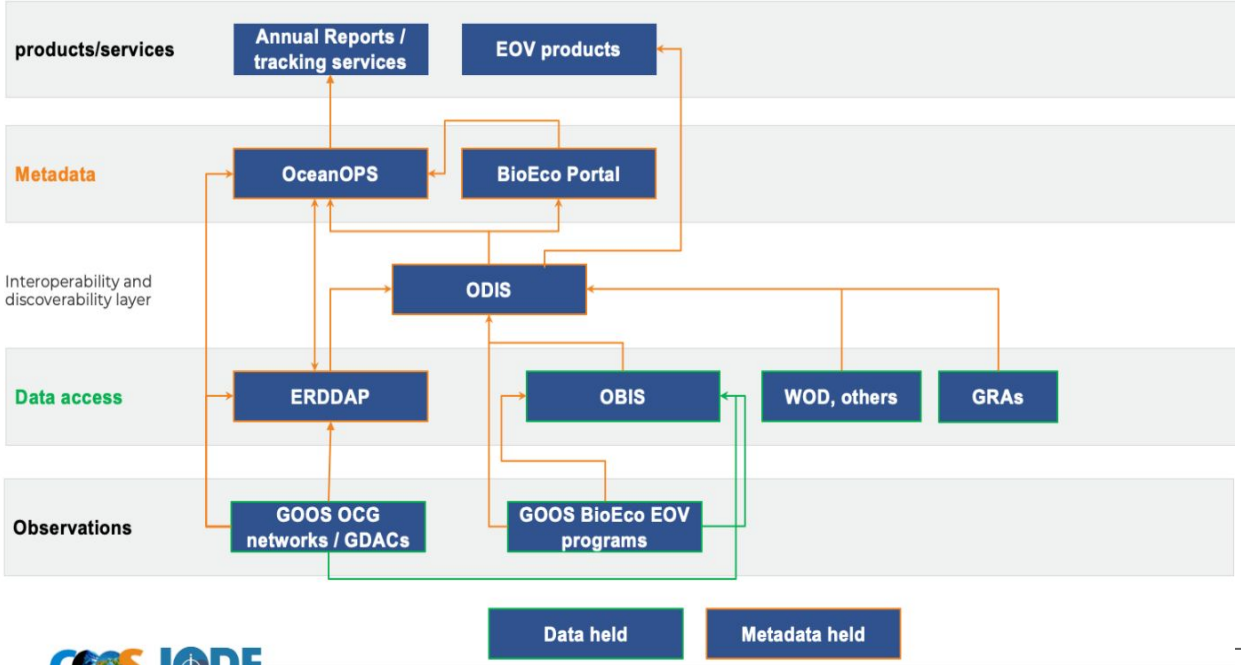
Joint Vision – north star to aim for

Defined a clear niche in the digital ecosystem which is unique to IOC, that is unique, valuable, built on existing infrastructure, and aligned with other (open) architectures

- EOV data of documented quality, following FAIR & CARE principles, available for all
- IOC providing a (federated) gateway to all ocean data, with GOOS certified EOV data clearly identified
- Harnessing the IOC value chain to deliver trusted information to as many as possible
- High value products that deliver EOV data into global assessments and multilateral processes, and that can be traced back to the point of truth (i.e. observations)
- Wherever you are in the world to be able to appropriately access EOV data
- IOC has a clearly defined role in digital ecosystem which is unique and investable
- Help bridge the digital divide and mature digital ecosystems globally

Data Architecture

Agreed IOC Data Architecture – major step forward to harmonise IOC capacities
Based on data virtualisation / data fabric architectural model
- ODIS, EOVs, FAIR & CARE principles, and metadata linked to original source
Form a Working Group and prepare a joint proposal for IOC Assembly June 2025



- GOOS OCG ERDDAP is a Hypernode in ODIS
- OBIS is a Super GDAC for BioEco EOVs and biodiversity data writ large
- GOOS provenance and QC clearly identified
- Harvest and compile EOVs, support creation data products,, e.g. O2 synthesis
- Need provenance and licensing in metadata
- OceanOPS / BioEco Portal will interface for services

- **Meeting Report**

Next Steps

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The meeting agreed on the following.
Short Term Action 1. **Develop a draft proposal for the IOC Data Architecture** that can be presented in draft form for discussion at to the (i); GOOS Steering Committee in February 2025; (ii), the 28th IODE Committee Meeting Data Management in March 2025, and a **final version for submission to the IOC Assembly in Paris in June 2025**

Short term action 2: **Establish and start the work of the IOC Data Architecture Working Group** to devise the proposal for a cross IOC data architecture/space - Vision, Governance, Technical, Unique offer, Advocacy, Capacity, Diversity, Initial deliverables, Resource need, Risk

Short Term Action 3: Work on **short-term practical actions**

Working Group Members

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(c) The meeting agreed on the following initial focal points for the Working Group:

- ODIS- Lucy Scott/Pier Luigi Butttigieg
- OBIS/BioEco - Ward Appeltans/Pieter Provoost
- OCG/OceanOPS - Kevin O'Brien/Mathieu Belbeoch
- GOOS general - Emma Heslop/Joanna Post
- SDG 14.3.1/Science - Katherina Schoo/Kirsten Isensee
- GOOS BGC/IOCCP - Veronique Garcon/Nico Lange
- IODE general - Peter Pissierssens/Lotta Fyrberg
- DCC/DCOs Infrastructure - Terry McConnell, Enrique Alvarez, Adam Leadbetter

First meeting Feb 11: extend invitation to IOC Marine Spatial Planning, IWLearn, industry (Decade corporate data group), and Tsunami (again)

Next Steps

JAN/FEB 2025

IOC Officers
WG Formed
Support hired
GOOS SC
presentation

MAR/APR 2025

IODE Committee
presentation
Proposal
preparation

JUNE 2025

IOC Assembly
Joint session
Proposal and
Decision

2025 - 2026

Implementation
Phases with MVP

- Consultancy to be hired in the next 1-2 weeks - support writing proposal (IODE-GOOS)
- Agenda item GOOS SC (now) and IODE-28 March
- IOC Assembly 33 June 2025 - joint GOOS-IODE agenda item - scheduled Friday 27 June 3.4.3 IOC Data Architecture

Issues, Risks & Discussion

Global Ocean Observing System 2030 Strategy

Goal 2: System integration and delivery, provide authoritative guidance on integrated observing system design, sustain, strengthen and expand observing system implementation, and ensure FAIR data

SO7. Ensure GOOS ocean observing data and information are FAIR with appropriate quality and latency

Outcomes foreseen:

- An identified GOOS data architecture as part of broader oceanographic, atmospheric, earth system data architectures
- Data products based on EOVs/ECVs
- More data available, more appropriately, to more users
- Meaningful data metrics

Existing issues

- Adequate Resourcing
- Integration with WIS 2 for operational data flows

Risks

- Inaction – things are moving quickly and we need to respond in order to be in a position to open up GOOS data flows
- Resource reallocation/loss with shifting national priorities
- Support beyond the IOC Assembly (4 month contract)
- Product development requires new ‘product development’ skills

Considerations for the SC

- Identify the key outcomes of this work for GOOS and its stakeholders, and any missing elements/aspects in the planning
- Identify support for the work of OCG, BioEco and BGC Panels in this area as a priority towards the IOC Data Architecture
- Consider what additional resource BGC Panel/IOCCP will require to implement the GOOS Carbon and GHG plan associated with data products (ensure these are considered in the Carbon Plan outline)
- Facilitate and support a deeper engagement between OCG, BioEco Panel and OBIS to align data workflows and enable interoperability of the systems and metrics

Considerations for the SC

- Development of key GOOS network and community best practices is slow. If GOOS wants best practices, we will need to address incentives

- Best Practices endorsement is being opened up to other institutions GOOS should remain vigilant that the identity of what an endorsed best practice represents is not diluted in the OBPS

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Thank you

goosocean.org

unesco
Intergovernmental Oceanographic Commission

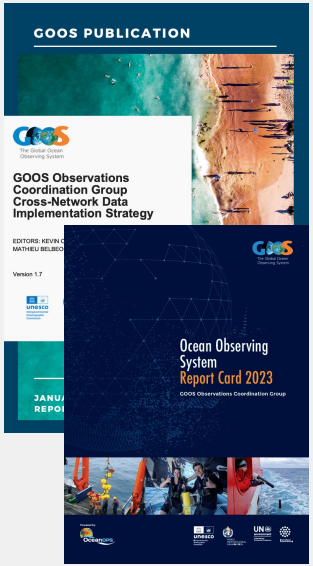
WORLD METEOROLOGICAL ORGANIZATION

UN environment programme

International Science Council

Developments – building blocks - since 2019

GOOS Observations Coordination Group (OCG)



- OCG network data mapping
- OCG Data Implementation Strategy
- WMO unified Data Policy - EOVs
- Report Card – cross GOOS
- Best practices documented

GOOS Biology and Ecosystems Expert Panel

- BioEco Portal launched
- BIoEco network data flows integrated with OBIS
- Best practices documented

OBIS
OCEAN BIOGEOGRAPHIC INFORMATION SYSTEM

GOOS Biogeochemistry Expert Panel

- BGC Panel working towards BGC value chains (not stable) GDAC and products
- Best practices documented

- **Not integrated cross discipline, sustained or trackable**
- **Not working towards a shared vision**